

**The niche of non-governmental organizations in a changing landscape
of citizens' preferences**

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Short Bios:

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Abstract

We investigate nongovernment public service providers within an agent-based computational model of bureaucrats, citizens, and elected officials. Our analysis explores the relationships of all four types of agents in a single, dynamic model. Specifically, we focus on the delivery of public goods to the citizenry through elected officials and bureaucrats. In our computational model citizens have diverse preferences for a variety of public goods. Political parties adapt their programs to get elected. Bureaucrats implement the priorities provided by the elected officials, who try to get reelected. Failure to provide the promised public goods affects the satisfaction of the citizens which may lead to the creation of nongovernment service providers, including for-profit firms and non-profit organizations. The model enables us to analyze how well preferences of citizens are met for different assumptions of the strategies of elected officials and bureaucrats.

Key-words: local political economy, nongovernmental organizations, preferences, agent-based modeling

Introduction

When preferences within a population of citizens change, when do parties successfully adapt, and when do Nongovernmental Organizations (NGOs) bloom? In this paper we model a public service provision world where citizens are served within the public sector by government bureaucrats and privately through NGOs. We are interested in the growth of NGO service providers due to unmet citizen preferences through relying on government provision alone. We investigate the conditions when citizen policy preference change leads to NGO sector growth, specifically we are exploring the government failure theory in the non-profit literature (Weisbrod 1977; Ben-Ner 1986; Marcuello 1998; Matsunaga and Yamauchi 2004). Our study evaluates how a mismatch between elected officials' party platforms and citizens preferences can create a niche for NGO provision.

Within the USA, governments have long relied upon private companies to police, dispose of trash, create roads, and perform countless other functions, but the funding for this production came from taxes through the local government (Ostrom et al. 1961). Many researchers have focused on the factors leading to growth of the non-profit portion of NGO sector in the US and abroad, specifically identifying lack of market and government alternatives, information asymmetry (Hansmann 1980), ability of non-profit organizations to deal with coordination problems (Enjolras 2000), and heterogeneity of stakeholders (Ben-Ner and Van Hoomissen 1992; Marcuello 1998). Countless researchers have extended this research to illustrate some of the efficiency gains for metropolitan areas through polycentricity and private production (McGinnis 1999). The

issue of private provision has also been explored, for example (Breton 1989). In this paper we further these analyses that focus on the supply or demand of public goods by modeling the electoral process and changing citizen preferences with an extension of the Kollman et al. (1997) model.

It is important to understand the creation of NGOs within local jurisdictions, as we have seen a rise in many types of NGOs, such as common interest developments (Fenster 1999; Helsley and Strange 2000) and land trusts (Press et al. 1996). Within the USA, environmental NGOs have been an integral part of the conservation and preservation movement providing a means for individuals to protect their land through conservation easements, technical assistance, and education (York et al. In press). Within the education system, private schools have long provided a private option when public schools were not available or inadequate. Common local government services, such as garbage collection and policing, are often supplemented by private providers within the community (Ostrom, 1998; Oakerson and Parks, 1988). Recently federal initiatives, such as the Faith Based Initiative, have encouraged NGOs, specifically religious organizations, to provide public goods. This paper does not focus on state or federally encouraged NGO creation, but rather on grassroots NGO creation. Using the computer model, we are also able to explicitly test how demand heterogeneity influences NGO creation while holding the transaction costs for creation constant. This answers the charge for more theoretical and empirical studies, which explicitly control for different levels government funding (Marcuelo 1998). In our experiments with low transaction costs, one could consider this an environment with ample opportunities for government subsidy and transfer payments to NGOs. Thus, we are able to explore NGO creation in a world where government

payouts are constant, specifically we evaluate how demand heterogeneity and government failure lead to NGO creation.

In our model, citizens may use NGO services to supplement or replace the government service provision. We explore the interaction between NGOs, citizens, elected officials, and bureaucrats through computer simulation. The model is based on citizen preferences over a set of issues, elected officials party platforms, bureaucratic response to officials and citizens, and citizens' efforts to create NGOs. The model is driven by a changing distribution of citizen preferences, allowing us to investigate the impact of the movement of citizens with differing preferences into a jurisdiction, an important issue in a highly mobile society.

The highly mobile nature of our society frequently means that within a jurisdiction the policy preferences of the citizenry shift fairly quickly over time. One common example of this process is when peri-urban areas are populated with exurbanites causing a change in the community from "rural" preferences to a citizenry that demands the amenities of a suburb (Rudel 1989). There are several examples of these processes including gentrification, movement of different ethnicities and races, or movement of retirement communities into jurisdictions. Our analysis focuses on increasing minority preference populations within a community creating a demand for NGO service provision.

Tiebout (1956) argued that citizens make their location decision based on the package of public and private services within the community. We assume that citizens are making their location decision because of goods external to the policy arena that we are

modeling. We focus on the impact of citizens entering the jurisdiction on elections and public good provision within their chosen jurisdiction.

We model interactions of citizens, elected officials, and bureaucrats as a principal-principal-agent problem. Within our model, citizens vote for officials whose party platform is closest to their policy preferences. After election officials balance desire for reelection with their party ideology in their policy adoption decisions. In between elections, officials are able to access polling results in order to update their platform. Bureaucrats implement the programs that are handed down from the elected officials, but they also slightly modify the programs to fit with the citizens' preferences. Bureaucrats balance between the citizens and elected officials' desires in order to maintain job security and limit complaints from citizens. The NGO in our model is created when there is a gap between public service provision and citizen desires.

Many researchers have explored the idea of "voting with your feet" (Lyons and Lowery 1986; Ostrom et al. 1978; Ostrom et al. 1961; Schneider 1989; Tiebout 1956). Moving is one means for dissatisfied citizens to improve the mismatch in preferences with public good provision, although several other means have also been explored in the exit, voice, and loyalty theory, including political protest and campaign contributions (Hirschman 1978; Lyons and Lowery 1986). Lyons and Lowery (1989) also discuss exit to alternative private service providers for specific public goods. In this paper we are focusing on this Lyons and Lowery type of exit to NGO provision, while allowing citizens to also exercise voice through voting and polling in between elections.

The ability of citizens to exit the political process or at least portions of the process, through private service providers has generated some concern. Specifically,

Helsley and Stronage (2000) explore exit into exclusive common interest developments and private schools. They investigate the problem with the “cream” of the society lives in exclusive gated communities or the upper classes send their children to private schools. We model these individuals as exiters on particular issues, rather than exiting from the political process as whole, as this more accurately reflects their status.

Overall our model brings together several streams of literature on NGO creation and citizens as consumers and entrepreneurs. We are not exploring citizens’ ability to vote with their feet, but rather their ability to use NGO services in place of public services. Through citizens’ ability to create and utilize NGO services we are explicitly exploring the government failure theory of non-profit creation. Our extension of Kollman et al.’s (1997) model to include bureaucrats, as well as citizens and elected officials, is an improvement as legislation and policy implementation frequently differ. We add sensitivity indices to investigate how bureaucratic influence alters the local political economy. We are interested in how an evolving citizen preference distribution leads to NGO creation, which directly explores the government failure theory in the non-profit literature. In the following sections, we will explain the model components: the adaptive parties, entrepreneurial citizens, and bureaucrats. Then we discuss the results from the experiments. We conclude by discussing our results within the literature, as well as introducing future research directions.

Adaptive parties

Within our model, there are two parties competing for V votes in a n -dimensional issue space. The preferences of each voter are represented by a vector of n integers. The vector \mathbf{x} represents the ideal positions on each issue out of k possible positions. The platform of a party is defined as $y \in \{0,1,\dots,k-1\}^n$. The expected utility to a voter from this platform is defined as the squared difference between the ideal point and the platform, scaled to a range between 0 and 1, and as defined as

$$u_i(y) = \sum_{j=1}^n \frac{(k-1)^2 - (x_{ji} - y_j)^2}{(k-1)^2} \quad (1)$$

As noted in Krebs (1998) many local elections are now nonpartisan, although the local party organization is often courted by candidates and officeholders in order to receive endorsements or campaign finance in nonpartisan elections. In our model, officials are officially or unofficially connected to a party with a party ideology and platform.

In line with Kollman et al. (1992) the parties adjust their platforms to win elections. We assume that the parties have some ideologies \mathbf{X}^l and that they may adapt their program within a tolerable change T_{max} to maximize the probability to win the elections.

The parties adapt their platforms by estimating the share of the votes that they may receive, and update the program if it increases the expected share of votes. In an iterative way, the parties adapt their program. The estimation of the share of votes is derived by sampling the opinions of the voters. A random sample of voters is “polled” enabling party platform adjustment between elections. In the poll, the voters sampled, a

total of V_{sample} , are assumed to give an honest reply. These polls may be considered actual polls, or citizen responses that are gathered through the countless vehicles that politicians gage public opinion such as public hearings, newspaper accounts, and personal communication. We explore different degrees of change among the preferences of citizens, as discussed in the experiment section below. Parties may adapt their ideology to reflect the changing citizens' preferences. With a probability p_I the ideologies \mathbf{X} of a party on a particular issue are adjusted. We simply assume that \mathbf{X} changes linearly with changes in the average preferences among the citizens.

There is mixed evidence regarding the impact of public polling on official activity. Greenwald et al. (2003) argue that polling is most effective in determination of the agendas for legislatures, but not necessarily important in the determination of actual legislation. We allow the elected officials to alter their policies after polling, but these officials still consider their party ideology. In our experiment, we test how government adaptation after polling impacts the citizen satisfaction and NGO creation. In our simulation we assume that each party can adapt 5 times their program, and every time they can tinker their program, they can try out 8 adaptations. This is in line with the adaptive party model of Kollman et al. (1992) and simulates a kind of local search routine in a political landscape.

The elected officials set priorities for policy implementation, which balance the probability of being reelected and the match of the implemented programs and their ideals. Thus the elected officials maximize

$$u_i(y^I) = P[\text{elected}]^\gamma \cdot \left(\frac{1}{n} \sum_{i=1}^n \frac{(k-1)^2 - (y_i^I - X_i^I)^2}{(k-1)^2} \right)^{1-\gamma} \quad (2)$$

The expected share in the next election is derived by sampling a share of the population on whether they will vote for the party with the program y^I . The second component varies between 0 (maximum mismatch), and 1 (perfect fit). The parameter γ reflect how much weight the elected officials put on getting reelected versus implementing the programs according to their ideology.

Entrepreneurial citizens and bureaucrats

After the elected officials determined their program, we allow preference change within the population of citizens. With a probability p_{influx} we update the preferences of a citizen across the seven issues. In all experiments we start with a population with preferences in the lower bound of possible positions, say 0 and 1, and these preferences are updated with higher values up to $k-1$. When p_{influx} is low, there will be an increasing diversity of preferences over time (Figures 1a and b). When p_{influx} is high there is a moving cohort of preferences (Figure 1c).

[Figure 1]

Given the proposed program of the elected official, the bureaucrats implement the program. The bureaucrats are assumed to take into account the queries of both the

citizens and the elected officials. If the citizens' preferences are not taken into account, they may start to complain to the elected officials about the provided services.

The bureaucrats chose for every issue i the position j such that Ω_{ij} is maximized.

$$\Omega_{ij} = \left(\frac{(n-1)^2 - (y_i^I - j)^2}{(n-1)^2} \right)^{\gamma_b} \cdot \left(\frac{1}{V_{sample}} \sum_{l=1}^{V_{sample}} \left(\frac{(n-1)^2 - (x_{il} - j)^2}{(n-1)^2} \right) \right)^{1-\gamma_b} \quad (3)$$

Where γ_b express the weight of the bureaucrats on the satisfaction of the elected officials versus the citizens. Thus, we assume that bureaucrats are attempting to satisfy both elected officials and citizens in order to reduce conflict.

There are two prevailing theories regarding bureaucrats' activities. One of the theories argues that bureaucrats seek to influence policy outcomes by imposing their preferences. Another theory argues that bureaucrats seek to increase the budgets in order to reduce their workload and increase their prestige.

Wintrobe (1997) argues bureaucrats may seek to implement their preferred policies or maximize their budgets. The principal-agent problem with bureaucrats and politicians is partially solved by creating competition between agencies, so the bureaucrats are more concerned about job security and seek to implement efficient programs that mirror politicians' preferences.

Torenvlied and Thomson (2003) use evidence from Dutch local authorities to argue that a multi-stage approach to implementation better predicts policy implementation than a political bargaining approach. Torenvlied and Thomson's research

support the theory that agencies are not always able to affect the actual political decision, but rather are able to shape implementation.

One means for bureaucrats to control policy implementation is through information asymmetry and technical knowledge about an issue. Ringquist et al (2003) investigate the effects of salience and technical complexity on the elected officials' control of bureaucratic action. They argue that public salience of an issue will create incentives for legislators to watch bureaucratic activity, whereas complexity of an issue will reduce the ability of legislators to monitor. They find some evidence in the quantity of legislative activity for particular types of issues, high salience/high complexity, low salience/low complexity, high salience/low complexity, and low salience/high complexity, which support these conclusions. Thus, there is room, especially in low salience and high complexity, issues for bureaucratic influence.

In our model, as described earlier, the bureaucrats are seeking to balance political pressure from citizens and elected officials. They are possibly given some room for influence through vague policy directives from the elected officials or due to inability of elected officials to monitor. We are not modeling the budget-maximizing bureaucrat, but rather a conflict-minimizing bureaucrat in this model.

We can calculate the dissatisfaction of the citizens about the provided services by the bureaucrats. The dissatisfaction of a citizen j about a policy issue i is denoted as δ_{ij} and is defined as the squared difference between the opinion of the citizen and the provided service.

$$\delta_{ij} = (x_{ij} - y_i^I)^2 \tag{4}$$

As consumers, citizens chose between government or nongovernment services. Lowery (1998) argues that citizens are often ineffective in their evaluation of public services in a quasi-market environment. Lowery focuses on the quality of the services provided. We are not focusing on efficiency of the provision, but rather that the citizen views the NGO provider as more closely matching his/her preference.

When there are NGO's we can also calculate the dissatisfaction of a citizen for the NGO programs. In such a case the y_i^I is replaced with y_i^{NI} .

In case a citizen is dissatisfied beyond a threshold δ_{\max} for all options, both governmental and non-governmental, the citizen will create a new program where the y_i^{NI} is equal to the preference of the motivated citizen x_i for that particular issue. We are building on Olson's idea regarding collection action that individual citizens will not produce a public good unless extremely motivated by their individual marginal costs and benefits (Olson 1965).

Nownes and Neeley (1996) argue that political entrepreneurs are essential in the creation of interest groups and that individual support of these groups determines the longevity of the organization. In our model, a political entrepreneur is a citizen motivated by his/her preference mismatch with the programs that are implemented. This citizen creates an NGO that then must be supported through participation by other citizens. We investigate how the transaction costs for NGO creation and participation change the political environment. Thus, we explore at what point a citizen is willing to invest resources into NGO creation and acknowledge Olson's (1965) collective action theory

with its expectation of NGO activity limited by transaction costs and marginal, individual benefits.

We assume at $t=0$ that there are no NGOs. Through the experiment we investigate the creation of NGO programs. At each time point, given the current options of programs, the program of the elected government and the NGO programs, the citizen will select which program to join. For each program, the agent calculates the expected utility, taking into account the extra transaction costs for NGO programs,

$$P_{ij} = \frac{e^{\mu(u_{ij}-c_j)}}{\sum_{j=0}^{\#ngo} e^{\mu(u_{ij}-c_j)}} \quad (5)$$

Where $j=0$ is the governmental program, and $c_0 = 0$

In our model, NGOs represent an alternative to public service providers. In some policy arenas, such as land use policy, NGOs have been more responsive to citizen preferences (York et al., in press), while in other arenas, such as healthcare, Johnson and Bond (1982) found that NGOs may be unresponsive to consumer preferences, like a preference for abortion services. Within our model, in the ten abstract policy arenas the NGOs are created and maintained when there is a significant population that is not served by the government service providers.

If an NGO program is not used, say less than n_{\min} users, then this program is taken out of the population of NGO programs. Thus we assume that a minimum amount of users is required to make a NGO program able to overcome the transaction costs. As

Nownes and Neeley (1996) argue, there needs to be a group of individuals contributing to the maintenance of a NGO.

Experiments

In our basic experiments we assume we have 251 types of voters. These “voters” represent classes of citizen types. These voters are assumed to vote in every election, and provide honest responses when a random sample is polled between elections. We assume that these types represent classes of preferences of voters within our society.

[Table 1]

Each condition below was simulated 100 times for 10 election rounds. The results show the average state of the system after the 10th election round. When we make statements of significant differences between different parameter settings, we have taken into account the standard deviation of the results for the 100 simulated runs per parameter setting. Preferences of agents are updated between 2 election rounds. Each time the preferences are updated there is a probability p_u that the preferences of an agent are updated. If the preferences are updated, the new preferences are drawn from $\min(k-1, 0.5*r_e + u[0,2])$. As a result new preferences appear from 0 and 1 at the beginning of the simulated period to opinions 5 and 6 around the 10th election cycle (see Figure 1). Such a change of preferences could represent replacement of an older generation by a new one, or people from outside the region with different preferences moving into the region.

In the first set of experiments we vary the rate of preference change p_{influx} . We see that up to 25% influx per election lead to a sharp reduction in the participation in governmental programs (Figure 3).

When p_I is equal to 0, and governmental parties do not change their ideologies, the participation in governmental programs declines, and there is a moderate number of successful NGOs who provide services (Figure 3). For p_I equal to 0.5 or 1, representing more adaptive parties' ideologies, interestingly there is a larger number of NGOs. Under this adaptive party condition NGOs are created that cater to agents that previously were served by the traditional party lines. But due to the adaptation of the government, the decline of participation in governmental programs does not continue to decline under moderate levels of preference change and actually increases under high probability levels of preference change (Figure 2). When p_{influx} is greater than 0.5, the rate of change becomes sufficiently large that the both the government and NGOs have trouble to keep up with the changing preferences (Figure 3). With a moderately adaptive government, p_I is equal to 0.5, the number of NGOs declines almost to the level of a totally adaptive government when p_{influx} approaches 1. As expected under static government ideology, NGO program numbers are highest with probability of preference change. The greatest number of NGO programs is found under unadaptive or moderately adaptive party ideologies with p_{influx} between 0.2 and 0.4.

We also analyzed the impact of flexibility to ideology. Obviously, if governmental parties are adapting, flexibility of ideology has no significant impact ($p_I=1$ & $T_{max}=7$). Interestingly if parties do not stick to their ideology when they write their programs in order to optimize the probability to win the election, and the parties do not

adapt to changing preferences, there is an increase of NGOs but the participation in governmental programs remain on the same low level ($p_l=0$ & $T_{max}=7$). The reason for this is the default value of γ which leads elected officials not to implement what they promised, and do not stick to their ideology either.

[Figure 2]

[Figure 3]

The priorities set by the elected officials have less influence than the priorities set by the bureaucrats. We analyzed the effect of combinations of γ and γ_b when p_{influx} is 0.25 and ideologies of parties do not change and as Figure 4 shows, when bureaucrats put more weight on satisfying the preferences of the officials, the level of participation in governmental programs drop. This is especially the case when elected officials focus on implementing their ideologies, instead of maximizing the probability to be reelected. A puzzling result is that the number of NGO programs created is low when elected officials focus on their ideologies and bureaucrats satisfy the officials (Figure 5). A reason for this lower diversity might be that in a situation like that there is no need for conservative NGOs, since they are served by the governmental programs.

[Figure 4]

[Figure 5]

Conclusions

The computational experiments show that the number of NGOs and variety of NGOs is the highest at a moderate level of change of preferences of the citizens, especially when parties change their ideologies, yet are unable to fill the gap on the left and right of policy preference spectrum. We find that NGO creation initially occurs by the newcomers who hold minority preferences, but as this minority becomes a majority NGO creation increases by the residents with more traditional preferences.

We find similar patterns of NGO creation under mobile and highly mobile citizen conditions. In a highly mobile jurisdiction, the elected officials are less able to adapt, which leads to an increase in NGO creation. We find evidence that government failure leads to NGO creation, especially with moderate levels of changing citizen preferences. By including bureaucrats in the local political economy, we offer another theory for different levels of growth in the NGO sector. In some communities, bureaucrats may be more responsive to citizen demands. Thus, the growth of the NGO sector may be slowed through bureaucrat sensitivity to citizen preference changes. Another interesting problem that our model has explored is the inability of NGOs to adequately serve a population with quickly changing preferences. In a rapidly changing world, neither the government nor the NGOs can match citizen changes leading to both government failure and NGO failure.

Like any model, our model is a simplification of reality, in our case local and regional political economies within the USA. However, we think that our analysis is a useful exercise that can provide some directions to empirical work. It would be interesting to perform case-studies on the motivations why certain NGO are created and

how the services the NGO provide differ from those provided by the government.

Another potential investigation is to explore whether the relative number of NGOs for a particular service differs between states and how this relates to the distribution of preferences.

Empirical work may test the impact of migration on NGO creation, especially because migration may indicate fewer resources and greater transaction costs for NGO creation. Given a constant resource base, we expect that a jurisdiction experiencing great growth in minority populations will produce more NGOs.

Future work may balance the possibility and cost to leave to another place, versus initiating and participating in private institutions, enabling us to explore Tiebout's exit option. In the future experiments, we would include transaction costs for moving that are similar to those for creating NGO's.

Furthermore, the creation of private service providers often has a spatial component, such as gated communities. Future work may examine how the spatial distribution of citizen preferences may impact NGO creation for specific districts within jurisdictions. We expect to find neighborhood effects due to clustering of preferences, although this may be mitigated in a highly mobile society.

Our model has illustrated how changes in mobility may be linked to NGO creation when incoming agents have different policy preferences. Furthermore we have illustrated that a moderately adaptive government is unable to address changing preferences in a highly mobile society, but NGOs also struggle under these conditions. We find the greatest quantity and diversity of NGOs in a society with some government adaptation and moderate influx of citizens. We investigated of the interrelationships

between elected officials responsiveness, bureaucratic implementation, changing citizen preferences, and NGO service provision. This preliminary investigation indicates that the private provision exit option is important in the investigation of local policy formation and implementation.

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Table 1: Parameter values in the default case of the simulations

Number of voter types (V)	251
Number of voter types polled in a sample (V_{sample})	51
Number of positions per issue (k)	7
Number of elections	10
Number of issues (n)	10
Steepness of effect utility differences on probability of participating program (μ)	20
Exponent utility function elected officials weighting being reelected versus probability of implementing own preferences (γ)	0.5
Exponent utility function bureaucrat weighting satisfying citizens versus elected officials (γ_b)	1
Maximum tolerable dissatisfaction (δ_{max})	0.3
Transaction costs for NGO programs (c_j)	0.4
Rate of change of parties to adopt to changing preferences (η)	0
Rate of influx of citizens with new type of preferences (p_{influx})	0
Maximum tolerable adjustments of parties compared to their ideology (T_{max})	0

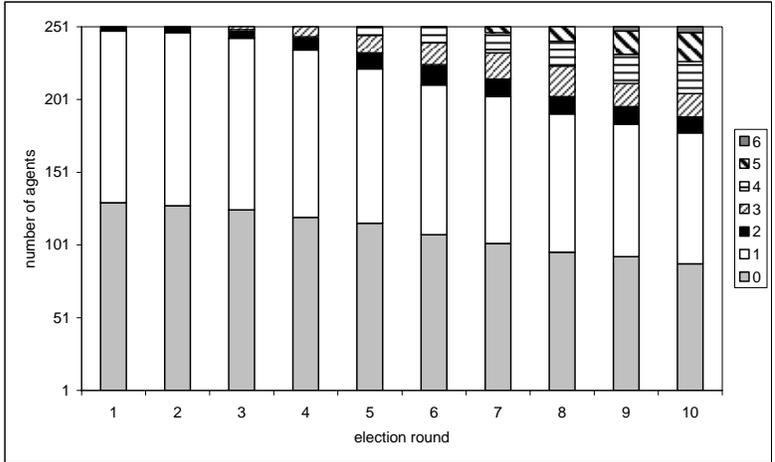


Figure 1a: Example of distribution of opinions on an issue when p_{influx} is 5%.

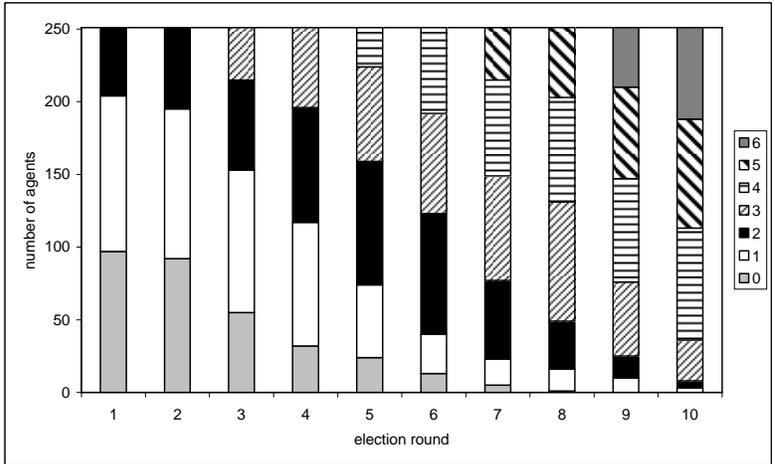


Figure 1b: Example of distribution of opinions on an issue when p_{influx} is 40%.

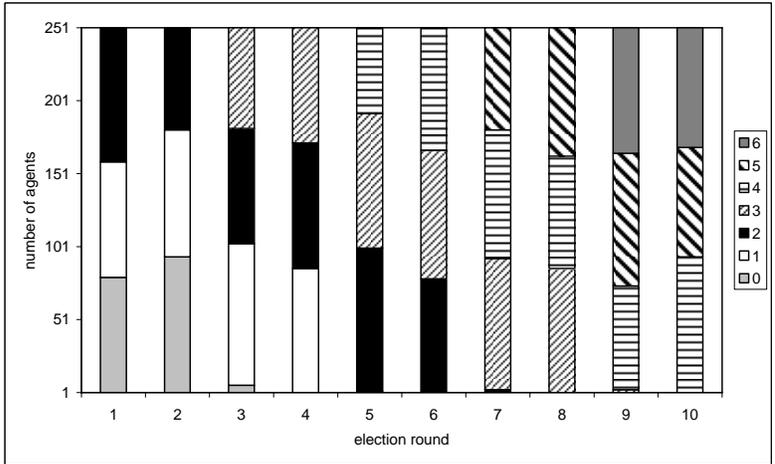


Figure 1c: Example of distribution of opinions on an issue when p_{influx} is 95%.

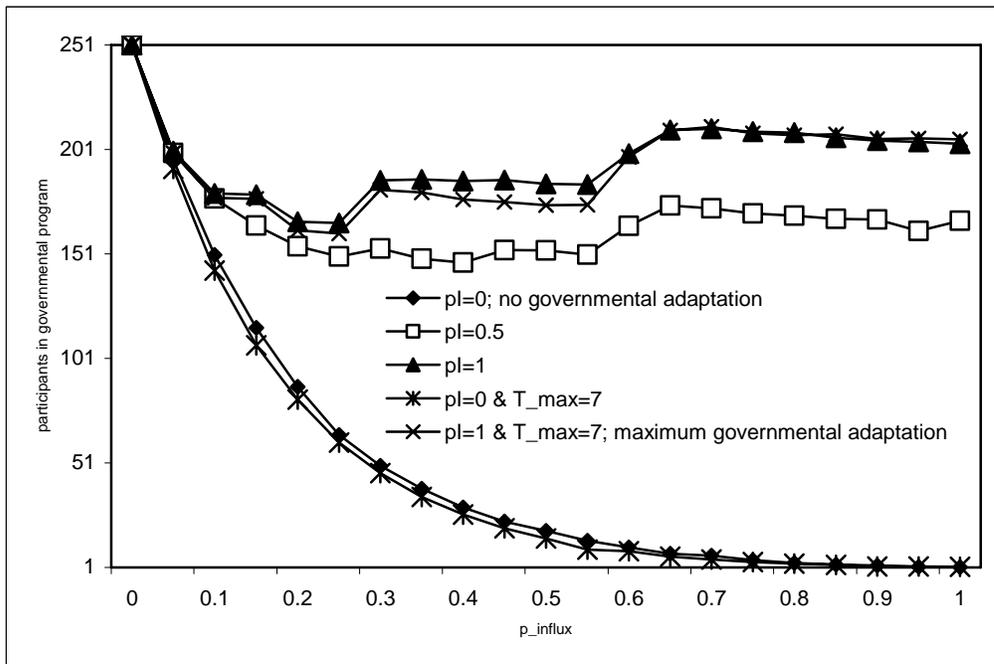


Figure 2: Number of voters types using services from the government after 10 election rounds for different levels of p_{influx} as an average of 100 runs, for different parameter values. Note that p_I refers to the probability of parties to adjust their ideologies.

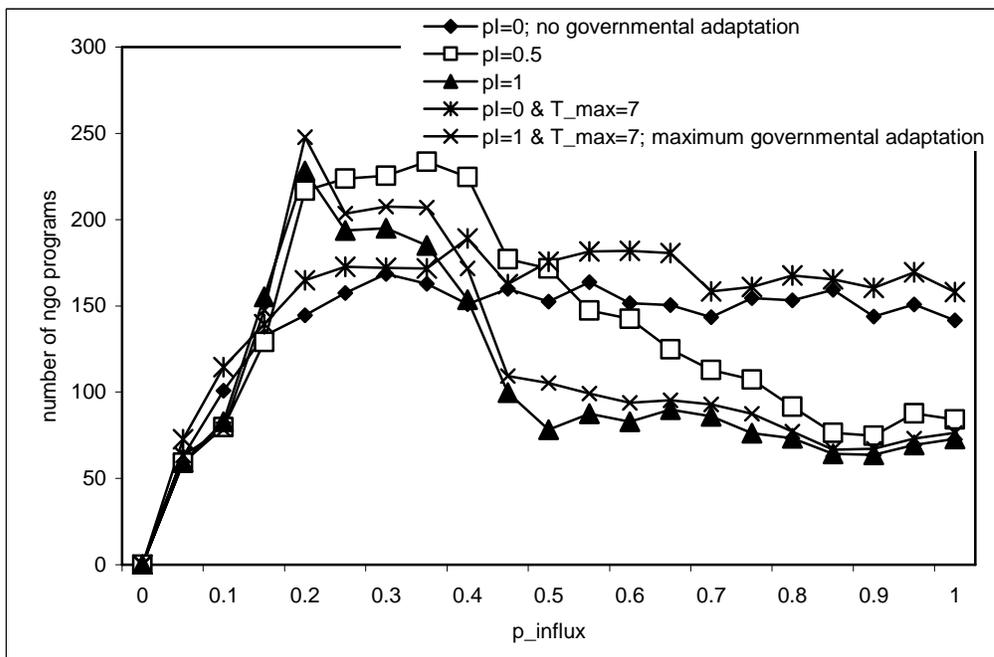


Figure 3: Number of programs after 10 election rounds for different levels of p_{influx} as an average of 100 runs, for different parameter values. Note that p_I refers to the probability of parties to adjust their ideologies.

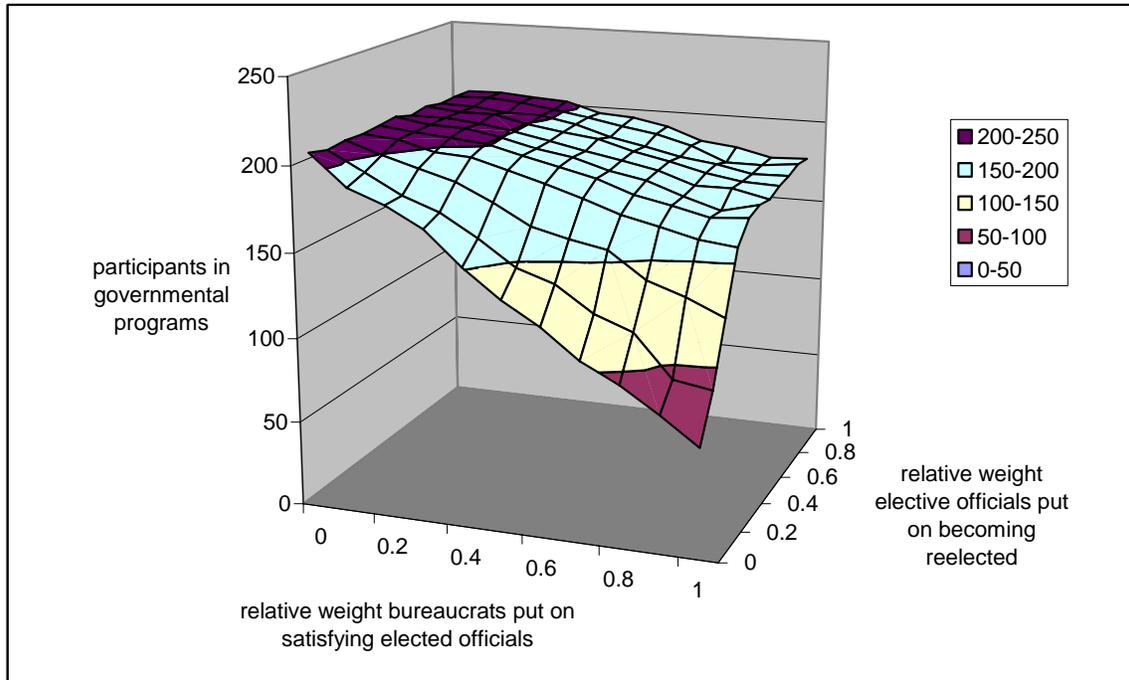


Figure 4: Number of participants in governmental programs after 10 election rounds for different levels of γ , the weight elected officials put on becoming reelected versus matching the preferences of the citizens.

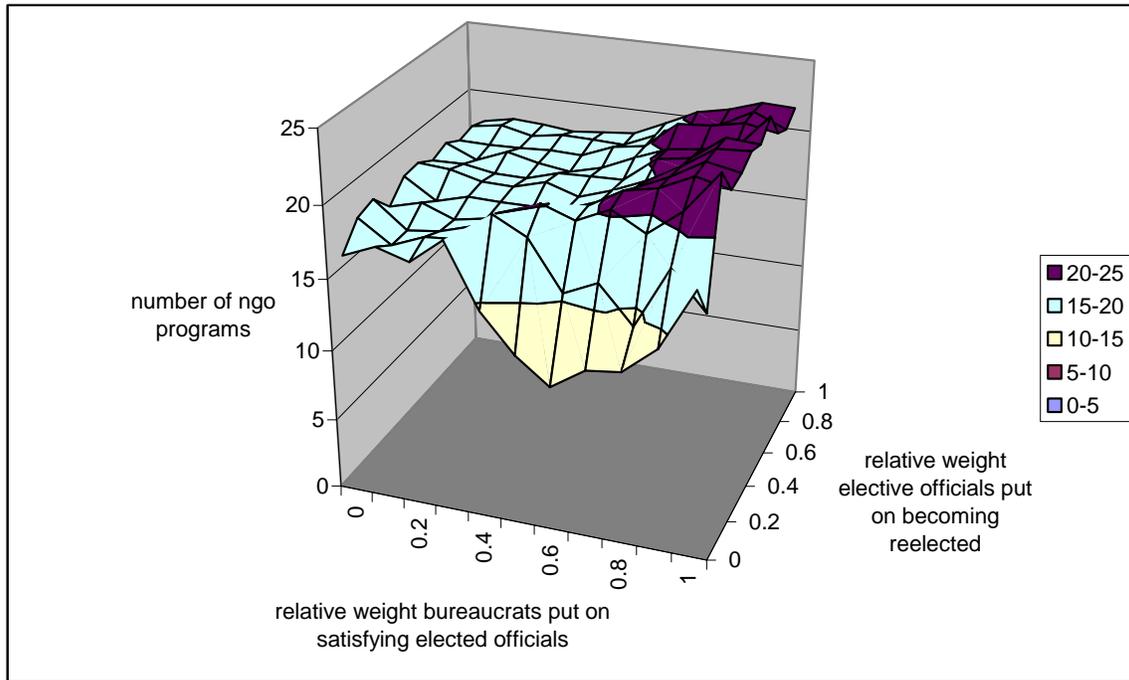


Figure 5: Number of programs after 10 election rounds for different levels of γ , the weight elected officials put on becoming reelected versus matching the preferences of the citizens.