Falling Apart or Flocking Together?

Financial Crises, Inequality and Left-Right Polarization in the OECD

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According to the conventional wisdom, political polarization has been growing in the past few decades, and increasing inequality and financial crises have fuelled this trend. Making use of new measures and differentiating between parliamentary and electoral polarization across the left-right cleavage, this article offers a comparative evaluation of this claim for the OECD countries. The results show that the electorates in the European Union have become more conflictive, while the political parties represented in the national parliaments have moved in opposite direction. The statistical analysis demonstrates in line with the theoretical expectations that currency crises have increased mass polarization. The article also offers some tentative support for the hypothesis that increased levels of income inequality enhance this trend and that growing elite discord increases the left-right confrontation in the electorate.

Keywords
Political polarization – Cleavage – Left-Right – Manifesto – Eurobarometer – Financial Crises

Paper prepared for presentation at the virtual annual meeting of the American Political Science Association, September 9-13, 2020. The authors acknowledge superb research assistance by Mark Kapteina, Mario-Konstantin Pless, Frederike Rübsam, and Sabrina Thillmann as well as funding by the Deutsche Forschungsgemeinschaft (DFG - German Research Foundation) under the Excellence Strategy of the German federal and state governments – EXC-2035/1 – 390681379.

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Introduction

Political theorists have maintained for a long time that political polarization is a key problem for governance. In the 19th century, both Marx (1931 [1867]) and De Tocqueville (1857) contended that a revolution becomes more likely if the workers start to organize themselves politically and if their economic situation does not improve in line with the welfare of capitalists. The end of the Weimar republic (Bracher 1955, Winkler 1994), the Russian revolution (Rosenberg and Koenker 1987), and other collapses of political order have been traced back to raising political antagonism.

More recently, McCarty et al. (2003, 2015) have noticed that economic inequality and political polarization have increased dramatically across the United States since the 1980s. Duca and Saving (2016) have shown in an econometric analysis that changes in inequality precede the changes in economic polarization in the U.S. although there is also some evidence for a reciprocal effect. Kuhn et al. (2020) and others have shown additionally that wealth inequality has grown after the collapse of the Lehmann Brothers, a result that is also observable for currency crises in the developed world (Rübsam and Schneider 2020). The experience from the Great Recession and especially the Great Depression thus suggests that major financial crises should increase the confrontation between the left and right.

We do, however, not know whether and to which extent these trends and patterns can also be found in other countries. Recent research has shown that political polarization has not been growing necessarily across all states, but that economic downturns fuel the political antagonisms. This article adds to this emerging literature through an examination of mass and elite polarization across the developed world. We examine whether the U.S. trends are also observable in other countries and what type of financial crises increase political polarization. In addition, we study whether inequality has an impact on the two measures of political polarization. Finally, we study the extent to which mass and elite polarization are interrelated.

The theoretical framework that we develop stresses the distributive consequences of financial crises. We therefore expect that especially currency crises and sharp depreciations frequently linked to them heighten the distributional conflict within a country and increase the confrontation between the political left and right within a country. Polarization should in this perspective further increase if the level of economic inequality is already high in a country. Our model suggests that especially mass polarization should grow in times of economic crises, but that more intensive elite polarization also feeds into this process.

The empirical analysis makes usage of the polarization measures that Esteban and Ray (1994, see also Duclos et al. 2004) have introduced. Relying on preference data to estimate the extent of the left-right confrontation in a country, we employ two of the most widely used political science databases, an updated version of the Manifesto data set (Budge et al. 2001) and the Eurobarometer surveys. While the former source is used to estimate the polarization in the national parliaments, the latter is intended to gauge corresponding values for electoral polarization. We compare the Esteban/Ray indicator to other measures that have been used to estimate political polarization, most notably the Sigelman-Yough (1978) index.

Our analysis shows for the period from 1980 to 2010 for a large part of the developed world that elite and mass polarization have evolved in the aggregate in opposite directions. While mass polarization has increased in the average European Union member state, elite

polarization has decreased. However, both mass and elite polarization react in line with our theoretical framework to financial crises and economic inequality.

Theorizing the Link between Crises, Inequality, and Polarization

Contending Theories of Political Polarization: Polarization belongs to the concepts that have an intuitive appeal, but that have, by and large, escaped a clear definition. Linz (1978, p. 44) defined political polarization as a "strong centrifugal tendency on the part of all participants and the fragmentation of parties" and wrote: "The immediate result is deep personal antagonism between parties and the impossibility of forming a broad, shifting center coalition against extremists on both sides of the spectrum". Similarly, Sartori (1979) warned that the failure of political elites to restrain the centrifugal tendencies inherent in political competition will lead to a breakdown of democracies. His classic typology distinguished between four types of party systems in which the polarized variant shows the most damaging forms of political competition.[1]

This article borrows from the literature on socio-economic polarization pioneered by Duclos et al. (2004) and Esteban & Ray (1994). The main motivation for their axiomatic measure is that standard inequality measures do not adequately capture the divisions within a society. Their polarization index takes the income of competing groups, their cohesiveness, and the interrelationship between these two factors into account. We define political polarization as the extent to which political groups develop cohesive ideological positions, but use this identity to distance themselves from their competitors.

The main motivation for their axiomatic measure is that standard inequality measures do not necessarily reflect the tensions within a society adequately. The main limitation of inequality measures, of which the Gini index is the most frequently applied one, is their insensitivity to group considerations.[2] Both intergroup ideological conflict and intra-group cohesion are important topics in comparative politics. The cleavages that structure the political debates within a country have been systematically examined following Lipset and Rokkan's pathbreaking study on party systems. They famously stated that social "cleavages do not translate themselves into party oppositions as a matter of course" (Lipset and Rokkan, 1967, p. 112). They particularly advanced the "freezing" hypothesis according to which the party system of the 1960s reflects the social conflicts of the beginning of the 20th century.

As Sartori (1979), Zielinski (2002) and many others have remarked, the theory of social cleavages is rather unspecific about the conditions under which a cleavage is activated and political conflict grows and diminishes. Yet, the cleavage structure in Western democracies has remained remarkably stable. Bartolini and Mair (1990) have shown in their longitudinal study that party system and electoral preferences have stabilized over the years; electoral volatility was lower after World War II than in the inter-war years.

[1] Although the Sartori's classification of party systems is still highly influential, its polarization ideal type is of limited usefulness in the empirical realm. Relying on the Sigelman and Yough (1978) polarization measure that we will discuss below, Pennings (1998, p. 87) concludes for the 1980s that "…the degree of polarization per system was exactly opposite to what one would expect on the basis of Sartori's typology". He particularly finds that two-party systems were moving towards more polarization in this period.

[2] Esteban and Ray (1994) illustrate this problem with several examples, showing that a uniform distribution of income across a ten-point continuum is as unequal as a society in which only two identically resourceful groups are positioned on points 3 and 8. More generally, inequality measures fail to distinguish between a convergence toward the global and a clustering effect around the local group means.

The most prominent dimension of conflict in the industrialized world is arguably still the division of parties and voters along the left-right continuum[3]. Political conflict along the left-right dimension has according to Lipset and Rokkan (1967) its main roots in the workers versus owners-cleavage that originated from the industrial revolution . Nieuwbeerta and Graaf (1999) show that the importance of class voting has only slightly diminished between 1980 and 1990 in twenty industrialized countries. Evans (1999, p. 333) concludes that "Controlling for over-time changes in relevant characteristics …does not alter class-vote patterns, or the centrality of class as a source of attitudes towards key issues such as inequality and redistribution". Goldthorpe (2002, p. 19) rejects claims that "other forms of social cleavage are superseding class as a basis of social identity."

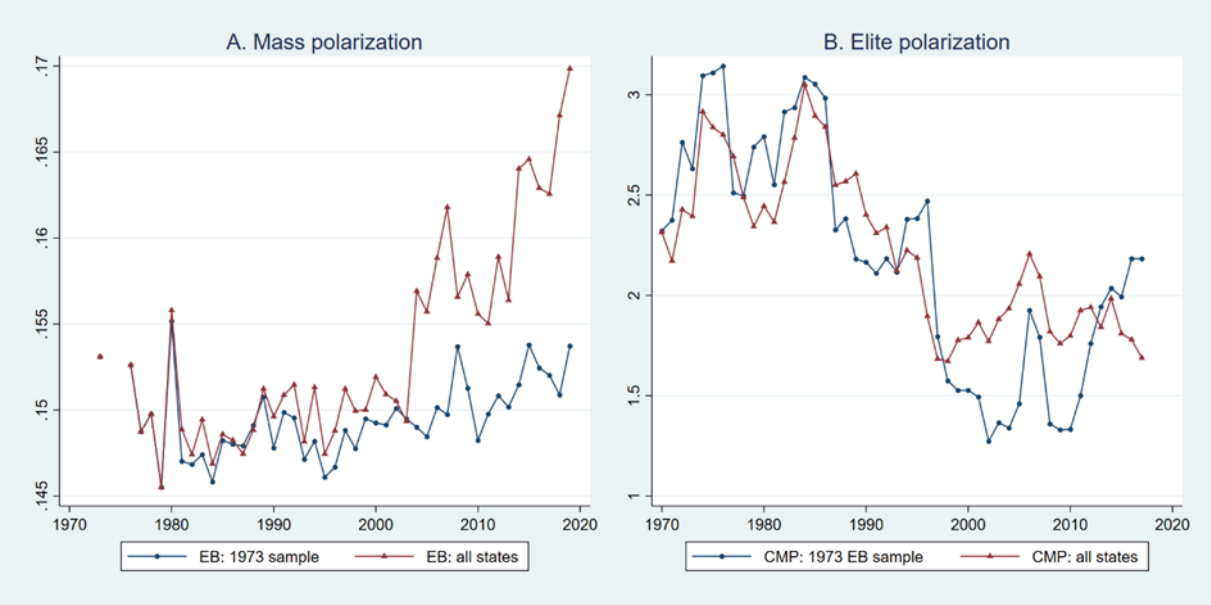
This view has not remained uncontested. Franklin et al. (2009) conclude, most fundamentally, that class voting is no longer important in advanced economies. The decline of the social democratic parties across the OECD has altered the identity of those who occupy the traditional left-right positions, but the left-right dimension remains a key cleavage in advanced economies. Benedetto et al. (2020) show that a decline of the industrial sector and lower government spending are associated with reduced support for social democratic parties in the developed world – a development that is especially noteable in the new era of globalization. Oesch and Rennwald (2018) note that the rise of the radical right in Western Europe has created a tripolar system between the traditional left and right and the extremist newcomers.

Although globalization and the Great Recession have added new cleavages to the political contestation in the industrialized world (Kriesi et al. 2008, 2012), the left-right antagonism remains a key element of electoral competition. In the United States, this conflict has become especially pronounced among political elites. McCarty et al. (2003, p. 4) observe that the political polarization has reached unprecedented heights since the 1980s. Especially elite polarization has been shown to follow a U-shaped pattern with a strong acceleration since the mid-1970s (see also McCarty, 2019). Although the electorate is less strongly divided along party lines, there is increased ideological self-sorting and 'affective polarization' of the general public. Self-sorting refers to the tendency of the liberal-conservative and democrat-republican dimensions to align more strongly. McCarty (2019) contends that "…the expressed policy preferences of voters are increasingly associated with their partisan identifications (PID). If we know the PID of a voter today, we can much better predict her positions on economic policy, abortion, guns, and a whole host of other issues. A generation ago this would not have been the case." (p. 50). Boxell et al. (2020) analyze affective polarization in the OECD during 1975-2017 using survey data and assert that while the US is clearly the leader, Canada, New Zealand and Switzerland have faced heating of the interparty divisions, too (p. 2)

[3] Robertson (2006) also insists on the unidimensionality of political space and states that "…we should expect the occasions when more than one is effective to be almost pathological." (p. 174). However, several recent studies also scrutinize other aspects, which define the strained relations among competing groups (see e.g. Hutter et al., 2018; Draca and Schwarz, 2018). Our choice of dimensions is also based upon the data availability and potential generalizability of the outcomes of the current analysis. While the inherent European ideational (region-dependent) plurality is a promising safety catch to guard us against extreme group polarization (for instance, Graham and Svolik, 2020 show for the US that party ties quite often override the importance of democratic principles providing a blank check for politicians), it makes at the same time the European landscape less amenable to the large-N analysis. Therefore, in this study we will concentrate only on the most important and visible left-right dimension. Its validity will be apparently increasing with higher issue alignment over this cleavage (which we can rightfully expect during the years of economic distress).

This begs the question whether or not similar trends can be observed in other advanced economies. The descriptive evidence that we present in Figure 1 shows that political polarization measured through the Esteban and Ray index has been growing in the OECD world mainly among the electorates and not among the political elites. As we have public opinion data only for Europe, the examined Eurobarometer data shows that this increase is largely due to the growing confrontation between the left and the right in the Eastern and Central European states that joined the European Union in 2004, 2007 and 2013. The corresponding Esteban and Ray index for parties shows that political polarization along the left-right divide has been falling since the the 1980s, but has started to rise again in the years following the Eurozone crisis. However, it has not reached the level it had in the waning decade of the Cold War.

Figure 1. Level of polarization among electorates (panel A) and among political parties.



Note: The analysis relies on data taken from the Eurobarometer and Comparative Manifesto project (panel B). The blue lines represent the data for the member states of the European Union (Community) in 1973, the red line all the states for which data exists.

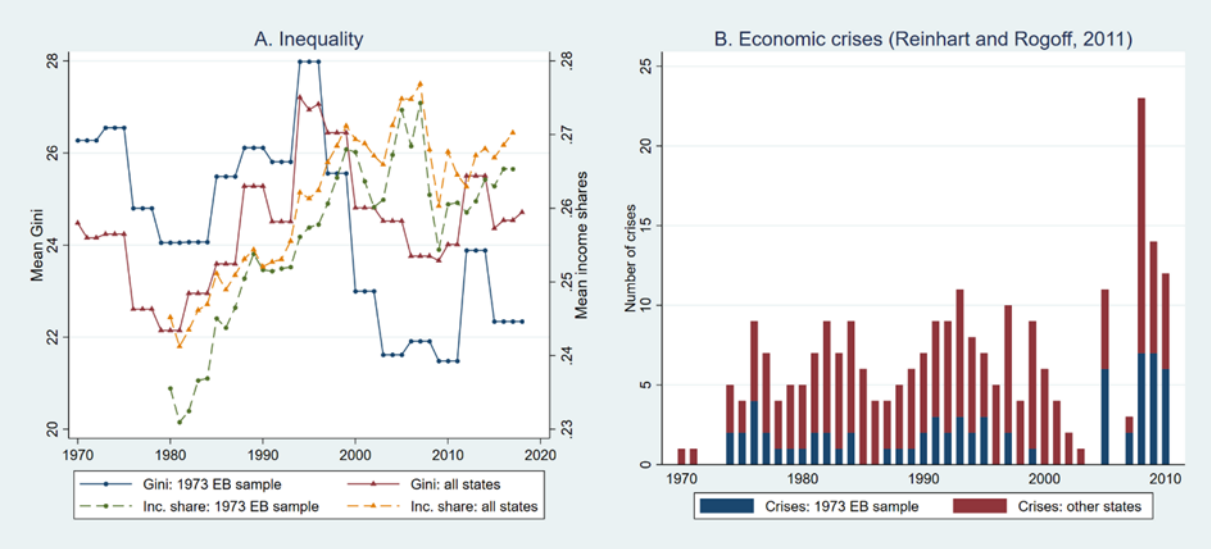
Drivers of polarization: Mainly socio-economic and institutionalist explanations have been advanced to account for the variation on the left-right dimension across time and space. In this article, we mainly focus on two key variables – the incidence of financial crises and inequality – that the recent literature has used to explain the rise of populism and vote share of the extreme right in the aftermath of the downfall of the Lehman Brothers.

Figure 2 shows how these two potential drivers of left-right polarization have evolved over time. Panel A documents the income and wealth inequality have evolved over time: In the current version of the paper we are working only with income inequality operationalized either via Gini indices or top 10% income shares. . As an increasing number of studies has show, wealth inequality has grown dramatically in the last few decades. The inequities have dropped in the starting years of the Great Recession, but has rebounded shortly afterwars again. Income inequality, conversely, has fallen among the 1973 member states of the European Union

(Community), but has increased in the entire sample of developed democracies studied in this paper. As we have more detailed information for income inequality, the empirical analysis will focus on this dimension. [4]

Panel 2B documents that the number of financial crises has grown during the past few decades. While around 5 countries experienced a financial crises across the OECD per year, the number of crises years has doubled after the onset of the Great Recession.

Figure 2: Economic inequality and financial crises in the developed democracies



Note: Data on economic crises are taken from Reinhart and Rogoff (2011) and will be updated to 2019.

Several studies have examined the link between economic crises and polarization. Mian et al. (2014) provides evidence that in the aftermath of financial crises governments tend to become less popular, opposition forces gain leverage (and are then less likely to introduce reforms) and voters become more dispersed ideologically. Inflation, debt and banking crises have the most pronounced effects. Funke et al. (2016) find in a study covering more than one century that the number of parties in the parliament and fractionalization tend to rise after a banking crisis. Pelizzo and Babones (2007) add case study evidence on how - economic downturns in the Weimar Republic, the French 4th Republic (1945-1956) and the Italian 1st Republic (1963-1987) have increased elite polarization and unleashed political crises. Steiner and Martin (2012) examine 24 developed democracies between 1950 and 2005 and contend that deeper economic integration decreases party polarization. According to them, neither population size nor the level of economic development seem to polarize elites.

However, the relationship between crises and polarization is not as straightforward as it seems at first sight. Kriesi (2012) argues that economic voting in the immediate wake of the crisis was one of the major mechanisms for punishing the incumbents without "…a systemic pattern of swings to the left or to the right." (p. 519). More generally, if the "…simply confused and disengaged" (McCarty, 2019, p. 67) electorate moves to the center due to the crisis-related

[4] The correlation between the two indicators of economic inequality is 0.45.

uncertainty, left-right polarization could go down[5]. Lima and Artiles (2018) also indicate using the European Social Survey data that while Eastern Europe has shifted to the right in the post-austerity world, Southern Europe (Greece, Spain and Portugal) went mostly to the left.

While post-crisis positional shifts among the general public might be to a large extent explained by the expression of disagreement vis-a-vis the ruling elites, we should not downplay the role of economic costs. In particular, economic crises can have signicant redistributive consequences and generate outright *winners* and *losers*.[6] This cost mechanism will motivate people to update their stances and take either *pro*- or *anti*-market positions after a crisis has occurred. Therefore, we contend that economic shocks, subsequent disintegration and acrimonius negotiations about the possible (easy) way out should increase polarization of both the general public and party platforms:

H1A: Financial crises increase public and elite left-right polarization.

Financial crises come in different forms, and we do not expect them to exert uniform effects because of their varying distributional consequences. The literature (Laeven & Valencia, 2018; Reinhart & Rogoff, 2011) typically distinguishes banking, currency, debt, and inflation crises. Rübsam and Schneider (2020) show in a related study that currency crises have increased inequality in the OECD world. This is not surprising in light of the economic restructuring that rising import prices and difficulties in servicing foreign currency credits provoke.[7] The losers of such economic shocks can be disproportionally found among the lowly paid. Muraoka and Rosas (2020) come in a comparative study to a similar conclusion: "…our argument depends exclusively on the assumption that left-leaning parties typically take positions on redistribution and market regulation that are consistent with the economic preferences of poorer voters…" (p. 5). Banking crises, by contrast, typically hurt those working in the financial sector and capital owners unless the government "saves" creditors with tax money. Roine et al. (2009) note in this context that "...the outbreak of banking crises is associated with reduced income shares of the rich." (p. 974). Brown (2013) provides a comprehensive overview of the effects of banking crises on households and notes that negative effects are likely to be more pronounced in high-income countries.

H1B: Especially currency crises increase electoral left-right polarization.

Han (2015) and Fenzl (2018) examine how inequality affects political polarization. Han (2015) studies the connection between economic inequality and party polarization and highlights the concept of *permissive* (i.e. proportional representation) and *restrictive* (i.e. majoritarian single-member district) electoral systems. The former activate the inequality-polarization link allowing parties to move to the ideological extremes under more unequal income distributions thus broadening the representation of public interests. Fenzl (2018), conversely, shows that higher income inequality depolarizes party systems. The author also argues that as inequality

[5] Kriesi (2018) shows additionally that support for democracy has grown in Southern and Central Europe after the onset of the Eurozone crisis.

[6] In particular, heterogeneous skill, employment and asset structures of households fuel the automatic redistribution after a given shock event (see Brown, 2013; Kuhn et al., 2020).

[7] "When banking crises unleash currency crises they further lead to sectoral changes in labor demand: Employment in export-oriented sectors (e.g. commodities, agriculture) are boosted, while labor demand in manufacturing sectors that rely on imported inputs decreases." (Brown, 2013, p. 7)

goes up, poor voters participate less in elections (not examined explicitly)[8], which leads to the diminishing vote shares of the left parties and forces them to move to the center. Duca and Saving (2016) show for the U.S. that elite polarization and income inequality coevolve.

McCarty et al. (2003, p. 4) observe in a detailed empirical study an increasing party-income divide in the U.S. electoral landscape: "...we can see that the stratification of partisanship by income has steadily increased over the past 40 years, leading to an increasing cleavage between the parties" (see also McCarty et al., 2015). This trend is, however, not directly driven by increased inequality but rather by growing political polarization. Rosenthal (2004, p. 37) expects that this divide strengthens rather than weakens the retrenchment efforts in social policy: "As long as prosperity continues for voters in the middle to upper segments of the income distribution, we are unlikely to see a major shift in favour of sharply redistributive policies." Muraoka and Rosas (2020) scrutinize the perceived positions of political parties and respective disagreements both among voters and between voters and experts under different levels of inequality using the CSES surveys. The authors conclude that income inequality does not impact perceived party positions per se, but that it significantly exacerbates the distorting pressure of income classes in more unequal societies (p. 8). In other words, in a very inegalitarian environment poorer and richer voters will have biased perceptions of the party system in place (and these misperceptions tend to go in opposite directions) . This finding is a quite important detail in the economy-centered explanation of political polarization that we are pursuing in this study. In particular, if inequality was high before the economy experienced a shock, we should expect a massive (and probably more extreme) correction of the (false) left-right self-placement of the electorate afterwards (irrespective of what has happened to the parties). If this automatic correction coincides with the dissolution of centrist factions (i.e. fringe groups do not dissolve and become moderates at once), polarization will escalate.

> *H2A*: High income inequality is associated with higher public and elite left-right polarization.
> *H2B*: Economic crises in highly unequal societies are associated with higher public and elite left-right polarization.

Political and institutional explanations: Additional hypotheses can be derived from a rich literature, which has its roots in Duverger's law, the spatial theory of voting and Sartori's (1979) seminal contribution to our understanding of party systems. The general conclusion of the political economy contributions is that electoral rules in conjunction with the preference distribution of the decision makers importantly affect the centrifugal tendencies under which a society might suffer. Although he did not explicitly draw on the formal theory of politics, Sartori (1979) similarly expected that party system fragmentation and the distance between the contending forces largely determine the degree of polarization within a political system.

The canonical starting point for any inquiry into the interplay between parties, voters and electoral institutions is still Downs' "An Economic Theory of Democracy". It is by now a well-established finding that party competition in a multidimensional issue space violates the Downsian prediction that parties will converge to the position of the median voter. Yet, parties

[8] Bonica et al. (2013) write for the US context: "Turnout for the 2010 midterm election decreased only slightly from levels in 2008 for top incomes but decreased substantially for those with household incomes below $15,000 so that only about one-third of that group reported voting." (p. 111).

converge to extreme positions in a multidimensional space. Merrill and Adams (see also Adams et al., 2009, p. 60; 2002, p. 288) expect in this vein that "the more extreme the position of a candidate's partisan, the more extreme the candidate's optimal position". Adams et al. (2004) provide empirical evidence that party positioning largely responds to unfavourable shifting public opinion away from previous stances. This could also mean that government opposition polarization is a function of an increasing policy divergence across voters. Similarly, Ezrow (2007) based on the Eurobarometer surveys (1976-1998) and CMP data on party positions for 62 elections in 12 developed countries finds that "…shifts in party system dispersion systematically vary in the same direction as shifts in voter dispersion." (p. 188).

Warwick (2004) observes that parties are often more extreme than their supporters. He demonstrates that neither the Downsian model nor the related directionality theory can account for these differences. Faul-Oller et al. (2003) show formally that the strategic nomination of candidates might be a reason for what they call the 'polarization of platforms'. Polarization occurs especially in situations in which both parties chose radical candidates. Bischof and Wagner (2019) strongly argue that once a more extreme party enters parliament, voters polarize (and this causality is unidirectional). In particular, the authors assume that once radical-right challengers obtain seats, a surge of discontent and resistance among the opposing voters (backlash effect) and cheers among their supporters (legitimization effect) will galvanize the society in question increasing ideological dispersion in the general public. It is important to note, that radical-right entries into national parliaments are perceived as one-time events. Interestingly, neither the lagged party system polarization (operationalized via standard deviations of RILE scores from the Comparative Manifesto Project) nor the effective number of parties (based on the seats in parliament from the CMP) seem to exert any statistically significant influence on the public ideological dispersion (p. 898). More generally, we should, however, remember that variance as a measure of dispersion does not necesserily increase in the process of formation of distinct ideological groups albeit being responsive to their extremity.

Political polarization differs also across political systems, as Cox' (1990, 1997) pioneering work on electoral rules shows. Differentiating between systems with cumulative and non-cumulative voting, he identifies three 'centrifugal' and 'centripetal' incentives for candidates or parties that take an ideological positions in order to gain elections: "…ideological dispersion and minority representation can be promoted by (1) decreasing the number of votes per voter; (2) allowing partial abstention; and (3) increasing district magnitude" Cox (1990, p. 927). A case study by Adams (1996, p. 141) confirms that parties are more ideologically dispersed in legislatures that are elected through a multi-member rather than a single-member district system: "…parties under multi-member districts will be ideologically diverse, which may undermine the ability of party leaders to build coalitions and enforce bargains." Schmitt and Franzmann (2020) provide a thorough review of the existing scholarship on the elite and public polarization (defined via variance estimates) and then empirically examine multiple theoretical mechanisms which could link these phenomena[9]. While the elite polarization tends to positively respond to institutional (type of the electoral system) and competition (ENP, centrist cabinet, opposition strength) parameters, no effects have been documented for the variance of the left-right self-placement of voters[10] (pp. 83-84). However, public left-right

[9] "To explain polarisation, we must explain how the sum of actors' calculi within party competition leads to an overall dynamic." (p. 67).

[10] Even though statistically significant correlations exist for voters' party identification and satisfaction with democracy (p. 84).

dispersion has been found to dovetail with higher *perceived* party polarization (i.e. drawing upon the party positions *as seen by voters in CSES surveys* and *not by CMP coders*). Empirically we test the following hypothesis:

> *H3*: Higher public left-right polarization is associated with higher elite left-right polarization.

As Neto and Cox (1997) show in an evaluation of Duverger's law, the institutionalist and the sociological interpretations are not mutually exclusive. The same is obviously the case for political polarization which can result from both socio-economic cleavages and electoral institutions (Schneider & Wiesehomeier, 2008). One peculiarity of the previous research on the economic and institutional determinants of both public and elite polarization is the lack of coherency when defining polarization. As a consequence, it is conceptually quite complicated to be able to generalize the results of multiple studies to form a unified framework. In this article we will try to shed some light on the interactions between an economy and its inhabitants, while sticking to the axiomatic polarization parameter of Esteban and Ray (with known properties and behaviour).

Research design, data and results

Operationalization of polarization and methodology: This paper examines whether financial crises, economic inequality or their interaction increases the level of left-right contestation in the developed world and whether elite polarization increases mass polarization.

An updated version of the Manifesto data set (Krause et al., 2019; Volkens et al., 2019) is used to calculate parliamentary polarization among parties on the general left-right dimension. The manifesto data set is based on the content analysis of party platforms in each election after World War II in a sample of countries that, by and large, correspond to the OECD member states. The measures refer to the frequency with which the major political parties addressed and qualified specific policy areas and measures. The polarization scale employs the items that the Manifesto project has qualified as left-right issues[11].

The second dataset is the updated version of the Eurobarometer trend file (Schmitt et al., 2008), which has been manually constructed to ensure the consistent and continuous coverage of left-right self-identification of voters for as many countries as possible. In particular, we have combined the Mannheim Eurobarometer Trend File (Schmitt et al., 2008) (covering years 1970-2002 and surveys ECS70-EB51.1 and EB52.0-57.2) with 95 subsequent individual Eurobarometers (covering years 2002-2019 and surveys from EB58.0 to EB92.1).[12] One subtle limitation to the internal validity of this information source is that in different countries the left-right question might theoretically have slightly different substantive

[11] We use the RILE scores that measure the difference between the shares of left- and right-wing issues in individual party manifestos on a scale ranging from -100 (left) to 100 (right). To make all values positive, we have added 100 to each observation.

[12] In total, 121 Eurobarometer surveys have been conducted between 2002 and 2019. However, only 95 of them have been selected since not all of them include the ideological self-placement. In the combined Eurobarometer series there are 37 countries and the data spans from 1973 to 2019 (3610 country-surveys and 873 country-years). The largest number of surveys (173) is available for Belgium, Denmark, France, Germany, Ireland, Italy, Luxembourg, the Netherlands and United Kingdom. Such discrepancy between the number of country-surveys and country-years is driven by the fact that in many cases there are up to eight surveys per single country-year (as e.g. for Belgium in 2017).

interpretations by the respondents. This should not be a major concern, however, as long as this variable captures a meaningful cleavage within a given society (i.e. whether respondents consistently map the major divisions onto this scale).

One of the problems in the study of political polarization is the multitude of operational definitions of this concept. In some applications, it is simply indiscriminately used as a synonym for political conflict (Esteban & Schneider, 2008). Most studies that deal with political polarization in an active manner refer to range-based measures. Volkens (1994) uses, for instance, the range of the ideological positions of the competing parties as an indicator of what she refers to as polarization:

$$Pol - DMAX = |x_L - x_R| \quad (1)$$

where x_L is the position of the most leftist and x_R the position of the most right-wing party. The problem with the range as a polarization measure is that it does not weigh the power of the groups and their relative coherence. A situation is which an extreme leftist party with many parliamentary seats or voters confronts a marginal right-wing party take the extreme positions is treated in the same manner as a constellation with two equally powerful extremist parties. Furthermore, the range as a measure of polarization does not take into account that the sway of competing groups is not simply given. As probably any intuitive understanding of the term suggests, polarization of a society should be growing with the intensity of group-identification or, more technically speaking, with a decreasing variance of group member preferences.

Sigelman and Yough's (1978) influential measure of ideological polarization corrects the deficiency related to left-right positions of parties. The SY indicator represents the weighted variance of the party positions; it, therefore, weighs the distance of the parties from the mean on a left-right scale with their electoral stength according to the following formula (p. 357):

$$Pol - SY = \sum_{i=1}^{N} v_i \, (x_i - \bar{x})^2 \quad (2)$$

In equation (2), v_i is the percentage of votes won by each party in the last election, x_i its left-right score and $\bar{x}$ the mean position of the whole parliament on the left-right continuum. In our analysis we will rely on the seat shares instead (i.e. to directly account for the potential political pressure to be exerted on competitors). The weighted variance is, however, not completely adequate in many applications as a measure of polarization as it considers parties to be unitary actors. Intuitively, if a coherent right-wing government faces an equally homogeneous left-wing opposition, polarization should be high. In the event that one or both of the competing camps are fragmented, polarization should be lower. Consider the following example for three groups with positions 1, 8 and 10 on the 1-10 scale and relative sizes of 60%, 20% and 20% of the electorate respectively. If the two right-wing groups decide to form a coalition with position 9 and size 40%, the weighted variance naturally goes down although political polarization should have increased with the emergence of a unified radical right group.

The Esteban-Ray measure corrects for these counter-intuitive implications through the combination of information on intra-group homogeneity and inter-group distance. As Duclos et al. (2004, p. 1737) write: "…polarization is related to the alienation that individuals and groups feel from one another, but such alienation is fuelled by notions of within-group identity." This leads to the indicator that sums up 'all effective antagonisms within a society' (Esteban and Ray, 1994, pp. 831–834):

$$Pol - ER = K \sum_{i=1}^{N} \sum_{j=1}^{N} \pi_i^{\alpha+1} \pi_j |y_i - y_j| \quad (3)$$

where $\alpha \in (0, \alpha^*], \alpha^* \approx 1.6$ (Esteban and Ray, 1994, p. 834) is an identification parameter, y_i and y_j are means of the group positions[13], π_i and π_j represent relative group sizes[14] and $K > 0$ is some constant (in our case $K = 0.5$ as in the Ginis). We will choose $\alpha = 1$ as the baseline specification.[15] The parameter α is the key ingredient in this index, since it *upweighs* the group shares. Hence, the estimate departs from the conventional Gini measure (with $\alpha = 0$)[16]. In the Eurobarometer setting, this index is minimized for a uniform distribution and maximized when the population mass is equally distributed between the far-left (i.e. 1) and far-right (i.e. 10) camps. Its sound axiomatic basis and ability to capture not only the relative size of competing groups (fractionalization), but also to factor in the ideological distance among them (diversity and extemism) makes it superior over alternatives.

The polarization parameters discussed above will be computed for both elites and the general public. In addition to this, we will also use the effective number of parties to describe the elite level fractionalization. The effective number of parties (Laakso & Taagepera, 1979, p. 4) accounts for the relative group size:

$$Pol - ENP = \frac{1}{\sum_{i=1}^{N} \pi_i^2} \quad (4)$$

π_i indicates the vote- (or seat) share of a party $i = 1, \ldots, N$. The ENP measure increases with the number of competing groups. Therefore, it will be maximized for multiparty highly heterogeneous political systems (e.g. Belgium).

We will use the log-transformed versions of polarization indices and rely on percentage interpretation of coefficients. The estimation procedure will be based upon OLS framework with robust standard errors clustered on the country level. All model specifications include either one- or two-way fixed effects (FE). While country-specific fixed effects will control for time-invariant institutional and cultural characteristics, year dummies will control for time varying factors common for all countries (e.g. consider trade and financial liberalization, increased capital and labour mobility or economic hardships which might not have resulted in the crisis being recorded for a particular country but have still exerted their informational impact

[13] Given the nature of the Eurobarometer data, we already have pre-defined groups. However, if one works with political parties or even single candidates, the Esteban and Ray polarization index is easily adjustable. For instance, Clark (2009) states that in his study of the US Supreme Court "…a group is either a single justice or more than one justice with the same ideal point." (p. 148).

[14] Population shares in Eurobaromater surveys have been calculated based on the sums of weights of each observation (i.e. not the number of observations, since the Eurobarometer surveys generally use fixed-size samples for each country, which does not always fully correspond to the underlying populations). This index was then averaged over surveys within country-years.

[15] Indridason (2011) assumes for the case of coalition formation in parliaments that "…the degree of polarization sensitivity is in the centre of the permissible values of α (1.3)." (p. 705). Han (2015) follows the author and also sets α = 1.3 for measuring polarization in various party systems.

[16] Please note that in the current application of the Esteban and Ray (1994) polarization index we have not divided country-year left-right distributions by the corresponding mean values. If one sets α=0 and K = 0.5, then the index applied to the left-right mean-standardized positions turns into the *relative* Gini coefficient. However, if the left-right positions are not divided by the within country-year mean values, we get an *absolute* Gini. When working with the 1-10 left-right distributions we are primarily interested in the *absolute* (not *relative*) distances between the competing groups.

on the national left-right landscapes). The non-random nature of our sample and possible correlations between unobserved time-invariant effects and explanatory variables make FE a more conservative estimation strategy.

One peculiar feature of the data investigated is the mix of country-year and country-election observations. The usage of different time periods becomes mandatory through our definition of elite polarization where the number of seats remains roughly constant betweeen ballots and where the manifestos do not change either. One choice among the possible patchwork of strategies could be to use fixed time windows (e.g. 5- or 10-year terms). However, there is no guarantee that the chosen window will be appropriate and well-aligned with the actual country-specific elections. Therefore, we have decided to construct a second dataset, where the unit of analysis is a country-specific electoral term. Under this setting each electoral term is described by the political parameters of the most recent elections (i.e. in its first year) and all other socio-economic characteristics are simple arithmetic averages. The dataset (both versions: country years and electoral terms) has been assembled and prepared using RStudio (R Core Team, 2019; RStudio Team, 2020), whereas all estimations and figures in the main part of the paper have been produced with STATA 16.1 (StataCorp., 2019). All replication materials can be provided upon request.

Economic crises and controls: The data on economic crises come from Reinhart and Rogoff (2011) and are currently available until 2010. The authors cover banking, currency, debt[17] and inflation crises. The definitions are provided below in Table 1.

Table 1. Definitions of economic crises from Reinhart and Rogoff (2011)

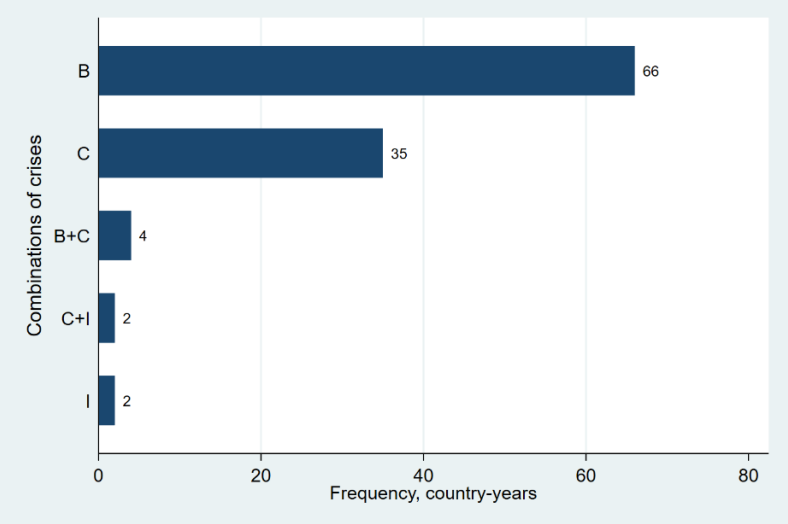
Type of crisis	Definition
Debt	*External*: "A sovereign default is defined as the failure of a government to meet a principal or interest payment on the due date (or within the specified grace period). These episodes include instances in which rescheduled debt is ultimately extinguished in terms less favourable than the original obligation." (p. 11) *Domestic*: "The definition given above for an external debt crisis applies. In addition, domestic debt crises have involved the freezing of bank deposits and/or forcible conversions of such deposits from dollars to local currency." (p. 11)
Banking	"We mark a banking crisis by two types of events: (1) bank runs that lead to the closure, merging, or takeover by the public sector of one or more financial institutions and (2) if there are no runs, the closure, merging, takeover, or large-scale government assistance of an important financial institution (or group of institutions) that marks the start of a string of similar outcomes for other financial institutions." (p. 11)
Currency	"An annual depreciation versus the U.S. dollar (or the relevant anchor currency - historically the U.K. pound, the French franc, or the German DM and presently the euro) of 15 percent or more." (p.7)
Inflation	"An annual inflation rate of 20 percent or higher." (p.7)

Figure 3 shows the frequency of crises years across the developed democracies. We included them in the sample for the years in which they were OECD members. During the time period

[17] We code both *external* and *domestic* debt crises as debt crises.

covered, these states experienced banking crisis during 66 country years and currency crises in 35 country years. Double banking and currency crises occurred during four country years. We also observe two country years with an inflation crises and two combined inflation and currency crises. In the empirical application, we distinguish between currency and non-currency crises.

Figure 3. Composition of the binary crisis indicator based on Reinhart and Rogoff (2011)



Data for additional covariates was taken from a variety of sources. Income inequality is represented by the top 10% post-tax income shares (adults, equal-split) from Alvaredo et al. (2020) and Gini coefficients from Hammar and Waldenström (2020). In the main part of the analysis we work with income shares due to the higher transparency of the underlying inequality concept and data availability on the country year basis. Next, we add dummies for election years (both parliamentary and presidential) as they are likely to be associated with greater public interest in politics and ideological self-sorting. This information comes from Bormann and Golder (2013). Growth of GDP per capita and inflation are taken from the World Bank's WDI (Teorell et al., 2020). The Comparative Political Dataset was the source for unemployment rates (AMECO, 2020; Klaus et al., 2019). Table 1 provides the summary statistics below in the *country year* format. However, elite polarization will enter the estimatoins only in the *country-electoral-term* configuration.

Table 2. Summary statistics

Variable	Obs	Mean	Std. Dev.	Min	Max
Mass polarization, logged	712	-1.87	.103	-1.99	-1.141
Elite polarization, logged	1379	.64	.61	-1.668	2.038
Effective number of parties	1379	3.392	1.311	1.536	8.934
Election year	1397	.329	.47	0	1
Crisis	1178	.236	.425	0	1
Gini	1300	24.52	6.339	9.191	46.04
Top 10% income share	829	26.779	3.867	18.2	39.85
GDP pc growth, %	1482	2.319	2.852	-8.998	23.986
Unemployment rate	1348	6.134	4.222	0	27.5

Main findings: In Table 3 we see results of estimations for the country-year dataset. All models are two-way FE OLS regressions, which is the longitudinal equivalent to a difference-in-differences framework in a time-series setting. The dependent variables have been log-transformed. Models 1-4 are estimated on the full dataset, whereas models 5-8 include only countries from the first 1973 Eurobarometer survey discussed above. Financial crises tend on average to increase public polarization by approx. 2% (for all states). Interestingly, as columns (3) and (7) indicate, these overall effects seem to be driven mainly by the currency shocks (polarization goes up to 3%). While these effects are quite small, they are only estimated for the year of the crisis event. In other words, we do not study the possibility of the cycle of escalation to emerge with shocks of longer duration potentially setting off even more instability and mass anger. We neither look at whether the post-crisis left-right polarization is likely to stay high after the initial surge.

Table 3. Economic crises, inequality and mass polarization (country-years)

Model	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
Sample	All countries				1973 Eurobarometer sample			
Election year	0.007***	0.007**	0.007**	0.007**	0.006*	0.006	0.007**	0.006
	(0.002)	(0.003)	(0.003)	(0.003)	(0.003)	(0.003)	(0.003)	(0.003)
Ef. number of parties	-0.012	-0.006	-0.006	-0.005	-0.001	-0.006	-0.005	-0.006
	(0.007)	(0.007)	(0.008)	(0.007)	(0.004)	(0.005)	(0.004)	(0.005)
GDP growth (lag)	0.004*	0.004	0.004	0.004	0.008**	0.010*	0.010*	0.010*
	(0.002)	(0.003)	(0.003)	(0.003)	(0.004)	(0.004)	(0.004)	(0.005)
Unemployment (lag)	0.002	0.003	0.003	0.003	0.000	0.000	-0.000	0.000
	(0.002)	(0.002)	(0.002)	(0.002)	(0.002)	(0.002)	(0.002)	(0.002)
Income shares (lag)	0.002	0.002	0.002	0.001	-0.003	-0.000	0.000	0.000
	(0.003)	(0.002)	(0.003)	(0.002)	(0.003)	(0.004)	(0.004)	(0.003)
Crisis		0.019*		-0.050		0.013		0.040
		(0.010)		(0.044)		(0.009)		(0.094)
Currency crisis			0.023**				0.030**	
			(0.009)				(0.011)	
Non-currency crisis			0.016				0.004	
			(0.013)				(0.014)	
Crisis x Income				0.003				-0.001
				(0.002)				(0.004)
R-squared, within	0.162	0.179	0.180	0.187	0.244	0.250	0.267	0.250
N	524	389	389	389	298	229	229	229

Note: Clustered standard errors in parentheses: * p < 0.1, ** p < 0.05, *** p < 0.01

Next, we interact crisis dummies with the income shares of the richest 10%. Neither the interaction term nor the individual parameters are significant. It is quite an intriguing finding that growth of GDP per capita in the previous year might also polarize the voters, which could imply redistributional issues (however, these effects are residual vis-à-vis the crisis indicators and are to be viewed with caution). The dummy for election years is highly significant in 6 out

of 8 models and signals that if there is an election, public polarization automatically goes up by more than 1%.

As far as the impact of elite dynamics on the general public is concerned, we need now to turn to our electoral term dataset. Since party manifestos change only with elections, simply including these parameters in the country-year analysis is unlikely to properly reflect the underlying DGP. In Table 4 we regress multiple measures of public polarization on the elite polarization operationalized using the technique of Esteban and Ray (1994) mentioned above, economic crises and several controls (unit FE are present in all specifications). Note that since we are working with electoral terms, crisis indicators now represent *shares* of the electoral term spent under economic turmoil. While we could not find evidence of the linkages between the Esteban and Ray parameters of public and elite left-right distribution, people are definitely not mere spectators of the political stability being thrown into quesiton. In particular, higher elite polarization in the current electoral term (proxied by the elections in its first year) is associated with a more dispersed (columns 4-6) and fractionalized (columns 7-9) electorate. For instance, a 1% increment in elite polarization is associated with an approx. 0.04% increase in variance (model 6) and 0.05% enlargement of the effective number of groups of voters in terms of the left-right distribution on the 1-10 scale (for each year on average). That is, doubling of elite polarization can increase the variance of public left-right positions by up to 10%. While the cofficient on the share of years spent under crisis in the third setting is negative and statistically significant, the interaction term with the income shares of the richest 10% is positive and significant at 5%. Since we are working with levels of the variables, this indicates that once more than approx. 24% of income (roughly 25th percentile in our data) goes to the top income earners, crises can increase polarization.

While staying in the country-electoral term framework, we are now moving to the factors most likely related to the elite left-right polarization (Table 5). All polarization indicators are logged as before. The independent variables enter the models either in the first or second lags primarily due to how the data is structured. In other words, party positions revealed in an election (and, therefore, associated with the following electoral term since each electoral period is identified by the elections in the beginning) are likely to be affected by the economic and societal factors from the previous electoral term.

Table 5 shows that there is only limited evidence of higher public polarization in the previous electoral period influencing party positions in the current one. In fact, the effects of the elections two terms ago could be even negative (for the index defined as in Esteban and Ray (1994) in models 2 and 3; for the weighted variance in models 5 and 6).

Are economic crises in OECD associated with higher pressure on politicians in parliaments in terms of their left-right positioning? According to Table 5 they are, albeit via quite heterogeneous routes. While there is no evidence that the polarization of elites as defined using the Esteban and Ray (1994) index is correlated with economic calamities, financial crises can still impact politicians. In particular, in a very unlikely scenario of the whole electoral term being spent under a constant economic crunch, the following elections might result in a parliament with more than 70% hike in variance of the party left-right positions, a 15% jump in the effective number of parties or an almost 32% gain in the distance between political fringes (see models 5, 8 and 11). The negative relationship between DMAX and income inequality would be an interesting question for future research.

Table 4. Determinants of mass polarization (electoral terms)

Model	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)
Dependent variable	Pol-ER	Pol-ER	Pol-ER	Pol-SY	Pol-SY	Pol-SY	Effective number of groups	Effective number of groups	Effective number of groups
Pol-ER (elites)	-0.001	-0.001	-0.003	0.069***	0.043*	0.044*	0.066***	0.043*	0.048**
	(0.007)	(0.006)	(0.006)	(0.021)	(0.024)	(0.023)	(0.014)	(0.022)	(0.020)
Pol-ER (elites, lag)	0.007	0.003	0.003	0.055***	0.052***	0.053***	0.045***	0.044**	0.045***
	(0.007)	(0.007)	(0.007)	(0.015)	(0.018)	(0.018)	(0.011)	(0.016)	(0.015)
Crisis		0.008	-0.149**		-0.017	0.081		-0.019	0.343
		(0.010)	(0.069)		(0.040)	(0.269)		(0.042)	(0.247)
Income shares		0.004	0.002		-0.003	-0.002		-0.008	-0.002
		(0.003)	(0.002)		(0.010)	(0.011)		(0.010)	(0.009)
Crisis x Income shares			0.006**			-0.004			-0.014
			(0.003)			(0.010)			(0.009)
GDP growth (lag)		0.001	0.002		-0.008	-0.008		-0.009*	-0.010**
		(0.003)	(0.003)		(0.007)	(0.007)		(0.005)	(0.005)
Unemployment (lag)		0.001	0.001		-0.001	-0.001		-0.002	-0.002
		(0.002)	(0.002)		(0.003)	(0.003)		(0.003)	(0.003)
R-squared, within	0.007	0.037	0.070	0.146	0.177	0.179	0.160	0.220	0.244
N	185	128	128	185	128	128	185	128	128

Note: Clustered standard errors in parentheses: * p < 0.1, ** p < 0.05, *** p < 0.01

Table 5. Determinants of elite polarization (electoral terms)

Model	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)	(12)
Dependent variable	Pol-ER	Pol-ER	Pol-ER	Pol-SY	Pol-SY	Pol-SY	Pol-ENP	Pol-ENP	Pol-ENP	Pol-DMAX	Pol-DMAX	Pol-DMAX
Pol-ER (public, lag)	-1.544	-0.859	-0.765	-2.871	-2.025	-1.979	-0.196	-0.446	-0.402	-0.618	-0.515	-0.625
	(1.282)	(1.535)	(1.550)	(2.943)	(3.559)	(3.535)	(0.583)	(0.586)	(0.608)	(1.393)	(1.684)	(1.752)
Pol-ER (public, second lag)	-2.501	-3.559*	-3.535*	-3.763	-5.506**	-5.495**	-0.238	-0.356	-0.345	-0.328	-0.256	-0.284
	(1.881)	(1.719)	(1.708)	(2.258)	(1.905)	(1.922)	(0.545)	(0.576)	(0.571)	(0.891)	(0.809)	(0.832)
Crisis (lag)		0.208	0.638		0.691**	0.898		0.149*	0.350		0.317**	-0.188
		(0.147)	(1.505)		(0.239)	(2.321)		(0.078)	(0.704)		(0.136)	(1.005)
Income shares (lag)		-0.069	-0.066		-0.145	-0.144		0.010	0.012		-0.095**	-0.099***
		(0.072)	(0.068)		(0.112)	(0.104)		(0.017)	(0.017)		(0.036)	(0.034)
Crisis (lag) x Income shares (lag)			-0.016			-0.008			-0.008			0.019
			(0.058)			(0.089)			(0.025)			(0.038)
GDP growth (second lag)		-0.026	-0.027		-0.023	-0.024		0.006	0.005		-0.015	-0.014
		(0.031)	(0.029)		(0.054)	(0.052)		(0.009)	(0.009)		(0.018)	(0.017)
Unemployment rate (second lag)		-0.024	-0.024		-0.018	-0.017		0.001	0.001		0.021	0.021
		(0.022)	(0.021)		(0.045)	(0.045)		(0.009)	(0.009)		(0.014)	(0.015)
R-squared, within	0.080	0.188	0.189	0.073	0.238	0.238	0.008	0.113	0.115	0.008	0.235	0.238
N	138	112	112	138	112	112	138	112	112	138	112	112

Note: Clustered standard errors in parentheses: * p < 0.1, ** p < 0.05, *** p < 0.01

Discussion and conclusion

This article has made several contributions to the dispute on whether or not political polarization is growing in the industrialized world and what political and economic factors drive these processes. First, we have introduced some new and axiomatically based measures to show that the experiences of the United States with an increasing elite polarization do not automatically translate to the rest of the OECD. While electoral polarization has been growing at the average, the left-right contestation between parties represented in the national parliaments has declined. Second, the analysis confirms that financial crises together with economic inequality is a major driver of these trends. However, as can be expected from the divergent distributional consequences, mainly currency crises increase the left-right contestation. A third insight is that changes in elite polarization precede equivalent changes in mass polarization.

We believe that it it is worth to consider how crises affect alternative measures of discontent such as trust towards the government or the demand for redistribution. Although the left-right cleavage remains a leading antagonism in advanced democracies, an exclusive focus on this dimension marginalizes other conflict dimensions such as the divide between nationalist and cosmpolitan attitudes. However, a better understanding of the heterogeneous impacts of different types of economic crisis on polarization will give us more leeway to develop efficient post-crisis reform strategies.

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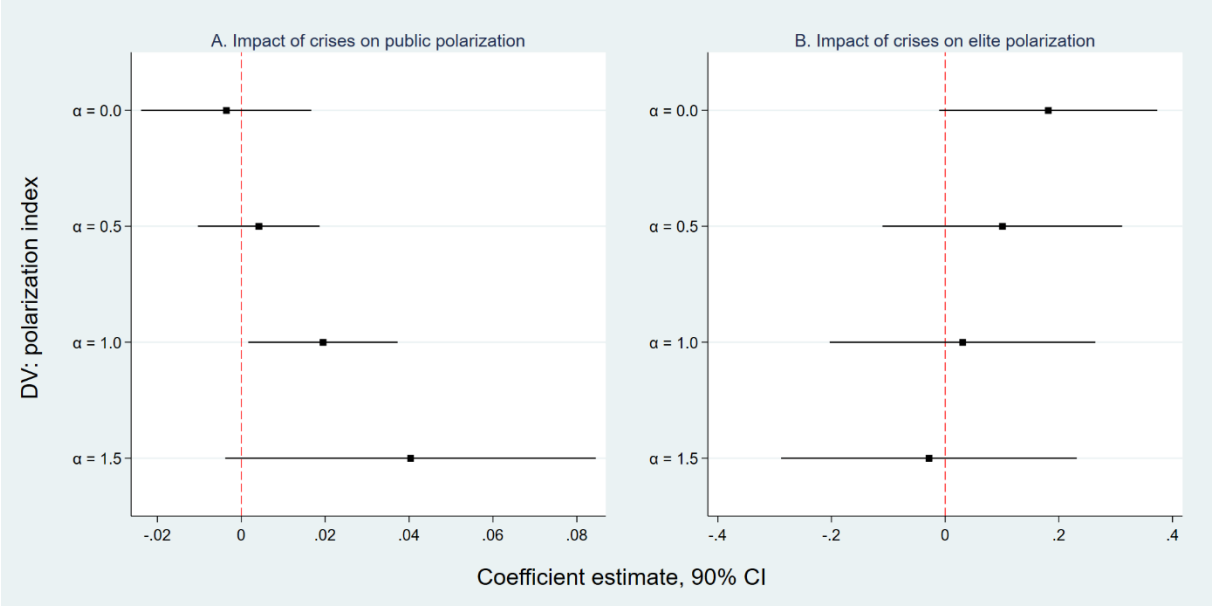
Appendix

Appendix 1. Robustness check: different values of the alpha parameter in the polarization indices

In this section we re-estimate the models examining interlinkages between economic shocks and public (Table 3, model 2: subplot A) and elite (Table 5, model 2: subplot B) polarization for different values of the weight parameter α in the index of Esteban and Ray (1994): 0, 0.5, 1 and 1.5. Each subplot represents four regressions with estimated coefficients for the binary crisis indicator placed on the vertical axis. The visualizations include 90% confidence bounds for each estimate. The complete regression tables can be provided upon request and have been excluded to save space. After comparing the subplots, several points are worth noting.

Figure A1. Impact of crises on public (A) and elite (B) polarization under different α values



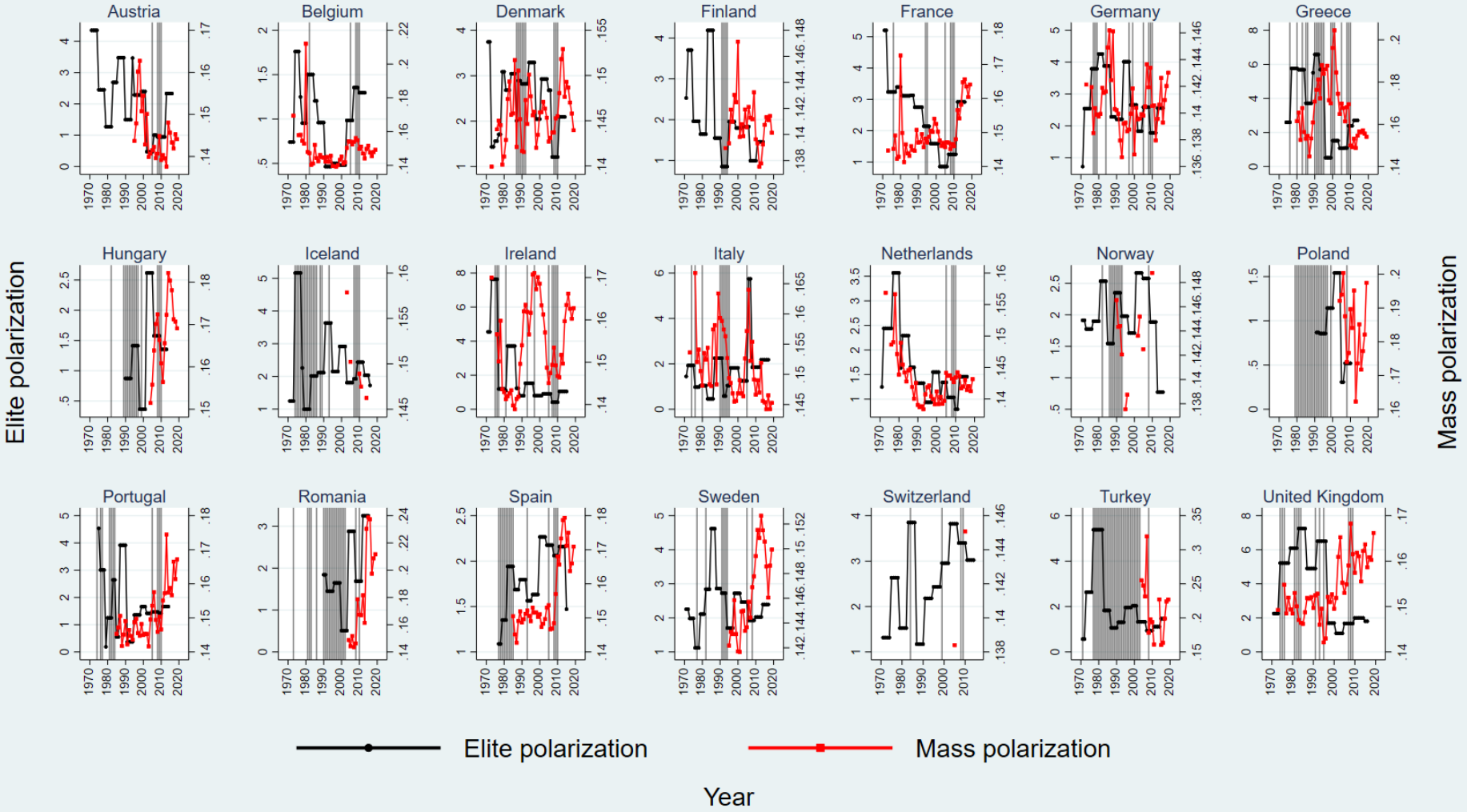
First, there is evidence that economic headwinds might be indeed linked to the increases in public left-right polarization. If we go from the absolute Gini coefficient (subplot A, top row) to polarization measures, both size and significance of the coefficient estimates increase. However, for α = 1.5, the estimate does not cross the 10% significance threshold. Second, a completely different story is observed for politicians. While the absolute Gini (subplot B, top row) barely touches the 10% significance limit, all further polarization parameters are not distinguishable from zero. This result is in line with the more nuanced dynamic described above in Table 5. In particular, the elites are likely to be become more heterogeneous and dispersed ideologically with the post-crisis political void also potentially resulting in more extreme views being expressed in parliaments. However, this process is unlikely to dovetail with the formation of several dominant and internally uniform camps. More generally, the broad confidence intervals of the coefficients in the current and previous sections should be of little surprise, given that the relatively low variation in the dependent variable itself is then further reduced by the fixed effects and contrasted against the slow-changing inequality in democratic regimes.

Appendix 2. Country profiles

The combined Eurobarometer dataset covers (for different years) 37 countries: Albania, Austria, Belgium, Bulgaria, Croatia, Cyprus, Czech Republic, Denmark, Estonia, Finland, France, Germany, Greece, Hungary, Iceland, Ireland, Italy, Latvia, Lithuania, Luxembourg, Macedonia, Malta, Montenegro, Netherlands, Northern Cyprus, Norway, Poland, Portugal, Romania, Serbia, Slovakia, Slovenia, Spain, Sweden, Switzerland, Turkey, United Kingdom. Northern Cyprus has been excluded from the dataset because there is almost no information on this territory. All Eurobarometer series are arithmetic averages over surveys within country-years.

In Figure A2 below we show the interrelatedness between public and elite left-right polarization (using the index described in Esteban and Ray, 1994) and crisis data from Reinhart and Rogoff (2011). The data sources overlap for the following countries: Austria, Belgium, Denmark, Finland, France, Germany, Greece, Hungary, Iceland, Ireland, Italy, the Netherlands, Norway, Poland, Portugal, Romania, Spain, Sweden, Switzerland, Turkey, United Kingdom. Romania has never been in the OECD and, therefore, does not participate in the regression analysis.

Figure A2. Elite polarization, mass polarization and economic crises



Note: vertical lines mark currency, bank, debt or inflation crises till 2010 according to the dataset of Reinhart and Rogoff (2011).

Appendix 3. Gini as a proxy for inequality

In this Section we repeat the whole estimation pipeline from the main part with Gini coefficients from Hammar and Waldenström (2020) used instead of the income shares of the top 10% of earners. Table A1, A2 and A3 correspond to Table 3, 4 and 5 in the main part of the analysis.

Table A1. Economic crises, inequality and mass polarization (country-years)

Model	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
Sample		All countries			1973 Eurobarometer sample			
Election year	0.007***	0.006*	0.006*	0.005*	0.005	0.005	0.005	0.005
	(0.002)	(0.003)	(0.003)	(0.003)	(0.004)	(0.004)	(0.004)	(0.004)
Ef. number of parties	-0.015**	-0.011	-0.011	-0.010	-0.009	-0.012*	-0.012*	-0.012*
	(0.007)	(0.007)	(0.007)	(0.007)	(0.006)	(0.006)	(0.006)	(0.006)
GDP growth (lag)	0.005**	0.004	0.004	0.004	0.008**	0.008*	0.008*	0.008*
	(0.002)	(0.003)	(0.003)	(0.003)	(0.003)	(0.004)	(0.004)	(0.004)
Unemployment (lag)	0.003	0.004*	0.004*	0.004*	0.001	0.001	0.001	0.001
	(0.002)	(0.002)	(0.002)	(0.002)	(0.002)	(0.002)	(0.002)	(0.002)
Income shares (lag)	-0.001*	-0.001*	-0.001*	-0.002**	-0.001	-0.001	-0.002*	-0.001*
	(0.001)	(0.001)	(0.001)	(0.001)	(0.001)	(0.001)	(0.001)	(0.001)
Crisis		0.014*		-0.027		0.012		0.030
		(0.008)		(0.030)		(0.008)		(0.049)
Currency crisis			0.017**				0.026**	
			(0.008)				(0.010)	
Non-currency crisis			0.012				0.002	
			(0.011)				(0.012)	
Crisis x Income shares (lag)				0.002				-0.001
				(0.001)				(0.002)
R-squared, within	0.171	0.183	0.183	0.189	0.202	0.227	0.236	0.227
N	573	429	429	429	351	271	271	271

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

Table A2. Determinants of mass polarization (electoral terms)

Model	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)
Dependent variable	Pol-ER	Pol-ER	Pol-ER	Pol-SY	Pol-SY	Pol-SY	Effective number of groups	Effective number of groups	Effective number of groups
Pol-ER (elites)	-0.001	0.001	0.000	0.069***	0.055**	0.054**	0.066***	0.052***	0.053***
	(0.007)	(0.007)	(0.007)	(0.021)	(0.024)	(0.024)	(0.014)	(0.015)	(0.015)
Pol-ER (elites, lag)	0.007	0.005	0.005	0.055***	0.055***	0.055***	0.045***	0.045***	0.045***
	(0.007)	(0.007)	(0.007)	(0.015)	(0.017)	(0.017)	(0.011)	(0.013)	(0.014)
Crisis		0.006	-0.098**		-0.025	-0.107		-0.019	0.095
		(0.010)	(0.044)		(0.043)	(0.153)		(0.042)	(0.127)
Income shares		0.001	-0.001		0.006	0.005		0.003	0.004
		(0.001)	(0.001)		(0.006)	(0.006)		(0.005)	(0.005)
Crisis x Income shares			0.004**			0.003			-0.005
			(0.002)			(0.005)			(0.005)
GDP growth (lag)		0.003	0.004		-0.001	-0.000		-0.006	-0.007
		(0.003)	(0.003)		(0.008)	(0.008)		(0.006)	(0.005)
Unemployment rate (lag)		-0.001	-0.000		-0.013*	-0.013*		-0.008*	-0.009*
		(0.002)	(0.002)		(0.007)	(0.006)		(0.005)	(0.004)
R-squared, within	0.007	0.024	0.068	0.146	0.237	0.239	0.160	0.220	0.227
N	185	139	139	185	139	139	185	139	139

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

Table A3. Determinants of elite polarization (electoral terms)

Model	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)	(12)
Dependent variable	Pol-ER	Pol-ER	Pol-ER	Pol-SY	Pol-SY	Pol-SY	Pol-ENP	Pol-ENP	Pol-ENP	Pol-DMAX	Pol-DMAX	Pol-DMAX
Pol-ER (public, lag)	-1.544	-1.188	-1.169	-2.871	-2.803	-2.855	-0.196	-0.452	-0.474	-0.618	-1.039	-1.208
	(1.282)	(1.475)	(1.578)	(2.943)	(3.704)	(3.918)	(0.583)	(0.557)	(0.575)	(1.393)	(2.000)	(2.146)
Pol-ER (public, second lag)	-2.501	-3.509	-3.507	-3.763	-5.644**	-5.652**	-0.238	-0.513	-0.516	-0.328	-0.054	-0.078
	(1.881)	(2.144)	(2.167)	(2.258)	(2.640)	(2.675)	(0.545)	(0.640)	(0.644)	(0.891)	(0.855)	(0.866)
Crisis (lag)		0.191	0.234		0.663**	0.542		0.148*	0.098		0.322**	-0.069
		(0.155)	(0.529)		(0.241)	(0.949)		(0.081)	(0.199)		(0.135)	(0.530)
Income shares (lag)		-0.026	-0.026		-0.039	-0.040		-0.004	-0.004		0.013	0.009
		(0.022)	(0.021)		(0.028)	(0.026)		(0.007)	(0.006)		(0.011)	(0.011)
Crisis (lag) x Income shares (lag)			-0.002			0.005			0.002			0.017
			(0.020)			(0.038)			(0.008)			(0.020)
GDP growth (second lag)		-0.018	-0.018		-0.019	-0.018		0.001	0.001		-0.013	-0.011
		(0.025)	(0.025)		(0.048)	(0.049)		(0.010)	(0.010)		(0.020)	(0.020)
Unemployment rate (second lag)		-0.021	-0.021		-0.015	-0.014		0.008	0.008		0.002	0.003
		(0.027)	(0.027)		(0.045)	(0.045)		(0.007)	(0.007)		(0.012)	(0.013)
R-squared, within	0.080	0.157	0.157	0.073	0.191	0.191	0.008	0.128	0.128	0.008	0.101	0.105
N	138	118	118	138	118	118	138	118	118	138	118	118

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