CAN DEMOCRACY ALWAYS LEAD TO EFFICIENT ECONOMIC TRANSITIONS?*

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Preliminary and Incomeplete - please do not cite or circulate

July 2007

Abstract. I examine the role of political institutions in facilitating the adoption of a long-term surplus-maximizing policy when the economy is in transition. In the model I consider, a transition process gradually restructures economic institutions so that the population's long-term preference may differ from its short-term preference. A democracy may fail to implement the optimal policy if the electorate does not take into account the increased benefit from transition in later periods. A dictatorship will implement the optimal policy if the dictator has complete information about the population's preference and if the increase in surplus due to transition is high. If there is incomplete information about the population's preference, a democratic system's ability to aggregate private information increases when the economy is in transition. A dictatorship is constrained by its ineffectiveness in aggregating private information. Under incomplete information, the effectiveness of a political institution critically depends on the level of uncertainty about the population's preference and the population's ability to adapt to economic policies.

1. Introduction

The belief that democracy leads to efficient economic outcomes is based on two different premises. First, democracy creates political freedom in the sense that the political outcome reflects the will of the electorate. Second, the electorate, if provided with political freedom, can reach an efficient economic outcome.[1] Both theoretical research and empirical evidence show that a democratic system achieves outcomes that majority of the electorate prefers. Evidence in support of the second premise — the electorate can always guide a democratic

Key words and phrases. Political Economy, Institutions, Transition, Economic Development.
JEL Classification: D72, D78, O12.

*I gratefully acknowledge valuable comments from David Austen-Smith, Sandip Baliga, Joyee Deb, Timothy Feddersen, Sven Feldman, Bård Harstad, Johannes Hörner and Peter Klibanoff. I am solely responsible for remaining errors.

[1]See Sen (2000) for an insightful discussion on economic needs and political freedom. See, among other studies, Bhalla (1994), Przeworski (1995), Przeworski and Limongi (1993).

system to achieve an efficient economic outcome — is limited. Can a democracy then lead to efficient economic outcomes? In this paper, I provide a rationale for why a democratic system may fail to implement the optimal policy when the economy is undergoing transition. To this end, this paper develops a theoretical framework to address the broader question of how political institutions impact policymaking during the process of economic transition.

Understanding the role of political institutions in economic transition is important for at least two reasons. First, if we start from the premise that a specific institution always implements efficient economic transition, then diverse economic performance of different sections of an economy under the same political institution is puzzling. India is now fifteen years into its economic liberalization process, which began after a severe foreign exchange crisis in 1991. Central planning was discarded and the economy moved toward a decentralized, market-oriented one. The economic liberalization has been coupled with a political decentralization process, in which democratically elected bodies heading autonomous units in state governments undertake a majority of the policymaking at the state level. Though India, on average, has achieved remarkable success in the process of economic reform in the last fifteen years, there is huge variation in this process across different states.[2] While some states achieve high economic growth and are comparable to middle income countries in Europe, others are way behind.[3,4] Second, from a normative standpoint, the analysis of the impact of political institutions can provide important insights that can guide current efforts to build new democracies.

In this paper, I show why political competition over policies can lead to non-adoption of an objectively superior policy when the economy is passing through a transition process. The key assumption in the model is that institutional change due to transition is not instantaneous. Economic transition gradually restructures economic institutions and therefore, the electorate's short-term preference over policies may differ from its long-term preference. I show that if the electorate does not take into account the long-term benefits of policies from transition, a democratic system may lead to the selection of a policy that does not maximize long-term surplus. Significantly, this result does not assume that political parties have short-term objectives.

The assumption that transition gradually restructures economic institutions is a plausible one and has both theoretical and empirical support. Roland (2000) emphasizes the nature

[2]See *India: Development Policy Review*, World Development Report 2006: World Bank.

[3]For example, Maharastra and Gujarat reached an average annual growth rate of more than 6% in per capita gross state domestic product in 90s, while in Bihar and Uttar Pradesh, the average annual growth rate in per capita gross state domestic product was less than 1.3% during the same time period. (Ahluwalia, (2000))

[4]Similar evidence can be found in economic performance across transition countries in Central and Eastern Europe in 1990s. Most countries recovered growth after a few years, while Russia and most former Soviet Union countries (apart from Latvia and Lithuania) saw little recovery in growth through most of the 1990s. (Roland, (2000))

of gradualism in the process of transition. It is useful to draw a parallel here with long-term development programs.[5] A successful transition process should be thought of not as a short-term change in policy, but as a sequence of reforms that takes place over a sufficiently long period of time.[6] This gradual process forces us to think about institutional change in a dynamic way. I focus on a specific dynamic property of economic transition. I assume that the benefit from a policy increases over time when the economy is in transition. During this process, the population gradually adjusts itself to the policy, and can derive greater benefits from the policy after this adjustment. Therefore the long-term (after adjustment) benefit from any policy is higher than the short-term (before adjustment) benefit.[7] In a two-period model, I capture this effect in reduced form. There are two generations of citizens, each living for a single period. There are two policies of which one is selected in each period. During economic transition, the population adapts to policies so that the second generation of citizens receives an increased benefit from the policy implemented in the first period, compared to the first generation. There are effectively two transition paths, depending on the policy that is implemented in the first period. A process of transition is called efficient if the economy adopts the path that maximizes the two-period aggregate surplus. This notion of efficiency emphasizes the importance of the gain in aggregate surplus in the second period due to transition. For example, if a "manufacturing-friendly" policy leads to a high aggregate surplus in the second period, an efficient transition process should adopt such a policy in the first period, even if it produces low surplus in the first period compared to an alternative "agriculture-friendly" policy.

I study the impact of two kinds of political institutions on policymaking: democracy and dictatorship. My model of democracy is a simple two-period extension of standard electoral competition models with full policy commitment (Wittman 1983, Calvert, 1985). In every period, two political parties, after committing to a policy, compete in an election and the winner is selected by majority-rule voting. In a dictatorship, one party selects the policy in both periods in the absence of any election. Effectively, there are two forms of dictatorship, depending on the party that rules. The only distinction between a democracy and a dictatorship is that the former is a situation where the electorate has some control in determining the political outcome, whereas in the latter, only one party has political

[5]Drazen (2000) describes transition as a multistage process of significant economic transformation of an economy.

[6]See also Dewatripont and Roland, (1992a), (1992b), (1995); Wei (1997).

[7]Consider, for example, the introduction of a free-trade policy to a hitherto-closed economy. The economy developed two production sectors, e.g., agriculture and industry, to meet its consumption needs. Assume that the industrial sector has a comparative advantage. With the introduction of a free-trade policy, the industrial sector will grow and the agricultural sector will shrink. New opportunities in the industrial sector will come up and the population will eventually move toward activities related to the industrial sector. Initially a large section of the population, which was involved in agricultural activities, faces a high cost with the introduction of a free-trade policy. Over time the population adapts itself to institutional changes, and benefits from the increased opportunities in the industrial sector, where they have a comparative advantage.

rights.[8] I assume that parties are long-lived and have policy preferences. Parties also care about maximizing aggregate surplus as the ruling party gets a fraction of the total surplus in any period.

Under democracy, if there is complete information about the electorate's preference, then both parties offer the median voter's most preferred policy. Since the first-generation electorate does not take into account the benefits to the second generation from transition, the electorate may reject the policy that maximizes two-period aggregate surplus.[9] This result emphasizes the importance of the population's position on the transition path. Even if a policy can increase economic surplus by a large margin after the population adjusts itself to the policy, it may be rejected at the beginning if the majority of the electorate does not get sufficient benefit from the policy reform at the initial stage. There is substantial empirical evidence to support this result. In their study on post-independence development in Indian states, Drèze and Sen (1995, 1996) suggest the difference in the electorate's ability to respond to policy reform as one of the reasons for the striking contrast in state-level performances in India.[10] Under dictatorship, the ruling party has incentives to implement the policy that maximizes two-period aggregate surplus since it gets a fraction of the increased surplus due to transition in the second period with certainty. The party that does not have a vested interest in the superior policy can also adopt the superior policy if the increased surplus due to transition is sufficiently high.

When citizens have private information about the policy cost, an informational problem arises in the sense that the adopted policy can be different from the policy that would have been adopted in the absence of private information. A dictatorship always suffers from the informational problem when the ruling party does not have complete information about the electorate's preference. A democratic system, on the other hand, fails to solve the informational problem only if both parties offer the same policy in an election, which happens if parties believe that the population is polarized on the policy dimension. This could lead to an error in policy selection if parties have incomplete information about the population's preference. I show that when parties take into account the effect of transition, they are less likely to offer the same policy in election.

When there is incomplete information about the population's preference, both kinds of institutions have limited ability in adopting the long-term, surplus-maximizing policy. A dictatorial system's effectiveness is constrained by the informational problem. A democratic

[8]The ruling party will have the same payoff function in both institutional forms. By assuming this, I focus only on the issue of policy selection.

[9]It is important to distinguish this situation from the case when there is no effect of transition. In the absence of any effect of transition, the electorate may still reject the policy that maximizes aggregate surplus. This possibility can arise if there is uneven distribution of surplus among citizens within a generation. However, the source of inefficiency that I characterize here is different and is caused by uneven distribution of surplus between generations.

[10]See also Ahluwalia (2000), Keefer and Khemani (2005), Kohli (2006b).

system is constrained by the first-period electorate's preference even though it becomes increasingly efficient in solving the information problem. I show that the relative effectiveness of a political institution in implementing an efficient transition critically depends on two factors: the level of uncertainty about the population's preference and the ability of the population to adapt to economic policies.

Taken together, these results have significant implications for policymakers. A large body of literature suggests that political institutions are likely to matter during the process of transition (Dewatripont and Roland (1995); Roland (2000)). This article provides some insight on how political institutions can make a difference in economic performance during transition. I show that the effectiveness of a political institution in choosing an efficient transition path depends critically on characteristics of the population concerned. In some sense, it extends Sen's (2004) insight that "the achievements of democracy depend not only on the rules and procedures that are adopted and safeguarded, but also on the way the opportunities are used by the citizens."

The reduced form model of transition that I develop here is simple and novel in the existing literature. The political economy of transition is part of the fundamental trend in recent economic research to integrate the political process into the analysis of economic problems. Further research is needed to evaluate the impact of economic transition in the developing world and draw lessons from the variations in institutions across countries. I set up a theoretical framework for further research in this field. Though the main interest of this paper lies in understanding the role of political institutions on economic performances of transition economies, this model can also fit a broad class of selection problems between two alternatives when agents have private costs.[11]

The rest of the paper is organized as follows. The next section links this work to related literature. Section 3 describes the theoretical framework. Sections 4 and 5 analyze the model under complete information and incomplete information respectively. In Section 6, I briefly discuss the political economy of India's economic reforms. Section 7 concludes with a short discussion of the main findings of the paper.

2. **Related Literature**

My paper is related to several strands of literature. The model of democracy builds on the theory of electoral competition between candidates with policy preferences under full policy commitment. Wittman (1977, 1983), Calvert (1985) and Roemer (1994, 1997, 1999) study similar models where candidates with policy preferences compete in an election

[11]Consider an example of a factory-manager who has to decide whether to adopt a new production technology. Workers have technology-specific costs. In this context, transition can be thought of as a learning process which gradually reduces workers' cost of using the new technology over time. If the manager lets the workers decide whether to adopt the new technology, they may not vote for the efficient technology if they have to incur a very high cost at the initial stage. On the other hand, taking a decision without consulting the workers could be erroneous if the manager is not well-informed about the distribution of workers' cost after the adoption of new technology.

and there is uncertainty about the electorate's preference.[12] I extend the static model of elections into a multi-period election model to allow for dynamic preferences of the electorate. Though several other articles study the multi-period model of election, they focus on analyzing re-election incentives with moral hazard and adverse selection.[13] Less formal work exists on a repeated model of election that allows for dynamic preferences of the electorate. My framework is distinct from existing dynamic models of re-election for several reasons. I allow the future preference of the electorate to be responsive to the current period policy. Therefore, this framework makes the future preference of the electorate endogenous and gives insights on how preferences of the electorate develop over time. Coate and Morris (1999) and Acemoglu and Robinson (2001) study similar models where some players' actions in the first period influence the preference of a section of the electorate in the future. Coate and Morris study an agency-style model of political competition where an interest group responds to the introduction of an economic policy in the current period by undertaking actions that increases its willingness to retain the policy in the future. This extra willingness is translated into political pressure and may result in inefficient policy persistence. Acemoglu and Robinson model political competition in a reduced form. The ruling group may redistribute resources inefficiently in the current period to increase the re-election probability, by influencing the electorate's preference in the future. I model the change in preferences in a reduced form. Unlike the above models, this paper studies the effect of political constraints on policymaking when preferences change over time due to transition.

My paper focuses on comparing the effectiveness of different institutions in choosing the long-term, objectively superior policy. This paper therefore contributes to the literature on the role of institutional structure on policymaking. Existing literature focuses mainly on two issues: information revelation and accountability to the electorate. Maskin and Tirole (2004) consider a model where a homogeneous population may have a different level of information about the optimality of an economic policy than a public official. The authors study the effectiveness of making the public official accountable to the electorate.[14] In this paper, I address both issues from a different angle. I consider a heterogeneous population where citizens' cost to policy is private information. In a democracy, politicians care about re-election and therefore the electorate's preference influences politicians' actions. This

[12]Osborne (1995), Persson and Tabellini (2000) provide a good survey on the theory of electoral competition with full policy commitment.

[13]Austen-Smith and Banks (1989), Ferejohn (1986) study dynamic models of election with moral hazard. Banks (1990), Banks and Sundaram (1993) study dynamic models of election with moral hazard and adverse selection.

[14]In a setting similar to Maskin and Tirole (2004), Razvan Vlaicu (2006) compares incentives to pander to popular opinion in two different institutions for delegating executive power: popular election and appointment by a popularly elected body.

could lead to inefficiency if the electorate's preference in the short run is not congruent with the long-term preference.[15]

This article provides a rationale for democratic failure and can be contrasted with other explanations provided in the literature. Fernandez and Rodrik (1991) show that uncertainty about the distribution of gains and losses from a policy reform can lead to inefficient policy persistence, even if the efficient policy would have been supported if it was introduced initially. As discussed earlier, Coate and Morris (1999) and Acemoglu and Robinson (2001) also provide explanations as to why politicians may continue with or undertake an inefficient policy. Others, such as Tullock (1975) and Baldwin (1989), have cited non-economic reasons, based on asymmetric attitudes to gains and losses from removing the status quo, to explain the choice of an inefficient policy.

At a more general level, this paper is related to a huge body of empirical literature on the relation between political institutions and long-term economic development. The empirical literature is inconclusive. Some articles (Przeworski (1966), Adelman and Morris (1967), Hunnington and Dominguez (1975), Marsh (1979), Weede (1983), and a survey by Siroway and Inkles (1991)) provide empirical support for the conjecture that authoritarianism fosters development in absence of particularistic pressures. Some other works (Pourgerami (1988, 1991), Scully (1988, 1992), Barro (1991), Remmer (1990)) support the conjecture that democratic institutions, by putting constraints on the acts of politicians, can do better in the process of development. Prezworski and Limongi (1993) and Bardhan (2000) provide a good survey on this empirical literature.

3. **The Model**

3.1. **The Environment.** I consider a two-period economy. There are two policies, (0 and 1). In each period, one policy is adopted.[16] There are two generations of citizens. Each generation lives for one period. Citizens have policy-specific costs. I assume that there is a unit mass of citizens distributed over the interval $[0,1]$. In each period, a citizen located at $x \in [0,1]$ incurs a cost of x if policy 0 is adopted or $(1-x)$ if policy 1 is adopted. Let F^t denotes the t-th period distribution of citizen's cost for $t = 1, 2$. Let C_p^t denote the total cost of adopting policy $p \in \{0,1\}$ in period t.

$$\begin{aligned} C_0^t &= \int_0^1 x dF^t(x) = E_{F^t}(x) \\ \text{and } C_1^t &= \int_0^1 (1-x)\, dF^t(x) = 1 - E_{F^t}(x) \end{aligned} \tag{E2}$$

where $E_F(x)$ is the expected value of x with respect to the distribution function F.

[15] Related works in this section of the literature are Rogoff (1985), Faure-Grimand and Gromb (2000) and McCubbins (1987). All these emphasize the benefit of not making officials subject to an election mechanism.

[16] The two policies can be thought of as two different production economies: agricultural and manufacturing. For example, if policy 0 is adopted, the economy moves toward an agrarian economy. Those who are involved in agriculture-based activities, receive a higher payoff in an agriculture-based economy compared to a manufacturing-based economy.

The two policies also differ in terms of production revenue. Let p^t denote the economic policy that is implemented in period $t \in \{1,2\}$. The net temporal revenue for a citizen located at x in period t is given by[17]

$$\begin{cases} R_0 - x & \text{if } p^t = 0 \\ R_1 - (1-x) & \text{if } p^t = 1 \end{cases} \quad \text{for } t = 1,2 \tag{3.1}$$

The total surplus of the economy under policy $p \in \{0,1\}$ in period $t \in \{1,2\}$, is

$$S_p^t = R_p - C_p^t$$

3.2. **Distribution of Policy Cost.** The framework differs in the level of information about citizens' distribution of policy cost. I consider two possibilities. First, both parties and the electorate have perfect information about the distribution of policy cost. Second, I assume that there is uncertainty about the true distribution of policy cost. I call the former a model under complete information and the latter a model under incomplete information[18]. In the model under complete information, parties know the true distribution F^t before the election in period $t \in \{1,2\}$. In the model under incomplete information, in period 1, the distribution F^1 is a random draw from a set of distributions $\mathcal{F}^1 = \left\{F_1^1, F_2^1, ...\right\}$ where each $F_i^1, i = 1,2,...$ is a probability distribution defined on the interval $[0,1]$. Let $Q = \{q_1, q_2, ...\}$ denote the prior distribution on $\mathcal{F}^1$ where $q_i \geq 0$ is the probability that F_i^1 is drawn and $\sum_{i=1}^{\infty} q_i = 1$. In period 2, a new population is drawn from a set of distributions $\mathcal{F}^2 = \left\{F_1^2, F_2^2, ...\right\}$ according to the same prior belief Q, where each $F_i^2, i = 1,2,...$ is a probability distribution on the interval $[0,1]$.

3.3. **Political Parties.** There are two political parties, P_0 and P_1. P_0 prefers policy 0 and P_1, prefers policy 1. In any period, the party that holds office gets a fraction $\lambda \in (0,1)$ of the total surplus in period t. Since $\lambda > 0$, the party that holds office in some period t cares about maximizing total surplus in period t (see Section 3.6 for further discussion on λ). The temporal payoff of party P_i, $i \in \{0,1\}$ in period t is

$$\pi_i^t = \begin{cases} u.I\left\{p^t = i\right\} + \lambda S^t & \text{if } P_i \text{ holds office in period } t \\ \\ u.I\left\{p^t = i\right\} & \text{if } P_i \text{ does not hold office in period } t \end{cases} \tag{E3}$$

$$\text{where} \qquad I\left\{p^t = i\right\} = \begin{cases} 1 & \text{if } p^t = i \\ 0 & \text{if } p^t \neq i \end{cases} \tag{3.2}$$

[17] I assume that $|R_0 - R_1| < 1$ to rule out the uninteresting case where every citizen prefers one policy to the other.

[18] Relaxing the assumption of complete information is common in literature (see Calvert (1985), Persson and Tabellini (2000)). In reality, incomplete information can arise for several reasons. Possibility of abstention can generate uncertainty about the true distribution of vote share between parties. Similar uncertainty can arise if the population is divided on issues other than the two policies in consideration, for example, candidates' competency factors, and if there is incomplete information about the population's preference on these other factors.

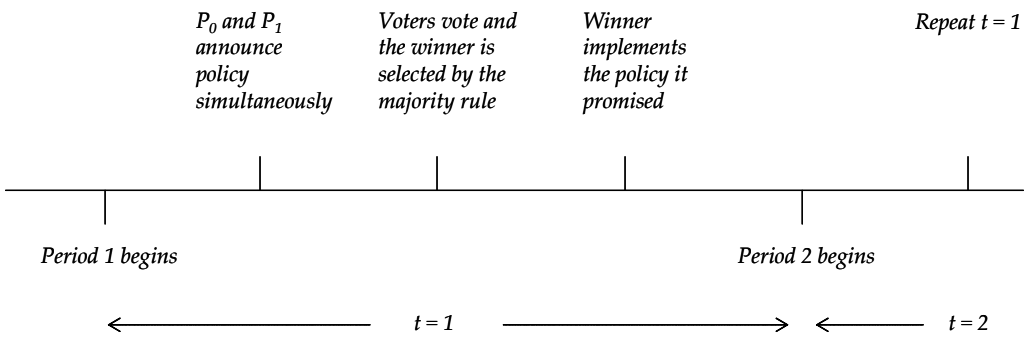

FIGURE 1. Timeline

Hence, if P_i's preferred policy is implemented in period t, it gets a temporal payoff u. If it holds office in period t, then it also gets a fraction of the total surplus in period t. Parties are long-lived and want to maximize the aggregate surplus over two periods.

3.4. **Political Institutions.** I consider two different political institutions: democracy and dictatorship. In a democracy the preferences of all citizens matter in determining political outcomes; while in a dictatorship, only one party has political rights.

3.4.1. *Democracy.* The model of democracy used here is a two-period extension of the standard electoral competition model with full policy commitment (Calvert (1985), Wittman (1977), (1983)). In each period, the two parties, P_0 and P_1 compete in an election. Before election, both parties commit to a policy. All citizens then vote and the winner is selected by a majority rule. Every citizen wants to maximize his temporal revenue. The winning party then implements the policy that it promised. Party P_i, $i \in \{0,1\}$ tries to maximize its total payoff, which is the sum of period 1 payoff π_i^1 and period 2 payoff π_i^2. Figure 1 gives the timeline of the electoral game.

Strategies and Equilibrium:

In this paper, I focus on pure strategies by political parties, due to their analytical tractability. The probability that the majority prefers policy 1 over 0 is the only payoff-relevant variable for political parties. Let f^t denote the probability that the majority prefers policy 1 in period $t = 1, 2$. A strategy for party P_i, s_i, has two components, s_i^1 and s_i^2.

$$\begin{aligned} s_i^1 &: [0,1] \to \{0,1\} \\ s_i^2 &: [0,1] \times \{0,1\} \to \{0,1\} \end{aligned}$$

The mapping $s_i^1\left(f^1\right)$ is the probability that P_i offers policy 1 in the first period, given f^1 and the mapping s_i^2 is the probability that P_i offers policy 1 in period 2 given f^2 and the first period policy outcome.

I assume that voters vote sincerely. A strategy v_x for a citizen located at $x \in [0,1]$ is the probability with which the citizen votes for party P_0 given the policies offered by P_0 and P_1.

$$v_x : \{0,1\} \times \{0,1\} \to [0,1]$$

I assume that voters select a party at random if both parties offer the same policy.

Subgame perfect Nash equilibrium is used as the solution concept.

3.4.2. *Dictatorship.* Under dictatorship, one party decides the policy in both periods. In the first period, the ruling party maximizes its expected two-period aggregate payoff. In the second period, the party implements the policy that maximizes its second period payoff, given the first period outcome. Since parties have different policy preferences, there are two forms of dictatorship possible. If P_0 decides policy in both periods, I call it $0-$*dictatorship*. If P_1 decides the policy in both periods, I call it $1-$*dictatorship*.

3.5. **Economic Transition.** I model the effect of economic transition in reduced form. The population gradually adjusts itself to a policy during the transition process. If the ruling party adopts policy 0 in the first period, the population adapts itself to policy 0. Then, the second generation of citizens is likely to have a lower cost to policy 0, compared to the first generation. Similarly, if policy 1 is adopted in the first period, the second generation of citizens is likely to have a lower cost to policy 1, compared to the first generation. I call a population that exhibits this phenomenon an *adaptive* population. Formally, the effect of transition is captured by the concept of stochastic dominance.

Definition 1. *A distribution function F on $[0,1]$ stochastically dominates a distribution function G on $[0,1]$ if $F(x) \leq G(x)$ for all $x \in [0,1]$ and $F(x) < G(x)$ for at least one $x \in [0,1]$.*

First consider an environment with complete information. A population is adaptive if the second period population distribution either stochastically dominates the first period distribution (when policy 1 is adopted) or is stochastically dominated by the first period distribution (when policy 0 is adopted). Next, consider the incomplete information case. I assume that the second period distribution depends on the first period policy, but is independent of the true first period distribution. Let $\mathcal{F}_0^2$ (or, $\mathcal{F}_1^2$) denote the set of second period distribution if policy 0 (or, policy 1) is adopted in the first period. The definition of adaptiveness is stated formally below.

Definition 2. *A population is said to be adaptive if (i) $F_i^2 \in \mathcal{F}_1^2$ stochastically dominates $F_i^1 \in \mathcal{F}^1$ for $i = 1, 2, ...$ when policy 1 is implemented in period 1 and (ii) $F_i^1 \in \mathcal{F}^1$ stochastically dominates $F_i^2 \in \mathcal{F}_0^2$ for $i = 1, 2, ...$, when policy 0 is implemented in period 1. A population is said to be non-adaptive if $F_i^1 = F_i^2$ for $i = 1, 2, ...$, irrespective of the choice of the first period policy.*

With this definition, I assume that the first and second period distributions F^1 and F^2 are conditionally independent. Therefore, the only information political parties have about

F^2 from the outcome of the first period election is whether F^2 is drawn from the set $\mathcal{F}_0^2$ or $\mathcal{F}_1^2$.

3.6. **Discussion of the Model.** I consider a stylized, tractable model to capture the effect of economic transition In this section, I briefly discuss three important characteristics of the model and extent to which they can be relaxed.

No externality: The distribution of policy cost along $[0, 1]$ implies that if the second period population moves towards 0 on the policy dimension, then they not only have a strictly lower cost to policy 0 but also a strictly higher cost to policy 1. This assumption can be partially relaxed. However, the results do require that if policy 0 is adopted, the second generation's cost to policy 1 should not strictly decrease. In other words, I rule out the existence of any externality where the adoption of policy 0 may lead to a reduction in cost to policy 1 in a later period.

The level of rent extraction by the ruling party is the same under both institutions: The assumption that the ruling party extracts the same level of surplus in a democracy and a dictatorship may be questionable. But, since the focus of this paper is on the effectiveness of a political institution in policymaking, this assumption is reasonable. Furthermore, relaxing this assumption does not make any qualitative difference to the main results of this paper.

The second period distribution is independent of the first period distribution under incomplete information: This assumption may be arguable as parties can learn a lot about the second period distribution given the median voter's choice in the first period. The effect of learning creates a different set of incentives for political parties. I ignore learning effects in order to focus attention on the incentives created by the transition process.

4. **Analysis: Under Complete Information**

Consider an environment with complete information.

4.1. **Benchmark Case.** I begin by looking at the optimal choice of a social planner, who tries to implement the policy that maximizes the two-period aggregate surplus. The social planner solves the following problem:

$$\max_{q\in\{0,1\},\, p\in\{0,1\}} S_q^1 + S_{q,p}^2 \tag{4.1}$$

For the subsequent analysis, I make the following assumption to rule out the possibility of multiple equilibria.

Assumption 1. *Given any first period policy $q \in \{0, 1\}$, if the social planner is indifferent between choosing policy 0 and 1 in the second period, he implements the first period policy q in the second period.*

The first lemma states that the social planner will always continue with the first period policy in the second period, irrespective of whether the population is adaptive or not.

Lemma 1. *Suppose assumption 1 holds. Under complete information, the social planner will implement the same policy in both periods.*

Proof. In Appendix A. □

The intuition for the result is the following. The second period surplus from policy p is the same as (higher than) the first period surplus from the same policy, if it has already been implemented in period 1, when the population is not adaptive (is adaptive). Therefore, incentives to implement any policy p in the second period can not decrease if the policy p has been implemented in the first period.

Given Lemma 1, the social planner's problem can be rewritten as

$$\max_{p\in\{0,1\}} S_p^1 + S_{p,p}^2 \tag{4.2}$$

Define $\triangle_1$ as the difference between the first period surplus from the two policies in period 1.

$$\triangle_1 = S_0^1 - S_1^1$$

Define $\triangle_2$ as the difference between the second period surplus from policy 0 given that 0 was implemented in period 1, and the second period surplus from policy 1 given that 1 was implemented in period 1.

$$\triangle_2 = S_{0,0}^2 - S_{1,1}^2$$

The following proposition states the social planner's optimal strategy.

Proposition 1. *Consider the complete information case. Suppose Assumption* 1 *holds.*
a) If the population is not adaptive, the social planner will implement policy 0 (*policy* 1) *in both periods if* $\triangle_1 > 0$ (< 0). *He will be indifferent between the two policies if* $\triangle_1 = 0$.
b) If the population is adaptive, the social planner will implement policy 0 (*policy* 1) *in both periods if* $\triangle_1 > -\triangle_2$ $(< -\triangle_2)$. *He will be indifferent between the two policies if* $\triangle_1 = -\triangle_2$.

Proof. In Appendix A. □

An important implication of Proposition 1 is that the optimal choice for the social planner depends on how the transition process changes economic surplus in the second period. When the population is adaptive, the social planner may not implement the first period surplus maximizing policy if the increase in aggregate surplus from the other policy is sufficiently high. I call policy 0 the *superior policy* if $\triangle_1 > -\triangle_2$. Similarly, policy 1 is *superior* if $\triangle_1 < -\triangle_2$. If $\triangle_1 = -\triangle_2$, both policies are equally effective.

4.2. **Democracy.** Let us now look at the outcome under democracy. I make the following assumption to rule out multiple equilibria.

Assumption 2. *If a political party is indifferent between offering two policies, it offers the policy in which it has a vested interest (i.e.* P_0 *offers policy* 0 *and* P_1 *offers policy* 1*).*

It is easy to see that under complete information, both parties will offer the median voter's most preferred policy in equilibrium. Suppose the median voter prefers Policy 0. It is a dominant strategy for P_0 to offer policy 0. Party P_1 will also offer policy 0 since otherwise, it will lose the election for sure (and policy 1 will not be implemented in any case). An

identical argument works if the median voter prefers policy 1. This result does not depend on whether the population is adaptive. When the population is non-adaptive, the median voter's preference does not change across periods. When the population is adaptive, the median voter will face a lower cost to the first period policy in the second period. Therefore, the median voter would still prefer the first period policy. These findings are described in the following proposition.

Proposition 2. *Suppose Assumption* 2 *holds. Under complete information, in a democratic system, both parties will offer the the median voter's most preferred policy. The same policy will be implemented in both periods. Moreover, the implemented policy will be the same, irrespective of whether the population is adaptive or not adaptive.*

From Proposition 2, we see that the outcome under democracy does not depend on whether the population is adaptive or not. Therefore, the effect of transition is not reflected in the outcome under democracy even if the parties have long-term objectives. The following simple example illustrates this.

Example 1. *Consider an example with three voters. Let us think about policy* 0 *as an "agriculture-friendly" policy and policy* 1 *as a "manufacturing-friendly" policy. Suppose all three citizens are engaged in farming in period* 1 *and have zero cost to policy* 0*. Assume* $R_0 = 1$ *and* $R_1 = 1.6$*. For every citizen, the net payoff from implementing policy* 1 *is* $(1.6 - 1) = 0.6$*. The net payoff from implementing policy* 0 *is* 1*. Therefore, the median voter prefers policy* 0*, and both parties will offer* 0 *in equilibrium. The same policy will continue in the second period.*

Now consider a transition process where the population adapts perfectly to the first-period implemented policy. This implies that if the manufacturing-friendly policy 1 *is implemented in period* 1*, the second period population will move from* 0 *to* 1*, and will have zero cost to manufacturing. It is easy to see that the manufacturing-friendly policy actually maximizes two period aggregate surplus. (The two period aggregate surplus from policy* 1 *is* $(3 \times 0.6) + (3 \times 1.6) = 6.6$ *and the surplus from policy* 0 *is* $(3 \times 1) + (3 \times 1) = 6$*.)*

4.3. **Dictatorship.** In a dictatorship, the ruling party adopts the policy that maximizes its two-period aggregate payoff. The party that has a vested interest in the superior policy will always implement it. The party that does not have vested interest in the superior policy will still implement it if the second-period gain from implementing it is large enough. The same policy will be implemented in both periods, since the gain from implementing the first period policy weakly increases in the second period. As before, I make an assumption to rule out multiplicity of equilibria.

Assumption 3. *Given the first period policy* $q \in \{0, 1\}$*, if the ruling party is indifferent between choosing policy* 0 *or policy* 1*, it will implement the first period policy* q *in the second period.*

The following proposition describes the policy outcome under both forms of dictatorship.

Proposition 3. *Consider the complete information scenario. Suppose Assumption* 3 *holds.*
a) Under 0− *dictatorship: If the population is not adaptive,* P_0 *implements policy* 0 (*policy* 1) *in both periods if* $\triangle_1 \geq -\frac{u}{\lambda}$ $\left(< -\frac{u}{\lambda}\right)$. *If the population is adaptive,* P_0 *implements policy* 0 (*policy* 1) *in both periods if* $\triangle_1 \geq -\frac{2u}{\lambda} - \triangle_2$ $\left(< -\frac{2u}{\lambda} - \triangle_2\right)$
b) Under 1− *dictatorship: If the population is not adaptive,* P_1 *implements policy* 0 (*policy* 1) *in both periods if* $\triangle_1 > \frac{u}{\lambda}$ $\left(\leq -\frac{u}{\lambda}\right)$. *If the population is adaptive,* P_1 *implements policy* 0 (*policy* 1) *in both periods if* $\triangle_1 > \frac{2u}{\lambda} - \triangle_2$ $\left(\leq \frac{2u}{\lambda} - \triangle_2\right)$.

Proof. In Appendix A. □

4.4. **Institutional Comparison.** From the optimal choice of the social planner, we know that the social ranking of alternatives depends on how transition affects the second period surplus. However, under a democratic system, the policy outcome does not reflect the change in aggregate surplus due the adaptiveness of the population. It is noteworthy that the population, even in the first period, may reject the policy that maximizes surplus in the first period.[19] This possibility can arise if there is uneven distribution of surplus among citizens within a generation. However, the source of inefficiency that I characterize here is different. By committing to an efficient redistribution scheme, a party with a vested interest in the first period surplus maximizing policy can ensure that the majority elects it in the first period, but will not necessarily be able to implement the two-period aggregate surplus maximizing (superior) policy. On the other hand, one kind of dictatorship (where the ruling party has a vested interest in the superior policy) can always implement the superior policy.

The relative efficiency of the dictatorship does not depend on the assumption that parties get a fraction of the total surplus in every period. However, this assumption gives us a stronger result. If the parties get a fraction of the total surplus in both periods, and if the increase in surplus in the second period due to transition is sufficiently high, then both forms of dictatorship adopt the superior policy, while the democracy may be unable to do so. To see this, assume that $\triangle_1 > -\triangle_2$ so that policy 0 is the superior policy (from Proposition 1). Proposition 3 shows that under 0− dictatorship, policy 0 will be implemented in both periods, since $\triangle_1 \geq -\frac{2u}{\lambda} - \triangle_2$ for any values of $u \geq 0$ and $0 \leq \lambda \leq 1$. For any given value of u, if λ is sufficiently high (in particular, $\lambda > 2u/(\triangle_1 + \triangle_2)$), P_1 also adopts policy 0 under 1− dictatorship. The following numerical example illustrates these findings.

Example 2. *Consider the economy of example* 1. *We have* $\triangle_1 = S_0^1 - S_1^1 = 3 \times (1 - 0.6) = 1.2$ *and* $\triangle_2 = 3 \times (1 - 1.6) = -1.8$. *Since* $\triangle_1 < -\triangle_2$, *policy* 1 *is the long-term surplus maximizing policy. In period* 1, *the median voter's preferred policy is policy* 0, *and if policy* 0 *is implemented in period* 1, *the median voter will also prefer* 0 *in the second period. Therefore, under a democratic system, policy* 0 *will be implemented in both periods. Under* 1− *dictatorship, the pro-manufacturing group* P_1 *will implement policy* 1 *in both periods. Under* 0− *dictatorship, the pro-agricultural group* P_0 *will also implement policy* 1 *if and only if* $\frac{2u}{\lambda} < 0.6$.

[19] See Acemoglu and Robinson (2001) and Fernandez and Rodrik (1991) for a theoretical explanation.

A key implication of these findings is that the population's position on the transition path is an important factor for the adoption of long-term surplus maximizing policy. To see this, consider a situation where parties can commit to efficient redistributive policies in a single period so that the majority always chooses the surplus maximizing policy in that period. In this situation, the economy fails to adopt the efficient transition path only if the population in the first period does not receive sufficient benefit from the transition. From Proposition 1, we see that such a possibility arises if $\triangle_1 \in (0, \triangle_2)$ or $\triangle_1 \in (-\triangle_2, 0)$. If $\triangle_1 \in (0, \triangle_2)$, policy 1 is the long term surplus maximizing policy but the majority does not receive sufficient benefit from policy 1 in the first period (as $\triangle_1 > 0$). Hence, if the population is at the beginning of the transition process so that the majority does not receive a large benefit from the transition initially, it is likely to reject the optimal policy at the initial stage.

5. **Analysis: Under Incomplete Information**

This section analyzes the model under incomplete information.

5.1. **Democracy.**

5.1.1. *Temporal Game.* I first look at the equilibria of a single period game. Let f denote the probability that the majority favors policy 1 over 0. This is the only payoff-relevant variable for political parties. Let $E(S_0)$ and $E(S_1)$ denote the expected aggregate surplus from policy 0 and policy 1 respectively.

I make the following assumption to ensure the existence of pure strategy equilibria.[20]

Assumption 4. $E(S_0)\,E(S_1) \leq \frac{2-u\lambda(R_0+R_1-1)}{2\lambda^2}$.

The following proposition describes the equilibrium outcome of the temporal game.

Proposition 4. *Suppose Assumptions 2 and 4 hold. In the temporal game, both parties offer policy* 1 *if* f *is high* ($f > 1 - \frac{\lambda E(S_1)}{2(u+\lambda E(S_0))}$) *and policy* 0 *if* f *is low* ($f < \frac{\lambda E(S_0)}{2(u+\lambda E(S_1))}$). *For intermediate values of* f, P_0 *offers policy* 0 *and* P_1 *offers policy* 1.

Proof. In Appendix A. □

Proposition 4 shows that if there is little uncertainty about preferences (extreme values of f) only one policy is offered in equilibrium and the informational problem may not be solved. However, a democracy aggregates information if there is a high level of uncertainty about population preferences (intermediate values of f). Then, both policies are offered and the information problem is solved in the sense that the median voter's preferred

[20] If Assumption 4 is violated, then $1 - \frac{\lambda E(S_1)}{2(u+\lambda E(S_0))} < \frac{\lambda E(S_0)}{2(u+\lambda E(S_1))}$. In that case, if f is high, both parties offer policy 1. If f is low, both parties offer policy 0. In the intermediate range, there does not exist any pure strategy equilibrium. However, mixed strategy equilibria exist where parties offer both policies with positive probability. In a mixed strategy equilibrium, the informational problem is solved with a probability strictly less than 1.

policy wins. The range of values of f over which information is aggregated is given by $\left[\frac{\lambda E(S_0)}{2(u+\lambda E(S_1))}, 1-\frac{\lambda E(S_1)}{2(u+\lambda E(S_0))}\right]$.[21]

Notice that this interval expands as the party's payoff from its preferred policy, u, increases. A similar effect is generated if the fraction of the total surplus that the winning party gets, λ, decreases. Further, this interval moves to the right (left) as $E(S_0)$ ($E(S_1)$) increases. To see why this is true, recall that since the aggregate surplus from the two policies is a constant, if $E(S_0)$ increases, $E(S_1)$ decreases. The following corollary states these findings.

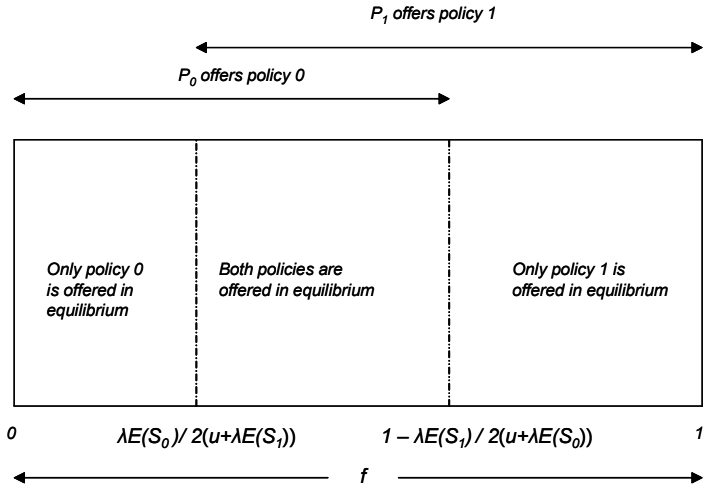

FIGURE 2. Equilibrium strategies in the temporal game

Corollary 1. *The range of values of f for which both policies are offered in equilibrium of the temporal game, increases as the policy-specific payoff u increases, or as the fraction of the surplus that the winner gets from holding office, λ, decreases. This range moves to the right (left) as the surplus from policy 0 (policy 1) increases.*

5.1.2. *Two-period game.* Now consider the two-period game. If the population is not adaptive, the probability that the majority favors policy 1 does not change between periods. If the population is adaptive, in the second period it is more likely to adapt the policy that was implemented in the first period. So if policy 0 was adopted in the first period, the probability that the majority favors policy 1 to policy 0 in the second period decreases, compared to the probability that the majority prefers policy 1 to policy 0 in the first period.

Let f_p^2 denote the probability that the majority favors policy 1 in period 2, given the first period policy $p \in \{0,1\}$. The following proposition describes the effect of adaptiveness of the population on parties' belief about the majority's preference.

[21]At the two boundaries, when $f = 1$ or 0, a democratic system can solve the informational problem since there is no uncertainty about the majority's choice. I ignore these two points since they do not add any positive mass to the set of values of f in which the informational problem is solved.

Lemma 2. *If the population is not adaptive, political parties' beliefs about the majority's preference remain the same in both periods, i.e.,* $f_p^2 = f^1$ *for* $p \in \{0, 1\}$*. If the population is adaptive, then political parties' belief that the majority prefers policy* 1 *in the second period increases (decreases) if policy* 1 *(policy* 0*) is implemented in the first period. Formally, we have,* $f_1^2 \geq f^1 \geq f_0^2$*.*

Proof. In Appendix A. □

The following proposition describes the equilibrium outcome of the two-period game.

Proposition 5. *Consider the two-period game with incomplete information. Suppose Assumptions* 2 *and* 4 *hold. If the population is not adaptive, the range over which both policies are offered remains the same as in the case of the temporal game. If the population is adaptive, this range expands, compared to the case of the temporal game.*

Proof. In Appendix A. □

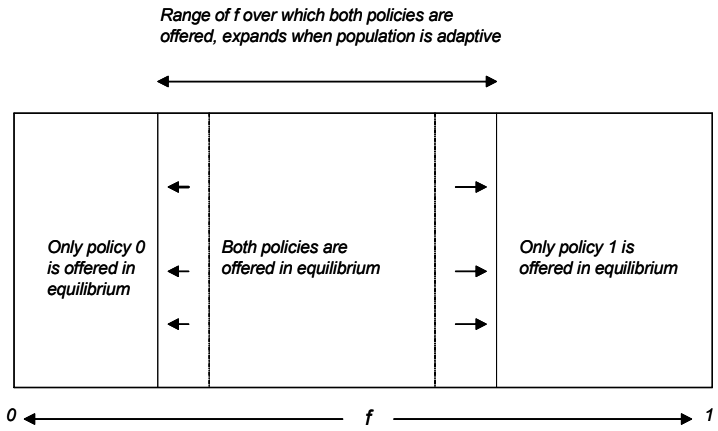

FIGURE 3. Equilibrium outcome when the population is adaptive

The intuition for the above result is the following. If the population is adaptive, the value of winning with one's preferred policy in the first period increases compared to the temporal game. For example, if policy 0 is implemented in period 1, the majority is more likely to prefer policy 0 in the second period compared to the first period (Lemma 2). P_0's incentive to offer policy 0 increases since its expected payoff increases when the majority is more likely to prefer policy 0. Similarly, the value of winning with the other's preferred policy in the first period decreases, if the population is adaptive. Hence, the range over which both policies are offered expands.

A key observation from this result is that the electoral system becomes more efficient in solving the informational problem when the population is adaptive.

5.2. **Dictatorship.** We now look at the policy outcome under dictatorship.

When the population is adaptive, the expected surplus in the second period depends on the first period policy. Let $S^1_{q,p}$ denote the second period surplus from implementing policy $p \in \{0,1\}$ given the first period policy $\sigma \in \{0,1\}$. The following lemma describes the effect of adaptiveness of the population on the expected surplus in the second period.

Lemma 3. *If the population is not adaptive, the expected surplus from any policy remains the same in both periods, i.e.,* $E\left(S^1_p\right) = E\left(S^2_{\sigma,p}\right)$ *for all* $p \in \{0,1\}$ *and* $\sigma \in \{0,1\}$. *If the population is adaptive, then the second period expected surplus from policy* $p \in \{0,1\}$ *is strictly more (less) than the first period expected total surplus from the same policy* p *if the same (the other) policy is implemented in period* 1. *Formally,* $E\left(S^2_{0,0}\right) > E\left(S^1_0\right) > E\left(S^1_{1,0}\right)$ *and* $E\left(S^2_{1,1}\right) > E\left(S^1_1\right) > E\left(S^1_{0,1}\right)$.

Proof. In Appendix A. □

In the two period game, the ruling party adopts the policy that maximizes its expected two-period payoff. The following proposition describes the outcome under dictatorship.

Proposition 6. *Consider the game with incomplete information. Suppose Assumption* 3 *holds.*
Under 0− *dictatorship: If the population is not adaptive* P_0 *implements policy* 0 (*policy* 1) *in both periods if* $E(\triangle_1) \geq -\frac{u}{\lambda}$ $\left(< -\frac{u}{\lambda}\right)$. *If the population is adaptive,* P_0 *implements policy* 0 (*policy* 1) *in both periods if* $E(\triangle_1) \geq -\frac{2u}{\lambda} - E(\triangle_2)$ $\left(< -\frac{2u}{\lambda} - E(\triangle_2)\right)$
Under 1− *dictatorship: If the population is not adaptive* P_1 *implements policy* 0 (*policy* 1) *in both periods if* $E(\triangle_1) > \frac{u}{\lambda}$ $\left(\leq -\frac{u}{\lambda}\right)$. *If the population is adaptive,* P_1 *implements policy* 0 (*policy* 1) *in both periods if* $E(\triangle_1) > \frac{2u}{\lambda} - \triangle_2$ $\left(\leq \frac{2u}{\lambda} - \triangle_2\right)$.

Proof. The proof is similar to the proof of Proposition 3, and therefore, skipped. □

Since the ruling party maximizes its expected payoff, the choice of policy under incomplete information could be different from that under complete information. This creates an informational problem in any form of dictatorship. In the following subsection, I compare the relative efficiencies of the two institutions in solving the informational problem and achieving the aggregate surplus maximizing policy.

5.3. **Comparison of Political Institutions.** We first need to define a social ranking over policies for the incomplete information scenario. For any given distribution F of the population in the first period, a social preference relation is defined over the two policies in terms of the expected two-period aggregate surplus.[22] Let F be the the true distribution in the first period. Given F, the maximum expected two period surplus from policy 0 is given by

$$\Sigma_{0,F} = S^1_0 + \max\left\{E_Q\left(S^2_{0,0}\right), E_Q\left(S^2_{0,1}\right)\right\}.$$

[22]Here, the expectation is taken with respect to the second period distribution.

The first term S_0^1 is the first period surplus, which depends on the distribution function F. The second term $\max\left\{E_Q\left(S_{0,0}^2\right), E_Q\left(S_{0,1}^2\right)\right\}$ is the maximum expected second period aggregate surplus (note that the expectation is taken with respect to Q as there is uncertainty about the true distribution in the second period). Similarly, I define the maximum expected two period surplus from implementing policy 1 in the first period, given the true distribution F, by

$$\Sigma_{1,F} = \left(S_1^1\right) + \max\left\{E_Q\left(S_{1,0}^2\right), E_Q\left(S_{1,1}^2\right)\right\}.$$

I define a social preference relation over policies $\{0,1\}$ as follows:

$$0 \succsim_F 1 \text{ if and only if } \Sigma_{0,F} \geq \Sigma_{1,F} \ .$$

Given this preference relation defined for every distribution $F^1 \in \mathcal{F}^1$, the ex-ante probability that policy 1 is socially preferred to policy 0 is given by

$$\pi = P(1 \succeq 0) = \sum_{\left\{i\,:\,1 \succeq_{F_i^1} 0\right\}} q_i$$

The ex-ante probability that 0 is preferred to 1 is $1-\pi$. Without loss of generality, I assume that policy 1 is ex-ante socially preferred, i.e., $\pi \geq 1/2$.

Formally, I define the event when a political institution chooses the inferior policy as follows:[23]

Definition 3. *An ex-post (interim) 'error' in selection occurs in the first period if an institution*
(i) implements policy 0 *when the true population distribution is some* $F \in \mathcal{F}^1$ *for which* $1 \succsim_F 0$ *, or,*
(ii) implements policy 1 *when the true population distribution is some* $F \in \mathcal{F}^1$ *for which* $0 \succsim_F 1$.

In a dictatorship, the ruling party's selection rule is based on the expected two period surplus from both policies and its private benefits from implementing the policy in which it has a vested interest. Under democracy, the selection rule is controlled by the majority's preference in the first period.

Let f_r denote the ex-ante probability that the majority prefers policy 1 and policy 1 is socially preferred to policy 0. For notational simplicity, I denote the probability that the majority favors policy 1 in the first period by f in this subsection. The following proposition describes the two institutions' relative effectiveness in adopting the superior policy.

[23]This definition of social ranking of policies excludes many interesting possibilities. For example, the efficiency of a democratic system in solving the informational problem in the second period is completely ignored. The reason behind considering an interim ex-post efficiency in policy selection is to make the analysis simple and tractable. Considering ex-post efficiency at the end of the second period does not make any qualitative difference to the main results in this section.

Proposition 7. *Without loss of generality, assume that* 1 *is the ex-ante socially preferred policy, i.e.,* $\pi \geq 1/2$.
(*i*) *For high differences in expected surplus between the two policies* ($E(\triangle_1)+E(\triangle_2) \geq \frac{2u}{\lambda}$), *the probability of error under* 0- *and* 1-*dictatorships is the same. If the majority is less likely to make an error when they choose the ex-ante socially preferred policy (if* $f \leq 2f_r$), *a democratic system has lower (weakly) probability of error than any form of dictatorship.*
(*ii*) *For low differences in expected surplus between the two policies* ($E(\triangle_1) + E(\triangle_2) \leq -\frac{2u}{\lambda}$), *the probability of error under* 0- *and* 1-*dictatorships is the same. Unless the majority is more likely to make an error when it chooses the ex-ante socially preferred policy (if* $f-(1-2\pi) \leq 2f_r$), *a democratic system has higher (weakly) probability of error than any form of dictatorship.*
(*iii*) *For intermediate differences in expected surplus between the two policies* ($E(\triangle_1) + E(\triangle_2) \in (-\frac{2u}{\lambda}, \frac{2u}{\lambda})$), *one form of dictatorship has strictly lower probability of error than the other (e.g. for* $\pi \geq 1/2$, 1− *dictatorship does better than* 0− *dictatorship). Unless the majority is more likely to make an error when it chooses the ex-ante socially preferred policy (if* $f-(1-2\pi) \leq 2f_r$), *a democratic system has higher (weakly) probability of error than the better form of dictatorship.*

Proof. In Appendix A. □

From the above proposition, we see that the relative effectiveness of a political institution explicitly depends on three parameters: The probability (π) that policy 1 is socially preferred, the probability (f) that the majority prefers policy 1 and the probability (f_r) that the majority is choosing the right policy when it is chooses the socially preferred policy. These parameters describe the nature of uncertainty about the population's distribution[24]. Population adaptiveness impacts the institutional comparison in a more subtle and implicit way. First, adaptiveness affects the ex-ante social preference ranking over alternatives. Second, the policy outcome under a democracy also significantly depends on the adaptiveness (the majority's choice is implemented over a wider range when the population is adaptive). Therefore, an important implication of Proposition 7 is that the relative efficiency of an institution depends on both the level of uncertainty about the population's distribution and the adaptiveness of the population.

[24]In the model under complete information, these parameters take extreme values, either 0 or 1. In presence of uncertainty, they can take any value between 0 and 1.

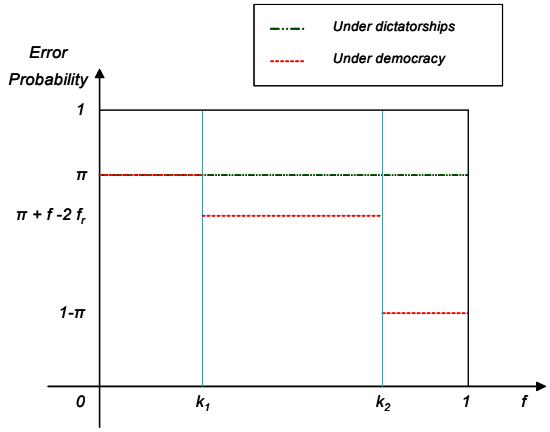

FIGURE 4(a) $E(\triangle_1)+E(\triangle_2)\geq\frac{2u}{\lambda}$

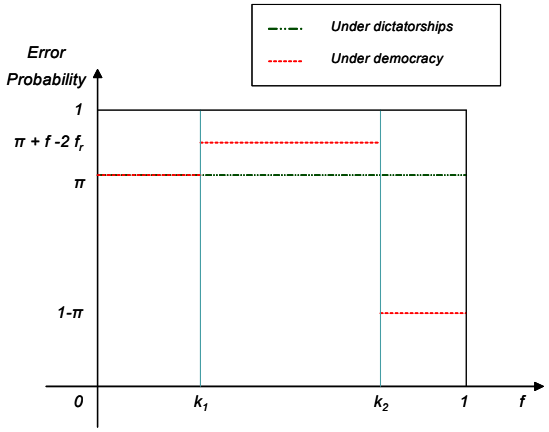

FIGURE 4(b) $E(\triangle_1)+E(\triangle_2)\geq\frac{2u}{\lambda}$

FIGURE 4 illustrates the case when the difference in the expected surplus between the two policies is sufficiently high ($E(\triangle_1)+E(\triangle_2)\geq\frac{2u}{\lambda}$). Under both forms of dictatorship, the probability of error is π. In Fig. 4(a), where $f\leq 2f_r$, a democracy is more likely to choose the superior policy in the first period, for any f. In Fig. 4(b), where $f\geq 2f_r$, the comparison is ambiguous. If f is sufficiently high ($f>k_2$), a democratic system is more likely to adopt the superior policy. For low f, a dictatorial system is more likely to adopt the superior policy.

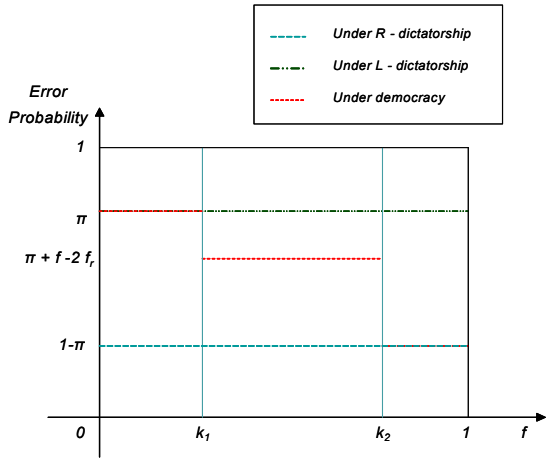

FIGURE 5(a) $E(\triangle_1)+E(\triangle_2)\in(-\frac{2u}{\lambda},\frac{2u}{\lambda})$

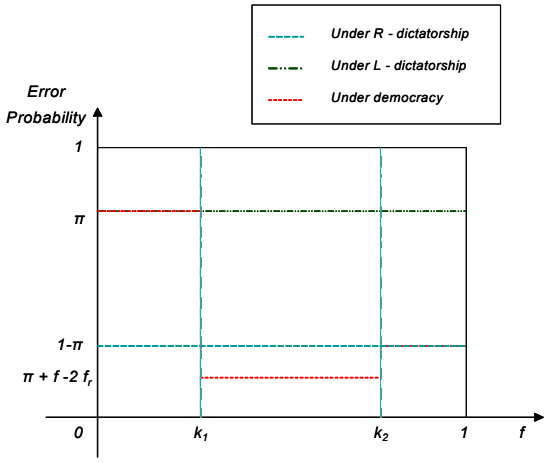

FIGURE 5(b) $E(\triangle_1)+E(\triangle_2)\in(-\frac{2u}{\lambda},\frac{2u}{\lambda})$

FIGURE 5 illustrates the case when the difference in expected surplus between the two policies is moderate ($E(\triangle_1)+E(\triangle_2)\in(-\frac{2u}{\lambda},\frac{2u}{\lambda})$). The error probability is $1-\pi$ under $1-$ dictatorship, and π under $0-$ dictatorship. Under $1-$ dictatorship, the ex-ante probability of adopting the superior policy is always high if $f-(1-2\pi)\geq 2f_r$ (Fig. 5a). If $f-(1-2\pi)\leq$

$2f_r$ (Fig. 5b), a democracy has a low error probability if both policies are offered in equilibrium.

6. **Political Economy of India's Economic Reform**

The impact of India's economic liberalization in 1991 on its economic performance has been subject of much academic study and debate. Empirical regularities that emerge from the Indian transition experience lend strong support to the main theoretical findings of this paper.

India began its economic liberalization process in late 1980s but strated following it systemetically after a severe foreign exchange crisis in 1991. At that time, central planning was discarded and the economy moved toward a decentralized, market-oriented one. The economy grew at a remarkably high rate in the post-reform period. The growth in GDP accelerated to 6.5% per annum compared to 5.5% in the 1980s (Ahluwalia (2000)). However, the rates of economic growth across Indian states started diverging more in the 1990s than in the 1980s (See Ahluwalia (2000); Kohli (2006a), (2006b); Bhattacharya and Saktivel (2004), Shetty (2003)). For example, the coefficient of variation was 0.14 in the 1980s and 0.29 in the 1990s.

Average Rate of Growth of Gross State Domestic Product (per cent per year)

	1980-81 to 1990-91	1991-92 to 1998-99
Bihar	4.66	2.88
Rajasthan	6.60	5.85
Uttar Pradesh	4.95	3.58
Orissa	4.29	3.56
Madhya Pradesh	4.56	5.89
Andhra Pradesh	5.65	5.20
Tamil Nadu	5.38	6.02
Kerala	3.57	5.61
Karnataka	5.29	5.87
West Bengal	4.71	6.97
Gujarat	5.08	8.15
Haryana	6.43	5.13
Maharashtra	6.02	8.01
Punjab	5.32	4.77
Combined GSDP (of 14 states)	5.24	5.90
GDP (National Accounts)	5.47	6.50

Source: Ahluwalia (2000)

Table 1

In the post-reform period, Gross State Domestic Product (GSDP) growth rate increased significantly (by 1% or more) in five major states (Madhya Pradesh, Kerala, West Bengal, Gujarat and Maharastra) but declined significantly in three others (Bihar, Uttar Pradesh, and Haryana) (See Table 1).[25] Difference in private investment is an important factor in

[25]In this context, it is noteworthy that Kohli (2006b) believes that the performance of Haryana and Punjab may not be considered typical. He attributes the decline in these states' performance more to a general decline in agricultural growth rate in these two states.

explaining the divergent performance (See Ahluwalia (2000) and Kohli (2006a, 2006b)). Average private investment was 19.19 % of GSDP in the states with increased growth, but only 6.57% in the states with declining growth. Why were some states better able to attract private investment than others? Sinha (2004) points out that the government of Gujarat took a very active role in attracting private investment. In the post-liberalization period, the government of Gujarat continued to invest in projects where private investment needed further encouragement.[26] In Bihar, investment declined from 15-20% of total public spending in the 1980s to 5-10% in the post-reform period (World Bank 2005, Ch. 3). World Bank's report on economic performance of Bihar attributes this to a variety of fiscal pressures and the need to serve populist interests.

What can explain this difference in economic policy making across states? India's democracy is characterized by regional politics, where state-level politics is driven by locally relevant issues. Liberalization increased the role of state governments in many critical areas of economic policy making. This made economic policy making and economic performance an issue of electoral importance at the state level. If the democratic political system in Gujarat could successfully provide politicians the incentive to implement economic policies to attract private investment, why did the same political institution fail to do so in Bihar? The composition of the population prior to the reforms had an important role to play. In Bihar, around 55% of population was in poverty in 1993-94. Most of the labor force was unskilled and not ready for high-skilled labor intensive industrial work. On the other hand, Gujarat started out with an advantage (Kohli, 2006b) in that it had an industry-oriented productive labor force and industry-friendly infrastructure. The reforms of 1991 created new opportunities and Gujarat's population was ready to adapt itself to these opportunities. The people in Bihar were slow to adapt to the transition and so the political leadership had no incentive to promote opportunities for growth.[27]

To sum up, India's reforms had mixed success in achieving economic development, with performance varying significantly across states. The initial composition and 'adaptiveness' of the people in a state affected state-level policies which in turn impacted the effectiveness of reforms.

7. **Concluding remarks**

In this paper, I present a model of economic transitions and analyze the impact of political institutions on policy-making during transition. I focus on an important dynamic aspect of the transition process. Economic transition restructures institutions gradually. As a result, the population adjusts to the new policies over time, and so its short-term preferences may differ from its long-term preferences. In such a situation, what forms of political institutions

[26]For example, the state government announced a special incentive package, which included investment subsidy and sales tax benefit and five additional electronics industrial estates were planned.

[27]Bihar has not been proactive in courting private investment or articulating a development strategy and "vision." Thus the government does not have an investment council, conveying a lack of concern about fostering and protecting private investment (World Bank 2005: p32).

can be trusted with implementing the long-term surplus maximizing policy? I compare the impact of two institutions: a democratic system in which the electorate determines the political outcome, and a dictatorial one in which a small group of people has political rights in the absence of any election.

I show that a democracy may fail to adopt the long-term surplus maximizing policy. The current distribution of the population's preferences is a critical determinant of the effectiveness of a democracy. A polarized electorate that is currently concentrated towards an inefficient policy may reject the superior policy in an election. Interestingly, this result does not assume that the political parties have short term objectives. Indeed, a democratic system can implement the long-term surplus maximizing policy only if the policy provides sufficiently high benefits to the median voter at the early stages of transition. This finding is consistent with empirical evidence (Ahluwalia 2000, Kohli 2006b).

A long-lived dictatorship can implement the efficient policy in such a situation. A party with a vested interest in the superior policy will surely adopt it. A dictatorship that does not have a vested interest in the superior policy may still adopt it if the overall benefit is sufficiently high.

However, the effectiveness of a dictatorship depends critically on the assumption that the dictator has complete information about the population's preferences. If the population's preferences are not known with certainty, both democracies and dictatorships can make inefficient policy choices.

In an environment with incomplete information, a democracy has an informational advantage over a dictatorship. In a democracy, the informational problem is solved as the electorate can reveal its policy preferences. I find that in fact, a democratic system's ability to solve the informational problem increases during economic transition. Sen (2000) emphasizes the informational role of democracy. He attributes the massive failure of China's development program in the late 1950's to the government's inability to gather information at the bottom.[28] However, this informational advantage can still not ensure an efficient policy choice as the majority's choice is not necessarily the long-term surplus maximizing policy.

In this article, I focus on policy selection and abstract from a host of other important issues, such as transition of political institutions, redistribution of surplus, and politicians' incentives for extracting surplus. Models capturing these other effects would be interesting extensions. I treat political institutions as exogenous. Consider an environment where one form of dictatorship may be replaced by another form of dictatorship, unless the dictator

[28]Interestingly enough, Mao Tse-tung made the following observation to a gathering of seven thousand cadres in 1962: "Without democracy, you have no understanding of what is happening down below; the situation will be unclear; you will be unable to collect sufficient opinions from all sides; there can be no communication between top and bottom; top-level organs of leadership will depend on one-sided and incorrect material to decide issues, thus you will find it difficult to avoid being subjectivist." (Quoted in Mao Tse-tung, *Mao Tse-tung Unrehearsed, Talks and Letters*: 1956-1971, edited by Stuart R. Schram, Harmondsworth: Penguin Books, 1976, pp. 277-278.)

maintains a fixed base of supporters.[29] In this case, a dictator who does not have a vested interest in the superior policy will have an incentive not to adopt it if the gain from transition is extremely high. This is because as the population adjusts to the transition, the probability that the current dictatorship will be replaced by another one increases. This can help explain why some African countries under dictatorial rule can still not implement efficient economic transitions. I leave a detailed analysis of this issue to future research.

The present analysis compares two political institutions. Can other institutions perform more efficiently? A democracy here is essentially a parliamentary regime where politicians are accountable to the voters through the legislature. It will be interesting to analyze how a presidential regime, in which voters elect the executive and the legislature separately would perform. Japan and South Korea follow an interesting system where activist states have allied closely with business groups to foster economic development (Kohli 2006b). Since businesses can adapt to the transition process faster than the general electorate, this alliance changes the current payoffs to the political parties. More theoretical work is needed to capture the finer details of such institutional structures.

This article contributes to the growing literature on the political economy of transition. It attempts to answer the question of how political institutions impact the transition process – an issue with significant implications for current efforts to build new democracies. While we must acknowledge the value of democratic institutions in creating political freedom, they should not be viewed as mechanical devices for efficient economic performance. The effectiveness of a political institution during an economic transition depends significantly on the population's responsiveness to the opportunities created during the transition.

[29]The difference between this set-up and the democratic institution in this paper is subtle. In a democracy, both parties have to commit to a policy first and then compete in an election. In the new set-up I am describing here, the ruling party does not have to compete over policies in an election. As long as the ruling party maintains its supporters' base, it can adopt any policy.

8. Appendix A

Proof of Lemma 1:

Proof. Assume, if possible, that the social planner implements (as an optimal solution to the problem (4.1)) policy 0 in the first period and policy 1 in the second period. Hence,

$$S_0^1 + S_{0,1}^2 = \max\left\{S_0^1 + S_{0,1}^2, S_0^1 + S_{0,0}^2, S_1^1 + S_{1,1}^2, S_1^1 + S_{1,0}^2\right\} \tag{8.1}$$

Since policy 1 is implemented in period 2, given that policy 0 was in effect in period 1, we must have (given Assumption 1)

$$S_{0,1}^2 > S_{0,0}^2 \tag{8.2}$$

Case 1: If the population is not adaptive.

Since $F^2 = F^1$, $S_{q,p}^2 = S_p^1$ for all $q \in \{0,1\}$ and $p \in \{0,1\}$. If $S_{0,1}^2 \geq S_{0,0}^2$, we must have $S_1^1 \geq S_0^1$, which contradicts (8.1).

Case 2: If the population is adaptive.

Then, F^1 stochastically dominates F^2 if policy 0 is implemented in period 1. Hence, $S_{0,0}^2 \geq S_0^1$ and $S_1^1 \geq S_{0,1}^2$. Together with (8.2), this implies that $S_1^1 > S_0^1$. Hence, $S_1^1 + S_{1,1}^2 > S_0^1 + S_{0,1}^2$ (since $S_{1,1}^2 \geq S_{0,1}^2$ when the population is adaptive). This contradicts (8.1).

Using similar argument, one can show that it is not optimal to implement policy 1 in the first period and policy 0 in the second period.

This completes the proof. □

Proof of Proposition 1:

Proof. Given Lemma 1, policy 0 is the two-period aggregate surplus maximizing policy if and only if $\triangle_1 + \triangle_2 \geq 0$. If the population is adaptive, we have $\triangle_1 = \triangle_2$. Hence, the condition $\triangle_1 + \triangle_2 \geq 0$ reduces to $\triangle_1 \geq 0$. □

Proof of Proposition 3:

Proof. The argument for proving the result that the same policy will be implemented in both periods is similar to the proof of the equivalent result in Lemma 1. Hence we skip that part. Given that the same policy will be implemented in both periods, P_0 gets payoff $2u + \lambda\left(S_0^1 + S_{0,0}^2\right)$ from implementing policy 0. P_0 gets payoff $\lambda\left(S_1^1 + S_{1,1}^2\right)$ from implementing policy 1. Comparing the two payoffs, we see that P_0 will implement policy 0 if and only if $\triangle_1 \geq -\triangle_2 - \frac{2u}{\lambda}$. Similarly, the selection rule under 1- dictatorship can be derived. □

Proof of Proposition 4:

Proof. Step 1: In equilibrium, parties together cannot offer policies in which they do not have a vested interest. To see this, let us assume, on the contrary, that P_0 offers policy 1 and P_1 offers policy 0 in equilibrium.

Given that P_1 offers policy 0, P_0 will offer policy 1 if

$$f \cdot \lambda E\left(S_1\right) + (1-f) \cdot u > u + \frac{\lambda E\left(S_0\right)}{2} \tag{8.3}$$

The term on the left hand side is the expected payoff of P_0 if it offers policy 1, given that P_1 offers policy 0. The term on the right is the expected payoff of P_0 if it offers policy 0, given that P_1 offers policy 0. We have strict inequality because of Assumption 2. Similarly, the condition that ensures that P_1 will offer policy 0, given that P_0 offers policy 1 is

$$(1-f)\cdot\lambda E\left(S_0\right)+f\cdot u>u+\frac{\lambda E\left(S_1\right)}{2}\ . \tag{8.4}$$

After simplifying and adding (8.3) and (8.4) together, we find

$$\frac{\lambda E\left(S_0\right)}{2\left(u+\lambda E\left(S_1\right)\right)}+\frac{\lambda E\left(S_1\right)}{2\left(u+\lambda E\left(S_0\right)\right)}>1\ ,$$

which violates Assumption 4.

Step 2: Given step 1, we know that if P_0 offers policy 1 in equilibrium, P_1 must offer policy 1. If P_0 offers policy 0 in equilibrium, there are two possibilities: P_1 offers either policy 1 or policy 0. Given P_0 offers policy 0, by offering policy 1, P_1 gets $f\cdot\left(u+\lambda E\left(S_1\right)\right)$ and by offering policy 0, P_1 gets $\lambda E\left(S_0\right)/2$. Comparing the two payoffs, we see that P_1 offers policy 1 if

$$f\geq\frac{\lambda E\left(S_0\right)}{2\left(u+\lambda E\left(S_1\right)\right)} \tag{8.5}$$

(we have weak inequality because of Assumption 2). Using similar line of argument, one can show that P_0 will offer policy 0 given P_1 offers policy 1 if

$$1-f\geq\frac{\lambda E\left(S_1\right)}{2\left(u+\lambda E\left(S_0\right)\right)}\ . \tag{8.6}$$

Hence, both parties will policy 1 if and only if $f\geq 1-\frac{\lambda E(S_1)}{2(u+\lambda E(S_0))}$; both parties will offer policy 0 if $f\leq\frac{\lambda E(S_0)}{2(u+\lambda E(S_1))}$; and, in the intermediate range, parties offer policies in which they have vested interest. □

Proof of Lemma 2:

Proof. Part 1: When the population is not adaptive:

We have $\mathcal{F}^1=\mathcal{F}^2$. F^1 and F^2 are two independent draws from the same set of distributions. Hence, $f_p^2=f^1$ for $p\in\{0,1\}$.

Part 2: When the population is adaptive:

Case 1: Let $v\in[0,1]$ denote the location of the citizen who is indifferent between policy 0 and policy 1. Given any distribution F, the majority favors policy 1 if and only if $m\left(F\right)\geq v$ where $m\left(F\right)$ denotes the median of the distribution F.

$$f^1=\sum_{\left\{i:m\left(F_i^1\right)\geq v\right\}}q_i$$

First, I show that $f_1^2\geq f^1$.

$$f_1^2=\sum_{\left\{i:m\left(F_i^2\right)\geq v\right\}}q_i$$

If policy 1 is implemented in period 1, F_i^2 stochastically dominates F_i^1. Hence, $m\left(F_i^2\right) \geq m\left(F_i^1\right)$. Therefore, $m\left(F_i^1\right) \geq v \Rightarrow m\left(F_i^2\right) \geq v$ and $\left\{i : m\left(F_i^1\right) \geq v\right\} \subseteq \left\{i : m\left(F_i^2\right) \geq v\right\}$. Hence, $f_1^2 \geq f^1$.

Using similar argument, one can show that $f_0^2 \leq f^1$. □

Proof of Proposition 5:

Proof. When the population is not adaptive, $f_p^2 = f^1$ for both $p = 0$ or 1. Hence, any party's strategy does not alter between the two periods.

Consider the case when the population is adaptive. Hence, we have $f_1^2 \geq f^1 \geq f_0^2$. In the second period stage game, P_0's expected payoff for any given first period policy $p \in \{0, 1\}$, is

$$\pi_0^2\left(f_p^2\right) = \begin{cases} \frac{E\left(S_{p,1}^2\right)}{2} & f_p^2 > 1 - \frac{\lambda E\left(S_{p,1}^2\right)}{2\left(u+\lambda E\left(S_{p,0}^2\right)\right)} \\ f_p^2\left(u + E\left(S_{p,0}^2\right)\right) + \left(1 - f_p^2\right) E\left(S_{p,1}^2\right) & \text{if} \quad f_p^2 \in \left[\frac{\lambda E\left(S_{p,0}^2\right)}{2\left(u+\lambda E\left(S_{p,1}^2\right)\right)}, 1 - \frac{\lambda E\left(S_{p,1}^2\right)}{2\left(u+\lambda E\left(S_{p,0}^2\right)\right)}\right] \\ u + \frac{E\left(S_{p,0}^2\right)}{2} & f_p^2 < \frac{\lambda E\left(S_{p,0}^2\right)}{2\left(u+\lambda E\left(S_{p,1}^2\right)\right)} \end{cases}$$

P_0's expected payoff is decreasing in f_p^2 for any $p \in \{0, 1\}$. Similarly, we can write the expression for P_1's expected payoff in the second period $\pi_1^2\left(f_p^2\right)$ as a function of f_p^2. $\pi_1^2\left(f_p^2\right)$ will be increasing in f_p^2. In the first period, if P_0 offers policy 0, P_1's expected two-period payoff by offering policy 1, is

$$f^1\left(u + \lambda E\left(S_1^1\right) + \pi_1^2\left(f_1^2\right)\right) + \left(1 - f^1\right)\pi_1^2\left(f_0^2\right)$$

On the other hand, by offering policy 0, P_1 gets

$$\frac{1}{2}\lambda E\left(S_0^1\right) + \pi_1^2\left(f_0^2\right)$$

Comparing the two payoffs, we see that P_1 will offer policy 1 (given P_0 offers policy 0) if and and only if

$$f^1\left(u + \lambda E\left(S_1^1\right)\right) + f^1\left(\pi_1^2\left(f_1^2\right) - \pi_1^2\left(f_0^2\right)\right) > \frac{1}{2}\lambda E\left(S_0^1\right)$$

(strict inequality because of assumption 2). Notice that $\pi_1^2\left(f_1^2\right) - \pi_1^2\left(f_0^2\right)$ is positive as $f_1^2 \geq f_0^2$. Recall the equivalent constraint for the temporal game (8.5): $f^1\left(u + \lambda E\left(S_1^1\right)\right) > \frac{1}{2}\lambda E\left(S_0^1\right)$. Since $\left(\pi_1^2\left(f_1^2\right) - \pi_1^2\left(f_0^2\right)\right)$ is positive, the cut-off value of f^1 above which P_1 will offer policy 1 (given P_0 offers policy 0) will increase compared to the temporal game. Similarly, comparing P_0's expected payoff from offering policy 0 and policy 1 (given P_1 offers policy 1), we find that P_0 offers policy 0 if and only if

$$\left(1 - f^1\right)\left(u + \lambda E\left(S_0^1\right)\right) + \left(1 - f^1\right)\left(\pi_0^2\left(f_0^2\right) - \pi_0^2\left(f_1^2\right)\right) > \lambda E\left(S_1^1\right)$$

Since $\pi_0^2()$ is decreasing in f_p^2, $\left(\pi_0^2\left(f_0^2\right) - \pi_0^2\left(f_1^2\right)\right)$ is positive. Comparing this constraint with the equivalent constraint of the temporal game (8.6), we can see that the cut off value of $\left(1 - f^1\right)$ over which P_0 offers policy 0 increases. Hence, compared to the temporal game, P_0 will offer policy 0 for smaller values of f^1. Hence, the range of f^1 for which both policies are offered expands. Furthermore, assumption (2) rules out the possibility that both parties simultaneously offer policies

in which they do not have a vested interest (The proof of the last statement is similar to the proof given in Proposition 4; hence skipped). □

Proof of Lemma 3:

Proof. Part 1: When the population is not adaptive:

The second period population is independent of the first period policy. Hence, for any $p \in \{0,1\}$, we will have $E\left(S^2_{0,p}\right) = E\left(S^2_{1,p}\right)$.

Moreover, we have $F^1_i = F^2_i$ for all $i = 1, 2....$ Hence,

$$\begin{aligned} E\left(S^1_0\right) &= R_0 - E\left(C^1_0\right) = R_0 - E_Q\left(E_{F^1_i}(x)\right) \\ &= R_0 - E_Q\left(E_{F^2_i}(x)\right) = E\left(S^2_{q,0}\right) \text{ for all } q = 0,1. \end{aligned}$$

Similarly, it can be shown that $E\left(S^1_1\right) = E\left(S^2_{q,1}\right)$ for any $q = 0,1$.

Part 2: When the population is adaptive:

Suppose that policy 0 is implemented in period 1.

We will show that $E\left(S^2_{0,0}\right) \geq E\left(S^1_0\right) \geq E\left(S^2_{1,0}\right)$. Since policy 0 is implemented in period 1 we have F^1_i stochastically dominates F^2_i for all i. Hence, $E_{F^1_i}(x) > E_{F^2_i}(x)$.

Therefore, $E\left(S^1_0\right) = R_0 - E\left(C^1_0\right) = R_0 - E_Q\left(E_{F^1_i}(x)\right) < R_0 - E_Q\left(E_{F^2_i}(x)\right) = E\left(S^2_{0,0}\right)$.

If policy 1 is implemented in period 1, then F^2_i stochastically dominates F^1_i for all i.:

$\Rightarrow E_{F^1_i}(x) \geq E_{F^2_i}(x)$. Hence, $E\left(S^1_0\right) = R_0 - E_Q\left(E_{F^1_i}(x)\right) > R_0 - E_Q\left(E_{F^2_i}(x)\right) = E\left(S^2_{1,0}\right)$.

Similarly, comparing $E\left(S^1_1\right)$ with the second period surplus, it can be shown that $E\left(S^2_{1,0}\right) < E\left(S^1_1\right) < E\left(S^2_{1,1}\right)$. □

Proof of Proposition 6:

Proof. Ex-ante probability of error is π if policy 0 is adopted; and $(1-\pi)$ if policy 1 is adopted. Under $0-$ dictatorship, policy 0 is adopted if and only if $E(\triangle_1) + E(\triangle_2) \geq -\frac{2u}{\lambda}$. Under $1-$ dictatorship policy 0 is adopted if and only if $E(\triangle_1) + E(\triangle_2) \geq \frac{2u}{\lambda}$. If $E(\triangle_1) + E(\triangle_2) \geq \frac{2u}{\lambda}$, both forms of dictatorship adopt policy 0; if $E(\triangle_1) + E(\triangle_2) \leq -\frac{2u}{\lambda}$, both forms of dictatorship adopt policy 1; and for the intermediate values of $E(\triangle_1) + E(\triangle_2)$, policy 0 is adopted in $0-$ dictatorship where as policy 1 is adopted in $1-$ dictatorship.

Let us now look at the policy selection rule under democracy. The ex-ante probability that the majority favors policy 1 over policy 0 is f. In the range of values of f where both policies are offered, an error in selection occurs if the median votes prefers the inferior policy. There are two possibilities - the median voter prefers policy 1 but the true population distribution is some distribution F with $1 \succeq_F 0$ or the median voter prefers policy 0 but the true population distribution is some distribution F with $1 \succeq_F 0$. We calculate

$$\begin{aligned} & P\left(\text{the median voter prefers policy 1 and } 0 \succeq 1\right) \\ = \; & P\left(\text{the median voter prefers policy 1}\right) \\ & -P\left(\text{the median voter prefers policy 1 and } 1 \succeq 0\right) \\ = \; & f - f_r \end{aligned}$$

where f_r is the ex-ante probability that the majority prefers policy 1 and policy 1 is also socially optimal choice.

$$\begin{aligned} & P\left(\text{the median voter prefers policy 0 and } 1 \succeq 0\right) \\ = \; & P\left(1 \succeq 0\right) - P\left(\text{the median voter prefers policy 1 and } 1 \succeq 0\right) \\ = \; & \pi - f_r \end{aligned}$$

Hence, when both policies are offered in election and the ex-ante probability that the median voter chooses an inferior policy is $\pi + f - 2f_r$ $(= (f - f_r) + (\pi - f_r))$. In the range of values of f where both parties offer only policy 1 the probability of error is $1 - \pi$. In the range of values of f where both parties offer only policy 0 the probability of error is π.

Comparing the error probability under democracy with the error probabilities under both forms of dictatorship, we get the result. □

9. **Appendix B**

9.1. **Informative Planning.** In the model under incomplete information, I assume that the dictator does not have any information about the median voter's preference. In reality, a dictator can acquire some information about the majority's preference through public surveys. Alternately, we can think of a referendum or plebiscite, where a social planner can gather information about the majority's preference through direct voting. In this section, I consider the possibility that a planner may acquire the information about the majority's choice and I show how availability of this information can improve the quality of decision making.

This analysis is made under an assumption of constant loss. More speficially, I assume that the loss in surplus is constant and independent of the voter's distribution if the superior policy is not adopted. Under this assumption, minimizing expected loss is equivalent of minimizing the probability of non-adoption of the superior policy.

Consider the case of a planner (call him P), who is informed about the majority's preference, but does not have the full information about the population's preference. Essentially, we can classify voters' distributions into four categories. i) the majority favors policy 0 and policy 0 is soically preferred, say, F_1^1; ii) the majority favors policy 1 and policy 0 is socially preferred; iii) the majority favors policy 0 but policy 1 is socially preferred, and iv) the majority favors policy 1 and policy 1 is socially preferred. Assume that the prior probabilities of these four possibilities are given by

η_1, η_2, η_3 and η_4 respectively.

	F_1^1	F_2^1	F_3^1	F_4^1
Socially preferred policy	0	0	1	1
Majority's choice	0	1	0	1
Prior probability	η_1	η_2	η_3	η_4

The probability that policy 1 will be socially preferred (ex-post) is

$$\pi = \eta_3 + \eta_4$$

If P conditions his decision on the set of all possible distributions, the probability of making error is $\min\{\pi, 1-\pi\}$ (which is the same as $\min\{\eta_1+\eta_2, \eta_3+\eta_4\}$). Under the constant loss assumption, P will choose policy 1 if $\pi \geq 1-\pi$. Hence, the probability of error will be $1-\pi$.

The probability that the majority favors policy 1 is

$$f = \eta_2 + \eta_4$$

The probability that majority favors policy 1 and policy 1 is socially preferred is

$$f_r = \eta_4$$

We can see that the probability that the majority makes an error in selection is $\pi + f - 2f_r = \eta_3 + \eta_4 + \eta_2 + \eta_4 - 2\eta_4 = \eta_2 + \eta_3$.

Consider the case when P knows the information about the majority's choice. If P knows that the majority favors policy 1, then he will condition his decision on the two distributions $\left\{F_2^1, F_4^1\right\}$. Then, the probability of error is $\min\left\{\frac{\eta_2}{\eta_2+\eta_4}, \frac{\eta_4}{\eta_2+\eta_4}\right\}$. Similarly, if P knows that the majority favors policy 0, the probability of error is $\min\left\{\frac{\eta_1}{\eta_1+\eta_3}, \frac{\eta_3}{\eta_1+\eta_3}\right\}$. The ex-ante probability of error under informative planning is $f \cdot \min\left\{\frac{\eta_2}{\eta_2+\eta_4}, \frac{\eta_4}{\eta_2+\eta_4}\right\} + (1-f) \cdot \min\left\{\frac{\eta_1}{\eta_1+\eta_3}, \frac{\eta_3}{\eta_1+\eta_3}\right\} = \min\{\eta_1, \eta_3\} + \min\{\eta_2, \eta_4\}$, which is less (weakly) than both $\min\{\pi, 1-\pi\}$ and $(\pi + f - 2f_r)$.

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