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# On the Vote Purchasing Behavior of Incumbent Governments\*

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## Abstract

A couple of months before the Swedish election in 1998, the incumbent government distributed 2.3 billion SEK to 42 out of 115 applying municipalities. This was the first wave of a four-year long grant program intended to support local investment programs aimed at an ecological sustainable development. This temporary grant program differs from traditional intergovernmental grants in several aspects, most importantly in the sovereign decision making power given to the incumbent central government. In this paper we investigate whether there were any tactical motives behind the distribution of these grants. We find support for the hypothesis that the incumbent government used the grant program under study in order to win votes. In particular, we find strong support for the Lindbeck-Weibull/Dixit-Londregan model in which parties distribute transfers to regions where there are many swing voters. This result is statistically as well as economically significant. We do however not find any support for the model that predicts that the incumbent government transfer money to its own supporters.

**Key words:** Political Economy, Intergovernmental Grants, Vote Purchasing

**JEL Classification:** D72, H73, H77

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## 1. Introduction

In the spring of 1998, a few months before the Swedish elections, 2285 million SEK<sup>1</sup> were distributed to 42 out of 115 applying Swedish municipalities. These grants were the first wave of a specially designed support program intended to support, by means of intergovernmental grants, local investment programs aimed at an ecological sustainable development and to increase municipal employment. The decision making design for these “ecological” grants differs a lot from how the distribution of intergovernmental grants is traditionally performed: The preparation as well as the final decision is made by the incumbent government and there is no explicit formula describing how the grants ought to be distributed. Furthermore, the grants are not connected to the efficiency and equity goals otherwise typically attached to intergovernmental grants. Hence, the government can freely choose which municipalities to distribute money to, taking the effect on their re-election possibilities into account. This makes this specific grant program uniquely suitable to use when investigating the vote-purchasing behavior of incumbent governments.

In this paper, we will use data from the “ecological” grant program and investigate whether these grants were used tactically by the incumbent government. The purpose is to test two competing theories. The prediction from the first model, put forward by Lindbeck & Weibull (1993) and Dixit & Londregan (1996), is that the incumbent government purchases votes by distributing money to regions where there exist many swing voters. In contrast, the prediction from the other model, presented by Cox & McCubbins (1986), is that the incumbent government purchases votes by investing in regions where they already have high support (for example in regions where the party in power in the local government is the same as the party in power at the central level).

The results give strong support for the prediction from the Lindbeck-Weibull/Dixit-Londregan model: the incumbent (socialist) government used the specially designed grant program tactically by favoring municipalities where there existed many swing voters. The tactical use of the grants is of statistical as well as economic significance. The data does, however, not support the prediction from the Cox-McCubbins’ model.

The paper is organized as follows: In the next section we discuss the conditions one would like to put on a dataset in order to be able to investigate the vote purchasing behavior of

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<sup>1</sup> 1 USD is approximately equal to 8.5 SEK.

governments and to what extent the data we use fulfill these conditions. Thereafter, in Section 3, we present the theoretical models and some earlier empirical evidence concerning tactical redistribution. Section 4 presents some descriptive statistics and Section 5 the econometric strategy and the results. Finally, Section 6 concludes.

## **2. A suitable data set**

To test theories that claim that the incumbent central government uses intergovernmental grants for tactical purposes, we would ideally like to have a situation in which (1) the incumbent central government decides on its own whether a lower level government shall be granted or not, (2) we may disentangle any possible strategic use of grants from the equity and efficiency purposes typically attached to intergovernmental grants, (3) the granting decisions are made in close connection to an election<sup>2</sup>, and (4) voters know that their municipality has/has not been granted. In this study, we will use data that we claim fulfills all four conditions, both concerning the decision making process, the aim, the timing and the information. This has not been the case in any of the earlier empirical studies<sup>3</sup> since in most countries the systems for intergovernmental are prescribed by laws that cannot be changed overnight: condition (1) above is hence not fulfilled. The prescribed formulas are typically linked to different need-variables in the municipalities, implying that (2) is not fulfilled. One way to separate between political factors and equity and efficiency aspects of grants (and thereby trying to fulfill (2)) is to include a number of socio-demographic variables in the regressions and thereby trying to control for redistributive motives of intergovernmental grants and federal spending. It is however far from obvious how to do this. The problem is well described in Levitt & Snyder (1997): If we do not control for equity and efficiency variables we risk exaggerating the political impact of grants, but on the other hand, targeting grants to specific minorities might be a perfect way for politicians to buy support and by including them we might fail to identify tactical aspects which actually are present. In fact, in many countries, for example Sweden, the rules for intergovernmental grants are set up in such fashion, that it is only through these demographic

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<sup>2</sup> One could argue that, since the money is already distributed, there is no need for voters to re-elect the incumbent government and that what ought to matter for voters' decisions are election promises. There is however empirical evidence, see, e.g., Stein & Bickers (1994) and Levitt & Snyder (1997), that increased spending in fact affects voters' behavior. This could have at least two explanations; one is that voters feel under the obligation to support those who have treated them well; the other possible explanation is that voters believe that a party that has supported them in the past also will support them in the future and hence see the actions of the incumbent government before the election as an indicator of how it will act in the future. Whatever the reason is, what matters in the end is that the incumbent government believes that voters react positively if the municipality in which they live is granted. In this paper we assume that this is the case.

<sup>3</sup> See, e.g., Bungey *et al.* (1991), Grossman (1994) and Johansson (1999).

factors that regions can be targeted. Ideally, one would like to test the tactical theories on a grant program that is not intended to equalize income and that is free from specific formulas describing how the grants are to be distributed.

The grant program we study in this paper was introduced in 1997, when it was decided that the Swedish central government should construct a specially designed support program to support, by means of intergovernmental grants, local investment programs aimed at an ecological sustainable development.<sup>4</sup> These grants were supposed to be temporary and supplementary to the usual intergovernmental grants that are motivated by efficiency and equity reasons. The grants are economically important; 7.4 billion SEK were to be distributed during four years (1998-2001). Only municipalities could apply for these grants. For a municipality to be eligible for the grants, four main criteria had to be fulfilled: (i) the proposed investment project must be fully detailed and developed in the application, (ii) the estimated cost for the project must be given, (iii) the investment program must be designed for an ecological sustainable development, and (iv) the project must increase the employment in the municipality. The applications were sent to the incumbent central government (ministry of environment), and the incumbent central government had the final say about which municipalities that should be granted.

There are mainly four aspects that make this data set suitable for the purpose of this paper, besides its economic significance. Firstly, and most importantly, the decision making process on which of the municipalities are to receive grants differs from the traditional way of distributing grants to municipalities. The usual intergovernmental grants are distributed among the municipalities according to rather strict pre-defined rules based on equity and efficiency arguments and are handled by central authorities that are independent of the incumbent central government. But for the temporary grants for an ecological sustainable development, it is the incumbent central government that solely decides on which municipalities that are to be granted (after preparation at the ministry of environment). Furthermore, one of the important decision-makers at the ministry of environment is a former member of the Swedish parliament for the incumbent government (the social democrats). Secondly, the grant program is not intended to fulfill equity and efficiency objectives, but rather to support an ecological sustainable development. In fact, there existed no pre-defined guidelines whatsoever on how the “ecological” grants were supposed to be distributed (see Rapport 1998/99:8 from Riksdagens Revisorer). Thirdly, the decisions were made five to six months before the 1998

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<sup>4</sup> See prop 1996/97:150.

elections<sup>5</sup>. We can also note that the grant program is a four-year program in which the incumbent government distributes money in each of the years 1998-2001. Finally, the yes or no nature of the decision makes it easy to apprehend and the question has also attracted much attention in the local, as well as the central, press, giving us reason to expect voters to be aware of how their own municipality has been treated. The grants for an ecological sustainable development hence fulfill all four desirable conditions and are thus perfectly suited to use for studying the question of vote purchasing behavior.

The applications for these grants designed for an ecological sustainable development will be made in several waves. We will use data from the first wave of applications. The final day for the first wave applications was February 16, 1998. 115 out of a total of 288 Swedish municipalities applied for the grants. Decisions were made during March and April. 42 of the 115 applying municipalities received grants amounting to a total of 2.3 billion SEK. Housing and construction constitute the largest part of investment projects granted, followed by energy-projects, sanitation and nature and water conservation.

### **3. Tactical redistribution: theories and empirical evidence**

The idea that the incumbent government considers political strengths of regions when distributing resources across the country is old. Investigating New Deal spending, Arrington (1969) found the somewhat mysterious fact that spending did not seem to promote equity between states but rather to favor states with high income. In fact, economic variables did a very bad job explaining New Deal spending.<sup>6</sup> Wright (1974) attacked this “oddity” by incorporating a number of political variables in the analysis. Starting out with a theoretical model where the president maximizes the probability of winning and where voters react positively to new spending programs, he predicted that spending will be higher in states with higher “political productivity”, a measure depending on the electoral votes per capita, the variability in the vote share of the incumbent government in past elections and the predicted closeness of the presidential elections. Running cross-section regressions for the period 1933-1940 on 48 states, Wright found a considerably higher  $R^2$  in the political regression than in the

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<sup>5</sup> In Sweden there are, since 1994, elections every fourth year. The elections are conducted on the same day (first Sunday in September) to all three levels of government (central, county, and municipal).

economic regression. He hence concluded that interstate inequalities in federal spending, to a large extent, were consequences of vote maximizing behavior of politicians. Anderson & Tollison (1991) claimed that it was not the result of the presidential election alone that mattered, the congressional influence was important as well, and perhaps even more important. Their idea was that states whose representative in the congress has large power (e.g. length of tenure, speaker in House or Congress) would be favored. Using the same data as Wright, they found that many of these congressional variables entered with expected signs and statistical significance. Wallis (1996) examined the findings of Wright and Anderson & Tollison closer using panel data. He found that economic variables did matter and that when excluding Nevada<sup>7</sup> from the sample, the impact of Anderson & Tollison's congressional variables disappeared while Wright's presidential variables still entered significantly. Wallis further expanded the investigated period beyond the New Deal, using data on federal government grants to states for the years 1932, 1942, 1962, 1972 and 1982. He found that i) the results change dramatically when controlling for fixed effects, ii) taking the simultaneity between spending and grants into account, the result that high-income states are favored disappears and economic variables does matter, and iii) while Wright's presidential variables seem to matter much during the New Deal, congressional factors are more important in the long run.

Many of the early studies lack a strict theoretical ground and are rather ad hoc in which political variables to include. During the recent years, some more stringent theoretical models have been developed. In this paper we will concentrate on two competing theoretical models that yield quite different testable empirical implications.<sup>8</sup> The first model is taking its root in the papers

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<sup>6</sup> Reading (1973) examines the political rhetoric behind the New Deal. There were three goals of the New Deal: 'relief', 'recovery' and 'reform'. He finds no support for the hypothesis that spending and loans were directed to poorer regions, which he takes as evidence that the New Deal did not fulfil the 'reform' goal.

<sup>7</sup> Nevada was the state receiving the largest per capita grants during the period. In addition, Nevada has a 1 in the dummy variable for Senate leadership during the whole period.

<sup>8</sup> There are in the literature also a number of other models that has been empirically investigated (see, e.g., Stein & Bickers, 1994 and Levitt & Snyder, 1995). Stein & Bickers (1994) investigate the use of pork barrels by incumbent congressmen in the US congress in the 1988-election. They put forward and find support for the following hypotheses: i) it is not dollars spent that matters, but rather the number of new projects initiated, ii) not all incumbents need to use grants to improve their electoral fortune, only those in a vulnerable situation do (vulnerable meaning that they got elected with a very small margin) iii) it is not the number of projects per se that makes people like the incumbent, rather the awareness of these new projects iv) awareness increases with the number of new projects and v) the electoral support of an incumbent increases with voters' awareness of new projects. Levitt & Snyder (1995) investigate the impact of political parties on federal spending. Underlying the analysis is an assumption that politicians would, if they could, support their own. Levitt & Snyder contrast three different models; a "weak party" model where parties play no role and what matters is whether the representatives of a district have powerful positions in the chamber; a "strong party" model where parties play a crucial role and where the distribution of outlays changes fast if the political identity of the district's representatives changes; and an intermediate model where a party with a sufficiently strong position during a sufficiently long time period is able to favor its own districts. These models are tested empirically by using district-level data on election outcomes and federal assistance programs for the period 1984-1990. Dividing the sample according to geographical concentration, allocation rules and initiation time, they find i) spending being an increasing function of the number of Democratic votes in the district, ii) spending favoring groups that are geographically concentrated being

by Lindbeck & Weibull (1987, 1993) and Dixit & Londregan (1996, 1998) (hereafter LW/DL), and the second model is the one presented in Cox & McCubbins (1986).

The today most commonly used theory is perhaps the one originating from the papers by Lindbeck & Weibull and Dixit & Londregan. They consider a two-party system where parties, facing an election, promise different groups of voters transfers in order to win their votes. Voters have preferences over the parties (hereafter ideological preferences) and decide which party to vote for, taking these preferences into account as well as the consumption levels promised by the two parties. In each region there is a distribution of ideological preferences and, given a certain level of regional transfers, there will be a critical value (cutpoint) that divides voters into those voting for one party and those voting for the other party. The parties try to move this cutpoint, and thereby increasing their vote-shares, by using regional transfers.<sup>9</sup> Figure 1 illustrates an example with two regions,  $S$  and  $E$ , where  $X$  denotes the voters' preferences for the incumbent government. The vote-share of the incumbent government is given by the proportion of voters with positive values on  $X$ , that is, the share to the right of the cutpoint. By giving a region grants, the incumbent government hopes to move the cutpoint to the left and thereby increasing their vote-share. We see from the figure that a dollar spent in region  $S$  will yield a larger number of won votes than a corresponding dollar spent in region  $E$ , since there is a larger density at the cutpoint (i.e. more swing voters) in region  $S$  than in region  $E$ .

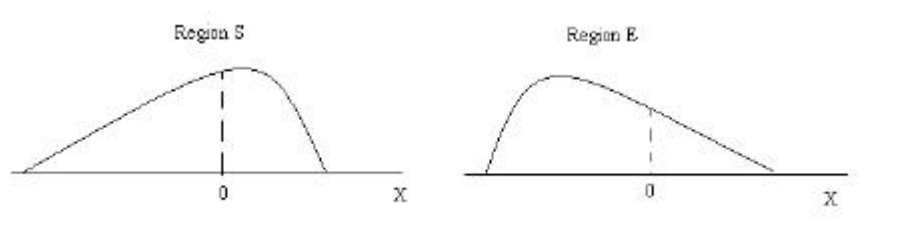
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avored, iii) programs that are allocated through formulas are more heavily skewed to democrats and iv) the pattern is strongest for programs initiated during the period 1975-1981, a period during which the Democrats had a strong majority in both the House and the Senate.

<sup>9</sup> More formally, the theoretical model is as follows: Assume that all inhabitants in a region have identical income levels (these are however allowed to differ between regions). There are two parties,  $A$  and  $B$ , maximizing the number of votes. An individual living in region  $i$  will vote for party  $B$  if  $U(C_{iB}) - U(C_{iA}) > X$ , where  $X$  is the voter's preferences of party  $A$  over party  $B$  and  $C$  is the consumption level promised by party  $A$  (when indexed with an  $A$ ) and party  $B$  (when indexed with a  $B$ ) respectively. The cutpoint in region  $i$  is hence defined as  $X_i = U(C_{iB}) - U(C_{iA})$ . In each region, there is a distribution of  $X$  given by  $\Phi_i(X)$ , with density  $f_i(X)$ . The vote share for party  $B$  is then given by  $\sum_i N_i \Phi_i(X_i)$ , where  $N_i$  is the share of the population living in region  $i$ . This is maximized by the party by choosing  $T_{ip}$ ,  $p = A, B$  (the amount of grants to distribute to each region) subject to  $\sum_i N_i T_{ip} = R$ , where  $R$  is available resources. In equilibrium both parties choose the same transfer-promises given by the condition  $U_c(C_{ip}) f_i(X_i) = U_c(C_{jp}) f_j(X_j)$ . Grants will hence be an increasing function of the density at the cutpoint ( $f_i(X_i)$ ) and a decreasing function of income (since higher income means lower marginal utility of consumption). See Dixit & Londregan (1996) for a more detailed description.



Figure 1



The amount of transfers a region receives will hence be positively correlated with the density at the cutpoint. The theory further predicts grants to be targeted at regions with low income, since voters with low income has higher marginal utility of income and thus can be more easily persuaded to vote for a party promising them high transfers than high-income earners (i.e., the cutpoint moves more in a poor region).<sup>10</sup> Notice that the size of the population in the region does not matter. Under some assumptions on the distribution functions (i.e. symmetry and single peakedness) and parties' objective functions, there will be a one-to-one correspondence between the density at the cutpoint and the closeness of the last election. Johansson (1999) uses this closeness proxy as well as an estimate<sup>11</sup> of the densities at the cutpoints and tests the model for Swedish municipalities. While she finds no support for grants being used as a tactical instrument when using the closeness-measure, she does find support for the tactical hypothesis when using the latter proxy.

The second theory that will be tested is presented in Cox & McCubbins (1986). They divide voters into three groups; support groups, opposition groups and swing groups. Parties invest in votes by promising redistribution to these groups. Assuming that parties are risk-averse and that swing groups are riskier investments, they predict that politicians will invest little (if at all) in opposition groups, somewhat more in swing groups, and more still in their support groups. When testing this model, we will use two different variables, both assumed to capture the strength of the political support for the incumbent (socialist) government in each municipality. The first one is a dummy indicating if there is a socialist majority in the municipal council. The other variable measures the share of inhabitants in each municipality that was casting their vote in favor for the incumbent government (the social democrats) in the last election.

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<sup>10</sup> The main difference between the LW/DL theory and the grant program we study is that the describes monetary transfers directed directly to individuals, while, in our case, transfers are given to the municipalities to use in investments which, in the end, affects individual utility positively. It is therefore not obvious how we should expect municipal income to affect the amount of grants the municipality receives.

<sup>11</sup> This estimate is obtained by using survey data from the Swedish Election Studies. See below for a description.

In addition, there is one alternative model that has been somewhat investigated in the empirical literature, namely Grossman (1994). He takes as a starting point the fact that the same parties appear at both the state and the federal level and, therefore, some interaction between local and central politicians is likely to occur. In the model, federal politicians transfer money to the state level, making it possible for state politicians to raise public spending and thereby increasing their reelection possibilities. In return, state politicians invest their political capital in efforts to increase the support of state voters for the federal politicians. The model hence predicts that states where politicians are effective at raising political support will receive large grants from the federal government. The problem is however that it is not obvious how to measure political effectiveness, a problem that is demonstrated by the fact that the three studies testing this model (Bungey, Grossman & Kenyon, 1991; Grossman, 1994; Worthington & Dollery, 1998) all use different sets of political variables and even predict different signs for some of them. What they do agree about is that states will be given larger grants if the party in power in the federal government also is in power in the state government and if the race in the last local election was close. When it comes to how the number of seats held by the incumbent federal government in the state house of representatives affects transfers, the views differ. Grossman claims that it has a positive effect using the same argument that is used for the dummy indicating that the same party is in power in the central as well as the local government. Worthington & Dollery argue for a negative effect since there is no need to win votes in a state where the incumbent government already has high support. Finally, Bungey *et al.* try to incorporate both effects by claiming that the number of seats enters negatively but that the variable squared enters positively.<sup>12</sup> Notice that the political variables used in the empirical studies resemble those implied by the two models above; the closeness of the local elections is very closely correlated with the closeness proxy from the LW/DL-model and two other variables are the same as are used by us when testing the Cox-McCubbins model. Therefore, we will consider the estimations of the Grossman model as a sensitivity analysis of the LW/DL and Cox-McCubbins models (i.e., we will investigate how sensitive these two models are to the inclusion of other political variables).

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<sup>12</sup> As a consequence of the different views about how political variables influence grants, the empirical evidence is rather hard to interpret. While Grossman (1994) and Worthington & Dollery (1998) claim to have found some support for public choice considerations being important when distributing grants to Australian and American states, Bungey *et al.* (1991) find none for Australian states.

**Table 3.1** The variables used to test the different models and their expected sign.

<b>Variable/ Model</b>	<b>Lindbeck-Weibull/ Dixit-Londregan</b>	<b>Cox – McCubbins</b>	<b>Grossman / Sensitivity*</b>
Cutpoint density	+		(+)
Distance between blocs (central gov)	-		(-)
Distance between blocs (local gov)			-
Income	-		
Socialist majority in municipal council		+	+
Share of votes for social democrats		+	+/-

\* The variables without parenthesis are the ones used in earlier studies to test the Grossman model. The variables within parenthesis will be used to test the sensitivity of the LW/DL model to the inclusion of other political variables.

Our empirical strategy will be as follows: First, we estimate the models developed by LW/DL and Cox-McCubbins separately. Thereafter, as a sensitivity analysis, we estimate a model where we include political variables from both these models. As was described above, and which is also illustrated by Table 3.1, this “nested” model contains in fact the same political variables that have been used in empirical studies testing the Grossman-model. When constructing the variable “Cutpoint density”, we follow Johansson (1999). In short, the technique is the following: First we use survey data from the 1994 Swedish Election Study<sup>13</sup> in order to estimate the distributions of political preferences and second, we decide the locus of the cutpoints using the 1994 elections to the parliament. In the 1994 Swedish election study, 2296 individuals have answered a number of questions regarding their feelings and attitudes toward different Swedish parties and politicians. Using these answers, we construct, through factor analysis methods, a variable that measures voters’ preferences of the conservative bloc over the socialist bloc. Since respondents in the election survey are observed at the level of constituency<sup>14</sup>, we can then estimate constituency-specific distributions of these preferences. Finally, we use the result from the 1994 election to the parliament in each municipality in order to define cutpoints and, thereafter, measure the densities at these cutpoints, yielding a variable for each municipality (except for Gotland, for which there are very few observations in the election survey).<sup>15</sup>

<sup>13</sup> The 1994-study was performed by Mikael Gilljam and Sören Holmberg at the Department of Political Science, Göteborg. The data set is handled and distributed by the Swedish Social Science Data Service (SSD) at Göteborg University.

<sup>14</sup> There are 29 constituencies in Sweden; the municipality of Stockholm, the county of Stockholm, the county of Uppsala, Södermanland, Östergötland, the county of Jönköping, Kronoberg, the county of Kalmar, Gotland, Blekinge, Kristianstad, the municipality of Malmö, Malmöhus north, Malmöhus south, Halland, Göteborg and Bohuslän, Älvsborg north, Älvsborg south, Skaraborg, Värmland, the county of Örebro, Västmanland, Kopparberg, Gävleborg, Västernorrland, Jämtland, Västerbotten and Norrbotten.

<sup>15</sup> For a detailed description on how the variable was constructed, see Johansson (1999).

#### 4. Descriptive statistics

Before going in to details about the econometric specifications and the estimation results, we will, in this section, take a quick look at the data. Is there any pattern that can be observed from data concerning which types of municipalities that, on the one hand, apply for grants and, on the other, are granted? We start by dividing the municipalities into different types depending on their size and geographical location and investigate whether different types of municipalities behave and are treated different. Thereafter we divide the municipalities into those applying and those not applying and those granted and those not granted and compare the mean and standard deviation of the variables to be used in the empirical analysis for these groups of municipalities.

In Table 4.1 we divide the municipalities into different types depending on their size and population. In the first two columns we study the applying municipalities, and in the last four columns we study the applying municipalities. From the table, we note that all of the three big cities (Stockholm, Malmö, and Göteborg) have applied for grants. Otherwise, the fraction of municipalities applying within each group of municipalities ranges from 30 percent (for the municipalities labeled as “other smaller municipalities”) to 57.7 percent (for the municipalities labeled as “larger cities”). Turning to the type of municipalities that was granted, we see that the fraction of municipalities that was granted within each group of municipalities is more unevenly distributed over the different groups of municipalities than is the case for the applying municipalities. From the last four columns of Table 4.1, it seems that large municipalities (i.e., “big cities”, “larger cities”, and “other larger municipalities”) have been favored while the opposite seems to be true for “industry”, “rural”, “sparsely populated municipalities”, and “other smaller municipalities”. The most extreme case in the latter group is “sparsely populated municipalities” where none of the eleven applying municipalities was granted.

What is the geographical location of the municipalities that have applied for the grants? Is the geographical location the same for those of the municipalities that were granted? This can be studied in Table 4.2. From the first two columns we note that, if we exclude Blekinge (where none of the five municipalities applied) and Gotland (where the only municipality applied), the lowest fraction that has applied is 23.1 percent (Östergötland) and the highest is 63.6 percent (Jönköping). However, like in Table 4.1, it appears as if the fraction of granted municipalities is more unevenly distributed: From the last four columns of Table 4.2 it can be noted that it

seems to have been a clear disadvantage to be located in the northern part of Sweden: None of the 21 applying municipalities in the counties of Gävleborg, Jämtland, Västerbotten and Norrbotten received any grants (including Dalarna and Västernorrland, only three of the 30 applying municipalities in the north of Sweden were granted).

Next we turn to a comparison of the variables used in the empirical analysis. These summary statistics are given in Table 4.3. We use the following variables<sup>16</sup>: As controls for the municipalities' socio-economic, demographic, and financial needs we use the vacancy rate in the municipality (i.e., number of vacant jobs/number of unemployed persons in the municipality), social welfare spending in the municipality, the municipality's tax base, the municipality's financial result (Result 2), and the demographic structure in the municipality (fraction young and fraction old). These variables are the ones typically used when controlling for the equity and/or efficiency purposes normally attached to intergovernmental grants. The vacancy rate, which is a measure of labor market tightness which gives the probability for a job searcher of finding a job in a given municipality, is also motivated by the fact that one of the purposes of the grant program under study was to increase the employment rate in the municipalities. If the incumbent government uses this grant program to increase an unemployed person's chances of getting a job in municipalities characterized by "tight" labor markets, we would expect a negative sign for the vacancy rate.<sup>17</sup> When testing the political models discussed in Section 3, we use the political variables presented in Table 3.1: the estimated cutpoint densities, the distance between the blocs at the central government level, the distance between the blocs at the local government level, a dummy indicating whether there is a socialist majority in the municipal council, and the share of votes for the social democrats (in the election to the central government). Since the main purpose with the grant program under study was to enhance the environmental activities in the municipalities, we must somehow control for this. We have chosen to use two environmental variables: the municipalities' environmental rating in 1997<sup>18</sup> and the share of votes for the environmental party in the last election to the municipal council.

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<sup>16</sup> The definitions of the variables are given in appendix A1 (data appendix). Summary statistics of the full sample is given in Table A1.1 and the raw correlations between the variables are presented in Table A1.2.

<sup>17</sup> We have also experimented with the unemployment rate instead of the vacancy rate. The unemployment rate did however have low explanatory power (in a statistical as well as in an economic sense). In the paper, we only report the results when the vacancy rate is used. The results when the unemployment rate is used are available upon request.

<sup>18</sup> We have also experimented with other specifications of the rating-variable, but this does not seem to affect the qualitative results.

Starting with a comparison between municipalities applying for grants (applicants) and municipalities not applying for grants (non-applicants), we note that there are very small differences in the means and standard deviations of the variables. The only variables that seem to differ somewhat are welfare spending per capita in the municipality and the environmental rating: The applying municipalities have more social welfare spending per capita on average (1003 SEK compared to 882 SEK) and the environmental rating is, on average, higher in the applying municipalities (18.16 compared to 16.09). One tentative implication from this and from the results in tables 4.1 and 4.2 is that there are no selection problems. If one still want to test more rigorously for any potential selection bias, the municipality's social welfare spending and environmental rating seems to be important variables in the selection equation.

Turning to a comparison between granted and non-granted municipalities, we see from the last two columns in Table 4.3 that several of the variables differ in mean values, notably the political and environmental variables. Starting with the political variables, we note that the granted municipalities are to a less extent ruled by a socialist majority (45.2% compared to 53.4% respectively), a finding which contradicts the prediction derived from the Cox-McCubbins and Grossman models. The granted municipalities also have a larger estimated cutpoint density (0.032 compared to 0.028) and witnessed closer races between the blocs in the last election (0.143 compared to 0.252 in the election to the central government and 0.155 compared to 0.234 in the election to the local government). These differences are all in line with the predictions derived from the Lindbeck/Weibull-Dixit/Londregan model. For the environmental variables, the granted municipalities have a higher environmental rating (20.14 compared to 17.01) and a higher share of votes for the environmental party in the last election to the municipal council (0.054 compared to 0.039). Finally, looking at the "needs" variables, there seem, except for the social welfare-spending variable, to be no clear differences between the granted and non-granted municipalities. This fact strengthens us in our belief that this grant program is free from the equity and efficiency considerations typically attached to traditional intergovernmental grants.

**Table 4.1.** Number of municipalities within each group that applied for the grants and that were granted.

Group of municipalities	Applying municipalities		Granted municipalities			
	#/total	%	#/total	%	#/applying	%
Big cities	3/3	100	3/3	100	3/3	100
Suburbs	12/36	33.3	5/36	13.9	5/12	41.7
Larger cities	15/26	57.7	10/26	38.5	10/15	66.7
Middle sized cities	19/40	47.5	6/40	15.0	6/19	31.6
Industry	19/53	35.8	5/53	9.4	5/19	26.3
Rural	13/30	43.3	3/30	10.0	3/13	23.1
Sparsely populated munic.	11/29	37.9	0/29	0	0/11	0
Other larger municipalities	11/31	35.5	7/31	22.6	7/11	63.6
Other smaller municipalit.	12/40	30.0	3/40	7.5	3/12	25.0

**Notes:** **Big cities:** municipalities with more than 200.000 inhabitants; **Suburbs:** More than 50% of the municipalities' employed travel to another municipality to get to their work; **Larger cities:** municipalities with more than 50.000 inhabitants and with less than 40% employed within industry; **Middle sized cities:** municipalities with 20.000 to 50.000 inhabitants and with less than 40% employed within industry; **Industry:** municipalities with more than 40% employed within industry and which are not sparsely populated; **Rural:** municipalities with more than 8.7% employed within agriculture and forest and which are not sparsely populated; **Sparsely populated municipalities:** municipalities with less than five inhabitants per square kilometer and with less than 20.000 inhabitants; **Other larger municipalities:** Other municipalities with 15.000 to 50.000 inhabitants; **Other smaller municipalities:** Other municipalities with less than 15.000 inhabitants.

**Table 4.2.** Geographical location of the municipalities that applied and that were granted.

County	Applying municipalities		Granted municipalities			
	#/total	%	#/total	%	#/applying	%
Stockholm	12/25	48.0	7/25	28.0	7/12	58.3
Uppsala	2/6	33.3	0/6	0	0/2	0
Södermanland	3/9	33.3	0/9	0	0/3	0
Östergötland	3/13	23.1	1/13	7.7	1/3	33.3
Jönköping	7/11	63.6	1/11	9.1	1/7	14.3
Kronoberg	4/8	50.0	2/8	25.0	2/4	50.0
Kalmar	6/12	50.0	2/12	16.7	2/6	33.3
Gotland	1/1	100	0/1	0	0/1	0
Blekinge	0/5	0	0/5	0	0/0	0
Skåne	16/33	48.5	6/33	18.2	6/16	37.5
Halland	1/6	16.7	1/6	16.7	1/1	100
Göteborg/Bohus	5/15	33.3	3/15	20.0	3/5	60.0
Älvsborg	8/19	42.1	6/19	31.6	6/8	75.0
Skaraborg	6/17	35.3	3/17	17.6	3/6	50.0
Värmland	2/16	12.5	1/16	6.2	1/2	50.0
Örebro	5/12	41.7	4/12	33.3	4/5	80.0
Västmanland	4/11	36.4	2/11	18.2	2/4	50.0
Dalarna	5/15	33.3	1/15	6.7	1/5	20.0
Gävleborg	4/10	40.0	0/10	0	0/4	0
Västernorrland	4/7	57.1	2/7	28.6	2/4	50.0
Jämtland	4/8	50.0	0/8	0	0/4	0
Västerbotten	5/15	33.3	0/15	0	0/5	0
Norrbottn	8/14	57.1	0/14	0	0/8	0

**Table 4.3.** Descriptive statistics: A comparison between, on one hand, municipalities applying for grants (applicants) and municipalities not applying for grants (non-applicants), and, on the other hand, between granted and non-granted municipalities.

<b>Variables</b>	<b>Applicants</b> Mean (Std. Dev.)	<b>Non-applicants</b> Mean (Std. Dev.)	<b>Granted</b> Mean (Std. Dev.)	<b>Non-granted</b> Mean (Std. Dev.)
<b>Controls for “needs”</b>				
Vacancy rate	.160 (.126)	.153 (.095)	.144 (.072)	.169 (.148)
Social welfare spending	1.003 (.565)	.882 (.382)	1.232 (.734)	.872 (.388)
Tax base	92737 (11862)	91578 (11189)	93978 (8933)	92022 (13263)
Result 2	5.10 (2.98)	4.95 (3.51)	5.12 (2.87)	5.10 (3.06)
Young	20.42 (1.77)	20.46 (1.73)	20.32 (1.77)	20.48 (1.77)
Old	16.80 (5.23)	18.25 (5.07)	14.81 (5.70)	17.94 (4.61)
<b>Political variables</b>				
Cutpoint density	.029 (.006)	.029 (.007)	.032 (.003)	.028 (.007)
Distance between blocs (central gov.)	.212 (.160)	.221 (.163)	.143 (.105)	.252 (.172)
Socialist majority in municipal council	.504 (.502)	.509 (.501)	.452 (.504)	.534 (.502)
Distance (local government)	.205 (.151)	.212 (.155)	.155 (.107)	.234 (.164)
Share of votes for social democrats	.444 (.091)	.451 (.094)	.431 (.059)	.452 (.105)
<b>Environmental var.</b>				
Environmental rating in 1997	18.16 (5.67)	16.09 (4.85)	20.14 (6.29)	17.01 (4.97)
Share of votes for environmental party	.045 (.024)	.047 (.027)	.054 (.024)	.039 (.023)



## 5. Econometric strategy and empirical results

### 5.1 Econometric strategy

In the empirical analysis we will concentrate on the 115 applying municipalities. That is, we investigate the determinants to whether a municipality receives any grants *given* that the municipality has applied (that is, in analogy with the program evaluation literature, we investigate the “treatment of the treated”). This is the suitable method to use when trying to determine whether the incumbent government used the specific grant program tactically, which is the main question of interest in this paper.<sup>19</sup>

There are, in principle, two questions that one could be interested in investigating; i) *What determines whether an applying municipality receives grants or not?* and ii) *What determines how much the applying municipalities receive?* The first question can be investigated by estimating a probit (or logit) model (zero/one variable on left-hand side) on the 115 municipalities that have applied for grants. When examining the second question, we must bear in mind that we have (left) censored data; of the 115 applying municipalities, 42 received grants, implying that we have 73 observations censored at zero. This can be taken into account by estimating a Tobit model, where the independent variable is received grants per capita. An assumption behind the Tobit model is, however, that the same model describes the decision of whether a municipality is to be granted as the decision of how much the municipality will receive. It is possible that these decisions differ, in which case the probability of a limit observation is independent of the regression model for the nonlimit observations (see, e.g., Lin & Schmidt, 1984). It turns out that when we test whether a Tobit specification is appropriate to use<sup>20</sup>, we reject the null that this is the case in all cases but one (see Table A2.2). We will therefore concentrate on the probit analysis, that is, on the first of the two questions stated above.<sup>21</sup>

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<sup>19</sup> If we, for some reason, instead want *all* municipalities (no matter whether they apply or not) to be the population of interest, we must make sure that the applying municipalities constitute a random sample. If they don't, we will end up with biased estimates. In order to investigate whether selection matters we will estimate the probit model both with and without selection correction.

<sup>20</sup> We use a likelihood ratio test (see Lin & Schmidt, 1984, for a description). The test-statistic, which is distributed as  $\chi^2$  under the null, is given by

$$I = -2[\ln L_T - (\ln L_P + \ln L_{TR})],$$

where  $L_T$  is the likelihood from the Tobit model and  $L_P$  and  $L_{TR}$  are the likelihoods from a probit model and a truncated regression respectively.

<sup>21</sup> However, since we don't know how well the likelihood ratio test works in samples of 115 observations and with a rather high degree of censoring (73 out of 115, or 63 percent of the observations, are censored at zero), we have chosen to present the Tobit results (and the likelihood ratio tests) in appendix A2. It is worth stressing that the qualitative

In the analysis, we will use two sets of regressors. In the first, and most parsimonious one (Model 1), we use those two variables that are predicted to matter in the Lindbeck-Weibull/Dixit-Londregan (LW/DL) model (i.e., the municipalities tax base and the political variable) or the Cox-McCubbins model and only control for those variables that are supposed to be important for the grant program under study (i.e., the vacancy rate in the municipality, the municipality's environmental rating in 1997, and the fraction of votes on the environmental party in the last election to the municipal council). In the second one (Model 2), we also control for some different "municipality needs" (i.e., demographic structure, fraction of persons on social welfare, and financial result). As argued in the introduction, the setup of the grant program under investigation gives us no reason to suspect these variables to matter. It might however be the case that the incumbent government takes equity considerations into account anyway.

## 5.2 Which municipalities are granted? Results from probit estimates

In this section, we investigate the determinants to whether an applying municipality receives grants or not. The probit results (without selection correction) are given in tables 5.1-5.3.<sup>22</sup> When testing the Lindbeck-Weibull/Dixit-Londregan (LW/DL) model, two different variables are used to capture the density at the cutpoints: the cutpoint densities estimated by Johansson (1999) and the closeness-proxy (i.e., the distance between the political blocs at the central government level).

The results for the LW/DL model are presented in Table 5.1. From the results in the first two columns, where we use the estimated cutpoint density variable, we note that this political variable is clearly significant in both estimations and has the expected positive sign: the more swing voters there are at the cutpoint, the higher is the probability that a municipality receives money from the incumbent government. This conclusion does not alter when we instead use the closeness proxy. From the last two columns of Table 5.1 we note that this variable, as the cutpoint density variable, is significant with the expected sign: the further apart the two blocs

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results (in terms of which variables that enters significantly and the signs of these variables) in the Tobit model are very similar to those in the probit specification.

<sup>22</sup> The probit model is given by  $y_i = (\mathbf{b}' x_i + \mathbf{e}_{1i} > 0)$ , the selection equation by  $y_i^{select} = (\mathbf{g}' z_i + \mathbf{e}_{2i} > 0)$ , and the correlation between the two by  $corr(\mathbf{e}_{1i}, \mathbf{e}_{2i}) = \mathbf{r}$  (where  $\mathbf{e}_{1i}, \mathbf{e}_{2i} \sim N(0,1)$ ). When selection correcting the model, we found that (i) we could never reject the null hypothesis that  $\mathbf{r} = 0$ , implying that there seems to be no problems with selection bias, and (ii) the qualitative results were the same as those in tables 5.1-5.3 when we selection corrected the model. Therefore we have chosen (in order to save space) to not report the selection corrected results in the paper. We have also estimated the model assuming that the error terms are logistically distributed (the logit model). This gave results that were very similar to the probit estimates. The results are available upon request.

were from each other in the last election (in the election to the central government), the lower is the probability that the municipality will receive any grants. In other words, the closer the race in the last election, the more swing voters exist, and the higher is the probability to get money from the central government.

Among the other regressors, only the environmental variables and the vacancy rate seem to matter (in a statistical sense), even though none of them enters significantly in all models. Looking at the estimated coefficients, it turns out that the tighter a municipality's labor market (i.e., the lower the vacancy rate) is, the higher a municipality's environmental rating is (in 1997) and the more people there is voting for the environmental party in the municipality, the higher is the probability that the municipality will get money from the "ecological" grant program. Since all the other control variables are insignificant in all four estimations, it seems like the grant program under study is not used for the equity and/or efficiency purposes that intergovernmental grants traditionally are. We consider the results in Table 5.1 to lend strong support for the LW/DL model.

Next, we turn to the results for the Cox-McCubbins model. We use two different political variables, intended to capture the size of the support group, to test this model: "socialist majority in municipal council" (a variable indicating if the party in power in the central government also is in power in the municipal government) and "share of votes for social democrats" (which measures the share of votes in each municipality that the social democrats got in the election to the central government). We see from the results, given in Table 5.2, that these political variables have mixed success when it comes to explanatory power. While the variable "socialist majority in municipal council" is insignificant in Model 1 and significant at the 5 percent level in Model 2, the variable "share of votes for social democrats" is significant in both models: at the 10 percent significance level in Model 1 and at the 5 percent level in Model 2. The real problem for the Cox-McCubbins model is, however, that both variables enter negatively in all models, thus contradicting the hypothesis that the government gives money to its own supporters to a larger extent than to supporters of other parties. Among the other regressors, only the two environmental variables enter statistically significantly. Our reading of the results in Table 5.2 is hence that we do not find any support for the Cox-McCubbins model.

Finally, we turn to the Grossman model and the sensitivity analysis. These results are presented in Table 5.3.<sup>23</sup> Regarding the Grossman model, it is, as noted above, somewhat unclear which political variables to include and the expected signs of these. In Model A below we have included some of the variables used in earlier empirical applications. As can be seen from the table, the only political variable that enters significantly (and with the expected negative sign) is the closeness of the local election. It is interesting to note that this variable is closely related to the political “closeness” variable used in the LW/DL model (the raw correlation between these two variables is 0.925), implying that the results of Model A in Table 5.3 lend further support for the LW/DL model even when controlling for some other political variables than those predicted by the theoretical model to matter. This is further strengthened by the results of Model B and Model C, where we have extended the LW/DL model to include the political variables used in the estimations of the Cox-McCubbins and Grossman models. In this sensitivity analysis, the political variables from the LW/DL model are still significant with their expected signs, while the political variables predicted by the Cox-McCubbins and Grossman models do not enter significantly. The results for the LW/DL model in Table 5.1 can therefore be considered to be quite robust.

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<sup>23</sup> To save space, we only present the results for the parsimonious Model 1 since the control variables used in Model 2 were all insignificant and did not significantly affect the parameter estimates for the variables used in Model 1. The results for Model 2 are available upon request.

**Table 5.1** Probit estimates: Lindbeck-Weibull/Dixit-Londregan model.

Variable	Model 1	Model 2	Model 1	Model 2
Vacancy rate	-2.502 (1.593)	-2.750 (1.732)	-3.127* (1.690)	-3.688* (1.899)
Tax base	1.61e-05 (1.39e-05)	3.77e-06 (1.77e-05)	2.22e-05 (1.43e-05)	1.33e-05 (1.79e-05)
Social assistance		.429 (.368)		.335 (.355)
Result 2		.068 (.051)		.072 (.050)
Young		-.086 (.095)		-.145 (.101)
Old		-.057 (.043)		-.050 (.043)
Cutpoint density	87.618** (29.063)	102.356** (32.886)		
Distance between blocs (central gov.)			-3.902** (1.078)	-4.584** (1.247)
Environmental rating in 1997	.057** (.026)	.025 (.031)	.038 (.025)	.006 (.030)
Share of votes for environmental party	9.730 (6.107)	10.312* (6.261)	10.576* (6.016)	11.765* (6.265)
Constant	-5.587** (1.666)	-2.373 (3.645)	-2.358** (1.171)	2.272 (3.550)
# of observations	114	114	115	115
Pseudo-R2 #	0.185	0.244	0.206	0.265
Log Likelihood	-61.11	-56.73	-59.89	-55.49

**Notes:**

Standard errors within parenthesis.

\*\* denotes significance at the 5 percent level

\* denotes significance at the 10 percent level

#  $Pseudo R^2 = 1 - \frac{L_1}{L_0}$ , where  $L_0$  and  $L_1$  are the constant-only and full model log-likelihoods respectively.

**Table 5.2** Probit estimates: Cox-McCubbins model.

Variable	Model 1	Model 2	Model 1	Model 2
Vacancy rate	-1.674 (1.495)	-1.904 (1.613)	-1.865 (1.526)	-1.938 (1.611)
Tax base	6.22e-06 (1.19e-05)	-4.61e-06 (1.52e-05)	2.62e-06 (1.17e-05)	-8.82e-06 (1.44e-05)
Social assistance		.556* (.330)		.501 (.332)
Result 2		.061 (.046)		.062 (.046)
Young		-.071 (.093)		-.063 (.092)
Old		-.050 (.037)		-.049 (.037)
Socialist majority in municipal council	-.351 (.270)	-.606** (.306)		
Share of votes for social democrats			-2.649* (1.551)	-3.548** (1.680)
Environmental rating in 1997	.052** (.024)	.017 (.028)	.051** (.024)	.017 (.028)
Share of votes for environmental party	12.589** (5.806)	12.492** (5.991)	13.271** (5.763)	13.639** (5.947)
Constant	-2.031* (1.061)	1.164 (3.164)	-.685 (1.315)	2.659 (3.348)
# of observations	115	115	115	115
Pseudo-R2 #	0.117	0.182	0.125	0.185
Log Likelihood	-66.68	-61.77	-66.06	-61.52

**Notes:**

Standard errors within parenthesis.

\*\* denotes significance at the 5 percent level

\* denotes significance at the 10 percent level

#  $PseudoR^2 = 1 - \frac{L_1}{L_0}$ , where  $L_0$  and  $L_1$  are the constant-only and full model log-likelihoods respectively.

**Table 5.3** Probit estimates: Grossman model/sensitivity analysis.

Variable	Model A	Model B	Model C
Vacancy rate	-2.603 (1.672)	-3.104* (1.736)	-2.592 (1.621)
Tax base	2.11e-05 (1.52e-05)	2.68e-05* (1.6e-05)	1.39e-05 (1.41e-05)
Cutpoint density			83.988** (31.851)
Distance between blocs (central gov)		-6.182** (1.856)	
Distance between blocs (local government)	-4.012** (1.545)		
Socialist majority in municipal council	.5484 (.463)	.706 (.471)	.176 (.432)
Share of votes for social democrats	-1.242 (2.763)	.752 (3.172)	-1.588 (2.560)
Environmental rating in 1997	.032 (.026)	.023 (.027)	.056** (.026)
Share of votes for environmental party	13.378** (6.007)	12.265** (6.166)	10.156* (6.189)
Constant	-2.081 (1.844)	-2.866 (1.977)	-4.643** (2.271)
# of observations	115	115	114
Pseudo-R <sup>2</sup> #	0.177	0.231	0.188
Log Likelihood	-62.10	-58.08	-60.92

**Notes:**

Standard errors within parenthesis.

\*\* denotes significance at the 5 percent level

\* denotes significance at the 10 percent level

#  $Pseudo R^2 = 1 - \frac{L_1}{L_0}$ , where  $L_0$  and  $L_1$  are the constant-only and full model log-likelihoods respectively.

### 5.3 Is the tactical use of the “ecological” grants of any economic significance?

To investigate whether the tactical use of the intergovernmental grants is of any economic importance, we calculate the marginal effects for those variables that were significant in the LW/DL model (Table 5.1). More specifically, we calculate the change in probability of being granted caused by one standard deviation changes in the explanatory variables. These figures are given in Table 5.4. In addition, we have calculated the elasticities for these explanatory variables (given in Table 5.5).

Starting with the results in Table 5.4, we see that the political variables seem to be economically more important than the labor market and environmental variables; a one standard deviation increase in the density at the cutpoint or a one standard deviation decrease in the distance between the blocs yields an increase in the probability that a municipality will be granted with 22-25 percent. This is to be compared with the corresponding figures for the vacancy rate (which are 10-14 percent), the environmental rating (1-10 percent), and for the share of votes for the environmental party (approximately 10 percent).

**Table 5.4** The change in the probability of being granted caused by a one standard deviation change in the explanatory variables, for the Lindbeck-Weibull/Dixit-Londregan model.

Variable	Model 1	Model 2	Model 1	Model 2
Vacancy rate	-0.098	-0.106	-0.121	-0.140
Cutpoint density	0.221	0.255		
Distance between blocs (central gov)			-0.225	-0.259
Environmental rating in 1997	0.109	0.047	0.071	0.011
Share of votes for environm. party	0.091	0.095	0.098	0.107

Turning to the elasticities in Table 5.5, the same picture emerges. Given model, increasing the density at the cutpoint with one percent or decreasing the distance between the blocs with one percent, increases the probability of being granted with more than a one percent change in any of the other variables. This difference is most pronounced for Model 2, where the cutpoint density variable is used; while increasing the density at the cutpoint with one percent increases the probability of being granted with 3.4 percent, a one percent increase in any of the environmental variables or a one percent decrease in the labor market variable only increases the probability of being granted with approximately 0.5 percent. When using the distance variable instead, the difference is smaller; a one-percent decrease in the distance yields a 0.9



percent change in the probability of being granted, to be compared with a 0.55-0.7 percent changes caused by one-percent changes in the other variables.

**Table 5.5** Elasticities, for the Lindbeck-Weibull/Dixit-Londregan model.

Variable	Model 1	Model 2	Model 1	Model 2
Vacancy rate	-0.432	-0.482	-0.547	-0.660
Cutpoint density	2.827	3.355		
Distance between blocs (central gov)			-0.953	-1.147
Environmental rating in 1997	1.077	0.481	0.714	0.117
Share of votes for environm. party	0.494	0.532	0.544	0.620

## 6. Conclusions

In this paper we have been studying how the incumbent central government used their sovereign decision making power when deciding which municipalities that were to receive money from a specially-designed grant program (with the purpose of supporting local investment programs aimed at an ecological sustainable development and to increase municipal employment).

We find support for the hypothesis that the temporary “ecological” grants are used tactically by the incumbent (socialist) government. In particular, we find strong support for the prediction derived from the Lindbeck-Weibull/Dixit-Londregan model saying that the incumbent government purchases votes by investing in those municipalities where there exist a lot of swing voters. This result is statistically as well as economically significant. The conclusion is strengthened by a sensitivity analysis: It turns out that even though we extend the Lindbeck-Weibull/Dixit-Londregan model by political variables predicted by other models, the original variables are unaffected while the added variables enter insignificantly.

We do *not* find support for the hypothesis that the incumbent government purchases votes by investing in their own supporters (measured as socialist majority in the municipal council and fraction of votes cast for the social democrats in the municipality in the last election), a prediction derived from the model presented in Cox & McCubbins (1986).

Among the control variables, it is only variables measuring the municipalities' interests in environmental issues and the vacancy rate (measuring labor market tightness), that enter statistically significant. This comes perhaps as no surprise given the design of the special-purpose grant program used in this paper. Other need-variables, such as demographic structure and financial situation, do not seem to matter in deciding whether a municipality's application will be granted or not.

Are there any policy implications to be drawn from this study? Well, even though our results strongly indicate that the incumbent government will, if it can, use available resources in order to win votes, we cannot tell, from this study, whether this leads to a less efficient distribution of grants than if the incumbent didn't exhibit any vote purchasing behavior. However, if one believes that an inefficient distribution of grants is the likely outcome of such behavior, the policy recommendation would be that one should be careful when designing grant programs. In particular, one should avoid programs with vague rules and where the incumbent government has sovereign decision making power.

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## **A1. Data appendix**

Below follows a description of the variables used in the paper.

### **Controls for “needs”**

#### **Vacancy rate**

The number of new and remaining vacancies divided by the number of unemployed persons.

#### **Tax base**

The municipalities' tax base per capita.

#### **Social welfare**

Social welfare pending divided by the number of residents in the municipality.

#### **Result 2**

The municipalities' cash flow after financial and other costs have been paid.

#### **Young**

Share of population younger than 16.

#### **Old**

Share of population older than 64.

### **Political variables**

#### **Cutpoint density**

The density at the cutpoint, where the distributions of bias in favor of the opposition are estimated at the constituency level using data from the Swedish Election Studies and the cutpoints are given by the vote share of the winning bloc in the election. See Johansson (1999) for a more detailed description.

#### **Distance between blocs (central gov)**

The difference in vote-shares between the socialist and the conservative bloc in the central election, expressed in absolute values. The socialist bloc consists of S, V and Mp and the conservative bloc of M, Fp, C, Kd, NyD.

#### **Distance between blocs (local gov)**

The difference in vote-shares between the socialist and the conservative bloc in the local elections, expressed in absolute values. The socialist bloc consists of S, V and Mp and the conservative bloc of M, Fp, C, Kd, NyD.

#### **Socialist majority in municipal council**

A dummy taking value 1 if S and V have more than 50% of the votes in the municipal council, 0 otherwise.

#### **Share of votes for social democrats**

The share of votes in each municipality for S in the central government election.

### **Environmental variables**

#### **Environmental rating in 1997**

The rating is conducted every year by the environmental journal “Miljö Eko”. The 1997 rating was presented in Miljö Eko No. 5, 1997.

#### **Share of votes for environmental party**

The share of votes in each municipality for Mp in the local government election.

**Table A1.1** Summary statistics

<b>Variable</b>	<b>Mean</b>	<b>Std. Dev.</b>	<b>Min</b>	<b>Max</b>
Grants per capita	141.6175	503.6816	0	4534.98
Vacancy rate	0.1557	0.1086	0.0404	1.0670
Tax base	92040.53	11455.81	71452	165436
Social welfare	0.9310	0.46708	0.1707	3.4782
Result 2	5.0139	3.3034	-5	15
Young	20.4450	1.7408	14.4431	25.4057
Old	17.6720	5.1764	0	28.0128
Cutpoint density	0.0291	0.0070	0.0109	0.0427
Distance between blocs (central gov)	0.2175	0.1615	0.0007	0.6442
Distance between blocs (local gov)	0.2092	0.1529	0.0011	0.6636
Socialist majority	0.5069	0.5008	0	1
Votes for social democrats	0.4482	0.0929	0.1305	0.6677
Environmental rating	16.9167	5.2816	5	31
Votes for environm. party	0.0458	0.0259	0.0024	0.1826

**Table A1.2** Correlation matrix

	VAC. RATE	TAX BASE	SOC ASSIST	RES 2	YOUN G	OLD	DENS CUTP	DIST LOC	DIST CENT	SOC MAJ	VOT SOC D	ENV. RAT.	VOTE MP
VAC. RATE	1.000												
TAX BASE	0.253	1.000											
SOC ASSIST	-0.065	0.132	1.000										
RES 2	0.151	0.040	-0.170	1.000									
YOUN G	0.128	0.008	-0.201	-0.010	1.000								
OLD	-0.029	-0.430	-0.476	0.012	-0.276	1.000							
DENS CUTP	0.182	-0.214	0.054	-0.106	0.194	0.068	1.000						
DIST LOC	-0.152	0.232	-0.137	0.072	-0.261	0.065	-0.784	1.000					
DIST CENT	-0.073	0.295	-0.063	0.132	-0.226	-0.003	-0.717	0.925	1.000				
SOC MAJ	-0.241	-0.017	0.260	0.032	-0.347	-0.037	-0.449	0.587	0.589	1.000			
VOTE SOC D	-0.304	-0.210	0.127	0.054	-0.272	0.051	-0.370	0.484	0.442	0.756	1.000		
ENV. RAT.	-0.068	0.180	0.518	-0.041	-0.098	-0.410	-0.011	-0.126	-0.070	0.197	0.138	1.000	
VOT MP	-0.115	0.141	0.175	-0.189	-0.091	-0.218	0.210	-0.174	-0.124	-0.109	-0.047	0.274	1.000

## A2. Tobit results

Here we present the results from the Tobit estimations.<sup>24</sup> These estimations are based on the 115 applying municipalities. Testing for normally distributed residuals, we use a conditional moment test as described in Greene (1993, p. 701f). The null hypothesis is that the residuals are normally distributed. The test is performed by running a regression of the third and fourth moment on the first order conditions. Under null, the constants in these regressions are insignificant. In the tables below, we present the t-values of these coefficients as well as the P-values. As can be seen from the tables, we cannot reject the null of normally distributed residuals in any of the seven models.

<sup>24</sup> The Tobit model is given by  $y_i^* = \mathbf{b}'x_i + \mathbf{e}_i$ , where  $y_i = 0$  if  $y_i^* \leq 0$  and  $y_i = y_i^*$  if  $y_i^* > 0$ . The log-likelihood function is given by

$$\ln L = \sum_{y_i > 0} -\frac{1}{2} \left[ \ln(2\pi) + \ln \mathbf{s}^2 + \frac{(y_i - \mathbf{b}'x_i)^2}{\mathbf{s}^2} \right] + \sum_{y_i = 0} \ln \left[ 1 - \Phi \left( \frac{\mathbf{b}'x_i}{\mathbf{s}} \right) \right],$$

where the first part is the classical regression for the nonlimit observations and the second part is the probabilities for the limit observations. Simply applying ordinary least squares yields inconsistent results.

**Table A2.1** Tobit estimates: Lindbeck-Weibull/Dixit-Londregan model.

<b>Variable</b>	<b>Model 1</b>	<b>Model 2</b>	<b>Model 1</b>	<b>Model 2</b>
Vacancy rate	-3408.590* (1988.647)	-3877.169* (2182.811)	-3741.202* (2088.238)	-4636.376** (2307.71)
Tax base	0.012 (0.015)	0.002 (0.019)	0.016 (0.015)	0.008 (0.020)
Social assistance		126.713 (287.623)		102.624 (305.547)
Young		-146.500 (90.093)		-183.898** (82.856)
Old		-47.050 (40.795)		-38.727 (40.459)
Result 2		73.633 (53.865)		85.199 (54.913)
Cutpoint density	112487.000** (32221.370)	124991.500** (34211.260)		
Distance between blocs (central gov.)			-3971.692** (1192.901)	-4692.444** (1174.464)
Environmental rating in 1997	50.174* (28.745)	25.628 (30.767)	30.415 (30.261)	6.249995 (32.672)
Share of votes for environmental party	9991.954 (6825.294)	10357.010 (6829.405)	11610.280 (7403.778)	12262.960 (7608.462)
Constant	-5949.764** (1809.325)	-1590.973 (3281.010)	-1822.957 (1300.696)	3399.149 (3014.539)
sigma	1442.639** (261.436)	1411.756** (264.153)	1483.232** (273.9615)	1449.567** (277.207)
# of observations	114	114	115	115
Log Likelihood	-397.20	-394.75	-398.49	-395.76
Conditional moment test, normality t (P> t )				
Skewness	0.287 (0.77)	0.429 (0.67)	0.845 (0.40)	1.145 (0.25)
Kurtosis	0.187 (0.85)	0.288 (0.77)	0.518 (0.61)	0.753 (0.45)
Likelihood ratio test of the Tobit specification				
<i>I</i> (df)	13.89 (6)	23.65 (10)	22.95 (6)	30.58 (10)
P-value	0.03	0.01	0.00	0.00

**Notes:** Robust standard errors within parenthesis.

\*\* denotes significance at the 5 percent level

\* denotes significance at the 10 percent level

**Table A2.2** Tobit estimates: Cox-McCubbins model.

<b>Variable</b>	<b>Model 1</b>	<b>Model 2</b>	<b>Model 1</b>	<b>Model 2</b>
Vacancy rate	-2548.778 (1816.193)	-3048.617 (2040.531)	-2769.859 (1886.907)	-3155.027 (2121.357)
Tax base	0.002 (0.013)	-0.010 (0.018)	-0.003 (0.014)	-0.014 (0.016)
Social assistance		379.540 (330.523)		310.119 (317.464)
Young		-130.896 (84.863)		-119.374 (82.585)
Old		-44.860 (41.106)		-40.725 (38.410)
Result 2		72.552 (57.811)		78.054 (57.411)
Socialist majority, municipal council	-502.894 (398.307)	-800.454* (435.614)		
Share of votes for social democrats			-3961.367* (2045.553)	-5099.593** (2142.259)
Environmental rating in 1997	50.885 (34.950)	20.293 (35.493)	47.163 (31.517)	17.031 (33.493)
Share of votes for environm. party	13926.450* (7737.189)	13713.410* (8047.014)	14324.550* (7452.852)	15067.070* (7737.000)
Constant	-1677.850 (1243.511)	2821.172 (3097.230)	332.786 (1642.533)	4827.180 (3144.678)
sigma	1496.544** (261.812)	1463.796** (261.857)	1478.743** (256.341)	1448.203** (254.847)
# of observations	115	115	115	115
Log Likelihood	-402.07	-399.18	-401.29	-398.63
Conditional moment test, normality t (P> t )				
Skewness	-0.242 (0.819)	0.249 (0.80)	-0.417 (0.68)	-0.100 (0.92)
Kurtosis	-0.364 (0.72)	-0.115 (0.91)	-0.605 (0.55)	-0.473 (0.64)
Likelihood ratio test of the Tobit specification				
<b>I</b> (df)	12.29 (6)	21.70 (10)	12.99 (6)	21.88 (10)
P-value	0.06	0.02	0.04	0.02

**Notes:** Standard errors within parenthesis.

\*\* denotes significance at the 5 percent level

\* denotes significance at the 10 percent level



**Table A2.3** Tobit estimates: Grossman model/sensitivity analysis.

<b>Variable</b>	<b>Model A</b>	<b>Model B</b>	<b>Model C</b>
Vacancy rate	-3459.909 (2173.921)	-3764.408* (2135.591)	-3548.514* (2002.521)
Tax base	0.016 (0.015)	0.015 (0.015)	0.009 (0.015)
Cutpoint density			103333.300** (36846.760)
Distance between blocs (central gov)		-4622.044** (1662.360)	
Distance between blocs (local government)	-4491.053** (1947.267)		
Socialist majority in municipal council	611.844 (611.619)	555.904 (637.706)	232.002 (574.446)
Share of votes for social democrats	-2435.211 (2733.561)	-1847.296 (2894.463)	-2748.090 (2636.963)
Environmental rating in 1997	24.493* (34.850)	19.695 (38.518)	47.831 (33.193)
Share of votes for environmental party	13902.670 (8049.477)	12564.540 (7958.922)	10186.860 (7207.805)
Constant	-990.775 (702.867)	-944.453 (1759.010)	-4230.692* (2230.306)
sigma	1453.507** (256.365)	1481.165** (268.836)	1431.594** (256.432)
# of observations	115	115	114
Log Likelihood	-398.41	-398.05	-396.84
Conditional moment test, normality t (P> t )			
Skewness	0.568 (0.57)	1.200 (0.23)	0.349 (0.73)
Kurtosis	0.378 (0.71)	0.873 (0.38)	0.245 (0.81)
Likelihood ratio test of the Tobit specification			
<i>I</i> (df)	18.43 (8)	38.20 (8)	16.13 (8)
P-value	0.02	0.00	0.04

**Notes:**

Robust standard errors within parenthesis, in case nothing else is indicated.

\*\* denotes significance at the 5 percent level

\* denotes significance at the 10 percent level

**A3.**

The following 115 municipalities applied for the grants in the first wave. Those with an asterisk were granted

Alingsås*	Härnösand*	Nynäshamn*	Uppvidinge
Aneby	Hässleholm	Osby	Vaggeryd
Bjuv	Jokkmokks	Pajala	Vallentuna
Boden	Kalmar*	Piteå	Vansbro
Bollebygd	Karlsborg	Ragunda	Vara
Bollnäs	Karlstad*	Sala*	Vänersborg*
Borlänge	Kiruna	Salem*	Vännäs
Botkyrka*	Klippan	Sandviken	Värnamo
Båstad	Kristianstad*	Sjöbo	Västervik
Dals-Ed*	Kristinehamn	Skara*	Växjö*
Danderyd	Kumla*	Sollentuna	Åre
Eksjö*	Kungälv*	Solna	Åstorp
Emmaboda	Kävlinge*	Stockholm*	Älvdalen
Eskilstuna	Lindesberg*	Strängnäs	Örebro*
Fagersta*	Ljungby*	Sundsvall*	Örkellunga
Falkenberg*	Ljusdal	Surahammar	Örnsköldsvik
Färgelanda*	Luleå	Svalöv	Östersund
Gagnef	Lund*	Sävsjö	Östra Göinge
Gnesta	Lycksele	Söderhamn	Övertorneå
Gnosjö	Malmö*	Söderköping	
Gotland	Malå	Södertälje*	
Gällivare	Mariestad	Tierp	
Göteborg*	Mark*	Timrå	
Hallsberg*	Mjölby	Tingsryd	
Haninge*	Munkedal*	Tjörn	
Heby	Mönsterås*	Tomelilla*	
Hedemora*	Mörbylånga	Tranemo	
Helsingborg*	Nacka	Tranås	
Hjo*	Nora	Trollhättan*	
Huddinge*	Norrköping*	Töreboda*	
Håbo	Norsjö	Uddevalla	
Härjedalen	Nybro	Umeå	