# IDEOLOGUES BEAT IDEALISTS

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We'd all like to vote for the best man but he's never a candidate.— Frank Hubbard

**Abstract**

Our model considers a majority election between an ideologue committed to a fixed policy and an idealist candidate who implements the ex-post socially optimal policy. Voters are aware that their individual rankings of policies may change after the election according to common or idiosyncratic shocks. We show that in the unique symmetric informative pure-strategy Nash equilibrium, the ideologue often beats the idealist, even when this choice hurts *all* groups within the population. Inefficiency arises both for sincere and for strategic voters; we also show that it is more pervasive in the latter case.

# 1 INTRODUCTION

Voters are often aware that their ranking of policies might change after an election. The following question arises naturally: When will they cast their ballots for an ideologue who always chooses a fixed policy rather than for an idealist who chooses a policy in line with public opinion after the election? Consider the following scenario for concreteness.

An election is in the offing, and the result hinges on one central issue: How best to respond to an adversary that will pose a threat if it has weapons of mass destruction (henceforth WMD). Voters are divided on how to respond to this potential danger. Some support a direct confrontation (policy 0), while other less hawkish voters prefer a diplomatic response(policy 1). A simple majority election chooses one of two candidates $B$ and $U$, whose electoral platforms will be described shortly. However voters are aware that their rankings of policies 0 and 1 can change *after* the election owing to either common or idiosyncratic preference shocks. The two types of shocks are mutually exclusive, i.e. only one type will hit any electorate. The next paragraph describes these shocks in detail. The elected candidate then picks one of the two policies 0 and 1. A voter gets a unit of utility if and only if this is his new preferred policy.

DESCRIPTION OF SHOCKS:    With some probability conclusive evidence will come to the fore, either for or against the said opponent being a threat, and cause all voters to agree on what the right policy is; this we call a "common" shock. To illustrate, if it is discovered that the enemy is close to developing WMDs then even the pacifist prefer war; similarly, everybody prefers a diplomatic response when there is no doubt that the adversary is technologically incapable of producing WMDs. However it is more likely that such conclusive public evidence will be absent and shocks will be "idiosyncratic" as opposed to common, causing voters to change their rankings independently of one another.

THE CANDIDATES:    $B$, is the ideologue/biased candidate who implements policy 0 irrespective of the post-shock rankings; $U$, is the idealist/unbiased candidate who credibly promises to wait until voters learn their final rankings, and to then pick the policy preferred by the majority. Who stands a better chance of winning a (simple) majority election? One might expect U to be the natu-

ral choice, especially when there is a significant probability that policy-0 will be bad for *all* voters. (Note that in the case of a common shock, U always implements what everyone prefers.) We find, perhaps counterintuitively, that voters may prefer *B*, thereby committing to a policy rather than waiting to learn their final rankings. Political satirist Frank Hubbard's quip, quoted at the start of the paper, could be turned on its head — (Often) we wouldn't like to vote for the best man even if he were a candidate!

The next three paragraphs explain the intuition for the rational voter, where the effect is more striking[1]. Henceforth the "type" of a voter at any date is defined to be his preferred policy(0 or 1) at that date. Without loss of generality, suppose that each voter is more likely to be type-0 than type-1 in the initial draw. For simplicity assume for now that shocks are towards 1 only— Either there is a common shock making all voters type-1's, or idiosyncratic shocks change each type-0 voter into type-1 with a small probability $p$ independently of the other voters. Idiosyncratic shocks are more likely than a common shock.

Unless the vote is "close", i.e unless type-0 and type-1 voters are present in almost equal numbers in the initial draw, idiosyncratic shocks are unlikely to change the majority. (On average only a proportion $p$ of type-0's changes after an idiosyncratic shock; if $p$ is small the same group will be in a majority both before and after an idiosyncratic shock.) Each voter's utility is higher if U wins, because (i) U chooses policy 1 if the common shock hits, and (ii) idiosyncratic changes are unlikely to matter because close elections are *ex-ante* unlikely.

Strikingly enough, B is more likely to win in equilibrium, when type-0's vote U and type 1's vote B. Let us consider a rational type-0 voter. Although he does not know the exact proportion of types in the draw by nature, he is aware that his vote matters only when he is pivotal, i.e. nature chooses type-0's and type-1's in almost equal numbers initially. In this case the election is close and if there are idiosyncratic shocks, then a majority of voters is very likely to become type-1. Each type-0 voter thinks that, conditional on idiosyncratic shocks, he himself won't change(because $p$ is small) while enough others will flip; if this happens, U will choose policy 1 at the next date whereas our voter would still want policy 0. Therefore he votes for the ideologue committed to policy 0 to

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[1]We later define the sincere and the rational voters separately. Proofs in section 3 cover the case of the sincere voter.

guard against *other* type-0 voters changing their views later. When we compare our work to previous work on commitment bias, this will emerge as one of our key insights: This inefficiency hurts *both* groups within the population, including the current majority. In other words even a type-0 is better off under U. But he chooses B because *U is bad precisely in those cases where his vote matters.*

The logic underlying our result works for both large and small populations. Voters too can be either rational/strategic (vote according to a Nash equilibrium) or sincere (vote as if there were no other voters). Interestingly enough, we show the inefficiency is aggravated with strategic voting. To the extent one finds strategic considerations to be more important in small groups we point out why committees and boards may be subject to more pervasive inefficiency. Where large elections are concerned, the closer the contest the more plausible is such an effect.

Our model also sheds light on the following question: When does an electorate choose to defer a decision so that a more informed choice is possible? Choosing B is equivalent to picking a policy immediately; picking U amounts to waiting until events unfold and a more informed choice is possible. Our work shows that even when a common shock is quite likely, the electorate might commit hastily. Examples of public referenda fit this formulation quite naturally, as the following incident illustrates. In October 1992, the Swedish Nuclear Fuel and Waste Management Company (SKB), an organization charged with the responsibility of safely disposing nuclear waste, proposed to conduct a study to determine the *feasibility* of locating a repository. One of the towns to be evaluated was Storuman, in northern Sweden. The findings of the SKB would not be binding on the city and if Storuman were deemed feasible it would still be up to the city council to decide, in keeping with public opinion and the interest of the city, whether to allow SKB to actually build a nuclear waste dump. A 1995 referendum asked "whether SKB should be allowed to continue the search for a final repository location in Storuman". The outcome was an overwhelming 'no' (70.5%): Voters opted to reject it outright rather than allow more information to be disclosed by a *non-binding* scientific study. Our model suggests that voters might have been driven by the fear that even if they themselves are not persuaded, others could change their minds. Our penultimate section discusses further implications of the model, including that for candidate entry.

## 1.1 RELATED LITERATURE

Our work is related to several strands of literature. The first link is to the status-quo bias against reforms, especially the work of Fernandez and Rodrik[FR]. The second link is to a long literature on spatial competition, especially the recent work of Callander. Finally this forms part of the extensive literature on pivotal voting and information aggregation.

The status-quo bias in reform is well documented— welfare-improving reforms are defeated by the status-quo; see for example Samuelson and Zeckhauser. FR[2] provides an explanation in the context of trade reforms, to our knowledge the first that does not appeal to risk-aversion. Their explanation is based on the identity of the winners being unknown at the time of voting. All voters of the majority group are *ex-ante identical* and hence maximise the expected value of the *group*, behaving in effect like the representative voter of the group.

Our goals are different: FR considers why desirable reforms may not be adopted, whereas our main application shows how ideologically committed candidates may have an edge over a candidate who promises to update his policy stand in reponse to changed views of the elctorate. From a substantive point of view, our mechanisms are very different — in this paper the strategic interaction of voters generates inefficiency, whereas FR's inefficiency is independent of strategic considerations. Indeed, both rational and sincere voting generate the same results in FR because each voter has a weakly dominant strategy to vote for the policy he prefers in expectation whether or not he is strategic.

This allows us to contrast the predictions for sincere and rational voters. We find that an electorate with strategic voters does no better than one with sincere voters, and indeed strictly worse in many situations. Strategies of others are not relevant for a voter in FR; effectively, each voter has a choice between two lotteries that are independent of the types and strategies of other voters. In contrast, candidate U's policy in our model is contingent on the electorate's final rankings; our rational voter must therefore take others' equilibrium strategies into account. Even when we are faced with the same preference shocks, it is possible that the electorate chooses B but if any individual alone

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[2]Roland Benabou first drew out attention to this paper, and pointed out a very natural link between our work and theirs.

were confronted with the choice, he would choose U. Each voter is wary that others might change their minds. The second substantive distinction is that inefficiency survives in our model even when the "idiosyncratic" shock is unlikely to precipitate a large change. Our model is also different in that voters choose between candidates rather than policies; we also add a common shock both for realism and robustness.

This brings us to related literature that uses the concept of strategic voting, first introduced in the '*Theory of Voting*' by Farquharson. More recently this has been exploited by Austen-Smith and Banks, Feddersen and Pesendorfer, and Meirowitz to analyse information aggregation. Feddersen et. al. finds that in a large election a vanishingly small proportion of the electorate votes informatively[3], but information is almost perfectly aggregated and the efficient decision is taken. We show that the equilibrium may not be efficient, even when all agents vote informatively. Our model does not have a true state that all voters are trying to learn. The conduit through which pivotal voting affects the vote is also different is our model. A voter's ranking of alternatives does not depend on the others' types or rankings; however being pivotal is informative about the distribution of opinions at the next date, and therefore about $U$'s policy.

Our work may also be linked to models of candidate location, notably the pioneering work of Downs and Hotelling. In our model a candidate with an extreme position beats an unbiased candidate. While the valence aspect of voting has long been discussed informally in political science (Stokes 1963 is a standard reference), Callander pioneered the idea that candidates want to be perceived as ideological. Thus candidates do not converge to the median to avoid appearing as panderers. Details on this literature are contained in a subsequent section. Our model provides a different reason for being committed to an ideology. Finally we should mention Friedenberg et. al.; in spite of the the similar tilts the model and mechanism are very different. Both papers argue that ideologically committed candidates can often do better than idealistic or pragmatic ones.

The remainder of our paper is organized as follows: Section 2 puts our contribution in perspective with illustrative examples; Section 3 sets up the model, presents the decision problems of the sincere

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[3]To vote informatively is to condition the vote on one's signal. This amounts to ignoring trivial equilibria where all voters cast their ballots for the same candidate.

and pivotal voters, and characterizes the resulting equilibria, and shows simulations for a small number of voters. Section 4 looks at situations where the voting rule at the initial date differs from that used at the subsequent date; Section 5 discusses some related issues; and Section 6 concludes.

## 2  NUMERICAL EXAMPLE

We begin with an example that illustrates our key intuition and results. It is a special case of the model laid out in the next sections because, it restricts attention to unidirectional shocks. This is done to simplify calculations.

## Example 1

There are 101 voters, and two alternative policies, 0 and 1. At date-0, the initial date, nature chooses each voter's type, which is the policy he ranks higher. Types are drawn independently — type-0 with probability .75, and type-1 with probability .25; each voter learns his own type. Voters understand that when it is time to implement a policy at the next date (date-1), their ranking of policies could be different. Each voter gets a utility of 1 if his preferred alternative (in the new ranking) is implemented, and 0 otherwise. There are two candidates — $U$, the unbiased candidate, behaves like the social-planner and implements the policy that the majority wants at date-1; the other candidate $B$ always implements policy 0.

After the election one of two shocks is possible: With probability 0.2, a common shock causes all voters to switch together to type-1; otherwise each type-0 voter independently or idiosyncratically changes to type-1 with (conditional) probability $p = .1$ (with probability $1 - p = 0.9$ he remains a type-0). One-sided shocks simplify calculations; neither the intuition nor the proofs hinge on it, as will be apparent. Note that U is the efficient choice.

The utility of a type-0 voter from voting B is $1 - 0.2 - 0.8 * 0.1 = 0.72$, since he gets a utility of 1 as long as he stays a type-0 and nothing if he switches. The two negative terms above correspond to the two ways in which he can switch: (i) in response to a common shock (probability 0.2) and (ii)

in response to an idiosyncratic shock (probability 0.8 times $p = 0.1$). Conditional on being pivotal, his utility from voting U is $1 - 0.8 * 0.9 * (1 - (0.9)^{50}) \approx 0.28$. This is derived as follows. If there is an idiosyncratic shock(probability 0.8) when he is pivotal, the probability that at least one of the other type-0s changes is $(1 - (0.9))^{50}$; he stays at 0 with probability 0.9. If his vote matters, then an idiosyncratic shock will trigger *critical* defections and he loses unless he is among those switching. Since $0.28 < 0.72$, he votes for $B$ who wins with very high probability[4], even when the probability of idiosyncratic change is very low!

Let us now check that $B$ gives all voters, including type-0's, a lower expected utility than $U$. Type-0's are expected to be in the majority at both dates with very high probabilities[5]; therefore a type-0 knows that his preferred policy will be implemented by $U$ at the next date with probability close to 1, whereas $B$ does so with probability 0.72 only. So a sincere type-0 voter , who does not condition on being pivotal, will vote for U and avoid the inefficiency.

If candidate B is elected, with probability at least 0.2 the policy chosen is bad for the everyone; this gives a sizeable lower bound on the inefficiency[6]. It might appear at first glance that what the rational voters should try to guard against is the common shock towards 1, when B proves bad for everybody; but the logic of voting says otherwise!

In FR each voter knows the probabilities with which he prefers policies 0 and 1; he votes for that which gives the highest expected utility. This is a weakly dominant strategy, even when every voter assigns positive probability to being pivotal. Thus the logic and effects are the same irrespective of whether voters are sincere or are rational (play as in a Nash equilibrium). Our framework allows us to distinguish between these two alternative assumptions about voters.

Inefficiency a la' FR is possible only when the efficient policy hurts the current majority on average; we refer to this as the *type I* inefficiency. In terms of our model, an idiosyncratic swing in rankings must be large enough to change the balance of power. If $p$ is small then there cannot be any inefficiency in FR. In contrast, the inefficiency displayed by our voter is more pervasive— it

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[4]Nature's draw is almost certain to result in type-0's being in a majority at date 0

[5]It can be checked that if the type-0's are in a majority at date-0, they can become a minority with probability of the order of $10^{-23}$.

[6]The majority is most likely to switch only when there is an common shock towards of policy 1.

can happen even when idiosyncratic shocks are extremely unlikely to change the balance of power in expectation. (Recall that common shocks tilt all voters towards U, and cannot be responsible for the electorate choosing B.) We refer to this as *type-II* inefficiency. A combination of two features— voting over candidates instead of policies, and equilibrium considerations — results in this *type-II* inefficiency, although either one alone would not do so.

## 3  THE MODEL

We present below a simple model, chosen with analytical tractability in mind. There are two dates($\tau = 0, 1$), an odd number[7] of voters in $S = \{1, 2, ..., 2n + 1\}$, $(n > 1)$ and a binary policy space $A = \{0, 1\}$. We now define what we mean by "type".

DEFINITION: Voter $i$'s type $t_i^\tau \in A$ at date-$\tau$ specifies the policy he ranks higher at date-$\tau$.

Implicitly the above definition assumes for simplicity that there are no ties. At date-0, nature draws each voter's initial type $t_i^0 \in \{0, 1\}$ from a Bernoulli distribution with $\Pr\{t_i^0 = 0\} = q \in (0.5, 1)$. Each voter's type at date-0 is private information: It seems realistic to say that a voter does not know the exact types of the others, but has a general sense of the dispersion in opinion. Elections are held at date-0 as well. The election is not among policies, but among two candidates — $U$ and $B$. Candidate $B$ is known to be an ideologue committed to policy $0$[8]. After the elections, each voter's type changes to $t_i^1$ according to a stochastic process described shortly. The idealist $U$ credibly promises to implement the ex-post social optimum policy if elected. If policy $a \in A$ is implemented at date-1, voter $i'$s utility is given by

$$u_i(a; t_i^1) = \begin{cases} 1 \text{ if } a = t_i^1 \\ 0 \text{ otherwise} \end{cases}.$$

Utilities are earned at date-1; there is no discounting. Fig. 1 below shows the temporal structure of the game. It is important to note that our voters can use Bayesian reasoning, and the result does not

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[7]Our calculations would be different if we also considered an even number of voters, because then we would also have to deal with ties. However the intuition should go through.

[8]Assuming $q > 0.5$ is without loss of generality since there are two alternatives only. All we need is a candidate who is ideologically committed to the policy that is ranked higher by the majority at date 0.

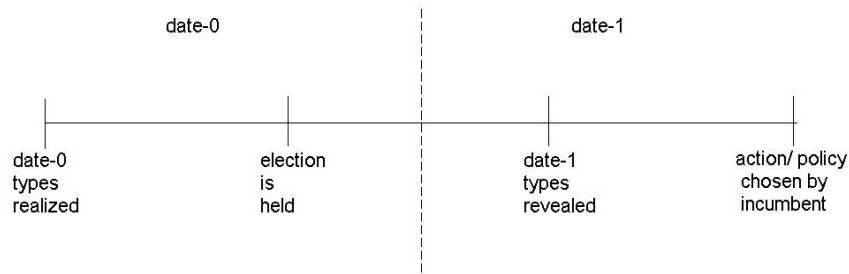arise from their inability to foresee that they may change.



Fig.1: Timeline

Voters' types change over time as new events (shocks)[9] occur. Each shock can be classified according to two criterion — its nature(common or idiosyncratic), and its direction(whether the net movement is towards 0 or 1). With probability $\delta$, a common shock hits; all voters then prefer policy 0 with probability $\pi$ or policy 1 with probability $1 - \pi$. With probability $\mu$, idiosyncratic private shocks arrive. These shocks are towards policy 0 with probability $\phi$ and towards policy 1 with probability $1 - \phi$. An idiosyncratic shock towards 0 makes each $i$ with $t_i^0 = 1$ (henceforth, type-1) switch to policy 0 with probability $p$ independently of the others, while the voters of type-0 are unaffected; if it is towards 1 then all type-1's stay put but each type-0 changes to 1 with probability $p$ independently of the others. Lastly, with the remaining probability$(1 - \delta - \mu)$ there are no shocks and $t_i^1 = t_i^0 \forall i$. Fig. 2 below summarizes the structure of shocks. The relative magnitudes of $\delta$ and $\mu$ have no effect on the result as long as $\delta < \mu$ . In a realistic case, one would expect $\delta$ to be much small than $\mu$ because idiosyncratic changes are much more likely than everyone switching en-masse.

A comment on our model of shocks is in order. There are alternative ways to model an idiosyncratic shock towards 0. One is to have changes occurring in both directions and letting $p$ be the *net* shock towards 0. We chose the other formulation, where 1's become 0 but $0's$ do not become 1's. This simpler formulation permits cleaner algebra and succinct interpretations; all our results should go through with the first formulation[10]. We focus on symmetric pure strategy equilibria; see the

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[9]We should mention that what we call ranking shocks have in the macroeconomics literature been referred to as preference shocks.

[10]One can imagine yet another formulation, where the shocks are zero mean. This interpretation of idiosyncratic change as a random noise is not what we have in mind, but our qualitative implications would not be sensitive to this assumption.

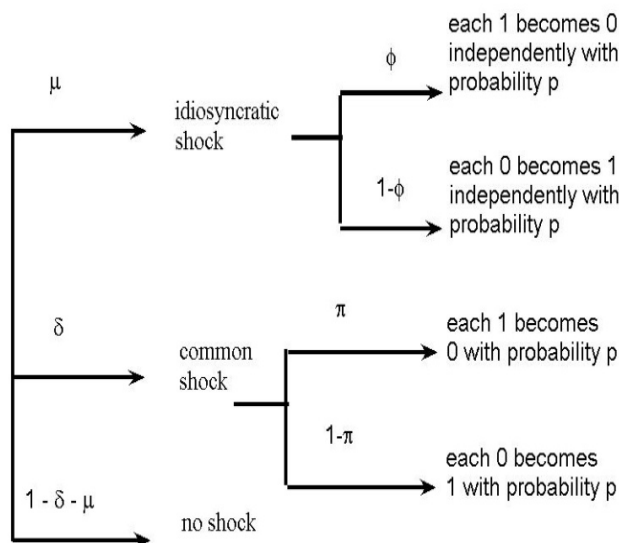penultimate section for a discussion of this point.



Fig. 2: Schematic Representation of Changing Types

## 3.1  THE SINCERE VOTER

The sincere voter does not necessarily play a best response to the strategies of the other voters, but instead picks the candidate who is more likely to agree with him at date-1 given the unconditional distribution of types. When he is not pivotal his vote does not affect the result; when he is indeed pivotal, his vote may differ from that of the rational voter. While falling short of rationality in one of many ways, the sincere voter provides the most natural and useful benchmark against which to compare the rational voter; this also facilitates comparison with previous work. An interesting point emerges from the comparison: When voters are strategic the outcome could be worse than when they are sincere. As we shall see, the sincere voter can only generate one of the two forms of inefficiency discussed below. Another important motivation is that our sincere voter is similar to Harsanyi's rule-utilitarian voter[12].

Since $q > 0.5$, the vote of the type-0 voter determines the outcome of the election in a large population. Proposition 1 below shows that the type-0's vote $U$ when either (1) type-0's are expected to be in a majority at date-1, or (2) type-1's are expected to be in a majority at date-1, and any particular

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type-0 voter is very likely to switch to type-1 at the next date i.e. $p$ is 'high'. He votes $B$ only when the majority is likely to be at 1 at the next date but he is very likely to stay put i.e. $p$ is 'low'. In other words, he prefers to commit and safeguard his interests today if and only if he thinks he will be in the minority at the next date.

**PROPOSITION 1:** *Let $q \in (0.5, 1)$ and suppose n is large enough. Define $p^* := \frac{1}{2}\left(1 - \frac{\delta(1-\pi)}{\mu(1-\phi)}\right)$.*

*(i) If $q(1-p) < 1/2$, sincere type-0 agents strictly prefer to vote B(U) according as $p \begin{cases} < \\ > \end{cases} p^*$.*

*(When p equals the cutoff $p^*$, they are indifferent between B and U.)*

*(ii) If $q(1-p) > 1/2$, they (weakly) vote U.*

*(iii) The sincere type-1 voters always prefer to vote for U.*

*(iv) When $q(1-p) < 1/2$ and $p < p^*$, the probability that B wins goes to 1 as $n \to \infty$.*

**PROOF :** Let $u_i(C, t_i^0)$ denote the expected utility of voter $i$ when candidate $C \in \{B, U\}$ wins and $i$'s date-0 type is $t_i^0 \in \{0, 1\}$.

SINCERE TYPE-0 VOTER: The expected utility of a sincere type-0 voter $i$ when $B$ is elected is given by

$$u_i(B, 0) = 1 - \mu(1-\phi)p - \delta(1-\pi).$$

Voter $i$ gets 1 except in two cases captured by the negative terms above. The second term is the loss incurred when the voter sways to an idiosyncratic 1-shock and the third term is due to a common 1-shock.

In order to derive the utility $u_i(U, 0)$ we first define the following probabilities. For any pair $(a, b) \in A \times A$, let $Q_b^a(1)$ be the probability that the date-1 majority is at $a$, conditional on an idiosyncratic 1-shock and $t_i^1 = b$. Similarly $Q_b^a(0)$ is the probability that the majority is at $a$, conditional on an idiosyncratic 0-shock and $t_i^1 = b$. Note that the superscript denotes the majority, the subscript denotes the voter, and the policy in parentheses is the direction of the idiosyncratic shock. Using the

above notation,

$$Q_1^0(1) := \Pr\left\{\left|\{j \neq i : t_j^1 = 0\}\right| \geq n+1 \,\|\, idiosyncratic\ 1\text{-}shock\ ,\, t_i^1 = 1\right\}$$

$$Q_0^1(1) := \Pr\left\{\left|\{j \neq i : t_j^1 = 1\}\right| \geq n+1 \,\|\, idiosyncratic\ 1\text{-}shock\ ,\, t_i^1 = 0\right\}, and$$

$$Q_0^1(0) := \Pr\left\{\left|\{j \neq i : t_j^1 = 0\}\right| \leq n-1 \,\|\, idiosyncratic\ 0\text{-}shock\ ,\, t_i^0 = t_i^1 = 0\right\}.$$

Let $Q_1$ be the probability that type-1's are in a majority at date-0 conditional of voter $i$ being of type-0.

$$Q_1 := \Pr\left\{\left|\{j \neq i : t_j^0 = 0\}\right| \leq n-1 \,\|\, t_i^0 = 0\right\}$$

If $\theta = q(1-p)$ and $\psi = q+(1-q)p$, we have

$$Q_1^0(1) := \sum_{j=n+1}^{2n} \binom{2n}{j} \theta^j (1-\theta)^{2n-j}, Q_0^1(1) := \sum_{j=0}^{n} \binom{2n}{j} \theta^j (1-\theta)^{2n-j},$$

$$Q_0^1(0) :== \sum_{j=0}^{n-1} \binom{2n}{j} \psi^j (1-\psi)^{2n-j}, \ Q_1 = \sum_{j=0}^{n-1} \binom{2n}{j} q^j (1-q)^{2n-j}.$$

When $U$ is elected, the expected utility is

$$u_i(U,0) = 1 - \mu(1-\phi)pQ_1^0(1) - \mu(1-\phi)(1-p)Q_0^1(1) - \mu\phi Q_0^1(0) - (1-\mu-\delta)Q_1.$$

The four negative terms correspond to the potential sources of loss under $U$: (i) when an idiosyncratic 1-shock hits and voter $i$ changes to type-1, while type-0's are a majority; (ii) when an idiosyncratic 1-shock hits and voter $i$ remains 0 but the majority is at 1 at date-1; (iii) the majority is at 1 after an idiosyncratic 0-shock while voter $i$ remains type-0; and (iv) the majority is at 1 in the initial draw given that $i$ is type-0 and there is no shock. Note that $U$ always gives a utility of 1 when a common

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shock hits. The type-0 voter casts the ballot for $B(U)$ if

$$u_i(B,0) \begin{array}{c} > \\ < \end{array} u_i(U,0) \tag{1}$$

$$\Leftrightarrow \mu(1-\phi)p + \delta(1-\pi) \begin{array}{c} < \\ > \end{array} \mu(1-\phi)pQ_1^0(1) + \mu(1-\phi)(1-p)Q_0^1(1) + \mu\phi Q_0^1(0) + (1-\mu-\delta)Q_1$$

$$\tag{2}$$

First note that $q > 0.5 \Rightarrow \lim_{n\to\infty} Q_0^1(0) = \lim_{n\to\infty} Q_1 = 0$; these limits do not depend on the value of $p$. The probability that an arbitrary voter is type-0 at date-1 is $q(1-p)$. Define the random variable $X_0(1) \sim \text{Binomial}(2n, q(1-p))$ as the number of $j$ out of $2n$ (not $2n+1$) who have $t_j^1 = 0$ after an idiosyncratic 1-shock; then

$$\Pr\{X_0(1) \ge n+1\} = \Pr\left\{\frac{1}{2n}X_0(1) \ge \frac{1}{2} + \frac{1}{2n}\right\}.$$

The Weak Law of Large Numbers guarantees that $\lim_{n\to\infty} \Pr\left\{\left|\frac{1}{2n}X_0(1) - q(1-p)\right| < \varepsilon\right\} = 1$ for any $\varepsilon > 0$.

Case 1 : If $q(1-p) > 0.5$, there exists a small enough $\varepsilon > 0$ so that

$$Q_1^0(1) = \Pr\left\{\frac{1}{2n}X_0(1) > \frac{1}{2} + \frac{1}{2n}\right\} \ge \Pr\left\{\left|\frac{1}{2n}X_0(1) - q(1-p)\right| < \varepsilon\right\} \uparrow 1.$$

It follows that

$$q(1-p) > 0.5 \Rightarrow \lim_{n\to\infty} Q_1^0(1) = 1 \text{ and } \lim_{n\to\infty} Q_0^1(1) = 0.$$

Substituting the above limits in (2), asymptotically $i$ strictly prefers to vote $B$ iff $\delta(1-\pi) < 0$, which is never the case.

Case 2 : When $q(1-p) < 0.5$, the date-1 majority is expected to be at 1 and by a logic similar

to Case 1 above it follows that

$$q(1-p) < 0.5 \Rightarrow \lim_{n\to\infty} Q_0^1(1) = 0 \text{ and } \lim_{n\to\infty} Q_1^0(1) = 1.$$

From (2), $i$ strictly prefers to vote for $\begin{Bmatrix} B \\ U \end{Bmatrix}$ for large $n$ according as $p \begin{Bmatrix} < \\ > \end{Bmatrix} \frac{1}{2}\left(1 - \frac{\delta(1-\pi)}{\mu(1-\phi)}\right).$

SINCERE TYPE-1 VOTER: A type-1 voter's expected utility from $B$ is given by

$$u_i(B,1) = \delta\pi + \mu\phi p.$$

He gets a utility of 1 iff he switches to 0 himself, in response to either an idiosyncratic or a common 0-shock. Define the following quantities — $P_b^a(0)$ is the probability that the majority is at $a$ following an idiosyncratic 0-shock and $t_i^1 = b$; $P_b^a(1)$ is the corresponding probability when the idiosyncratic shock is towards 1 rather than 0. His utility from voting $U$ is

$$u_i(U,1) = \delta + \mu\phi p P_0^0(0) + \mu\phi(1-p)P_1^1(0) + \mu(1-\phi)P_1^1(1) + (1-\mu-\delta)Q_1.$$

As before, $Q_1$ is the probability that the initial draw has more $1-$types. By arguments similar to the ones made for the sincere 0-voter above,

$$q > 0.5 \Rightarrow \lim_{n\to\infty} P_0^0(0) = 1 \text{ and } \lim_{n\to\infty} P_1^1(0) = 0 \text{ and } \lim_{n\to\infty} Q_1 = 0.$$

Substituting the above limits in equation (2), we see that asymptotically a sincere voter $i$ of type 1 casts his ballot for B(U) when

$$\delta\pi \begin{Bmatrix} > \\ < \end{Bmatrix} \delta + \mu(1-\phi)\lim_{n\to\infty} P_1^1(1).$$

Case 1: When $q(1-p) > 0.5$, we have $\lim_{n\to\infty} P_1^1(1) = 0$. Voter $i$ strictly prefers B(U), for large

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$n$, according as $\delta\pi \begin{cases} > \\ < \end{cases} \delta$. Since $\delta(1-\pi) \geq 0$, he always (weakly) prefers to vote for $U$.

Case 2: When $q(1-p) < 0.5$, we have $\lim_{n\to\infty} P_1^1(1) = 1$. For large $n$, he votes for $B(U)$

according as $\delta\pi \begin{cases} > \\ < \end{cases} \delta + \mu(1-\phi)$. Since $\delta(1-\pi) + \mu(1-\phi) \geq 0$, he always (weakly) prefers to

vote for $U$. (Note that $\delta(1-\pi) > 0$ is a sufficient condition for $i$ to strictly prefer to vote for $U$.)

THE WINNING CANDIDATE:

Consider large $n$. When either (1) $q(1-p) > 0.5$, or (2) when $q(1-p) < 0.5$ and $p > \frac{1}{2}\left(1 - \frac{\delta(1-\pi)}{\mu(1-\phi)}\right)$,

both the type-0's and 1's vote $U$ and he wins with probability 1. When $q(1-p) < 0.5$ but $p <$

$\frac{1}{2}\left(1 - \frac{\delta(1-\pi)}{\mu(1-\phi)}\right)$, the type-0's vote $B$ while the 1's vote $U$; since $q > 0.5$, B is the more likely winner;

his exact probability of winning is

$$Pr\{B \text{ wins}\} = \Sigma_{k=n+1}^{2n+1} \binom{2n}{k} q^k (1-q)^{2n-k} \geq \frac{1}{2} \ \forall n.$$

Furthermore, $Pr\{B \text{ wins}\} \to 1$ as $n \to \infty$. ∎

Fig. 3 summarizes the limiting behaviour of the type-0 voter. In regions II and IV, the type-0 voter elects $U$ because he expects to remain in the majority even if there is an idiosyncratic shock, and has nothing to lose by voting $U$; when there is an common 1-shock, he is better off with $U$ as $B$ would still continue to implement the policy 0; with a common 0-shock, both $B$ and $U$ pick 0. In region I, a majority is expected to prefer policy 1 at date-1; since $p$ is high each type-0 expects to switch and be in the subsequent majority. So he votes for $U$. Finally in region III, the sincere type-0 voter picks the socially suboptimal candidate $B$ because the majority is likely to prefer 1 at the next date, but given that $p$ is small he would probably stay put at 0.
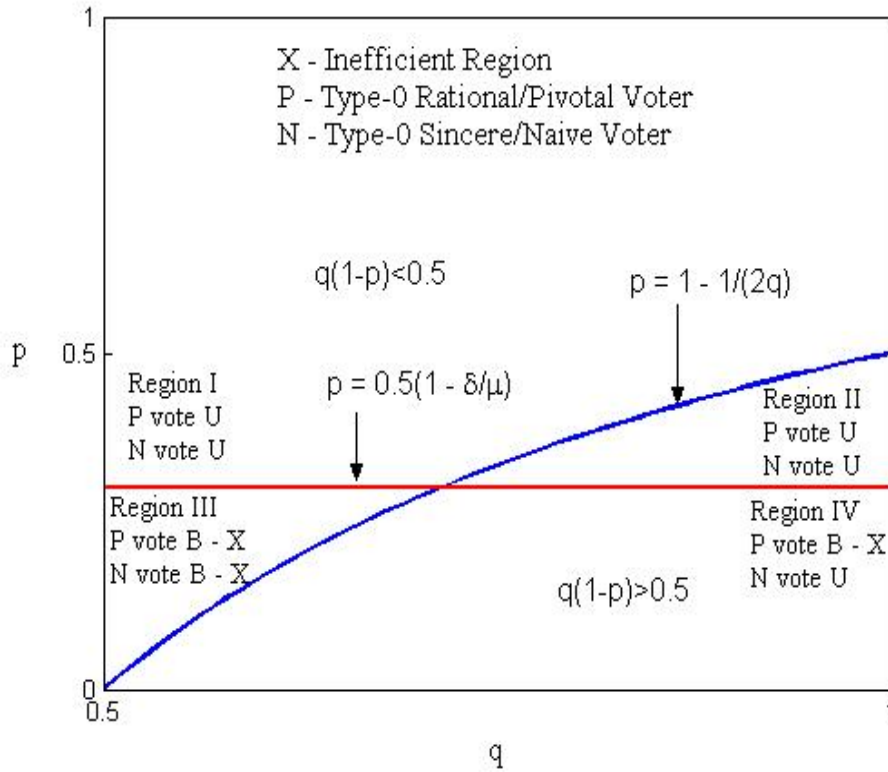
Fig. 3: How Type-0's Vote

## 3.2  THE RATIONAL VOTER

We have seen above that the sincere voter of type $a$ maximises the value of group-$a$, because he is in effect the representative agent of the group. All agents of a group are ex-ante identical, and the probabilities that appear in the decision of the sincere voter are the expected proportions for the representative agent. The probability $p$ of switching can be interpreted as the expected proportion of type-0's who switch when there is an idiosyncratic 1-shock. But the situation is very different when we require the strategies to constitute a Nash equilibrium. We conjecture the following Nash equilibrium in pure strategies : Each voter of type-0 votes $B$, and all type-1's vote $U$; then we solve for the range of parametric values where this is indeed the case.[11]

Let $u_i(c \mid c_0, c_1; t_i^0, \text{piv})$ denote the utility of the pivotal voter of date-0 type $t_i^0$ when he votes

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[11]We ignore trivial equilibria in which all voters support the same candidate. Our focus is on symmetric equilibria in which all voters of a type vote the same way.

for candidate $c$, the type-0's vote for candidate $c_0$ and the type-1's vote for candidate $c_1$. Consider a pivotal type-0 voter. When he is pivotal the utility of voting for $B$ is the same as that for the sincere voter:

$$u_i(B \mid B,U; \ 0, \ \text{piv}) = 1 - \mu(1 - \phi)p - \delta(1 - \pi).$$

The utility of voting for U is now different from that for the sincere voter:

$$
\begin{aligned}
u_i(U \mid B,U; \ 0, \ \text{piv}) &= \quad \delta + (1 - \mu - \delta) + \mu\phi \quad + \mu(1 - \phi)\left\{(1 - p)^{n+1} + p\right\} \\
&= \qquad\qquad 1 \qquad\qquad\qquad - \mu(1 - \phi)(1 - p)\{1 - (1 - p)^n\}.
\end{aligned}
$$

Utility from $U$ is 1 whenever there is an common shock, no shock, or an idiosyncratic 0-shock. If an idiosyncratic 1-shock arrives, the type-0 voter gets 1 if nobody switches or if he himself switches. The pivotal voter prefers $B$ when

$$
\begin{aligned}
u_i(B|B,U;0,piv) \quad &> \quad u_i(U|B,U;0,piv) \\
\Leftrightarrow \delta(1 - \pi) + \mu(1 - \phi)p \quad &< \quad \mu(1 - \phi)(1 - p)\left\{1 - (1 - p)^n\right\}.
\end{aligned}
\tag{3}
$$

To see it graphically for even small n, assume $\pi = \phi$; inequality (1) then reduces to

$$f(p,n) = 1 - 2p - (1 - p)^{n+1} > \frac{\delta}{\mu}.$$

Fig. 4 shows how $f(p,n)$ compares to a threshold of $\delta/\mu$ for different values of $n$. Since $f(n + 1,p) > f(n,p)$ for all $p$ in $(0,1)$,the range of values of $p$ for which the committed candidate wins is growing with $n$; as $n \uparrow \infty$, the negative term $(1 - p)^{n+1}$ goes rapidly to 0, and the condition reduces to $1 - 2p > \frac{\delta}{\mu} \Leftrightarrow p < \frac{1}{2}\left(1 - \frac{\delta}{\mu}\right)$.[12] There exists a $p > 0$ satisfying the above if $\delta < \mu$, i.e. if the probability of an common shock is less than that of a idiosyncratic shock. The only requirement is

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[12]If we turn to the case when there is no common shock, i.e. $\delta = 0$, then 0's vote B if $(1 - p)^{n+1} < 1 - 2p$. Using a quadratic Taylor series expansion, a sufficient condition for this is $1 - (n + 1)p + \frac{(n+1)n}{2}p^2 < 1 - 2p$, or $\frac{(n+1)n}{2}p < n - 1$. i.e. $p < \frac{2(n-1)}{n(n+1)}$. For 7 voters, for example, this effect is observed for $p < 1/3$. Thus with $\delta = 0$, the bias towards commitment is very much a reality even with relatively few voters.

that $\delta < \mu$: the entire population switching is less likely than voters to switch idiosyncratically. So $\delta$ may be quite large.
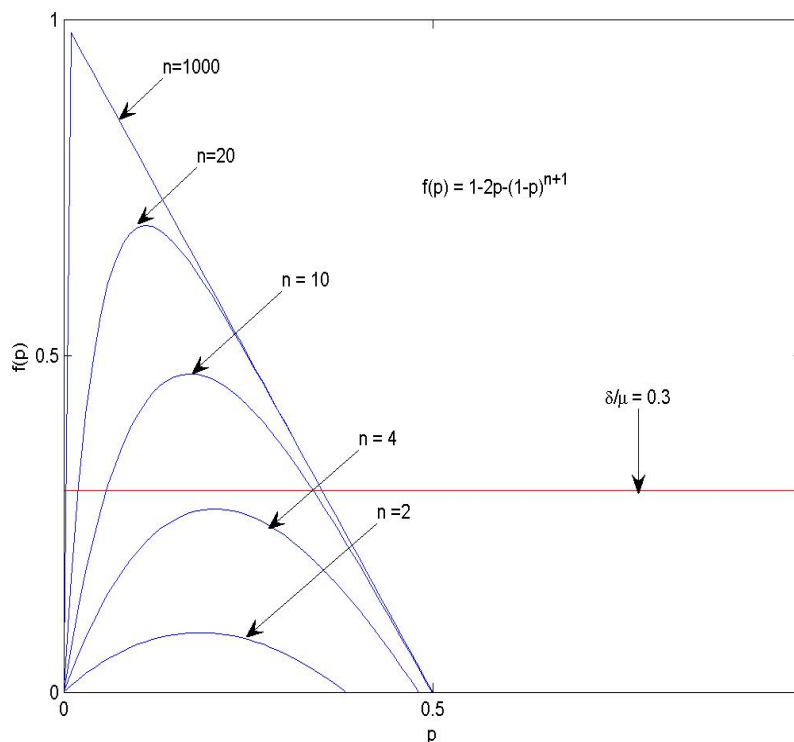


Fig 4: Simulation Results for "Small" $n$

For $n$ large, (3) reduces to approximately

$$\delta(1-\pi) + \mu(1-\phi)p < \mu(1-\phi)(1-p) \tag{4}$$

This inequality admits of an intuitive explanation. The LHS of (4) is the loss from voting for B and getting him elected — the first term is the loss when the entire population switches to type-1 at date 1, the second is the loss when voter $i$ idiosyncratically switches (and finds himself on the wrong side vis-a-vis $B$). The RHS is the loss when $U$ is elected; this loss happens only when $i$ switches idiosyncratically to $i$. The pivotal voter reacts very differently to the possibility of an idiosyncratic switch depending on who is in power — $B$ or $U$. When $B$ is in power, $i$ loses when he himself switches irrespective of what the others do. When $U$ is in power, $i$ is no longer afraid that he will

switch; instead what he fears is staying put when others switch. The above inequality captures exactly this asymptotic trade-off.

**PROPOSITION 2** : *Define* $p^* := \frac{1}{2}\left(1 - \frac{\delta(1-\pi)}{\mu(1-\phi)}\right)$. *When* $q \in (0.5, 1)$ *and* $n$ *is large enough, in the unique symmetric Nash equilibrium in pure strategies is marked by the following:*

*(i) when* $p < p^*$ *all type-0's vote B and all type-1's vote U; B wins with a probability that tends to 1 in large populations;*

*(ii) when* $p > p^*$*, all voters (type-0 and type-1) prefer U to B.*

**PROOF** : Let $p < p^* := \frac{1}{2}\left(1 - \frac{\delta(1-\pi)}{\mu(1-\phi)}\right)$. Inequality (4) above shows that for large enough $n$, the type-0 voters vote $B$ if type-1 voters conform to the conjectured equilibrium strategy. Since $q > 0.5$, the Weak Law of Large Numbers ensures that with a very high probability type-$0's$ are a majority on election day, which in turn implies that $B$ wins.

Finally to show that the above conjecture indeed gives us a Nash Equilibrium, we show that the pivotal type-1's will vote $U$. Recall the definition: $u_i\left(c \mid c_0, c_1; t_i^0, \text{piv}\right)$ is the utility of voter $i$ of type $t_i^0$ when he votes for candidate $c$, provided type-0's vote for candidate $c_0$ and type-1's vote for candidate $c_1$. Expected utility from $B$ is

$$u_i(B \mid B, U; 1, \text{piv}) = \delta\pi + \mu\phi p$$

, while that from $U$ is

$$u_i(U \mid B, U; 1, \text{piv}) = (1 - \mu - \delta) + \delta + \mu(1 - \phi) + \mu\phi(1 - p)^{n+1} + \mu\phi p.$$

Under $\mu = \phi$, type-1 's vote $U$ if $\phi(\mu + \delta) < 1$, which necessarily holds.

When $p > p*$, we can use similar reasoning to conclude that all voters prefer $U$ to $B$. The intuition for this result is as follows. Candidate $B$ is valuable to voter $i$ of type-0 only in as much as he guards against the possibility that policy1 is chosen because others have flipped while $i$ remains unchanged.

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If $p$ is large it means that $i$ is very likely to switch in response to an idiosyncratic shock; so he does not fear being left in the minority.  ■

For large $n$, there are two forms of inefficiencies illustrated above. The first, which corresponds to region III of Fig. 3 and is exhibited by both sincere and rational voters, was discussed in Section 2.1. The difference between the sincere and the rational voter is in region IV: the rational voter prefers the committed candidate even when he expects to remain in the majority following an idiosyncratic shock. Conditional on himself being pivotal, the value of $q$ is irrelevant. In contrast to the decision of the sincere voter for large $n$, his decision depends only on the value of $p$ and not that of $q$. However the socially optimal choice depends on $q$; hence the inefficiency. The interaction among pivotal voters enters through the size of the population: When $n$ is large it is almost certainly the case that, starting from a pivotal situation, a type-0 voter will be in minority if he does not switch following an idiosyncratic shock. The proposition below summarises this.

**PROPOSITION 3 :** *When $p < \frac{1}{2}\left(1 - \frac{\delta(1-\pi)}{\mu(1-\phi)}\right)$ and $p < 1 - \frac{1}{2q}$ , sincere voting results in election of U, while pivotal voting almost surely results in the election of the committed candidate B. If B wins, he implements a sub-optimum policy with at least probability $\delta(1-\pi) > 0$, which is the probability of an common 1-type shock. All sincere voters vote U, whereas the pivotal type-0 and 1 vote B and U respectively. Thus for large n, B wins with a probability arbitrarily close to unity if voters are rational; U wins if they are sincere.*

**REMARK :** *For all n, not necessarily large, and $q > 0.5$ the probability of an inefficient decision is bounded below by $\delta(1-\pi)/2$. This follows since B wins with a probability bounded below by $0.5$ for all n.*  ■

Fig. 4 shows that when there are very few voters, the pivotal type-0's may not prefer B when $p$ is below a threshold. For very small $p$ they (strictly) prefer B if $\delta < 0$, which is impossible. What is

the reason for this difference between a small and a large population? Recall that the rational voter's fear is of being left behind when the vote is close and idiosyncratic shocks hit. In other words, he fears staying put while at least one person on his side defects and destroys the slim majority. With very few voters this fear is swamped by that of an common 1-shock that would render B undesirable for all voters.

# 4  VARYING THE VOTING RULE

The previous sections assumed that the voting rule used at date-0 is the same as the decision rule used at date-1 by the unbiased candidate $U$. Recall that an interpretation of our framework, one that we mention earlier, is the choice between acting now or waiting; with this interpretation it is indeed natural to suppose that the voting rule at 0 and $U$'s rule at 1 are the same. But if we think of it as an electoral contest, one is naturally led to investigate the properties when the two rules are different. This section accordingly looks at an $m - rule$ at date 0, to be defined shortly. In this section, we examine the behaviour of the pivotal voter for a range of such voting rules.[13] We shall continue to focus our attention on large electorates. Suppose now that the committed candidate $B$ and unbiased candidate $U$ contest in an election where $B$ wins if he receives a fraction $m > \frac{1}{2}$ or more of the votes and U wins otherwise.

As one would expect, increasing $m$ from $\frac{1}{2}$ makes it difficult for $B$ to win, and helps mitigate the inefficiency generated by the pivotal voter. However the inefficient equilibrium turns out to be robust in a large range of $(m, p)$ values. To see this, let us re-examine the conjectured equilibrium in which type-0's vote $B$ and type-1's vote $U$, and analyze the pivotal type-0 voter's decision. Recall that $q > 0.5$ means that in the symmetric equilibrium the vote of the type-0 voters is the deciding vote. Under the new voting rule, the pivotal voter conditions on the state of the world in which $k$ voters are of type-0 , where $\frac{k}{2n+1} < m \leq \frac{k+1}{2n+1}$. If $m(1-p) > \frac{1}{2}$ and $n$ is large, by the law of large numbers we know that it is highly likely the majority at date-1 will remain at 0. The pivotal voter

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[13]At the risk of being redundant, we should like to emphasize that while the voting rule has been altered, candidate $K$ remains committed to implementing the policy that is preferred by the majority at date$-1$.

is therefore not conditioning on a precarious majority and this allays his fear of being left behind while the majority switches to policy 1 at the next date. Under this condition we thus find that the inefficient equilibrium conjectured above fails to exist. By providing a buffer between the point the pivotal voter conditions upon and the simple majority, the $m-rule$ reduces the type-0 voter's incentive to protect himself by voting for the committed candidate $B$. When the above condition is not met the inefficient symmetric equilibrium survives.

More formally, the utility of the pivotal voter of type-0 when he votes $B$, given that all 0's vote $B$ and 1's vote $U$ following the equilibrium, is identical to that in the previous section and is given by

$$u_i(B|B,U; \, 0, \, piv) = 1 - \mu(1-\phi)p - \delta(1-\phi)$$

, where we have assumed $\phi = \pi$ for simplicity. The utility of the pivotal voter above from voting $U$ can be written as

$$u_i(U|B,U; \, 0, \, piv) = \delta + (1-\mu-\delta) + \mu\phi + \mu(1-\phi)\{p\Theta_1 + (1-p)\Theta_0\}$$

, where $\Theta_a$ is the probability that the majority prefers policy $a \in \{0,1\}$ at date$-1$, conditional upon starting at date-0 from a situation in which $k+1$ voters are of type-0 and the rest of type-1. The four terms correspond to the situations in which the pivotal voter $i$ of type $t_i^0 = 0$ gets a utility of 1 by voting $B$ and thereby electing him. The first term $\delta$ is for an common shock, when all voters agree on the policy and $B$ implements it ; the next is when no additional information arrives and $i$ continues to be in a $m-$supermajority and thus in a simple majority at date-1; the third term is for the common shock towards 0 , when the majority for 0 is bolstered; the last terms is for the idiosyncratic shock towards 1— $i$ gets 1 iff he switches and the majority swings to 1 or if he stays put and so does the majority. Depending on whether $p$ is large or small relative to the value $m$ , $\Theta_0$ or $\Theta_1$ is much larger than the other in the limit. Let us first consider the case when $p < 1 - \frac{1}{2m}$. By the Weak Law of

Large Numbers, for any $\varepsilon > 0$,

$$\lim_{n\to\infty} P(|\text{fraction of popln. of type-0 at next date} - m(1-p)| < \varepsilon) = 1$$

It follows then that if we choose a small enough $\varepsilon$ then $\lim_{n\to\infty}\Theta_0 = 1$ and $\lim_{n\to\infty}\Theta_1 = 0$. Therefore, the utility from voting for $U$ converges to

$$\lim_{n\to\infty} u_i(U|B,U;0,\, piv) = 1 - \mu(1-\phi)p$$

For the pivotal voter to prefer candidate $B$, it is therefore necessary for $\delta(1-\phi) < 0$. Since this is not true, the conjectured equilibrium does not exist when the electorate is large and $p < 1 - \frac{1}{2m}$.

When $p > 1 - \frac{1}{2m}$, a similar argument gives $\lim_{n\to\infty}\Pi_0 = 0$ and $\lim_{n\to\infty}\Pi_1 = 1$. The utility from voting for $U$ then converges to

$$\lim_{n\to\infty} u_i(U|B,U;0,\, piv) = 1 - \mu(1-\phi)(1-p)$$

In this case, the pivotal voter prefers voting $B$ when $\delta < \mu(1-2p)$, or equivalently $p < \frac{1}{2}\left(1 - \frac{\delta}{\mu}\right)$. Note that this constraint is identical to the one derived for the simple majority rule. Fig. 5 shows how the pivotal $type-0$ voter's relative preference for each candidate varies with the parameter $p$ for different $m - rules$. For each $m$, the voter prefers candidate $B$ to $U$ for values of $p$ where the curve lies above 0. Note that as $m \to \frac{1}{2}$, the inefficiency is possible for smaller and smaller values of $p$. When $m = \frac{1}{2}$, any $p > 0$ can give rise to the inefficient equilibrium for large enough electorates; this is the content of the previous section.
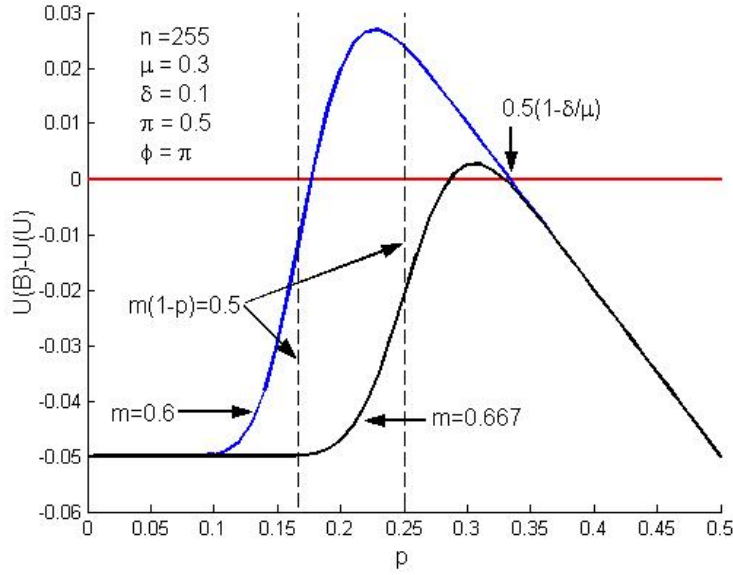
Fig. 5: Simulation Results for *m*-Rules with $m > \frac{1}{2}$

***PROPOSITION 4*** : *The values of p which supports the inefficient equilibrium shrinks as m increases. If* $m > \frac{\mu}{\mu + \delta}$*, the inefficient equilibrium does not exist for any value of p.*

***PROOF*** : We have already verified that the pivotal $type - 0$ voters will conform to the behaviour of the inefficient equilibrium when $p$ is in the range specified. Now we show that the pivotal $type - 1's$ will vote $U$. Expected utility from $B$ is

$$u_i(B \mid B, U; \ 1, \ \text{piv}) = \delta\pi + \mu\phi p$$

, while that from U is

$$u_i(U \mid B, U; \ 1, \ \text{piv}) = \delta + \mu(1 - \phi)\Pi_1 + \mu\phi p.$$

Under $\phi = \pi$, and $p > 1 - \frac{1}{2m}$, $type - 1$ 's vote U if $\phi < 1$, which necessarily holds. ∎

It follows immediately from the last inequality in the proposition above that the inefficient equilibrium cannot arise for the unanimity rule ($m = 1$). While our framework is not directly comparable

to the information aggregation models, it might be interesting to note that this result contrasts with the inferiority of the unanimity rule documented previously.

# 5  DISCUSSION

CANDIDATE ENTRY AND OTHER APPLICATIONS

Let us move back one step in time and ask which candidates actually enter an election. Let $c > 0$ denote the cost of entering an election; this includes the cost of filing nomination, campaigning, etc. The candidate could be either one who cares about his legacy and when in office picks the alternative that the majority prefer, or an ideologue who benefits from one of the two alternatives independently of the electorate's rankings. Let us consider a simple extension of the model where $q$ has not been revealed when the candidates decide to enter. Suppose $q$ is equally likely to be 0.25 and 0.75 and let $b$ denote the benefits from being in office for any type of candidate. If there is a potential candidate of each type and $b > 2c$, then in equilibrium the 0-candidate and a 1-candidate will both choose to enter. When $q = 0.25$ the 1-candidate wins with a probability arbitrarily close to 1 for a large enough $n$ ; with $q = 0.75$ the 0-candidate wins; this clearly does not hinge on the specific numbers we use above to make the point. The legacy candidate will therefore choose not to enter the fray as his expected gain from entry will fall short of the cost $c > 0$ — He cannot win the election irrespective of what value of $q$ is drawn. The electorate will not have the option of voting for the best candidate, as in the tongue-in-cheek quote at the start of the paper.

Interpreting the model as a choice between deciding now or later suggests why some groups push for an early vote even if they might be able to learn something useful by delaying the vote. For example, newspapers document the case where Republicans, seeing an opportunity, forced a quick vote and swift rejection of Democratic lawmaker Rep. John Murtha's call for an immediate troop withdrawal from Iraq. Our model suggests that what might have led Republicans to swiftly put it to vote is the very fear that delaying might lead to small yet critical defections. This logic survives even if voters foresee that they might be committing to a policy possibly disastrous for society.

In an article published in the Op-Ed section of the *L.A. Times*[14], Bruce Schulman argues that changing sides has been costly in American politics of late. Candidates spend resources trying to explain away changes in their stand on key issues, from affirmative action to foreign policy. Even fairly incontrovertible evidence of having changed does not dissuade them for arguing otherwise. Schulman suggests that political candidates do not wish to come across as opportunists who pander to the electorate for political gain. This line of reasoning is also explored by first Callander and then Kartik and McAfee, who modify the Hotelling/Downs model of electoral competition to give voters with an explicit preference for candidates with *character*. Our paper offers a different explanation for why political candidates might prefer to commit to an ideology rather than update their stands as new information becomes available. In an environment with changing preferences, the best conceivable flip-flopper, one who adjusts his position to what is best for society at large, cannot expect to win against an ideologue. Office seeking candidates might therefore prefer to be perceived as having ideological biases although the electorate does not *intrinsically* value this trait.

PIVOTAL ARGUMENTS AND OUR MODEL

Even decades after Farquharson introduced the concept of pivotal voting in his classic monograph, its predictions are debated in the literature. On the one hand there is work(for example Austen-Smith and Banks, and Feddersen and Pesendorfer) explaining various phenomena using the pivotal calculus; recent studies find their predictions consistent with the data. On the other hand, Margolis and some others have argued that the amount of sophistication needed to sustain some of the equilibria that this literature throws up is too much to expect. Surely voters don't calculate a complicated probability of being pivotal, and mix with the exact probability required to make others play their role. Myerson expresses concerns about mixed asymmetric strategies. Our work steers clear of both these criticisms. We look at *symmetric pure* strategies in which voters use their signal (i.e. voters do not ignore their signal and vote identically). First, our intuition works unchanged for small populations, where strategic considerations could be key. Secondly, historically many large elections have been decided by a single-digit margin, and quite a few by a single vote. Finally, and perhaps

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[14]Schulman, Bruce J. 2007 April. "Beware the politician who won't flip-flop", Op-Ed, L.A. Times.

most importantly, we adopt a model of pivotal voting to maintain continuity with the standard for-mulation, not because we need each voter to behave as if he is pivotal. Our insights work just as well if our voters are group-rule utilitarians. Harsanyi introduced the rule-utilitarian voter, one who votes according to the rule that maximises social utility *if everyone else follows the same rule.* This concept is further extended by Feddersen and Sandroni, and by Coate and Conlin to include *group* rule-utilitarians, who choose the action that is best for the *group* when everybody in the group fol-lows it. In essence this argues that supporters (and opponents) of a certain policy can be divided into several subgroups; within each subgroup there is no conflict of interest and thus no need to be strategic, but subgroups are strategic among themselves. One can then replace the word "voter" in our arguments with "typical voter of the subgroup *i*"; the rest is unchanged.

# 6  CONCLUSION

The electoral system is prone to widespread inefficiency when we relax the assumption that voters' rankings of policies are unchanged from the time they vote and the time a policy is implemented. This paper illustrates two forms of inefficiency. When voters who are in a majority today are more likely to be in a minority tomorrow, they oppose social-welfare improving policies. This requires a probability of idiosyncratic switching large enough to reduce the ex-ante majority to an ex-post minority. A large range of electoral situations is better described by a model in which the probability of voters changing idiosyncratically is small. One might hope that in such a case the inefficiency will be mitigated, if not eliminated. We argued above that this is not the case — In the unique symmetric pure strategy Nash equilibrium, voters prefer to elect the ideologue rather than elect an idealist who waits for all information to be revealed and thereafter takes the optimal decision. The key to understanding this paradoxical result is that the *pivotal* voter finds himself in a fragile majority that is easily overturned; even though such a situation is (unconditionally) unlikely, he bases his vote on this situation and commits to the alternative that he currently prefers. This continues to hold even if there is a sizeable chance that everybody will dislike the committed candidate's choice due to a common shock.

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