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The Optimal Number of Governments for Economic Development

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Abstract: In the private sector, many small firms imply shallow hierarchy and narrow product lines. Similarly, in the public sector many small governments imply shallow hierarchy and narrow governments. This paper explains when replacing broad, deep governments with shallow, narrow governments increases stability and reduces corruption. My general conclusion is that developing nations plagued by instability and corruption probably have too few elections and too few democratic governments.

Introduction

An automobile manufacturer can make tires for its cars in a subsidiary or buy tires from another firm. Making tires involves one firm using hierarchical organization, whereas buying tires involves two firms transacting in a market. According to the standard formulation, firms are hierarchies bounded by markets.² Hierarchies work by orders, whereas markets work by bargains. At the point where an organization touches a market, administration ends and trade begins. Vertical integration subtracts markets and vertical disintegration adds markets. Along the vertical dimension, the extent of hierarchy and the number of markets measure the same thing with different sign. Optimizing the extent of hierarchy is, consequently, the same as optimizing the number of markets.

Turning from the private sector to the public sector, the ministry of education can administer local schools or the citizens in each locality can elect a school board for schools. The ministry of education is one organization and each school board is a small government. In this example, administration involves one hierarchical organization and politics involves many governments. Just as the private sector consists of hierarchies and markets, so the public sector consists of hierarchies and governments. Orders direct hierarchies and elections direct democratic governments. At the point where a public organization touches an election, administration ends and politics begins. Vertical integration subtracts elections and vertical disintegration adds elections. Along the vertical dimension, the extent of hierarchy and the number of elections measure the same thing with

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¹I would like to thank Martin McGuire and other participants in the IRIS conference on market-augmenting government for comments on the first draft of this paper. This paper draws upon my book, The Strategic Constitution (Princeton University Press, forthcoming), Part II.

² Ronald Coase, "The Nature of the Firm," *Economica* 4 (1937): 386; Oliver E. Williamson, *Markets and Hierarchies, Analysis and Antitrust Implications: A Study in the Economics of Internal Organization* (New York: Free Press, 1975); Oliver E. Williamson, *The economic institutions of capitalism : firms, markets, relational contracting*, 1st edition (New York and London: Free Press).

different sign. Optimizing the extent of hierarchy is, consequently, the same as optimizing the number of elections vertically.

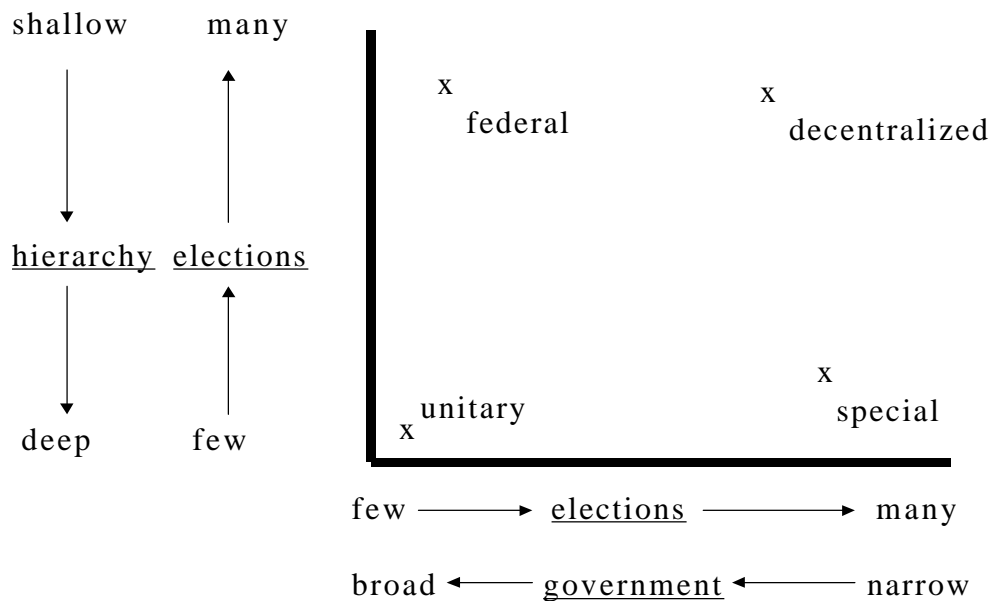
My analogy between the firm and the state has focused on vertical integration or disintegration. Now I turn from vertical to horizontal organization. One firm can manufacture cars and another firm can grow cucumbers, or a single firm can do both. Similarly, an elected town council can control police and a separately elected school board can control schools, or the town council can control both police and schools. In general, the scope of a government's power can encompass many issues or few issues. When one democratic government controls many issues, the citizens vote for one set of officials. When a separate democratic government controls each issue, the citizens vote for many sets of officials. In a democracy, the citizens vote for as many sets of officials as there are governments. Horizontal integration subtracts elections and horizontal disintegration adds elections. Along the horizontal dimension, the scope of government and the number of elections measure the same thing with different sign. Optimizing the scope of government is, consequently, the same as optimizing the number of elections horizontally.

This paper concerns the optimal number of democratic governments. I search for the optimum along the vertical dimension in which hierarchy trades off with government, and I also search along the horizontal dimension for the optimal breadth of each government. This approach yields some novel conclusions about instability and corruption, which especially (but not uniquely) afflict developing nations. In the private sector, many small firms imply shallow hierarchy and narrow product lines, and in the public sector many small governments imply shallow hierarchy and narrow government. This paper explains when replacing broad, deep governments with shallow, narrow governments increases stability and reduces corruption. My general conclusion is that developing nations plagued by instability and corruption probably have too few elections and too few democratic governments.

Organizational Space

Figure 1 depicts organizational space with the vertical dimension representing the depth of hierarchy and the horizontal dimension representing the breadth of each government.³ A point in the organization space of Figure 1 is specified by a given depth of hierarchy and breadth of government, or, equivalently, by a given number of elections on the vertical and horizontal dimensions.

Figure 1: Organizational Space



Different points in the organization space of Figure 1 correspond roughly to countries with different political subdivisions. Deep hierarchy and broad government, as indicated by the origin of the graph, characterize unitary states like Japan or France. Moving vertically from the origin holds the breadth of government constant while hierarchy becomes shallow. This move roughly depicts the change from a unitary state to a federal system like Canada or Australia. The provinces of Canada and the states of Australia have broad powers subordinated in some respects to the federal government. Moving

³ While the feasible points are probably discrete (you cannot hold half of an election), the space is continuous.

horizontally from the origin holds the depth of hierarchy constant while governments narrow. This move depicts the multiplication of special governments with single purposes. To illustrate, in the San Francisco area special district governments with separate elections provide regional parks, public transportation, water, and other local public goods. Finally, moving diagonally from the origin, governments narrow and hierarchies become relatively shallow. This move depicts the simultaneous decentralization and fragmentation of government.

This paper concerns the optimum in the organizational space represented by Figure 1. The optimum occurs at the depth of hierarchy and breadth of government that maximizes the satisfaction of citizens. By inserting utility curves representing the satisfaction of citizens in Figure 1, I could depict the optimum, but I will avoid this complication.⁴ Instead, I will analyze separately the optimum along the vertical dimension and also along the horizontal dimension.

This paper is not about...

Figure 1 depicts two dimensions characterizing the problem of the optimal number of governments. Explaining variance in the performance of governments requires a model with more dimensions. The omitted dimensions cause confusion between the optimal number of governments and related problems. To avoid confusion, I want to mention some problems that this paper is *not* about.

Locating the optimal boundary between the public and private sector has engaged the best minds in economics and their findings contributed to global privatization in the 1990s. The boundary between the public and private sector, however, is not my topic. The problem of the optimal size of the state differs from the problem of the optimal number of governments. In effect, my analysis varies the number of governments while holding constant the size of the state.

Convention distinguishes the branches of government into the executive, legislature, and judiciary. Dividing power among the branches of government

⁴ This exercise requires a social welfare function. At this point in the paper, I do not want to raise the philosophical questions posed by this controversial idea.

has engaged the best minds in political theory. Their findings contributed to the spread of stable democracies and the rule of law. The division of powers, however, is not my topic. The problem of the optimal division of powers within a state differs from the problem of the optimal number of governments. In effect, my analysis varies the number of governments while holding constant the division of powers.

Sometimes people can choose among alternative governments by moving or stipulating jurisdiction in a contract. Economists have identified circumstances in which competition can cause a race to the top or a race to the bottom.⁵ Ideally, competition might solve the problem of the optimal number of governments, just as competition can solve the problem of the optimal number of firms. In reality, however, the scope of government competition remains quite limited. Instead of competition, this paper concerns the sphere of collective choice where competitions fails to optimize automatically the number of governments . Competition among governments, however, is not my topic.

movingmove to governments, or when people can Governments can compete to attract people, either by moving people to governments as through migration or by moving government jurisdiction to people as by choice of laws in a contract. Competition

An efficient economy provides people with the greatest feasible satisfaction of their preferences for private goods. Similarly, an efficient state provides citizens with the greatest feasible satisfaction of their preferences for public goods. Just as markets respond to consumers, so elections respond to citizens. Given favorable circumstances, the responsiveness of elections to citizens makes democracy the best form of government for satisfying preferences. Instead of *asking*, this paper *assumes* that democracy is the best

⁵ For example, see Tiebout, Charles. "A Pure Theory of Local Expenditures." *Journal of Political Economy* (1956): 416-24, and see Romano, Roberta. "The State Competition Debate in Corporate Law." *Cardozo Law Review* 8, no. No. 4 (1987): 709-757. I review these theories in Chapter 5 of *The Strategic Constitution* (Princeton, New Jersey: Princeton University Press, 1999 forthcoming).

form of government. Having assumed that some form of democracy is best, I ask how many elections are optimal.

Just as law constrains abuse by judges, so civil service rules limit corruption in state administration. The civil service is apparently the best form of administration to prevent corruption among officials. Instead of *asking*, this paper assumes that a civil service bureaucracy is better than politicized bureaucracy. Having made this assumption, I determine the optimal depth of bureaucracy.

Factor or Splice

I begin with an analysis of political instability. The conventional analysis of unstable democracy focuses upon the relationship between the legislature and the executive. The executive provides coherence through orders. Infighting in the legislature, however, can cause paralysis or chaos. Given these facts, increasing executive power at the expense of the legislature can increase stability. The gain in stability, however, creates a risk to democracy. The executive might suspend elections and rule by decree. In the conventional analysis, the executive provides stability and potentially endangers democracy, whereas the legislature provides democracy and potentially endangers stability.

Instead of the usual analysis, I view stability as depending on the number of governments. Under certain circumstances, single-purpose governments are more stable than comprehensive governments. In these circumstances, increasing the number of governments and narrowing their scope, or organizing single-issue referenda, increases stability. I will explain the circumstances under which increasing the number of elections increases political stability.

Broad jurisdiction *splices* independent issues together like the strands of a rope. By “splicing” I mean combining issues and deciding them all at once. For example, the U.S. Congress often enacts omnibus legislation with extensive log-rolling. To splice indirect democracy, citizens should elect representatives to assemblies with power over many different issues. In contrast, narrow jurisdiction *factors* politics into independent issues like a mathematician dividing a large number into prime numbers. By “factoring” I mean separating issues and deciding them one at a time. For example, citizens may elect a town council to

control the police and a school board to control schools. To factor indirect democracy, citizens should elect separate governments for separate issues. To factor direct democracy, citizens should decide each issue in a separate referendum. In Figure 1, factoring represents a move to the right along the horizontal axis, whereas splicing represents a move to the left.

Sometimes a constitution factors, as when the town's constitution establishes an elected council and a separately elected school board. Alternatively, a constitution may allow for factoring without requiring it. For example, the constitutions of the U.S. states prescribe procedures for establishing special governments for such activities as parks, transportation, and water. Citizens can establish or abolish special governments by following the prescribed procedures. Alternatively, the constitution may limit or forbid factoring, as when the constitution prevents a branch from delegating authority or a government from ceding authority.

I have discussed clear-cut cases of factoring, but unclear cases often occur. To illustrate by the European Union, the ministers forming the Council of Ministers differ on different issues. Thus the Council may consist of the national ministers of agriculture to decide a question about farm subsidies, whereas the Council may consist of the national ministers of transportation to decide a question about railroads. In reality, the national ministers of finance often dictate to other national ministers.

Transaction Costs of Bargaining

I will use a simple model of collective choice to analyze factoring and splicing in indirect and direct democracy. Civil servants rank from low to high, and administration proceeds by orders. In contrast, members of the town council hold the same rank and government often proceeds by bargains. *In general, superiors give orders and equals bargain.*

Instead of pure hierarchy or pure equality, government typically mixes orders and bargains. To illustrate, in some American cities the members of the town council bargain with each other in the shadow of the mayor. A strong mayor causes the town council to proceed relatively more by orders, whereas a

weak mayor causes the town council to proceed relatively more by bargains. Similarly, the oxymoron “first among equals” traditionally describes the relationship between the British Prime Minister and her cabinet. As suggested by this phrase, British cabinet ministers bargain with each other in the Prime Minister’s shadow.

As explained, reality mixes orders and bargains, but my analysis separates them for clarity’s sake. Assume that each government consists of elected officials who bargain with each other. Spliced government lowers the transaction costs of bargaining across issues. To illustrate, the advocates of strong police may want to cut a deal with the advocates of rich schools. If the town council controls police and schools, the council members can bargain and agree to implement strong police and rich schools. Conversely, factored government raises the transaction cost of bargaining across issues. To illustrate, if the town council controls police and the school board controls schools, the advocates of strong police may have difficulty cutting a deal with the advocates of rich schools.

I have explained that factoring raises, and splicing lowers, the transaction costs of bargaining across issues. Now I consider what determines whether citizens benefit more from low transaction costs or high transactions.

Complements

Reasoning by analogy with the private sector, proponents justify horizontal mergers in private firms based on “complementarities” that create “economies of scope”. To illustrate, automobiles and cucumbers are unrelated products. Manufacturers of automobiles and growers of cucumbers, however, may face comparable labor regulations. Consequently, merging the manufacturer of automobiles and the grower of cucumbers might save total costs of regulatory compliance.

Similarly, the citizens under the jurisdiction of a government might have complementary tastes in public goods. To illustrate, consider an example with two citizens A and B, and two public goods X and Y. If A intensely wants X and feels indifferent about Y, whereas B intensely wants Y and feels indifferent about

X, then A and B have complementary tastes for X and Y. A and B can cut a deal to help satisfy their most intense desires. B supports A's efforts to obtain X, and A supports B's efforts to obtain Y. To illustrate concretely, if a religious party in Israel intensely favors restricting activity on the Sabbath and remains indifferent about labor law, whereas a secular party intensely favors protecting unions and remains indifferent about restricting activity on the Sabbath, then these two parties can strike a deal for mutual gain.⁶

The scope of complements determines the potential gain from splicing governments. When different political factions have complementary tastes for public goods, splicing lowers the transaction costs for politicians to bargain and "roll logs." In these circumstances, splicing increases the surplus realized by political cooperation and thus satisfies the preferences of citizens more fully than otherwise.

Conflict

Citizens, however, may have non-complementary tastes. To illustrate, if A intensely likes X and B intensely dislikes X, then A and B have non-complementary tastes for X. The differences in preferences of A and B for X provide no basis for them to cut a deal. To illustrate concretely, if a religious party wants Israel to expand its territory at the risk of war, and a secular party wants to cede land in the hope of obtaining peace, then these preferences provide no basis for the two parties to strike a deal.

Given purely non-complementary preferences, politics becomes a game of pure conflict in which one player's win is another's loss. The divergence of interests in a game of conflict makes the players adversaries, not allies or rivals.

⁶ Since William Riker, *The Theory of Political Coalitions* (1962), the economic theory of political coalition formation focuses upon the "minimal winning set" or a similar idea. Another possibility is to focus on the most complementary coalition. The most complementary coalition maximizes the gains from trading votes. See Chapter 3 of Robert Cooter, *The Strategic Constitution* (Princeton, New Jersey: Princeton University Press, 1999 forthcoming).

To illustrate, consider an example of redistributing wealth by majority rule among self-interested people. By assumption, any majority has the power to redistribute from the minority to itself. If players are symmetrical, the contest for distribution destabilizes every possible coalition.

To see why, assume that three voters, denoted A, B, and C, must distribute \$100 among them by majority rule. Initially, someone proposes to divide the money equally: $(A,B,C)=(\$33,\$33,\$33)$. A's counter-proposal is to share the surplus equally with B and give nothing to C: $(A,B,C)=(\$50,\$50,\$0)$. A and B can implement A's counter-proposal under majority rule, and A's counter-proposal makes A and B better off than the initial proposal. A coalition is *blocked* if another coalition can implement a distribution that is Pareto superior for its members. So A's counter-proposal blocks the initial proposal. It is not hard to see that *any* proposal is blocked by another proposal. Thus A's proposal is blocked by B's counter-proposal to distribute the surplus $(A,B,C)=(\$0,\$75,\$25)$, and B's proposal is blocked by C's counter-proposal to distribute the surplus $(A,B,C)=(\$50,\$0,\$50)$.

By definition, the *core* of a game is the set of unblocked distributions. Since every proposal is blocked by an alternative, the game has an empty core. In general, majority rule games of distribution with symmetrical players have an empty core. Each player can make credible demands whose satisfaction is infeasible.⁷ Generalizing these results, Arrow proved that any democratic

⁷ Each member of a potential coalition may demand his marginal contribution to it as the price of joining. A member's marginal contribution to the coalition may be computed as the fall in the coalition's total value caused by the member quitting. Here I apply the *Shapely value* of a coalition member. See Duncan

constitution can result in cyclical voting.⁸ Voting cycles, especially provoked by a contest for redistribution, destabilize democracies, especially in developing countries.

Median Rule

Instead of cycling, many democracies produce stable government that pursues policies near the center of the political spectrum. The median rule explains why the center dominates the politics of many democracies. Under certain conditions, voting among paired alternatives along a single dimension of choice yields an equilibrium at the point most preferred by the median voter. The crucial condition for this result is that each voter has single-peaked preferences. With single-peaked preferences, a voter's satisfaction always increases when moving towards the voter's most preferred point along the single dimension of choice.⁹ With multiple-peaked preferences, a voter's satisfaction increases at some point when moving away from the voter's most preferred point.

To illustrate, consider possible attitudes towards expenditures on public schools. Conservatives who send their children to private school want to keep

Luce and Howard Raiffa, *Games and Decisions: Introduction and Critical Survey* (New York, London, Sydney: John Wiley & Sons, 1967) at page 249.) With *increasing returns to scale* (super-additivity), however, cooperation does not create enough value for each member to receive the marginal product of membership, so paying the marginal product of membership to everyone is *infeasible*. To illustrate concretely, consider a coalition formed by A and B that distributes the surplus equally between them: (A,B,C)=\$(50,\$50,\$0). If either member of the coalition were to leave it, the payoff to the coalition would fall from \$100 to \$0. By this logic, the marginal product of each of the two members of the coalition equals \$100, but the total product of the coalition also equals \$100. Consequently, paying \$100 to each member of the coalition is infeasible.

Infeasible demands may be *credible*. A threat by a member of a majority coalition is credible, according to one definition, if another coalition could satisfy the demand without worsening its own position. To illustrate by the preceding example, consider the coalition formed by A and B that distributes the surplus equally between them: (A,B,C)=\$(50,\$50,\$0). If B were to withdraw from the coalition, the coalition's payoff would fall from \$100 to \$0. Noting this fact, assume that B demands a payoff of \$75 to remain in the coalition. The threat is credible because B could leave the coalition and form a new coalition with C, distributing the surplus (A,B,C)=\$(0,\$75,\$25), which makes B and C better off. A, however, can also make the same demand as B. So A and B can each make a credible demand for \$75. Both demands cannot be satisfied, because there is only \$100 to distribute. So each demand is credible and both demands are infeasible.

⁸Kenneth J. Arrow, *Social Choice and Individual Values*, 2nd; (1951, 1st edition) ed. (1963).

⁹I review these results in Chapter 2 of *The Strategic Constitution* (Princeton, New Jersey: Princeton University Press, 1999 forthcoming).

expenditures low on public schools. Liberals who send their children to public school want to keep expenditures high on public schools. The satisfaction of conservative or liberal voters always increases when moving towards the voter's most preferred level expenditure, so their preferences are single-peaked. A third group of voters -- call them YUPPIES -- have more complicated preferences. They would most prefer a high level of expenditure, in which case they will send their children to public school, but, if the level is not high, they would prefer it to be low so they send their children to private school and save on taxes. The worst alternative for the YUPPIES is a moderate level of expenditure on public schools. Consequently, the YUPPIES have preferences with two peaks.

I have explained that the median rule applies to single-peaked preferences and not to multiple-peaked preferences. Another problem of majority rule concerns the intensity of sentiment. Democracy gives equal weight to all votes, regardless of how strongly the voter feels about the issues. From an efficiency perspective, however, more weight should be given to intensive preferences. To illustrate, assume that the chairman of a three-person committee asks each one to write his or her vote on a slip of paper concerning a certain proposal. When the slips of paper are collected, the chairman reports, "I have two slips marked 'Yes' and one marked 'No, No, oh please, please No!'" The unresponsiveness of majority rule to the intensity of feeling about issues causes its inefficiency.

Being unresponsive to intensities, the median rule is not generally efficient by the cost-benefit standard. Under a special assumption, however, the median rule is cost-benefit efficient. Majority rule counts voters, whereas cost-benefit analysis adds individual values. Counting voters gives the same result as adding individual values under the assumption of "strong symmetry." Under strong symmetry, each non-median voter who gains from a change away the median can be matched with at least one voter who loses, and the loser loses no less than the winner wins.¹⁰ The requirement of symmetrical effects can be

¹⁰ In notation, let x_m^* denote the point most preferred by the median voter. Consider any alternative x^* . Let J denote the set of individuals who (strongly) prefer x_m^* to x^* , and let

expressed in terms of the intensity of preferences. When the distribution of political sentiment is strongly symmetrical, the intensity of right-wing feeling and the intensity of left-wing feeling offset each other. To illustrate strong symmetry, consider a move from the median to the right. Strong symmetry implies that for each right-wing voter who gains, there must exist a left-wing voter who loses just as much.

Strong symmetry is rare in fact, but approximate symmetry is not so rare. To see why, consider the relationship between the total benefits and the mean benefits. By definition, the total benefits equal the mean benefits multiplied by the number of voters. Consequently, for a given number of voters, maximizing total benefits for all voters is equivalent to maximizing mean benefits.¹¹ In asymmetrical distributions, the mean and the median are different. In symmetrical distributions, such as the normal distribution, the mean and the median are identical. As the distribution of the voters' utilities most preferred points becomes more symmetrical, the median approaches the mean. As the median approaches the mean, the voter equilibrium tends to become cost-benefit efficient. (Additional conditions are necessary to assure this result.¹²)

If factoring results in asymmetrical distributions of preferences, then the median rule results in inefficient outcomes. Splicing, however, enables the factions to bargain across issues and express their intensity of sentiment by trading votes. Asymmetrical distributions of preferences thus create complementarities and economies of scope that splicing potentially exploits.

K denote the set of individuals who (weakly) prefer x^* to x_m^* . By strong symmetry, for each k in K there exists a j in J such that $u_j(x_m^*) - u_j(x^*) \geq u_k(x^*) - u_k(x_m^*)$. This fact implies

$$\sum_{i \in J \cup K} u_i(x_m^*) \geq \sum_{i \in J \cup K} u_i(x^*).$$

¹¹Here I use the proposition that, if continuously differentiable concave function $f(x)$ achieves its maximum at a value x^* , then the function $k \cdot f(x)$, where k is a constant, also achieves its maximum at the same point x^* .

¹²The "distribution" in this paragraph refers to the most preferred points of the voters. "Strong symmetry" concerns the utility functions of each individual. The "additional conditions" concern the relationship between utilities and most preferred points. Specifically, the representation of utilities must reduce to the representation of most preferred points.

City Council and School Board

I have explained that splicing lowers the transaction cost of bargaining across issues, and successful bargaining across issues can increase the satisfaction of voters with complementary tastes. Splicing also increases the risk of failed bargains and circular votes. When spliced voting causes intransitivity, factored voting may improve the outcome by allowing the median voter to prevail on separate dimensions of choice. Median rule on separate dimensions of choice often satisfies the preferences of voters more efficiently than an unstable contest of distribution. Intransitive preferences in multi-dimensional choice may factor into single-peaked preferences on each single dimension of choice. In general, single-purpose government is like a safe stock with a modest yield, whereas multi-purpose government is like a risky stock that pays a lot or nothing.

To develop these points, I turn to a quantitative example. Assume that expenditure on police and schools are the two major political issues in a small town. First consider splicing the issues. A town council that decides both issues provides a forum for bargaining. If bargaining succeeds, council members who care intensely about police may trade votes with council members who care intensely about schools, so that each one gets what it wants most. If bargaining fails, the council members may waste resources in an unstable contest of distribution. Second consider factoring the issues. A town council that controls police and a separately elected school board that controls schools denies a forum for bargaining over the two issues. With bargaining obstructed and assuming single-peaked preferences, the median voter prevails on each dimension of choice.

Figure 2 sharpens the example with numbers. Assume that voters in a town are divided into equal numbers of liberals, conservatives, and moderates. Expenditure can be high or low for schools and police, with the resulting net benefits for each group of voters indicated in Figure 2.¹³ The liberals intensely

¹³I implicitly assume additively separable utility functions for each group, so any group's total utility equals the sum of its utility on each of the two issues.

prefer high expenditures on schools and mildly prefer the savings in taxes from low expenditures on police. The opposite is true of conservatives, who intensely prefer high expenditures on polices and mildly prefer the savings in taxes from low expenditures on schools. The moderates mildly prefer the tax savings from low expenditures on police and schools. The row labeled “total” indicates the sum of net benefits to the three groups.

Figure 2: Voters’ Net Benefits

	<u>school expenditures</u>		<u>police expenditures</u>	
	<u>low</u>	<u>high</u>	<u>low</u>	<u>high</u>
liberal	0	11	1	0
conservative	1	0	0	11
moderate	2	0	3	0
total	3	11	4	11

Assuming majority rule, contrast the consequences of splicing and factoring issues in Figure 2. If the issues are factored, then 2 out of 3 voters (conservatives and moderates) vote for low expenditures on schools, so factoring results in low expenditures on schools. Furthermore, 2 out of 3 voters (liberals and moderates) also vote for low expenditures on police, so factoring results in low expenditures on police. Thus factoring results in low expenditures on schools and police.

If issues are spliced, the voters must choose among 4 combinations of public goods depicted in the columns of Figure 3. The net benefits to voters depicted in Figure 3 are calculated from the numbers in Figure 2. For example, (low,high) indicates low expenditure on schools and high expenditure on police,

which results in a payoff of 0 for liberals, 12 for conservatives, and 2 for moderates.

Figure 3: Voter Net Benefits from Combinations of Public Goods
Expenditures on Schools and Police, Respectively

	<u>(1)</u>	<u>(2)</u>	<u>(3)</u>	<u>(4)</u>
	<u>(high,high)</u>	<u>(low,low)</u>	<u>(high,low)</u>	<u>(low,high)</u>
<u>liberal</u>	<u>11</u>	<u>1</u>	<u>12</u>	<u>0</u>
<u>conservative</u>	<u>11</u>	<u>1</u>	<u>0</u>	<u>12</u>
<u>moderate</u>	<u>0</u>	<u>5</u>	<u>3</u>	<u>2</u>
<u>total</u>	<u>22</u>	<u>7</u>	<u>15</u>	<u>14</u>

The numbers in Figure 3 can be used to deduce the winner in a vote between any two alternatives. If voters simply vote their preferences in Figure 3, without bargaining or trading, then an intransitive cycle results. Specifically, 2 of 3 voters (liberal and conservative) prefer (law,high) rather than (low,low). 2 of 3 voters (conservative and moderate) prefer (high,low) rather than (high,low). 2 of 3 voters (liberal and moderate) prefer (high,low) rather than (low,high). And, finally, 2 of 3 voters (conservative and moderate) prefer (low,high) rather than (high,high). As explained, column (1) beats (2), (2) beats (3), (3) beats (4), and (4) beats (1). Thus voting in Figure 3 results in an intransitive cycle.

Figure 2 and Figure 3 illustrate the general principle that splicing dimensions of choice can cause intransitivity where none exists on any single dimension of choice. Instead of simply voting their preferences, however, splicing may cause the voters to bargain with each other and cooperate. Since liberals care more about schools than police, whereas conservatives care more about police than schools, they have complementary tastes and they could

profitably trade votes. A platform calling for high expenditure on schools and police allows the liberals and conservatives to get what they want on the issue that each one cares the most about, as required for efficiency.¹⁴ Stabilizing such an agreement requires the parties to abandon the majority rule game of distribution, which has no core,¹⁵ and cooperate with each other.

Whether comprehensive government or single-purpose governments satisfy the preferences of political factions better depends upon the ability of politicians to cooperate. In general, splicing increases the gains from cooperation and factoring issues decreases the losses from conflict. Finding the optimal number of governments requires balancing these considerations. These facts suggest the prescription, “Splice when cooperation is likely and factor when conflict is likely.”

Factoring by Referenda, Splicing by Legislation

Most constitutions that permit referenda restrict them to a yes-or-no vote on a single issue.¹⁶ To illustrate, Californians might be asked to vote “yes or no” on restricting abortions and “yes or no” on capital punishment, but the law precludes Californians from being asked to vote “yes or no” on restricting-abortion-and-restricting-capital-punishment. A practical reason compels restricting each ballot initiative to a single issue. Logrolling, which combines

¹⁴ Cost-benefit efficiency requires choosing the level of expenditures that maximizes the sum of net benefits, which occurs with high expenditures on schools and high expenditures on police.

¹⁵ Since the voters’ preferences form an intransitive cycle, any coalition formed simply by trading votes in **Figure 3** is dominated by another coalition (empty core). For example, a liberal-conservative coalition to obtain (high,high) is dominated by a liberal-moderate coalition to obtain (high,low); a liberal-moderate coalition to obtain (high,low) is dominated by a conservative-moderate coalition to obtain (low,low); and so on. Thus the liberal-conservative coalition might not prove stable. To guarantee its stability, the parties

issues in a single vote, requires bargaining. Bargaining among different groups requires representation. Ballot initiatives bypass elected representatives. Thus a multiple-purpose ballot initiative invites bargaining without any framework for it.

In legislatures the members often bargain, compromise, and draft a single bill that combines different issues. In contrast, rules restricting ballot initiatives to a single issue prevents logrolling, so different groups have little incentive to bargain or vote strategically. When citizens vote their preferences on a single dimension of choice, the median usually prevails. In general, direct democracy factors the issues, so the median voter should prevail. In contrast, members of legislatures bargain, compromise, and roll logs. In general, indirect democracy splices issues, which should result in bargains or cycles.

The contrast between splicing and factoring predicts some consequences of a shift from indirect to direct democracy. A change from indirect to direct democracy often replaces cycles or bargains among representatives with the preference of the median voter on each dimension of choice. Is this change better or worse? That depends on how well indirect democracy works. Given informed voters and competitive elections, indirect democracy produces effective representation of political interests. If representatives bargain successfully and cooperate with each other, then citizens get their way on their preferred issues. In these circumstances, indirect democracy satisfies the preferences of voters better than direct democracy.

would need the ability to make side-payments. With side-payments, the liberal-conservative coalition dominates other possible coalitions, and no possible coalition dominates the liberal-conservative coalition.

¹⁶ See California Constitution, art. II sec. 8(d)).

Indirect democracy, however, can create a political cartel whose members conspire to blunt electoral competition. For example, the spectacular disclosure of corruption among leading Italian politicians in the 1990s suggests that citizens had little influence over deals struck by their representatives. An opaque political process and proportional representation made Italian electoral competition relatively ineffective. In these circumstances, a change to direct democracy can break the political cartel.

In addition, indirect democracy can cause an unstable contest of redistribution among interest groups. Changing to direct democracy can increase stability, which should increase the satisfaction of citizens with politics.

I have explained that direct democracy causes the median voter to prevail on each dimension of choice, which is better than a cycle or a political cartel, and worse than perfect bargaining by elected representatives. This proposition summarizes the main difference in theory between direct and indirect democracy. Besides this large difference, some small differences are sometimes important.

First, direct democracy gives more weight to those citizens who actually vote, whereas indirect democracy gives more weight to the number of citizens living in a district. To illustrate, assume that poor people, who vote at relatively low rates, live in poor districts. Indirect democracy apportions representatives by population, so the number of representatives from poor districts reflects the number of poor citizens, including those who do not vote. In contrast, direct democracy responds to the citizens who actually vote. Thus, in the preceding example where rich people vote at higher rates than poor people, direct

democracy gives more weight to the opinions of rich people. This phenomenon may tilt California ballot initiatives in favor of older, conservative, white citizens.

Second, critics of direct democracy allege that the majority of citizens will vote to redistribute wealth from the few to the many. For example, if most citizens buy auto insurance, they will vote to cap its price. Or if most citizens rent houses, they will vote for rent control. More generally, critics of direct democracy allege that the majority of citizens will vote to undermine the rights of the minority.

This criticism, however, has a weak foundation in theory. From the viewpoint of theory, direct democracy factors voting, which does not necessarily harm minorities more than spliced voting. Spliced voting encourages citizens to coalesce into blocks in order to bargain with each other. A system of proportional representation can guarantee representation in political bargaining to every minority group. Two-party competition, however, contains no such guarantees. When groups coalesce, some minorities may suffer permanent exclusion from the ruling coalition.

In contrast, after factoring the issues, the minority on one dimension of choice is seldom the same group of people as the minority on another dimension of choice. Any single person with complicated political views wins on some dimensions of choice and loses on others. In general, factoring issues can dissolve large blocks of citizens and insure that everyone wins some of the time. In addition, all the non-median voters participate in determining the median voter. Thus everyone's preferences has an effect on the voter equilibrium.

Any democratic system of politics, whether direct or indirect, requires protection of minorities, such as ethnic groups and wealthy people. Forms of protection include bicameralism and constitutional rights.¹⁷ Thus the Bill of Rights in the U.S. constitution constrains the states, so a federal judge would nullify a California referendum that violates the U.S. Bill of Rights. This fact imposes an essential constraint on California's referenda. Furthermore, on many political issues, the bicameral U.S. Congress can pre-empt states by enacting federal legislation.

Besides the legal obstacles, transaction costs currently limit the frequency of referenda. Specifically, electoral rules usually require the costly gathering of signatures to create a ballot initiative, thus limiting the number of referenda placed upon the ballot. In the future, however, technological developments such as collection of signatures over the Internet and electronic voting could dramatically lower the transactions cost of direct democracy. With lower costs, the pace of referenda will accelerate, thus forcing citizens to vote on a barrage of hopeless proposals and to decide close votes over and over again.

Is there a better means to ration referenda? Bonding offers an attractive alternative. According to this approach, supporters could place a proposition on the ballot by posting money bond with the electoral commission. If the proposition performed well in the election, the bond would be returned. Conversely, if the proposition performed poorly in the election, the bond would be forfeited to the state. For example, in lieu of 100,000 signatures, supporters of

¹⁷ Saul Levmore, "Bicameralism: When Are Two Decisions Better Than One?"

an initiative might post \$100,000, which they would forfeit unless the initiative won, say, at least 45% of the votes.

Compared to collecting signatures, bonding reduces the transaction costs of direct democracy. Compared to cheap collection of signatures by Internet, bonding discourages frivolous or previously defeated initiatives. By bonding ballot initiatives, constitutional law could reduce the velocity of direct democracy without stopping it or imposing unnecessary costs. Note that some countries, notably New Zealand and the United Kingdom, already require candidates for Parliament to post bond that they forfeit for poor performance in elections. Also note that a market for bonds would allow poor groups to mount an initiative for a popular issue.¹⁸

Optimal Breadth of Government

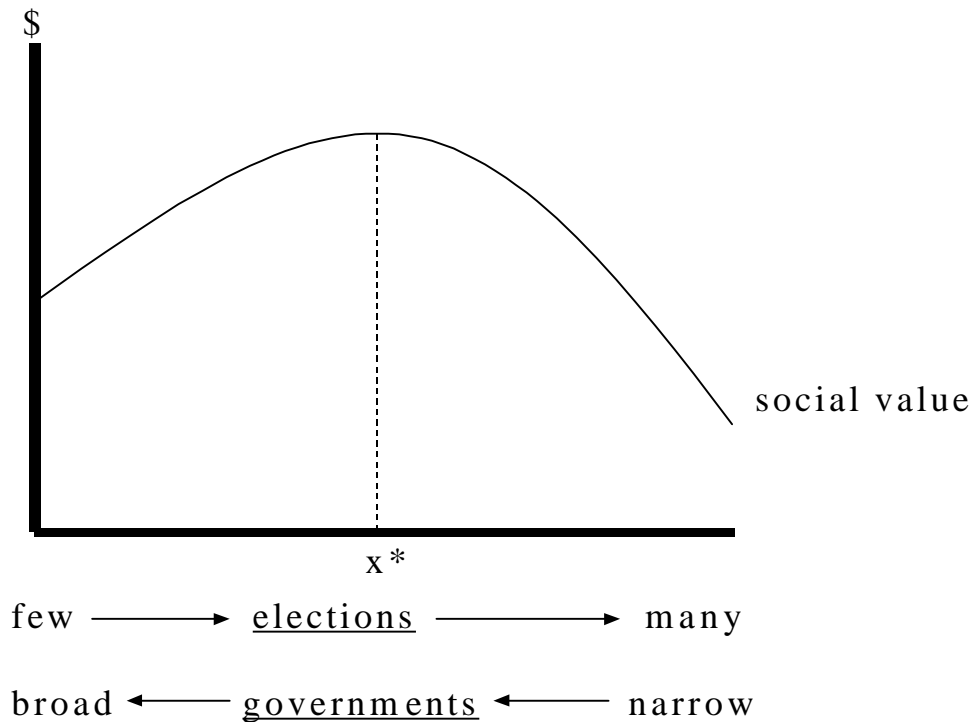
Citizens need an elected legislature so their representatives can bargain together. I have explained that increasing the breadth of government creates economies of scope by allowing vote-trading among people with complementary tastes. I also explained that broad government can cycle or engage in redistributive contests. In these circumstances, citizens benefit from narrower government, which substitutes the median rule for bargains. Figure 4 depicts social value as increasing and then decreasing as the breadth of government increases. Unstable democracies are presumably to the left of the optimum x^* . To increase stability, these democracies should factor political issues. Beyond x^* , too many elections causes the loss of too much surplus. At the optimum x^* ,

International Review of Law and Economics 12:145-162 (1992).

¹⁸ Also note that people accused of crimes in the U.S. must post bail to escape jail while awaiting trial. The person who appears for trial recovers the bail, whereas the person who fails to appear for trial forfeits the bail. In reality, most people borrow money for bail from a professional bail-bondsman, who charges a rate based upon his assessment of the risk. Similarly, with ballot initiatives a market should develop allowing supporters to borrow the bond. Lenders would charge low rates for promising ballot initiatives that carry low risk, and lenders would charge high rates for unpromising initiatives that carry high risk.

the gain from more stability exactly offsets the loss from foregone surplus as the number of elections increases.

Figure 4: Optimal Breadth of Government



Deepen or Devolve

Now I turn from the problem of stability to the problem of corrupt administration. The usual analysis of corrupt administration focuses upon the depth of political appointments in the state bureaucracy. Political appointees escape the rules imposed on civil servants to constrain corruption. As political appointments go deeper, more officials take more bribes. Consequently, increasing civil service appointments at the expense of political appointments can reduce corruption in administration.

Instead of the usual analysis, I view corruption as depending on the number of governments. Under certain circumstances, reducing the height of the bureaucracy reduces corruption. I will explain the circumstances under which increasing the number of elections along the vertical dimension decreases political corruption.

I begin by summarizing the arguments that I will develop in detail. Centralized government deepens hierarchy by requiring administration to reach down to localities. As the chain of command lengthens, officials can divert more resources away from their intended purposes. Deep hierarchy, consequently, promotes corruption. To reduce the diversion of resources, officials at the top impose rigid rules on administrators. Rigid rules impose increasing costs as the pace of social and economic change accelerates. As power devolves, however, the number of elections increases. Too many elections drain the reservoir of civic spirit that animates voters. Consequently, the quality of participation declines. The optimal number of elections balances the decline in the quality of participation against less diversion and more flexibility obtained by more elections. Now I will demonstrate these facts more formally.

Rule game

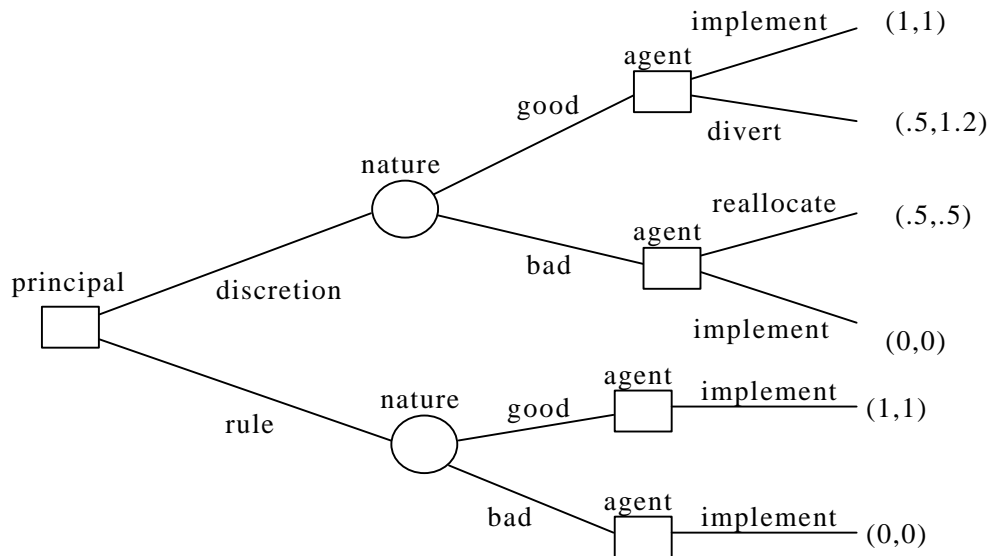
I begin by depicting a simple agency game of administration to show how deeper hierarchy causes more resource diversion and less flexibility. After delegating responsibility to an agent, should the principal give the agent discretion or require the agent to follow a rule? Principals impose rules on agents for a variety of reasons, such as reducing transaction costs, improving coordination, increasing predictability, reducing disparity, and facilitating transparency. Instead of discussing many reasons, I will reduce the problem of imposing rules to its simplest elements and analyze one fundamental tradeoff. Imposing rules on agents reduces their opportunities to divert resources, whereas giving discretion to agents allows them to respond flexibly to changing circumstances. Diversion of resources is the cost of flexibility in an organization.

I will formulate the rule game in order to analyze the tradeoff between diversion and flexibility. In the rule game, nature chooses a state and then the

agent acts. Knowing nature's state, the agent who enjoys discretionary power can respond flexibly to events as they develop. The principal wants the agent to reallocate resources when unexpected events occur, and the principal does not want the agent to divert resources when events occur as expected. Discretion gives the agent control over the decision, whereas a rule requires the agent to implement the principal's plan in all circumstances. The principal must decide whether to give the agent discretion or impose a rule.

Figure 5 depicts the rule game concretely as a tree. First, the principal decides whether to give the agent discretion or impose a rule. Second, nature chooses a good or bad state. Third, if the agent has discretion, the agent decides whether to follow the principal's plan or divert resources. Alternatively, if the principal imposes a rule, the agent must follow the rule regardless of the state of nature.

Figure 5: Rule game



The payoffs from different paths in the game tree appear in parenthesis at the right side of Figure 5, with the principal's payoff written first and the agent's payoff written second. Relative payoffs illustrate important facts, whereas absolute payoffs signify nothing. The principal's plan is designed for a good state. If a good state materializes, the payoff to the principal is higher when the agent implements the principal's plan (1), rather than diverting resources to an alternative project (.5). If a bad state materializes, however, the payoff to the principal is higher when the agent reallocates some resources to the alternative project (.5), instead of implementing the principal's plan (0). So a loyal agent with discretion implements the principal's plan in a good state and reallocates resources to an alternative project in a bad state.

The agent's interests do not coincide perfectly with the principal's. In a good state, the agent's payoff is higher when he diverts resources to his preferred project (1.2), rather than implementing the principal's plan (1). In a bad state, the agent's payoff is also higher when he reallocates resources to his preferred project (.5), rather than implementing the principal's plan (0). The

agent's dominant strategy is to divert resources, which serves the principal in a good state and disservices the principal in a bad state.

Now I turn from what the actors do to what they know. As in the delegation game, the rule game assumes that the principal who delegates a task to the agent knows the entire payoff matrix and observes his own payoff, but he does not observe the state of nature or the agent's act. Figure 6 summarizes what the principal can infer from what he observes. When his payoff equals 1, the principal can infer from Figure 6 both the state of nature (good) and the agent's act (implement). Similarly, when his payoff equals 0, the principal can infer from Figure 6 the state of nature (bad) and the agent's act (divert). When his payoff equals .5, however, the principal cannot infer whether the agent's reallocation was loyal (bad state) or disloyal (good state).

Figure 6: Principal's Payoff From Giving Discretion to Agent

		Agent	
		implement	reallocate
Nature	good (lucky)	1.0 (reveal)	.5 (hide)
	bad (unlucky)	0 (reveal)	.5 (hide)

Solution

The rule game's solution is a pair of strategies that maximize each player's expected payoff, given the strategy of the other player. To solve the game recursively, assume that the principal gives discretion to the agent. The last decision in time is the agent's choice between implementing the principal's policy or reallocating resources. As depicted in Figure 6, the agent's payoff from reallocating exceeds his payoff from implementing, regardless of the state of nature, so the agent has a dominant strategy.¹⁹ Knowing this, the principal computes his best strategy by assuming that the agent will use discretion to

¹⁹ The following table summarizes the agent's payoffs.

Agent's Payoffs Assuming Principle Give Discretion to Agent

		Agent's Act	
		implement	reallocating
State of Nature	good	1	1.2
	bad	0	.5

reallocate resources. As depicted in Figure 5, imposing a rule on the agent yields a higher payoff to the principal in a good state, whereas giving discretion to the agent yields a higher payoff to the principal in a bad state. In this example, the rational principal imposes a rule when the probability of a good state p exceeds $1/2$, and, otherwise, the rational principal gives the agent discretion.²⁰

The game's solution can be summarized as follows:

$p \geq .5 \quad \Rightarrow \quad$ principal imposes rule, agent implements
 $p < .5 \quad \Rightarrow \quad$ principal gives agent discretion, agent diverts.

I mention in passing several more special assumptions in my formulation of the rule game. First, my "solution" solves the problem of delegating power for a given contract between the principal and agent. Computing the optimal contract for the principal and agent requires another formulation of the problem.²¹ Second, I computed the game's solution when rationally self-interested actors play it once. In reality, the actors may repeat the game, which gives the agent more reason to cooperate. Third, I implicitly assumed that the principal cannot invest in monitoring the agent. In reality, monitoring increases the risk of punishment, which deters diversion by agents. Finally, I assume that agents are self-interested, whereas some agents may remain loyal due to moral commitment.

Graph

Figure 7 graphs the tradeoff between diversion and flexibility characterized by the rule game. The horizontal axis in Figure 7 represents constraint of the

²⁰ If p denotes the probability that the state of nature is good, imposing a rule and giving discretion to the agent yield the same expected payoff to the principal when p solves the following equation:

$$\underset{\text{rule}}{1p + 0(1-p)} = \underset{\text{discretion}}{.5p + .5(1-p)}.$$

Solving this equation yields $p=.5$, which is the tipping point.

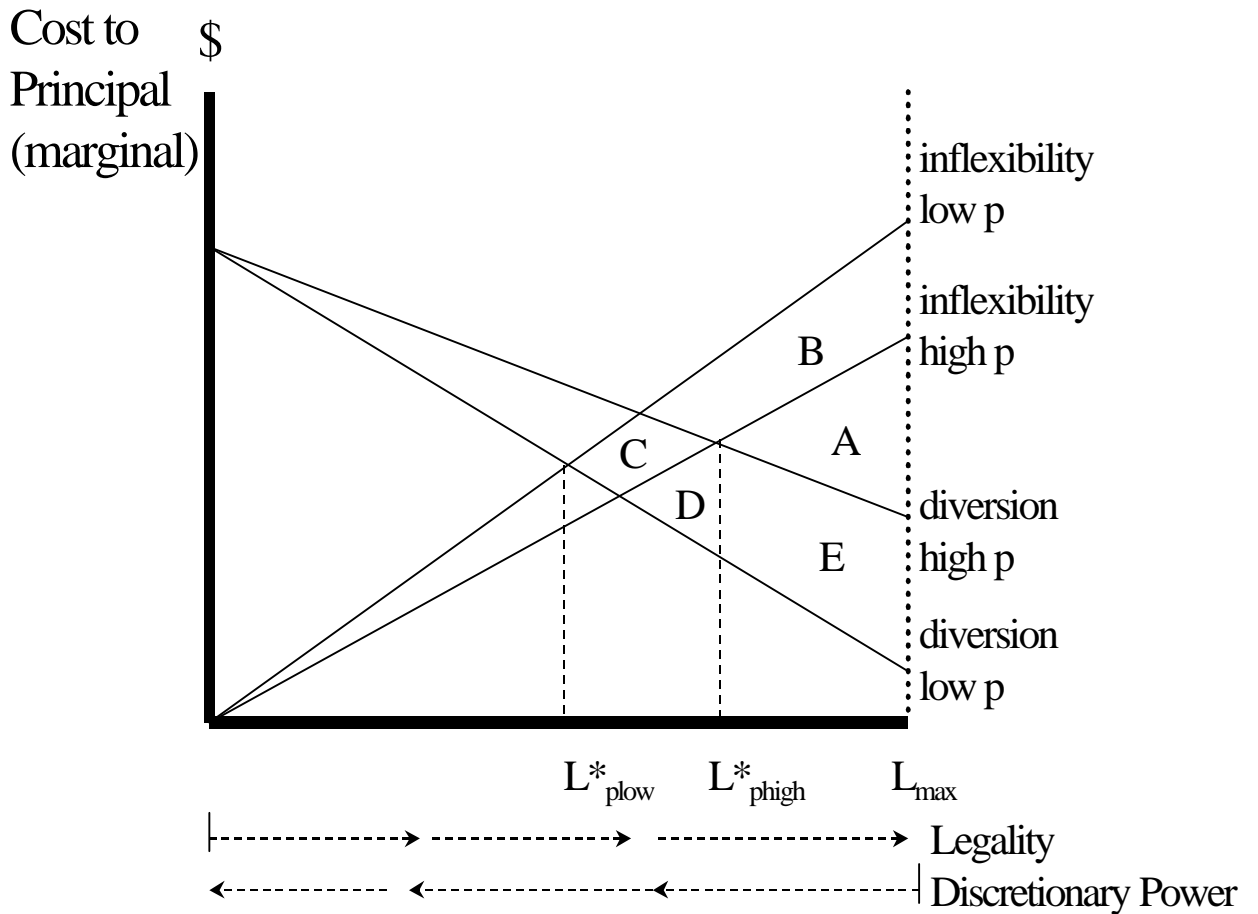
²¹ In a general game of contracting, the parties could adjust the payoffs by making side payments, which could improve their incentives. To illustrate, if $p < .5$, instead of retaining the contract resulting in the payoffs in Figure 5, the principal and agent both prefer a contract in which the principal promises to pay the agent a bonus of $.3$ conditional on the agent receiving a payoff of 1 . This contract, like any optimal contract, induces the agent to maximize the joint payoffs.

agent by rules, which increases when moving to the right. The rule of law implies that officials follow rules, rather than exercising discretion. Consequently, the horizontal axis in Figure 7 characterizes more constraint by rules as an increase in “legality”. Conversely, the horizontal axis in Figure 7 represents the agent’s discretionary power, which increases when moving to the left. In Figure 7 legality and discretionary power are polar opposites.

The vertical axis Figure 7 depicts the principal’s marginal costs. Moving from left to right, the principal imposes more rules and allows less discretion to the agent, so diversion costs typically decrease and inflexibility costs typically increase at the margin.²² The intersection of the marginal cost curves in Figure 7 corresponds to the level of legality that minimizes the principal’s total costs.

²² *Marginal* diversion costs typically decrease, and marginal inflexibility costs typically increase, because the principal typically imposes rules first on those activities where diversions costs most and inflexibility costs least.

Figure 7: Flexibility-Diversion Tradeoff



The costs of inflexibility and diversion depend upon the environment's predictability. Good luck reduces the cost of inflexibility, so an increase in the probably p of a good state causes the "inflexibility curve" to shift down in Figure 7. Conversely, good luck increases the diversion of resources by agents, so an increase in p causes the "diversion" curve to shift up in Figure 7. Combining these effects, an increase in the probability of good luck from p_{low} to p_{high} causes the principal's preferred level of legality to shift up from L^*_{plow} to L^*_{phigh} in Figure 7.

In general, predictability makes rules more attractive to principals, whereas unpredictability makes discretionary power more necessary.

Examples

To illustrate the rule game, assume that the minister of health constructs a plan to maximize the number of kidney transplants. Implementation of the plan requires the work of an administrator and cooperation from the nurses. If the nurses cooperate, the minister's payoff (1) comes from the administrator implementing the plan. If the nurses resist, however, the minister's highest payoff is higher when, instead of implementing the plan (0), the administrator reallocates some funds to another program (.5). The minister must decide whether to impose rules that enforce the plan or give the administrator discretionary power.

The minister cannot observe the behavior of the nurses or the administrator. A high payoff (1) enables the minister to infer that the administrator implemented the plan and the nurses assisted, and a low payoff (0) enables the minister to infer that the administrator implemented the plan and the nurses resisted. In contrast, with an intermediate payoff (.5), the minister cannot infer whether the administrator reallocated funds in response to the nurses' resistance or diverted funds even though the nurses cooperated. If the nurses are more likely to cooperate than resist, the minister's payoff is higher from imposing the rule. Conversely, if the nurses are more likely to resist than cooperate, the minister's payoff is higher from giving discretion to the administrator.

A second example concerns procurement by the state. In many state universities a professor who wants to purchase a computer has to follow prescribed procedures that constrain the choice of sellers and the terms of the contract. Procurement rules typically reduce purchaser's discretion in order to avoid kickbacks or bribes.

A third example concerns challenges to the legality of actions by state agencies. Assume the court interprets a statute and imposes a rule on a state agency. Individuals harmed by departures from the rule have the right to sue the agency, thus alerting the court concerning the agency's misbehavior. To illustrate concretely, federal courts interpreted the US constitution as requiring

the police to recite a list of procedural rights when charging a person with a crime (“Miranda warnings”). If police obtain evidence about a crime by failing to recite these procedural rights, the courts exclude the illegally obtained evidence from trial. Like all rules, the procedures do not fit every case. Even so, the courts apparently prefer to prescribe the rules for all cases rather than giving discretion to the police.

Significance of Rule Game

Having developed the model of rules, I next consider its significance. The constitution or other fundamental laws sometimes requires officials to make rules and follow them. The rule game predicts some consequences of the constraints of legality. Requiring more legality than the principal prefers imposes costs upon him. Specifically, the principal loses to the extent that the cost of agent's inflexibility exceeds the reduction in diversion costs. The magnitude of the principal's loss depends upon the environment's predictability. The harm is greater when the environment becomes less predictable and bad luck becomes more probable.

Figure 7 illustrates these facts. To be concrete, assume the probability of good luck equals p_{low} , so the principal prefers $L^*_{p_{low}}$. Now assume that the principal is forced to increase legality to L_{max} . The resulting loss to the principal equals the amount by which the cost of inflexibility exceeds the marginal cost of diversion in the interval $[L^*_{p_{low}}, L_{max}]$, as indicated by the area $A+B+C+D+E$ in Figure 7. If the probability of a good state rises from p_{low} to p_{high} in Figure 7, the principal's loss from a requirement of maximum legality L_{max} shrinks from the area $ABCDE$ to the area A .

Politics, Civil Service, and Courts

In many state bureaucracies, politicians occupy the top offices and civil servants occupy the subordinate offices. To illustrate, the U.S. President appoints the head of most agencies, each head chooses a personal staff, and the civil service fills most jobs below the head's personal staff. Alternatively, political appointment can go deep into administration. In a patronage system, the

winners in the game of politics distribute state jobs to loyal followers as the spoils of victory. To illustrate, patronage operates deep in administration in the City of Chicago and many developing countries.

Administration by civil servants suffers from inflexibility, whereas administration by political appointees suffers from corruption. The best system apparently provides for political appointment at the top level in the bureaucracy and civil service control below the top. The rule game can explain why patronage produces more efficient government at high levels of administration, and civil service rules produce more efficient government at low levels of administration.

Think of the state as a chain of relationships in which each official is an agent relative to those above him. In the typical state bureaucracy, civil servants are agents relative to the political appointees heading the organization, political appointees heading the organization are agents relative to elected officials, and elected officials are agents relative to the citizens who vote. In each of the chain's links, a combination of discretion and legality orders the relationship with the agent. Now I explain why efficiency requires discretion to dominate legality at the top of the chain, and efficiency requires legality to dominate discretion at the bottom of the chain.

The closer to the top of the chain, the more citizens know about officials. To illustrate by U.S. foreign affairs, the communications media scrutinize the President, monitor the Secretary of State, occasionally notice an ambassador, and mostly ignore civil servants in the State Department. When the principal has more information, the agent has less scope for undetected diversion of resources. In terms of Figure 7, more information for the principal causes diversion costs to rise more slowly as the agent receives more discretion.

Voters have relatively good information about top officials, the environment of high politics is also unpredictable. In Figure 7, low predictability increases the costs of inflexibility. To illustrate, unpredictable diplomatic crises require a flexible response by the Secretary of State.

Extensive monitoring and an unpredictable environment tip the balance in favor of giving broad discretion to officials at the top of agencies. Broad discretion

requires politics, not the civil service. Rather than imposing rules, voters communicate goals to top officials. So efficient administration in a democracy requires political control over top officials in state agencies.

Conversely, the public cannot scrutinize lower levels of administration. Consequently, the public holds top officials responsible for any diversion of resources detected in the lower levels of administration. To discharge their responsibility, high officials impose rules to reduce diversion by low officials. In terms of Figure 7, less information for the principal causes diversion costs to rise more quickly as the agent receives more discretion. Rules constrain such abuses. So efficiency in a democracy requires civil service rules to control employment at less visible levels of administration. (High officials also have other reasons to make rules for a complex bureaucracy.²³)

The problem of monitoring also arises in a judicial hierarchy. When faced with disputes, courts sometimes can choose between deciding each case on its own merits or developing general rules that apply to all cases. Case-by-case adjudication retains flexibility for lower courts and permits them to diverge from the preferences of higher courts. In contrast, rules reduce flexibility in lower courts and compel lower courts to conform more to the preferences of higher courts.²⁴

My discussion of politics, administration, and courts suggests three vague boundaries that demarcate significant changes in discretionary power. First, officials enjoy *strong* discretion when law leaves them free to pursue political goals. To illustrate, legislators have strong discretion in proposing legislation, and the executive has strong discretion when selecting the cabinet. Second,

²³As the state bureaucracy grows, regulatory agencies pose obstacles to citizens, who turn to elected officials for help. Providing help requires knowledge that increases by interacting with the state bureaucracy over many years. See Morris P. Fiorina, *Congress: Keystone of the Washington Establishment* (New Haven: Yale University Press, 1977). In doing such “casework” for constituents, the incumbent in the legislature has the advantage of experience over a challenger. Following the principle, “The best guide to a maze is its architect,” legislators have an incentive to create a bureaucratic maze so that voters reject challengers and rely upon incumbents as guides. Thus incumbent politicians sometimes seek an electoral advantage by increasing the complexity of administration faced by citizens and retaining control over it.

²⁴In common law systems, trial courts decide facts and appeals courts decide law. In these systems, case-by-case adjudication allows lower courts to control more outcomes by making them turn on facts. Conversely, general rules allow higher courts to control more outcomes by making them turn on law.

officials enjoy *weak* discretion when the law prescribes goals and leaves officials free to choose the means. To illustrate, a civil engineer in the ministry of roads can decide how to build a road required by an executive order, and the ministry of education can design a program to improve literacy as prescribed by legislation. Third, *pure legality* leaves officials without any discretion, which results in mechanical decision-making. To illustrate, a table that prescribes an exact punishment for each crime or the exact division of assets on divorce leaves little discretion to judges.

Legislators and the executive typically have political discretion, and civil servants typically have technical discretion. The situation of judges is more complicated. Common-law systems give judges discretion to make some kinds of law, whereas civil law systems sometimes aspire to eliminate the discretionary power of judges. Philosophers of law disagree about the ideal mix of politics, technique, and legality in judging.²⁵ In any case, pure legality, or the mechanical application of law, fails for most decisions. British unions periodically paralyzed the railways by a tactic called “work-to-rule,” which means that the workers implemented all rules literally. Like the railroads, courts that apply rules mechanically cannot do justice.

Voting

I have explained that a deeper hierarchy better disguises the diversion of resources, whereas more elections and a more shallow hierarchy lowers the cost of monitoring by citizens. Thus more elections can reduce corruption and increase flexibility. Now I want to explain how too many elections dilutes civic spirit required for effective elections. Citizens must decide whether to vote and

²⁵ Thus Ronald Dworkin, who is among the most celebrated Anglo-American philosophers, argued that each legal dispute has one right answer, thus suggesting that judges have little discretion. See Ronald Dworkin, *Taking Rights Seriously* (London: Duckworth, 1977). These views evolved somewhat in *Law's Empire* (1986). Note that empirical studies often conclude that judges on high courts implement their own political philosophies. See Saul Brenner, “Ideological Voting on the U.S. Supreme Court: A Comparison of the Original Vote on the Merits With the Final Vote,” *Jurimetrics Journal* (1982): 287-293.

how to vote. First I will analyze how a rational citizen will vote, and second I will analyze whether a rational citizen will vote.

Self-interest or Public Interest?

I like ice cream better than cabbage because of the taste, he likes San Diego better than Seattle because of the weather, and she likes the Republicans better than the Democrats because she is conservative. Among the many reasons that people have for their preferences, I will contrast two broad types. On the one hand, a citizen can vote based on material self-interest. A narrowly self-interested voter asks, "Which outcome will do more to increase my own wealth and power?" On the other hand, a public-interested voter asks, "Which outcome will benefit the country more according to my political philosophy?"

To supply efficient quantities of public goods, officials need information about the policy preferences of citizens. By supplying this information, self-interested voting sometimes promotes efficiency in the supply of public goods. All too often, however, citizens use politics to obtain advantages for themselves at the expense of others. Banks want loan guarantees, farmers want price supports, unions want tariffs, artists want subsidies, taxis want fewer licenses for cabs, the elderly want property tax exemptions, and so forth. This kind of self-seeking wastes resources and oppresses the powerless. While people seldom criticize a consumer in the grocery store for following his self-interest when filling his shopping cart, people often criticize citizens for voting their self-interest.

Do most citizens vote their self-interest or the public interest? The determinants of voting behavior have been studied for many years. Survey research reveals that voters know little about issues or candidates, so they typically rely upon guidance from political parties, ideology, and informed friends or associates. In spite of their ignorance, however, citizens tend to vote for candidates who promote the interests of the groups to which they belong. For example, farmers tend to vote for candidates who subsidize agriculture, ethnic

groups tend to vote for candidates who benefit minorities, and investment bankers tend to vote for candidates who liberalize finance.²⁶

Supporting candidates who advance a group's interests can benefit a person by showing solidarity with its members.²⁷ To illustrate, dairy farmers in a rural community may be more willing to cooperate with other dairy farmers who endorses milk subsidies. Conversely, an ethnic group may censor members who oppose preferential treatment for minorities.²⁸ In general, groups develop ideologies that advance a self-serving conception of the public interest, like the automobile worker who believes that "what's good for General Motors is good for America."

Why Vote?

Journalists often deplore the fact that only about half of the eligible citizens vote in major U.S. elections, and participation has fallen since the 19th century.²⁹ Voter participation rates are similar in other countries, except where democracy is new, or the law compels citizens to vote as in Australia and Argentina, or the names of non-voting citizens are posted in public as in some Italian towns. Unlike journalists, however, economists find voter participation rates mysteriously *high*. Models of self-interest predict much lower voter participation rates than actually occur, and here is why. A self-interested citizen will decide whether or not to vote by comparing the cost of voting and his expected benefit. Given current rates of voter participation, the probability is negligible that a single vote in a large election will effect the outcome. So the effort required to vote exceeds the expected benefit for voters in large elections.

Some notation clarifies this point. The value of the time required to vote usually measures its opportunity cost, which I denote C_i for citizen i . For

²⁶ Campbell, Angus, Philip E. Converse, Warren E. Miller, and Donald E. Stokes, *The American Voter* (New York: Wiley, 1960).

²⁷ In *Law, Cooperation, and Rational Choice* (Harvard University Press, forthcoming), Eric A. Posner emphasizes this mechanism for creating social norms.

²⁸ For the dynamics of "ethnification", see Timur Kuran, "From Melting Pot to Salad Bowl: Ethnic Activity and Social Induced Ethnification" 27 *J. Legal Studies* (1998).

²⁹ Bumper sticker on pickup truck in Berkeley: "If God had intended us to vote, He would have given us candidates."

simplicity, assume that the citizen cares about who wins the election, not the margin of victory. Let p_i denote the probability that citizen i 's vote decides the election's outcome. Let B_i denote the increase in citizen i 's wealth or power obtained by getting his preferred outcome in the election.³⁰ Thus the expected benefit from voting equals $p_i B_i$. According to the *self-interested theory of voter participation*, a citizen votes when $p_i B_i \geq C_i$, and a citizen does not vote when $p_i B_i < C_i$. The self-interested theory of voting predicts that voter participation rates will fall until $p_i B_i$ approximately equals C_i . The *paradox of voting* refers to the fact that current levels of voter participation far exceed the rate at which $p_i B_i$ equals C_i . If the self-interested theory of voting accurately described the behavior of most citizens, voter participation rates would fall far below current levels.

To illustrate, assume that having your preferred candidate win the election is worth \$1,000 to you. Assume that voting requires 1 hour of your time, which you value at \$10. Self-interest prompts you to vote if $p_i \$1,000 \geq \10 , which implies $p_i \geq 1/100$. In large elections, the probability of any one vote being decisive is *much* smaller than 1/100. Computing the subjective probability of being decisive p , which is called the *power of a vote*, depends upon what the voter thinks other voters will do (Palfrey and Rosenthal 1985). According to one calculation, the power of a vote in a typical U.S. general election approximately equals 10^{-8} .³¹ Under any reasonable assumptions, the power of a vote is so small in a large election that purely self-interested citizens would not bother to vote at current rates.

If narrow self-interest does not explain why people vote at observed rates, what does? An important tradition in political theory dating from Aristotle holds that political participation appeals to the social nature of people. According to this tradition, people express themselves by performing civic duties, and self-

³⁰ To illustrate, in a vote between a republican and democratic candidate, the benefit B_i of a republican voter i equals $u^i(x_r) - u^i(x_d)$.

³¹ See discussion in Hasen, Richard L. "Voting Without Law?" *University of Pennsylvania Law Rev.* 144 (1996): 2135-2179.. Using a different method of calculation, (Romer) concludes at page 200 that the probability of a tie in a U.S. presidential election in which 50 million people vote is approximately 10^{-4} .

expression is intrinsically satisfying.³² Deliberative theories of democracy stress the satisfaction that people take in exercising the responsibilities of citizenship, such as voting.

By voting rather than not voting, I increase the probability that people who agree with my politics will like the election's results. So people who agree with my politics will say that I ought to vote. The fact that citizens often praise voters and criticize non-voters indicates the existence of a social norm. Besides self-expression, people may do their civic duty to obtain praise or avoid criticism from others.

To represent the influence of civil duty, let v_i denote the value to i of fulfilling i 's civic duty, where v_i is large for some people and small for others. According to the civic virtue theory, everyone votes whose value v_i outweighs the net cost $C_i - p_i B_i$. Thus citizens vote when $v_i \geq C_i - p_i B_i$.³³ This formula encapsulates a *mixed motive theory of voting*, which combines self-interest and civic duty. The mixed motive theory has testable implications.³⁴

The mixed motive theory of voting also helps to explain why people inform themselves about how to vote. Just as rationally self-interested people would not bother to vote at observed rates, so rationally self-interested people would not bother to obtain the information needed to decide how to vote. A very low probability of being decisive undermines the incentive to vote and also the incentive to become informed. A combination of self-expression and social obligation, however, might cause voters to obtain information about how to vote.

³² Expressive voting theory is explored in Geoffrey Brennan and Loren Lomasky, *The Pure Theory of Electoral Preference*. Cambridge: Cambridge University Press, 1993.

³³ Let $f(v, b)$ denote the density function representing the distribution of social value v and material benefit b among citizens. The total number of voters in an election, according to this theory, equals the sum of all the voters for whom v exceeds $C - pB$, or

$$\text{voter participation} = \int_{C-pB} f.$$

³⁴ As with the self-interested theory, the mixed motive theory predicts that voter participation should increase when the power of a vote p increases, the private material benefit B_i from winning the election increases, or the opportunity cost of voting C_i decreases. In addition, the mixed motive theory predicts that voter participation increases when the value of conforming to the social norm v_i increases. v_i might increase because more people internalize civic virtue, the social advantage from political participation increases, or the social cost from not voting decreases.

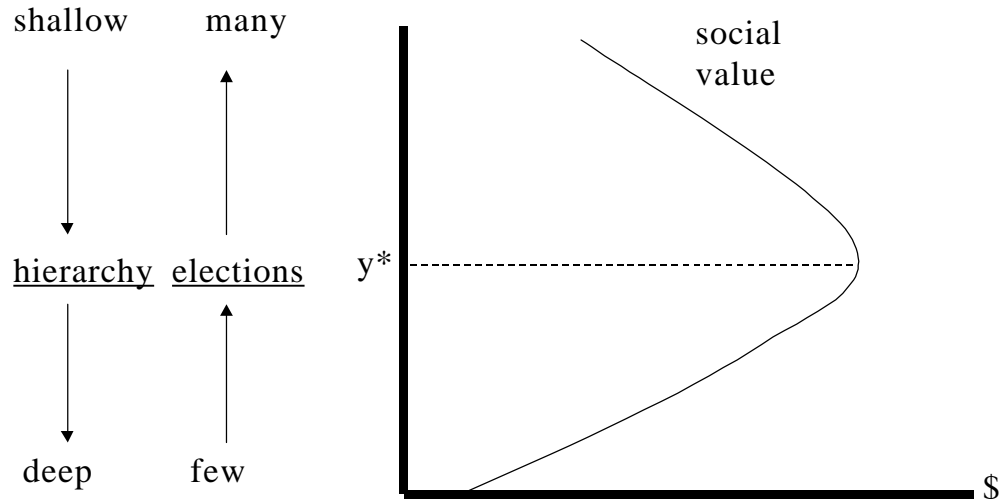
To represent the influence of civil duty, let v_i denote the value to i of fulfilling i 's civic duty by learning a little more about the election. Let c_i denote the cost of political information to i , and let b_i denote the increase in the decisive voter's benefit from knowing more about how to vote. According to the civic virtue theory, person i gathers political information until $v_i \geq c_i - p_i b_i$.

Democracy is a great motivator. Perhaps civic virtue v and v increases with the initial growth of democracy. Increasing the number of elections, however, eventually begins to dilute civic virtue. When the total number of elections is large, the value v or v for any particular election decreases with a further increase in the number of elections. By these facts and the preceding formulas, too many elections results in a fall in voter participation and also in voter information about each election.

Optimal Height of Administration

Too deep administration dilutes democratic purposes and gives too much discretion to administrators, in which case the constitution should replace hierarchies with elected governments. Conversely, too many elections can drain the reservoir of civic spirit that animates voters, in which case the constitution should replace governments with hierarchies. Figure 8 depicts social value as increasing and then decreasing as the height of hierarchy increases. Corrupt democracies are presumably below the optimum y^* . To reduce corruption, these democracies should devolve power.

Figure 8: Optimal Height of Administration



Conclusion

The state provides public goods and the legal framework for private markets. Instability and corruption create obstacles to economic development. The usual remedy commends centralizing authority until the threat of dictatorship offsets increased stability and efficiency. In a succinct formulation of the problem, Omar Azfar said “the idea is to create a government strong enough to protect property rights and personal safety but so circumscribed that it does not indulge in public predation.”³⁵

I propose a non-conventional solution to this problem. A democracy plagued by political instability should reduce the scope of unstructured bargaining among politicians and increase the scope of the median rule. To achieve this substitution, political issues should be factored. To factor, replace comprehensive government with single-purpose governments, and substitute

³⁵ Private communication to me.

indirect democracy for direct democracy. Each single-purpose government and each referendum requires a separate election, so the number of elections must increase.

Each link in the chain of a deep bureaucracy provides an opportunity to divert resources. Imposing rules on administrators reduces corruption at the cost of less flexibility. In a period of rapid social and economic change, strict rules to reduce corruption impose an especially high cost in terms of administrative inflexibility. Instead of more rules, a democracy plagued by corruption should reduce the height of its bureaucracy and the number of elections. Each additional level of government in a federal system requires a separate election, so the number of elections must increase.

At the beginning of this paper I explained that I would isolate and examine two variables—the horizontal and vertical number of elections—that affect the performance of government. My analysis omits consideration of many other variables. In some circumstances, interaction with additional variables could nullify my conclusions. To illustrate, in some post-communist countries without effective local elections, the devolution of power might increase corruption. Instead of federalism, devolution might produce feudalism. In spite of this qualification, my model identifies real forces at work in political economy that conventional theories neglect. Determining the relative power of these forces requires empirical research combining laboratory experiments, econometric research comparing states, and case studies.