Unemployment and Electoral Support for Dominant Parties: Not Always their "Achilles Heel"[1]

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Abstract

Conventional wisdom suggests that dominant parties should pay a hefty electoral price when unemployment is rising. In this paper we present evidence from OECD countries (1970-2007) documenting a *non-monotonic* relationship: dominant parties actually benefit from increases in unemployment conditional on unemployment being relatively low and are harmed by increases in unemployment conditional on unemployment being relatively high. We propose a mechanism to explain this non-monotonic relationship. When unemployment is relatively low, then public finances are strong. Hence, dominant parties - which are the only parties with access to the public purse - can woo the unemployed - who are relatively more responsive to transfers (Dixit and Londregan 1996) - by credibly promising more redistribution (e.g., Alesina et al. 2000; Robinson and Verdier 2013). When unemployment is relatively high, then public finances are weak. Hence, dominant parties can no longer credibly promise transfers to the unemployed and, thus, bear the cost of a shrinking economy.

Keywords: dominant parties, unemployment, redistributive politics, economic voting.

1 Introduction

The effect of unemployment on electoral outcomes and, more specifically, on the incumbent's chances of electoral success has been studied extensively in the context of two party systems. Unemployment is found to have an impact on voting decisions, both at an individual (Fiorina 1978; Kinder and Kiewit 1979, 1981; Kiewiet 1983) and also at a country level (Kramer 1971; Arcelus and Meltzer 1975; Bloom and Price 1975; Tufte 1978; Kinder, Adams, and Gronke 1989; Campbell 2000; Holbrook 2008; Wright 2012): an increase in the unemployment rate is found to be detrimental for the electoral success of the incumbent party or candidate. Nevertheless, little is known on the electoral effects of unemployment in the context of multi party systems. Such systems are not only different to two party ones in that many parties participate in government but also in that there are many parties that never (or, at most, very rarely) participate in governments - the so-called protest parties. That is, there is a division between parties that have current or potential hold of government portfolios, which we call *dominant*, and parties that are regularly in the opposition, which we call non-dominant. In such systems one should study the electoral effect of unemployment in two dimensions: a) it may influence the re-election probability of the incumbent party or coalition (that is, the distribution of votes within the class of dominant parties) and b) it may influence the cumulative vote share of all dominant parties. Unlike most other studies (e.g., Dassonneville and Lewis-Beck 2013) which study the first dimension (the re-election probability of an incumbent), the present paper focuses on the second dimension; on the systemic effect of unemployment on the overall distribution of electoral power and the structure of the party system. For this reason, in our analysis we use two aggregate measures as our outcome variables: a) the cumulative vote share of all dominant parties, and b) its mirror image, the index of electoral fragmentation which measures the dispersion of electoral power among parties.

Conventional wisdom and the theory of protest voting postulate that unemployment should have a negative effect on the cumulative vote share of dominant parties. Yet mere inspection of aggregate data from a sample of OECD countries, with a relatively stable - over time - set of dominant parties (Fig. 1), seems to contradict this conjecture; if anything this relationship

is non-negative. In fact, it looks (Fig. 1) as if dominant parties actually gain from an increase in unemployment instead of paying a hefty price when unemployment is relatively low and that they are harmed only when unemployment is relatively high. That is, in contrast to the idea that dominant parties only stand to lose from an increase in unemployment, a more complex mechanism seems to be in operation. We explore this relationship in a set of countries (OECD) with multi-party systems and we provide empirical evidence which suggests that it is indeed a *non-monotonic* one: the effect of unemployment on the electoral performance of dominant parties is initially positive and then negative. These findings naturally raise the following question: what is the mechanism taking place and under what conditions dominant parties can take advantage of economic malaise and increase their vote shares?

To provide an answer we propose a theoretical mechanism that can uncover the *net* (unconditional) effect of unemployment on the electoral support for dominant parties. To develop this mechanism, we rely on models of redistributive (e.g., Dixit and Londregan 1996) and special interest (e.g., Myerson 1993) politics in order to relate unemployment to electoral outcomes. In particular, we explore whether dominant parties can exploit an increase in the unemployment rate and use "disguised redistribution" (e.g., Alesina et al. 2000) or rent provision (e.g., Stokes 2005) in order to woo the unemployed, and if so, under what conditions. Thus, our mechanism highlights the incentives of dominant parties to use redistribution for opportunistic (electoral) purposes. It also points to a set of necessary conditions that allow dominant parties to capitalize electorally on the most needy voters (the unemployed) and increase their vote shares (for example, lack of substantial checks and balances). As a result of applying our theoretical framework, we arrive at a markedly different prediction regarding the relationship between unemployment and electoral support for dominant parties that is consistent with our empirical findings but not consistent with traditional theories of protest and economic voting.

With regards to our empirical analysis, we use a panel of data from OECD countries and we employ a variety of different econometric models. In particular, we use both a 2SLS model (where we exploit exogenous variation in the oil prices to identify exogenous changes in unemployment)

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and also a GMM (Arellano-Bond) dynamic panel estimator in order to get causal inference and we are able to estimate the net effect of unemployment on our variable of interest. By effectively dealing with issues of endogeneity, we then establish the non-monotonic nature of the relationship between unemployment and support for dominant parties (electoral fragmentation).

Our analysis on the aggregate effects of unemployment has arguably non negligible policy implications. The concentration of electoral power in the hands of the dominant parties may pave the way for a reversal in the inclusive nature of political institutions (Acemoglu and Robinson 2012). Thus, increased dispersion of electoral power among parties (i.e., lower vote shares for the dominant parties) can be viewed as a positive indication of greater power-sharing. Several studies (Alesina 1987; Alesina and Roubini 1992; Barro 1996; Persson and Tabellini 2003; Acemoglu et al. 2005; Acemoglu and Robinson 2006, 2012) have extensively documented the impact of political institutions on economic outcomes and have found that prosperity and economic success are driven by political institutions and politics. Nevertheless, all these studies primarily focus on the one side of this relationship, namely, the link from political institutions to economic outcomes. Yet, as the recent trends of rising income inequality in many advanced industrialized democracies demonstrate, the real danger is when economic malaise, such as unemployment, spills into political inequality and lack of representation. Thus the present study aspires to bridge this gap in the literature by exploring the reverse direction of the relationship between economic and political outcomes. In particular, by developing a theoretical framework - based on redistributive politics - that makes it possible, we focus on the impact of unemployment on the concentration of electoral power by dominant parties and we show that under certain conditions - and contrary to conventional wisdom - dominant parties can capitalize electorally on unemployment.

Overall, our work emphasizes the point that in the absence of inclusive *political* institutions[1] that subject political power to constraints, inclusive economic institutions (e.g., redistributive mechanisms) that are primarily designed to expand economic opportunity and enable under-served citizens can be exploited by dominant parties for electorally motivated purposes (Acemoglu et al.

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[1]The term *inclusive institutions* is used to characterize institutional structures that incorporate a solid grid of institutional checks and balances that subject the power of governments and governing elites to constraints and stop them from exploiting state resources to consolidate their political dominance.

2013).[2] In turn, this can lead to greater concentration of electoral and political power.[3] Hence, we provide an additional insight on the role of institutional checks and balances in diffusing the concentration of political power by restricting the ability of *dominant* parties to use the public purse and lure the unemployed. As a result, our paper sheds more light to the bidirectional relationship between economic and political outcomes and by doing so, highlights the importance as well as the limitations of inclusive economic and political institutions.

2 Theoretical framework

As stressed in the introduction, in order to provide a comprehensive account for the relationship between unemployment and support for dominant parties we develop a theoretical framework based on models of redistributive politics. Our proposed mechanism aims at highlighting the incentives of certain parties to use the public purse for opportunistic (electoral) purposes. This will allow us to identify the *net* effect of unemployment on the distribution of electoral power among different parties (and electoral fragmentation).

2.1 Special interest politics of redistribution

In order to conceptualize the notion of electorally motivated redistribution, we build on existing models of redistributive politics (e.g., Myerson 1993; Dixit and Londregan 1996). The idea behind such models is that parties will always attempt to woo the group of voters who are relatively more willing to switch their votes in response to more generous redistribution promises. That is, "the Dixit-Londregan model predicts that parties should target poor voters because their votes should be cheaper to buy" (Cox 2009) - in this case the unemployed. Given that unemployed voters are striving to make ends meet, they are more responsive to redistribution than the employed ones (due to *diminishing marginal utility of income*) and, hence, they are more likely to vote for those parties - the dominant ones - that can utilize the public purse to offer increased income transfers of

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[2] Acemoglu et al. (2013), albeit in a different set-up, make an analogous point by showing that voters are willing to accept less institutional checks and balances in return for generous redistribution.

[3] Electoral support for dominant parties measures the concentration of electoral - and hence, political - power within a party-system and, as a result, it also can be used as a proxy for political power-sharing. That is, electoral support for dominant parties is the mirror image of *electoral fragmentation.*

any kind. Therefore, for an unemployed voter economic necessity is the most salient determinant of party choice and voting behavior. As their welfare depends on such transfers, ceteris paribus, unemployed voters are more likely to vote for a party that makes generous promises. That is, from the perspective of a rational forward-looking agent, the unemployed are an easy *target* for the dominant parties.

But, why is it only that dominant parties can *credibly* target the unemployed by making generous promises? The answer is that dominant parties (and only them) can access and utilize the public purse for their own electoral (opportunistic) purposes. As evidence suggests, unemployed voters can be more easily targeted by dominant parties which can use income transfers of many kinds. In particular, Alesina et al. (2000) showed how municipalities in the US use employment contracts as a form of *disguised redistribution* in order to get the vote of the unemployed. Moreover, Robinson and Verdier (2013) showed that offering disguised redistribution, which can take many forms (e.g., short-term renewable public employment contracts or participation in welfare programs), solves the dynamic problem of incentive compatibility that more traditional forms of vote buying exhibit. As the renewal of the employment contract or the continuation of the welfare program is contigent on the electoral success of the party (or politician) that has offered it, this type of disguised redistribution successfully aligns the career concerns of the politician with the unemployed voters' incentives. Clearly, a party that has no chance of participating in a government cannot engage in this type of behavior - any rational, forward-looking agent will find such promise to be empty.

In addition, while certain political parties might oppose outright redistribution policies, such forms of disguised redistribution and transfers are harder to oppose.[4] In the same vein, Stokes (2005) provides further evidence on why the unemployed might form a target constituency for dominant parties.[5] While previous formal literature suggested that political machines target core

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[4] Recent studies (e.g., Kriner and Reeves 2012) have found that despite their "anti-redistribution" rhetoric even right-wing parties engage in such forms of transfers and, in turn, are rewarded electorally by the voters.

[5] Stokes (2005) notes that "there is scattered evidence both in the qualitative and formal literature that poor voters become the target of machine (clientelist) parties. Moreover, the formal literature emphasizes the diminishing marginal utility of income as the reason why those types of benefits can generate more votes among the poor."

constituencies,[6] Stokes (2005) departs from this premise by showing that "[parties] give handouts not to die-hard supporters but to people whose future support is in doubt." Clearly one can view the unemployed voters as such. Thus our argument is on the same lines with Stokes (2005). In sum, unemployed voters form the perfect target constituency for the dominant parties (the least expensive to attract voters due to diminishing marginal utility of income) and, hence, targeting the unemployed is not only *rational* but also the most *efficient* and *dynamically incentive compatible* method for a dominant party to increase its vote share.

This implies that when unemployment increases by a little, and as long as public funds for redistribution are available, dominant parties can benefit a lot by targeting their transfers towards the unemployed voters and capturing those extra votes. Yet this argument has a twist: it may not be always possible for a dominant party to credibly promise transfers and get the vote of the unemployed due to an *endogenous* constraint. Ever increasing unemployment definitely is a signal of an ailing economy that suffers a huge output loss. This, in turn, implies that the state's capacity to raise revenue (via income taxes) is also hindered by economic under-performance and a shrinking tax base. As a result, all promises to provide any kind of redistribution or targeted transfers is no longer considered credible by voters as parties now lack adequate resources to finance them (state revenues are insufficient).[7] Therefore, the initial positive effect of unemployment on the vote shares of dominant parties is now reversed - there are far more unemployed voters, but there are no resources to woo them. This gives rise to a non-monotonic relationship between unemployment and support for dominant parties.

In fact, our theory would suggest that to the extent that we sometimes observe high unemployment to be associated with higher electoral fragmentation and bleak support for dominant parties, this is not a *direct (net)* effect of rising unemployment, rather it reflects the increasing financial constraints (less revenues) faced by those parties in their effort to use the public purse in order to attract the vote of the unemployed. In order to disentangle the *net* effect of unemployment that our theory predicts, in the section that follows we formulate two hypotheses whose testing

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[6]Nevertheless, Larcinese et al. (2012) find little empirical evidence to support this claim.

[7]Issuing debt is also not an option as rational, forward-looking voters understand that intertemporally the budget must balance which implies a future tax hike.

will verify the operation of our proposed mechanism. Additionally, we will also formulate two alternative hypotheses and test them against our main hypotheses.

2.2 Testable predictions

In this section, we state our main hypothesis, which is a straightforward implication of the theoretical mechanism presented in the section above, the *non-monotonic* relationship between unemployment and electoral support for dominant parties (electoral fragmentation). Formally, our hypothesis is:

H.1: The relationship between unemployment and the vote shares of dominant parties has an inverted U-shape. Electoral support for dominant parties (electoral fragmentation) initially rises (declines) with unemployment before it declines (rises).

That is, our main hypothesis ($H.1$) runs contrary to traditional protest and retrospective voting theories which postulate a monotonic and negative (positive) relationship between unemployment and electoral support for dominant parties (fragmentation). This also implies that as financial constraints increase, the ability of dominant parties to engage in electorally motivated spending is being limited. Thus any initial positive effect that unemployment has on their vote shares is contigent on their ability to credibly promise and supply targeted transfers to the unemployed voters - which, in turn, depends on the availability of scarce financial resources (state revenues). In sum, our statement suggests that unemployment can be damaging for dominant parties only *indirectly*, to the extend that their ability to introduce politically motivated redistribution is compromised.

2.2.1 Alternative hypotheses

From the discussion so far, still it might not be straightforward how our proposed mechanism differs from retrospective or protest voting theories and why our expected findings cannot be consistent with those two theories and, hence, one needs a theoretical framework like ours in order to explain them. Both of them would imply that given an increase in unemployment voters abandon the incumbent party (or the dominant parties altogether) and vote for other - smaller - ones as a form

of protest or punishment. That is, they should predict that either the incumbent party (and its coalition partners) are losing votes to the main challenger (and perhaps other smaller parties) or all dominant parties are losing out to smaller ones. Since our *dependent variable* (electoral support for dominant parties) is a summation of vote shares of more than one party, an increase implies a net vote transfer from a non-dominant party towards the dominant ones. But, in both cases, those theories would predict either a *negative* effect, in the case of vote diffusion from all dominant parties - incumbent and main challenger - towards smaller ones, or *no* effect at all, as any transfer of votes between dominant parties (e.g., from the incumbent to the main challenger) leaves our dependent variable unchanged. Thus they cannot capture the *initially positive* effect that we find.

The only way that those theories could be consistent with a such relationship is if any vote transfer (in the form of protest) from the incumbent (and its coalition partners) towards the main challenger (and other dominant parties) is matched with a significant vote transfer from the smaller parties towards the challenger as well.[8] Nevertheless, this implies that we should observe an increase in unemployment to be associated with a significant increase in the vote share of the challenger and its chances of winning the elections, thus making it more likely to observe an incumbent defeat or a change in the composition of the governing coalition. In order to exclude this possibility we test our first alternative hypothesis ($H_A.1$):

$H_A.1$: *An increase in unemployment decreases the re-election probability of the incumbent and increases the probability of observing a change in composition of the governing coalition.*

Failure to confirm this alternative hypothesis would imply that the increase in the vote shares of dominant parties is not driven by an outright rejection of the incumbent governing party (or coalition) or an increase in the popularity of the main opposition which has led to increased electoral support for the main challengers. Rather, the observed increase in the vote shares of dominant parties must be directed towards the incumbent as well (otherwise we should have at least observed a change in the composition of the government or governing coalition).

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[8]Recall that, given how we have defined our dependent variable, the latter is absolutely necessary as, otherwise, it is invariable to vote transfers that occur exclusively among dominant parties.

This leaves one last alternative mechanism - different from protest voting though - that needs to be explored. Perhaps the increase in the vote shares of dominant parties is driven by increased electoral support for the incumbent, as in periods of economic crisis (e.g., high unemployment) voters might have the tendency to identify with the parties in power - what is known as the "rally around the flag" effect. Hence, this could explain why one can fail to get enough support for our alternative hypothesis (H_A.1) without our mechanism necessarily being in operation. But, in turn, this implies that we should observe the incumbent being re-elected with higher frequency.

H_A.2: *An increase in unemployment increases the re-election probability of the incumbent.*

In practice, the second alternative hypothesis (H_A.2) is the mirror image of H_A.1. Failure to confirm both of them simultaneously, while our main hypothesis is confirmed, will eliminate protest or retrospective voting as a possible explanation. Then, any increase in the vote shares of dominant parties as a result of increased unemployment cannot be attributed to vote transfers among dominant parties (our variable is immutable to those changes) nor can it be an outcome of increased electoral support for only a subset of dominant parties (e.g., only for the governing party or for the main challenger) as this would have led to one of the two alternative hypotheses being confirmed. Rather, it has to be a *net transfer* of votes from the smaller parties - with no chance of being in office - towards the dominant ones. This makes our proposed mechanism all the more likely - but not necessarily the only one in operation - since unlike all other theories our mechanism does not discriminate among dominant parties. Instead, the distinction is made among parties that can use the public purse to woo the unemployed (given the conditions specified above) and those that cannot.

3 Empirical analysis

Given the lack of any comparative empirical study on the effects of unemployment on systemic variables, such as the concentration of electoral power within a party-system, our work is a first attempt to systematically explore this relationship. Of course, we must stress that the present

study does not aspire to provide a complete account of how the unemployed vote. Rather, our goal is to uncover and document this non-monotonic relationship between unemployment and support for dominant parties (electoral fragmentation) which is consistent with our theoretical framework. We do so in the following section.

3.1 Data description and variable definitions

For our empirical analysis, we have compiled a data set that contains aggregate political, socio-demographic, institutional and economic data from OECD states. The main source of our data is the *Comparative Political Data Set I* (Armingeon et al. 2009), which consists of a compilation of (mostly) annual data for 22 OECD states, all of which are consolidated parliamentary democracies, from 1970 to 2007.[9] We have supplemented this data set with socioeconomic, fiscal and labor data retrieved from the online OECD database and observations collected from the OECD *i-Library*. Finally, data for oil prices were retrieved from OPEC and the US Energy Information Administration (EIA).

The data are organized in a manner that is suitable for a cross-country, longitudinal, pooled time series analysis. Our units of analysis are election (not calendar) years. The reason is that most political, electoral and institutional variables (and of course both our dependent variables) only vary at elections. Moreover, to ensure that we are not discarding vital information, for most parts of our analysis, we have decided to average the data at the election term level.[10] Therefore, we are left with almost 200 observations at the election-year level. For a complete description of the data set, we refer the reader to the online code-book[11] and the online OECD database (*OECD i-Library*). Finally, we formally define our two dependent variables: the *sum of the vote shares of the dominant parties* and *electoral fragmentation*.[12] We define the sum of vote shares of the

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[9]In the cases of Greece, Spain and Portugal, political data were collected only for the democratic periods. Data for Greece are missing during the period 1967-1973. Data for Portugal are missing until 1975 and for Spain until 1976.

[10]The average time between elections (electoral term) is approximately three years.

[11]Data and code-book are publicly available online at:

http://www.ipw.unibe.ch/content/team/klaus_armingeon/comparative_political_data_sets/index_ger.html

[12]In order to completely distinguish our theory from protest and retrospective voting theories, we use the sum of the vote shares of the dominant parties as an alternative to electoral fragmentation. We must stress here that the identities of the dominant parties within each country may vary over time and we have taken this into account when constructing our variable (even though in most countries the identities of dominant parties have remained unchanged for a long period of time).

dominant parties, in country i at election-year t, as follows:

$$V_{i,t} = \sum_{j \in D_{i,t}} v_{j,i,t}$$

where $v_{j,i,t}$ is the vote share (in percentages) of party j in country i at election-year t, such that party j belongs to the subset of dominant parties $\mathcal{D}_{i,t} \subset \mathcal{N}_{i,t}$ in country i at election year t (where $\mathcal{N}_{i,t}$ is the set of all parties in country i that contested elections in year t and $\#N_{i,t}$ stands for the cardinality of this set).[13]

Further, we also define electoral fragmentation (Rae Index) as follows:

$$F_{i,t} = 1 - \sum_{j=1}^{\#N_{i,t}} (v_{j,i,t})^2$$

where $v_{j,i,t}$ is the vote share (in percentages) of party j in country i at election year (or term) t. For a more detailed description of all our variables we refer the reader to Appendix C. Effectively, $V_{i,t}$ captures the same information with electoral fragmentation - in fact, it is its mirror image - with the only exception that, unlike the latter, it is *immutable* to vote swaps between dominant parties.

3.2 The OLS model

To test our hypothesis, we estimate the following OLS model:[14]

$$V_{i,t} = \beta_0 + \beta_1\ q_{i,t} + \beta_2\ q_{i,t}^2 + \mathbf{X}'_{i,t}\gamma + a_i + \lambda_t + \eta_{i,t} \tag{1}$$

where the dependent variable $V_{i,t}$ is sum of vote shares of dominant parties and $q_{i,t}$ is the unemployment rate for country i in election-year t, respectively. Unemployment is measured as a percentage of the total active labor force, $\mathbf{X}'_{i,t}$ is the vector with the control variables[15] and, finally,

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[13] For a party j in country i to be classified as a member of the set $\mathcal{D}_{i,t}$ at time t the following conditions must be satisfied: party j must have participated in government at least once in the past (i.e., sometime in $t-1$) and should have reasonable chances to be represented in the prospective parliament at time t. Given that the identity of dominant parties across different countries has remained relatively unchanged over time, defining a stable (non-time varying) set $\mathcal{D}_i$ would not alter our results significantly.

[14] We also estimate the same model after replacing $V_{i,t}$ with $F_{i,t}$ as our dependent variable.

[15] Our control variables include: the type of electoral rule (proportional vs. majoritarian), a dummy variable controlling for the incumbency effect, the type of government (single-party vs. coalition), the degree of institutional constraints, the number of parties contesting elections, the growth rate of GDP, tax revenues and debt as percent of the GDP.

α_i and λ_t are country and year fixed effects. We have also included a quadratic term to account for the non-monotonic relationship, as suggested by our theory. According to our hypothesis, we anticipate $\beta_1 > 0$ and $\beta_2 < 0$ (concave relationship).[16]

From the set of control variables we would like to elaborate further on three of them: total tax revenues (as percent of GDP), public debt (as percent to GDP) and the degree of institutional constraints.[17] The first two (tax revenues and public debt) capture the magnitude of fiscal constraints that dominant parties face in using the public purse for opportunistic (electorally motivated) purposes. Insufficient state revenues and (or) the inability of the state to access the international financial markets (due to excessive debt burden) obviously constrain electorally motivated transfers as they render non-credible any such promise.

But, in addition to the financial constraints, dominant parties might also face an additional set of exogenous institutional constraints (e.g., an independent central bank, budgetary rules etc.) that also can limit their ability to engage in politically motivated transfers. That is, while non-ruling parties certainly have no access to the public purse and, hence are constrained in their ability to use for their own electoral purposes, the same might be true for dominant parties as well (see e.g., Martin and Vanberg 2013).[18] If that is the case, then when they face high institutional constraints their ability to woo the unemployed voters is not significantly different from that of small parties which, in turn, results in less votes (Fig. 2 and Fig. 3). As a result, high institutional constraints mitigate (exacerbate) the positive (negative) effect of unemployment on the vote shares of dominant parties. For this reason in some specifications we also interact this variable with unemployment.

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[16] If we replace the sum of vote shares of the dominant parties with electoral fragmentation, we expect a convex relationship, that is, $\beta_1 < 0$ and $\beta_2 > 0$.

[17] $CONSTRAINTS$ is a time-variant (annually) index (range 0-6) that measures the degree of institutional constraints faced by the central government (taken from Armingeon et al. 2009). It is an additive index composed of 6 dummy-variables ('1'=constraints, '0'=otherwise) (1) EU membership=1, (2) degree of centralization of state structure (federalism=1), (3) the difficulty of amending constitutions/balanced-budget constitutional provisions (very difficult=1) (4) strong bicameralism=1 (5) central bank autonomy=1 (6) frequent referenda=1. High values indicate powerful constraints, low values are indicative of a large maneuvering room being available to the central government.

[18] Martin and Vanberg, using the same data with us, find that restrictive budgetary procedures (e.g., budgetary rules) "[...] can eliminate the expansionary fiscal pressures." Moreover, Larcinese et al. (2012) - who find modest support for the conjecture that US Presidents will favor financially their core supporters - attribute their findings "to institutional features of distributive politics that are particular to the US" such as bi-cameralism, federalism and the system of checks and balances (Congress guards control over the public purse) which severely limit the President's influence over the distribution of federal expenditures. They conclude by stressing that "even though [the President] would like to target voters, he cannot."

In the following section, we present our OLS results that should serve as a benchmark.

3.2.1 OLS results

Table 1 presents our OLS estimates under two alternative specifications in order to test our main hypothesis (H.1). In columns 1 and 2 we estimate our OLS model, using both dependent variables, where the key explanatory variables are unemployment and its square. First, note that the coefficient on unemployment β_1 is positive (1.97) - negative (-0.72) when the dependent variable is electoral fragmentation - and statistically significant at any conventional level. Moreover, β_2 is also negative (with value -0.05) - positive (with value 0.02) when the dependent variable is fragmentation - and statistically significant under all alternative specifications, exactly as expected. This verifies the existence of a non-monotonic relationship.

Further note that, in these two specifications we have included an interaction term between unemployment and institutional constraints to account for the differential impact that unemployment might have on the vote shares of dominant parties (electoral fragmentation) when the opportunistic use of the public purse is subjected to additional exogenous constraints. As expected, the coefficient is negative (with value -0.4) - positive (with value 0.15) when fragmentation is the dependent variable - and statistically significant at the 5% level. The coefficient on the interaction term (approximately one fifth of the magnitude of β_1 in absolute terms) can be interpreted as follows: as a country moves from an environment with low to an environment with the highest possible degree of constraints (e.g., by establishing the autonomy of the central bank) - thus limiting the ability of dominant parties to use the public purse for electoral purposes - the positive (negative) effect of unemployment on the vote shares of dominant parties (electoral fragmentation) is completely eliminated, ceteris paribus.[19]

In summary, our OLS estimates yield statistically significant support to our prediction of a non-monotonic and concave (convex) relationship between unemployment and electoral support for dominant parties (electoral fragmentation). Nevertheless, despite the absence of any theoretical or empirical evidence suggesting the existence of a relationship running in the opposite direction,

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[19] In our sample the index that measures the degree of institutional constraints varies - across countries - from 1 to 5.

the possibility that electoral fragmentation may affect unemployment cannot be dismissed outright - at least not without exploring it further. Electoral outcomes (and fragmentation as an aggregate index) convey information on the distribution of electoral power which, in turn, might affect policies and institutions. Therefore, with this in mind, in the next section we introduce instrumental variable (IV/2SLS) models where we use the non-policy induced changes (shocks) in the price of oil as an instrument in order to get some exogenous (non-policy induced) variation in unemployment and insulate our estimates from any concerns regarding reverse causality or endogeneity.

3.3 The 2SLS/IV model

As stressed above, a potential source of concern with the OLS estimates is reverse causality (endogeneity). Therefore, in order to account for exogenous, non-policy induced variation in unemployment which will allow us to estimate its causal effects on the vote shares of dominant parties and electoral fragmentation, we introduce instrumental variables in our econometric specification. For this purpose, we employ oil price shocks which - as we show below - are exogenous to policy changes and, hence, they constitute relevant and valid instruments that satisfy the exclusion restriction.[20] First, we briefly discuss the relevance of the instrument in our context - implying that there is an economically meaningful relationship between oil price shocks and unemployment. Then we explain in detail how we were able to obtain the (exogenous) shocks on the price of oil and construct our IVs and, finally, we elaborate further on why our instrument also is valid, that is, it satisfies the exclusion restriction.

3.3.1 Relationship between oil price shocks and unemployment

The idea of using oil price shocks as an instrument for unemployment is extensively discussed by Levitt (2001) who summarizes strategies for identifying the causal effects of unemployment on crime.[21] In an other study, at the US states level, Raphael and Winter-Ebmer (2000) argue that oil price shocks are relevant instruments for unemployment. Clearly, as many studies point out

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[20] For a more detailed and extensive discussion on the validity and suitability of using the shocks on the price of oil as an instrument for unemployment we refer the readers to Levitt (2001).

[21] The difficulty in identifying the causal effect of unemployment on crime is similar to ours due to reverse causality and unobserved policies that affect simultaneously both the crime rates and unemployment.

both at the theoretical (e.g., van Wijnbergen 1985) and at the empirical level (Keane and Prasad 1996; Blanchard and Gali 2007; Raphael and Winter-Ebmer 2000) oil price shocks can affect unemployment and the labour market, mainly through two channels: as adverse *supply shocks* and via the *real wage effect*. In the very short-run the supply shock in the goods market, caused by increased oil prices, dominates and causes unemployment to increase. Yet, in the medium and long run the labour market adjusts. The increase in the general price level - higher oil prices raise the production costs of many intermediary goods - causes real wages (w_t/p_t) to fall below the worker's *marginal productivity* (MPL) and, hence, firms are willing to employ more workers - oil-intense capital and labour are net perfect substitutes (Keane and Prasad 1996). As a result, investment will increase and there will be excess demand in both labour and goods markets. This increase in investment and the *real wage effect* will dominate over the medium-run and, as a result, the effect of an oil price increase on employment (unemployment) is positive (negative). Recent empirical studies (e.g., Keane and Prasad 1996) confirm these predictions[22] - and so do our first-stage OLS estimates that we present in Table 7 (Appendix A). Therefore, we conclude that oil prices shocks are a relevant instrument.

3.3.2 Oil price shocks estimation and IV construction

In order to compute the oil price shocks and construct our IV, we estimate the following AR(2) model:[23]

$$P_{i,t} = \phi_{i,0} + \phi_{i,1} P_{i,t-1} + \phi_{i,2} P_{i,t-2} + u_{i,t} \tag{2}$$

where $P_{i,t}$ is the real (PPI-index) price of imported crude oil at refinery[24] and $u_{i,t}$ is the residual of the AR(2) process. Since the literature (e.g., Blanchard and Gali 2007) suggests that the full

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[22] Keane and Prasad (1996) note: "We find that oil price increases result in a substantial decline in real wages for all workers [...]. The use of panel data econometric techniques to control for unobserved heterogeneity is essential to uncover this result, which is completely hidden in OLS estimates. While the short-run effect of an oil price increase on aggregate employment is negative, *the long-run effect is, in fact, positive.*"

[23] The choice of an AR(2) process was dictated by the systematic and significant second-degree auto-correlation in the residuals that was observed. An AR(2) process is the most efficient way to get a precise estimate on the oil price shocks.

[24] This means that we use the real price for oil prior to any taxes or any other tariffs being levied upon them by any government. We also exclude oil producing countries that can affect the price of oil from from our analysis.

effect of oil price shocks on the labour market materializes with a lag, in most specifications we use multiple lags of the predicted residuals (oil price shocks) $\hat{u}_{i,t}$, weighted by the index of industrial intensity $w_{i,t}$ (constructed using OECD data on industrial production and employment) for each country i at year t. We define the vector of our instruments as follows:[25]

$$\boldsymbol{Z}_{i,t} = (\hat{u}_{i,t-1}, \cdots, \hat{u}_{i,t-n})$$

where $\boldsymbol{Z}_{i,t}$ is an n-dimensional vector (with $n = 2$ for the just-identified model and $n \geq 3$ when the model is overidentified).[26] Formally, we estimate the following 2SLS model (in some specifications we also include a lagged dependent variable):

$$\binom{q_{i,t}}{q_{i,t}^2} = \boldsymbol{b}_0' + \boldsymbol{b} \times \boldsymbol{Z}_{i,t}' + \boldsymbol{X}_{i,t}'\boldsymbol{\gamma} + \boldsymbol{\alpha}_i + \boldsymbol{\lambda}_t + \boldsymbol{\nu}_{i,t} \ (1^{st} \text{ stage regressions}) \tag{3}$$

and

$$V_{i,t} = \beta_0 + \boldsymbol{\beta} \cdot \hat{\boldsymbol{Z}}_{i,t}' + X_{i,t}'\gamma + \alpha_i + \lambda_t + \eta_{i,t} \ (2^{nd} \text{ stage regression}) \tag{4}$$

where $\boldsymbol{b}$ is a $2 \times n$ matrix ($n \geq 2$), $\boldsymbol{\beta} = (\beta_1, \beta_2)$, $\hat{\boldsymbol{Z}} = (\hat{q}_{i,t}, \hat{q}_{i,t}^2)$, $\boldsymbol{X}_{i,t}$ is a k-dimensional vector with the control variables,[27] whereas α_i and λ_t are country and year fixed effects respectively. In accordance with empirical literature (e.g. Keane and Prasad 1996) presented in the section above, we expect $\boldsymbol{b} < 0$ (oil price increases were found to have a positive effect on employment and thus, reduce unemployment in the long-run). Results of this specification are presented in Tables 1, 2 and 3 while Table 7 (Appendix A) summarizes the first-stage results of all the 2SLS models presented in this paper.

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[25] One can also employ more simple methods of estimating oil price shocks and constructing our IVs that involve no indexation at all or simply use real imported oil prices at refinery without predicting the residuals of an AR(2) process. Since all of them produce almost identical results, we do not present them here but are available by the authors upon request.

[26] Another reason to include multiple lags of the predicted residuals of real oil prices is associated with the fact that in most specifications we aggregate our data on unemployment at the election term level which usually contains information over many years. Hence the use of at least three lags.

[27] We use the same control variables as in the OLS specification above.

From the above discussion it should be clear why the exclusion restriction is satisfied. The requirement is that oil price shocks (the vector of instruments $\boldsymbol{Z}_{it}$) must be uncorrelated (orthogonal) to the second-stage residuals η_{it}. The primary issue with the exclusion restriction is whether electoral fragmentation (support for dominant parties) and oil price shocks can be related via variables other than unemployment (operating via the real wage effect). For instance, policies that affect growth (and aggregate demand) also might affect oil prices and electoral outcomes. Or perhaps, an increase in the price of oil can induce different policy responses in countries with different levels of fragmentation, and these policy responses may, in turn, affect unemployment. Yet for reasons presented below, we believe that these are not valid concerns.

First, in order to insulate our results, we exclude from our sample all oil producing countries and the US.[28] This addresses two other adjacent concerns: the monotonicity condition[29] and reverse causality (we need to ensure that electoral outcomes do not affect oil price shocks). It is extremely difficult to argue that changes in electoral outcomes in any non-oil producing small or medium-sized OECD economy can affect the price of oil. However, even if one's demand for oil depends on electoral outcomes (and growth), a single country's demand is still a negligible share of aggregate world demand. Thus we can be sure that electoral outcomes at an individual small open economy cannot affect current oil prices - not to mention the *past lags* oil price shocks.[30] This brings us directly to our next point, which is to stress that, in fact, our IV is *not* the price of oil per se but the *lags of the residuals* of an AR(2) process. That is, even if one believes that oil prices are driven by the individual demand in one (large) economy at time t, what we have estimated in equation (2) is the *purely exogenous* component (residual) of the lagged price of oil at time $t-1$. Hence, it cannot depend on any policy at time t - the AR process with the optimal number of lags takes account of any serial auto-correlation between past and present oil prices.

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[28] The US is excluded for a variety of reasons: as a large, open economy and an oil producer with significant oil reserves, its energy policy might affect oil prices. Moreover, it has a two-party, presidential system, making the study of electoral fragmentation trivial.

[29] In a world of potentially heterogeneous treatment effects, instruments may have no effect on some subjects, but all those who are affected should be affected in the same direction.

[30] There is a growing amount of empirical evidence suggesting that oil prices follow a pattern that is largely unaffected by voting behavior in any OECD economy (Pindyck 1999; Barnett and Vivanco 2003; Cashin et al. 2000; Engel and Valdes 2000; Bartsch 2006). Moreover, note that in all specifications we use *lags* of oil price shocks that cannot be affected by current demand.

Furthermore, concerning the worry that policy responses to *exogenous oil price shocks* can be correlated with the sum of vote shares of the dominant parties (or electoral fragmentation), Bernanke et al. (1997) find that almost all of the observed movement in the instruments of monetary policy and, hence, all the changes in policy are largely explained by the central bank's *commitment* to macroeconomic stabilization. Moreover, they find that "[...] shocks to monetary policy explain relatively little of the overall variation (typically, less than 20 percent) in output [and employment]." As a consequence, their findings do not support the view that changes in monetary policy depend on political outcomes and variables and to the extend which monetary policy has an effect on output and employment this is coming almost exclusively from the policy rule (the "reaction function") of the central bank. But in almost all OECD states, central banks have a substantial degree of policy independence and autonomy, which insulates the bank's reaction function from political control. In addition, much of the output (and employment) stabilization takes place via automatic stabilizers that are also beyond the political control of governments. As a result, it is very unlikely that policy responses to oil price shocks can be correlated with our dependent variable. Moreover, it is also highly unlikely that those policy responses have any important effect on unemployment (and the business cycle). Overall, it should be clear by now that our instrument is valid and satisfies the exclusion restriction.[31] That is, the effect of oil price shocks on electoral fragmentation (and the vote shares of dominant parties) comes solely through changes in unemployment.[32]

3.3.3   Results

We now present the estimates of the 2SLS model in Tables 1 and 2. Table 1 presents the results of the baseline model (both for the full and restricted sample). Columns 3 and 4 (Table 1) are the benchmark[33] that we compare with the OLS estimates (Columns 1 and 2). As we can see, both

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[31] We also note that the results of the Sargan/J-test for overidentifying restrictions (when applicable), although they do not constitute a direct test of the exclusion restriction per se, consistently fail to reject the null hypothesis that the instrument is orthogonal to the second-state error term ($H_0 : E[\boldsymbol{Z}_{it}\eta_{it}] = 0$).

[32] We have also conducted a falsification test by estimating a reduced form equation of the effect of oil price shocks on the re-election probability of the incumbent and we found null results. They are available by authors upon request.

[33] The overidentified case with 2 endogenous regressors (unemployment and unemployment-squared) and 3 IV's on the restricted sample.

β_1 and β_2 have the expected signs and are statistically significant even at the 1% level. Compared to the OLS estimates the coefficient on the linear term β_1 increase in magnitude roughly by four times (from 2 to 8.5 and from -0.7 to -3.1 respectively) - and so do the standard errors. The same is true for the coefficient on the squared term β_2 (from -0.05 to -0.6 and from 0.02 to 0.17 respectively). In columns 5 and 6 we re-estimate our benchmark model using an Arellano-Bond dynamic panel estimator.[34] In particular, we estimate a two-step difference GMM model where in addition to our standard instruments (lags of oil price shocks) we have a set of GMM instruments which are the lags of the endogenous variables (unemployment and its square). In addition, since the dynamic panel specification allows us to do so, we have also added a lagged dependent variable (LDV) in our model - that is, we add $F_{i,t-1}$ and $V_{i,t-1}$ respectively. Not surprisingly, we obtain estimates similar to those in columns 3 and 4. In fact the estimated coefficients β_1 (2.7 and -1.2 respectively) and β_2 (-0.05 and 0.03 respectively) fall somewhere between the OLS and the 2SLS estimates - and closer to the OLS ones. That is, the OLS and 2SLS estimates provide a lower and an upper bound respectively. Furthermore, the reported Sargan statistic on overidentifying restrictions (where applicable) fails to reject the null that the vector of our instruments ($\boldsymbol{Z}_{it}$) is orthogonal to the second-stage residuals (η_{it}) at any conventional level.

Regarding the coefficient on the interaction term between unemployment and the degree of institutional constraints, it has the expected sign (positive when electoral fragmentation is the dependent variable and negative otherwise) and is statistically significant in most - but not all - specifications.[35] It can be interpreted as follows: conditional on a country exhibiting high institutional constraints (e.g., an independent central bank, balanced-budget constitutional clauses, fiscal federalism or bicameralism) that do not leave much room for dominant parties to engage in electorally motivated spending, the initially positive (negative) impact of unemployment on their vote shares (fragmentation) is mitigated. This finding is accordance with the stylized evidence

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[34] The Arellano-Bond (GMM) estimator provides an alternative method for analyzing data that are organized as a dynamic panel. We do not discuss it extensively in this paper - as we focus on the 2SLS/IV estimator - yet additional results are available by the authors upon request.

[35] As we have explained in the previous section, institutional constraints are a slow-changing variable, and much of the variation is subsumed by the use of country and year FE. Moreover, if one also aggregates the data at the election term level - as we do in Table 2 and onwards - this effect vanishes to a large extent.

presented in figures 2 and 3 (Appendix A). Therefore, increased institutional constraints induce greater fragmentation (and less concentration of electoral power in the hands of dominant parties).

Moreover, as we show in Table 2, our 2SLS estimates are robust to various alternative specifications.[36] In all cases, our estimates for both β_1 and β_2 are almost identical in magnitude with the estimates presented in Table 1 (although smaller in absolute terms as compared to the case where a LDV is not introduced and the data are not averaged at the electoral term level). The coefficient on the linear term ranges from 8.4 to 5.3 (previously 8.5) while the quadratic term ranges from -0.6 to -0.35 (previously -0.6) - when the dependent variable is the sum of vote shares of dominant parties - and both are statistically significant at any conventional level. Taken altogether, our findings seem to provide strong evidence in favor of both our mechanism and also our main hypothesis (H_1) about a non-monotonic relationship. Figure 4 (Appendix A) shows that our estimates are also qualitatively - not only statistically - significant since the change in the monotonicity of the relationship takes place at a range of unemployment values (around 6 and 7 percent) that are also politically and economically relevant - in our sample the median unemployment rate is almost 5.5 percent. That is, the positive part of the relationship between unemployment and electoral support for dominant parties is really meaningful.

The only issue that remains to be addressed is related to a well-known problem in the IV literature: weak instruments. Notice that in almost all specifications presented so far, where we estimated an overidentified model (a choice dictated by the fact that we average our data at the election term level), our IVs seem to be relatively weak, as the F-statistics is below the critical value of 10. This is the case despite the fact that our instruments are certainly relevant and valid (see Table 7, Appendix A). We attribute this to the following reason: the simultaneous inclusion of two endogenous regressors. We address this complications in the section that follows.

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[36] In Table 2, we introduce two variations on the model's specification: we average the data at the election term level and introduce a Lagged Dependent Variable in the model (LDV) in the standard 2SLS model - as we did in the Arellano-Bond (GMM) dynamic panel estimation.

3.4 Weak instruments and the just-identified model

The problem with the inclusion of many (potentially weak) instruments is that it tends to increase the bias of the 2SLS estimator towards the probability limit of the OLS estimates. The technical reason for estimating the just-identified model should be clear by now. The use of multiple instruments (lags of oil price shocks) - a choice dictated by the inclusion of two endogenous regressors in the model and the fact that we have decided to average our data at the electoral term level - generated concerns that those instruments might be weak. Clearly, then, the most efficient solution to this problem is to reduce the number of endogenous regressors to just one and use our best available instrument. For this reason, in the section that follows we estimate a just-identified model (one endogenous regressor and one IV) where we only include the quadratic term of unemployment $(q_{i,t}^2)$ in order to capture the non-monotonic nature of the relationship between unemployment and electoral support for dominant parties. In the Appendix, we repeat the same exercise by also using the linear term. In addition, again in the Appendix, we take one extra step that is common in the IV literature (see e.g., Angrist and Pischke 2009): we use the LIML estimator for the overidentified models (for the case of averaged data).

3.4.1 The just-identified IV model with the quadratic term

As explained above, in order to address the concern of weak instruments, we have resorted to the following solution: reducing the number of endogenous regressors to just one (we use the quadratic term) and estimating the simplest possible model (the just-identified IV model, using our single best instrument). While this can completely resolve the problem of weak instruments (see Table 3) it generates another concern. How to properly estimate a *non-monotonic* relationship between unemployment and electoral support for dominant parties (fragmentation) when using only a *single* regressor? In this section we introduce a modification of the simple just-identified model, where instead of using the *quadratic term* of unemployment we use its square deviations from its global maximum (minimum). Our goal is to show the existence of a concave (convex) relationship between unemployment and electoral support for dominant parties (fragmentation). Formally, we define

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$\hat{Q}_{\max} \equiv -\frac{\hat{\beta}_1^{2SLS}}{2\hat{\beta}_2^{2SLS}}$, where $\hat{\beta}_1^{2SLS}$ and $\hat{\beta}_2^{2SLS}$ are the predicted coefficients of the estimated 2SLS second-stage equation (4).[37] Then we estimate the following model:

$$(q_{i,t} - \hat{Q}_{\max})^2 = b_0 + b_1 \cdot \hat{u}_{i,t-1} + \boldsymbol{X}'_{i,t}\boldsymbol{\gamma} + \alpha_i + \lambda_t + \xi_{i,t}$$

and

$$V_{i,t} = \pi_0 + \pi_1 \widehat{(q_{i,t} - \hat{Q}_{\max})^2} + \boldsymbol{X}'_{i,t}\gamma + \alpha_i + \lambda_t + \varepsilon_{i,t}$$

where $\hat{Q}_{\max}$ is the argument that maximizes the second stage predicted equation of the standard 2SLS model.

The reason for including this *modified* quadratic term is the following: since we want to use only one instrument we can only include one endogenous regressor - the quadratic term - and omit the linear one. Then in order for our coefficient estimate π_1 to be meaningful we need to use the square of the term $(q_{i,t} - \hat{Q}_{\max})$ which measures the deviations from the critical value of unemployment $\hat{Q}_{\max}$ (see Fig. 4).[38] We expect $\pi_1 < 0$ when $V_{i,t}$ is our dependent variable (and positive otherwise). We present the results of those estimates in Table 3. In all specifications the coefficient on the quadratic term is positive and statistically significant at any conventional level. Moreover, the $F-$statistic of the excluded IV is *significantly* larger than 10, well above the critical zone, in all specifications. Therefore, we conclude that there is no need to worry about weak instruments, since the alternative estimation method that we have employed (the just-identified IV model with the quadratic term) produced identical results that yield strong support to our first hypothesis (H_1): the non-monotonic relationship between unemployment and electoral fragmentation. Furthermore, our estimates are robust to model alterations and large in

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[37]Recall we have estimated the following second-stage equation: $V_{i,t} = \beta_0 + \boldsymbol{\beta} \cdot \hat{\boldsymbol{Z}}'_{i,t} + X'_{i,t}\gamma + \alpha_i + \lambda_t + \eta_{i,t}$ where $\boldsymbol{\beta}^{2SLS} = (\beta_1^{2SLS}, \beta_2^{2SLS})$, $\hat{\boldsymbol{Z}}'_{i,t} = \begin{pmatrix} \hat{q}_{i,t} \\ \hat{q}_{i,t}^2 \end{pmatrix}$ and $\beta_1^{2SLS} > 0$ and $\beta_2^{2SLS} < 0$ (with opposite signs when the dependent variable is $F_{i,t}$).

[38]In practice, by estimating the deviations of unemployment from $\hat{Q}_{\max}$ (and $\hat{Q}_{\min}$ when fragmentation is the dependent varibale) we effectivelly transpose the symmetry axis of the second-stage equation from zero to $\hat{Q}_{\max}$. As a result, we can generate observations on the negative quadrant of the x-axis and our estimated relationship becomes meaningful.

magnitude - one standard deviation in unemployment, approximately 4%, can explain more than three quarters of the variation in fragmentation and the vote shares of dominant parties, ceteris paribus. For a single economic variable, the effect is quite large and politically significant.

3.4.2 Alternative hypotheses and discussion

Before discussing further the qualitative implications of our results, we need to discuss in greater depth the two alternative mechanisms and examine whether the alternative hypotheses that were presented in the introduction hold any validity. This is done in Table 4 where we test the two alternative hypotheses, namely that an increase in unemployment decreases (increases) the re-election probability of the incumbent.[39] Since both our dependent variables (*incumbent re-elected* and *government changed*) are binary we can test both hypotheses simultaneously.[40] Then we can reject them both at the same time if we find that the estimated coefficients are statistically indistinguishable from zero - this would imply that an increase in the unemployment rate is associated with neither an increase nor a decrease in the probability of observing a change in the incumbent party (or coalition). This is exactly what we find in Table 4, irrespective of our choice regarding the model's specification or the choice of our dependent variable. All the coefficients of interest fail to be statistically significant at any conventional level.

But in addition to those two, we also test a modified version of our second alternative hypothesis. Perhaps in the case of left-wing parties, unemployment might be a favorable issue for them to campaign on. For instance, Wright (2012) finds that in the US unemployment is a "Democrat issue" and an increase in unemployment is helping Democrat (but not Republican) incumbents

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[39] Notice that the two alternative hypotheses are the mirror image of each other.

[40] When we are dealing with a single-party government it is straightforward to see how the variables were constructed. When we are dealing with a coalition government, the variable *incumbent re-elected* takes the value of one if the major coalition partner of the incumbent government is again the major coalition partner in the new government (with the same or new allies). Contrary to that, the variable *government changed* takes the value of one as long as any change in the composition of the government or the cabinet has occured. This could include, the change in the relative strength of old coalitions partners (i.e., the minor partner became the major), the insertion of a new party in the old coalition, the change of prime-minister (who might originate from a different coalition partner) or the formation of a brand-new coalition. For example, the new German coalition government (CDU/SPD) constitutes a government change (from the previous composition of the CDU/FDP coalition) and, hence, *government changed* = 1, but since the major coalition partner is again the CDU (and incidentally the Chancellor is the same person) variable *incumbent re-elected* = 1. But if, instead, the major coalition partner was the SPD then *incumbent re-elected* = 0. That is, the two variables exhibit different degrees of sensitivity as to what constitutes an incumbent defeat.

to get re-elected. If this is the case, then we need to test one additional hypothesis: issue-voting. That is, unemployment is a party-specific issue that solely benefits the left incumbent. This is done in columns 5 and 6 (Table 4) where we estimate the incumbent's re-election probability, conditional on the incumbent being a left-wing party. Again, we find no evidence in support of this claim at any conventional level of significance and, hence, we conclude that neither of our two alternative hypothesis (and its conditional variant) can explain the empirical relationship that we have documented. This leaves our mechanism as the most plausible explanation for this documented non-monotonic relationship.

The implications of our empirical findings are twofold. First, the non-monotonic relationship that we have uncovered yields strong support for our proposed mechanism - though we need to stress that we do not claim that it is the only relevant mechanism that connects those two variables. When public finances permit it and absent any institutional or other constraints, dominant parties can exploit the relatively higher responsiveness of the unemployed to generous redistribution to obtain electoral gains (special interest motivation for redistribution). Second, they verify the important effect that economic conditions have on electoral outcomes and the structure of the party-system. Although there are, of course, other factors that affect electoral outcomes, the impact of unemployment seems to be among the most prominent determinants of electoral behavior and party-system structure in industrialized democracies. Therefore, our findings highlight the importance of economic conditions as determinants of party-system structure and electoral success. In doing so, we flag an additional reason for caution: inclusive economic institutions (e.g., the welfare state) might ultimately, in the absence of institutional checks and balances, help the dominant parties to consolidate their power instead of increasing electoral power-sharing.

4   Concluding remarks

In this paper, we have studied the effects of unemployment on electoral outcomes - and the chances of electoral success for the dominant parties - and we have uncovered a non-monotonic relationship between unemployment and support for dominant parties (electoral fragmentation). This implies

that dominant parties can, under certain conditions, exploit economic malaise. Departing from previous literature, we have presented a theoretical framework (special interest politics for redistribution) that is consistent with this non-monotonic relationship and we have suggested a possible link through which this effect operates: redistributive politics. Moreover, our findings pave the way for a closer inspection of the role of institutional checks and balances in limiting the ability of dominant parties to use the public purse for opportunistic purposes which is something that future formal and empirical work should explore in greater depth. Yet our theoretical framework need not be the only mechanism that relates unemployment with political outcomes. In this paper, we focused mainly in documenting this non-monotonic relationship that was completely ignored by past literature. Future work also should focus on spelling out more clearly the mechanisms involved.

Finally, our findings point to the fact that some unemployment can be beneficial for the dominant parties and, hence politically desirable. Only when unemployment exceeds a critical level (e.g., see Fig. 4) will dominant parties begin to suffer the consequences since redistribution promises either become insufficient or are not perceived to be credible. Therefore, our findings also can pave the way for revising the theory of political business cycles (Nordhaus 1975; Alesina 1987) by endogenizing parties' preferences over unemployment,[41] fiscal discipline and redistribution. Ultimately, by endogenizing parties' preferences over unemployment and public spending, a more systematic study of the relationship between economic outcomes, institutions, and political competition - in both directions - can be made possible. Nevertheless, this paper does not aspire to provide a formal model of political business cycles. It simply points to that direction by unveiling the intuition behind parties' opportunistic (electoral) motives that might favor policies that prioritize redistribution at the expense of fiscal discipline. We defer those questions for future formal and empirical research.

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[41] In Alesina (1987) preferences over unemployment are assumed to be exogenous.

References

[1] Acemoglu, D., J. A. Robinson, and R. Torvik (2013). "Why Do Voters Dismantle Checks and Balances?" *Review of Economic Studies,* 80 (3): pp. 845-875.

[2] Acemoglu, D., and J. A. Robinson (2012). *Why Nations Fail: The Origins of Power, Prosperity and Poverty.* New York: Crown Publishing Group Inc.

[3] Acemoglu, D., and J. A. Robinson (2006). *Economic Origins of Dictatorship and Democracy,* Cambridge and New York: Cambridge University Press

[4] Acemoglu, D., S. Johnson, and J. A. Robinson (2005). "Institutions as a Fundamental Cause of Long Run Growth," *Handbook of Economic Growth,* 1 (1): 385-472.

[5] Alesina, A. (1987). "Macroeconomic Policy in a Two-Party System as a Repeated Game," *Quarterly Journal of Economics*, 120 (3): 651-678.

[6] Alesina, A., and N. Roubini (1992). "Political Cycles in OECD Economies," *Review of Economic Studies*, 59 (4): 663-688.

[7] Alesina, A., Baqir, R., and Easterly, W. (2000). "Redistributive Public Employment." *Journal of Urban Economics*, 48 (2): 219-241.

[8] Angrist, J. D., and J. Pischke (2009). *Mostly Harmless Econometrics: An Empiricist's companion.* Princeton, NJ: Princeton University Press.

[9] Angrist, J. D., G. W. Imbens, and D. B. Rubin (1996). "Identification of Causal Effects Using Instrumental Variables," *Journal of the American Statistical Association*, 91 (4): pp. 444-455.

[10] Arcelus, F., and A. H. Meltzer (1975). "The Effects of Aggregate Economic Variables on Congressional Elections," *American Political Science Review,* 69 (4): pp. 1232–65.

[11] Armingeon K., P. Potolidis, M. Gerber, and P. Leimgruber (2009). "Comparative Political Data Set I 1960-2007." Institute of Political Science, University of Bern.

[12] Barro, R. J. (1996). "Institutions and Growth, an Introductory Essay," *Journal of Economic Growth,* 1 (2): pp. 145-48.

[13] Bartsch, U. (2006). "How much is Enough? Monte Carlo Simulations of an Oil Stabilization Fund for Nigeria," *IMF Working Paper* 06/142, Washington: International Monetary Fund

[14] Bernanke, B. S., M. Gertler, M. Watson, C. A. Sims, and B. M. Friedman (1997). "Systematic Monetary Policy and the Effects of Oil Price Shocks," *Brookings Papers on Economic Activity*, 1997 (1): pp. 91-157.

[15] Blanchard, O. J., and J. Gali (2007). "The Macroeconomic Effects of Oil Shocks. Why are the 2000s so Different from the 1970s?" *NBER Working Paper Series,* No. 13368.

[16] Bloom, H., and D. Price (1975). "Voter Response to Short-run Economic Conditions: The Asymmetric Effect of Prosperity and Recession," *American Political Science Review* 69 (1): 124–54.

[17] Campbell, J. E., and J. Garand (2000). *Before the Vote: Forecasting American National Elections.* Thousand Oaks, CA: Sage Publications.

[18] Cashin, P., H. Liang, and C. J. McDermott (2000). "How Persistent Are Shocks to World Commodity Prices?" *IMF Staff Papers,* 47 (2): pp. 177-217

[19] Dassonneville, R., and M. S. Lewis-Beck (2013). "Economic Policy Voting and Incumbency: Unemployment in Western Europe." *Political Science Research and Methods*, 1 (1): pp. 53-66

[20] Dixit, A., and J. Londregan (1995). "Redistributive Politics and Economic Efficiency," *American Political Science Review*, 89 (4): pp. 856-866.

[21] Dixit, A., and J. Londregan (1996). "The Determinants of Success of Special Interests in Redistributive Politics," *Journal of Politics*, 58 (4): pp. 1132-1155

[22] Eijffinger, S. C. W., and J. De Haan (1996). "The Political Economy of Central Bank Independence," in *Special Papers in International Economics*, No 19. P. B. Kenen, K. S. Rogoff,

M. B. Riccardi, L. Spais and L. H. Chandra (eds.). Princeton, NJ: Department of Economics, Princeton University.

[23] Engel, E., and R. Valdes (2000). "Optimal Fiscal Strategy for Mineral Exporting Countries," *IMF Working Paper,* 00/118. Washington, DC: International Monetary Fund.

[24] Fiorina, M. P. (1978). "Economic Retrospective Voting in American National Elections: A Micro-analysis," *American Journal of Political Science*, 22 (2): pp. 424-443.

[25] Grilli, V., D. Masciandaro, and G. Tabellini (1991). "Political and Monetary Institutions and Public Financial Policies in the Industrial Countries," *Economic Policy*, 6 (13): pp. 341-392.

[26] Holbrook, T. M. (2008). "Incumbency, National Conditions, and the 2008 Presidential Election," *PS: Political Science and Politics,* 41: pp. 709–12.

[27] Keane, M. P., and E. S. Prasad (1996). "The Employment and Wage Effects of Oil Price Changes: A Sectoral Analysis," *Review of Economics and Statistics*, 78 (3): pp. 389-400.

[28] Kiewiet, D. R. (1983). *Macroeconomics and Micropolitics: The Electoral Effects of Economic Issues.* Chicago: University of Chicago Press.

[29] Kinder, D. R., G. S. Adams, and P. W. Gronke (1989). "Economics and Politics in the 1984 American Presidential Election," *American Journal of Political Science,* 33 (2): pp. 491–515.

[30] Kinder, D. R. and D. R. Kiewiet (1979). "Economic Discontent and Political Behavior: The Role of Personal Grievances and Collective Economic Judgments on Congressional Voting," *American Journal of Political Science,* 23 (3): pp. 495–527.

[31] Kinder, D. R., and D. R. Kiewiet, (1981). "Sociotropic Politics: The American Case," *British Journal of Political Science,* 11 (1): pp. 129–141.

[32] Kramer, G. (1971). "Short-Term Fluctuations in U.S. Voting Behavior, 1896–1964," *American Political Science Review* 65 (1): pp. 131–43.

[33] Kriner, D. L., and A. Reeves (2012). "The Influence of Federal Spending on Presidential Elections," *American Political Science Review*, 106 (2): pp 348-366.

[34] Larcinese, V., J. M. Snyder Jr., and C. Testa (2012). "Testing Models of Distributive Politics Using Exit Polls to Measure Voter Preferences and Partisanship," *British Journal of Political Science*, (forthcoming)

[35] Levitt, S. D. (2001). "Alternative Strategies for Identifying the Link Between Unemployment and Crime," *Journal of Quantitative Criminology*, 17 (4): pp. 377-390.

[36] Martin, L. W., and G. Vanberg (2013). "Multiparty Government, Fiscal Institutions, and Public Spending," *Journal of Politics,* 75 (4): pp. 953-67.

[37] Myerson, R. B. (1993). "Incentives to Cultivate Favored Minorities Under Alternative Electoral Systems," *American Political Science Review*, 87 (4): pp. 856-869.

[38] Nordhaus, W. D. (1975). "The Political Business Cycle," *Review of Economic Studies,* 44 (2): pp. 169-190.

[39] Persson, T., and G. Tabellini (2003). *The Economic Effects of Constitutions.* MIT Press: Cambridge, MA.

[40] Powell, G. B. Jr. and G. D. Whitten (1993). "A Cross-national Analysis of Economic Voting: Taking Account of the Political Context," *American Journal of Political Science*, 37 (2): pp. 391-414.

[41] Pyndick, R. (1999). "The Long-run Evolution of Energy Prices," *Energy Journal,* 20 (2): pp. 127-37.

[42] Rae, D. W. (1968). "A note on the fragmentation of Some European Party Systems," *Comparative Political Studies,* 1 (3): pp. 413-418.

[43] Raphael, S., and R. Winter-Ebmer (2001). "Identifying the Effect of Unemployment on Crime," *Journal of Law and Economics,* 44 (1): pp. 259-283.

[44] Robinson, J. A., and T. Verdier (2013). "The Political Economy of Clientelism," *Scandinavian Journal of Economics,* 115 (2): pp. 260-291.

[45] Staiger, D., and J. H. Stock (1997). "Instrumental Variables Regression with Weak Instruments," *Econometrica,* 65 (3): pp. 557-586.

[46] Stokes, S. C. (2005). "Perverse Accountability: A Formal Model of Machine Politics with Evidence from Argentina," *American Political Science Review,* 99 (3): pp 315-325.

[47] Tufte, E. (1978). *Political Control of the Economy.* Princeton, NJ: Princeton University Press.

[48] Van Wijnbergen, S. (1985). "Oil Price Shocks, Unemployment, Investment and the Current Account: An Intertemporal Disequilibrium Analysis," *Review of Economic Studies,* 52 (4): pp. 627-645.

[49] Wright, J. R. (2012). "Unemployment and the Democratic Electoral Advantage," *American Political Science Review,* 106 (4): pp. 685-702.

5 Appendix A: Supplementary Material

5.1 The model with the linear term

In this section, we present two types of estimates based on the model that includes only the linear term on unemployment: a) the overidentified model with averaged data (one endogenous regressor but multiple IVs) where we compare two estimators (2SLS and LIML), and b) the just-identified model. But first we need justify our choice to estimate a variant of our baseline 2SLS model using only one endogenous regressor, the linear term on unemployment.[42] One might question our decision to exclude the quadratic term from the estimated equation. If one adheres to our theoretical findings (as we do), the relationship between unemployment and electoral fragmentation is clearly non-monotonic. Why then exclude the quadratic term? Is there any intuitive justification apart from the technical one, and how does this affect our estimates?

First, note that the main point we want to make is to question the conventional wisdom (e.g., theories of retrospective and protest voting) on the effect of unemployment on electoral outcomes by uncovering an initially negative relationship between unemployment and electoral fragmentation (positive when we replace fragmentation with the sum of vote shares of the dominant parties) that those theories cannot explain.[43] Moreover, attempting to estimate a monotonic relationship, instead of non-monotonic one, would result in significant under-estimation of our coefficient on unemployment (smaller in absolute terms),[44] as Figure 1 shows. Therefore, excluding the quadratic term is to our disadvantage, as it makes it much more difficult to establish the first part of this relationship. In fact, if we are still able to find a clear, positive (negative) and statistically significant relationship between unemployment and electoral support for dominant parties (fragmentation), even though we are deliberately underestimating (in absolute terms) the value of β_1, this will strengthen our point. As a result, the trade-off of estimating a simplified

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[42] Formally, we estimate: $q_{i,t} = b_0 + \sum_{n=1}^{m} \hat{u}_{i,t-n} + \boldsymbol{X}'_{i,t}\gamma + \alpha_i + \lambda_t + \xi_{i,t}$ and $V_{i,t} = \beta_0 + \beta_1 \cdot \hat{q}_{i,t} + \boldsymbol{X}'_{i,t}\gamma + \alpha_i + \lambda_t + \varepsilon_{i,t}$. Again, in some specifications we include a lag of the dependent variable (LDV).

[43] After controlling for any vote transfers taking place between the dominant parties, retrospective or protest voting theories can only explain why fragmentation rises (or the vote shares of the dominant parties decrease) as unemployment rises, but not the reverse as our theory predicts.

[44] Smaller positive value when our dependent variable is the sum of vote shares of dominant parties.

version of the model, to address the weak instrument issue, comes at virtually no cost.

5.1.1 Results

Table 5 compares the estimates of the overidentified models (with one endogenous regressor) using the LIML estimator with those of a standard 2SLS. Moreover, Table 6 presents the results of the just-identified model with a single endogenous regressor. In all specifications, the coefficient on unemployment is negative[45] (range from -1.3 to -0.8) and statistically significant at least at the 5% level, albeit smaller in magnitude than our estimates from the baseline 2SLS model in Tables 1 and 2 (recall we are underestimating β_1). In Table 5, where we continue to use data averaged at the election term level, one can see that the 2SLS estimates are slightly biased towards the OLS estimates, compared to the LIML estimates. Moreover, when the number of instruments included in the regressions increases from two to three (compare column 1 to 2 and 3 to 4), the bias on the 2SLS estimates is larger (and the coefficient is closer to the OLS estimates), while the LIML estimates remain virtually unchanged (and statistically significant). Of course, this comes at the cost of the LIML estimates being slightly less precise (standard errors are larger) but not to the extent of being uninformative and causing concern.[46] Since in all specifications, the 2SLS and the LIML estimates are quite similar in magnitude and informative, we conclude that the relatively low F-statistic (ranging from 2.5 to 5) is not detrimental to our results.

Moreover, in Table 6, we present the IV estimates of the just-identified model (one endogenous regressor) where we use our single best instrument (the first lag). In columns 1 to 3, we estimate the model with electoral fragmentation as our dependent variable. In the remaining three columns, we replace it with the sum of vote shares of the dominant parties. In all specifications (with and without weights or a LDV), our results are informative, statistically significant and in accordance with our predictions. The coefficient on unemployment is positive, ranging from 4.7 to 2.6, when $V_{i,t}$ is the dependent variable and negative, ranging from -0.8 to -1.3, when $F_{i,t}$ is the dependent variable. Also notice that the weak instrument problem is now *completely* resolved: the first-

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[45] Positive when the dependent variable is the sum of vote shares of the dominant parties (range from 2.3 to 4.1).

[46] Also note that, compared to the estimates of the just-identified model in Table 6, the LIML estimates in Table 5 appear to be statistically indistinguishable from them.

stage F-statistic on the excluded IV is above the desired critical value of 10 under *all* alternative specifications. Therefore, we conclude that our instrument is not weak (as the F-score suggests) and clearly valid (as the Sargan statistic suggests).

Table 1: *The effects of unemployment on the vote shares of dominant parties and electoral fragmentation under three alternative econometric estimators (OLS, 2SLS and GMM/Arellano-Bond)*

Dependent Variable	OLS Model		2SLS Model		GMM/Arellano-Bond	
	Electoral frag.	Dom. parties vote-shares	Electoral frag.	Dom. parties vote-shares	Electoral frag.	Dom. parties vote-shares
	(1)	(2)	(3)	(4)	(5)	(6)
Unemployment	-0.724	1.974	-3.073	8.484	-1.223	2.675
	(0.262)***	(0.711)***	(1.167)***	(2.504)***	(0.360)***	(0.782)***
Unempl.-squared	0.020	-0.049	0.167	-0.595	0.032	-0.051
	(0.009)**	(0.271)*	(0.082)**	(0.245)**	(0.013)**	(0.028)*
Constraints∗Unempl.	0.147	-0.403	1.801	-0.753	0.153	-0.574
	(0.058)**	(0.163)**	(0.970)*	(2.479)	(0.095)	(0.159)***
# of IVs	N/A	N/A	3	3	85	85
Industry Weights?	N/A	N/A	Yes	Yes	Yes	Yes
Sargan score (χ^2)	N/A	N/A	0.44	0.005	33.9	43.1
(p-value)			0.51	0.95	0.70	0.30
Other Controls?	Yes	Yes	Yes	Yes	Yes	Yes
Country FE?	Yes	Yes	Yes	Yes	Yes	Yes
Year FE?	Yes	Yes	Yes	Yes	Yes	Yes
LDV?	No	No	No	No	Yes	Yes
F-statistic (1st-stage)	N/A	N/A	7.4	5.6	38.8	24.1
Obs.	186	186	180	180	177	177
R^2	0.92	0.92	0.85	0.63	-.-	-.-

Note: (***) $p < 0.01$; (**) $p < 0.05$; (*) $p < 0.10$. Robust standard errors, clustered at the country level reported in parentheses. Corrected standard errors reported in all columns (2SLS models). In columns 1, 2, 4 and 6 we estimate a lagged dependent variable (LDV) model. Columns 1 and 2 are the same specifications (standard 2SLS model) with Columns 3 and 4 (Table 1) but with the inclusion of a LDV. Columns 3 to 6 reproduce the estimates of the standard 2SLS model but the data are aggregated at the electoral term level (columns 4 and 6 with the inclusion of a LDV are directly comparable to columns 1 and 2). IVs: In all columns lags of oil price-shocks which were estimated by predicting the residuals of an AR(2) process on real imported oil prices at refinery, weighted by the index of industrial intensity. For the overidentified 2SLS models (3 instruments and 2 endogenous regressors) the Sargan statistic of a J-test on overidentifying restrictions is reported. Other controls include: electoral rule dummy, number of parties, incumbent government defeated dummy (takes value of 1 if the incumbent has lost the elections), Debt/GDP ratio, GDP growth rate and government revenues (tax receipts) as percent of GDP.

Table 2: *Estimates of the overidentified 2SLS models using data averaged at the election term level under alternative econometric specifications (with the inclusion of a lagged dependent variable)*

	Basic Model		Data aggregated at electoral term			
Dependent Variable	Electoral Frag.	Dom. parties vote-shares	Electoral Fragmentation		Dominant parties vote-shares	
	LDV	LDV		LDV		LDV
Explanatory Variables	(1)	(2)	(3)	(4)	(5)	(6)
Unemployment (in %)	-3.312 $(0.965)^{***}$	8.364 $(2.597)^{***}$	-3.272 $(1.013)^{***}$	-3.248 $(1.153)^{***}$	5.880 $(1.580)^{***}$	5.243 $(1.763)^{***}$
Unemployment-square	0.195 $(0.062)^{***}$	-0.607 $(0.186)^{***}$	0.215 $(0.082)^{***}$	0.238 $(0.078)^{***}$	-0.344 $(0.147)^{**}$	-0.357 $(0.110)^{***}$
Institutional Constraints	1.924 $(1.000)^{*}$	-0.578 (2.952)	0.377 (1.130)	0.118 (1.065)	1.906 (2.371)	2.081 (1.823)
Other Controls	Yes	Yes	Yes	Yes	Yes	Yes
Year Fixed Effects?	Yes	Yes	Yes	Yes	Yes	Yes
Country Fixed Effects?	Yes	Yes	Yes	Yes	Yes	Yes
# of excluded IVs	3	3	3	3	3	3
Industry weights?	Yes	Yes	Yes	Yes	Yes	Yes
Obs.	179	179	180	179	180	179
R^2	0.81	0.59	0.78	0.72	0.86	0.85
J-test score (χ^2)	0.35	0.003	0.27	0.16	0.82	0.66
(p-value)	0.56	0.96	0.61	0.69	0.37	0.42
F-statistic (1st Stage)	6.9	3.9	3.4	3.1	3.7	2.9

Note: *(***) p < 0.01; (**) p < 0.05; (*) p < 0.10. Robust standard errors, clustered at the country level reported in parentheses. Corrected standard errors reported for the 2SLS models in all columns. In columns 1, 2, 4 and 6 a lagged dependent variable (LDV) was introduced into the standard 2SLS model. Columns 1 and 2 reports the estimates of the exact same 2SLS model as in columns 3 and 4 (Table 2) with the difference of adding a LDV. In columns 3 to 6 we reproduce the estimates of the standard 2SLS models (with - columns 4 and 6 - and without - columns 3 and 5 - a LDV) when all data are aggregated at the electoral term level (term averages). IVs: In all columns the lags of oil price-shocks, which were estimated by predicting the residuals of an AR(2) process on real imported oil prices at refinery, weighted by the index of industrial intensity. For all the overidentified 2SLS models (with 3 IVs and 2 endogenous regressors) the Sargan statistic of a J-test on overidentifying restrictions is reported. Other controls include: electoral rule dummy, number of parties, incumbent government defeated dummy (takes the value of 1 if the incumbent has lost the elections), Debt/GDP ratio, GDP growth rate and government revenues (tax receipts) as percent of GDP.*

Table 3: *Estimates of the just-identified model using only the quadratic term of unemployment under various alternative econometric specifications (with LDV)*

Dependent Variable	Baseline models (non-averaged data)				Averaged data	
	Electoral Fragmentation		Dominant parties vote-shares		Electoral Fragment.	Dom. parties vote-shares
	2SLS	LDV	2SLS	LDV	LDV	LDV
Explanatory Variables	(1)	(2)	(3)	(4)	(5)	(6)
Unemployment-squared	0.146	0.125	-0.262	-0.271	0.085	-0.202
	$(0.052)^{***}$	$(0.057)^{**}$	$(0.113)^{**}$	$(0.102)^{***}$	$(0.032)^{***}$	$(0.102)^{**}$
Other Controls	Yes	Yes	Yes	Yes	Yes	Yes
Year FE?	Yes	Yes	Yes	Yes	Yes	Yes
Country FE?	Yes	Yes	Yes	Yes	Yes	Yes
Industry weights?	Yes	Yes	Yes	Yes	No	No
LDV?	No	Yes	No	Yes	Yes	Yes
Obs.	183	182	183	182	182	182
R^2	0.87	0.89	0.89	0.88	0.91	0.91
F statistic (1st- Stage)	14.0	11.7	13.1	10.2	15.8	15.4

Note: *(***) $p < 0.01$; (**) $p < 0.05$; (*) $p < 0.10$. Robust standard errors, clustered at the country level reported in parentheses. Corrected standard errors reported for all models. In columns 2, 4, 5 and 6 a lagged dependent variable (LDV) was introduced. Estimates of the squared undemployment term in columns 1 and 3 are based on the estimated coefficient values of the basic 2SLS model presented in Table 1. Estimates in columns 2, 4, 5 and 6 are based on the 2SLS models of Table 2. In columns 5 and 6 data were aggregated at the election term level (electoral term averages). IVs: In all columns the lags of oil price-shocks, which were estimated by predicting the residuals of an AR(2) process on real imported oil prices at refinery, weighted by the index of industrial intensity (except columns 5 and 6 where no weights were used). All models are just-identified (i.e. we use 1 IV). Other controls include: electoral rule dummy, number of parties, degree of institutional constraints, incumbent government defeated dummy (takes the value of 1 if the incumbent has lost the election), Debt/GDP ratio, GDP growth rate and government revenues (tax receipts) as percent of GDP.*

Table 4: *The effect of unemployment on the probability of government change and the re-election probability of the incumbent under alternative econometric specifications (Alternative Hypothesis 1 and 2)*

Dependent Variable:	Incumbent won re-election (binary)				Incumbent (left) won re-election		Government changed	
	OLS	IV	Probit	IV Probit	OLS	IV	OLS	IV
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
Unemployment (in %)	0.018	0.099	0.013	0.310	-0.009	0.110	0.010	-0.029
	(0.027)	(0.073)	(0.082)	0.258	(0.021)	(0.061)	(0.018)	(0.033)
Other Controls	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Country Fixed Effects?	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Year Fixed Effects?	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Industry Weights?	N/A	Yes	N/A	Yes	N/A	Yes	N/A	Yes
# of IVs	N/A	1	N/A	1	N/A	1	N/A	1
Obs.	175	175	165	150	175		175	175
R^2	0.37	0.35	0.30	-.-	0.44	0.23	0.53	0.50
$F-$ statistic (1st stage)	N/A	12.5	N/A	12.5	N/A	9.6	N/A	12.4

Note: *Robust standard errors, corrected and clustered at the country level reported in parentheses. (***) p < 0.001; (**) p < 0.01; (*) p < 0.05. The dependent variable is a dummy that takes the value of 1 if the incumbent government (or coalition) was re-elected, and 0 otherwise. In Columns 7 and 8 the variable is sensitive to any change in the composition of the coalition (identity or order of coalition partners) even if some members of the coalition remain the same. In Columns 1 to 6 the variable changes only if the major coalition partners are voted out but not if there is an additional new coalition member or if the identity of the minor partner has changed. In Columns 1, 5, and 7 estimate a linear probability model (LPM). Even columns 2, 6, and 8 are the just-identified IV/2SLS versions of the LPM models. Column 3 estimates a Probit model and column 4 its IV analogue. The F-statistic on the excluded IVs is reported for all the 2SLS/IV models. IV: In all even columns, lags of oil price-shocks estimated by predicting the residuals of an AR(2) process on real imported oil prices at refinery, weighted by the index of industrial intensity. All IV models are just-identified (one lag). Other controls include: electoral rule dummy, number of parties, degree of institutional constraints, Debt/GDP ratio, GDP growth rate, government revenues (tax receipts) as percent of GDP.*

Table 5: *The coefficient of the linear term of unemployment under two alternative estimators (2SLS and LIML) in the overidentified models (1 endogenous regressor and multiple lags/ IV's) under various alternative econometric specifications*

Dependent Variable	Model with linear term				LDV Model	
	Electoral Fragmentation		Dominant parties' vote-shares		Electoral Fragment.	Dom. parties vote-shares
	(1)	(2)	(3)	(4)	(5)	(6)
2SLS	-1.231	-.854	4.064	2.173	-.812	2.278
	$(0.528)^{**}$	$(0.371)^{**}$	$(1.755)^{**}$	$(0.915)^{**}$	$(0.400)^{**}$	$(1.112)^{**}$
R^2	0.87	0.90	0.79	0.87	0.91	0.90
J-test score (χ^2)	0.19	3.46	0.02	2.87	0.68	0.32
(p-value)	0.66	0.18	0.90	0.24	0.41	0.58
LIML	-1.248	-1.205	4.072	3.454	-.853	2.338
	$(0.535)^{**}$	$(0.594)^{**}$	$(1.759)^{**}$	$(1.938)^{*}$	$(0.400)^{**}$	$(1.149)^{**}$
R^2	0.87	0.87	0.79	0.82	0.91	0.90
J-test score (Rubin χ^2)	0.12	1.56	0.02	4.07	0.67	0.31
(p-value)	0.73	0.22	0.90	0.13	0.41	0.58
Weights?	Yes	Yes	Yes	Yes	Yes	Yes
# of IV's	2	3	2	3	2	2
LDV?	No	No	No	No	Yes	Yes
Other Controls?	Yes	Yes	Yes	Yes	Yes	Yes
Year Fixed Effects?	Yes	Yes	Yes	Yes	Yes	Yes
Country Fixed Effects?	Yes	Yes	Yes	Yes	Yes	Yes
F-statistic (1st-Stage)	4.52	3.54	2.46	3.14	4.24	5.1
Obs.	182	180	174	174	183	175

Note: (***) $p < 0.01$; (**) $p < 0.05$; (*) $p < 0.10$. *Robust standard errors, clustered at the country level reported in parentheses. Corrected standard errors reported in all columns (2SLS and LIML models). Columns 1 through 4 present the 2SLS and LIML estimates of the baseline model (with only the linear term). In columns 5 and 6 we add a lagged dependent variable (LDV). In all columns data are averaged at the election term level. All models are overidentified (one endogenous regressor - the linear term on unemployment - and at least two IVs). IV: lags of oil price-shocks estimated by predicting the residuals of an AR(2) process on real imported oil prices at refinery, weighted by the index of industrial intensity. For the 2SLS models we report the Sargan statistic of a J-test on overidentifying restrictions. For the LIML models we report the Anderson-Rubin statistic. In all columns the first-stage F-score on the excluded IV's is reported. Other controls include: electoral rule dummy, number of parties, the degree of institutional constraints, incumbent government defeated dummy, debt/GDP ratio, GDP growth rate and government revenues (tax receipts) as % of GDP.*

Table 6: *Results of the just-identified IV model (with one endogenous regressor) on the effect of unemployment under various alternative econometric specifications*

Dependent Variable	Electoral fragmentation			Dominant parties vote-shares		
	(1)	(2)	(3)	(4)	(5)	(6)
Unemployment (in %)	-1.270	-1.089	-.800	4.669	3.615	2.585
	(0.545)**	(0.448)**	(0.382)**	(2.167)**	(1.523)**	(1.427)*
Other Controls	Yes	Yes	Yes	Yes	Yes	Yes
Year Fixed Effects?	Yes	Yes	Yes	Yes	Yes	Yes
Country Fixed Effects?	Yes	Yes	Yes	Yes	Yes	Yes
Industry-related weights?	No	Yes	Yes	No	Yes	Yes
# of IVs	1	1	1	1	1	1
LDV?	No	No	Yes	No	No	Yes
Obs.	183	183	182	183	183	182
R^2	0.86	0.87	0.91	0.74	0.81	0.88
F statistic (1st-Stage)	18.8	14.5	11.1	10.8	12.5	8.9

Note: *(***) $p < 0.01$; (**) $p < 0.05$; (*) $p < 0.10$. Robust standard errors, clustered at the country level reported in parentheses. Corrected standard errors reported in all columns. Columns 3 and 6 reproduce the estimates of the same IV model, as in columns 2 and 5 repsectively, with the addition of a lagged dependent variable (LDV). The F-statistic of the first-stage excluded IV is reported. IV: In all columns, one lag of oil price shocks which were estimated by predicting the residuals of an AR(2) process on real imported oil prices at refinery, weighted by the index of industrial intensity (except columns 1 and 4). Other controls include: electoral rule dummy, number of parties, degree of institutional constraints, incumbent government defeated dummy, debt/GDP ratio, real GDP growth rate and the share of government revenues (tax receipts) as % of GDP.*

Table 7: *First-stage OLS estimates of the overidentified 2SLS (Tables 1 and 2) and the just-identified IV model (Table 6) under various econometric specifications (LDV, averaged data).*

Dependent Variable	Unemployment (in %) (electoral term average)		Unemployment (in %) at election year (not averaged over the whol term)			
	(1)	(2)	(3)	(4)	(5)	(6)
Excluded IV						
L. Oil Price shocks weighted AR(2) residuals	-0.029 $(0.014)^{**}$	-.-	-0.034 $(0.015)^{**}$	-0.011 $(0.003)^{***}$	-.-	-.-
L. Oil Price shocks unweighted AR(2) residuals	-.-	-0.025 $(0.013)^{**}$	-.-	-.-	-0.010 $(0.002)^{***}$	-0.010 $(0.003)^{***}$
Other Controls	Yes	Yes	Yes	Yes	Yes	Yes
Country Fixed Effects?	Yes	Yes	Yes	Yes	Yes	Yes
Year Fixed Effects?	Yes	Yes	Yes	Yes	Yes	Yes
Industry Weights?	Yes	No	Yes	Yes	No	No
# of lags (IVs)	3	3	3	1	1	1
Obs.	180	180	180	183	183	182
R^2	0.86	0.86	0.84	0.83	0.83	0.83
$F-$ statistic	3.42	2.46	7.40	14.45	18.84	13.92

Note: *Robust standard errors, corrected and clustered at the country level reported in parentheses. (***) p < 0.001; (**) p < 0.01; (*) p < 0.05. Columns 1 and 2 are the first-stages of overidentified 2SLS model with averaged data at the electoral term level. Column 3 is the first-stage of the baseline 2SLS model (Table 1). Columns 4 to 6 present the estimates of the first-stage OLS regressions of the just-identified IV models presented in Table 6. F-statistics on the first-stage OLS regressions are reported in all columns. Other controls include: electoral rule dummy, number of parties, degree of institutional constraints, incumbent government defeated dummy, Debt/GDP ratio, GDP growth rate and government revenues (tax receipts) as percent of GDP.*
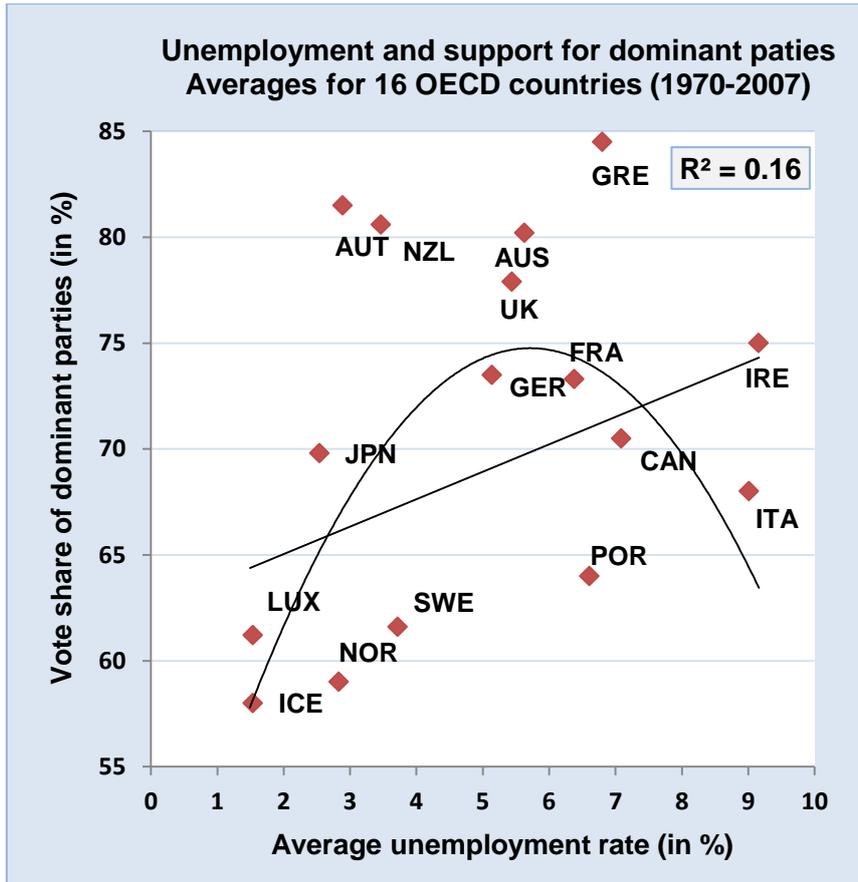
Figure 1. Average (at electoral term) unemployment rate and electoral support of dominant parties in OECD countries (1970-2007)
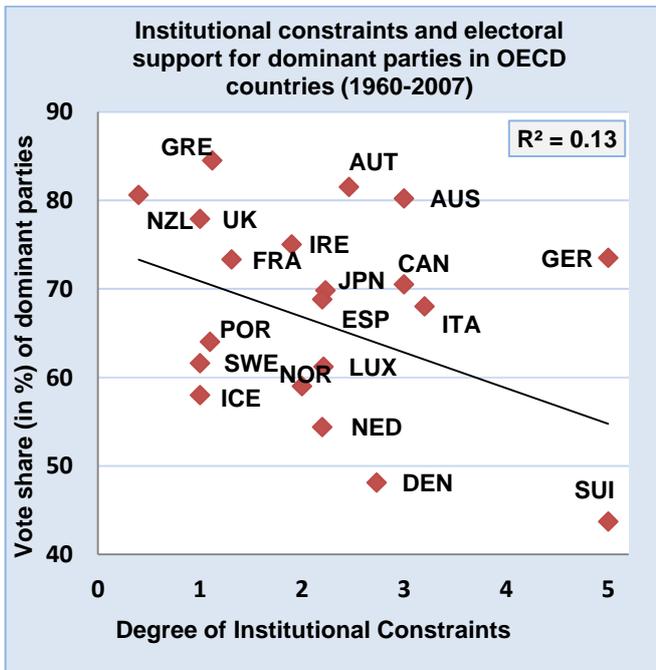

Figure 2. Institutional constraints and electoral support for dominant parties: OECD countries (1970-2007)
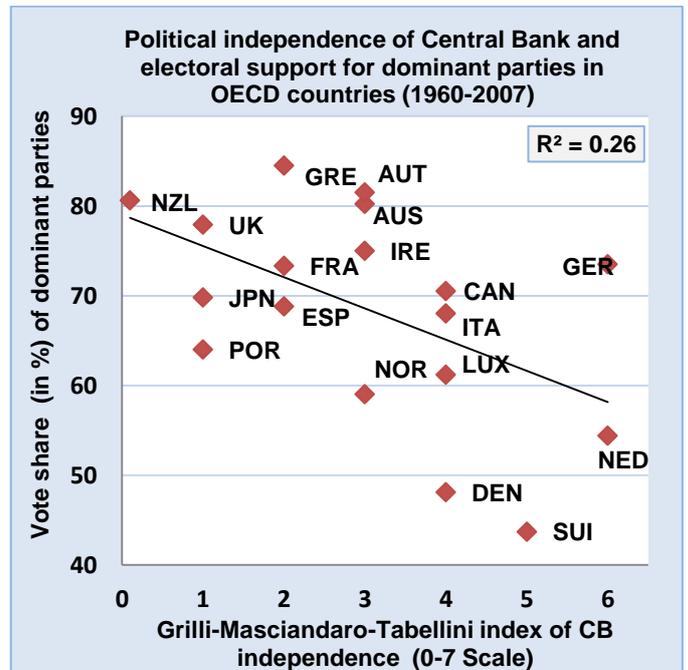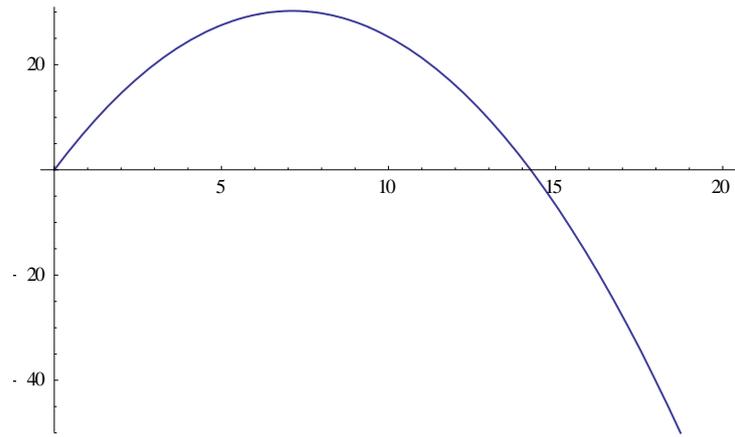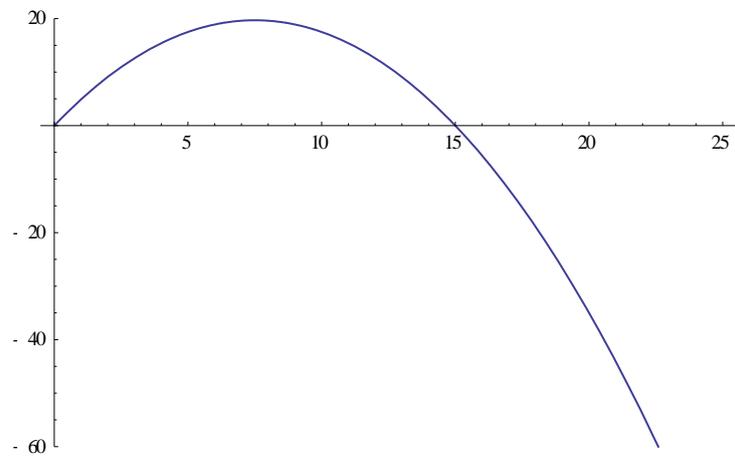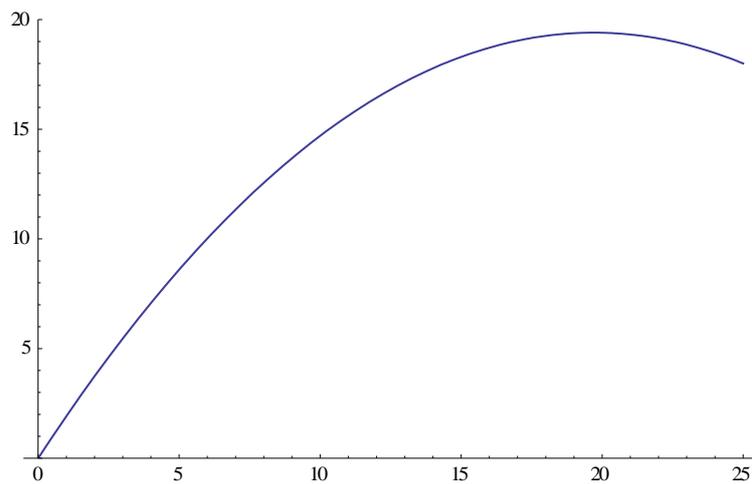
Figure 3. Central Bank independence and electoral support for dominant parties: OECD (1970-2007)

(a) Standard 2SLS

(b) 2SLS-LDV

(c) OLS

Figure 4. The estimated non-monotonic relationship between unemployment (horizontal axis in percentage terms) and the change in the electoral support for dominant parties under three different models: (a) 2SLS; (b) 2SLS with a lagged dependent variable (LDV) and averaged data at the electoral-term level; and (c) basic OLS.