6

Socioeconomic Origins of Electoral Systems

Introduction

The analyses presented in the previous chapters highlight our basic argument – SMD systems consistently yield lower real prices. This strong empirical regularity holds up not only in the advanced OECD countries, as shown in Chapter 3, but also in developing democracies, as shown in Chapter 4. In addition to empirical evidence amassed from the cross-national comparisons, the electoral system-to-prices link is further corroborated in our detailed study of the Italian case, where the shift toward a majoritarian system was followed by regulatory liberalization and a reduction of real prices.

As we elaborated in Chapter 2, PR systems' association with higher real prices by no means contradicts the emerging consensus in the political economy literature that PR systems also enhance socioeconomic equality. However, here we explore the seeming paradox more fully.

What does the "consensus" literature say? Many argue that proportional representation encourages more generous redistribution, a point we take up at greater length presently. More directly, Birchfield and Crepaz (1998) show that PR is systematically related to lower income inequalities because it allows wider access to the policy-making process and hence better represents the interests of the poor. In light of these findings, one might naturally wonder how, if PR systems also empower producers and raise consumer prices, they can still promote equality. At an even deeper level, one might ask why PR systems can continue as an equilibrium: Why do consumers not demand a change that will reduce prices?

As our theoretical discussion of PR's welfare effects near the end of Chapter 2 will (we hope) have made clear, greater social equality is exactly what we would expect, at least initially, from the pro-producer regulation that PR engenders. Usually, organized workers rapidly become the strongest element within the producer coalition, and among organized workers the most numerous segment is the lower skilled. As we have shown, wage compression – including a wage higher than marginal product for low-skill labor – almost always ensues precisely where pro-producer coalitions dominate. Owners and managers are compensated (and often more than compensated) by the higher prices their products command (above all in nontraded sectors) and, almost always, by

unions' commitment to training schemes that make initially less-skilled workers more productive. The losers from such arrangements, as others (e.g., Rueda 2007) have emphasized, are the "outsiders": less organized workers, unorganized homemakers, temporary workers, pensioners, the long-term unemployed, and (almost always) immigrants.

To put it more concisely: pro-producer policies entail both a welfare loss (to society as a whole) and a transfer – from the unorganized to the organized. In the short to medium run, those who receive the transfers are more than compensated for their share of the loss to social welfare. When, however, the welfare losses mount – and when, particularly, they rise suddenly because of some exogenous shock (a transport revolution opens previously sheltered sectors to trade, new immigrants increase the ranks of the unorganized) – then opposition to the system as a whole will rise, and clever politicians will exploit their opportunity.

This leads us to another legitimate concern about our previous findings, namely our implicit assumption that electoral systems are exogenous. Indeed, with the exception of the previous chapter, we treat electoral systems as fixed and we access their effects on real prices empirically. Our exogeneity assumption seems reasonable and justified, because empirically electoral systems change only rarely. Among the advanced democracies, only a few countries (among them

France, Italy, Japan, and New Zealand) have experienced substantial changes in their electoral systems since the early postwar era. Indeed, as Lijphart (1994) forcefully puts it, electoral systems as institutions "...tend to be very stable and resist change."

Nevertheless, the exogeneity assumption inevitably privileges the consequences over the origins of electoral systems. More importantly, as we briefly discussed in the earlier chapter, the exogeneity assumption might limit us from understanding the full link between electoral systems and policy outcomes. While the previous chapters establish that PR systems consistently lead to higher prices and greater socioeconomic equality, it might well be the case, as we have just noted, that many, or even most, voters in societies characterized by higher prices levels and greater socioeconomic equality have an incentive to maintain PR systems. In this sense, electoral systems could be self-sustaining, and through the feedback loop, the price effect of electoral systems identified earlier can even be self-reinforcing.

This chapter addresses explicitly this possibility, and hence relaxes the assumption of exogeneity in electoral systems. Several points, however, warrant our discussion before proceeding. First, in terms of modeling strategy, ideally it would be better to keep the original modeling setup and expand it into a fully dynamic model to tease out the causal complexity between electoral systems and socioeconomic

equality. Specifically, it would be desirable to go back to the Stigler-Peltzman model and try to model the parameter τ as a function of the prices parameter, p_c. This task, however, turns out to be far from straightforward.

Nonetheless, the solution we adopt here bears a close kinship to the earlier discussion. Our measures of electoral-system responsiveness ask, in essence, how policy reacts to *variation* in the position of the median voter. More precisely, in our original Stigler-Peltzman setup, the agents were producers and consumers, but the key mechanism lay in the "responsiveness" variable (τ), which captured how seats in the legislature, and hence the balance of consumer-producer power, was affected by variation in the position of the electorate.[1] To take our leading example, if in a two-party system Party A moves from 49 percent to 51 percent of the vote (i.e., the median voter moves from slightly toward B to slightly toward A), then Party A typically moves from 47.5 percent of the seats to 52.5 percent in an SMD system, but from 49 to 51 percent in a PR system. That greater responsiveness to shifts in the median voter is what produces a more pro-consumer policy (we say) under SMD. However, typically, at least over the medium run, the median voter does not shift around all that much. What we begin to look at in this

[1] In SMD systems, the median voter; in PR systems, of any shift between voting blocs (because the τ is by design uniform).

chapter is, over that medium run, how much the typical position of that median voter differs, in income and ideology,[2] from that of the mean voter. Put differently, we address now not variation but *central tendency*, that is, the longer-term average position of the median voter – and, more specifically, how social welfare changes when the distance between the longer-term positions of the mean voter and those of the median voter widen or diminish. In taking this approach, we build on the seminal redistribution model of Meltzer and Richard (1981) and relate the choice of electoral systems to the strategic consideration of the pivotal voter (see later discussion).

Second, we distinguish ourselves from the existing literature with our theoretical treatment. Some more recent studies have attempted to examine the determinants of electoral systems and to model explicitly the endogenous choice of electoral rules. The prevalent idea of this school is that the adoption of electoral institutions accords with political actors' strategic calculations. To a first approximation, the choice of electoral systems is modeled as a problem of constrained optimization, where political elites choose the electoral regimes that will maximize their chances of winning under the current contextual constraint (Bawn 1993; Boix

[2] We adopt here the Meltzer-Richard position, explicated we hope more clearly later, that relative income maps directly onto ideology.

1999; Benoit 2004). Despite the progressive accomplishments of this latter approach, it has not addressed directly the issue of why, empirically, electoral systems change so rarely.

Instead of a top-down approach, this chapter attempts to provide an alternative bottom-up perspective to account for change and persistence in electoral systems. We posit that PR (majoritarian) systems systematically lead to greater socioeconomic equality (inequality), and that increases in equality (inequality) in turn sustain PR (majoritarian) systems. In other words, a reciprocal causality connects PR (majoritarian) systems and socioeconomic equality (inequality), and this self-reinforcing cycle is sustained by a variety of political and economic forces. Importantly, the self-reinforcing cycle between electoral system and socioeconomic equality may provide a previously unnoticed reason for institutional stability.

To foreshadow our argument, this chapter unpacks and presents the self-reinforcing cycle between electoral system and inequality in a sequential way. To begin with, we build on the existing theoretical and empirical literature that points strongly to the conclusion that countries with PR systems exhibit greater socioeconomic equality. For instance, many argue that proportional representation (PR) systems lead to more generous redistribution, because politicians under PR systems are elected from multimember districts and hence have incentives to seek broader support from the general

population (Lizzeri and Persico 2001; Milesi-Ferretti et al. 2002; Persson and Tabellini 2000, 2003, 2004). In addition to the direct effect of PR on redistribution, PR leads to higher redistribution indirectly because it yields higher turnout (usually implying less loss of Left votes) and hence tilts the location of the median voter farther away from the mean voter (Flora and Heidenheimer 1981; von Beyme 1985; Tavits 2004).[3] Even if we hold the median voter at the same location, the result remains unchanged, because PR systems are associated with a higher probability of Center–Left governments and hence with more extensive redistribution (Powell 2002; Iversen and Soskice 2006). Meanwhile, PR systems, due to their lower seats-votes elasticity, are found to increase real prices in favor of producers and thus usually improve low-skill workers' welfare, at least to the extent that they are organized in strong unions, via higher wages (see again Chapter 2). Taken together, these forces jointly lead to greater income equality in a society.[4] Lastly, this high income equality, sustained by higher wages and generous welfare policies, in turn either gives rise to PR regimes or reinforces societal preferences in favor of existing PR systems and against any shift to majoritarianism. The other side of the logic applies to the

[3] Income is skewed to the right, so adding Left voters moves median more than mean.

[4] Alesina et al. (2001) have shown empirically that redistributive policy indeed leads to higher income equality.

case of majoritarian systems, where the electoral system and socioeconomic inequality mutually reinforce each other.

What causes changes in electoral systems then? We argue, as outlined earlier, that electoral reform results from strong exogenous shocks that fundamentally unsettle the existing self-sustaining equilibrium. As Rogowski and MacRae (2008) argue, exogenous shocks resulting from changes in production technology or factor endowments can significantly affect social and economic (in)equality. Importantly, where these exogenous shocks increase inequality, the initially more equal society has incentives to shift to a majoritarian system, because such a change diminishes the loss in utilitarian social welfare. By contrast, decreasing inequality creates incentives for the society to broaden political participation and adopt PR systems. Using a simultaneous equation model, we test our hypothesis against Carles Boix's data on twenty-two democracies in the early twentieth century and find strong supporting evidence.

Hence, this chapter develops a unifying framework that accounts for both the consequences and the origins of electoral systems. The self-reinforcing cycle proposed in this study provides a previously unnoticed account for institutional stability and significantly enriches our understanding of electoral systems' short-term effects and their long-term evolutional dynamics. In the next section, we develop our model and elaborate our theory about the formation

and persistence of electoral systems. Then we derive a set of hypotheses. In Section 3, we make use of Boix's data on electoral systems and Vanhanen's data on equality and test our hypothesis empirically. We then contrast our finding with alternative explanations of the choice of electoral systems. The final section concludes.

Theory

The path diagram in Figure 6.1 provides a graphical summary of our theory of self-reinforcing electoral systems. This self-reinforcing cycle can be decomposed into two components: The first concerns equality as a consequence; the second, equality as a cause of the electoral system. To facilitate our discussion, we discuss the case of PR systems, and readers can infer the case of majoritarian systems by the same logic.

Equality as a Consequence of Electoral Systems

A wealth of evidence and models now suggests that PR leads to higher social equality and majoritarianism to greater inequality, via a variety of political and economic mechanisms. We discuss them next.

Direct Redistribution Effect: An emerging branch of research in political economy asks whether and how electoral

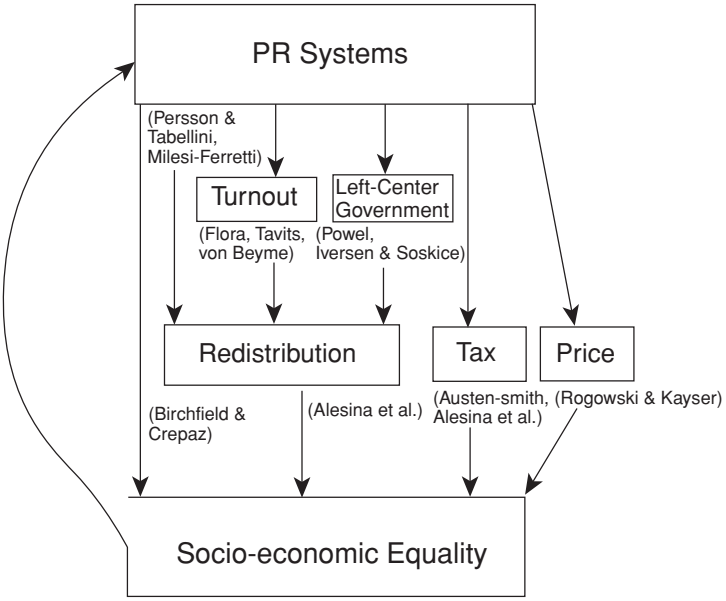

Figure 6.1. A theory of self-reinforcing electoral systems.

rules and other institutional arrangements (such as the division of power between the executive and the legislature, and between central and local government) shape the incentives of political actors and hence affect economic policy outcomes. PR systems are associated with societywide redistribution activities, whereas majoritarian/plurality systems are more likely to focus on district-specific spending on "pork." For instance, in a series of studies, Persson and Tabellini (2000, 2003, 2004) argue that multimember districts under PR systems encourage politicians to seek broader support in the

population, whereas single-member districts under majoritarian/plurality systems instead concentrate electoral competition only in some geographical constituencies (i.e., those marginal districts with more swing voters). Because society-wide redistribution programs, such as welfare and social security spending, are more effective in seeking broad support, and district-specic benets (i.e., "pork," loosely speaking) cultivate narrow support, they find that, compared to majoritarian systems, PR systems are characterized by higher redistributive spending.[5] One parallel redistribution effect induced by the difference between alternative electoral systems is that PR increases the size of the minimal winning coalition of voters needed by politicians. Under a stylized setting, a political party may need barely 25 percent of the national vote to win under a majoritarian system (i.e., slightly more than 50 percent of the vote in slightly more than 50 percent of the districts), while it needs 50 percent under PR. Politicians thus have stronger incentives to choose policy programs with societywide benefits under PR.

[5] Note that according to the model proposed by Persson and Tabellini (2000), parties under both PR and majoritarian systems will appeal and redistribute to the same group of voters; that is, the ones who are the least ideologically biased. Also, note that the rate of marginal votes gained from those ideologically neutral voters due to such redistribution is identical under both systems. What makes PR redistribute more is that the costs are smaller, because parties under PR do not internalize the votes lost from their core supporters.

The finding that PR systems redistribute more than majoritarian ones is echoed in other studies. Unlike Persson and Tabellini, who rely on a preelection model where electoral platforms are binding, Milesi-Ferretti et al. (2002) construct a postelection model where policy is a product of bargaining among elected legislators. Milesi-Ferretti et al. further differentiate two types of spending: redistributive transfers, which go to anyone who meets the qualification criteria, and spending on goods and services that are locally targeted. According to their model, spending on transfers is higher under PR systems. This is because, under PR systems, more than one social group will be represented in the legislature. In such a situation, groups belonging to the ruling coalition derive their utilities from transfer spending (not on public goods and services, because those are uniform across groups). Hence, the median voter will bias the fiscal policy in his or her favor by selecting a legislator with a preference for high spending on transfers.

Indirect Redistribution Effect: PR has also been found to lead to more redistribution indirectly. Voter turnout is the first channel. As Tavits (2004) succinctly documents, turnout is higher under PR around the world, perhaps because of the normative appeal that PR is fairer or for the practical reason that PR provides more options for voters. (Even likelier, in our view, PR lacks the safe districts of majoritarian systems, in which parties have little incentive to mobilize voters,

and voters little reason – knowing the outcome in their district is virtually pre-determined – to bear the costs of voting.) Importantly, poorer citizens also vote more frequently under PR, giving them more representation and power in political processes and forcing the government to be more responsive to their redistributive demands. This argument is consistent with Alesina et al.'s (2001) explanation of why European countries spend more on welfare than the United States, and is also in accordance with Powell (2000)'s finding that PR systems consistently bring governments' policies closer to the ideal position of the median voter, while majoritarian systems yield policies normally to the right of (i.e., less distributive than) the median voter. In addition, the higher turnout under PR pushes the location of the median voter toward the left (i.e., more redistributive) end of the ideological spectrum.

Another indirect path by which PR leads to higher redistribution is through the partisan composition of governments. Particularly, Iversen and Soskice (2006) argue that PR systems redistribute more than majoritarian ones because PR is likelier, holding the position of the median voter constant, to produce Center–Left governments. Their result is the optimal solution of the median voter after he or she conducts a cost-benefit analysis across all possible government coalitions. Specifically, under majoritarian systems, the Center–Right party is the lesser evil, because the worst-case scenario

under a Center–Right government is no gain in the median voter's utility, while she can suffer utility loss under a Center–Left coalition because of the redistributive demands of the Left. By contrast, under PR systems, the median voter can vote for a median party that can ally with the Left (thus forming a Center–Left coalition government). The median voter is comfortable with this arrangement because its party can rein in any attempt by the Left to tax the middle class. In a similar vein, Powell (2002, esp. table 3) shows empirically that PR is associated with a higher frequency of Center–Left governments.

Tax Effect: Several studies have noted that PR countries typically exhibit higher tax rates and flatter post-tax income distributions (Alesina et al. 2001). To disentangle this empirical regularity, Austen-Smith (2000) develops a model of income inequality as a function of the tax system. He captures the trade-off between economic output (which is determined by the voters' endogenous choice of occupation) and distribution by assuming a labor-leisure tradeoff among individual voters who have different endowments of ability. He also assumes that parties are ideological and class (occupation) based. In equilibrium, PR systems have higher tax and unemployment rates, lower national incomes, and flatter post-tax income distributions, provided that the cost of choosing to work is relative low. Intuitively, the different electoral systems produce different sets of pivotal voters, who have different

policy preferences: under majoritarian systems, the pivotal voter is the one with median income in the whole population, whereas under PR the pivotal voter is the one with average worker income, who may or may not be the same median individual identified under majoritarian systems. In addition, what drives a higher tax rate under PR is the two-edged effect from an increase in the tax rate: such an increase lowers net consumption utility but raises the income of the average employee by reshuffling the distribution of occupational choices. Therefore, as long as the cost of entering the workforce is low, a higher tax is preferred under PR because the income-increasing effect dominates the consumption-reducing effect, and this result holds regardless of whether electoral platforms are assumed to be binding.

Price Effect: In the previous chapters, we extended the Rogowski and Kayser (2002) argument that PR systems systematically privilege producers relative to consumers and, consequently, increase real prices. Our model considers a basic conflict between consumers and producers, the former seeking the lowest possible prices, the latter the highest possible prices consistent with profit-maximizing. Note that "producers" in our model explicitly include organized workers, who can more easily demand above-market wages when their industries enjoy above-market prices. Government can award producers the higher prices they seek, usually by restricting

supply. Importantly, in deciding how much to restrict supply, politicians implicitly measure the marginal rate of substitution (MRS) between consumer and producer support: Where even a slight decrease in consumer support would require a large increase in producer support to keep a politician's overall level of support unchanged, consumers are powerful (and prices will be low); where a slight decrease in producer support must be offset by a large increase in consumer support, producers are powerful (and prices will be high). In Chapter 2, we show formally that any institutional change that increases the marginal value of votes must move the MRS in a more pro-consumer (hence, lower-price) direction. Because PR systems normally reduce the marginal value of votes, or more precisely lower the seats-votes elasticity, PR systems should be more pro-producer. Therefore, under PR systems politicians tilt their regulatory decisions toward restrictive supply and hence higher prices and (normally) higher wages for workers. We have presented supporting evidence in the previous chapters, both statistically, using OECD (Chapter 3) and world (Chapter 4) panels, and in historical case studies (Chapter 5).

In sum, several derivations from the existing theoretical and empirical literature all lead to the same implication: Countries with PR (majoritarian) systems are associated with greater socioeconomic equality (inequality).

Equality as a Cause of Electoral Systems

A parallel line of research, chiefly by economic historians and political scientists, concurs with the association between institutions and equality, but proposes the opposite causal direction: that equality influences institutions. The essence of this argument is that greater income equality broadens political participation and hence contributes to the emergence and survival of democracy. For instance, in his game-theoretic model of political transitions, Boix (2003) attributes both the formation and the duration of democracy to rising income equality. Empirically, Przeworski et al. (2000) find that greater equality (and better economic performance) produces better odds of democratic survival (Przeworski et al. 2000). On the other hand, inequality is found to have the opposite effect: Engerman and Sokoloff (2002) argue that colonial-era income inequality in many Latin American countries has contributed to limited participation and persistent political-economic privileges for the ruling elite down to the present day (Engerman and Sokoloff 2002).

This chapter takes this argument, that rising income equality broadens political participation, one step further: We argue that countries are more likely to adopt (and retain) PR as income equality increases.[6] In the following section,

[6] In the recent literature, Boix (1999) argues that, historically, it was the combination of rising strength of socialists and political fragmentation

we first develop a simple public finance model of redistribution, based on the setup in Persson and Tabellini (2000), which takes into account voters' income inequality, demand for redistribution, and choice of electoral systems. The key finding is an important (yet commonly neglected) proposition: that aggregated social welfare is maximized by choosing the policy preferred by the *average*, rather than the *median*, voter in the income distribution. Making use of this proposition, we will turn to a spatial model and show that increases in inequality (equality) – because of a growing (reduction in the) gap between the average and the median income voter- will also increase (reduce) the welfare loss in a representative democratic society and hence make majoritarian (PR) systems more desirable.

A Public Finance Model of Redistribution

Replicating much of Persson and Tabellini's setup in their public finance model (2000, chap. 3), which follows in essence the argument originally advanced by Meltzer and Richard (1981), we consider a closed-economy society with the size of population normalized to unity. Citizens in this society,

among conservatives that transformed electoral systems from majoritarianism into PR. Cusack et al. (2007), questioning the validity of Boix's argument, attribute the adoption of PR to the geographical spread of specialized economic interests. In the later section, we will discuss our theory with reference to those related studies.

indexed by *i*, derive their utility according to the quasi-linear function

$$\mathrm{u^i} = \alpha^{\mathrm{i}}\mathrm{c^i} + (1 - \alpha^{\mathrm{i}})\mathrm{H(g)} \tag{1}$$

where c^i is private consumption, g is spending (per capita) on public goods, and $H(.)$ is a continuous and concave function. Note that a citizen's utility is a convex combination of private and public consumption, where the α^i ($\alpha^i \in [0, 1]$) term represents the weight on private consumption. Citizens differ in the relative weight α^i that they put on these two goods, but they do not differ in their valuation of the public good.

Each citizen also differs in the level of income, y^i. Assume y^i follows a cumulative distribution function $F(.)$ with mean y and median y^m. From the empirical regularity that the income distribution is right-skewed, we assume $y^m < y$. The government finances g by imposing a flat-rate tax (t) on each individual's income. Therefore, private consumption differs across individuals

$$c^i = (1 - t)\, y^i \tag{2}$$

The government faces a hard budget constraint, and no borrowing or rent-seeking is permitted. In other words, the budget constraint is governed by

$$g = ty \tag{3}$$

Hence, we can use direct substitution and rewrite the citizen's utility function as

$$\mathrm{u^i} = \alpha^{\mathrm{i}}(\mathrm{y} - \mathrm{g})(\mathrm{y^i}/\mathrm{y}) + (1 - \alpha^{\mathrm{i}})\mathrm{H}(\mathrm{g}) \tag{4}$$

It is easy to show that individual *i*'s optimal level of public-goods supply, g^{i*}, is

$$g^{i*} = H_g^{-1}\left[\left(\frac{\alpha^i}{1-\alpha^i}\right)\left(\frac{y^i}{y}\right)\right] \tag{5}$$

To demonstrate this result more explicitly (and without the loss of generality), we can use a log function to represent $H(.)$. If we do so, Equation (5) is simplified to

$$g^{i*} = \left(\frac{1-\alpha^i}{\alpha^i}\right)\left(\frac{y}{y^i}\right) \tag{6}$$

From Equation (6), we can clearly see that a citizen's preferred level of g decreases in α^i and y^i. Put differently, richer individuals, and those who place more weight on their private consumption, prefer less of the public good and lower taxation. Because we normally assume that richer individuals value public goods less,[7] these two effects should reinforce each other. Note however that the chief result, that demand for public goods decreases with wealth, holds even under the highly adverse assumptions that (a) all citizens weight private

[7] A familiar example is public schools: Because the rich can afford private schooling, they value provision of a good public school education less.

and public consumption the same, (b) all government spending is financed by a flat tax, (c) there is no explicit redistribution, only provision of a genuinely public good, and (d) all citizens derive the same utility from the public good. *A fortiori*, it seems self-evident that individual preferences for public spending will decline even more steeply with income when taxes are progressive or redistribution is explicit.

That the rich dislike public spending because of the higher tax burden seems unsurprising. What is crucial to our model is that, by the standard utilitarian criterion, the aggregated social welfare (i.e., the summed welfare of individual citizens) is maximized when (and only when) the welfare of the mean citizen is maximized. To see this mathematically, note that what maximizes the welfare of the mean citizen, $\frac{1}{n}\int_i u^i(r)dF$, obviously maximizes the aggregated social welfare, $\int_i u^i(r)dF$.[8] In other words, the socially optimal level of g^* when $y^i = y$, and under the limiting assumption that $\alpha^i = \alpha$ for all i, is

$$g^* = \left(\frac{1-\alpha}{\alpha}\right)\left(\frac{y}{y}\right) = \frac{1-\alpha}{\alpha} \tag{7}$$

To elaborate this point, Figure 6.2 plots the aggregated social welfare against the distance between the median income voter (defined as the voter whose preferred point is adopted

[8] This point becomes even trivial, given that n has been normalized to unity in our model.

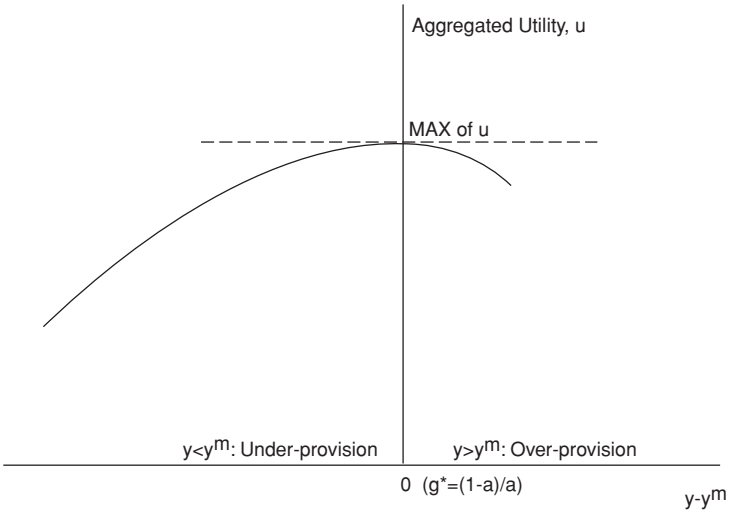

Figure 6.2. Aggregate social welfare as function of income difference between median voter and average citizen.

and represented by the final policy outcome) and the average income citizen. As we can see, given the concavity of the utility function, the aggregated social welfare is maximized when $y^m = y$ (and the corresponding $g^* = \frac{1-\alpha}{\alpha}$). As the position of the median voter diverges more from that of the mean citizen, so must the welfare loss from adoption of the preferred policy of the median voter increase.

Recall that the objective of our model is to show that change in inequality can change the welfare consequences of electoral systems. We have just established the first step toward our end: social welfare is maximized when the

preferred policy of the mean citizen is implemented. In practice, however, the actual policy outcome corresponds to the median voter whose position might or might not coincide with that of the mean citizen. The welfare loss emerges as the position of the median voter diverges more from that of the average citizen.

To move toward the second step of our argument, we need to know what determines the location of the median voter. Fortunately, the answer to this question has been persuasively provided by the work of G. Bingham Powell and others: that PR systems produce outcomes near the preferred policy of the median voter, while majoritarian systems lead to the adoption of policies on average well to the right of the median (Huber and Powell 1994; Powell 2000, 2002; McDonald et al. 2004). In the context of our chapter, PR reliably yields the policy (the one of concern here is the size of redistribution) that is closer to the ideal point of the median income voter, while majoritarian systems move policy to the right of the median voter and toward the position of the (richer) mean voter who prefers less redistribution.[9]

The last (and perhaps obvious) piece of our picture is that the distance between mean and median increases as income inequality grows. For the sake of argument, we assume that the rising income inequality does not change the position of

[9] Recall the income distribution is right-skewed, so $y > y^m$.

the median income voter but only moves the mean income in society up to a higher percentile. A familiar example that makes the point vividly is to imagine a society in which all members but one are equally wealthy, and that one – let us call him Bill Gates – is vastly wealthier. The median income, which is not affected by Gates' wealth, will be lower than the mean, which is so affected; and the wealthier Gates becomes, the more the distance between the median income (which will not change) and the mean (which will) increases.

With these points in mind, we argue that when inequality increases – indicated by the growing gap between the mean-income citizen and the median-income voter – the welfare loss will be reduced if the society shifts to a majoritarian system. Similarly, as the mean and the median converge (hence a reduction of income inequality), the initially unequal society might find a shift to PR welfare-improving. Obviously, incentives do not determine results, nor are welfare-improving steps always taken. Following the old political entrepreneur argument of Gary Becker (1983), we simply suggest that, to the extent politicians can appropriate some share of the resultant welfare improvements for themselves, they will be likelier to pursue the institutional change that changing equality stimulates.[10]

[10] A commonly accepted, if only parallel, example is that of electoral reform in the nineteenth-century United Kingdom: the Unreformed House of Commons represented a median (landowning) voter who supported

Change and Persistence in Electoral Systems: A Spatial Model

To formalize our argument, we begin our analysis with a (relatively) equal society that uses a PR system. (Because we assume it to be a democracy, all citizens are voters.) We graphically map the policy outcome onto the distribution of income where we identify the relative position of the median and the mean voter. This hypothesized society is represented in Figure 6.3, where we mark the policy desired by the median voter, that desired by the mean voter, that produced by PR systems, and that produced by majoritarian systems, by y^m, y, r^{PR}, and r^{MAJ}, respectively. Note that y^m is located in the middle of the distribution, because it represents the 50th percentile of income; y is located to the right of y^m, because the income distribution is right-skewed. In the initial situation, because the society is relatively equal, the distance between median and mean voter preferences is slight. Also notice that, following our previous discussion, we assume that the mapped policy position under PR systems, r^{PR}, coincides with y^m, and that the mapped policy position under majoritarian systems, r^{MAJ}, is located to the right of r^{PR}.

grain tariffs and opposed taxpayer-funded municipal improvements. As the average (mercantile or manufacturing) citizen increasingly diverged from the limited-franchise median, and inflicted growing welfare costs, incentives grew for political leaders to broaden the franchise and bring the median voter closer to the average citizen. The result was a succession of Reform Acts, beginning in 1832.

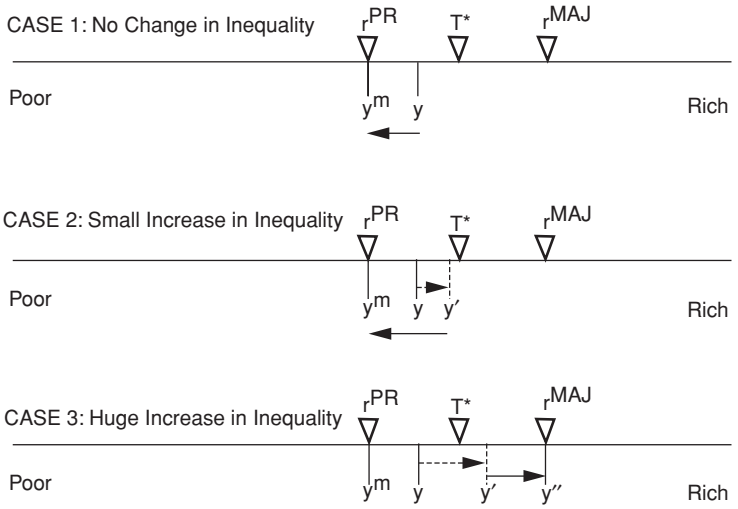

Figure 6.3. The effect of rising inequality on the shift to majoritarian systems in an equal society.

Let us assume that this society remains static and is immune from any external shock. In this case (Case 1 in Figure 6.3) we expect two consequences. First, compared to r^{MAJ}, r^{PR} is closer to y, so the society will endure less welfare loss if it sticks with PR (recall that the welfare loss increases as the policy position diverges more from that of the mean voter). Therefore, the society has no incentive to deviate and PR is sustained. Secondly, due to the redistributive nature of PR, PR contributes to a more equal society and the gap between y and y^m is reduced (as indicated by the direction of the dashed arrow). The increase of income equality and the resultant convergence between r^{PR} and y make the continuation of PR even

more appealing, which in turn strengthens the existing preference for PR.

Now, imagine that this society is exposed to some exogenous shock, and that income inequality increases as a result.[11] What would happen to the society's preferences among electoral systems, then? The answer depends on the magnitude of the shock and accordingly, how far y is pushed away from y^m. Let T^* (the "threshold") denote the midpoint between r^{PR} and r^{MAJ}, and the upshot is that as long as y stays within $[r^{PR}, T^*]$, PR will remain welfare-superior. However, if the external shock is huge enough to push y to the right of T^*, then the society as a whole (or, equivalently, a benevolent social planner), reevaluating the welfare consequences under alternative electoral systems, will rationally prefer a majoritarian system.

To see this point, suppose a minor external shock occurs and moves the position of the mean income voter slightly upward. This new scenario is represented in Case 2 in Figure 6.3, where the dashed arrow moves the mean voter's income position from y to y'. Under such circumstances, due to the upward shift of y, the policy produced by the existing PR system incurs higher welfare loss than before. However, PR is still welfare-superior and is maintained by the society.

[11] A classic example would be the opening of a labor-scarce economy to greater international trade: for a convincing real-world example, see O'Rourke and Williamson (1999, chap. 4).

This is because the distance between y' and r^{PR} is still shorter than that between y' and r^{MAJ}. In other words, if one shifted to a majoritarian system, the welfare loss resulting from the new redistribution policy, r^{MAJ}, would be even higher than the current welfare loss caused by r^{PR}. So PR is rationally maintained as the lesser evil. Moreover, if the society stops experiencing further increase in income inequality, then again, the redistributive nature of PR will gradually drag y' back toward y^m (as shown by the direction of the solid arrow) and offset the income inequality caused by the external shock. The long-term equilibrium will be near Case 1, where PR equalizes the society and the social preference for PR reinforces PR's persistence.

Finally, suppose the society experiences a huge increase in inequality (as shown by the direction of the dashed arrow in Case 3), moving the position of the average income voter, y, to y''. In this case, the distance between y'' and r^{PR} is longer than that between y' and r^{MAJ}, so the initial welfare loss caused by r^{PR} is higher than the one that would be caused by r^{MAJ}. Therefore, the society has an incentive to shift from PR to the majoritarian system because the electoral reform reduces the welfare loss. Importantly, if the society once chooses a majoritarian system, the fact that majoritarian systems tend to redistribute less will further increase income inequality, pushing y'' away from y (and even closer to r^{MAJ} as shown by the direction of the solid arrow).

The dynamic processes suggested in Figure 6.3 underscore the argument in this study: An equal society prefers PR to majoritarian systems because of the welfare advantage, and PR is self-sustaining and resistant to a small increase in inequality. However, when experiencing a great increase in inequality, the society has incentives to abandon its old PR system and adopt a majoritarian one because the new policy produced by majoritarian systems will make the society better off from a social welfare perspective.

The same logic of social welfare maximization applies to the opposite situation. At the risk of repetition, we depict the causal dynamic for a highly unequal society in Figure 6.4. As we can clearly see, the unequal society has a strong interest in installing and maintaining majoritarian systems, and the majoritarian system in turn increases inequality. In addition, when there is no change or only a small decrease in inequality, the majoritarian system is maintained (Case 4 and Case 5). Lastly, the society finds it welfare-improving to change to PR only when it experiences a large decrease in inequality (Case 6).

Again, we emphasize that welfare-improvement is not the whole story, and that – as political obstacles to free trade repeatedly demonstrate – obviously welfare-improving reforms are often blocked by organized interests. Among many other factors that might matter for outcomes, where producers, who benefit from PR, are well-organized in trade

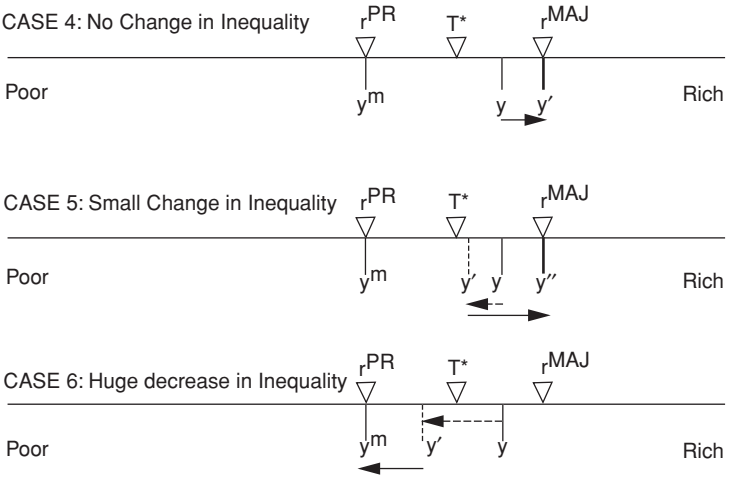

Figure 6.4. The effect of rising equality on the shift to PR systems in an unequal society

unions and industry associations – and this is particularly likely to be the case, as Wallerstein (1989) showed, in smaller countries – the switch to PR will be easier and its abandonment harder.

Empirical Testing

We extend the data provided by Boix (1999) to test our hypotheses. To the best of our knowledge, Boix's is the first systematic study that uses quantitative data to investigate the origin of electoral systems crossnationally.[12] In his

[12] Note that, in her pioneering study, Bawn (1993) analyzes the logic underlying the choice of electoral rule in Germany.

elegant study, Boix seeks to understand what factors affect the choice of electoral rules for opportunistic incumbents. To answer this question, he assembles a sample of twenty-two democratic countries during the interwar years,[13] and he captures the distinction between PR and majoritarian systems by using the "effective electoral threshold" (EET) as the dependent variable. Technically, the EET measures "...the proportion of votes that, for each electoral system, secures parliamentary representation to any party with a probability of at least 50 percent" (Boix 1999, 614). Intuitively, it measures how difficult it is for a party to obtain seats in parliament and hence taps into the degree of majoritarianism. The value of EET is lower under PR and is higher under majoritarian systems. We follow Boix and use EET as the dependent variable.[14]

We begin our empirical analysis by first trying to replicate Boix's study. As the results in Model 1 of Table 6.1 show clearly,

[13] They are: Australia (1919–39), Austria (1919–34), Belgium (1919–34), Canada (1919–39), Denmark (1919–39), Finland (1919–39), France (1919–39), Germany (1919–33), Greece (1923–36), Iceland (1934–39), Ireland (1922–39), Italy (1919–23), Japan (1925–40), Luxembourg (1919–39), the Netherlands (1919–39), New Zealand (1919–39), Norway (1919–39), Spain (1931–36), Sweden (1919–39), Switzerland (1919–39), the UK (1919–39), and the United States (1919–39). Later in his study, he supplements his sample with nine extra countries from after 1945, and his substantive results remain unchanged.

[14] For detailed description and the temporal variation of EET, see Boix (1999, 614–16).

Table 6.1. Estimation results

The dependent variable	Model 1 EET	Model 2 EET	Model 3 EET FARM1938
THREAT	−.131***		−.096*
	[.030]		[.049]
△FARM		−.860**	−.887**
		[.303]	[.329]
FARM1918			.838***
			[.074]
EET			−.366**
			[.157]
lnPOP			−2.144*
			[1.078]
Fragmentation ×	−33.647***		−19.075
Area Dummy	[10.898]		[13.797]
Constant	28.511***	27.712***	36.616***
	[3.735]	[5.140]	[4.809]
N; R2	22; .401	18; .239	18; .439

Note: Because of the omission of main effects, Models 1 and 3 are misspecified and likely biased. As our purpose is to replicate Table 3 in Boix (1999) as closely as possible, we nevertheless use his specification.

this chapter corroborates his main findings.[15] The key independent variable in Boix's study, THREAT, represents the joint effect of the strength of rising socialism and the coordination capability among the conservative ruling elites. Boix argues that the coefficient of THREAT should be negative, because

[15] We use the data provided in the appendix to Boix's article. While the numerical results do not appear exactly the same because THREAT is scaled differently, the results are substantively identical.

countries with strong socialist parties and fragmented conservative forces are more likely to adopt PR. Our results accord with Boix's.

To test the effect of increases in inequality on electoral systems, we first need a proxy for income inequality. The most common indexes for income inequality, such as the Gini index reported by Deininger and Squire, are unfortunately not widely available for the interwar period covered by Boix's data set. In his subsequent study, Boix (2003) therefore adopts two of Vanhanen's indices (1997) to capture income inequality before World War II: the distribution of agricultural property and the quality of human capital.

Vanhanen (1997) measures the distribution of agricultural property by calculating the share of total agricultural holdings held by family farms. As measured by decade beginning with 1858, Vanhanen defines family farms as ones that have less than four employees (including family members) and that are primarily cultivated by the family itself. As Boix (2003) notes, this definition differentiates family farms from large and professional farms that are cultivated by hired workers, and hence provides a good proxy for the degree of land concentration. In other words, countries with a higher percentage of family farms enjoy a higher degree of equality in land ownership. Given the centrality of land ownership and agricultural property to a family's income in the prewar period, we believe that measuring inequality through the percentage of

family farms is justified on strong theoretical grounds. Empirically, the percentage of family farms also seems to tap into income inequality very well. Boix reports that for the postwar period for which both the Gini index and Vanhanen's family farm indicator are available, the correlation between these two indexes is moderately high (−.66) (Boix 2003, 90).

The second proxy for income inequality that Boix suggests is Vanhanen's index of knowledge distribution. Put loosely, this index is based on the mean share of literates and students in the adult population. However, we believe that, unlike the distribution of agricultural property, the theoretical linkage between knowledge distribution and income inequality is less clear during the prewar period. Moreover, preliminary analysis suggests that the variable of knowledge distribution does not significantly affect the electoral system, especially once the agricultural property variable is taken into consideration. Hence, we drop the variable of knowledge distribution and proceed with only the variable of family farms variable as our indicator of income inequality.

Consistent with the time period examined in this chapter, we take the values of the family farms variable in both the 1930s (with the 1938 term) and 1910s (with the 1918 term), and we let the difference represent the change in inequality from the 1910s to 1930s. The resultant variable, ΔFARM, ranges from 1 to 26 and has a mean of 10.9 and a standard deviation of 7.8. This indicates that from the 1910s to 1930s,

there was a general trend toward increasing equality of agricultural holdings.[16] Note that Austria, Iceland, Ireland, and Luxembourg do not have information on this variable, reducing our sample size to eighteen. Therefore, the issue of degrees of freedom forces us to rely on a stylized empirical model rather than a fully specified one.

To test our hypothesis that an increase in equality (inequality) makes it more likely that a society will adopt a PR (majoritarian) system, Model 2 replaces Boix's threat variable with ΔFARM, and the estimated coefficient of ΔFARM turns out to be negative, as expected, and highly significant ($t = -2.8$). This result also vouches for an almost one-to-one effect of change in inequality on electoral systems: as the proportion of family farms increases by 1 percent (i.e., greater equality), the proportion of votes that a party needs to secure parliamentary seats is reduced by 0.86 percent (i.e., becomes less majoritarian). On the other side of the token, one can easily infer that an increase in inequality results in a system that is more majoritarian.

That an increase in equality (inequality) leads to more proportional (majoritarian) systems is only half of the picture. To test our main hypothesis that electoral systems are self-sustaining, we construct a nonrecursive model that

[16] This accords with many other measures of increasing equality, albeit on a smaller set of countries, in the interwar period: see particularly Atkinson and Piketty (2007).

contains two equations.[17] The first equation combines Model 1 and Model 2, and relates the electoral system variable to the variables of threat and change in income inequality. The second equation conversely tests whether income inequality in the 1930s (proxied as FARM1938) is dependent on electoral system (EET), after controlling for the initial inequality condition in the 1910s (FARM1918).[18] It also controls for a country's population size because to a certain extent it is harder to maintain socioeconomic equity in populous states.

The results in Model 3 strongly support our hypothesis. First, we can see that the electoral system exerts a strong redistributive effect: As the electoral threshold increases, income equality, represented by the proportion of family farms, deteriorates. Put differently, our empirical results corroborate the conventional wisdom that PR (majoritarian) systems are associated with greater (less) redistribution. Second, an increase in equality (inequality) continues to strengthen social preference for PR (majoritarian) systems. Perhaps even more importantly, Model 3 shows that on top of the political mechanism identified by Boix, the socioeconomic forces play at least

[17] The model is estimated via full three-stage least squares, and a small-sample adjustment is made.

[18] The reason for controlling for the initial condition is obvious: there is more room for an equal society to become polarized than an already unequal society.

an equally important role in shaping the formation and persistence of electoral systems. This suggests, at least to us, an account of electoral-system change that (a) is more strategic and less tactical than that of Boix (1999) and (b) favors the more parsimonious account of Boix (2003) over the more complicated one of Boix (1999).

Discussion

The previous empirical analysis, derived from our theoretical model, underscores the main points of our study: Electoral systems, as we observe, are normally self-sustaining and change little over time. Importantly, big changes of electoral systems are driven by exogenous shocks (such as wars, globalizations, and demographic or technological revolutions) that affect socioeconomic inequality. Particularly, an increase in equality increases the likelihood that PR will be adopted, while rising inequality favors a switch to (or retention of) majoritarian systems.

Our finding links this chapter directly to some recent studies that investigate the institutional consequence of income inequality. Rogowski and MacRae (2008) examine how shifts in social and economic inequality resulting from changes in economic and military technology, trade, and factor endowments shape politicians' incentives to broaden or restrict political participation. However, unlike Rogowski and MacRae

(2008), which focuses the effect of income inequality on political enfranchisement, this study deals with both persistence of and change in electoral systems. The finding of this chapter is congruent with Ticchi and Vindigni (2010), who argue that increasing equality in many countries during the twentieth century was associated with the shift to PR; while increasing inequality in recent years may push for a change to majoritarian methods of election. However, we propose an alternative and, in our view a more plausible, mechanism. In Ticchi and Vindigni's model, the median voter chooses the electoral system. Citizens are divided into three classes; the rich always favor majoritarian systems and the middle class always choose PR on the (to us unlikely) assumption that under majoritarian rule the poor will always vote for a rich candidate. The group that delivers the final verdict on electoral systems is the poor, who prefer PR only when the income distribution is highly unequal. In our study, the mechanism that does the work is the redistributive consequences of electoral systems and politicians' indirect incentives to maximization social welfare.

This chapter also relates to an emerging literature that seeks to understand the origin of electoral systems. As discussed earlier, Boix argues that existing right-wing parties chose PR when they were politically fragmented and were strongly challenged by the rising socialist movement. The reason is that, when existing right-wing parties are fragmented,

their supporters will find it hard to coordinate and remain united. With a strong socialist challenge, the fragmented right-wing parties are very likely to suffer a huge electoral loss if they do not shift to PR, where their existing supporter basis can be preserved.

Boix's logic, however, appears problematic. As Cusack et al. note, Boix does not entertain the possibility of electoral alliances among the conservatives. Importantly, once they enrich Boix's model to a more realistic game where they consider redistributive spending across different groups under different electoral systems, they argue that it is implausible that the right wing would ever choose PR. Their criticisms appear largely valid; and, as our empirical results in Model 3 indicate, once we factor in the redistributive consequence of electoral systems, the variable of THREAT becomes insignificant. Hence, rather than the combined effect of fragmented conservativism and rising socialism, Cusack et al. argue that the key to understanding the historical transition to PR lies in the expansion of specialized economic interests induced by the process of industrialization and urbanization. Their industrialization argument, while distinct from ours, falls squarely with our emphasis on change caused by external shocks.

Other recent contributions along the line of endogenizing electoral systems include Andrews and Jackman (2005),

Benoit (2004), and Blais et al. (2004)[19] where several plausible determinants, such as uncertainty, anticipated electoral gains, and the spread of democratic ideas, have been explicitly addressed. While informative, their emphasis is largely on exploring what factors contribute to the transition from majoritarian systems to PR, and hence their scope is somewhat limited. This chapter moves the literature a step farther by providing a socioeconomic account that can also explain the transition from PR to majoritarian systems (we speculate, for example, that the recent adoption of SMD in Italy and Japan may reflect rises in inequality). The theory of self-reinforcing electoral systems proposed in this chapter also enhances our understanding on the persistence of electoral systems.

Conclusion

Because of their far-reaching political and economic consequences, issues of electoral systems have spawned much exciting research over the past few years. Crudely summarized, studies of electoral systems have been developed in two parallel fashions. On the one hand, electoral systems are taken as given, and different electoral systems are found to affect

[19] The list of literature is not intended to be exhaustive.

voter turnout, cabinet stability, government duration, partisanship of the government, composition of governmental expenditures, budgetary deficits, prices, and income inequality. On the other hand, growing scholarly attention has been devoted to the endogeneity of electoral systems, with a special emphasis on the choice of electoral systems and the causes of electoral reform. This chapter seeks to integrate these two seemingly unconnected lines of scholarship into a unifying framework. We posit that a self-reinforcing cycle connects electoral systems and socioeconomic inequality. Specifically, in agreement with the existing theoretical and empirical literature, we argue that countries with PR systems are associated with left-wing (Center–Left) governments and extensive redistribution. Meanwhile, we posit that PR systems, due to their lower seats-votes elasticity, are found to restrain economic competition and increase the real price in favor of producers. These forces jointly lead to greater equality of incomes in a society. This high income equality, sustained by higher wages and generous labor policies, in turn either gives rise to PR or reinforces societal preferences for existing PR systems. We present evidence supporting our claim. The self-reinforcing cycle proposed in this study provides a plausible account for institutional stability, and significantly enriches our understanding of electoral systems' short-term effects and their long-term evolutional dynamics.