ELECTORAL SYSTEMS, POVERTY AND INCOME INEQUALITY

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Abstract

In this article we use the high-quality data coming from the Luxembourg Income Study Project, in a panel framework, to test for the effects of electoral systems on both poverty and income inequality. We find that when de degree of proportionality of an electoral system increases, inequality and poverty decrease. We also find than in presidential regimes, the levels of poverty and inequality are higher than in parliamentary regimes.

JEL Classification: D63, H53, C23.

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1. Introduction

The link between electoral systems, income inequality and poverty has been proposed by several authors. Austen-Smith (2002), considering a model with an endogenous tax structure determined through legislative bargaining, suggests that a proportional electoral system, usually characterized by more than two parties, tends to favor more redistributive taxes than a two-party majoritarian one. Thanks to this redistribution of wealth, it should be associated to less income inequality and lower levels of poverty.

Similarly, Roland and Verardi (2003) suggest that since in majoritarian systems, politicians tend to favor locally (not redistributive) targeted expenditures, while under the proportional rule, they tend to favor broad redistributive programs, the former systems should be associated to higher levels of income inequality and poverty than the latter. A first attempt to test for the effects predicted on income inequality has been made by Birchfield and Crepaz (1998), but their results have been strongly criticized by Atkinson (2000) for the lack of comparability between the data used, given the non-homogenous definitions considered. Verardi (2004) showed, using high quality data, how the predicted effects of Austen-Smith (2002) and Roland and Verardi (2003) are confirmed by the data but did not consider poverty.

In this article we use the high-quality data coming from the LIS[1] project, in a panel framework, to test for the effects of electoral systems on both poverty and income inequality. In addition, we also test for the effects of another electoral feature, the political regime.

The political regime represents the way in which the head of the government is elected and how he remains in office. There are many different systems in the World but all of them can be considered as being part of either the presidential regimes family or the parliamentary regimes family. Several authors have shown how presidential regimes, given their idiosyncrasies, are associated to lower levels of taxation (Persson and Tabellini, 1999) and less redistributive spending (Diermeier and Feddersen,1998; Persson, Roland and Tabellini, 2000) than parliamentary regimes. So, similarly to what explained previously for the electoral rule, we expect presidential regimes to be associated to more income inequality and higher levels of poverty than parliamentary regimes. We will test for this in the empirical part.

The structure of the paper is as follows: In the second section, we briefly review the literature linking electoral systems, inequality and poverty, in the third, we present the methodology and the data we use and in the fourth, we present our major findings. Finally, in the fifth, we conclude.

[1] Luxembourg Income Study

2. Brief review of the literature

Electoral specialists almost all agree that the principal determinant to translate votes into seats in parliamentarian elections, is the district magnitude.[2] Under a single-member district system, voters vote for one representative, in each district, that has to be chosen by a majority rule.[3] Under a multi-member system, all the representatives must be chosen following a proportional allocation rule to respect the share of votes cast by everyone[4].

Persson and Tabellini (1999) have shown, in the context of a Downsian model of electoral competition, that in larger districts, electoral competition will be diffused since parties will seek support from broad coalitions of voters. On the opposite, in smaller districts, competition will be concentrated in geographically determined constituencies, and spending will be targeted locally. Thus, when the district magnitude is large, public expenditures will be broad and composed principally of transfers while when it is small, expenditures will be mainly composed of local public goods. A similar conclusion is reached by Milesi-Ferretti et al. (2000). Extending the strategic delegation model of Chari et al. (1997), they show that in large electoral districts, legislators represent nationwide distributed socio-economic groups, targeting expenditures towards them. In small districts, they represent locally determined groups and prefer to target expenditures locally.

In addition, in single-member districts, the objective is to win 50% of the votes in 50% of the districts[5]. Under full proportional representation, a coalition of parties needs approximately 50% of the national vote to get to power. Therefore, politicians internalize the benefit for a larger share of the population in the second case. As shown by Lizzeri and Persico (2001), this will end in more redistributive programs in proportional representations and more local public good expenditures in majoritarian systems.

Given that local public goods are not redistributive by nature, Verardi (2003) and Roland and Verardi (2003) have suggested that proportional systems should be associated to lower levels of inequality. Austen-Smith (2002), considering a model with an exogenous political structure reaches a similar conclusion. He shows that proportional systems are associated to more redistributive taxes than a typical two-party majoritarian system, implying less income inequality. All these theories suggest that majoritarian systems should be associated to higher levels of income inequality than proportional representations. Birchfield and Crepaz (1998) have tried to test such a relationship but unfortunately, as highlighted by Atkinson (2000), their data are of a too weak quality to

[2] That is to say, the number of members to be elected in each electoral district.
[3] First Past the Post, Alternative Vote or the Two-Round System.
[4] It is evident that the degree of proportionality of a system depends on the district size since when districts are very large, even very small parties are represented in the legislature.
[5] Or even less in the case of pure plurality.

accept their results without a further analysis[6]. For this reason, in this study, we try to test for this relationship but using high-quality data.

As far as the regime type is concerned, it is commonly accepted that the crucial aspects that differentiate the two main regime types are the separation of powers (between politicians and offices) and the maintenance of powers. Persson and Tabellini (2000) have shown, with a simple public finance model, that the separation of powers, and in particular the checks and balance constraint, has an effect on the size of the government since each organ of the state checks if the other is not extracting an excessive rent. This lowers the abuse of power and tends to lead to lower rents and lower tax levels. The redistributive effect of taxation should then be limited and this might bring to high levels of inequality.

Diermeier and Feddersen (1998) and later Persson, Roland and Tabellini (2000) have shown that, in parliamentary regimes, a government has to rely on a stable coalition to keep its power while, in presidential regimes, it can stay in office till the end of his mandate. This means that in parliamentary regimes, governments have to please a broader coalition of voters to stay in office. To do so, they orient spending towards the (non-geographically determined) heterogenous preferences of the coalition in power. This means that public spending will be associated to high levels of transfer expenditures rather than local public. In presidential regimes, the head of the government can remain in office till the end of his mandate and thus does not need to make this type of expenditures. Adopting the same reasoning as for the electoral rule, we can expect parliamentary regimes (that are associated to more redistributive spending) to have more policies that counter-act inequality than presidential regimes.

3. The methodology and the data

The scope of this paper is to determine if electoral systems affect the level of income inequality and of poverty. To test for this, we have to run a regression where the dependent variable is an inequality (or poverty) measurement and the independents are an indicator of the district magnitude, and indicator of the political regime and a set of control variables[7].

[6] They do not consider the estimations made to make the indices comparable between countries and they consider heterogeneous definitions of inequality.

[7] In this paper, we use as indicator of the district magnitude, the natural logarithm of the mean district magnitude of the country. We have to work with an average magnitude since in a country (even if proportional), there might be several districts. We take the logarithm so that the regression equation will be of the semi-logarithmic type and will allow us to see the percentage change in the mean district magnitude instead of a unit change. This is very important since we think that a change of a district magnitude by one unit is very different if we consider a single member district or, for example, a 20-member district.

The data on inequality and poverty are available from LIS for 28 countries and an average of almost 4 years for each country. The data have thus a panel data structure. Since the electoral variable we are interested in hardly changes over time, a fixed-effect regression is not suitable here. A random effect estimator would be of no use either, since we work with countries and it is difficult to believe in a strict independence between exogenous variables and the permanent component of the error term. A between estimator would be of no help since some dummy variables change over time, and the time of observation differs a lot between countries[8]. We have thus to work with a pooled clustered regression.

The cluster option is considered to control for the fact that observations are independent across countries but not within countries. Given that the panel is unbalanced, and we have no way of testing if the unobserved data are randomly missing, it might be argued that we give more importance to some countries than others. As a robustness test, we decided to compare our results with a weighted regression where all the observations are given the same importance. Finally, given that the number of observations is relatively limited, it might be possible that some results are created by outliers.

For this reason, we run a final regression removing the outliers. Since the elimination is the most drastic method to remove their influence, if the result of the outlier free regression is similar to the ordinary one, we can affirm without any doubts that the results have not been generated by exceptional information.

To detect the outliers, we prefer not to use standard regression diagnostic tools (such as standardized residuals, studentized residuals or Cook distances) since these methods have been shown to fail in the presence of multiple outliers because of the swamping and masking effect (Adnan et al. 2001)[9]. We prefer to run a least median of squares regression as suggested by Rouseeuw (1984) and calculate standardized residuals on this regression. In such a way we have a detection method that is based on a regression line that has not been attracted by outliers. The least median of squares methodology is a highly robust method that remains unaffected by up to 50% of outliers. It is not very efficient due to its slow convergence but since we are not interested in inference here this is not a problem.

As far as the data are concerned, we only work with democratic countries (and periods) since electoral systems have a meaning only for these[10].

The dependent variable used are Gini indices[11], the percentile ratios: percentile90/percentile10[12] and the percentage of people who earn less than 40% of the

[8] In particular, dummy variables identifying slight modifications in the definition of the indicator.

[9] Swamping occurs when observations are falsely identified as outliers. While masking occurs when true outliers are not identified.

[10] More than 0 in the polity variable, scaled from −10 to 10, available in the Jaggers and Marshall (2000) data set.

[11] N.B. $Gini \in [0;100]$

[12] That means how many times the richest 10% earns more than the poorest 10%.

median income; coming from the LIS data set. These are the only available inequality and poverty measurements that have an homogenous definition in all the countries.[13] All the measures are calculated on the differences on net[14] disposable income of individuals of all ages coming from an equivalence adjustment of households income through an equalitarian repartition within households.

Even if some small differences exist between and within countries, we think that for the purposes of this study, these differences remain extremely small and do not affect the generality of the results. For example, even if there is a change in France, Germany and the Netherlands on the survey on which inequalities are calculated, the definitions remain unchanged. Since we do not consider changes over time but only between systems, this should not affect the results.

Finally some calculation do not include self-employment income,[15] others include net income variables only[16] and finally some data on taxes are incomplete.[17] To correct for these effects, we create three dummies identifying each case and insert them on the right hand side of the regression.[18]

The variable identifying the district magnitude is the natural logarithm of the average number of elected representatives by district [19]. The variable identifying the regime type, is a dummy variable equal to one if the system is presidential and zero if it is parliamentary. Before explaining our classification procedure, it is important to define precisely what we mean by presidential and what mean by parliamentary regimes. As defined by Persson and Tabellini (1999), presidential regimes are characterized by two important features. Firstly, the decision power is split among different politicians, who are separately and directly accountable to the voters. Secondly, the maintenance of powers does not depend on a majority support in the assembly. Parliamentary regimes, on the contrary, rely on two completely different features. Firstly, proposal powers over legislation rest with the government and secondly, the survival of government depends on the support of a majority in the assembly.

Consistent with this definition, in order to define a country as being presidential, we follow the coding scheme adopted by Beck et al. (2001). The first step of the procedure is the identification of how the chief of the executive is elected. If the head of the executive is popularly elected, the country will temporarily be defined as presidential but might be recoded as parliamentary if it does not fulfill the other requirements belonging to the definition. It could be that even if a country has a popularly elected president, in fact it is a parliamentary regime (or vice-versa). A second check, therefore, is to see, when there is a president, if he has to share its power with an elected representative of the parliament in

[13] What is not the case in the Deininger and Squire (1996) dataset.
[14] Of transfers and direct taxes.
[15] Austria in 1995.
[16] Belgium in 1985, 1988 and 1996; Italy in 1986, 1991 and 1995; Luxembourg in 1985, 1991 and 1994; Spain in 1980 and 1990; and Hungary in 1991 and 1994.
[17] France in 1984, 1989 and 1994 and Poland in 1986, 1992 and 1995.
[18] Note that by removing the data for which data on taxes are incomplete, our results are even stronger.
[19] We take the logarithm so that the results can be red in percentage.

which case this could mean that there is no real separation of powers. If this is the case, it is important to identify the legislative power of the president. If the president can veto legislation that the parliament can override only with a super-majority or if he can appoint or dismiss cabinet ministers or dissolve the assemblies whenever he wants, the system is characterized as presidential, otherwise it is coded as parliamentary. It is for this reason that countries like France or Portugal, despite having a popularly elected president, are coded as parliamentary.

The control variables are those usually considered in inequality regressions. The first one (GDP per capita and GDP per capita squared) is considered because Kuznets (1955) and Lewis (1954) suggest that there should be a quadratic (inverted U) relationship between development and inequality [20]. The second control (percentage of people older than 65 year in the entire population) is considered because Deaton (1997) argues that inequality should increase together with the age structure of the population, the reason being that young people have more similar incomes than elderly people (Deaton and Paxson, 1994)[21]. The third control variable (secondary school or higher attainment by people older than 25 years) is motivated by Tinbergen (1975), Lodono (1990) and Li et al. (1998), who suggest that a higher educational attainment is expected to decrease inequality[22].

Finally, the degree of openness of the countries (measured as the export more the imports in percentage of GDP) is aimed to control for the link proposed between trade openness and inequality (as described in World Bank, 2000)[23]. Given the relative homogeneity of our countries, we do not expect all these variables to be highly significant here as it would be if data were available for all the countries in the world. We also control for regional fixed effect,[24] ethnic and linguistic fractionalisation,[25] and countries with a British legal system to remove an eventual Anglo-Saxon effect. Finally, we control also for time dummies identifying data available for each year to remove an eventual non-linear trend in inequality[26].

4. Results

As we can see in Table 1 , there seems to be a significant relationship between income inequality and electoral systems [27]. We see that an increase by 100% of the mean district

[20] Coming from the IMF Macro Time Series data.
[21] Coming from the UN population yearbooks.
[22] Coming from Barro and Lee (1996) education data. Missing data have been extrapolated from a time trend. Data for Czech and Slovak republic have been considered as being equal to data relative to Czechoslovakia. Data for Luxembourg have been proxied with Belgian data.
[23] Coming from the IMF Macro Time Series data.
[24] Through dummies identifying countries in East-Asia Pacific, Eastern Europe and Central Asia, Latin America, Middle-East and North Africa, North America and Western Europe.
[25] Available form Alesina et al. (2003).
[26] And to control for the fact that data are available for very different periods depending on the countries.
[27] Note that the time dummies, the regional dummies and the dummies identifying data not considering self-employed, considering only net income or considering incomplete taxes are present in all the regressions.

magnitude (mdm) lowers the Gini index by almost 4 points. Similarly, when the mdm increases by 100%, the share of income owned by the 10% richest with respect to the share owned by the 10% poorest decreases by approximately 0.5 units. Finally, an increase of 100% of the mean district magnitude, reduces by 1.07 units, the percentage of people who earn less than 40% of the median income. When we look at the regime type, we see that all other things been equal, presidential systems have higher levels of inequality. Indeed we see that in presidential systems the Gini index is in average 20 points higher than in parliamentary regimes and the inter decile proportion (decile90/decile10) is almost three times higher. The levels of poverty are also much higher. The percentage of people living with less than 40% of the median income in presidential regimes is in average 11.65 points higher than in parliamentary regimes. For all these measures, the results of the weighted, unweighted and robust regressions are similar.

Table 1: Electoral Systems and Income Inequality

	Gini Index			Percentile ratio (p90/p10)			Poverty measure		
Ln(Mean District Magnitude)	-3.91***	-3.94***	-3.62***	-0.53***	-0.53***	-0.46***	-1.07***	-1.07***	-1.03***
	(7.03)	(7.32)	(6.00)	(5.39)	(5.57)	(4.28)	(5.07)	(5.07)	(5.60)
Presidential Democracy	19.63***	20.50***	19.56***	2.93***	3.05***	2.97***	11.65***	11.65***	11.66***
	(3.50)	(3.75)	(3.83)	(3.83)	(4.18)	(3.50)	(4.12)	(4.12)	(4.54)
GDP (per Capita)	0.00	0.00	0.00	0.00	0.00	0.00	0.00**	0.00**	0.00***
	(0.69)	(0.59)	(1.14)	(1.03)	(0.94)	(1.26)	(2.43)	(2.43)	(3.05)
GDP (per capita) squared	-0.00	-0.00	-0.00	-0.00	-0.00	-0.00	-0.00**	-0.00**	-0.00***
	(0.58)	(0.51)	(1.02)	(1.10)	(1.02)	(1.31)	(2.78)	(2.78)	(3.11)
Education	0.11***	0.11***	0.14***	0.03***	0.02***	0.03***	0.06***	0.06***	0.08***
	(3.04)	(2.96)	(3.33)	(3.65)	(3.58)	(3.07)	(2.86)	(2.86)	(3.96)
Ethnic Fractionalization	-14.67	-17.15	-7.37	1.11	0.75	1.78	-10.84	-10.84	-7.50
	(0.92)	(1.08)	(0.48)	(0.42)	(0.29)	(0.59)	(1.32)	(1.32)	(0.96)
Linguistic Fractionalization	34.22	38.59	22.58	-0.04	0.59	-1.14	23.12	23.12	17.98
	(1.18)	(1.32)	(0.83)	(0.01)	(0.13)	(0.22)	(1.55)	(1.55)	(1.34)
Openness	-0.03	-0.03	-0.03	-0.00	-0.00	-0.00	-0.03**	-0.03**	-0.03***
	(1.29)	(1.30)	(1.53)	(1.07)	(1.09)	(1.12)	(2.46)	(2.46)	(3.42)
Elderly	-62.83**	-64.09***	-68.33**	-5.80	-5.98	-5.91	-1.90	-1.90	-5.33
	(2.45)	(2.87)	(2.57)	(1.34)	(1.56)	(1.32)	(0.16)	(0.16)	(0.50)
Constant	8.43	10.16	-2.66	-0.60	-0.35	-1.70	-12.24**	-12.24**	-18.27***
	(0.51)	(0.63)	(0.14)	(0.22)	(0.13)	(0.54)	(2.17)	(2.17)	(3.02)
Method	OLS	Robust	WLS	OLS	Robust	WLS	OLS	Robust	WLS
Number of Observations	90	89	90	90	89	90	88	88	88
Adjusted R^2	0.91	0.91	0.92	0.95	0.95	0.96	0.90	0.90	0.91

Robust t statistics in parentheses

* significant at 10%; ** significant at 5%; *** significant at 1%

5. Conclusion

The goal of this paper was to determine if electoral systems, inequality and poverty are linked in democratic countries. Using high-quality data coming from the LIS database and some simple panel methods, we have found that, first, when the degree of proportionality of a system increases, inequality and poverty decrease. Second, presidential regimes are associated to higher levels of income inequality and poverty. Three measures have been considered, the Gini index, the percentile ratio (p90/p10) and the percentage of people earning less than 40% of the median income. With all these measures, the results go in the same direction and resist to robustness checks. In future research, it might be interesting to study this feature more in detail by considering more complex specifications that could be directly linked to the theoretical models.

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