Electoral Incentives and Economic Policy across Political Regimes*

Vincenzo Galasso†
Dondena, IGIER, Università Bocconi and CEPR

Salvatore Nunnari‡
California Institute of Technology

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Abstract

This paper provides a direct test of the causal link from electoral rules to economic policy. Our theoretical model delivers unambigous predictions on the interaction between institutions and a time varying event, namely the unemployment rate in pivotal and non-pivotal districts. We use local level data on unemployment rate and political competition to obtain an empirical specification which matches our model. First, we test the effect of electoral incentives under majority rule, by analyzing the US House representatives voting records on the 2009 Emergency Unemployment Compensation Extension Act, which increased unemployment benefit coverage and generosity. Second, we exploit the time-varying dimension of our theoretical prediction to test the causal effect on panel data. We use a dataset with local information on electoral competitiveness and unemployment rates for 29 OECD countries in 1980-2001 and employ panel analysis on different measures of UB generosity. The empirical evidence strongly supports our theoretical predictions.

Keywords: Electoral Rules, Economic Policy, Unemployment Benefits, Pivotal Districts

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†Department of Economics and IGIER, Università Bocconi, via Roentgen 1, 20136, Milano, vincenzo.galasso@unibocconi.it.

‡Division of the Humanities and Social Sciences, California Institute of Technology, MC 228-77, Pasadena, CA, 91125, snunnari@hss.caltech.edu.

1. Introduction

Economic policies largely differ across electoral rules. Existing empirical evidence suggest for instance that more redistribution takes place under proportional representation, while locally targeted transfers or public goods and pro-consumer policies are more common in majoritarian electoral systems (see Rogowski and Kayser [2002], Milesi-Ferretti, Perotti, and Rostagno [2002], Persson and Tabellini [2003] and Iversen and Soskice [2006]). Yet, much less is known on the existence of a casual link from political institutions to economic policy, and on the possible channels through which electoral rules may affect economic policy decisions. This paper concentrates on the different electoral incentives that political systems provide to office-seeking politicians. We focus on a specific welfare state program - unemployment benefits (UB) - which may be classified as broad or targeted according to the geographical dispersion of unemployment. Our simple theoretical model provides a clear testable implication, which is empirically validated both on US individual legislator voting data and on OECD country panel data: electoral incentives induce more generous UB transfers in majoritarian than in proportional systems if the unemployment rate is higher in pivotal than in non-pivotal districts.

Electoral rules introduce important differences in the electoral incentives of office-seeking politicians, in voters' choices, in parties' behavior and in the degree of political representation. Key contributions focusing on the role of electoral incentives for office-seeking policy-makers (see Stein and Bickers [1994], Persson and Tabellini [1999, 2000], Lizzeri and Persico [2001, 2005], and Denemark [2000]) share the view that in majoritarian systems electoral competition is concentrated in few pivotal electoral districts, which can be easily targeted by the (incumbent) politicians with pork barrel spending, such as direct transfers and local public goods[1]. Proportional representation features instead larger districts, and a more disperse electoral competition, which induces parties to seek support from broad coalitions in the populations by providing general public goods and broad transfers. Political institutions may also affect voters' behavior since the optimal strategic delegation to political representatives changes under different electoral rules (see

[1] A parallel literature suggests instead that pork barrel is mainly partisan, and thus provided to core voters (see for instance, Cox and McCubbins [1986], Levitt and Snyder [1995], Balla, Lawrence, Maltzman, and Sigelman [2002], Ansolabehere and Snyder [2006]), albeit possibly still in pivotal electoral districts.

Milesi-Ferretti, Perotti, and Rostagno [2002] and Gabel, Hix, and Malecki [2005]). Austin-Smith [2000] and Iversen and Soskice [2006] highlight the differences in the nature of the political parties and in the partisan composition of the governing coalition across electoral rules, which may lead to different policy outcomes. An alternative source of difference can be the geographical location of voters: with the right-wing electorate being more concentrated in rural areas, majoritarian systems - which underrepresent urban voters - may favor more conservative policies (see Rodden [forthcoming]). Hence, by affecting politicians', voters' and/or parties' behavior and political representation, electoral rules may influence economic policy decisions[2].

This paper contributes to the debate on the existence of a channel of transmission from political institutions to economic policy by examining the effect of electoral rules on a particular welfare state program - unemployment benefits (UB) - whose classification as a broad or targeted transfer may vary, over time and across countries, according to the geographical dispersion of unemployment. We build a simple theoretical framework, based on a probabilistic voting model with heterogeneous districts, to identify the different incentives that office-seeking policy-makers face under majoritarian and proportional electoral systems when choosing how to target the swing districts. Besides providing a local public good, politicians may transfer resources to the unemployed individuals through unemployment benefits (UB). Whether UB represents a broad or a narrowly targeted policy depends on the distribution of unemployed across electoral districts. This model provides a clear empirical prediction: when the unemployment rate is higher in pivotal than in non-pivotal districts, politicians provide more generous UB transfers in majoritarian than in proportional systems. Moreover, politicians in majoritarian systems are more reactive to changes in unemployment rates in either districts.

To provide a direct empirical test of the relevance of the electoral incentives identified in our theoretical model for the majoritarian regime, we examine the US House representatives individual voting behaviour on the 2009 Emergency

[2] A more critical strand of literature has instead challenged the view that such causality link may actually exist (see Acemoglu [2005], Aghion, Alesina, and Trebbi [2004], and Cusack, Iversen, and Soskice [2007]) by arguing that political institutions are endogenous. Since rational economic and political agents understand the implication of different electoral rules on economic outcomes, they will have induced preferences over political institutions. Hence, electoral rules and economic policies may be jointly determined by the preferences of the political elite.

Unemployment Compensation Extension Act, which extended UB coverage and generosity. Our results show that representatives elected in competitive districts featuring high unemployment rates are more likely to support EUCEA, thus suggesting that electoral incentives strongly matter in majoritarian systems. These results are in line with the empirical literature that underlines the importance of electoral competition in pivotal districts (see Stroemberg [2008], Mian, Sufi and Trebbi [forthcoming]) and of electorally vulnerable legislators (see Stein and Bickers [1994] and Bickers and Stein [1996]) for local government spending or pork barrel.

Evidence on the differential effects of the two electoral rules is instead obtained by using a dataset with novel and detailed information on local electoral relevance and constituence interests for 29 OECD countries in 1980-2001 and by employing panel analysis on different measures of UB generosity. The empirical evidence strongly supports our theoretical predictions. We find that in majoritarian systems politicians are more reactive to an increase in the unemployment rates both in the pivotal and non-pivotal districts than in proportional system. Moreover, if the unemployment rate is higher in pivotal than in non-pivotal districts, politicians provide more generous UB transfers in majoritarian systems.

Unlike our paper, the existing empirical contributions exploit mainly the variation in economic policy across countries to draw inference on constitutional effects (Aidt, Duta, and Loukoianova, [2006]; Milesi-Ferretti, Perotti, and Rostagno, [2002]; Persson and Tabellini, [2003]). As discussed in detail in Acemoglu [2005], the identification of casual effects with this cross country analysis is hindered by omitted variables and selection bias problems[3]. Fewer concerns would instead emerge with panel analysis, since country fixed effects would account for any time-invariant, country-specific unobserved determinants of economic policy, such as any direct effects of the constitution itself or of history, geography, or culture. Yet, this panel analysis is limited by the lack of constitutional reforms[4], which would allow for a clear within-country identification. Persson and Tabellini [2003] and Milesi-Ferretti, Perotti, and Rostagno [2002] hence try to exploit the

[3]Acemoglu [2005] provides a critical appraisal also of other estimation technics, such as instrumental variable, used in Persson and Tabellini [2003].

[4]Notice, however, that some countries, namely France, Italy, Japan and New Zealand, experienced some changes in electoral rules.

interaction between constitutional rules and other time-varying variables, such as unobserved common or country-specific shocks, or variables related to business and electoral cycle, using the methodology introduced by Blanchard and Wolfers [2000],[5] to identify these interaction terms using within-country variability. The drawback is that while these estimates are suggestive of some economic effects of political constitutions, they however do not represent a direct test of the predictions from the theoretical model. In a recent paper, Funk and Gathmann [2010] use reforms in electoral rules at Swiss local (canton) level to identify the effects of proportional and plurality rules on economic outcomes. They find supporting evidence that broad public spending is larger under proportional representation, and narrow spending under majority rules. Although their empirical strategy exploits within-canton electoral variations, thanks to most cantons switching from plurality to proportional rule over time, their analysis may still remain open to omitted variables problems, if unobservable factors are correlated with both the switches in electoral rules and with public spending.[6] Finally, Gagliarducci, Nannicini, and Naticchioni [2008] use micro data on Italian members of Parliament elected under a mixed electoral rule (75% majoritarian, 25% proportional) to test the effect of electoral rules on congressmen behavior. In a close-race regression discontinuity setup, they find that majoritarian congressmen present more bills targeted at their district of election and exert more effort in parliamentary activity.

The paper proceeds as follows. Section 2 introduces our simple model of policy formation under the two electoral systems, and obtains the main theoretical predictions. Sections 3 and 4 test respectively the predictions for the majoritarian system, and for the differences between the two systems. Section 5 concludes. All proofs are in the appendix.

2. The Model

We consider a stylized economy in which individuals may be employed or unemployed. Employed individuals receive a unitary wage and pay a tax, τ. Unem-

[5] The focus on indirect constitutional effects, captured by the interactions between the constitutions and other variables, further alleviates the concern of endogeneity. In fact, the possibility that historical or cultural determinants of the constitution would also influence these interactions seems more remote than the likelihood of a direct influence of the constitution on economic policy.

[6] The authors provide several robustness checks to address this issue.

ployed individuals receive an unemployment benefit, which consists of a transfer, f. Individuals value private consumption, which simply corresponds to their net income, and a local public good, g. The local public goods and the unemployment benefit system are financed through the tax revenues collected from the employed individuals.

Our country is assumed to be partitioned in districts. There are I districts of equal size. The utility of an average voter[7] in district $i \in I$ is given by the following utility:

$$V^i(\tau, f, g_i) = n_i V(1-\tau) + (1-n_i)V(f) + V(g_i) \tag{2.1}$$

where n_i represents the employment rate in district i and $1-n_i$ is the unemployment rate. Policies are decided and financed at the national level. Hence, the budget constraint is

$$\tau \sum_{i=1}^{I} n_i = \sum_{i=1}^{I} (1-n_i) f + \sum_{i=1}^{I} g_i \tag{2.2}$$

where the left hand side represents the tax revenues and the two terms on the right hand side are the spending in unemployment benefits and local public goods.

In this simple model, agents take no economic decisions, and their utility level is entirely defined by the vector of economic policies $(\tau, f, g_i)_{i=1}^{I}$. These policy decisions are taken by the politicians. In particular, we consider a probabilistic voting model (Lindbeck and Weibull [1987], Lindbeck and Weibull [1993], Coughlin [1992], Dixit and Londregan [1996], Persson and Tabellini [2000]), in which politicians running for election commit to an electoral platform, which amounts to a policy vector. Two parties (A and B) run for election. They are office-seeking and have no preferences on the policy vector to implement. Hence, they set the policies in order to maximize their probability of winning the elections.

While inactive as economic agents, individuals do take political decisions, i.e., they vote for party A or B. In this probabilistic voting model, their voting deci-

[7] This specification can be interpreted in different ways. It may represent the expected utility of individuals who are behind a veil of ignorance regarding their employment status. In this case, n_i represents the employment rate at district level, but also the probability that each individual is employed. Alternatively, individuals may know their employment status, but they live foreover and do not discount the future (their discount future is equal to zero), and hence the utility function at eq. 2.1 describes the utility of an average individual in district i, where now n_i represents the proportion of time that he will spent employed. Both interpretations are compatible with the policy decisions described in the next section.

sion depends on three factors: (i) the utility provided by the two parties through their choice of policy platform, and summarized by $V^i(\tau, f, g_i)$; (ii) an individual idiosyncratic component, σ, that measures whether an individual is closer ideologically to party A (in which case $\sigma < 0$) or B (so that $\sigma > 0$), and is orthogonal to the economic preferences described at eq. 2.1; and (iii) a common, country wide shock to the party popularity, δ, that may favor party A (in which case $\delta < 0$) or B (so that $\delta > 0$). Hence, an individual in district i with idiosyncratic characteristic σ_j will vote for party A if

$$V^i\left(\tau^A, f^A, g_i^A\right) - V^i\left(\tau^B, f^B, g_i^B\right) - \sigma_j - \delta > 0. \tag{2.3}$$

A strong individual ideology (or simpathy) towards one party or another, σ, will thus largely affect the individual voting decision. Each electoral district is populated by individuals with different ideology, σ. To capture this aspect, we consider a district specific distribution of individual sympathy, which, for simplicity, we assume to be uniform. Therefore, in every district i, the individual ideology is distributed according to the following density function $\sigma^i \sim U\left[-\frac{1}{2\varepsilon^i} + \overline{\sigma}^i, \frac{1}{2\varepsilon^i} + \overline{\sigma}^i\right]$ and it is centred around a district specific mean, $\overline{\sigma}^i$. The parameters $\overline{\sigma}^i$ and ε^i are crucial in our analysis. Large absolute values of $\overline{\sigma}^i$ denote a district with a very strong ideological component in favor of party A ($\overline{\sigma}^i < 0$) or B ($\overline{\sigma}^i > 0$). Instead, for $\overline{\sigma}^i$ close to zero, the district is more ideologically neutral. Lower levels of ε^i correspond to districts with more dispersion of sympathy (or ideology), whereas districts with higher ε^i are more concentrated around the mean $\left(\overline{\sigma}^i\right)$, and have more non-ideological individuals. Finally, we take the distribution of the popularity shock, δ, to be uniform and to be centred around zero, so that no party enjoys an electoral advantage.

It is now useful to summarize the timing of the events. First, the two parties decide simultaneously and independently their electoral platform, which consists of a policy vector – respectively, $V^i\left(\tau^A, f^A, g_i^A\right)$ and $V^i\left(\tau^B, f^B, g_i^B\right)$. In taking their policy decisions, parties know the distribution of ideological voters across districts and the distribution of the popularity shock. Before the election the popularity shock occurs. Then, voters choose which party to support, according to the expression in eq. 2.3.

Parties choose their policies with the objective of maximizing their probability of winning the election. As largely acknowledged in the literature, however, differ-

ent electoral systems provide different incentives for office-seeking politicians, who may hence optimally choose to select different policies under different regimes. The next subsections will directly address these aspects.

Before turning to this analysis, it is however convenient to discuss some simplifying assumption. First, we consider two types of districts: swing (or pivotal) and non-pivotal districts. Pivotal or swing districts are assumed to be ideologically neutral (i.e.their distribution of ideological voters is centred around zero, or $\overline{\sigma}^S = 0$) and to have more non-ideological voters and less extremists (i.e., few individuals with large absolute values of σ, or $\varepsilon_{_S}$ large). Since these non-ideological voters can more easily be swayed by the use of proper policies, these districts are more likely to be pivotal or swing districts. The other districts are non-pivotal. They have a more disperse distribution of ideology, $\varepsilon_{_N} < \varepsilon_{_S}$, and thus more ideologically extreme voters. Furthermore, their distribution of ideological voter is not centred around zero. Indeed, we assume that half of these non-pivotal districts largely favour party A, while the other half favors party B. We denote the former as non-pivotal pro-A districts (NA) and the latter as non-pivotal pro-B districts (NB). Hence, we have that $\varepsilon_{_{NA}} = \varepsilon_{_{NB}} = \varepsilon_{_N} < \varepsilon_{_S}$; $\overline{\sigma}^{NA} < 0$ and $\overline{\sigma}^{NB} > 0$. Without loss of generality, we can assume symmetry across the two sets of non-pivotal districts, so that $\overline{\sigma}^{NB} = -\overline{\sigma}^{NA}$. The fraction of pivotal districts is equal to μ_S, whereas the average employment in these swing districts is n_S, and n_N in the non pivotal districts (regardless of their ideological bias), so that $\overline{n} = n_S\mu_S + n_N(1-\mu_S)$ is the average employment rate in the country; and, analogously, $\overline{u} = u_S\mu_S + u_N(1-\mu_S)$ is the average unemployment rate. Finally, to obtain simple analytical solutions, we consider a logarithmic utility function.

2.1. Proportional system

In a proportional system, political parties win the election if they obtain more than 50% of the votes, regardless of the districts where this electoral support is obtained. Using the machinery of probabilistic voting and some simple algebra, it

is easy to show that the probability of party A winning the election is given by

$$\Pi_A^P = \frac{1}{2} + \frac{\psi}{\overline{\varepsilon} I}\left\{\sum_{i\in S}\varepsilon_i\left[V^i\left(\tau^A, f^A, g_i^A\right) - V^i\left(\tau^B, f^B, g_i^B\right)\right] + \right.$$
$$\left. + \sum_{i\in N}\varepsilon_i\left[V^i\left(\tau^A, f^A, g_i^A\right) - V^i\left(\tau^B, f^B, g_i^B\right)\right]\right\} \tag{2.4}$$

where $\overline{\varepsilon} = \mu\varepsilon_{_S} + (1-\mu)\,\varepsilon_{_N}$ and ψ represents the density of the country wide party popularity shock. Clearly, if both parties implement the same policy, i.e., $\left(\tau^A, f^A, g_i^A\right) = \left(\tau^B, f^B, g_i^B\right)$, and thus provide the same utility to the voters, their chances of winning the election is one half, and the actual winner will entirely be determined by the popularity shock.

Yet, parties may try to increase their probability of winning the election by an accurate use of the policy vector. Since the unemployment benefit represents a national policy, while the level of the local public goods can be differentiated across districts, party A will maximize its chances of winning the election by solving the following optimization problem:

$$\max_{\{\tau,f,g_i\}} \mu\varepsilon_{_S}\left[n_{_S}V(1-\tau) + (1-n_S)V(f)\right] + \frac{\varepsilon_{_S}}{I}\sum\nolimits_{i\in S}V(g_i) + \tag{2.5}$$
$$(1-\mu)\varepsilon_N\left[n_N V(1-\tau) + (1-n_N)V(f)\right] + \frac{\varepsilon_N}{I}\sum\nolimits_{i\in N}V(g_i)$$

subject to the budget constraint at eq. 2.2.

In selecting the national policy, i.e., the unemployment benefit, party A will weight the increase in utility that this policy brings to the unemployed individuals against the utility cost for the employed, due to the higher taxes that they are required to pay. Whether unemployed or employed individuals are electorally more relevant to the party will depend on the distribution of the unemployment rate across districts. If the unemployment rate is higher in the pivotal districts, the unemployed will enjoy more political power, as measured by ε, and more generous transfers will emerge. Analogously, the level of local public good will not be homogenous across the country, as the swing districts will enjoy more public good, $g_S > g_N$. Before turning to the next proposition that summarizes these results, it is convenient to define $\alpha_S = \mu\varepsilon_{_S}/\overline{\varepsilon}$, as the importance of the swing voters in the pivotal districts relative to the average districts, and $k = [\mu\varepsilon_S n_S + (1-\mu)\varepsilon_N n_N]$ as the average employment rate weighted by the political relevance of the individuals according to their district type. Finally, it is convenient to define the elasticity of

the unemployment benefit transfer with respect to a change in the unemployment in the pivotal and in the non-pivotal districts respectively as $\eta^P_{f,u_S} = \frac{\partial f^P}{\partial u_S}\frac{u_S}{f^P}$ and $\eta^P_{f,u_N} = \frac{\partial f^P}{\partial u_N}\frac{u_N}{f^P}$.

Proposition 2.1. *Under proportional representation, both parties propose the same policy platform* $\left(\tau^P, f^P, g^P_S, g^P_N\right)$ *with* $f^P = \frac{(1-\overline{u})(\overline{\varepsilon}-k)}{2\overline{u}\overline{\varepsilon}}$, $\tau^P = 1 - \frac{k}{2\overline{\varepsilon}}$, *and* $g^P_S = \frac{(1-\overline{u})\varepsilon_S}{\overline{\varepsilon}} > g^P_N = \frac{(1-\overline{u})\varepsilon_N}{\overline{\varepsilon}}$. *Moreover, the elasticities of the unemployment benefit transfer with respect to a change in the unemployment in the pivotal and in the non-pivotal districts are respectively,* $\eta^P_{f,u_S} = u_S\mu\left[\frac{\varepsilon_S}{(\overline{\varepsilon}-k)} - \frac{1}{\overline{u}(1-\overline{u})}\right]$ *and* $\eta^P_{f,u_N} = u_N(1-\mu)\left[\frac{\varepsilon_N}{(\overline{\varepsilon}-k)} - \frac{1}{\overline{u}(1-\overline{u})}\right] < 0$. *Finally,* $\eta^P_{f,u_S} > 0$ *if* $\frac{\varepsilon_S}{\varepsilon_N} > \frac{(1-\mu)u_N}{(1-\mu)u_N - \overline{u}^2}$.

Under the proportional system, parties have an incentive to please the swinger voters, that is, those that are easier to convince if targeted with an appropriate policy. This policy will typically be the local public good, which is always higher in the districts with more swing voters (higher ε). Unemployment benefit represents instead a national policy, which is provided to unemployed individuals in all districts. Yet, also the unemployment benefits can be used to please the swing voters. An increase in the unemployment in the non-pivotal districts, u_N, is associated with a reduction in the unemployment benefits, $\eta^P_{f,u_N} < 0$, due to the negative effect of increasing taxes also in the swing districts to finance the system. However, an increase in unemployment in the pivotal districts may or may not increase the benefits, depending on the initial level of the unemployment in the non-pivotal districts, and therefore on the overall fiscal burden that financing this increase imposes on the swing districts.

2.2. Majoritarian system

In a majoritarian system, a political party wins the election if it obtains more than 50% of the votes in more than 50% of the districts. Assume for simplicity that the non-pivotal districts are sufficiently extreme in the distribution of preferences[8] that in the non-pivotal pro-A districts (NA) party A always wins and viceversa in the pro-B districts (NB). Since we assumed that there is an equal share of pro-A and pro-B non pivotal districts, a party wins the election if it wins in half of the

[8] This assumption may be relaxed at the cost of some additional algebra. Namely, in their optimization problem both parties will have to consider also the voters in these non-pivotal districts.

pivotal districts. Hence, the probability of party A winning the election in this majoritarian electoral system is simply

$$\Pi_A^M = \frac{1}{2} + \frac{\psi}{I} \sum_{i \in S} \left[V^i \left(\tau^A, f^A, g_i^A \right) - V^i \left(\tau^B, f^B, g_i^B \right) \right]. \tag{2.6}$$

Unlike in the proportional system, parties election probabilities depend exclusively on the pivotal districts. Hence, parties will have an incentive to target only the individuals in these districts. Their optimization problem becomes:

$$\max_{\{\tau, f, g_i\}} \mu n_S V(1-\tau) + \mu(1-n_S)V(f) + \frac{1}{I} \sum\nolimits_{i \in S} V(g_i) \tag{2.7}$$

subject to the budget constraint at eq. 2.2.

Under the majoritarian system, the policy decisions become more extreme. Parties only seek to please the individuals in the pivotal districts and do not internalize the cost imposed on the individuals in the other districts – regardless of whether a party expects to win or to lose in these non-pivotal districts. A first consequence is that the level of local public goods will be very uneven across the country, with the non-pivotal voters effectively getting none, $g_N = 0$. In selecting the unemployment benefit, the role of the unemployment in the pivotal districts becomes crucial: in absence of unemployment in the swing districts, there will not be any unemployment benefits. The next proposition summarizes the results.

Proposition 2.2. *Under majoritarian representation, both parties propose the same policy platform* $\left(\tau^M, f^M, g_S^M, g_N^M \right)$ *with* $f^M = \frac{(1-\overline{u})u_S}{2\overline{u}}$, $\tau^M = \frac{1+u_S}{2}$, $g_N^M = 0$ *and* $g_S^M = \frac{1-\overline{u}}{2\mu}$. *Moreover, the elasticities of the unemployment benefit transfer with respect to a change in the unemployment in the pivotal and in the non-pivotal districts are respectively,* $\eta_{f,u_S}^M = 1 - \frac{\mu u_S}{\overline{u}(1-\overline{u})}$ *and* $\eta_{f,u_N}^M = -\frac{u_N(1-\mu)}{\overline{u}(1-\overline{u})} < 0$. *Clearly,* $\eta_{f,u_S}^M > 0$ *if* $\overline{u}\,(1-\overline{u}) > \mu u_S$.

Increases in the unemployment rate among the non-pivotal districts, u_N, unambiguously reduce the unemployment benefits, $\eta_{f,u_N}^M < 0$, as they induce a net cost on the individuals in the pivotal districts. If instead the unemployment rises in these districts, parties may choose to increase the unemployment benefits, provided that the unemployment in these sector is not already too large, as suggested by η_{f,u_S}^M.

2.3. Comparing majoritarian and proportional systems

In both electoral systems, office-seeking parties choose their policy platform in an attempt to maximize their probability of winning the election. And in both cases the incentive is to please the voters in the swing districts. Hence, both parties will provide more local public good in the swing districts, with a stark result in the majoritarian case that follows from the stronger incentives provided by this electoral system. The unemployment benefit represents instead a national program, since unemployed individual in the entire country, that is, regardless of their district, are entitled to the same benefit. Hence, according to the existing literature reviewed in the previous section, ceteris paribus, one should expect this general spending item to be larger in proportional systems. However, if there is a large dispersion of the unemployment rate across districts, unemployment benefits may also have a more local – and hence targetable – component. In this case, the unemployment benefit system resembles more closely a local transfer, and parties in a majoritarian system may be using it more effectively. Hence, whether we should expect more or less UB under a majoritarian system will depend on whether the districts with more unemployment are more or less pivotal. The next proposition presents this comparison, and addresses the differences in elasticities.

Proposition 2.3. *If there is more unemployment in the swing than in the non-pivotal districts, $u_S > u_N$, there are higher unemployment benefits under majoritarian system than under proportional representation, $f^M > f^P$. Moreover, under a majoritarian system there is a higher elasticity of the transfers to the unemployment in the swing districts, $\eta^M_{f,u_S} > \eta^P_{f,u_S}$, and a lower elasticity of the transfers to the unemployment in the non-pivotal districts, $\eta^M_{f,u_N} < \eta^P_{f,u_N}$.*

The first result of the above proposition shows that, ceteris paribus, the difference in the level of the transfer in a majoritarian and in a proportional electoral regime depends on the unemployment differential between pivotal and non-pivotal districts. We shall test this result in our empirical analysis. The second result refers to the elasticities. Majoritarian systems are more reactive to changes in the unemployment rates. If the unemployment rate increases in the non-pivotal districts, we should observe a larger drop in majoritarian system; whereas if it rises in the swing districts, the benefits should increase more under majority rule.

We shall also test these empirical implications in our econometric analysis.

3. Empirical Analysis: Majoritarian System

To test the empirical predictions of our model for the majoritarian system, we consider the legislative response of the US Congress to the 2008-2009 economic recession and to the related surge in unemployment. In particular, we analyze individual politician voting decisions on the 2009 Emergency Unemployment Compensation Extension Act (EUCEA). This bill - introduced by Rep. Jim McDermott (D-Washington) in July 2009 and signed by President Obama in November 2009 - provided fourteen weeks of unemployment benefits to those job-seekers who had exhausted their benefits (or would have by the end of the year), and an additional six weeks of benefits to those living in states with unemployment rates above 8.5 percent. We try to assess whether the individual vote on the bill by the MCs was driven by the degree of competitiveness and by the labor market situation of their districts. According to our theoretical model, we should expect higher responsiveness by the MCs elected in contestable districts with high unemployment rates.

3.1. Data

Our analysis focuses on the determinants of votes in the House, both because this allows a more precise measure of unemployment rates – at the congressional district, rather than at state level, as it would be for the Senate – and because of the higher variation in voting behavior in the House. In fact, on September 22nd 2009, when the House passed the EUCEA by a large majority, a significant number of representatives from both parties voted against the bill (see Table 1 for details); whereas on November 2009, the Senate approved an amended version of the bill almost by unanimity (only 2 Democratic Senators abstained). We use two sets of data: unemployment data, and congressional electoral and voting data. Data on unemployment rates are from the Bureau of Labor Statistics (BLS) and from the American Community Survey (ACS), a survey conducted annually by the Census Bureau on a sample of counties. The ACS has unemployment rates for each congressional district of the 111th Congress (2008-2009). However, they are available only at an annual frequency and the most recent available data are

for 2008. Monthly BLS unemployment rates are available until September 2009, when the bill was voted in the House, but only at the state level. Most of our analysis focuses on unemployment rates at the congressional district level, but we also use the more recent state level data in our robustness checks. The second set of data covers congressional district electoral and voting behavior. These data include party affiliation, the first dimension of DW-Nominate representative ideology scores which are increasing in "conservativism" (Poole and Rosenthal [1985], [1997], [2007]),[9] and four measures of congressional districts electoral competitiveness: vote margins in the 2008 House elections, vote margins between the two presidential candidates in 2008, the Cook Partisan Voter Index, and a dummy for competitive 2010 House races. The vote margins in the last Congress election give us a direct measure of how contested the electoral victory was and, therefore, how uncertain the prospects for re-election in the next cycle may be. The vote margins between Obama and McCain in the presidential race of 2008 provide, instead, a measure of the ideological affiliation of a district that abstracts from any incumbency advantage or campaign effort by the current representative. Similarly, the Cook Partisan Voting Index (CPVI) is a measurement of how strongly a congressional district leans towards one political party compared to the nation as a whole.[10] Finally, we construct a dummy for competitive 2010 House races using the classification of the Cook Political Report, a nonpartisan political newsletter. We label as "competitive" all those races classified by the report as "Toss Up", "Lean D" or "Lean R" as of September 17th 2009.[11] Table 2 presents summary statistics with districts classified by the party affiliation of the representatives in the 111th Congress. We also provide evidence in Table 3 on the correlations be-

[9] We use DW-Nominate scores calculated as of January 2010, hence after the vote on the EUCEA. These are the first scores made available for the 111th Congress by Keith Poole (http://voteview.ucsd.edu). As a robustness test, we also use the DW-Nominate scores for the 110th Congress (2006-2007) for those representatives that were in the previous Congress. The scores have a correlation of 0.9997 and all the results (available upon request) are identical when using the previous score.

[10] For each congressional district the index is derived by averaging the results from the prior two presidential elections and comparing them to national results. In a district with a CPVI score of R+2, Republican presidential candidates received 2 percentage points more votes than the national average; likewise, a CPVI score of D+3 shows the Democrats received 3 percentage points more votes than the national average.

[11] The Cook Political Report, daily updated and available at http://www.cookpolitical.com, classifies the electoral races in Solid D/R, Likely D/R, Lean D/R, and Toss Up, in increasing order of uncertainty.

tween unemployment levels prior to the bill and the competitiveness of districts. While most measures of unemployment and competitiveness used in our analysis are uncorrelated,[12] some statistically significant correlations arise between district unemployment rate levels in 2008 and CPVI, absolute margin of victory in the 2008 House elections and margin in the 2008 Presidential elections, suggesting that more competitive districts are associated with less unemployment (notice in fact that these variables are inverse measures of competition). Regression results based on these measures may thus underestimate the effect of the higher responsiveness by congressmen elected in contestable districts with high unemployment rates.

3.2. Empirical Model

We estimate a reduced-form model that examines the determinants of politician voting behavior on EUCEA. Following Snyder [1991] and Mian, Sufi, and Trebbi [forthcoming], we describe the preferences of a representative i over her vote on a particular bill v as follows:

$$U_i = f(v_i) + g(v_i) + \varepsilon_i^v$$

where the function f maps the Yes/No vote into a unidimensional ideological preference space and g maps the vote into a reelection probability. Following a random utility approach, the representative decision implies that the choice of a Yes vote ($v = 1$) follows:

$$\Pr(v_i = 1) = \Pr(f(1) - f(0) + g(1) - g(0)) > \varepsilon_i^0 - \varepsilon_i^1$$

We assume $f(v_i) = (\beta_1 * ID_i * v_i)$ and $g(v_i) = (\beta_2 * UNEMP_i * v_i) + (\beta_3 * COMP_i * v_i) + (\beta_4 * COMP_i * UNEMP_i * v_i)$. In these equations, ID_i indicates the (unidimensional) ideological position of the representative from congressional district i as approximated by the DW-Nominate first dimension score, $UNEMP_i$ indicates the constituent interest (as proxied by the unemployment rate) in congressional district i, and $COMP_i$ is a measure of the level of competition that

[12] State unemployment levels in August 2009 and the changes in these levels due to the economic recession of 2008/09 are uncorrelated with all the measures of electoral competitiveness used in our analysis. District unemployment levels in 2008 are uncorrelated with the dummy for competitive House races in 2010 and with the censored margin of victory in the 2008 House elections (whose construction is explained in the following paragraph).

the representative will face when running for re-election in the same district. The choice of a Yes vote simplifies to:

$$\Pr(v_i = 1) = \Pr(\beta_1 ID_i + \beta_2 UNEMP_i + \beta_3 COMP_i + \beta_4 (COMP_i * UNEMP_i)) > \varepsilon_i^0 - \varepsilon_i^1 \tag{3.1}$$

which can be directly estimated, given distributional assumptions on $(\varepsilon_i^0 - \varepsilon_i^1)$. The specification in eq. 3.1. allows us to test whether the effect of constituent interest (i.e. unemployment level) on voting behavior depends on the electoral status of the constituency, i.e. whether the district is pivotal or not.

3.3. Results

Table 4 presents linear probability regression estimates of the effect of unemployment rates, electoral competition and their interaction on voting patterns for House representatives.[13] In Column 1 we include as regressors only the unemployment rate and the measure of ideology. Both coefficients are statistically significant at the 1% level and they suggest that a one standard deviaton increase in the unemployment rate and in the "conservativeness" of a politician leads respectively to a 4.7% and a 16.7% increase in the likelihood of voting for EUCEA. This result is in line with the findings of Mian, Sufi, and Trebbi [forthcoming] on voting patterns in the 2008 American Housing Rescue and Foreclosure Prevention Act: both constituent interests and personal ideology strongly affect representatives' voting behavior. In Columns 2 through 8 we add a measure of electoral competitiveness and an interaction term between this variable and the district unemployment rate. Our primary measure of electoral competition is the dummy for competitive 2010 House race described above. We also use the Cook Partisan Voter Index (Column 3), the margin of victory in the last Congressional election (Column 4), and the margin between the two candidates in the last Presidential election (Column 5). We interact the competitiveness variable with the district level unemployment rate. The results show that the effect of the unemployment rate is stronger in competitive districts. The interaction term is always significant (at least at 10% level), and positive for those electoral variables that are increasing in the level of

[13] The results are substantially the same if we use a probit maximum likelihood specification in place of a linear probability specification. The use of a linear probability model in congressional voting is suggested and formally justified in Heckman and Snyder [1997] and recently used by Mian, Sufi, and Trebbi [forthcoming].

competition (2010 competitive race), or negative for those electoral variables that are decreasing in the level of competition (the margins in the last Congressional and Presidential elections and the CPVI). Hence, politicians from more contested districts are more responsive to higher unemployment rates in their constituency. In Column 6, we define the competitive district variable as 0 if the previous margin of victory is over 30% and 30 minus the margin of victory if the margin of victory is less than 30%. This functional form is meant to capture the fact that districts with large margins are unlikely to be competitive regardless of whether the margin is 30 or more. The results in Column 6 again suggest that unemployment rates matter more in more competitive districts. Robustness checks are at Columns 7 and 8, which present estimates including respectively state fixed effects, and districts demographic characteristics. The presence of the state fixed effects increases the R^2 from 0.19 to 0.48, but has only a small effect on the coefficient of the interaction term. Finally, column 9 uses a more recent measure of unemployment rate (on August 2009) at the state level, and confirms the previous results.

To evaluate the magnitude of the interaction effect between district competitiveness and unemployment rate, it is useful to examine the partial derivative with respect to unemployment rates using estimates from Column 2:

$$\frac{\partial YesVoteEUCEA}{\partial UnemploymentRate} = 1.846 + 8.582 * (CompetitiveRace2010)$$

When the dummy for competitive race in 2010 is 1, the partial derivative of a Yes vote with respect to the unemployment rate is 10.428, which implies that a one-standard-deviation increase in unemployment rates leads to a 20.9% increase in the probability of voting in favor of the EUCEA. In the case of a non competitive race, instead, this increase amounts to 3.7% only. Table 5 shows the marginal effects of unemployment rates on the probability of voting Yes for all the models estimated in Table 4 for two different level of competitiveness (indicated in the last two lines). Taken together, the evidence in Tables 4 and 5 supports the predictions of our model. An increase in the unemployment rate in the pivotal districts strongly increase legislators support for higher unemployment benefits; a raise of unemployment in the non-pivotal districts, on the other hand, has an impact whose magnitude is much smaller, often negligible, and even negative in one specification.

4. Empirical Analysis: Majoritarian System vs. Proportional System

In this section, we turn our attention to the predictions of our theoretical model regarding the difference between the policy implemented in a majoritarian and a proportional system. In particular, Proposition 3 shows that more unemployment in the pivotal districts than in the non-pivotal districts leads to higher unemployment benefits under majoritarian system than under proportional representation. Moreover, majoritarian systems are more reactive to changes in the unemployment rates: if the unemployment rate increases in the non-pivotal districts, we should observe a larger drop in majoritarian system; whereas if it rises in the swing districts, the benefits should increase more under majority rule. To test these predictions empirically, we analyze labor market policies – namely the level of public spending in labor markets and the generosity of unemployment benefits – in OECD countries over the period 1980-2001.

4.1. Data

Our sample consists of 29 OECD countries[14]. To test the two theoretical predictions we use five sets of data: on labor market policies, on electoral rules, on electoral relevance of subnational geographical units, local unemployment rates, and economic and demographic control variables at the national level. Labor market policies are summarized by four different variables: the amount of public spending in labor market policies as a fraction of GDP (from the OECD Social Expenditure Database), the unemployment benefit family replacement rate, the unemployment risk coverage, and an unemployment benefit generosity score. These last three variables are from Scruggs [2004] Welfare State Entitlements Data Set. The unemployment benefit family replacement rate is defined as "the ratio of net unemployment insurance benefit paid to a household with an average production worker, dependent spouse, and two dependent children (aged 7 and 12) against the net income of such a household in work"; while the unemployment risk coverage is "the percentage of the labor force insured for unemployment risk".[15]

[14] These are all OECD members, but Luxembourg, which is too small to allow for meaningful regional variations in unemployment levels (and electoral competition).

[15] Notice that this differs from the percentage of unemployed individuals, who are currently receiving benefits.

The unemployment benefit generosity score is an index that summarize various policy parameters of an unemployment insurance scheme (waiting periods, eligibility duration and benefit levels when eligible) into a single generosity parameter.

Our measure of electoral rules is a dummy variable that classifies the electoral formula into "majoritarian" or "proportional". Although the classification into these two rough labels is not always clear-cut, we assign each observation to one of the two rules, on the base of the prevailing component when the system is mixed. Constitutional reforms are rare events and political institutions are quite stable features of a democratic society. Nevertheless, we do observe some changes in our classification of electoral rules over time. In the 1980s, France experienced a proportional rule for a short period (1985-1986) before switching back to plurality rule; in the 1990s three countries of our sample pursued electoral reforms: in 1993 Italy went from a full proportional rule to a system where 75% of legislators were appointed through plurality rule and the remainding 25% according to proportional rule; in 1994 Japan moved to a semi-proportional system (single non-transferable votes) to a mixed system with most seats in the majoritarian tier; finally, in 1996 New Zealand moved from a plurality rule system to a mixed system in which most legislators are elected by proportional rule. Unlike Persson and Tabellini [2003], who do not allow political institutions dummies to change, we take into account constitutional reforms in our dataset and we switch the electoral rule dummy starting from the year in which the first election took place under the new electoral rule (rather than from the year when the reform was approved).

One crucial step to bring our model to the data is to identify which areas within a country are pivotal, being more densely populated by swing voters. For this purpose, we used data drawn from the World Value Survey (WVS) on political ideology of the interviewed: we define as "potential swing voters" the individuals who declared themselves in the middle of the right/left ideological scale (i.e. those who placed themselves on 5 or 6 in a scale between 1 and 10) and as "pivotal regions" those areas in the first quintile of the distribution of "potential swing voters".[16] Once classified the regions in pivotal and non-pivotal, we track the

[16]Four waves of the WVS were conducted during the period of interest for our analysis, in 1981, 1990, 1995, and 1999-2001. However, different countries were involved in different waves and sometimes, in the same wave, respondents from different countries were asked a different set of questions. Even when we have data on ideological position and geographical location of the respondents for more than one wave, the number of observations for single wave/region is

evolution of unemployment rates in these two groups of regions.[17] Data on regional unemployment rates and regional population in the period 1980-2001 were collected from different sources (EUROSTAT, the OECD Regional Database, national statistics offices, and national labor force surveys). We then average the unemployment rates in each group of regions (weighted by population size) to create for each country a time series of unemployment rate in the pivotal and non-pivotal districts. Our last set of data includes time series of national economic and demographic control variables. These controls are from SourceOECD and include per capita GDP, welfare expenditure as a % of GDP, and population 15-64 years old. Table 6 presents summary statistics with observations classified by the electoral rule in place. The differences between the two groups (majoritarian and proportional) in overall unemployment rates, unemployment rates in the pivotal districts, and unemployment rates in the non-pivotal districts are significantly different than zero (respectively, at the 10%, the 5% and the 1% level) with PR associated with higher unemployment. However, this does not undermine the validity of our results. In fact, as dictated by our theoretical predictions and described in detail in the next section, our identification strategy relies on the within-country variation in the relative rates of unemployment in pivotal and non-pivotal districts. This difference in unemployment rate between pivotal and non-pivotal districts is not significantly different from zero in either institutional group (majoritarian and proportional).

4.2. Empirical Model

Since we want to test two distinct theoretical predictions, we introduce two empirical models and present two sets of results. The first prediction is on the level of unemployment benefit: if there is more unemployment in the swing than in the non-swing districts, the unemployment benefits are higher under majoritarian than under proportional representation. To test this prediction, we run a model

small and, therefore, we pooled together the data from all waves to have a more robust index of ideological leaning of regions. As a consequence, our classification in "pivotal" or "non pivotal" areas is time invariant.

[17] The grid of subnational level regions we define for each country depends on the geographical disaggregation of the avalable data on ideological affiliation and local unemployment rates. Since we need to match these two different sets of data, for each country we use the regions from the least disaggregated dataset and we re-arrange accordingly the information from the most disaggregated ones.

with the following functional form:

$$UB_{it} = \beta X_{it-1} + \gamma MAJ_{it-1} + \delta \frac{U^S_{it-1}}{U^N_{it-1}} + \zeta \left(\frac{U^S_{it-1}}{U^N_{it-1}} * MAJ_{it-1} \right) + \phi n_i + \lambda v_t + u_{it} \quad (4.1)$$

where UB_{it} is one of the measures of labor market policies described in the previous section, X_{it-1} is a vector of national economic and demographic controls, MAJ_{it-1} is the electoral rule dummy (coded 1 when the electoral formula is majoritarian), U^S_{it-1} and U^N_{it-1} is the unemployment rate respectively in the swing and non-swing districts. We use one year lags of the independent variables since we assume that changes in the environment at time t have an impact on policy outcomes only in the following period, due for instance to inertia in the legislative process. Variables in X_{it-1} include the lagged dependent variable to eliminate AR(1) serial correlation (see Arellano and Bond[1991]). Moreover, we use robust standard errors clustered by country, which provide correct coverage in the presence of any arbitrary correlation structure among errors within the country panels (Williams [2000]). We use the ratio between the unemployment rates in the two groups because, according to the model, what matters is the difference between the two. Moreover, n_i are country fixed effects and v_t are year fixed effects to control respectively for countries' unobserved, time invariant heterogeneity and for shocks that are common to all countries in any given year. Finally, u_{it} is a vector of error terms specific to each country. Because we introduce country dummies into the regressions, the coefficients on the independent variables represent a cross-country average of the longitudinal effect.

We focus on δ and ζ, to test, respectively, the impact on these policies of a relative increase of the unemployment level in the swing districts in the proportional system, and how different this impact is in a majoritarian system. For the model to support our theory, ζ should be positive.

Our second prediction concerns the elasticities: majoritarian systems are more responsive than proportional systems to changes in the unemployment rate in non-pivotal districts, as well as to changes in unemployment in the pivotal districts. To test this prediction empirically, we introduce two differences to the model at eq. 4.1. First, we take logs of variables on both sides (with the exclusion of the electoral rule dummy) to interpret the coefficients of the independent variables as elasticities. Second, instead of using the ratio of unemployment levels in the two groups, we include two separate regressors (unemployment rates in the swing and

non-swing districts) and their interactions with the electoral rule. This second difference is due to the fact that, according to the theoretical model, majoritarian systems should always be more reactive to changes in unemployment levels both in swing and non-swing areas. Hence, we estimate:

$$\begin{aligned}\log(UB_{it}) &= \beta\log(X_{it-1}) + \gamma MAJ_{it-1} + \delta_1\log\left(U^S_{it-1}\right) + \delta_2\log\left(U^N_{it-1}\right) \\ &+\zeta_1\left(\log\left(U^S_{it-1}\right) * MAJ_{it-1}\right) + \zeta_2\left(\log\left(U^N_{it-1}\right) * MAJ_{it-1}\right) + \phi n_i + \lambda v_t + u_{it}\end{aligned} \tag{4.2}$$

Here the main coefficients of interests are ζ_1, and ζ_2 that capture the different impact of an increase in the unemployment rate in the pivotal and non-pivotal districts in the majoritarian and proportional system. If the data are in line with our theory, ζ_1 should be positive and ζ_2 negative. Moreover, according to Proposition 2, the proportional system should have a negative elasticity in the non-pivotal districts (i.e. δ_2 negative), while our theory does not offer a clear cut prediction on δ_1.

4.3. Results

Tables 7 and 8 present regression estimates of the model described at eq. 4.1 for a set of four different dependent variables. In table 7, the dependent variables are respectively the expenditure in labor market policies as a fraction of GDP (columns 1-4) and the unemployment benefit generosity score (columns 5-8); in table 8, the family replacement rate (columns 1-4) and the unemployment risk coverage (columns 5-8) . In the first column of each set of regressions (columns 1 and 5) we examine the role of the national level of unemployment rate, the electoral rule and their interaction, besides controlling for a usual set of additional explanatory variables (namely, the lagged dependent variable, per capita GDP, welfare expenditure as a share of GDP, and the share of population aged 15-64). We cannot reject the null hypothesis of these coefficients being equal to zero, which implies that, regardless of the electoral rule, the overall level of unemployment in the country does not affect labor market policies. This result is in line with our theoretical model, and justifies a further look at regional labor markets. In columns 2 and 6 (in both tables) we add the ratio between the unemployment rate in the swing and non-swing districts, and its interaction with the electoral rule dummy. The coefficient of this ratio is never significantly different from zero, suggesting that in the

proportional system the impact on the labor market policies of an increase of the unemployment level in the swing districts is negligible. However, the coefficient of the interaction is significant and positive for all four dependent variables, but the unemployment risk coverage. Hence, in a majoritarian system, an increase of the unemployment level in the swing districts leads to more generous unemployment benefits and to more spending in labor market policies. Similar conclusions can be reached from separate regressions on the subsamples of country/years with majoritarian electoral rule (columns 3 and 7 in both tables) and with proportional representation (columns 4 and 8 in both tables).

In Tables 9 and 10, we test our theoretical predictions on the elasticities using the model at eq. 4.2. The variables of interest are never significant when we consider spending in labor market policies (Columns 1-4 in Table 9). However, when we use the measures of unemployment benefits generosity, our theoretical predictions are strongly confirmed. The coefficients of the interaction variables in Table 9 (Column 6) and Table 10 (Columns 2 and 6) suggest that when a majoritarian system is in place, the reaction to a change in the unemployment rate is more pronounced. In particular, the generosity of the unemployment spending increases more as a result of higher unemployment in the pivotal districts (the coefficient of log(unemp_piv)*maj is positive and significant), but it also decreases more as a result of higher unemployment in the non-pivotal districts (the coefficients of log(unemp_nopiv)*maj is negative and significant). Similar results hold for the unemployment risk converage, and for the unemployment benefit family replacement rate. Separate regressions on the subsamples of majoritarian and proportional systems provide similar evidence, particularly for the unemployment benefit replacement rate, and for the unemployment benefit generosity score.

5. Conclusions

Is there a casual link going from political institutions to economic policy, as a recent theoretical literature in comparative politics has suggested? And which are the possible transition mechanisms through which electoral rules affect economic outcomes? While a wide body of theoretical literature has suggested several possible channels, ranging from the different electoral incentives that electoral rules provide to office-seeking politicians to their impact on voters and/or parties behav-

ior or degree of representation, the empirical literature has been less succesful in identifying a causal link running from political institutions to economic outcomes.

This paper provides a novel test of the impact of electoral rules on an economic policy, namely unemployment benefits. The main contribution is to develop a test that allows to identify this effect on within-country variation in economic policy. To do this, we develop a simple theoretical framework, which delivers a sharp empirical prediction: if the unemployment rate is higher in pivotal than in non-pivotal districts, politicians provide more generous UB transfers in majoritarian than in proportional systems. We can then test how changes in the relative unemployment in these two types of districts (pivotal and non-pivotal) translate into policy outcomes under the two electoral rules.

A direct empirical test of the relevance of electoral incentives is carried out by analyzing the US House representatives individual voting behaviour on the 2009 Emergency Unemployment Compensation Extension Act, which extended UB coverage and generosity. Representatives elected in competitive districts featuring high unemployment rates were more supportive of EUCEA. Evidence on the differential effects of the two electoral rules on economic policy were obtained by using panel analysis on a novel dataset with detailed information on local electoral relevance and constituent interests for 29 OECD countries in 1980-2001. Empirical evidence strongly supports our theoretical predictions.

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Appendix

Proof of Proposition 3.1

The optimization problem at eq. 2.5, subject to the budget constraint at eq. 2.2, gives raise to the following first order conditions

$$FOC\ (g_i) : -\left[\mu\varepsilon_S n_S + (1-\mu)\varepsilon_N n_N\right]\frac{V'(1-\tau)I}{I\overline{n}} + \varepsilon_i V'(g_i) = 0 \qquad i = S, N$$

$$FOC\ (f) : -\left[\mu\varepsilon_S n_S + (1-\mu)\varepsilon_N n_N\right]\frac{1-\overline{n}}{\overline{n}}V'(1-\tau) + \left[\mu\varepsilon_S(1-n_S) + (1-\mu)\varepsilon_N\left(1-n_N\right)\right]V'\left(f\right) = 0$$

Recall that $k = \left[\mu\varepsilon_S n_S + (1-\mu)\varepsilon_N n_N\right]$, so FOC (g_i) gives

$$\begin{aligned} g_S &= \frac{(1-\tau)\left(1-\overline{u}\right)\varepsilon_S}{k} \\ g_{NP} &= \frac{(1-\tau)\left(1-\overline{u}\right)\varepsilon_N}{k} \end{aligned}$$

so that $\overline{g} = \mu g_S + (1-\mu)g_{_N} = \frac{(1-\tau)(1-\overline{u})}{k}\overline{\varepsilon}$, whereas FOC (f) gives

$$f = (1-\tau)\frac{\overline{\varepsilon}-k}{k}\frac{1-\overline{u}}{\overline{u}}$$

Using the above expressions for $\overline{g}$ and f, we can rewrite the budget constraint at eq. 2.2 as:

$$\tau = \frac{\overline{g}}{\overline{n}} + f\frac{1-\overline{n}}{\overline{n}} = \frac{\overline{g}}{1-\overline{u}} + f\frac{\overline{u}}{1-\overline{u}},$$

hence

$$\tau = 1 - \frac{k}{2\overline{\varepsilon}}.$$

Moreover, we have

$$\begin{aligned} g_{_S} &= \frac{\left(1-\overline{u}\right)\varepsilon_{_S}}{\overline{\varepsilon}} > g_{_N} = \frac{\left(1-\overline{u}\right)\varepsilon_{_N}}{\overline{\varepsilon}} \\ f &= \frac{\left(1-\overline{u}\right)\left(\overline{\varepsilon}-k\right)}{2\overline{u\varepsilon}} \end{aligned}$$

To obtain the elasticities η^P_{f,u_S} and $\eta^P_{f,u_{_N}}$ notice that

$$\begin{aligned} \frac{\partial f}{\partial u_S} &= \frac{\mu}{2\overline{u}^2\overline{\varepsilon}}\left[\left(1-\overline{u}\right)\overline{u}\varepsilon_{_S} - \left(\overline{\varepsilon}-k\right)\right] \\ \frac{\partial f}{\partial u_N} &= \frac{1-\mu}{2\overline{u}^2\overline{\varepsilon}}\left[\left(1-\overline{u}\right)\overline{u}\varepsilon_{_N} - \left(\overline{\varepsilon}-k\right)\right] \end{aligned}$$

Thus, $\eta^P_{f,u_N} = \frac{\partial f}{\partial u_N}\frac{u_N}{f} = (1-\mu)\,u_{_N}\left[\frac{\varepsilon_{_N}}{\overline{\varepsilon}-k} - \frac{1}{(1-\overline{u})\overline{u}}\right]$, and $\eta^P_{f,u_S} = \frac{\partial f}{\partial u_S}\frac{u_S}{f} = \mu u_{_S}\left[\frac{\varepsilon_{_S}}{\overline{\varepsilon}-k} - \frac{1}{(1-\overline{u})\overline{u}}\right]$.

Clearly, $\eta^P_{f,u_N} < 0$ if $\varepsilon_{_N}(1-\overline{u})\,\overline{u} < \overline{\varepsilon} - k = \mu\varepsilon_S u_S + (1-\mu)\varepsilon_N u_N$, which can be re-written as $\varepsilon_{_N}\mu u_S + (1-\mu)\varepsilon_N u_N - \varepsilon_N\overline{u}^2 < \mu\varepsilon_S u_S + (1-\mu)\varepsilon_N u_N$ or $\mu u_{_S}(\varepsilon_{_N} - \varepsilon_{_S}) - \varepsilon_N\overline{u}^2 < 0$ since $\varepsilon_{_N} < \varepsilon_{_S}$.

Instead, to have $\eta^P_{f,u_S} > 0$ we need to have $\varepsilon_{_S}(1-\overline{u})\,\overline{u} > \overline{\varepsilon} - k = \mu\varepsilon_S u_S + (1-\mu)\varepsilon_N u_N$, which can be re-written as $(1-\mu)\varepsilon_{_S}u_{_N} - \varepsilon_{_S}\overline{u}^2 > (1-\mu)\varepsilon_{_N}u_{_N}$ or $\frac{\varepsilon_{_S}}{\varepsilon_{_N}} > \frac{(1-\mu)u_{_N}}{(1-\mu)u_{_N}-\overline{u}^2}$.

Proof of Proposition 3.2

The optimization problem at eq. 2.7, subject to the budget constraint at eq. 2.2, gives raise to the following first order conditions

$$FOC\ (g_{_N}) : -\mu n_{_S}\frac{V'(1-\tau)I}{I\overline{n}} < 0$$

$$FOC\ (g_{_S}) : -\mu n_{_S}\frac{V'(1-\tau)I}{I\overline{n}} + V'(g_i) = 0 \quad \forall i \in S$$

$$FOC\ (f) : -\mu n_S\frac{1-\overline{n}}{\overline{n}}V'(1-\tau) + \mu(1-n_S)V'(f) = 0$$

Hence, we have

$$\begin{aligned} g_{_N} &= 0 \\ g_{_S} &= \frac{(1-\tau)(1-\overline{u})}{\mu(1-u_S)} \\ f &= \frac{(1-\tau)u_S(1-\overline{u})}{\overline{u}(1-u_S)} \end{aligned}$$

which, using the budget constraint at eq. 2.2 become $g_{_S} = \frac{1-\overline{u}}{2\mu}$ and $f = \frac{u_S(1-\overline{u})}{2\overline{u}}$ since $\tau = \frac{1+u_S}{2}$.

Simple algebra shows that $\eta^M_{f,u_N} = \frac{\partial f}{\partial u_N}\frac{u_N}{f} = -\frac{(1-\mu)u_N}{\overline{u}(1-\overline{u})} < 0$, and $\eta^M_{f,u_S} = \frac{\partial f}{\partial u_S}\frac{u_S}{f} = 1 - \frac{\mu u_S}{\overline{u}(1-\overline{u})}$, which is clearly positive if $\overline{u}(1-\overline{u}) > \mu u_S$..

Proof of Proposition 3.3

To show that $f^M = \frac{u_S(1-\overline{u})}{2\overline{u}} > f^P = \frac{(1-\overline{u})(\overline{\varepsilon}-k)}{2\overline{u}\overline{\varepsilon}}$ if $u_S > u_N$ recall that $\overline{\varepsilon} - k = \mu\varepsilon_S u_S + (1-\mu)\varepsilon_N u_N$, and $\overline{\varepsilon} = \mu\varepsilon_S + (1-\mu)\varepsilon_N$. Hence, $f^M > f^P$ if $u_S\overline{\varepsilon} > \overline{\varepsilon} - k$ or $(1-\mu)\varepsilon_N u_S > (1-\mu)\varepsilon_N u_N$.

It is easy to see that $\eta^M_{f,u_S} = 1 - \frac{\mu u_S}{\overline{u}(1-\overline{u})} > \eta^P_{f,u_S} = \mu u_S \left[\frac{\varepsilon_S}{\overline{\varepsilon}-k} - \frac{1}{(1-\overline{u})\overline{u}}\right]$ if $1 > \frac{\mu u_S \varepsilon_S}{\overline{\varepsilon}-k}$, which is always satisfied since $\overline{\varepsilon}-k = \mu\varepsilon_S u_S + (1-\mu)\varepsilon_N u_N$. Analogously, it is straightforward to see that $\eta^M_{f,u_S} = -\frac{u_S \mu}{\overline{u}(1-\overline{u})} < \eta^P_{f,u_S} = u_S \mu \left[\frac{\varepsilon_S}{(\overline{\varepsilon}-k)} - \frac{1}{\overline{u}(1-\overline{u})}\right] < 0$.

Table 1
Voting Patterns on the EUCEA of 2009

Panel A: House Vote, 09/22/2009

	Democrats	Republicans	Independents	Total
# Voting "Yes"	227	104	-	331
# Voting "No"	19	64	-	83
Abstained	9	9	-	18
Total	255	177	-	432

Panel B: Senate Vote, 11/04/2009

	Democrats	Republicans	Independents	Total
# Voting "Yes"	56	40	2	98
# Voting "No"	0	0	0	0
Abstained	2	0	0	2
Total	58	40	2	100

Table 2
Summary Statistics for Congressional Districts

	Democrats						Republicans					
	N	MEAN	SD	10th	50th	90th	N	Mean	SD	10th	50th	90th
Economic and Demographic Variables												
District unemployment rate (2008)	258	0.066	0.021	0.043	0.063	0.093	179	0.062	0.018	0.042	0.059	0.086
State unemp rate (Aug 2009)	258	9.734	1.974	7.200	9.350	12.200	179	9.679	2.090	6.800	9.900	12.200
State unemp rate (Aug '09-Aug '08)	258	3.709	0.983	2.600	3.700	4.600	179	3.728	0.996	2.600	3.800	4.600
State unemp rate (Aug '09-Aug '08)	258	4.968	1.436	3.500	4.600	6.800	179	5.013	1.506	3.400	5.000	6.700
Population (2008)	258	677.68	56.74	620.84	670.15	753.53	179	726.18	81.67	645.19	712.07	830.72
% population 5-17 years old (2008)	258	17.142	2.148	14.970	17.080	19.970	179	17.704	1.635	15.550	17.740	19.700
% black population (2008)	258	15.323	17.369	1.510	7.790	48.980	179	8.545	8.472	1.480	5.950	19.580
% hispanic population (2008)	258	17.318	19.667	1.990	9.705	48.240	179	12.128	12.830	1.970	7.270	28.740
Median household income (2008)	258	53.054	14.743	37.113	50.482	74.451	179	55.307	13.610	42.173	51.662	73.706
% population w/ high school educ (2008)	258	83.612	7.896	73.000	86.000	90.900	179	86.331	4.751	79.200	87.300	91.700
% population in poverty (2008)	258	14.466	5.914	7.800	13.400	22.700	179	11.675	3.983	6.600	11.700	16.500
Political and Electoral Variables												
DW-Nominate ideology score	258	-0.349	0.161	-0.568	-0.355	-0.149	179	0.629	0.171	0.443	0.620	0.838
Vote margin in House elections, 2008	258	45.911	30.245	10.000	40.000	100.000	179	29.626	23.986	7.000	24.000	54.000
Vote margin in Presidential elections, 2008	258	28.826	21.693	5.000	24.000	64.000	179	16.441	13.032	2.000	13.000	35.000
Partisan Voter Index (September 2009)	258	12.105	9.906	2.000	9.000	28.000	179	11.101	6.748	3.000	10.000	21.000
Competitive race 2010 dummy	258	0.101	0.302	-	-	-	179	0.084	0.278	-	-	-

Table 3
Correlation Matrix for Unemployment and Electoral Competitiveness

	District Unemp '08	State Unemp Aug '09	State Unemp 1YR Change	State Unemp 2YR Change
Competitive Race '10 Dummy	-0.0393	-0.0131	0.0152	-0.0239
Cook Partisan Voter Index	0.2185***	-0.0103	-0.0216	0.0125
Margin House Elections '08	0.1701***	0.0068	0.018	-0.0037
Margin House Elections '08 Censored	-0.0857	-0.0161	-0.0071	-0.0008
Margin Presidential Elections '08	0.2393***	0.0286	0.0074	0.0316

***, **, * Correlation statistically different from 0 at the 1%, 5%, and 10% level, respectively.

Table 4
Unemployment Rates, Pivotal Districts and Voting Patterns on the EUCEA of 2009

Dependent Variable	(1) *Pr(vote yes)*	(2) *Pr(vote yes)*	(3) *Pr(vote yes)*	(4) *Pr(vote yes)*	(5) *Pr(vote yes)*	(6) *Pr(vote yes)*	(7) *Pr(vote yes)*	(8) *Pr(vote yes)*	(9) *Pr(vote yes)*
District Unemployment (2008)	2.364**	1.846*	5.179***	6.036***	5.467***	1.012	-2.709**	2.292**	
	(1.0423)	(1.067)	(1.670)	(2.0406)	(1.6584)	(1.1265)	(1.042)	(1.0948)	
State Unemployment (Aug 2009)									.332***
									(.0531)
Ideology score (DW-N 1st dim)	-.3293102***	-.334***	-.352***	-.382***	-.403***	-.363***	-.3111***	-.343***	-1.37***
	(.0389)	(.0387)	(.0380)	(.0409)	(.0414)	(.0408)	(.0390)	(.0482)	(.1814)
Competitiveness		-.491**	-.002	.002	-.0004	-.012	-.647***	-.4988**	-3.769*
		(.2425)	(.0061)	(.0024)	(.0027)	(.0100)	(.2098)	(.2420)	(2.289)
Unemployment*Competitiveness		8.582***	-.116*	-.069**	-.065*	.272*	10.239***	8.702***	.446*
		(3.2561)	(0.059)	(.0339)	(.0372)	(.1566)	(2.9150)	(3.261)	(.267)
Constant	.632***	.662***	.5732***	.498***	.551***	.692***	1.128***	1.714**	.552***
	(.0696)	(.0714)	(.1131)	(.1352)	(.1113)	(.0765)	(.1717)	(.7456)	(.0417)
Specification	LPM	LPM	LPM	LPM	LPM	LPM	LPM	LPM	LPM
Competitiveness variable	-	Comp race '10	CPVI	Margin08	Margin08 Pres	Margin08 Cens	Comp race '10	Comp race '10	Comp race '10
State FE	NO	NO	NO	NO	NO	NO	YES	NO	NO
Census controls	NO	NO	NO	NO	NO	NO	NO	YES	NO
Observations	432	432	432	432	432	432	432	432	432
R-squared	0.1808	0.1910	0.2297	0.2170	0.2311	0.2010	0.4781	0.2112	0.3111

Robust standard errors in parentheses
* significant at 10% level; ** significant at 5% level; *** significant at 1% level

Table 5
The Marginal Effect of Unemployment on the Probability of Voting Yes
The effect on Prob(Vote=Yes) associated with a 1 SD increase of the unemployment rate

	(2)	(3)	(4)	(5)	(6)	(7)	(8)
Competitive Seat	+20.9%	+9.2%	+11.4%	+10.2%	+13.6%	+15.06	+22%
Non Competitive Seat	+3.7%	+3.1%	+7.9%	+6.7%	+2.7%	-5.4%	+4.6%
Specification	LPM	LPM	LPM	LPM	LPM	LPM	LPM
Competitiveness variable	Comp race '10	PVI	Margin08	Margin08 Pres	Margin08 Cens	Comp race '10	Comp race '10
State FE	NO	NO	NO	NO	NO	YES	NO
Census controls	NO	NO	NO	NO	NO	NO	YES
Definition of Competitive Seat	Comp'10=0	CPVI=D/R+5	Margin'08=0.05	MarginPres=0.05	Margin'08=0.05	Comp'10=0	Comp'10=0
Definition of Non Competitive Sea	Comp'10=1	CPVI=D/R+30	Margin'08=0.30	MarginPres=0.30	Margin'08=0.30	Comp'10=1	Comp'10=1

Table 6
Summary Statistics for OECD Countries 1980-2001

	Majoritarian						Proportional					
	N	MEAN	SD	10th	50th	90th	N	Mean	SD	10th	50th	90th
Economic and Demographic Variables												
Overall unemployment rate	168	7.180	3.029	2.510	7.375	11.320	437	7.975	5.325	2.010	7.130	15.990
Unemployment rate in swing districts	115	7.402	3.827	2.223	7.032	12.660	196	8.455	4.503	3.275	7.806	15.047
Unemployment rate in non-swing districts	115	7.256	2.485	3.956	7.412	10.261	196	8.661	5.260	3.139	7.852	16.631
GDP per capita	168	17162.96	6601.40	9670.17	16619.20	26124.61	449	16228.74	7870.63	6830.25	15013.11	26567.20
Welfare expenditure (% GDP)	158	17.390	6.119	11.030	17.625	24.450	407	21.253	6.857	11.480	21.990	29.480
Population 15-64 years old (% tot pop)	168	66.645	1.861	64.820	66.315	69.158	449	65.751	3.342	61.565	66.800	68.753
Labor Market Policy Variables												
Labor market policies spending (% GDP)	100	1.598	0.790	0.570	1.580	2.695	290	2.366	1.559	0.565	2.025	4.415
UB generosity score	146	6.787	2.218	4.207	6.654	10.534	250	8.267	2.840	4.612	9.323	11.181
UB family replacement rate	145	0.602	0.098	0.455	0.625	0.703	244	0.689	0.157	0.559	0.721	0.831
Unemployment risk coverage	137	0.788	0.179	0.502	0.795	1.000	225	0.780	0.140	0.642	0.826	0.922

Note: Countries coded as "majoritarian" are Australia, Canada, France (1980-84 and 1987-2001), Italy (1994-2001), Japan (1980-93), South Korea, New Zealand (1980-1995), UK, US ; Countries coded as "proportional" are Austria, Belgium, Czech Republic, Denmark, Finland, France (1985-86), Germany, Greece, Hungary, Iceland, Ireland, Italy (1980-1993), Japan (1994-2001), Mexico, Netherlands, Norway, New Zealand (1996-2001), Poland, Portugal, Slovakia, Spain, Sweden, Switzerland, Turkey .

Table 7
Unemployment Rate in Pivotal vs Non-Pivotal Districts, Electoral Rule and Labor Market Policies

	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
Dependent Var	*Labor Mkt Policies Spending (% GDP)*				*Unemployment Benefit Generosity Score*			
Unemp	-.0172	-0.019	-0.002	-0.113***	-.0027605	-0.010	-0.009	-0.021
	(.0166)	(0.016)	(0.020)	(0.039)	(.021719)	(0.020)	(0.027)	(0.042)
Maj	.0542204	-.8524451			.3676526	-.6613405		
	(.2369543)	(.484871)			(.2469577)	(.4732118)		
Unemp*Maj	-.0164				-.0100809			
	(.0206)				(.0228681)			
Unempratio		-0.324	0.029	0.167		0.169	0.199	0.794**
		(0.339)	(0.418)	(0.205)		(0.397)	(0.564)	(0.353)
Unempratio*Maj		0.758*				0.793**		
		(0.444)				(0.386)		
Constant	9.705	8.974	5.414	24.774*	-13.741	-13.962*	-20.510	14.233
	(6.402)	(6.433)	(9.127)	(14.489)	(8.451)	(8.209)	(13.804)	(16.915)
Observations	223	223	147	76	220	220	123	97
Overall R-squared	0.946	0.9494	0.9494	0.7121	0.9301	0.8978	0.8463	0.7808
Group	ALL	ALL	PROP	MAJ	ALL	ALL	PROP	MAJ
Specification	CTRY & YR FE	CTRY & YR FE	CTRY & YR FE	CTRY & YR FE	CTRY & YR FE	CTRY & YR FE	CTRY & YR FE	CTRY & YR FE

Robust standard errors in parentheses
* significant at 10% level; ** significant at 5% level; *** significant at 1% level
Other controls: lagged dependent variable, gdp per capita, welfare expenditure as a % of gdp, population 15-64 yo

Table 8
Unemployment Rate in Pivotal vs Non-Pivotal Districts, Electoral Rule and Labor Market Policies

	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
Dependent Var	*Unemployment Benefit Family Replacement Rate*				*Unemployment Risk Coverage*			
Unemp	-.0008544	-0.002	0.006	-0.005	.00659	0.005	0.008	0.001
	(.0040495)	(0.004)	(0.006)	(0.005)	(.004717 0	(0.004)	(0.008)	(0.002)
Maj	.0516001	-.1408276			.0546004	-.1187347		
	(.0459756)	(.0888258)			(.05177080	(.12372720)		
Unemp*Maj	-.0029466				-.0060306			
	(.004175)				(.0051619)			
Unempratio		-0.074	-0.070	0.101**		-0.101	-0.101	0.029**
		(0.075)	(0.129)	(0.042)		(0.108)	(0.174)	(0.014)
Unempratio*Maj		0.147**				0.132		
		(0.074)				(0.121)		
Constant	-.194	-.0740	-2.945	-1.858	-2.778	-2.342	-3.160	.098
	(1.497)	(1.472)	(3.013)	(1.930)	(1.813)	(1.801)	(3.775)	(.656)
Observations	213	213	116	97	193	193	104	89
Overall R-squared	0.7838	0.7678	0.4555	0.7553	0.0328	0.0275	0.024	0.9922
Group	ALL	ALL	PROP	MAJ	ALL	ALL	PROP	MAJ
Specification	CTRY & YR FE	CTRY & YR FE	CTRY & YR FE	CTRY & YR FE	CTRY & YR FE	CTRY & YR FE	CTRY & YR FE	CTRY & YR FE

Robust standard errors in parentheses
* significant at 10% level; ** significant at 5% level; *** significant at 1% level
Other controls: lagged dependent variable, gdp per capita, welfare expenditure as a % of gdp, population 15-64 yo

Table 9
Unemployment Rate in Pivotal vs Non-Pivotal Districts, Electoral Rule and Elasticity of Labor Market Policies

	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
Dependent Var	*Log of Labor Mkt Policies Spending (% GDP)*				*Log of Unemployment Benefit Generosity Score*			
Log(Unemp)	-0.0115545				0.0052033			
	(0.0627192)				(.0216233)			
Maj	-.1746552	-0.2212722			.0596069	.0521844		
	(.147115)	(.1590789)			(.054468)	(.0555831)		
Log(Unemp)*Maj	0.041597				.0094055			
	(0.068942)				(.0250328)			
Log(Unemp_piv)		-0.163	-0.018	-0.046		0.02	0.117	0.121**
		(0.143)	(0.142)	(0.127)		(0.068)	(0.075)	(0.055)
Log(Unemp_piv)*Maj		0.130				0.152**		
		(0.181)				(0.069)		
Log(Unemp_nopiv)		0.143	0.121	-0.070		-0.027	-0.131*	-0.102
		(0.144)	(0.148)	(0.189)		(0.069)	(0.078)	(0.068)
Log(Unemp_nopiv)*Maj		-0.070				-0.141*		
		(0.203)				(0.077)		
Constant	5.33	8.252	-3.017	12.343**	-6.29**	-7.028***	-14.659***	2.538
	(4.045)	(5.552)	(2.459)	(5.768)	(2.760)	(2.602)	(3.645)	(7.904)
Observations	223	223	147	76	220	220	123	97
Overall R-squared	0.8707	0.8446	0.9295	0.7461	0.9705	0.9552	0.8694	0.9047
Group	ALL	ALL	PROP	MAJ	ALL	ALL	PROP	MAJ
Specification	CTRY & YR FE	CTRY & YR FE	CTRY & YR FE	CTRY & YR FE	CTRY & YR FE	CTRY & YR FE	CTRY & YR FE	CTRY & YR FE

Robust standard errors in parentheses
* significant at 10% level; ** significant at 5% level; *** significant at 1% level
Other controls: lagged dependent variable, gdp per capita, welfare expenditure as a % of gdp, population 15-64 yo

Table 10
Unemployment Rate in Pivotal vs Non-Pivotal Districts, Electoral Rule and Elasticity of Labor Market Policies

	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
Dependent Var	*Var dep: log of unemp benefit family replacement rate*				*Var dep: log of unemployment risk coverage*			
Log(Unemp)	-0.007138				.017715*			
	(0.0295794)				(.0093943)			
Maj	.0239077	.1135306			.0579079**	.0391461		
	(.0745922)	(.0783137)			(.0230152)	(.0247647)		
Log(Unemp)*Maj	.0089737				-.0274888**			
	(.0331058)				(.0112416)			
Log(Unemp_piv)		0.153	0.250**	0.202***		-0.058	-0.041	0.021
		(0.095)	(0.124)	(0.065)		(0.038)	(0.050)	(0.014)
Log(Unemp_piv)*Maj		0.069				0.089**		
		(0.095)				(0.040)		
Log(Unemp_nopiv)		-0.164*	-0.223*	-0.231***		0.070*	0.044	-0.006
		(0.097)	(0.126)	(0.080)		(0.037)	(0.050)	(0.016)
Log(Unemp_nopiv)*Maj		-0.091				-0.105**		
		(0.108)				(0.041)		
Constant	-0.7656	-2.021	-4.167	-23.531**	-3.519**	-3.198**	-6.419***	.727
	(3.647)	(3.501)	(5.121)	(8.827)	(1.370)	(1.353)	(2.385)	(1.920)
Observations	212	212	115	97	191	191	102	89
Overall R-squared	0.9457	0.8978	0.8631	0.7777	0.9594	0.9374	0.7613	0.9945
Group	ALL	ALL	PROP	MAJ	ALL	ALL	PROP	MAJ
Specification	CTRY & YR FE	CTRY & YR FE	CTRY & YR FE	CTRY & YR FE	CTRY & YR FE	CTRY & YR FE	CTRY & YR FE	CTRY & YR FE

Robust standard errors in parentheses
* significant at 10% level; ** significant at 5% level; *** significant at 1% level
Other controls: lagged dependent variable, gdp per capita, welfare expenditure as a % of gdp, population 15-64 yo