Economic Growth and the Rise of Political Extremism*

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October 2010

Abstract: In many western democracies, political parties with extreme platforms challenge more moderate incumbents. This paper analyses the impact of economic growth on the support for extreme political platforms. We provide a theoretical argument in favor of growth effects (as opposed to level effects) on the support for extreme political parties and we empirically investigate the relationship between growth and extremist votes. Lower growth rates benefit right-wing and nationalist parties, but do not have a robust positive effect on the support for communist parties. Our estimates indicate that extreme political platforms are unlikely to gain majorities in OECD countries, unless there is an extreme drop in the GDP per capita growth rate.

Keywords: Political Regimes, Political Extremism, Economic Growth.
JEL: O40, O52, P16.

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1 Introduction

Over the last decades, political parties with extreme platforms challenged more moderate incumbents in many western democracies (see Figures 1 and 2). Such extreme platforms rarely gained large vote shares, but frequently their success affected the political positions of more moderate parties - and so political outcomes. This paper analyses the impact of economic growth on the support for extreme political platforms. We provide a theoretical argument in favor of growth effects (as opposed to level effects) on the support for parties with extreme political platforms and we empirically investigate the relationship between growth and extreme votes.

It is not straightforward to define – in economic terms – what an extreme political platform is. Our view of extremism applies to countries in which there is some democratic competition amongst a few long term incumbent parties and where competition is limited to only a small subset of the entire policy space. In many democratic countries, there seems to exist a broad consensus about what constitutes such a set of decent policies - i.e. policies that only redistribute resources among the members of society within certain bounds.[1] In this context, we call an entrant's political platform extreme if it includes major differences in the distribution of resources compared to standard policies. In practice, such extreme political platforms often propose to redistribute resources away from specific subgroups of society (such as the rich, ethnic minorities, or citizens of specific regions).

Our analysis is based on the observation that extreme parties are frequently perceived to create more uncertainty about future policy outcomes than established parties. One reason for this is that extreme parties often have little or no government experience. Another reason may be that, once a political movement based on an extreme platform has come to power, the political elite may define new - and different subgroups of society that become the subject of redistribution. Historically, many regimes that were based on an extreme political agenda had the feature that some groups of society - be it ethnical, educational or professional - were stigmatized and suffered from redistribution or oppression.[2]

[1] For related theoretical analyses see Artale and Grüner (2003), and Grüner (2007).

[2] Frequently, extreme political parties with a small membership basis attract a large number of dissatisfied voters. The interaction of these voters and the party members is hard to predict. This adds to the uncertainty about the political consequences of an electoral outcome.

The choice of such a regime comes along with a cost when no group that benefits today can be really sure that this will stay so in the future. In the long run, this creates an income risk for all citizens and a trade-off between short-run gains from redistribution and long-run losses due to increases in income uncertainty. Economic growth increases the cost of uncertainty and so increases support for a moderate regime.

In the first part of the paper we develop a simple game theoretic model that further analyzes these effects. The purpose of the model is twofold. First, it shall give reasons for why economic growth and not just the level of income may have an impact on the support for moderate political regimes. Second, it shall provide testable comparative static results about the determinants of political radicalism.

In our model, extreme political parties offer short-run gains from redistribution to many individuals. However, the same individuals also face long-run losses due to more instability and higher income risk. Only sufficiently poor agents are in favor of extreme policy platforms. The model permits a comparative static analysis with respect to several variables of interest. The growth rate is associated with a higher cost of future income risk. This reduces the number of voters in favor of extreme policies. Similarly, a higher discount factor raises the vote share of moderate platforms. The share of stigmatized agents has ambiguous effects on the support for the moderate regime. On the one hand, it increases revenues from redistribution, on the other hand, stigmatized agents favor moderate policies. Moreover, the scope for future expropriation may also be affected. Economic inequality raises the support for redistribution and it also affects the effect of changes in economic growth.

An important prediction of our model is that the effects of economic growth on the support for an extreme political party depends on the perceived likelihood that this party will generate unstable policies that affect different ethnic, regional or religious subgroups of society over time. If policies are perceived as stable - in the sense that the same groups of society remain priviledged, political support of this party is unaffected by growth.

In the empirical part of our paper we construct a panel dataset for 16 OECD countries that includes survey-based measures of political support for right-wing/nationalist parties and communist parties. We use this data to approximate the support for extreme political platforms. We apply rigorous panel data techniques to estimate the impact that economic growth has on the share of voters who favor such platforms. Any attempt to investigate the relationship between growth and the support for certain policies

is plagued by causality problems - support for different policies is likely to shape institutions and institutions are likely to affect growth. We address this causality issue by using instrumental variable techniques and panel fixed effects regressions. Specifically, we use both system-GMM estimation as well as international oil price shocks as instrumental variables to deal with endogeneity issues. We deal with unobservable cross-country heterogeneity and common year shocks by using country and time fixed effects.

Our main finding is a negative and significant effect of real per capita GDP growth on the support for extreme political parties. At the same time, our analysis also makes clear that even major changes in the GDP per capita growth rate will most likely not change the political outcome in any of the OECD economies substantially. According to our estimates, a one percentage point drop in real per capita GDP growth would on average increase the share of extreme right-wing political parties by roughly one percentage point. In most economies this is unlikely to have any lasting impact on the political outcomes.

It is particularly noteworthy that there is a differential effect of growth on left-wing and right-wing extremism. There is a clear effect on the support for extreme right-wing parties whereas we find little evidence on the support for communist parties. To the extent that communist parties mainly wish to redistribute from the rich to the poor, this is in line with our theoretical predictions.

Our paper is related to a literature that investigates the relationship of economic development and political outcomes. For a long time, social scientists have argued that income and democracy go hand in hand. Two different kinds of theoretical arguments have been made in favor of a positive relationship between income and democracy. The first class of explanations concerns a possible causality that goes from income to democracy.[3] The most popular one is that a higher income level enables an emerging middle class to successfully fight for political emancipation.[4] The second set of arguments concerns

[3]See for example Geddes (1999), Przeworski et al. (2000), Glaeser et al. (2004), Acemoglu et al. (2008, 2009), Papaioannou and Siourounis (2008), or Brückner and Ciccone (2010) among others. For earlier contributions, see Lipset (1959) or Huntington (1991).

[4]There is little theoretical or empirical work on the relationship of growth and voting outcomes. One exception is De Neve (2010), who attempts to relate the US median voter's preference for the size of the government sector to economic growth. In his model agents only derive utility from changes in private and public consumption. With an appropriate utility function, all voters prefer a higher tax rate when income growth is higher. The

the inverse causal direction. According to this view, democracy has a positive impact on economic freedom and so creates a higher living standard. A synthesis of both views has recently been proposed by Persson and Tabellini (2009). They argue, that voters learn from the economic performance of their political system. Citizens are only willing to defend democracy if they believe in its economic benefits. A switch from democracy to an autocratic regime is more likely when the system performs poorly in economic terms. This implies that old democracies are likely to have higher levels of GDP whereas new democracies can start with a low level of GDP.

Most of the above arguments focus on the relationship between the level of output and democratic institutions. However, some economists also argue that economic growth is another independent and major determinant of the support for and development of a democratic political system. This point has recently been raised by Benjamin Friedman (2003). Friedman argues that only a continuous improvement of individual living standards provides the ground for a sound functioning of a democratic system and for the development of a more open political system. One of the reasons Friedman gives why individuals are more content with the political system if they experience improvements of their living standards is that individual well being is linked to income growth and not just the level of income.

The remainder of the paper is organized as follows. Section 2 introduces the theoretical model. Sections 3 and 4 describe the dataset and estimation strategy. Section 5 presents the main empirical results. Section 6 concludes.

2 A simple theoretical framework

2.1 The moderate regime

Consider a population of $i = 1, ..., n$ individuals who live in periods $t = 0, \ldots, \infty$. In every period, the economy is in one of two possible political regimes, the moderate (M) and the extreme one (E). In regime M, all individuals have a given income, $\tilde{y}_{it}$, that grows with a constant growth rate:

$$\tilde{y}_{it} = g^t \tilde{y}_{i0}, \text{ with } g > 1, \text{ and} \quad (1)$$

$$\frac{1}{n} \sum_{t=1}^{n} \tilde{y}_{i0} = \bar{y}_0. \quad (2)$$

model has nothing to say though about the support for extreme political positions.

An individual's income under the moderate regime should be thought of as the market income corrected through "standard" redistributive measures such as a progressive income tax system.

All individuals are risk averse and care about discounted utility derived from net income y_t. They maximize the expected value of

$$\sum_{t=0}^{\infty} \delta^t \mathbf{u}\left(y_{it}\right), \tag{3}$$

with $u'\left(y_t\right) > 0, u''\left(y_t\right) < 0$. More specifically, in order to obtain closed form solutions, we assume that

$$\mathbf{u}\left(y_{it}\right) = \mathbf{y}_{it}^{\alpha}. \tag{4}$$

Discounted expected utility is given by

$$\mathbf{U}^M := \sum_{t=0}^{\infty} \delta^t \mathbf{u}\left(y_{it}\right) = \sum_{t=0}^{\infty} \delta^t \left(g^t \tilde{y}_{i0}\right)^{\alpha} = \sum_{t=0}^{\infty} \left(\delta g^{\alpha}\right)^t \tilde{\mathbf{y}}_{i0}^{\alpha} = \frac{1}{1-\delta g^{\alpha}} \tilde{\mathbf{y}}_{i0}^{\alpha}. \tag{5}$$

In regime M, in each period individuals may support one of the two regimes in a vote. Either they support the existing regime M or they vote for regime E. In what follows we consider an extreme case where this policy turns the system into a persistent political regime that is characterized by high income uncertainty.

2.2 Regime E

At the beginning of each period, nature randomly selects a subset S of the $s \cdot n$ individuals that are stigmatized. In each period, every individual knows, whether he or she belongs to the set S or not. In regime E all incomes $\tilde{y}_i$ are collected by the state (who also observes S) and redistributed evenly across all individuals who are not stigmatized. Therefore net incomes in period t are

$$\mathbf{y}_{it} = \begin{cases} \frac{1}{1-s} g^t \bar{y}_0 & \text{if } i \notin S \\ 0 & \text{if } i \in S \end{cases}. \tag{6}$$

For simplicity, we assume that agents have no choice in an extremist regime; i.e. such a regime persists. Permitting the return to the moderate

regime would not affect our results. Discounted expected utility of agents in $N \setminus S$ in an regime E, beginning at t=0, is:

$$\begin{aligned} U^E := & \quad u\left(\frac{\bar{y}_0}{1-s}\right) + \sum_{t=1}^{\infty} \delta^t (1-s)\, u\left(\frac{g^t \bar{y}_0}{1-s}\right) && (7) \\ = & \quad su\left(\frac{\bar{y}_0}{1-s}\right) + \sum_{t=0}^{\infty} \delta^t (1-s)\, u\left(\frac{g^t \bar{y}_0}{1-s}\right) && (8) \\ = & \quad s\left(\frac{\bar{y}_0}{1-s}\right)^{\alpha} + (1-s)^{1-\alpha} \frac{\bar{y}_0^{\alpha}}{1-\delta g^{\alpha}}. && (9) \end{aligned}$$

The parameter s captures the relative importance of redistribution from stigmatized to non-stigmatized agents relative to income redistribution from rich to poor. When $s = 0$, the extreme regime merely redistributes income from rich to poor. When $s > 0$, there is also redistribution from stigmatized to non-stigmatized agents.

2.3 Equilibrium

A strategy of an agent maps the history of the game into a voting decision. Without restricting generality, we consider the optimization problem of an agent in period 0. An agent who is not stigmatized in period 0 prefers the continuation of the status quo to an extreme political regime if

$$\begin{aligned} U^M & > U^E \Leftrightarrow && (10) \\ \frac{1}{1-\delta g^{\alpha}} \tilde{y}_{i0}^{\alpha} & > s\left(\frac{\bar{y}_0}{1-s}\right)^{\alpha} + (1-s)^{1-\alpha} \frac{\bar{y}_0^{\alpha}}{1-\delta g^{\alpha}} \Leftrightarrow && (11) \\ \tilde{y}_{i0} & > Y := \left(\left(1-\delta g^{\alpha}\right) s\left(\frac{1}{1-s}\right)^{\alpha} + (1-s)^{1-\alpha}\right)^{\frac{1}{\alpha}} \bar{y}_0. && (12) \end{aligned}$$

The same condition applies to all further periods. Therefore, players have the following weakly dominant strategies. All agents with initial income $\tilde{y}_{i0} \geq (<)Y$ support (oppose) regime M in all periods, independently of whether they are stigmatized in period t or not. Stigmatized agents with initial income $\tilde{y}_{i0}$ support regime M if

$$\frac{1}{1-\delta g^{\alpha}} \tilde{y}_{i0}^{\alpha} \geq 0 + \delta g^{\alpha} (1-s)^{1-\alpha} \frac{\bar{y}_0^{\alpha}}{1-\delta g^{\alpha}} \Leftrightarrow \tilde{y}_{i0} > Y' := \delta^{\frac{1}{\alpha}} g\, (1-s)^{\frac{1-\alpha}{\alpha}}\, \bar{y}_0. \quad (13)$$

Otherwise, they support regime E. Note that, for appropriate parameters δ, g, α, and s the threshold level Y is below the initial average income $\bar{y}_0$. Therefore, societies in which the median of the income distribution is below the mean need not necessarily turn into an extreme political regime. Moreover, as one can easily verify, the threshold income Y' above which stigmatized agents prefer the status quo always lies below Y if $\delta g^{\alpha} < 1$. This condition must hold for the discounted sum of utilities to exist.

2.4 Results

Our simple theoretical model produces a number of useful results.[5]

1. A higher discount factor increases support for the moderate regime because agents care more about the future income risk.

2. A higher growth rate increases support for the moderate regime because it increases the variance of future income in an extreme political regime.

3. A higher individual income raises an individual's support for the moderate regime.

4. Consider an alternative distribution of income at date zero that preserves the income ratio $\tilde{y}_{i0}/\bar{y}_0$ for all individuals. It follows from (12) and (13) that all individuals favour the moderate regime if and only if they did so under the old income distribution. Hence, ceteris paribus, the initial average income $\bar{y}_0$ does not affect the political outcome.

5. Inequality (measured by the share of individuals who earn less than Y) reduces support for the moderate regime.

6. Consider a uniform distribution of initial income with a given mean. Inequality reduces the marginal effect of growth on the support for regime M.

7. The share of stigmatized agents in the population s has an ambiguous effect on the support for the moderate regime. If $\delta = 1/g^{\alpha}$ then a higher share s reduces the threshold for income above which agents who are not stigmatized support the moderate regime.

[5] The results follow directly from conditions (12) and (13).

8. When s=0, there is no effect of growth on the support for regime E. This means that the support for a regime that merely redistributes from the rich to the poor does not change when the growth rate increases.

In our empirical analysis that follows, we mainly concentrate on the effect of economic growth on the support for extreme political platforms (the second theoretical result). We also present some first empirical evidence on the role of level effects (result 4) and the role of inequality for the marginal effect that economic growth has on the support for extreme political parties (result 6). Moreover, in relation to result 8, we compare the effects of economic growth on the support for left-wing and right-wing parties.[6]

3 Description of the OECD Vote Share Dataset

We constructed a semi-annual panel dataset comprising 16 OECD countries for the period 1970-2002.[7] Our main measure for the rise of extreme political parties is from Eurobarometer.[8] Eurobarometer conducted from 1970 to 2002 semi-annual surveys of individuals' voting intentions in OECD countries.[9] The question asked in the Eurobarometer survey was the following: "If

[6]We have also made an attempt to test result 5 by looking at the cross-country correlation between measures of income inequality (as well as measures of poverty) and the support for extreme political platforms. We did not find a significant relationship, which may be due to the insufficient number of cross-country observations (16) in our OECD dataset. We have also made an attempt to test hypothesis 5 with panel data, using the labor income share as a proxy for income inequality. Our main finding was that increases in the labor income share are associated with a significant within-country decrease in the support for extreme political platforms, which is consistent with result 5. Results are not reported here for space purposes and are available from the authors upon request. Note that due to lack of data on country-specific discount and stigmatization factors, we are unable to test the other results from the model.

[7]The countries (time-period) covered in our dataset are: Austria (1994-2002), Belgium (1970-2002), Denmark (1973-2002), Finland (1993-2002), France (1970-2002), West-Germany (1970-2002), Great Britain (1973-2002), Greece (1980-2002), Ireland (1973-2002), Italy (1970-2002), Luxembourg (1973-2002), Netherlands (1970-2002), Norway (1990-1995), Portugal (1985-2002), Spain (1985-2002), and Sweden (1994-2002).

[8]The data is publicly available at http://zacat.gesis.org/webview/index.jsp.

[9]The average survey size was 1088, with an interquantile range of [1000, 1049]. Note that because the surveys were taken randomly across individuals, changes in the voter participation rate which may be due to changes in GDP per capita growth does not posit a concern for our estimation strategy.

there were general elections tomorrow, which party would you vote for". We then constructed three variables that proxy the support for extreme political platforms in a country-period. The first variable proxies the support for right-wing/nationalist parties. This variable is constructed by summing over all the votes given to right-wing/nationalist parties (right-wing/nationalist parties are identified according to the ZEUS party code) and dividing these votes by the total number of votes in the survey. The second variable proxies the support for communist parties. This variable is constructed by summing over all the votes given to communist parties (again identified according to the ZEUS party code) and dividing these votes by the total number of votes in the survey. The third variable proxies the total support for extreme political parties and is constructed by adding the vote shares obtained by right-wing/nationalist parties with the vote shares obtained by communist parties.

Basic summary statistics of the vote share of extreme political parties in our sample are as follows. The mean vote share of right-wing/nationalist parties is 0.016. The between-country standard deviation is 0.031 and the within-country standard deviation is 0.016. The interquantile range is [0, 0.026]. 5% of all the right-wing/nationalist vote shares are larger than 0.08 and the sample maximum is 0.15. For communist parties, the mean vote share is 0.041. The between-country standard deviation is 0.044 and the within-country standard deviation is 0.025. The interquantile range is [0, 0.071]. 5% of all the communist vote shares are larger than 0.156 and the sample maximum is 0.222.

Note that the vote share of extreme political parties is heavily positively skewed. Once we demean the vote share from its country-average and the common time fixed effect the skewness disappears however. This is shown in the kernel density plot of Figures 3 and 4.

To present also some specific examples of the empirical evolution of the vote share of extreme political parties we plot in Figures 1 and 2 time-series graphs of the right-wing/nationalist vote share and the communist vote share for 4 of our 16 OECD countries (Denmark, Italy, West-Germany, and France). These graphs show that there is substantial variability in the vote share of extreme political parties, both across time as well as across countries in a given time period. For example, while the average vote share of right-wing/nationalist parties in Denmark was around 8 percent in the 70s, 3 percent in the 80s, and 4 percent in the 90s, in West-Germany the vote share of right-wing/nationalist parties was around 0.3 percent in the 70s,

0.9 percent in the 80s and 2.5 percent in the 90s. In Italy the vote share of right-wing/nationalist parties was around 4 percent in the 70s, 3 percent in the 80s, and 7 percent in the 90s; in France it was around 0 percent in the 70s, 2 percent in the 80s, and 4 percent in the 90s. For the communist parties, the share of votes obtained in Denmark was around 6 percent in the 70s, 11 percent in the 80s, and 10 percent in the 90s. In West-Germany the share of votes obtained by communist parties was around 0.5 percent in the 70s, 0.3 percent in the 80s and 0.5 percent in the 90s. In Italy the share of votes obtained by communist parties was around 14 percent in the 70s, 16 percent in the 80s, and 14 percent in the 90s; and in France it was around 8 percent in the 70s, 6 percent in the 80s, and 5 percent in the 90s.

4 Estimation Strategy

We use the following econometric model to estimate the effect that real per capita GDP growth has on the vote share of extreme political parties:

$$Voteshare_{c,t} = a_c + b_t + cGrowth_{c,t-1} + u_{c,t},$$

where a_c and b_t are country and time fixed effects that capture country-specific unobservables and time-specific common shocks respectively. $u_{c,t}$ is an error term that is clustered at the country level to allow for arbitrary within-country serial correlation. As a baseline regression we use least-squares to estimate the effect that (lagged) real per capita GDP growth has on the vote share of extreme political parties. Note that for our least-squares estimator to provide a consistent estimate of the effect that lagged per capita GDP growth has on the vote share of extreme political parties it is necessary that real per capita GDP growth does not systematically respond to future changes in the share of votes obtained by extreme political parties. Stated differently, this assumption boils down to current investment and labor market decisions being independent of future, predictable changes in the political system. This may be a rather strong assumption that we address econometrically in two ways.

First, we consider using system-GMM estimation (Blundell and Bond, 1998) to estimate a dynamic version of the above equation that uses the lagged vote share as a right-hand-side regressor. Including the lagged vote share on the right-hand side implies that the residual variation in the vote

share which correlates with per capita GDP growth is not predictable by agents that use past vote shares to forecast future vote shares. Hence, changes in the current vote share are surprise changes that cannot be predicted by past vote shares. Because these surprise changes cannot be systematically predicted by past vote shares they are less likely to systematically affect past per capita GDP growth due to anticipation effects.

As a second approach to deal with endogeneity issues, we consider instrumental variable techniques that use international oil price shocks as an instrument for real per capita GDP growth. Because the effects of international oil price shocks on real per capita GDP growth are dependent on whether a country is an oil importer or an oil exporter, we construct a country-specific oil price shock series as $Oilshock_{c,t} = \triangle Log(OilPrice_t) * \theta_c$, where $\triangle Log(Oilprice_t)$ is the log-change of the international oil price (obtained from IMF statistics) and θ_c is the country-specific average share of (net) oil exports in GDP (obtained from OECD statistics). Note that we explicitly use a time-invariant net export share to ensure that our oil price shock variable reflects only time-specific movements in the international oil price and not time-specific movements in countries' export-shares. For our oil price shock variable to be a valid instrument we therefore need that country-specific (future) changes in the vote share of extreme political parties do not systematically affect (current) changes in the international oil price. This condition will be satisfied as long as output growth in each OECD country does not significantly affect changes in the international oil price. Or stated differently, that each of our 16 OECD countries is a price taker on the international oil market. According to the International Energy Agency none of our countries has an export or import share that exceeds 5% of total world oil production so changes in the demand or supply of oil to the international oil market which are due to changes in the vote share of extreme political parties in a specific OECD country are likely to have only a negligible effect on the international oil price.

5 Main Empirical Results

Table 2 presents our baseline estimates of the effect that real per capita GDP growth has on the vote share of right-wing/nationalist parties. In column (1) we show the estimates of a least squares regression that does not control for country or time fixed effects. The obtained coefficient on per capita

GDP growth in this pooled least-squares regression is negative (-0.071) and statistically significant at the 1 percent level. In column (2) we add the level of per capita GDP to the right-hand-side of the estimating equation. In line with our theoretical predictions from Section 2, the corresponding coefficient on GDP per capita is not significantly different from zero. Moreover, the real per capita GDP growth rate continues to have a highly significant negative effect on the support for extreme right-wing/nationalist parties.

In column (3) we add country fixed effects to account for potential unobservable cross-country heterogeneity. This leaves our point estimate on real per capita GDP growth mostly unchanged. Controlling in column (4) in addition to the country fixed effects for also time fixed effects which capture unobservable shocks common across OECD countries does however make our point estimate increase in absolute size substantially. The point estimate is -0.136 and statistically significant at the 1 percent level. Economically, the estimate implies that a one percentage point decrease in real per capita GDP growth of the prior two quarters increases the vote share of extreme right-wing/nationalist parties in the following period by about 0.136 percentage points.

As an identification check we run in column (5) a false experiment that includes future per capita GDP growth conditional on past per capita GDP growth in the estimating equation. A significant point estimate on future per capita GDP growth could indicate endogeneity problems as a past change in the vote share could affect current GDP per capita growth. We find however that future per capita GDP growth conditional on past per capita GDP growth does not enter the estimating equation with a statistically significant sign and that quantitatively the point estimate on future per capita GDP growth is rather small. Moreover, we find that lagged per capita GDP growth continues to have a statistically significant negative effect on the vote share. In column (6) we also document that per capita GDP growth shocks averaged over the past two years have a significant negative effect on the vote share, pointing towards persistence in the effects that past GDP per capita growth shocks have on current voting behavior.

To check whether our linear specifications miss out on important non-linearities in the relationship between real per capita GDP growth and the vote share of extreme right-wing/nationalist parties we show in Figure 5 non-parametric local polynomial estimates. The nonparametric local polynomial estimates allow for a flexible functional relationship between real per capita GDP growth and the vote share of extreme right-wing/nationalist parties.

The estimates are computed using an Epanechnikov kernel, with bandwidth selection based on cross-validation criteria. As can be seen, there is a clear downward sloping relationship between real per capita GDP growth and the vote share of extreme right-wing/nationalist parties over the entire range of real per capita GDP growth. Moreover, the 95% confidence bands indicate that the linear relationship implicitly assumed in our estimating equation cannot be rejected.

In Table 3 we present system-GMM estimates that take into account dynamics in the vote share of extreme right-wing/nationalist parties. The estimated AR(1) coefficient on the vote share is 0.66 and this indicates quite persistent dynamics in our dependent variable. Column (1) also shows that the point estimate on lagged per capita GDP growth in the dynamic panel regression is negative and statistically significant just like in the static panel regression. Note however that the interpretation of the point estimate on the lagged per capita GDP growth variable is slightly different in the dynamic panel regression from the interpretation of the point estimate on the per capita GDP growth variable in the static panel regression because (residual) changes in the vote share are in the dynamic panel regression surprise changes that cannot be forecasted by past changes in the vote share.[10] As column (1) shows, the estimated coefficient on lagged per capita GDP growth is -0.062 and has a t-value of -2.46. The point estimate therefore implies that a permanent decrease in the growth rate of 1 percentage point increases the vote share of extreme right-wing/nationalist parties by over 0.18 percentage points in the long-run. On the other hand, a purely transitory growth shock increases the vote share of extreme right-wing/nationalist parties by 0.06 percentage points on impact and then slowly converges towards zero over time. In column (2) we repeat the exercise using the average real per capita GDP growth rate over the past two years and find similarly to the static panel estimates that past growth shocks have a significant negative effect on the vote share.

In Table 4 we further address the issue of possible endogeneity bias in our estimating equation by using international oil price shocks as instrumental variables. The two-stage least squares estimate in column (1) produces a point estimate on lagged per capita GDP growth of -0.998 that is statistically significant at the 1% level. Despite being quantitatively larger than the corresponding least-squares estimate of column (3) in Table 2, a formal

[10] Higher order lags of the vote share are not statistically significant.

Hausman test does not reject the hypothesis that the least-squares estimate is equal to the IV estimate. The first stage F-statistic for the two-stage least squares estimate is around 11.9 so that the maximum relative IV bias is less than 10% according to the tabulations in Stock and Yogo (2005). Moreover, the Hansen J-test does not reject the validity of past oil price growth shocks as instrumental variables for per capita GDP growth. In column (2) we also compute the two-stage least squares estimate for the average real per capita GDP growth rate over the past two years. The first stage F-statistic for this two-stage least squares regression is about 30 and hence easily exceeds the critical values for weak instruments. In the second stage, we obtain a point estimate on lagged per capita GDP growth of -0.374 that is statistically significant at the 5% level. Again we tested the validity of our instruments and did not find evidence that they are systematically correlated with the second stage error.

In Table 5 we report estimates of the effect that economic growth has on the support for communist parties. Our model predicts that the growth effects depend on the stability of redistributive measures over time that voters associate with different parties. We find that the two-stage least squares estimates, reported in columns (1) and (2) of Table 5 do not yield a significant effect of economic growth on the vote share obtained by communist parties.[11] According to our theory, an explanation for this differential effect could be that voters perceive communist parties as being more clearly in favour of redistribution along conventional lines – i.e., from rich to poor – than right-wing/nationalist parties. Note that while the Hausman test does not reject that the least squares estimates reported in columns (3) and (4) of Table 5 are significantly different from the instrumental variables estimates reported in columns (1) and (2) the least squares estimate in column (3) is barely significant at the 10% level and that the least squares estimate in column (4) is not significant at any conventional confidence level.

In Table 6 we report the overall effect that economic growth has on the support for extreme political platforms. The two-stage least squares estimate in column (1) of the effect that economic growth has on the combined variables of right-wing/nationalist and communist vote shares is -0.548 (significant at the 1% level). This estimate implies that a decline of growth by three percent would, on average lead to an increase of the vote share of ex-

[11] The corresponding system-GMM estimates, not reported here for space purposes, are also insignificant.

treme political parties of at most two percentage points. Column (2) shows that the two-stage least squares estimate of the effect that economic growth has on the support for extreme political platforms is also negative when using the real per capita GDP growth rate averaged over the past two years but the t-value in this case is only -1.04 and hence not significant. On the other hand, the respective least squares estimates reported in columns (3)-(4) of Table 6 are both negative and statistically significant at the 1 percent level at least.

According to our theoretical analysis in Section 2, more income inequality should be associated with a smaller effect of growth on the support for extreme political parties. In Table 7 we test for the impact of inequality on the marginal effect that economic growth has on the support for extreme political parties by ordering the countries in our data set according to their median-to-mean income ratio (net of taxes and transfers) and then splitting them into two subsamples with an equal number (8) of countries. Panel A of Table 7 reports the least squares and instrumental variables estimates for the sample with the highest median-to-mean income ratio; Panel B reports the estimates for the sample with the lowest median-to-mean income ratio.[12] As can be seen, the effect of GDP per capita growth on the support for extreme political parties is quantitatively larger and statistically stronger in the group of countries with high median-to-mean income ratios (low inequality) than in the group with low median-to-mean income ratios (high inequality). This result is consistent with our theoretical prediction of a dampening effect of greater income inequality on the marginal effect that economic growth has on the vote share of parties with extreme platforms.[13]

[12]The median median-to-mean after-tax income ratio in Panel A is 0.92; in Panel B the median median-to-mean after-tax income ratio is 0.83. The datasource is OECD (2009) statistics.

[13]While we can reject at conventional confidence levels that the estimates of column (2) of Panel A are significantly different from the estimates of column (2) of Panel B, this is not the case for the other specifications. Applying the sample split to the right-wing/nationalist parties yields a 2SLS coefficient on economic growth for the low inequality countries of -1.57 that is significant at the 1 percent level, and a 2SLS coefficient for the high inequality countries of -0.04 that is insignificant. For the communist parties the 2SLS estimates are insignificant and quantitatively small regardless of whether we consider the high inequality sample or the low inequality sample. We have also checked the robustness of our results to using the Cameron et al. (2010) multi-cluster estimator. This yielded very similar t-values to the ones reported here when standard errors were clustered at both the country and the period level.

6 Conclusion

Many observers believe that the standard of living and the distribution of income are major determinants of the political support for radical political platforms. Our empirical analysis suggests that economic growth is an important and independent determinant of political radicalism: a lower growth rate increases the support for extreme political platforms.

There are good reasons to believe that industrialized countries' per capita GDP is likely to grow less strongly in the coming decades. Demographic developments impose limits on GDP per capita growth and increasing prices for raw materials make the production in those countries more expensive. The current financial crisis has led to the largest drop in per capita GDP of industrialized countries since the 1930s and the necessity to reduce levels of public debt and the so called for regulation of the financial system may have long-lasting adverse effects on real per capita GDP growth. If Benjamin Friedman is right with his hypothesis, political outcomes could be affected significantly in those economies (see also Miegel, 2009).

The empirical results in this paper instead show that it is unlikely that even strong recessions can change political outcomes. Even a significant drop of the GDP per capita growth rate of three percentage points would increase on average the vote share of the extreme parties considered in our sample by less than two percentage points. Such an increase in the vote share will most likely not change the political outcome in any of the OECD economies substantially.

Our present analysis may be extended into several directions. As the data become available, it is desirable to extend the empirical analysis to developing countries and to other historical episodes.[14] All of the OECD countries in our sample are democracies with a strong historical record of democracy, and it would be interesting to see whether results also hold in countries that have had little to no experience with democracy. Moreover,

[14]In the Appendix we have made an attempt to include developing countries in our empirical analysis by using data provided by the Database of Political Institutions (Beck et al., 2001) on the number of seats received by the 1st, 2nd, and 3rd largest party in parliament. The Database of Political Institutions codes whether the 1st, 2nd, and 3rd largest party in parliament has nationalist origin, but unfortunately does not provide information on the number of seats obtained by more minor parties (to which nationalist parties often belong). The Appendix discusses further the pros and cons of using the Database of Political Institutions for our empirical purposes and also presents estimation results.

our theoretical analysis points out that there may be other determinants of political extremism that should be studied empirically as well as the data become available. One may also extend the theoretical framework to permit different growth effects of different political regimes. In particular, adaptive expectations about growth rates may lead to an interesting dynamic relationship between growth and the political regime. Multiple equilibria may obtain when extreme political regimes grow little which makes individuals believe, that redistribution through the continuation of an extreme political regime is the best way to secure a high living standard.

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Appendix. Results Using the Database of Political Institutions

In this appendix we discuss the use and estimation results for an alternative dataset: the Database of Political Institutions (Beck et al., 2001). The Database of Political Institutions provides information on the number of seats obtained by the 1st, 2nd, and 3rd largest political party voted into parliament and records whether political parties are nationalist. A key requirement for coding a party as nationalist in the Database of Political Institutions is that a primary component of the party's platform is the creation or defense of a national or ethnic identity. According to the Database of Political Institutions examples that fall into the "nationalist" category are parties that have fought for independence, either militarily or politically; parties that advocate the persecution of minorities; or parties that are listed as xenophobic. One clear advantage of the Database of Political Institutions is that it covers a much larger sample of countries than our OECD dataset (180 countries for the period 1975-2006). However, a major disadvantage of the Database of Political Institutions for the purpose of our empirical analysis is that the Database of Political Institutions only provides information on the number of seats obtained by the 1st, 2nd, and 3rd largest political party in parliament. In particular, the database does not provide information on the actual vote share obtained by nationalist parties. For many countries extreme right-wing/nationalist parties only receive a small share of the total number of votes and are therefore not represented as the 1st, 2nd, or 3rd largest party in parliament.

To show what happens when using the information provided by the Database of Political Institutions we present in Appendix Table 1 system-GMM estimates where our dependent variable is the number of seats obtained by a nationalist party in parliament (given that the nationalist party is the 1st (alternatively, 2nd or 3rd) largest party in parliament).[15] Overall we find that there are significant negative effects of past real per capita GDP growth (real per capita GDP growth data are from the Penn World Tables, version 6.3, Heston et al. 2009) on the number of seats received by a nationalist party if the nationalist party constitutes the 2nd or 3rd largest party in

[15]Note that the variable is 0 if the 1st (alternatively, 2nd or 3rd) largest party in parliament is not a nationalist party. The variable is missing if no information was provided on the number of seats received.

parliament (see columns (2) and (3)). For the case of the nationalist party already constituting the largest (i.e. ruling) party in parliament we do not find a statistically significant effect of past per capita GDP growth on the number of seats that the nationalist party received (see column (1)). These results are consistent with the results that we obtained from the survey based vote shares of radical parties in our OECD dataset. Nevertheless, we believe that for purposes of examining empirically how economic growth affects the support for extreme political parties the survey based vote shares are more suitable than the information provided by the Database of Political Institutions on the number of seats obtained by the 1st, 2nd, and 3rd largest party in parliament.

Table 1. Summary Statistics

	Mean	Std. Dev.	Obs.
Vote Share of Right-Wing / Nationalist Parties (Eurobarometer)	0.016	0.027	610
Vote Share of Communist Parties (Eurobarometer)	0.041	0.052	610
Share of Net Oil Exports in GDP (OECD Statistics)	-0.013	0.033	610
GDP Per Capita Growth (OECD Statistics)	0.012	0.054	610
Mean-to-Median After Tax Income Ratio (OECD Statistics)	1.145	0.062	610
GDP Per Capita (OECD Statistics)	16588	11462	610

Table 2. GDP Growth and the Rise of Right-Wing/Nationalist Parties

	(1)	(2)	(3)	(4)	(5)	(6)
	LS	LS	LS	LS	LS	LS
GDP Growth, t-1	-0.071*** (-2.73)	-0.073*** (-3.57)	-0.071*** (-2.69)	-0.136*** (-2.80)	-0.126*** (-2.93)	
GDP Level, t-1		-6.60×10^{-8} (-0.17)				
GDP Growth, t+1					-0.030 (-0.84)	
Average GDP Growth, t-1 to t-4						-0.076** (-2.34)
Within-Country R^2	0.086	0.086	0.086	0.156	0.156	0.186
Country FE	No	No	Yes	Yes	Yes	Yes
Year FE	No	No	No	Yes	Yes	Yes
Observations	610	610	610	610	610	610

Note: The method of estimation is least squares. The t-values listed in parentheses are based on Huber robust standard errors that are clustered at the country level. The dependent variable is the share of survey votes received by right-wing / nationalist parties. *Significantly different from zero at 90 percent confidence, ** 95 percent confidence, *** 99 percent confidence.

Table 3. GDP Growth and the Rise of Right-Wing/Nationalist Parties

	(1)	(2)
	SYS-GMM	SYS-GMM
Voteshare, t-1	0.657***	0.779***
	(11.88)	(20.40)
GDP Growth, t-1	-0.062**	
	(-2.46)	
Average GDP Growth, t-1 to t-4		-0.025***
		(-2.01)
AR (2) Test, p-value	0.122	0.106
Sargan Test, p-value	0.166	0.127
Country FE	Yes	Yes
Year FE	Yes	Yes
Observations	530	530

Note: The method of estimation is system-GMM (Blundell and Bond, 1998). The t-values shown in parentheses are based on Huber robust standard errors that are clustered at the country level. The dependent variable is the share of survey votes received by right-wing / nationalist parties. *Significantly different from zero at 90 percent confidence, ** 95 percent confidence, *** 99 percent confidence.

Table 4. GDP Growth and the Rise of Right-Wing/Nationalist Parties

	(1)	(2)
	2SLS	2SLS
GDP Growth, t-1	-0.998***	
	(-3.69)	
Average GDP Growth, t-1 to t-4		-0.374**
		(-2.42)
First Stage F-stat	11.898	30.938
Hansen Overid. Test, p-value	0.2145	0.8597
Hausman Endogeneity Test, p-value	0.5802	0.4902
Country FE	Yes	Yes
Year FE	Yes	Yes
Observations	610	610

Note: The method of estimation is two-stage least squares. The t-values shown in parentheses are based on Huber robust standard errors that are clustered at the country level. The instrumental variables are the *t*-2 to *t*-4 oil price growth rate weighted by the country-specific (time-invariant) net export share of oil in GDP (see Section 4 for a detailed description of the instrument). The dependent variable is the share of survey votes received by right-wing / nationalist parties. *Significantly different from zero at 90 percent confidence, ** 95 percent confidence, *** 99 percent confidence.

Table 5. GDP Growth and the Rise of Communist Parties

	(1)	(2)	(3)	(4)
	2SLS	2SLS	LS	LS
GDP Growth, t-1	0.443		-0.102*	
	(1.57)		(-1.69)	
Average GDP Growth, t-1 to t-4		0.250		-0.035
		(1.23)		(-1.04)
First Stage F-stat	11.898	30.938	.	.
Hansen Overid. Test, p-value	0.353	0.732	.	.
Hausman Endogeneity Test, p-value	0.334	0.584	.	.
Country FE	Yes	Yes	Yes	Yes
Year FE	Yes	Yes	Yes	Yes
Observations	610	610	610	610

Note: The method of estimation in columns (1) and (2) is two-stage least squares; columns (3) and (4) least squares. The t-values shown in parentheses are based on Huber robust standard errors that are clustered at the country level. The instrumental variables are the *t*-2 to *t*-4 oil price growth rate weighted by the country-specific (time-invariant) net export share of oil in GDP (see Section 4 for a detailed description of the instrument). The dependent variable is the share of survey votes received by communist parties. *Significantly different from zero at 90 percent confidence, ** 95 percent confidence, *** 99 percent confidence.

Table 6. GDP Growth and the Rise of Extreme Political Parties

	(1)	(2)	(3)	(4)
	2SLS	2SLS	LS	LS
GDP Growth, t-1	-0.548***		-0.239***	
	(-3.34)		(-2.97)	
Average GDP Growth, t-1 to t-4		-0.125		-0.111***
		(-1.04)		(-2.67)
First Stage F-stat	11.898	30.938	.	.
Hansen Overid. Test, p-value	0.479	0.811	.	.
Hausman Endogeneity Test, p-value	0.850	0.536	.	.
Country FE	Yes	Yes	Yes	Yes
Year FE	Yes	Yes	Yes	Yes
Observations	610	610	610	610

Note: The method of estimation in columns (1) and (2) is two-stage least squares; columns (3) and (4) least squares. The t-values shown in parentheses are based on Huber robust standard errors that are clustered at the country level. The instrumental variables are the *t*-2 to *t*-4 oil price growth rate weighted by the country-specific (time-invariant) net export share of oil in GDP (see Section 4 for a detailed description of the instrument). The dependent variable is the sum of the share of survey votes received by right-wing/nationalist parties and communist parties. *Significantly different from zero at 90 percent confidence, ** 95 percent confidence, *** 99 percent confidence.

Table 7. GDP Growth, Inequality, and the Rise of Political Extremism

Panel A: 8 OECD Countries With Highest Median to Mean Income Ratio (Low Inequality)

	(1)	(2)	(3)	(4)
	2SLS	2SLS	LS	LS
GDP Growth, t-1	-0.678** (-2.40)		-0.229*** (-3.13)	
Average GDP Growth, t-1 to t-4		-0.124** (-2.02)		-0.090** (-2.08)
First Stage F-stat	63.704	61.059	.	.
Hansen Overid. Test, p-value	0.8895	0.5257	.	.
Hausman Endogeneity Test, p-value	0.3750	0.9191	.	.
Country FE	Yes	Yes	Yes	Yes
Year FE	Yes	Yes	Yes	Yes
Observations	253	253	253	253

Panel B: 8 OECD Countries With Lowest Median-to-Mean Income Ratio (High Inequality)

	(1)	(2)	(3)	(4)
	2SLS	2SLS	LS	LS
GDP Growth, t-1	-0.280 (-0.75)		-0.167 (-1.47)	
Average GDP Growth, t-1 to t-4		-0.004 (-0.06)		-0.084 (-1.55)
First Stage F-stat	9.705	2.918		
Hansen Overid. Test, p-value	0.707	0.523		
Hausman Endogeneity Test, p-value	0.290	0.242		
Country FE	Yes	Yes	Yes	Yes
Year FE	Yes	Yes	Yes	Yes
Observations	357	357	357	357

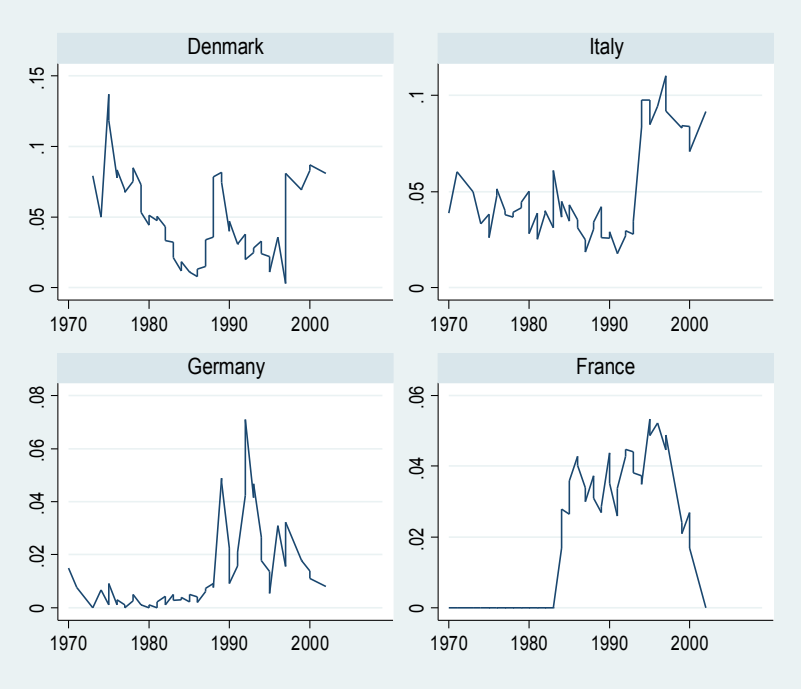
Note: The method of estimation in columns (1) and (2) is two-stage least squares; columns (3) and (4) least squares. The t-values listed in parentheses are based on Huber robust standard errors that are clustered at the country level. The instrumental variables for the two-stage least squares estimation are the *t*-2 to *t*-4 oil price growth rate weighted by the country-specific (time-invariant) net export share of oil in GDP (see Section 4 for a detailed description of the instruments). The dependent variable is the share of survey votes received by right-wing / nationalist parties and communist parties. *Significantly different from zero at 90 percent confidence, ** 95 percent confidence, *** 99 percent confidence.

Appendix Table 1. GDP Growth and the Rise of Political Extremism
(Database of Political Institutions)

	1st Largest Party	2nd Largest Party	3rd Largest Party
	(1)	(2)	(3)
	SYS-GMM	SYS-GMM	SYS-GMM
GDP Growth, t-1	-8.418	-10.181	-7.100
	(-0.31)	(-0.99)	(-0.68)
GDP Growth, t-2	-1.167	-21.395**	-14.613*
	(-0.02)	(-2.18)	(-1.85)
GDP Growth, t-3	-26.161	-19.585	-0.246
	(-1.41)	(-1.59)	(-0.03)
GDP Growth, t-4	62.808	-27.158*	-7.034**
	(0.98)	(-1.69)	(-2.06)
GDP Growth, t-5	-52.655	-13.947	-10.359
	(-1.09)	(-1.55)	(-0.85)
Number of Seats in Parliament, t-1	0.920***	0.716***	0.796***
	(26.86)	(6.21)	(44.69)
Country FE	Yes	Yes	Yes
Year FE	Yes	Yes	Yes
Observations	3466	1293	742

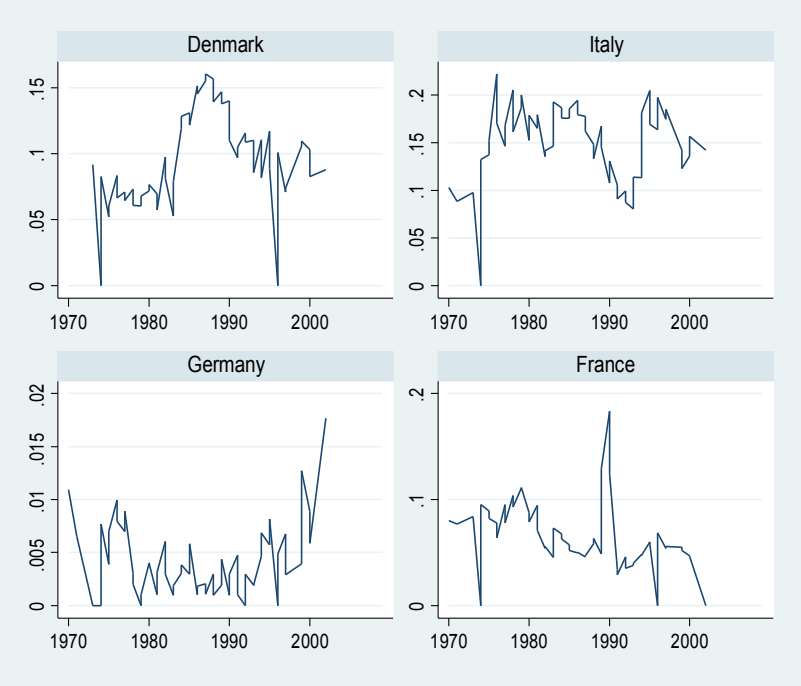
Note: The method of estimation is system-GMM (Blundell and Bond, 1998). The t-values listed in parentheses are based on Huber robust standard errors that are clustered at the country level. The dependent variable in column (1) is the number of seats in parliament that are obtained by a nationalist party if the party constitutes the 1st largest party in parliament; column (2) the number of seats in parliament that are obtained by a nationalist party if the party constitutes the 2nd largest party in parliament; the number of seats in parliament that are obtained by a nationalist party if the party constitutes the 3rd largest party in parliament. *Significantly different from zero at 90 percent confidence, ** 95 percent confidence, *** 99 percent confidence.

Figure 1. Time-Series Plots of the Vote Shares of Right-Wing / Nationalist Parties



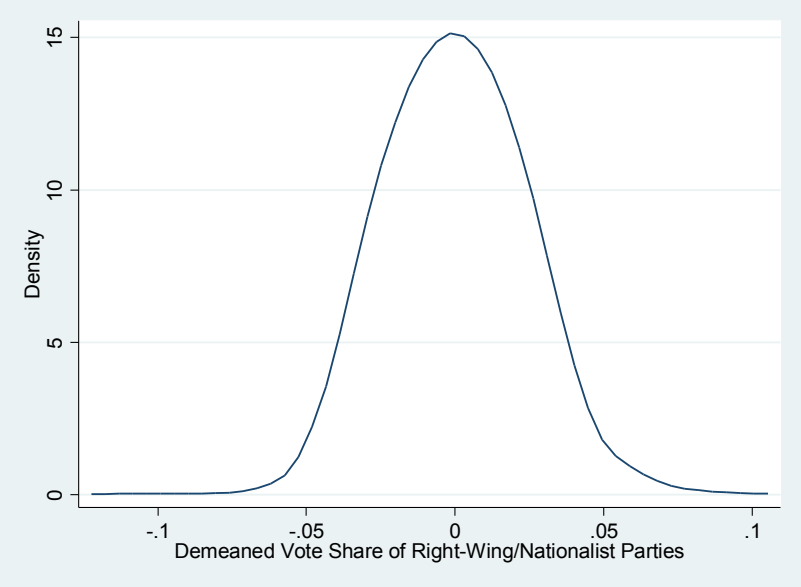
Source: Eurobarometer. The figure is based on answers to the question: "If there were general elections tomorrow, which party would you vote for". Right-wing/nationalist parties are classified according to the ZEUS party code.

Figure 2. Time-Series Plots of the Vote Shares of Communist Parties



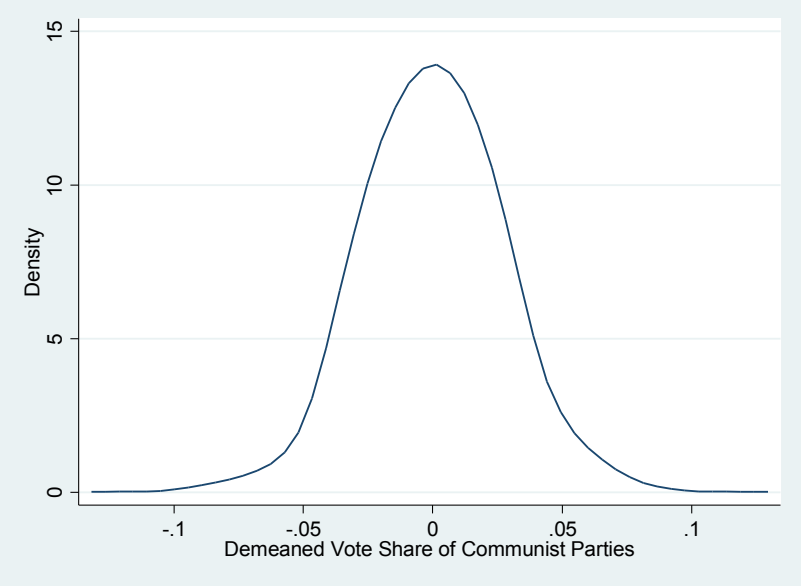
Source: Eurobarometer. The figure is based on answers to the question: "If there were general elections tomorrow, which party would you vote for". Communist parties are classified according to the ZEUS party code.

Figure 3. Kernel Density Plot of Demeaned Vote Shares of Right-Wing / Nationalist Parties



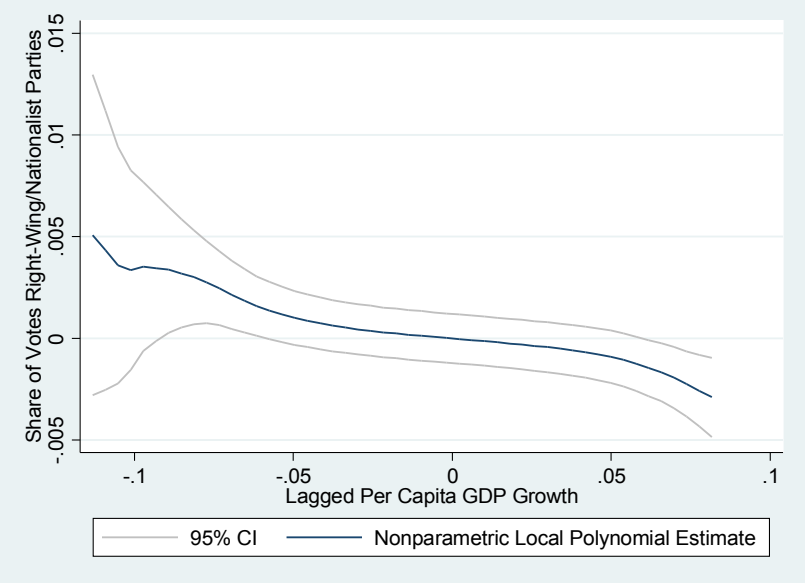
Note: The figure shows an Epanechnikov kernel density estimate of the vote share of right-wing / nationalist parties. The vote share has been demeaned from the country and time fixed effect.

Figure 4. Kernel Density Plot of Demeaned Vote Shares of Communist Parties



Note: The figure shows an Epanechnikov kernel density estimate of the vote share of communist parties. The vote share has been demeaned from the country and time fixed effect.

Figure 5. Per Capita GDP Growth and Vote Shares of Right-Wing / Nationalist Parties



Note: The figure shows nonparametric local polynomial estimates (based on an Epanechnikov kernel) of the relationship between the share of votes obtained by right-wing / nationalist parties and lagged per capita GDP growth. Both the share of votes obtained by right-wing / nationalist parties as well as lagged per capita GDP growth have been demeaned from the country and time fixed effect.