Modelling Social Choice: A comparison of Political Economy in the United States and European Polities.

Norman Schofield*

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Abstract

Formal models of elections have emphasized the convergence of party leaders towards the center of the electoral distribution. This paper discusses various political episodes in British and US history to suggest that political divergence is generic. This leads to the inference that political choice involves electoral judgment as well as preference. The stochastic electoral model is extended to incorporate the basis of judgment, namely valence. The model suggests that when the electoral system is based on proportional electoral methods, then there will be numerous parties with very different valences, adopting very divergent positions. Under plurality rule, on the other hand, the role of activists appears to restrict the number of parties to two, and to cause a slow political rotation in the policy space.

*Center in Political Economy, Washington University in Saint Louis,One Brookings Drive, Saint Louis MO 63130. E-mail:schofield.norman@gamil.com.

1 Introduction

Architects of Change: Constitutional Quandaries and Social Choice (Schofield, 2006*)* may be thought of as an extended interpretation of Madison's argument in Federalist X (Madison, 1999 [787]), which uses ideas from social choice theory and from the work of Douglass North, Mancur Olson and William Riker, in an attempt to develop "rational choice" approaches to the evolution of society. This research program can be regarded as continuing the work of Madison's contemporaries, Condorcet and Laplace.

North's early work with Thomas (North and Thomas, 1973, 1977) attempted an economic explanation of the transition from hunter/gatherer societies to agriculture. Later, he proposed a "neoclassical theory of the state," wherein "Leviathan" contracts to set up a system of property rights and taxes (North, 1981). His later work has focused on institutions, and how they change as a result of incentives, knowledge and beliefs (North, 1990, 1994, 2005). One of his most persuasive pieces is his work with Weingast (North and Weingast, 1989) on the Glorious Revolution in 1688 in Britain, and how this transformed Britain's ability to manage debt, fight wars (particularly with France), and develop an empire.

Riker's earliest work was on American Federalism, particularly the logic underlying the need for Union in 1787 (Riker, 1953, 1964) and the stability of parties as coalitions (Riker, 1962). After working for a number of years on rational choice theory (Riker and Ordeshook, 1973), Riker returned to

American political history, to interpret key events in terms of "heresthetic" (1982, 1984, 1986, 1996). Riker coined the word heresthetic from the greek $\alpha\iota\rho\varepsilon\tau\iota\kappa o\zeta$, meaning "able to choose." His book on *Liberalism Against Populism* (1982b) argued that social choice theory implied that populism, in the sense of existence of a "general will" was vacuous. At best, all democracy could hope for was the liberal capacity to remove autocrats.

Much of Olson's work has attempted to grapple with understanding how some societies are successful and others much less so. In his early book, Olson (1965) used the idea of the prisoner's dilemma to suggest that cooperation may fail, as individuals pursue their selfish ends (by strikes, revolutions, etc.) and indirectly constrain economic growth. Later, Olson (1982) used this argument to provide a "declinist" explanation of why stable democracies such as Britain and the U.S. appeared less vital (in the 1980's) than the newer democracies of the post World War II era (such as France, Germany, Japan, etc.).

In the book and this paper I attempt to construct the beginnings of a theory of democratic choice that I believe can be used as a heuristic device able to tie together these differing historical accounts. The basic underlying framework is adapted from social choice theory, as I understand it, on which I graft a "stochastic" model of elections. This model is an attempt to extend the Condorcetian theme of electoral judgement. I shall argue that its logic was the formal principle underlying Madison's justification for the Republican scheme of representation that he made in *Federalist* X. While

this logic does not imply a general will in the sense of Rousseau, it does suggest that Riker was overly pessimistic about the nature of democracy. On the other hand, the social choice framework suggests that democracy, indeed any polity, must face difficult choices over what I call chaos and autocracy. These difficult choices are the *constitutional quandaries* of the title of this book. The historical choices that I discuss often involve a leader or theorist, *an architect of change,* either in the realm of politics or economics, who interprets or frames the quandary troubling the society in a way that leads to its resolution.

2 Balancing Risk and Chaos

Figure 1 is intended as a schematic representation of the formal results from social choice theory. This Figure is replicated in Chapter Two, where a more detailed discussion is provided of its interpretation. This figure is intended as a theoretical construct whose purpose is to suggest the relationship between the many differing results of the theory. The vertical axis denotes the "axis of chaos" The theorems of social choice, from the earliest result by Arrow (1951) to the later work on spatial voting theory (MacKelvey and Schofield, 1986, 1987) imply that as factionalism increases then utter disorder can ensue. The term *chaos* was introduced to describe the possible degree of disorder, by analogy to *mathematical chaos* which was used to characterize a deterministic dynamical system, f with the feature that for almost any pair of outcomes

x, y, in the state space X there exists a trajectory

$$x \to f(x) \to f^2(x) \to ...f^t(x) = y. \tag{1}$$

(See Li and Yorke, 1975).

For a voting rule, with specified voter preferences and an initial point x, let $f(x)$ be the set of alternatives that beat x. More generally, we can think of the set $f(x)$ as the set of alternatives that can come about from x, as determined by the social rule. The idea of *social chaos* is that there are conditions under which, starting from almost any x it is possible to reach almost *any* possible outcome $y = f^n(x)$ by reiterating the social rule. When the set Y that can be reached is large, in some sense, then we can call Y the *chaotic domain*. In contrast we can identify the *core* or *social equilibrium*, y, as an attractor of f, that is a single outcome y with $y = f^t(x)$, which results from any x, after some number of iterations of the rule. The *chaos theorem* sets out the conditions for existence or otherwise of the social equilibrium and for the situation where the chaotic domain becomes almost the whole of X. For example, for any voting procedure, f, without a dictator, oligarchy or collegium,[1] able to control or restrain social choice, then as the dimension of X increases then so does the extent of voting chaos. For social choice,

[1]Roughly speaking a voting rule is characterized by a family of winning coalitions, D, say. A *dictator* is a single agent who belongs to every winning coalitions and is also winning. An *oligarchy* is a group that belongs to every winning coalition and is itself winning, while a *collegium* is a group of voters that belongs to every winning coalition in D, but need not be winning.

the chaos theorem is presented for a voting rule D, with specified voter preferences. If D is collegial, in the sense that there is a collegium, then the core $Core(f)$ of the social rule, f, will generally exist. If D is non-collegial, then there is an integer, $w(D)$, called the "chaos dimension," which characterizes D in the following sense: If the dimension of the space, X, exceeds $w(D)$ then the chaotic domain, $Chaos(f)$, of the social rule, f, will be almost the whole of X.

For a general social rule, f, Schofield (1985a) formally defines $Chaos(f)$ in terms of local cycles of the rule, and then shows that the union of $Chaos(f)$ and $Core(f)$ is non empty. Thus, if the rule has the property that $Chaos(f)$ is empty, then $Core(f)$ must be non-empty. The theoretical problem for democratic theory, is that if $Chaos(f)$ for the social rule, f, is non-empty then there may be no social equilibrium. However, as discussed at length below, it may be the case that democratic power resides in veto groups. Since a veto group is a collegium in some limited domain of policy (namely a subset of X), then $Chaos(f)$ will be empty, and the social chaos theorem will not apply. There has been much debate about the applicability of the social chaos result to democratic theory. See for example Riker (1980, 1982, 1984, 1986). Note however that chaos, as I interpret it, is not just a property of voting procedures.

For societies where war is the decision method, then I suggest that the chaotic domain, Y, is likely to be all of X. For less violent methods, the chaotic domain will typically depend on the heterogeneity of preferences in

the society. These results do not imply that democracies are necessarily chaotic, but they do suggest that they can be.[3] Throughout this book I shall use the term "chaos," somewhat loosely, to refer to a social situation where there is reason to believe that it is impossible to determine even in general terms, where the social trajectory will go.

[Insert Figure 1 here]

When war, or intense and unrestrained conflict dominates, then we can expect chaos, as in Kosova, in Lebanon during the civil war, and in Iraq at the present time. For a pessimist like Hobbes, it was obvious that any society could fall into chaos, unless mitigating institutional devices were constructed. The quote from Madison's *Federalist X* suggests that Madison certainly viewed direct democracy as subject to chaos. Indeed, in his other writings, he used the phrase "the mutability of the law" in commenting on the possible choices of the legislature. I take his comments to mean that he considered that legislative bodies such as the House and Senate were subject to a degree of disorder–possibly not the complete disorder of chaos. It should be noted that the chaos theorem refers to situations where individuals with specific and heterogeneous preferences come together either in war or assembly and are in conflict over an *outcome.* Thus a legislative assembly can be understood as a direct democracy, and consequently can exhibit chaos, as suggested by the social choice results. Madison was very clear that representative democracy involves the choice of a *person.* and he obviously believed that the voters in the Republic could make a sound choice for the

Chief Magistrate if their judgements were not contaminated by preferences. One purpose of this book is to explore the nature of social choice when it depends on judgement rather than simply individual preferences.

The rationalizability of social choice may hold when an electorate makes a specific and limited choice, particularly in a binary situation of yes or no. For example, the negative referenda votes in May and early June, 2005, in France and the Netherlands over the European Union (EU) Constitution, while unexpected, cannot be seen as truly chaotic, because they were one-off events. However the frantic responses by the political leaders of the EU may have elements of considerable disorder. At the same time, there are many institutional devices within the EU that are designed to control disorder.

The effect of these institutional "equilibrium" devices are well understood from the point of view of social choice theory. They all force "rationality" by concentrating power in various ways. This is shown in Figure 1 by the power characteristics of the decision rule, f, along the *risk axis.* The work, mentioned above, on social choice by Arrow (1951) considered a very strong rationality axiom. Using this he showed that if this rationality property is to be satisfied then the most extreme form of power concentration, namely "dictatorship" is a *necessary* condition in the case that individual preferences are unconstrained. Less extreme forms of power concentration include existence of an"oligarchy," or "collegium" or multiple veto groups. Because a "dictator" can make any choice "he" deems fit, and such a degree of power concentration almost never occurs in a polity, I shall use the term "autocrat"

for one who controls the levers of power of the polity, and has at least the ability to declare war without being constrained by some form of political veto. Clearly, Saddam Hussein was not a dictator, in the formal sense, but he certainly was an autocrat. Similarly, I use the term "oligarchy" for a group who if they agree, have "autocratic" powers. A "collegium" is a group without full autocratic powers, but who must all agree before the exercise of such power to pursue war etc. A "veto group" is one with collegial power within a specific restricted domain of policy. Obviously there can be many veto groups in any complex society.

Figure 1 presents my hypothesis that autocrats are likely to be extreme risk takers. To some degree, this is an empirical assertion. One only need make a list: Ghenghis Khan, Attila, Philip II of Spain, Napoleon, Hitler, Stalin. Kennedy's book, *The Rise and Fall of the Great Powers* (Kennedy, 1987) argued that great nations tend to over-exert themselves in the military realm, and through lack of fiscal caution, bring about their own demise. If we translate this argument by regarding the lack of fiscal caution as an element of risk taking more generally, then Kennedy's logic certainly seems valid for Philip II and Napoleon, and possibly for the leaders of the USSR during the cold war. Kennedy also argued that it applied to the U.S. in the post World war situation. Schofield (2006) gives the relevant data on military spending for the U.S. and USSR up until 1991, and suggests that there was little indication of this risk preferring military incaution by the U.S. until that date. Whether the same inference is valid today is another question

entirely.

On the risk axis, an autocrat is likely to be much more risk taking than an oligarchy. I also suppose that an oligarchy will tend to be more risk taking than a collegium. It is difficult to precisely differentiate between an oligarchy and a collegium. An example of an oligarchy was the Praesidium of the Soviet Union. All members of the Praesidium must agree, in principle, for a choice to be made, but if they do, then no decision making body can override them. A possible example of a collegium is the U.S. president together with his cabinet, in a situation where the majority parties of the House and Senate are in line with the President, and agree with his policy initiatives. The more general situation, of course, is where the President may veto Congress, and Congress may, in turn, counter his veto, with a super-majority. Thus the U.S. executive and Congress, regarded as a unit, can be interpreted as having collegial power. Because the Congressional counter-veto requires a supermajority, only very extreme situations can lead to chaos as a result of Presidential/Congressional interaction. Note, however, that President and Congress together do not comprise an oligarchy, since there are obvious policy domains in which Congress and President may concur, but are blocked by State Legislatures.

Because Congress may be factionalized, it can, as Madison expected, exhibit what he called "mutability"–a degree of disorder or incoherence in the laws that are passed. My understanding of the U.S. Constitution is that it had a precise design to allow the Presidential veto to overcome Congressional

mutability. Of course, if there is a well disciplined majority party in Congress, then it can act as a collegium, thus ensuring stability of some kind. However, it is certainly possible for Congress to become factionalized, leading to the collapse of the collegium. One instance of this was the Presidential election of 1844 and its aftermath, as discussed in Chapter Five, below. Because of the actions of Southern Democrats in blocking the candidacy of the New York Democrat, Martin Van Buren, the Northern and Southern wings of the Democrat party split, and Northern Democrats voted with Northern Whigs to suspend the gag rule, forbidding discussion of the issue of slavery in the House. This factionalization led eventually to a realignment of the party structure in the election of 1860.

Madison, of course, was concerned that the President would gain autocratic power, and to avoid this, the Congressional counter-veto was devised. However, even with the counter-veto, the President does have some autocratic power, and I shall use the term *weak autocrat* to characterize his power. It is evident that there is a tendency for U.S. presidents to display the degree of risk preference that characterizes autocrats. I judge that Congress will generally be risk-averse, which is why, I believe, power to declare war resides in Congress. Even when Congress and President are aligned, then one would still expect the Presidential risk-preference to be muted by Congressional risk-avoidance.

On the other hand, Congressional risk-avoidance has the effect of delaying the resolution of fundamental constitutional quandaries. Typically, a

quandary can only be faced if there is a risk-taking leader capable of forcing resolution. Without such a leader,the result can be the opposite of chaos, namely "gridlock." An illustration of this is given in Schofield (2006), in the discussion of the passage of Civil Rights legislation in 1957, while Johnson was leader of the Senate Decisions in the Senate can be blocked by the filibuster, and this can only be overcome by "cloture." This rule required "support from two-thirds of those present and voting to impose cloture. This meant that a minority coalition of one-third plus one of those present and voting could prevent a vote" (Rohde and Shepsle, 2005). First, as leader of the Senate, and later as President in 1964, Johnson was a risk taker able to persuade the collegium (of one-third plus one) of Southern Democrats to lift its block.

Rohde and Shepsle (2005) go on to observe that

> as a consequence of a huge upsurge in filibusters in the decade following the civil rights revolution, Rule 22 was amended in 1975, changing the requirement to an absolute standard – sixty votes – to close debate [in the Senate].

Obviously a group of 41 Senators has blocking power, and the change in the rule has reduced the collegial veto power of such a minority.

As I argue in Schofield (2006) that Madison developed his argument in *Federalist* X, from Condorcet's *Essai* of 1785. This led Madison to expect that the election of the President could be assumed to be characterized by a high "probability of a fit choice." In constrained situations where we may assume that judgements predominate, and voters evaluate the options in a

clear sighted fashion, then their choice of Chief Magistrate may indeed be well formed in this way. For this reason I locate the weak autocrat in Figure 1 at a position where the risk taking of the autocrat is balanced by the risk avoidance of the Congress, as well as by judgement of the electorate. It would be natural to assume that electoral judgement will generally be risk-avoiding. However, there are situations where a society feels threatened in some fashion, and may exhibit a degree of risk preference. It seems to me that the current situation with regard to the U.S. and Iraq is unusual, precisely because the electoral judgement has seemed to be much more risk preferring than is common. As the true risks of the current situation become apparent, this risk-posture may change.

It is important for my interpretation of electoral judgement that when the "preferences" of the electorate are muted by judgements, then their choice of the Chief Magistrate need not be subject to the chaos results. Whether this is an entirely valid argument is a somewhat delicate matter. Madison hoped that, because the election of the Chief Magistrate involved the selection of a person, rather than an option (as in the passage of a law), judgement rather than preference or interest would predominate. To argue this formally requires analysis of an electoral model where judgement and preference are both incorporated. Below, I present the tentative outline of such a model. It is of course entirely possible that beliefs or judgements in the electorate can be transformed in a chaotic fashion. Many of the illustrations of belief transformation presented in this book suggest that while the transformations

are highly contingent, they are associated with changes in what I call a *core belief.* In social choice theory. A *core,* in social choice theory is an unbeaten alternative. By analogy, a *core belief* is a belief that has general acceptance in the society.

As Figure 1 indicates, at the opposite end of the risk spectrum from autocracy is the situation of extreme risk-avoiding blocking groups. Veto groups are like collegia but with power in a limited domain. As indicated above, social choice theory implies that veto groups induce stability, so the effect is the opposite of chaos. A good illustration is provided by the veto power that French farmers have over changes in the EU Common Agricultural Policy (CAP). Obviously French farmers, together with their agrarian allies in Germany, and the new members of the EU, such as Poland, have a great deal to lose if the CAP is reorganized. CAP is only one instance of a variety of protectionist, risk-averse mechanisms that several veto groups have been allowed to deploy in the expanding European polities. The consequence seems to be that the core polities of France, Germany and Italy in Europe have stagnating economies. As of August 2005, the estimates of growth (based on the last quarter) were under 2 percent (1.8 percent in France, 1.1 percent in Germany, and about zero in Italy) with unemployment roughly 10 percent (about 8 percent in Italy, 10 percent in France and 9.6 percent in Germany). With risk aversion comes high saving, low imports, high trade surplus, and an appreciating euro. This will be increasingly exacerbated as the population structure ages. These facts compare with growth and

unemployment of 3.6 percent and 5.1 percent respectively in the U.S. and 2.1 percent and 4.9 percent, respectively in Britain

The "non" in France and "nee" in the Netherlands in May and June 2005 may have been induced by voter irritation at the apparent incompetence of the EU institutions, and it reasonable to infer that these referenda were based on electoral judgement. The problem is that outside Britain, almost every group, except possibly teenagers and students, has a veto over changes in crucial aspects of the social contract, particularly over unemployment and retirement benefits. Without doubt, it is much more comfortable to live in Europe rather than the U.S. The degree of risk avoidance could be reduced, but only by institutional mechanisms that are more risk preferring. The political institutions of the EU (the Commission, Council of Ministers, European Parliament, the rotating President of the EU) all appear to be risk averse. The negative referenda have induced some degree of disorder into the Council of Ministers, because the policy arena is now much more like a zero sum game that before, with ministers arguing over "rebates," and agricultural subsidies. Although the CAP budget has fallen over the last few years, from 70 percent of the EU budget to 40 percent, its effect is to distort agricultural trade, harming farmers in less developed countries. It is unclear at present whether or how this EU quandary will be resolved. What is interesting, is that the Labour Party in Britain, though recently chosen by a proportion of only 35 percent the British electoral (much reduced from its support in 2001) still controls 55 percent of Parliamentary seats. Unlike a party leader in the

same situation in a polity based on proportional representation, Blair, as leader of the party, has the power to engage in a fairly risky strategy against the other party leaders in the EU polities, directed at transforming the CAP. This is consistent with the view that leaders of polities based on proportional representation tend to be risk averse, while leaders chosen through plurality electoral methods are more likely to be risk-seeking

Social choice theory suggests that the EU quandary could be resolved by the selection of a weak autocrat, such as a popularly elected EU President. However, to satisfy Madison's fears of autocracy, it would be necessary for the electoral choice to be based on the judgements of voters rather than their preferences. It is difficult to see how a European wide election could have an information base that would be sufficient to support such a social choice based on judgement.

With this preamble in mind, I shall attempt to formulate a Madisonian model of election of the Chief Magistrate, President or political leader, that is in principle applicable to any democratic polity. The model will involve both judgement and preference. Variations of the basic model can then be interpreted in terms of a pure Condorcetian model of judgement, or belief aggregation, as well as a pure, potentially chaotic model of preference aggregation.

3 Preferences and Judgements

For the formal electoral model I shall assume that individuals have preferences that are can be represented as functions on some "policy" space X. This space characterizes both voter interests, and possible eventualities. In many of the examples, I argue that X conceptually derives from the societal deployment of the three factors of land, labor and capital. Because the factors are bounded at any time, we may more conveniently regard X as two dimensional. In empirical applications, for example, surveys nearly always indicate that voters conceive of a conflict between the requirements of capital and labor. What I term the labor axis is often derived from beliefs about civil rights or religion. A third non-factor dimension may involve attitudes to war. In some cases the social attitudes with regard to war are attributable to the desire for territorial expansion. Obviously this notion of factor dimensions is a heuristic device, but it does allow me to represent fundamental constitutional problems in a diagrammatical form.

The interests or beliefs of the population or "electorate," N (of size n) are described by a set $\{x_i\}$ of "ideal points," one for each "voter," $i = 1, \ldots, n$. An individual's ideal point in the space, X, is used to describe or represent that voter's interests. In electoral models the ideal point can be obtained from a survey. Whether we view x_i as representing preferences or beliefs is immaterial.

The set of options, S, of size s, is a set $\{z_j\}$, each one being a point in X.

In the situation of an election, each element of S is a declaration of intended or proposed policy. There is one for each candidate, j.

While it is usual to conceive of each z_j as simply a point, we can easily allow z_j to involve various possibilities, associated with differing probabilities of occurrence. In principle we can construct a more general model where beliefs are probabilities of outcomes, so the possible states are lotteries. This provides no technical problem, since we can put an appropriate topology on this extended state space. The topology I have in mind is a fine topology taking into account differentiability. See Schofield (1996, 1999a, b) and Schofield and Sened (2006).

In the simplest model, the "latent utility," u_{ij} of voter i for candidate j has the form

$$u_{ij}(x_i, z_j) = \lambda_{ij}(x_i) - A_{ij}(x_i, z_j) + \theta_j^{\mathrm{T}} \eta_i. \tag{2}$$

Here $\theta_j^{\mathrm{T}} \eta_i$ models the effect of the sociodemographic characteristics η_i of voter i in making a political choice. That is, θ_j is a k-vector specifying how the various sociodemographic variables appear to influence the choice for option j.Thus $\theta_j^{\mathrm{T}} \eta_i$ is simply the influence of i's sociodemographic characteristics on the propensity to choose j.

The term $A_{ij}(x_i, z_j)$ is a way of representing the "preference disagreement" between the interests of voter i and the j^{th} option. In particular $A_{ij}(x_i, z_j)$ may be some function of the distance between x_i, the preferred position (or ideal point) of voter i and z_j, the declared policy of candidate

j, according to some appropriate metric. In the standard electoral model, where X is a policy space it is assumed that $A_{ij}(x_i, z_j) = \beta\|x_i - z_j\|^2$ is the Euclidean quadratic loss (with $\beta > 0$) associated with the difference between the two positions. We can however conceive of $A_{ij}(x_i, z_j)$ much more generally. In the general case z_j will involve a lottery across different possibilities, and different individuals could evaluate these various possibilities in heterogeneous ways.

The model is stochastic because of the implicit assumption that

$$\lambda_{ij}(x_i) = \lambda_j(x_i) + \varepsilon_j \text{ for } j = 1, \ldots, s. \tag{3}$$

Here $\{\varepsilon_j\}$ is a set of possibly correlated disturbances and $\lambda_j(x_i)$ is the perception by a voter, i, with beliefs or interests, x_i, of the "valence" of the option presented by the candidate j. This valence is a way of modelling the non policy *judgement* by voter i of the quality of candidate j.

In the general model, the probability, Pr, that voter i chooses option j is

$$\rho_{ij} = \Pr[u_{ij}(x_i, z_j) > u_{ij}(x_i, z_k) \text{ for all } k \neq j]. \tag{4}$$

Previous versions of this model have assumed that the valence components $\{\lambda_j(x_i)\}$ are all zero, and have usually asserted that all candidates would converge to an "electoral mean" when they attempt to maximize their expected vote shares. In the discussion of this model given in Chapter Seven, it is argued that, in the situation where the candidate valences differ, then

this mean voter theorem will only hold when a particular necessary condition is satisfied. The condition depends on the valence differences between candidates, on the coefficient β that specifies the importance of policy, and on the variation of the distribution of voter ideal points, denoted as v^2. Further, the greater is the stochastic variance (or uncertainty) of the disturbances, then the easier is it for this condition to be satisfied. In contrast, high electoral variation will tend to produce divergence of candidate positions. The upshot of this analysis is that empirical situations can be found where convergence in candidate positions is very unlikely to occur. Schofield and Sened (2006), give examples from a number of polities based on proportional electoral systems where extreme divergence of party positions is explained by this model.

We can apply this model in various ways.

First, consider the pure preference based "non-stochastic" or deterministic case, $\varepsilon_j \to 0$, where valence is zero.

As noted above, a very extensive literature has shown that if decision making is binary (pitting options one against another), and based on majority rule, or more generally on a non-collegial voting mechanism, then "chaos" or disorder can ensue as long as the dimension of X is sufficiently large. The formal results show that chaos can be prevented by requiring that there be a collegium or veto player. Chapter Two discusses this possibility in the context of an analysis of decision making in Britain in the seventeenth and eighteenth centuries. The outcome in this situation of a collegium, oligarchy or autocrat may be a *core* or institutional equilibrium. In the absence of a core, and if

the dimension of X is sufficiently low, then the set of probable outcomes will be restricted, and I shall use the term the *heart* of the institution to refer to this set of possible outcomes.

In the stochastic situation, with $\varepsilon_j \neq 0$, it is necessary to focus on the "beliefs" or judgements of the participants.

In the case that $\beta \to 0$, then this is a situation of pure "belief aggregation." Individuals will choose among the various options with probability determined by the valence judgement that they have made. I suggest that the final decision is often the consequence of what I call a *belief cascade*. As more individuals decide that option z_s, say, is superior, then other voters will in turn, be swayed to form a judgement in favor of z_s. I use the term *Architect of change* for an agent, j, who is able to trigger this change in the social situation by providing a plausible argument for the option z_j.

In the more general case with $\beta \neq 0$, the valences $\{\lambda_j(x_i)\}$ and therefore the choices will depend on $\{x_i\}$. It may be the case that different, and opposed belief cascades are generated in the population. For example, in Chapter Five, I suggest that Lincoln's arguments, about the significance of the Dred Scott decision, generated opposing belief cascades in the northern and southern electorates.

More generally, suppose that there is information available to some subset M of the electorate which is consistent with the judgment

$$\lambda_s > \lambda_{s-1} > ... > \lambda_1. \tag{5}$$

by the members of M. Then it will be the case that, for every voter i in M, the subjective probabilities will be ranked

$$\rho_{is} > \rho_{is-1} > ... > \rho_{i1}. \tag{6}$$

It follows that the majority rule preference within the set M will choose candidate s with option z_s with greater probability than candidates $s-1, s-2, ..., 3, 2, 1$. If M is itself a majority under the electoral rule (or is a winning coalition of more than half the electorate) then candidate s will win. When an alternative such as z_s wins in this fashion, then it will be sustained by a belief (or set of related beliefs) held by a wining coalition. By analogy with the idea of a core, or unbeaten alternative, I use the term a *core belief* to refer to this common belief held by such a set of voters.

Condorcet in his *Essai* of 1785 argued essentially that a core belief would tend to be a correct belief. Roughly speaking, *Condorcet's Jury Theorem*asserts that, in a binary choice situation, the probability that a majority selects the true outcome will be greater than the probability that a typical individual will select the truth. Rae (1969) and Schofield (1972a, b) used a version of the theorem to argue that majority rule would be "rationally" chosen by an uncertain society as a constitutional rule. The theorem depends on the condition of voter (pairwise) independence" which is a very strong assumption, and unlikely to be satisfied. Recent work by Ladha (1992) and Ladha and Miller (1996) has attempted to extend the theorem to include

correlated choice. Empirical techniques also allow for modelling correlated choices (Schofield, Martin, Quinn and Whitford, 1998; Quinn, Martin and Whitford, 1999). The demonstration of this theorem is usually given for the case where only judgements are involved. but it is obvious that the result holds in some weaker sense when both interests and judgements are involved, as long as interests do not predominate. It is argued in Schofield (2006) that Madison had a version of this argument in mind when he wrote about the "probability of a fit choice" for the President in *Federalist X*. Of course, because interests may intrude in the calculation of a fit choice, we cannot assert, as did Condorcet, that the choice is necessarily superior. Notice also that the electoral rule (such as deployed in the Electoral College) may define a coalition as winning even though it does not comprise a majority. Recent literature has considered extensions of the Jury Theorem when individuals have private information and the decision problem is one of common value, so that all individuals would agree over the correct choice if they had full information.[7] The societal decisions considered in this book have the characteristic that both preferences and beliefs in the society are heterogeneous. I do not attempt to present a full theory of such situations. Instead I hope to combine elements of social choice theory and the theory of elections, to present a set of concepts that I feel can be useful in understanding democratic choice

Thus the *core belief* underpins the selection of the option s, with the greatest valence. I also use the notion of *the heart of the Constitution* to

refer to the configuration of beliefs that form the foundation for social choice at each point in time. A *constitutional quandary* is a situation of great uncertainty in the electorate. In the formal model this is associated with significant stochastic variance, and relatively insignificant valences. According to the standard electoral model all candidates should converge to the electoral center. Another way of expressing this is that the candidates should be risk averse. However, this assertion only holds true if the electoral variation is relatively small. If electoral preferences are very heterogeneous then candidates should rationally adopt very different positions.[8] We might say, for a situation with very great uncertainty, that these candidates for the attention of the electorate are *prophets of chaos.* Sometimes, out of this cacophony of voices, there is one who can overcome the barriers to clear perception and present a sensible way to interpret the quandary. Naturally, this does not always happen. I suggest that a polity will prosper when it is both open to the arguments of such an *architect of change,* and able to evaluate the opposing arguments. The *evolution of the Constitution* is due to this continuous process of argument, shifting beliefs and changing valences.

This model is applied in Miller and Schofield (2003) to suggest that the changing valences of parties in the U.S. is due to the influence of activists on candidate positions. This accounts for what I call a *structurally stable dynamic*, involving a slow rotation of party positions in what I consider to be a fundamental two dimensional policy space based on economic factors and civil rights . There is some evidence that a two-dimensional policy space

is also relevant for Britain (Schofield, 2005a), though I suggest below that the second dimension may be derived from, or sustained by, beliefs that were appropriate during the period of the British Empire. While my discussion largely focuses on Britain and the United States, it is the larger question of the evolution of what I call the *Atlantic Constitution* that forms the narrative of Schofield (2006).

4 An "Institutional Narrative": Applying North and Riker

Here I shall briefly sketch the narrative scheme that I shall use, based on the ideas of social choice, and on the notion of factor coalitions, forming in the policy space. Rogowski (1989) earlier made use of the assumption, from economic theory, that there can be assumed to be three factors of production: land, labor and capital. External and internal features may grant advantages to particular coalitions of these factor "interests." For example, the U.S. in the late 1700's could be characterized as abundant in land, with both labor and capital relatively scarce. Principal imports were manufactures, intensive in capital and skilled labor. Thus protection in the form of tariffs would necessarily benefit capital and "industrial labor." In contrast, since land was abundant, this economic interest, together with "agricultural labor," would benefit from free trade. Consequentially, the political conflict between the commercial Federalist Party and the agrarian Jeffersonian Republicans, at

the election of 1800, can be interpreted in factor terms. However, some of the elements of the controversy of that time can only be understood with respect to earlier factor conflicts in Britain, in the period from 1688.

North and Weingast (1989) had argued that the creation of the Bank of England in 1693 provided a method of imposing credible commitment on Parliament. The dilemma facing any government of that time was that war had become more expensive than government revenue could cover. Consequently, governments, or monarchs, became increasingly indebted. Risk-preferring, or war-loving, monarchs, such as Philip II of Spain or Louis XIV of France, were obliged to borrow. As their debt increased, they were forced into repudiation, thus making it more difficult in the future to borrow. Since the Bank of England "managed" the debt in Britain after 1693, there was an incentive for Parliament to accept the necessary taxation, and also to avoid repudiation. However, it was clear after 1688 that William III would pursue the war with France with great vigor and cost. Contrary to the argument of North and Weingast, this escalating debt could, in fact, force Parliament to repudiation. Until 1720, it was not obvious how Parliament could be obliged to commit to fiscal responsibility. How this was done was through the brilliant strategy of Robert Walpole, first "prime" minister.

The fundamental problem was that the majority of members of both Commons and Lords were of the landed interest. The obvious method of funding government debt (which had risen to 36 million pounds sterling by 1713) was by a land tax. Indeed the land tax raised approximately 50 per-

cent of revenue. War weariness had brought in a Tory government in 1710, and the obvious disinclination of the Tory landed gentry to pay increasing land taxes forced up the interest rate on long term government debt from 6 percent to 10 percent (Stasavage, 2002). In some desperation the government created the South Sea Company in 1711. After Queen Anne died in 1714, and the Hanoverian, George I, became sovereign, increasing speculation in South Sea Company stock and then the collapse of the "bubble" in September 1720, almost bankrupted the government. Walpole stabilized confidence in the Company by a swap arrangement with the Bank of England. In April 1721, Walpole, now Chancellor of the Exchequer and First Lord of the Treasury, began his scheme to stabilize government debt by instituting a complex system of customs and excise. By restricting imports, mostly foodstuffs and land intensive commodities, this system had the effect of supporting the price of the scarce commodity, land. From 1721 to 1740, these excise taxes and customs raised an increasing share of government revenue. As Brewer (1988) has described, the system required a sophisticated and skilled bureaucracy. The Walpole device had many effects. Firstly, it ushered in a long period of Whig dominance (at least until the 1800's). Protection of land remained in place until the Repeal of the Corn Laws in May 1846. As McLean (2000) has described, the Repeal was effected by Robert Peel, leader of the Tories (or conservatives), together with Wellington in the Lords, against the interests of the majority of their party. Famine in Ireland made it obvious to Peel and Wellington that unless food prices were lowered then social unrest could lead

to civil strife. The Walpole "bargain" of 1721 essentially created a compact between the "commercial" Whig interests and both Whig and Tory "landed" interests. By supporting land prices, the bargain led to increased investment in agriculture, and (possibly counter-intuitively) the decline of the agricultural labor force. Increased food prices may have reduced the real wage of industrial labor (Floud and McClosky, 1994). Although agricultural output increased in Britain, the population grew even more rapidly, and Britain became increasingly dependant on food imports, particularly from the U.S.

Jefferson was well aware of the implications of the Walpole bargain. His reading of the works of Henry St. John, Viscount Bolingbroke, led him to believe that the land-capital bargain led to corruption, as well as the filling of Parliament by placemen. In fact, Bolingbroke's arguments against Walpole were, to some degree, invalid, since the compact did make it possible for Britain to manage its debt, fight its wars and create an empire. Bolingbroke's logic was, however, valid for the U.S. Hamilton's attempt in 1793 to recreate Walpole's system would have necessitated both a land tax and tariff protection. Since U.S. imports were primarily manufactures, a tariff would protect the scarce factor, capital, associated with these imports. In Jefferson's view, this would have disadvantaged the landed interest. By creating an agrarian coalition, essentially of the Southern slave-owning landed interest, and western free farmers, Jefferson created a long-lasting compact under which the U.S. became the food supplier for Britain. Just as the Walpole compact persisted until 1846, so did Jefferson's agrarian coalition survive until 1860.

At that point, the southern demand for expansion to the Pacific destroyed the Jeffersonian-Jacksonian Democracy.

The aftermath of the Civil War created a new coalition, of commercial interests and industrial labor, as represented by the presidential victory of the Republican, McKinley, over the populist Democrat, William Jennings Bryan in 1896. From this perspective, U.S. politics in the period 1896-1956 can be interpreted in terms of a single factor dimension, *capital*, since we can regard the interest of land to be generally in opposition to capital. Thus, for the period from 1896 until the 1930's, the inclination of Republicans for the preservation of a hard money or gold standard rule was in opposition to the need for available credit in the agricultural sector.

In the 1960's, agitation for greater civil rights brought the labor axis into prominence. L. B. Johnson's positioning on this axis contributed to his great electoral victory in 1964, but also opened the way for the Republican Party to adopt an increasingly conservative position on the social dimension and gain political control in the southern states (Miller and Schofield, 2003).

In Britain, since 1846, all these factors have played a rôle at various times. For example, McLean (2002) has observed that the success of the Reform Bill, under the Conservative, Disraeli, in 1867, depended on beliefs about Empire. For industrial labor, "Empire" meant the opportunities for emigration and a better life in the Dominions of America, Canada and South Africa. By using the rhetoric of "Empire," the conservatives could hope to appeal to working class voters. In fact, such rhetoric was an important as-

pect of Thatcher's electoral success in the 1980's. Indeed, recent empirical analysis of electoral beliefs in Britain (Schofield, 2005a) make it clear that in addition to the usual economic (or "capital") axis, it is necessary to employ a second "social" axis. This axis incorporates "civil rights," but is also characterized by attitudes to European Union. Conservative MP's responses to a questionnaire on this topic suggest that they are strongly opposed to the incorporation of Britain within the European Union. In other words, political beliefs, that were founded on an economic rationale dating back over a hundred years, are still relevant, in a somewhat different form, today.

This narrative suggests that preferences, or interests, on economic factors, or dimensions, play an important role in political decisions. However, the manner in which these interests are transformed into beliefs is, to a considerable degree, still a matter of conjecture. Indeed, how these beliefs take political expression seemingly depends on the perception and strategies of political leaders such as Walpole, Peele, Disraeli, Franklin, Washington, Madison, Jefferson, Lincoln or Johnson.

It has been a long standing controversy whether political economy is best described by the concepts of "equilibrium" or "chaos" (Austen-Smith and Banks, 1998, 1999). In his later work, after 1980, Riker saw chaos as fundamental property, and focused on key "contingent" events in U.S. political history, like the Ratification of the U.S. Constitution in 1787-88, or the onset of the Civil War in 1860-61.

The brief description of British and U.S. political history offered here sug-

gests that neither equilibrium nor chaos are accurate descriptions of social choice. Instead, there can be long periods during which political economic equilibrium is quite stable. However, equilibria can be destroyed and dramatically transformed at key historical periods, as described above. Denzau and North (1994) have adopted ideas from evolutionary theory in biology (Eldredge and Gould, 1972) and from the notion of "informational cascades" (Bikhchandani, et al., 1992) and proposed the concept of "punctuated social equilibrium." As they suggest, this idea is an analogue in the social realm of Kuhn's notion of scientific revolution (Kuhn, 1962). At least intuitively, the notion of "punctuated social equilibrium" would seem entirely relevant to the puzzle of the collapse of the Soviet Union that so intrigued Olson. Indeed, it is entirely possible that the apparent relative decline of the U.S. and Britain (which seemed so obvious to Olson in 1982 and Kennedy in 1987) has been reversed, as the underlying political economic equilibrium has been transformed in these two countries since 1980.

The chapters in Schofield (2006) address these central questions, raised by North, Olson and Riker. It provides a more detailed overview of the differing political economic equilibria in Britain and the U.S. In particular, the chapter discusses how Walpole's "equilibrium" or balancing of Whig and Tory interests set the scene for British imperial expansion, and gave ammunition to Jefferson in his campaign against Hamilton. The "institutional" narratives then go on to consider the constitutional transformations in the U.S. in the key periods of the Revolutionary War, 1776-1783, the formation

of the two-party system in 1787-1808, and the period, 1857-1861, leading up to the Civil War.

The general argument is that the theoretical accounts, posing chaos against centrist equilibrium miss the underlying feature of dynamic stability, in the U.S. in particular. For example, Miller and Schofield (2003), suggest that political parties in the U.S. slowly cycle in the two-dimensional policy space that was created in the period just prior to the Civil War. In certain periods (such as 1896-1920) the principal axis is one of land/capital. However, in the more general situation, which has held from 1964 to the present, a second dimension, *the social axis* (a reflection of the free labor/slave axis) is also necessary for understanding political change

The electoral model suggests that the kind of analysis performed by political leaders such as Franklin, Madison, Jefferson, Lincoln and Johnson transforms social uncertainty into the much more amenable aspect of risk. Thus plurality, or majority decision-making allows such risk taking political agents to create solutions to dangerous political quandaries. It is for this reason that I use the term *architect of change* to refer to such agents of political transformation

The narrative presented in this section suggests that when beliefs rather than simply preferences or interests are relevant, then democratic systems based on majority rule can maintain a kind of structural stability, balanced between chaos and the rigidity of permanent equilibrium. The following sections of the paper develop the formal model.

5 The Spatial Model of Politics

The electoral models based on the early work of Hotelling (1929) and Downs (1957) essentially supposed that the motivation of parties is to win a majority of the votes or seats. The predictions of these Downsian, vote maximizing, models vary, but they tend to suggest that parties converge to an electoral center. The simplest model assumes two parties and a one-dimensional policy space, X. If voters "deterministically" choose the party with the nearest policy position, then vote maximizing leads both parties to position themselves at the median of the electoral distribution. In higher dimensions, two party pure strategy, vote maximizing Nash equilibria generally do not exist and instability may occur. However, mixed strategy Nash equilibria do exist and lie inside a subset of the policy space known as the *uncovered set.*[2] These "attractors" of the political process are centrally located with respect to the distribution of voters' ideal points. Such a conclusion seems at odds with empirical evidence that parties do not exhibit such strong convergence to the electoral center.[3]

Empirical analyses of presidential elections (Poole and Rosenthal,1984) using "stochastic" vote models also found no evidence of convergence to an electoral center. A formal basis for such stochastic models is provided by the notion of "Quantal response equilibria" (McKelvey and Palfrey, 1995).

[2] McKelvey 1986; Banks, Duggan and LeBreton, 2002.

[3] Adams, 1999a, b, 2001; Adams and Merrill, 1999; Merrill and Grofman, 1999; Adams, Merrill and Grofman, 2005.

In such models, behavior of each voter is modeled by a vector of choice probabilities.[4] A standard result in this class of models is *the mean voter theorem* -that all candidates converge to the electoral mean when they are motivated to maximize vote share (McKelvey and Patty, 2004) or plurality in the two party case (Banks and Duggan, 2005). An illustration of non-convergence of presidential candidate positions is provided in Figure 2. This presents an analysis of the distribution of voter preferred points, obtained from the national election survey for the Presidential election of 1964, together with estimated positions of the candidates, Johnson and Goldwater. It can be seen in the figure that the "estimated cleavage line" does not go through the origin, indicating asymmetry of some kind between the two candidates.

[Insert Figure 2 here]

Research for elections in the Netherlands,[5] Britain,[6] Israel,[7] Italy[8] and the United States[9] has constructed multinomial conditional probit (MNP) and logit (MNL) models and shown that the addition of *candidate or party valence* (Stokes, 1992) adds to the statistical significance of the estimations. Valence, λ_j, is the electoral perception of the "quality" of a candidate or

[4] Hinich 1977; Enelow and Hinich 1982, 1984, 1989; Coughlin 1992; Lin, Enelow and Dorussen, 1999.

[5] Schofield and Sened, 2005a, 2006.

[6] Schofield, 2004, 2005a, b. See Alvarez and Nagler, 1998; Alvarez, Nagler and Bowler, 2000 for related work.

[7] Schofield and Sened, 2005b, 2006.

[8] Giannetti and Sened, 2004.

[9] Schofield Miller and Martin, 2003; Miller and Schofield, 2003; Schofield, 2006.

party leader of party, j. In empirical models this valence can be assumed to be independent of the position of the party or candidate, and simply reflects the overall degree to which the party is perceived to have shown itself able to govern effectively in the past, or is likely to be able to govern well in the future.(Penn, 2003). The early empirical model of Poole and Rosenthal (1984) on U.S. Presidential elections included these valence terms and noted that there was no evidence of candidate convergence. Formal models of elections incorporating valence have been developed recently (Ansolabehere and Snyder, 2000; Aragones and Palfrey, 2002, Groseclose, 2001), and the partial results that were obtained suggested that convergence to an electoral center was unlikely.For xample, Figure 3 gives an estimate of party positions in the Israel Knesset in 1996, showing the tendency of parties to align along a principal electoral axis.

[Insert Figure 3 here]

The previous empirical analyses have now been complemented by theoretical results (Schofield, 2007a,b,c) which give cause to believe that divergence in policy position is generic. Since it is usual to assume in empirical models that the stochastic component of the model is associated with errors or disturbances that have the "Type I extreme value distribution" (Dow and Endersby, 2004; Train, 2003), this assumption is imposed on the formal model. The Theorem obtains the necessary and sufficient conditions for *the mean voter theorem* to be valid when the candidates have differing valences. These conditions are expressed in terms of a convergence coefficient that can be

computed from the parameters of the empirical model, namely the valence differences and the variance of the electoral distribution. When the sufficient condition is satisfied, then all candidates will adopt vote maximizing positions at the electoral mean. When the necessary condition fails, then no candidate will adopt such a position, and the candidate with the lowest valence will chose the most radical policy position. This formal model has been extended recently by Miller and Schofield (2006), Schofield and Miler (2006) and Schofield and Cataife (2006) to take account of the influence of activists on party and candidate positioning. See also Figure 4 for an illustration of how activism will pull both candidates away from the electoral origin.[10]

[Insert Figure 4 here]

6 Developing Superior Models

The stochastic spatial model is a powerful tool for studying the interaction between activists, political candidates and the electorate in a representative democracy. The proposed research is directed at the analysis of the relationship between electorally induced preferences and voting behavior by representatives in two different federal systems. Electorally induced policy preferences of Presidential candidates in the United States and of national parties in the European polities in the can be estimated using multinomial conditional logit methods.

[10] See also Schofield, 2002; Schofield Miller and Martin, 2003; Miller and Schofield, 2003; Poole, 2005.

One of the long standing puzzles in the study of U.S. politics is why precisely the plurality or majoritarian feature of the U.S. electoral system generates a two party structure.[11] I conjecture that the plurality system of the US gives greater power to activists and this generally restricts political competition to.a two-party situation.

The use of proportional electoral methods can be seen as the reason for the greater degree of political "fragmentation" in European polities (Laver and Schofield, 1990) In fact, the stochastic electoral model shows that low valence parties will tend to adopt distinctive positions at the electoral periphery. This can be seen very clearely in the Israel case for example.

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Figure 1. Chaos and Risk.

Figure 2. The US Presidential Election of 1964 with the electoral sample policy positions.

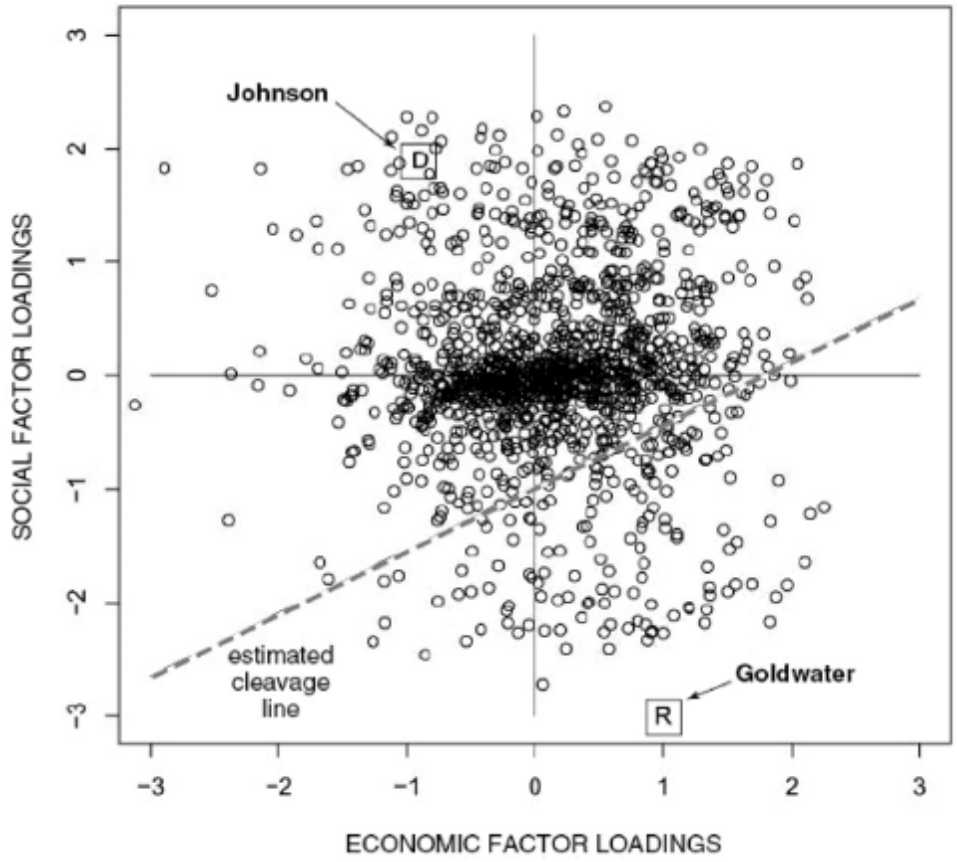

Figure 3. Party Positions in the Israel Knesset in 1996.

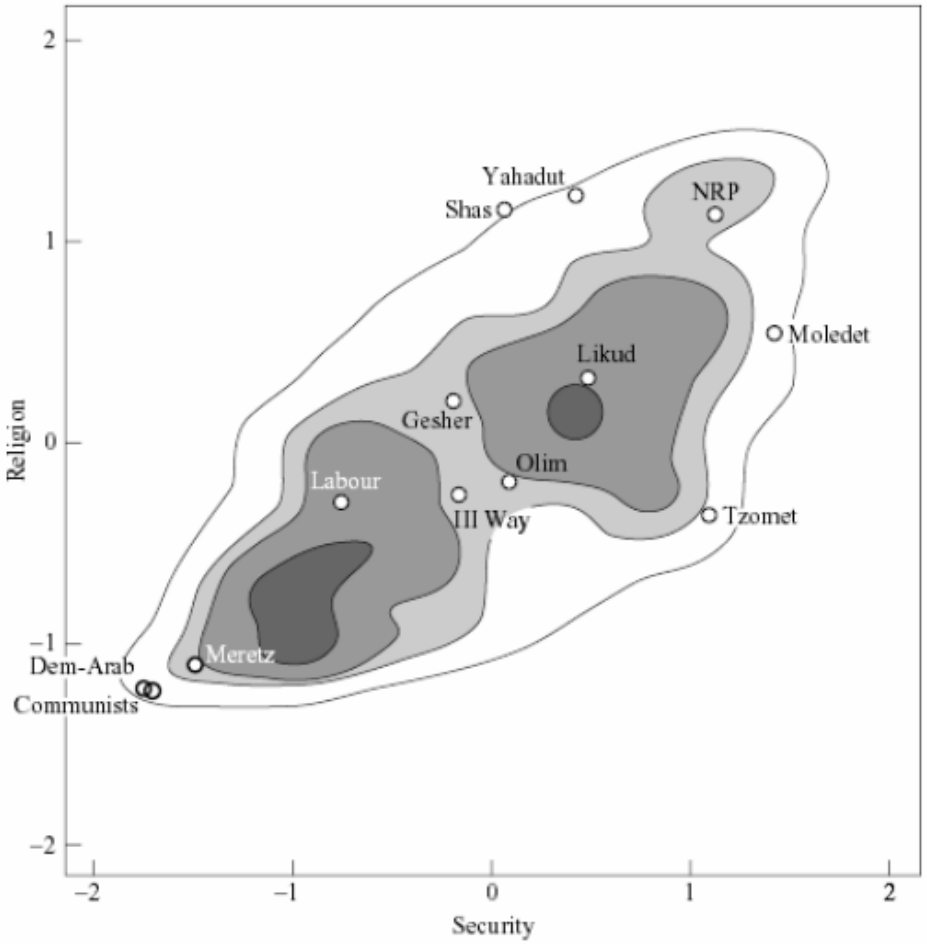

Figure 4. The Influence of Activists in US Elections.