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Intergovernmental Grants as a Tactical Instrument: Empirical Evidence from Swedish Municipalities*

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April, 2001

Abstract

Are grants to Swedish municipalities tactical, that is, do parties use these in order to get elected? In this paper, the theoretical model of Lindbeck & Weibull and Dixit & Londregan is tested, using panel data on 255 Swedish municipalities for the years 1981 - 1995. The empirical implication of the theory is that groups with many swing voters will receive larger grants than other groups. In the paper, a new method of estimating the number of swing voters is proposed and used. The results support the hypothesis that intergovernmental grants are used in order to win votes.

JEL classification: D72, H77

Keywords: political economy, tactical redistribution, intergovernmental grants

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1. Introduction

The traditional view on intergovernmental grants is that these are motivated by efficiency and equity considerations: A welfare maximizing government might want to transfer money from richer regions to poorer using lump-sum grants, or to correct for externalities by using matching grants. But this is not necessarily the only reason why we observe transfers between regions and between different levels of government. In this paper, an alternative explanation for intergovernmental grants is tested, namely that these are tactically motivated.

In the literature, there are several indications that politics matter for the allocation of governmental resources across regions. For example, when investigating New Deal spending in the United States during the 1930s, people noticed that money did not go to the poor south but rather to the already wealthy states in the west.¹ In order to explain this pattern, researchers started to include political variables in their analysis and found that these could explain the allocation of New Deal spending considerably better than economic factors. Wright (1974), for example, started out with a theoretical model where the president maximizes the probability of winning and where voters react positively to new spending programs, and 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 coefficient of determination in the political regression than in the economic regression. He therefore 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)

¹ See, e.g., Arrington (1969) and Reading (1973) for an analysis of New Deal spending.

examined the findings of Wright and Anderson & Tollison closer, using panel data. He found that economic variables did matter and that when excluding Nevada² from the sample, the impact of Anderson & Tollison's congressional variables disappeared while Wright's presidential variables still entered significantly. Furthermore, Wallis expanded the investigated period beyond the New Deal, using data on federal governmental 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 do 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.³

A problem with these three studies is however that they lack a stringent theoretical model to guide the researcher in which political variables to include and what signs to expect. The theoretical model of Lindbeck & Weibull (1987, 1993) and Dixit & Londregan (1996, 1998) provides what is missing, namely a theory with clear empirical implications; office motivated parties will use election promises in order to win votes. As a result, regions with many swing voters will be the ones receiving grants.⁴ Case (2001) tests this model as well as the model in Snyder (1989), using block grants from federal to sub-federal levels of government in Albania. Her results indicate that politics matter for the allocation of block grants. A somewhat different theoretical model is used by Strömberg (2001) when investigating radio's impact on a major New Deal relief program (FERA). The model he puts forward is a probabilistic voting model in which mass media and information are incorporated. The main finding of that paper is that US

² Nevada was the state receiving the largest per capita grants during the period. In addition, the dummy variable for Senate leadership takes the value one for Nevada during the whole period.

³ More recent evidence that tactics matters can be found in Grossman (1994), Bungey, Grossman & Kenyon (1991), and Worthington & Dollery (1998) who test the theoretical model put forth in Grossman (1994) on Australian respectively American data. This model 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. However, it is not obvious how to measure "political effectiveness" – a problem that is highlighted by the fact that the three studies testing the model all use different sets of political variables and even predict different signs for some of them. The empirical evidence is hence rather hard to interpret.

⁴ Alternative theoretical models are, e.g., Cox & McCubbins (1986), Levitt & Snyder (1995) and Stein & Bickers (1994).

counties with many radio listeners received more relief funds. One additional prediction of Strömberg's model is that counties with many swing voters will receive more relief programs, just as in the Lindbeck & Weibull model. However, this variable is seldom found to have any statistical significance in the empirical analysis.

In this paper I will test the Dixit & Londregan model on Swedish data for the years 1981-1995. More specifically, I will study the distribution of intergovernmental grants from the central to the local governmental level. These constitute an important revenue source for the Swedish local governments. This paper differs from the ones by Case and Strömberg (except for the data used) in one important aspect, the way the number of swing voters is measured. Case uses the closeness of the last election as a proxy for the number of swing voters. The validity of this proxy rests on a number of specific assumptions of the distribution of ideological preferences among voters, namely that they are symmetric and single peaked. Strömberg, on the other hand, estimates the number of swing voters by using data on the variation and mean of past county election outcomes⁵. In this paper I propose an alternative way to estimate the number of swing voters. The method, which is applied for the first time, uses factor analysis as well as a kernel density estimator on survey data from Swedish election studies. Thereby, we get a direct estimate of the variable from the theoretical model.

The findings in this paper are the following: When the closeness proxy is used, no statistical significant effects of tactics on the distribution of grants are found, although the effects have the predicted signs. If we instead estimate the number of swing voters directly using election survey data, it is found that municipalities with many swing voters are given larger grants than other municipalities. These findings hence support the hypothesis that intergovernmental grants in Sweden are partly used for pork-barrel politics.

⁵ This measure is similar in spirit to the political productivity measure used by Wright (1974). See Strömberg (2001) for a more thorough description.

The paper is organized as follows: in the next section, I give a short overview of the Swedish intergovernmental grant system as well as the political setup in Sweden during the studied period. In Section 3, the theoretical model is presented and testable implications from it are discussed. Section 4 discusses how to take the model to data and Section 5 describes and presents the data. In Section 6, the empirical results are presented, and, finally, Section 7 summarizes and concludes.

2. Some background facts on the Swedish system

In this section, I will present some facts about the political situation in Sweden during 1981-1995, the period studied in this paper, and also discuss the Swedish system of intergovernmental grants.

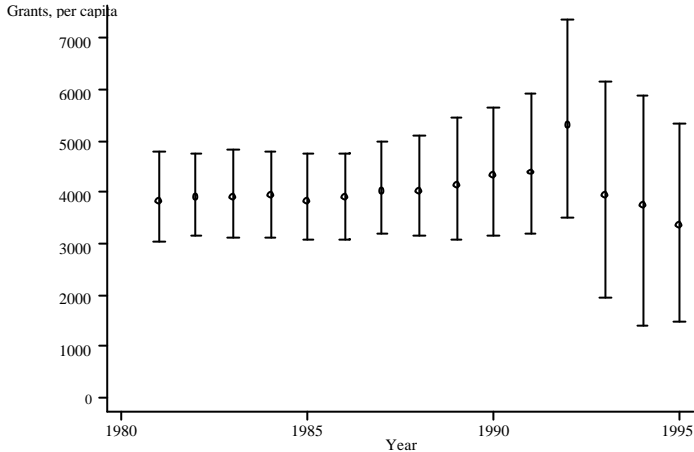
In Sweden, there is a parliamentary system with proportional election rules. Sweden is characterized by a multi-party system where the national parties traditionally play a very important role. During the past years, none of the existing parties has been able to gain own majority, and Sweden has consequently experienced coalition or minority governments. For most of the period studied in this paper, Sweden has been lead by the Social Democratic Party (S) in a minority government supported by the leftist party (V). There are two exceptions to this rule; in the beginning of the period, until the fall of 1982, there was a conservative government consisting of the Conservative Party (M) (until May 1981), the Center Party (C) and the Liberal Party (Fp), and the same is true for the period 1991-1994.⁶

There are three levels of government in Sweden; the central governmental level, the counties, and the municipalities. The counties are responsible for public medical service and the municipalities for schooling (since 1991), care for the elderly (since 1992 when the responsibility was transferred from the counties to the municipalities) and day-care. Grants from the central government is an important revenue source for local governments and constitute about 20 - 25 percent of the municipalities' aggregate revenues, although this share

⁶ See appendix A1 for a guide to the Swedish parties.

has been somewhat smaller during the 1990s. These grants are unevenly distributed over the municipalities and their importance as revenue source differs; for some municipalities the share is as small as 2 - 10 percent, while, for others, grants make up 40 - 50 percent of the municipalities' revenues. The uneven distribution is illustrated by *Figure 1*, which describes the evolution of grants over time. In the figure, the circles indicate the sample mean and the horizontal bars mark the upper and lower 10th percentiles. 80 percent of the sample is thus contained within the vertical lines.

Figure 1. The evolution of grants over time



Notes: The distance between the 10th and 90th percentiles, with mean values marked by o. Grants expressed in 1981 SEK.

In principle, there have been three kinds of intergovernmental grants in Sweden; equalizing grants supporting municipalities with small taxing-capacity and large costs, grants toward certain local government activities and grants toward certain investments, where the two former are the most important ones.

There have been several reforms of the grant system during the eighties and the nineties. Hence, the amount of grants that the municipalities have received fluctuates, as can be seen from *Figure 1*. The most important grant reform was carried out in 1993. Through this reform, a large part of the targeted grants toward certain local government became general lump sum grants. The distribution of these grants was however formula based both before and after the reform.

A grant system intended to equalize income between municipalities has existed since 1966. The idea behind the equalizing grants is the following: Guaranteed levels of per capita tax base for the municipalities are defined, taking into considerations the municipality's taxable income, geographical position, age structure of the municipalities' population, population density and other structural conditions that the municipalities cannot themselves influence. Those municipalities whose per capita tax base falls short of this guaranteed level receive grants up to the stipulated level. This system has undergone changes in 1979, 1988, 1993 and 1995. Originally, the calculations were quite simple with Sweden being divided into five regions according to the 1979-regulation. In 1988, the number of regions was increased to twelve⁷. In 1993, the division into regions was abolished and each municipality was instead given an individual weight according to its cost/need level, which was calculated taking, e.g., the population structure into account. In 1986, an additional element was added to the system when it was decided that municipalities with large tax bases were to pay a certain fee to the central budget.⁸ In addition to this guaranteed level, the government can decide over supplementary transfers to municipalities who have run into economical difficulties (so called extra tax equalizing grants). These transfers can also be motivated by other specific purposes, for example to secure public transportation in sparsely populated regions or to take precautionary measures against landslide or other environmental accidents. These discretionary transfers constitute approximately 2 percent of the tax-equalization grants.

A critical question for this study is of course whether the central government has the possibility to influence grants to local governments. As has been described above, there is some discretionary space, although rather limited. The largest share of intergovernmental grants is distributed to the municipalities by civil servants according to detailed regulations. This seems to indicate that parties lack the opportunity to distribute grants according to tactical considerations. What parties can influence, however, are the rules themselves and the grant system has indeed, as was discussed above, been subject to a number of reforms during the

⁷ The northern parts of Sweden were the winners of the 1988-reform.

⁸ See Söderström (1998) for a more detailed description of the Swedish tax equalizing grant system.

studied period. The argumentation is the following: If a government wants to target one specific region with grants, it can see to it that this region is a net winner of a reform by specifying the grant formulas accordingly. For example, if the region that the government wants to transfer money to have a large population of old people, the government can specify the grant formula in such a way that the share of population older than, e.g., 80 years has a large influence on grants received.

So what about the observed reforms, have they affected a large part of the budget? Looking at data, it turns out that the reforms during the eighties and nineties have not been minor. In 1992, for example, targeted grants made up 25 percent of municipal revenues and general grants only 5 percent. After the reform the figures were changed to 7-8 percent for targeted grants and almost 15 percent for general grants. Looking at *Figure 1* we can also conclude that the variation across municipalities has increased over time and that the level of intergovernmental grants has changed quite a lot. Something hence seems to have happened with grants to lower level governments. As we shall see in section 5, the same pattern does not turn up for many of the variables used in the formulas (e.g. demographic variables), indicating that the rules have not been the same across time.

To conclude, even though we do not have the perfect data to test the model (ideally one would like to have a grant program over which the incumbent government has full discretionary power⁹) I do, however, believe that using total grant is one fruitful way to start looking for the mechanism discussed in the Dixit-Londregan and Lindbeck-Weibull papers, and that the many reforms of the grant system have given the governments opportunities to actually affect the distribution of grants.

3. Theoretical model

⁹ A natural way to proceed would be to use the supplementary equalizing grants in the analysis rather than total grants. However, this is made impossible by limitations in data.

A shortcoming of many of the earlier studies investigating political influences on intergovernmental grants is the lack of strict theoretical models. The intention of this section is to provide what the other studies have lacked, namely a theoretical model which yields testable implications. The theoretical model used and tested in this paper is the one presented in Dixit & Londregan (1996). Similar models are presented in Lindbeck & Weibull (1987, 1993) and Dixit & Londregan (1998). I will here give a brief overview of the model.

There are two parties, party A and party B , facing an election. The parties are office-motivated and maximize their vote share. Parties do this by choosing election promises and will, in case of victory, implement these promises¹⁰. The instruments available for the two parties are lump sum transfers between regions, T_j being the transfers to region j . In order for promises to be credible, they must obey the balanced budget constraint given by

$$\sum_j N_j T_j^P = 0, P = A, B, \quad (3.1)$$

where N_j denotes the share of the population living in region j .¹¹

There is a continuum of voters situated in J different regions. Voters in a region are assumed to have the same original income, Y_j for voters living in region j . The consumption level of a voter in region $j = 1, \dots, J$ is given by

$$C_j = Y_j + T_j. \quad (3.2)$$

Voters decide whether to vote for party A or for party B by comparing the platforms announced by the two parties. However, the promised transfers are not the only things that

¹⁰ That parties actually implement their announced policies is an assumption and not a result derived from the theoretical model. This assumption is however standard in the literature.

¹¹ In order to give money to one region, the party must tax another region and the transfers can hence be negative. In the empirical application however, all transfers are positive. The budget constraint in (3.1) could easily be changed to allow only non-negative transfers financed by a lump-sum tax equal for all individuals. In order to keep things as simple as possible, I have chosen not to do this, but to use the formulation above, although it is not exactly coherent with the empirical analysis.

voters care about when making their choice. Besides preferences for own consumption they are assumed to have preferences over the parties, which do not depend on the promised transfer levels themselves, but are instead based on, e.g., ideological preferences and/or confidence in the parties' representatives. Let X_i denote voter i 's preference of party A over party B . Voter i living in region j will vote for party B if

$$U(Y_j + T_j^B) - U(Y_j + T_j^A) > X_i. \quad (3.3)$$

It is hence possible that an A -partisan actually votes for party B , given that this party's offer exceeds the offer made by the otherwise preferred party by a sufficiently large amount. Hereafter, I will denote X as "ideological preferences", even though X can contain elements that are not really ideological. It is assumed that voters differ in these ideological preferences and that there is a region specific distribution of X in each region: $F_j(X)$ with $f_j(X) = \frac{dF_j(X)}{dX}$. Furthermore, it is assumed that $f_j(0)$ is positive for all j .

Given the announced platforms, voters in each region are split into two groups; those with low X voting for party B and those with high X casting their votes in favor of party A . We can define the cutpoint, as the value of X which makes a voter indifferent between the two parties. This cutpoint will divide voters into two groups according to which party they support. The vote share for party B in region j is given by $F_j(U(Y_j + T_j^B) - U(Y_j + T_j^A))$ and the corresponding share for party A is $1 - F_j(U(Y_j + T_j^B) - U(Y_j + T_j^A))$.

When choosing election promises, party B maximizes the following objective function¹²

$$\max_{T_1^B, T_2^B, \dots, T_j^B} M^B = \sum_j N_j F_j(U(Y_j + T_j^B) - U(Y_j + T_j^A)), \quad (3.4)$$

¹² The corresponding objective function for party A is $\max M^A = 1 - \sum_j N_j F_j(U(Y_j + T_j^B) - U(Y_j + T_j^A))$

subject to the budget constraint given by equation (3.1). Maximization with respect to transfers to region j yields the following first order condition for party B

$$f_j(U(C_j^B) - U(C_j^A))U_c(C_j^B) - \mathbf{m} = 0, \quad (3.5)$$

where \mathbf{m} is the Lagrange multiplier for the budget constraint. The corresponding first order condition for party A is given by

$$f_j(U(C_j^B) - U(C_j^A))U_c(C_j^A) - \mathbf{m} = 0. \quad (3.6)$$

(3.5) and (3.6) are identical, which is not surprising since the game is symmetric.¹³ As is stated in Lindbeck & Weibull (1993) in a similar setting, the game has a unique symmetric Nash equilibrium given that the payoff functions are quasi-concave. We can hence state the following existence theorem:

Theorem: *If $f_j(U(C_j^B) - U(C_j^A))U_{cc}(C_j^P) + [U_c(C_j^P)]^2 f_j'(U(C_j^B) - U(C_j^A)) < 0$, for $P = A, B$, there exists a unique symmetric Nash equilibrium.*

Whether there exists a Nash equilibrium or not depends on the functional forms of the utility function and the distribution functions of ideological preferences. While the utility function is concave, the distribution functions might have non-concave segments. However, given that the utility function is "concave enough", possible non-concavities of the distribution functions will be offset and the second order condition will be fulfilled. I assume that this is the case and thus that a symmetric Nash equilibrium exists.

¹³ The model hence predicts identical election platforms for the two parties. Unfortunately, it is not clear how to test this implication empirically. One way would perhaps be to study parties' announced election programs, but this is beyond the scope of this paper. In Dixit & Londregan (1998) a theoretical model implying different election promises is presented. How to test that model is however far from obvious, in fact, I am not aware of any possible way to do it. One thing worth mentioning is however that if we, in the "Dixit-Londregan-1998-model", allow for two types of income transfers, one between regions and one between different income types, it turns out that the two parties, even though they differ in their ideological preferences, will announce identical regional transfers, see Johansson (1999).

In order to examine how grants are affected by the income level and the density at the cutpoints, consider the following partial derivatives obtained by comparative statics

$$\frac{dT_j}{dY_j} = \frac{-f_j(0)U_{cc}(C_j)}{f_j(0)U_{cc}(C_j) + f_j'(0)[U_c(C_j)]^2} < 0, \quad (3.7)$$

$$\frac{dT_j}{df_j(0)} = \frac{-U_c(C_j)}{f_j(0)U_{cc}(C_j) + f_j'(0)[U_c(C_j)]^2} > 0. \quad (3.8)$$

By assumption, the denominators in (3.7) and (3.8) are negative. Since the utility function is concave (i.e. $U_{cc} < 0$), we can conclude that grants will be negatively correlated with income (from equation (3.7)), and positively correlated with the density at the cutpoint (from equation (3.8)).

Testable implications from the theoretical model are hence the following: large grants can be expected in regions where *i*) the density at the cutpoint is high, *ii*) income is low.

4. Taking the model to data

4.1 How to measure the densities at the cutpoints

When taking the model to data, the problem of estimating the densities at the cutpoints must somehow be solved. Note from the section above that, since the parties promise identical transfers, the cutpoints will actually not be affected by the election promises. Given that the distributions of ideological preferences are symmetric and single peaked, and given that there are only two parties fighting for power, the density at the cutpoint will be higher the closer the race in the election is, since the peak of such a distribution is at the median, and so is the cutpoint in a close race. An earlier study, Case (2001), has made use of this relationship and consequently proxied the density at the cutpoints by the closeness of last election. Below, I

follow this study and create a variable that measures the difference between the vote shares of the two blocs¹⁴ in the election to the central level, measured for each municipality.

The validity of this proxy hinges on the assumptions of symmetric and single peaked distributions of X . These assumptions may be false, and the distributions might, for example, be skewed to the left or to the right. Furthermore, there could be a municipality in which half of the population is extreme conservatives and the rest communists, and where none would even consider to switch. In this case, the distribution of ideological preferences is certainly not single peaked and although the race in the election is close, the density at the cutpoint is very low. If possible, we would therefore like to take a look at the actual distributions of preferences. Since we know the result in the last election, and thereby the cutpoints, we could then measure the densities at these cutpoints and would not have to rely on the closeness-proxy. Even though we will never be able to observe individuals' true preferences, I claim that we can get a reasonably good picture of these by analyzing the Swedish Election Studies, which are large surveys performed every election year since 1956. Remember that X , the variable we want to capture, is a distribution of how much the offer by party B must exceed that of party A in order for a voter to vote for party B . This is a latent variable that we do not observe. What we do observe are a number of answers given by the respondents in election surveys. In the Swedish Election Studies, people are asked to grade their feelings towards the political parties and towards a number of Swedish politicians on a ten-graded scale from "dislike strongly" to "like strongly". Furthermore, they are asked how they experience that, on the one hand, the Swedish economy and, on the other hand, their private economy has changed during the last three years. They are also asked whether they believe the incumbent government is to blame for the fact that the Swedish economy deteriorated during the 1990s, and in what state they think the economy would have been had the opposition been in power.¹⁵

¹⁴ As mentioned in section 2, Sweden is a multiparty system. I have divided these parties into two blocs, one socialist bloc consisting of S, V and Mp, and one conservative bloc consisting of M, Fp, C, Kd and NyD.

¹⁵ See Appendix A2 for exact definitions of the variables used and for a general description of the Swedish Election Studies.

4.2 Factor analysis

The answers given to the questions in the survey all depend on the voters' underlying preferences, which we cannot observe. However, given that all answers depend on this latent variable, they are likely to be correlated and this fact is used in a factor analysis.¹⁶ The idea behind factor analysis is to describe a large number of variables by a smaller set of so called *common factors*. In my case, I have a large number of answers given to questions in the election surveys and I want to combine these answers into one single variable, the preference of party A over party B (i.e. X). In order to do this, we need to know how important each question is in deciding X .

Factor analysis is conducted in two steps, first the factor structure (i.e. the weight to put on each variable) is estimated and, second, the latent variable itself is estimated using the results from the first step. Assume that there are $p = 1, \dots, P$ questions and let the answer to question p form the variable z_p . We will then have P observed variables which we denote variates. Let $\Omega = [w_{ij}]$ be the variance/covariance matrix of z (partly induced by the latent variable). The basic assumption in factor analysis is that these P variates can be expressed by a smaller set of R hypothetical common factors f_r , $r = 1, \dots, R$, in the following way

$$z_p = \sum_{r=1}^R l_{pr} f_r + e_p, \quad p = 1, \dots, P, \quad (4.1)$$

where l_{pr} is the factor loading of the p th variate on the r th factor and e_p is an independent residual containing variations in z_p which are not accounted for by the R factors. The factor loadings tell, for each question, how much of the variation in the given answers that is due to the latent variable. Using information about the sample covariance matrix, the factor loadings can be estimated by maximum likelihood. For each variate, a share of the variance will not be accounted for by the R factors. This share is called the uniqueness of variate p . Let \mathbf{Y} be a $P \times P$ diagonal matrix of uniqueness. What we are mainly interested in is however not the

¹⁶ For a description of the method of factor analysis, see, e.g., Bartholomew (1987) and Lawley & Maxwell (1963).

factor loadings themselves, but the common factors, and the second step aims at estimating these.

The problem of estimating the common factors is similar to that of estimating fitted values in a regression analysis. What we would like to do is to express our hypothetical factors as linear combinations of the observed variates. In order to do this, we need to know the weight to put on each variate. If we knew the true factors, we could use, e.g., ordinary least squares to estimate a parameter vector, which in turn could be used to calculate fitted values. In this case, the variates correspond to the right hand side variables explaining variations in the dependent variables, the common factors. The true factors are however not known (it is exactly because we do not know the true factors that we need estimates of the parameters). What we do know is the variance/covariance of the variates given by $\mathbf{\Omega}$ and the factor loadings estimated in the first step. The latter capture some, although not all, of the covariation between the variates and the hypothetical common factors. Using the available information about $\mathbf{\Omega}$ and l , we can estimate scores in a similar fashion as parameters are estimated in an OLS-regression. Having obtained these scores, we can then, finally, estimate the factor loadings.

There are two different methods to estimate scores and common factors, the regression method and the Bartlett scoring method. Both methods will be used in the empirical analysis. The regression method builds on ordinary least squares and the common factors are obtained by the following formula

$$\hat{f} = \mathbf{\Omega}^{-1} \mathbf{z}. \quad (4.2)$$

The Bartlett scoring method, on the other hand, minimizes the sum of squares of the standardized residuals and the common factors are given by the following equation

$$\hat{f}_r^B = [l' \mathbf{y}^{-1} l]^{-1} l' \mathbf{y}^{-1} \mathbf{z}. \quad (4.3)$$

There is one problem that I have not yet discussed, namely how many common factors to retain. In principle, one could try with any number and thereafter test if these R factors are enough to take all (or at least a sufficiently large part of) the covariation between the variates into account.¹⁷ For practical reasons it is however often suitable to concentrate on only one or two common factors, since it becomes hard to interpret the factors if they are too many. In this paper, the theoretical model restricts R to one; we need one, and only one, estimate of the ideological preferences (X). I therefore set $R = 1$, thereby concentrating on one factor, although this is clearly not enough to take all covariation of the variates into account. Some of the variates will therefore have very high uniqueness (i.e. only a small part of the variation in the variable depends on X).¹⁸

4.3 Estimating cutpoint densities

The above described method is used on data from two election surveys, conducted in 1991 and in 1994, in order to estimate X . Having obtained the common factor X , its constituency specific distributions¹⁹ are estimated using an univariate kernel density estimator. Finally, the cutpoints are defined according to vote distribution in the last election, and the densities at these cutpoints are measured. Since there are as many cutpoints as there are municipalities, the procedure will yield municipality specific measures of the densities. Note that this method builds on the assumption that all municipalities in a constituency have the same distribution of ideological preferences. This assumption is forced by data limitations and ought to be remembered when interpreting the result.

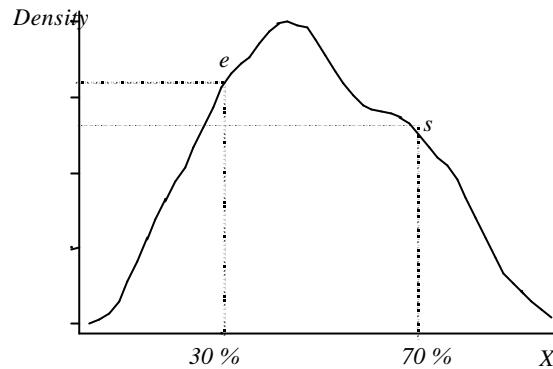
In order to clarify how the cutpoints are estimated, let me illustrate with an example. Assume that we have a constituency consisting of two municipalities, E and S . In *Figure 2* the distribution of preferences of party A over party B in this constituency is given. The distribution is obtained by first estimating X using factor analysis and, thereafter, estimating the distribution using a kernel density estimator.

¹⁷ E.g. Akaike (1983) and Bozdogan & Ramirez (1986) discuss how to choose R .

¹⁸ I have not conducted any sensitivity analysis where I have estimated two factors (or more) and used the second one in the estimations, since it is hard to see how one should interpret this second factor in terms of ideological preferences.

¹⁹ In the survey, individuals are not observed at the municipal level, but on the level of constituency. Sweden is divided into approximately thirty constituencies. Each municipality belongs to one, and only one, constituency.

Figure 2. The distribution of X in a region



Assume that party B won 30 percent of the votes in the last election in municipality E and 70 percent of the votes in municipality S . The value of the density at the cutpoint in municipality E is then given by the density at the point at which 30 percent of the cumulative distribution is to the left of point e . For municipality S , the corresponding density is given by the point where 70 percent of the cumulative distribution is to the left of point s .

4.4 Additional explanatory variables

According to theory, the density at the cutpoint is not the only tactical variable that matters, the income level in the municipality is important as well. I therefore include taxable income in the municipality as one of the regressor. The expected sign of this variable is negative.

It is perhaps a bit cynical to believe that tactical variables are the only factors that matters when designing a system for intergovernmental grants. Equity and efficiency aspects are probably important as well. If we do not control for this, we risk exaggerating the influence of tactics on intergovernmental grants²⁰. I therefore include a number of variables describing the economic situation of the municipalities (in addition to taxable income). Since municipalities are responsible for supplying services such as daycare, schooling and care for the elderly, the

²⁰ 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. 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.

demographic structure is an important determinant of the municipalities' costs. Equity concerns hence motivate support to municipalities with large shares of young and old people. Furthermore, the population density, given by the number of inhabitants per square meter, is included. See *Table 1* for a description of the variables used in the empirical application and their expected signs.

Table 1. Variables used in the empirical application and their expected signs

Variable	Description	E[sign]
GRANTS	Per capita grants received by the municipality.	
TAXABLE INCOME	Per capita taxable income in the municipality.	-
YOUNG	Share of inhabitants younger than 19, January the 1 st .	+
OLD	Share of inhabitants older than 64, January the 1 st .	+
POP DENSITY	Number of inhabitants per square meter.	?
DIFF BLOCS	The vote-difference between the conservative and the socialistic bloc in the election to the central parliament, measured at the municipal level, in percent, absolute values.	-
CUTPOINT DENSITY	The density at the cutpoint, where the distributions of bias in favor of the losing bloc 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 block in the election.	+

Notes: The timing of the variables DIFF BLOCS and CUTPOINT DENSITY are the following: for 1981 and 1982, results from the 1979-election are used, for 1983, 1984 and 1985, results from the 1982-election are used, for 1986,1987 and 1988, results from the 1985-election are used, for 1989, 1990 and 1991, results from the 1988-election are used, for 1992, 1993 and 1994, results from the 1991-election are used, and, finally, for 1995 results from the 1994-election are used.

In order to control for potentially omitted variables, I will include time dummies as well as municipality specific fixed effects in the estimations.

5. The Data

In order to get a feeling for data let us study it somewhat closer. In *Table 2* the mean, maximum, minimum and standard deviations for the variables used are given. In addition, the variation is divided into between and within variation, where the between measure gives the variation across municipalities and the within measure gives the variation across time.

We see from the table that for most of the variables, it is the variation across municipalities that accounts for the largest part of the overall standard deviation. This fact is particularly true for the demographic variables (YOUNG, OLD and POP DENSITY). One implication of this might be that a fixed effect could be able to capture most of the variation in these variables. This would result in insignificant parameter estimates for the variables in question. However, there are some variables for which the variation is almost as large for the between measure as for the within. These are taxable income in the municipality and the estimated densities at the cutpoints. Looking at the two variables measuring the number of swing voters, we can note that the variation (relatively to the mean) is bigger for CUTP DENSITY than for DIFF BLOCS even though there are more observations available for the latter variable.

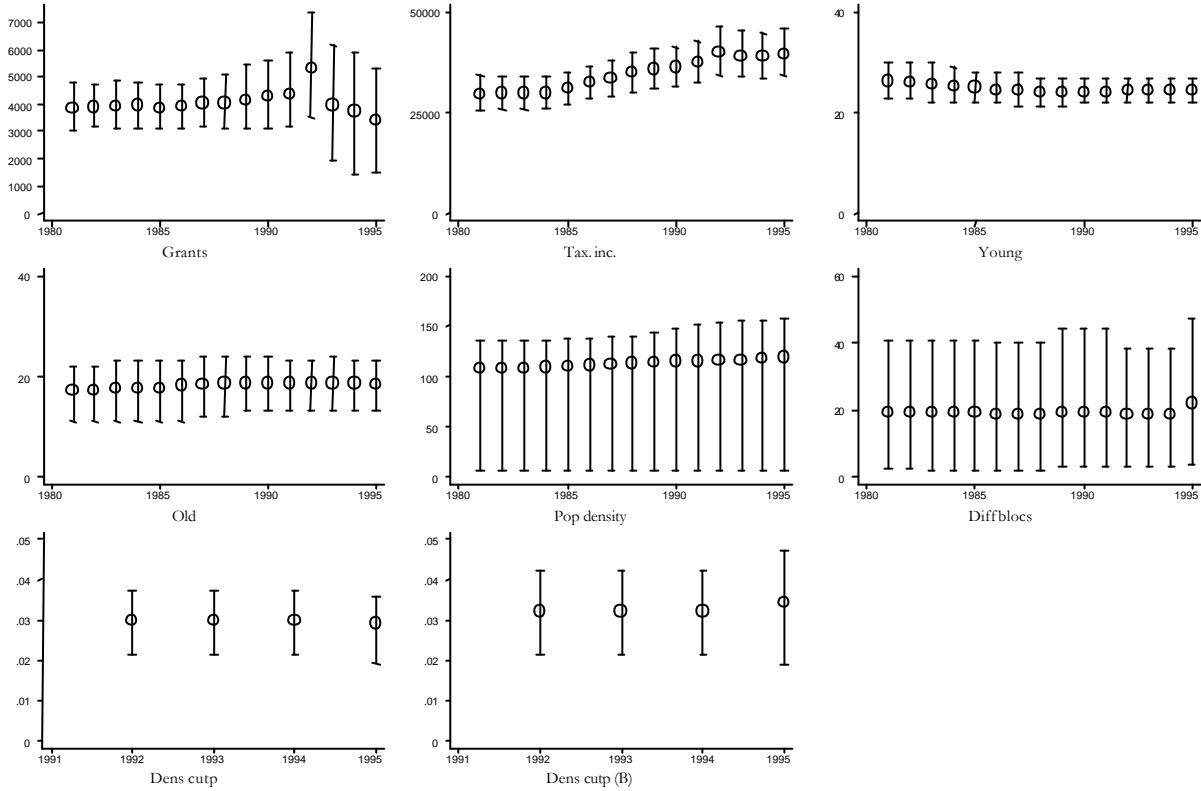
Table 2 Summary statistics for the variables used.

Variable		Mean	Std. Dev.	Min	Max
GRANTS	Overall	4032.222	1255.232	262.7846	12170.55
	Between		1058.425	2312.856	8823.292
	Within		677.8236	-659.96	7974.052
TAXABEL INCOME	Overall	34522.62	5968.883	19923.11	75505.83
	Between		4475.858	26828.89	64143.49
	Within		3958.232	21283.73	49556.07
YOUNG	Overall	24.72993	2.697532	15	39
	Between		2.478677	16.06667	33.33333
	Within		1.074865	20.3966	30.3966
OLD	Overall	18.16314	4.187618	5	28
	Between		4.109143	5.6	26.93333
	Within		0.844335	14.2298	21.6298
POP DENSITY	Overall	112.8677	377.0309	0.362276	3757.086
	Between		377.2581	0.37644	3564.76
	Within		18.70088	-301.44	360.9613
DIFF BLOCS	Overall	19.20929	14.3697	.0048251	65.30049
	Between		12.87722	3.481649	58.01198
	Within		6.424379	-8.974155	39.20384
CUTP DENSITY	Overall	0.030	0.00686	0.01087	0.05710
	Between		0.00548	0.01484	0.05099
	Within		0.00414	0.01054	0.04264
CUTP DENSITY (B)	Overall	0.033	0.00880	0.00639	0.06716
	Between		0.00705	0.01274	0.06146
	Within		0.00528	0.01558	0.05868

Notes: The time period is 1981-1995, except for the last two variables for which the time period is 1992-1995. Grants and taxable income are expressed in 1981 SEK and in per capita terms. The overall and within calculations use $255 \times 15 = 3825$ ($255 \times 4 = 1020$ for the last two variables) observations. The between calculations use 255 observations. The between mean is given by \bar{x}_i , and the within counterpart by $x_{it} - \bar{x}_i + \bar{x}$. (B) indicates that Bartlett scores are used when estimating the distributions of ideological preferences.

Some further information about the variations in the variables are given in *Figure 3*, where the circles indicate the sample mean and the horizontal bars mark the upper and lower 10th percentiles. 80 percent of the sample is thus contained within the vertical lines.

Figure 3



Looking at the graphs, we note that up until 1992, grants per capita to the municipalities were rising, as was taxable income in the municipalities. In 1993, however, grants fell, while taxable income stagnated. We can further note that the variation of grants across municipalities has been rising over time. This rising variation is not found in the other variables, which indicates that changes in grants cannot be explained by static formulas and, thus, that something happened in connection with the grant reforms. Concentrating on the demographic variables, we see that the mean values are rather constant over time, but as the municipalities has become

more similar when it comes to the share of population being young and old, they have become more disparate with respect to the population density. Looking at the three variables capturing the number of swing voters in the municipalities it is hard to detect any specific patterns.

What about the correlation between different variables? These are given in *Table 3*. Concentrating on the first column, where the correlations between the dependent variable (grants) and the explaining variables are given, we see that grants are positively correlated with the share of the municipality’s population older than 64, and negatively correlated with the share younger than 19, taxable income and the population density. We can further note that the population density shows a strong positive correlation with taxable income (hence, municipalities that are sparsely populated also typically have low taxable incomes), and that young and old are strongly negatively correlated. Looking at the political variables, we see that the two estimated cutpoint densities are closely correlated. In addition, both these variables show a rather strong negative correlation with the distance between the vote shares of the two blocs. This negative correlation would be expected if the assumptions of symmetric and single peaked distributions of ideological preferences are not too far fetched; the closer the race is, the higher density at the cutpoint, and the smaller distance between the two blocs. Hence; a large value on DIFF BLOCS indicates a low value on the density at the cutpoint.²¹ How do the two measures of the density at the cutpoint correlate with grants? While the estimated density at the cutpoints is positively correlated with grants (as predicted by theory), the distance between the vote shares of the two blocs is positively correlated with grants as well (opposed to the negative correlation predicted by theory). Looking at the correlation between the two political variables and the other regressors, we see from *Table 3* that the correlations are relatively low; for DIFF BLOCS it varies between -0.04 and 0.08 , and for CUTP DENSITY between -0.21 and -0.04 .

Table 3 Correlation matrix.

	Grants	Tax inc	Young	Old	Pop dens	Diff blocs	Den cut	Den cut B
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²¹ Furthermore, I can mention that it seems to be a lot of variation across the two surveys: The correlation between the 1991 and 1994 is only 0.17 for the regression method and as low as 0.05 for the Bartlett scoring method.

Grants	1.00							
Tax inc	-0.27	1.00						
Young	-0.16	-0.13	1.00					
Old	0.36	-0.33	-0.73	1.00				
Pop dens	-0.24	0.45	-0.20	-0.15	1.00			
Diff blocs	0.14	0.07	-0.08	0.08	-0.04	1.00		
Den cut	0.086	-0.21	-0.04	0.12	-0.11	-0.70	1.00	
Den cut B	0.0004	-0.18	-0.06	0.09	-0.08	-0.66	0.86	1.00

In the empirical application, I will estimate the model for two different time periods (1981-1995 and 1992-1995 respectively). Do these periods differ in any significant way? In 1992 there was a reform in which the responsibility for taking care of the elderly was transferred from the counties to the municipalities. In order to control for this, I use both time dummies as well as a variable capturing the share of people older than 64, which I allow to have different impact before and after the reform. But this is not the only thing that affected the municipalities in these years. During the nineties Sweden ran into a recession and this fell to a large extent upon the municipalities, which faced a number of new challenges. Higher unemployment led to both smaller taxable income and higher costs for social assistance programs. In addition, many public rentals operated by the municipalities had large problems with deficits. The local governments furthermore had to rely on own-source revenues to a larger extent, since decreased grants to lower level governments has been one of the actions taken by the central government when reconstructing the Swedish public finances. Given that these problems strike the municipalities in the same way, we can control for this using time dummies.

6. Empirical results

Next, the theoretical model from section 3 will be empirically tested. When measuring the density at the cutpoints, two alternative methods are adopted. First, the result from the last election is used to measure the closeness of the race, and thereby the density at the cutpoints. This shortcut builds on the assumptions of symmetric and single peaked distributions of ideological preferences. Second, the preferences and their distributions, from which densities at the cutpoints can be calculated, are estimated using data from the Swedish Election Studies. In the first case, the model is estimated for the period 1981-1995, while in the latter, due to data

limitations, only the period 1992-1995 is investigated. The estimations are performed controlling for both time effects and municipality specific fixed effects²².

6.1 Estimations using the Closeness Proxy, 1981-1995

In this section, election results are used to measure the closeness of the race. I thereafter use this closeness parameter as a proxy for the densities at the cutpoints in the municipalities. The following equation are estimated for the years 1981-1995:

$$\begin{aligned} GRANTS_{jt} = & \mathbf{a} + \mathbf{b}_1 TAXABLE_INCOME_{jt} + \mathbf{b}_2 POP_DENSITY_{jt} + \\ & + \mathbf{b}_3 YOUNG_{jt} + \mathbf{b}_4 OLD_91_{jt} + \mathbf{b}_5 OLD92_{jt} + \mathbf{b}_6 DIFF_BLOCS_{jt-} + \quad (6.1) \\ & + TIMEDUMMIES + \mathbf{m}_j + \mathbf{e}_{jt} \end{aligned}$$

where t denotes time periods, j denotes municipalities, \mathbf{m}_j is a municipality specific fixed effect and \mathbf{e}_{jt} is a white noise error term. The subindex ($t-$) indicates that results from the last election are used when creating the variable in question. The motivation for dividing the OLD variable into two components is the "care-for-elderly reform" in 1992.

If parties act tactically, we would expect $\mathbf{b}_1, \mathbf{b}_6 < 0$. If equity considerations matter as well, then it will be the case that $\mathbf{b}_1, \mathbf{b}_2 < 0$ and $\mathbf{b}_3, \mathbf{b}_4, \mathbf{b}_5 > 0$ with $\mathbf{b}_5 > \mathbf{b}_4$, since a municipality with low population density and large shares of young and old people is poorer than other municipalities.

Table 4. Results from estimations using closeness of the election as proxy for the density at the cutpoints, 1981-1995.

Variable	Coefficient	Robust Std. Err.	t-ratio
Difference blocs	-1.640	1.256	-1.31
Taxable income	-0.0708 **	0.0110	-6.46
Young	112.689 **	11.339	9.94
Old 81-91	-65.595 **	12.514	-5.24
Old 92-95	70.461 **	13.863	5.08

²² I have conducted tests for poolability and random effects, and rejected both.

Pop density	-3.716 **	0.595	-6.25
No of obs.	255 × 15 = 3825		
R^2 : within	0.64		
: between	0.06		
: overall	0.11		
F(20,3550)	318.11		

Notes: Results from within-estimations. Constant and time dummies included in both regressions. * denotes significance at the 10% level, and ** denotes significance at the 5% level.

The results are given in *Table 4*. Starting with the two tactical variables derived from the theoretical model, we see that taxable income enters with a significant (in a statistical sense), negative sign as expected. The effect of the distance between the blocs is however insignificant, although it has the correct sign. (The p-value for this variable is 0.192, indicating it is significant at the 20 percent level.) Looking at the control variables, we can note that they all seem to matter, in the sense that they all enter significantly with the expected signs, except for the share of inhabitants older than 64 during the years 1981-1992. This is perhaps not so strange since the counties had the responsibility for care for the elderly during this period. The results from this subsection seem to indicate that intergovernmental grants are not used for pork-barrel politics, since municipalities with many swing voters do not receive larger intergovernmental grants. However, they do not receive less grants either; in fact the parameter estimate is negative, as expected from theory, even though it is not statistical significant. We are hence not yet in the position to reject the theoretical model. Remember that the validity of the closeness proxy rested on the assumptions of symmetric and single peaked distributions of ideological preferences. It might be the case that it is these assumptions that are false rather than the theoretical model itself.

6.2 Estimations using Estimated Densities, 1992-1995

In this subsection, the assumptions that the distributions of ideological preferences (i.e. $F_j(X)$) are symmetric and single peaked are relaxed. Instead, survey data from the Swedish Election Studies is used when estimating X by means of factor analysis. When estimating X , both the regression method and the Bartlett scoring method are used (see section 4.2 for a description of the difference between these two methods). The distributions are thereafter estimated by a kernel density estimator and the cutpoints are defined using the result for the winning block in

the last election.²³ Finally, the densities at these cutpoints are measured.²⁴ Having acquired the densities at the cutpoints, the following equation is estimated for the years 1992-1995:

$$\begin{aligned}
 GRANTS_{jt} = & \mathbf{a} + \mathbf{b}_1 TAXABLE_INCOME_{jt} + \mathbf{b}_2 POP_DENSITY_{jt} + \\
 & + \mathbf{b}_3 YOUNG_{jt} + \mathbf{b}_4 OLD_91_{jt} + \mathbf{b}_5 OLD92__{jt} + \\
 & + \mathbf{b}_6 CUTPOINT_DENSITY_{jt} + TIMEDUMMIES + \mathbf{m}_j + \mathbf{e}_{jt}
 \end{aligned} \tag{6.2}$$

Given that parties care about equity, we would, following the same arguments as above, expect that $\mathbf{b}_1, \mathbf{b}_2 < 0$, and that $\mathbf{b}_3, \mathbf{b}_4, \mathbf{b}_5 > 0$ with $\mathbf{b}_5 > \mathbf{b}_4$, because of the "care-for-elderly reform". Given that tactics matters, we would expect grants to be larger for municipalities with high densities at the cutpoints and with low income, i.e. that $\mathbf{b}_6 > 0$ and $\mathbf{b}_1 < 0$. Results from these estimations are given in *Table 5*.

Table 5. Results from estimations using data from the Swedish Election Surveys, 1992-1995

Variable	Model 1: "Regression" scores			Model 2: Bartlett scores		
	Coefficient	Robust Std. Err.	t-ratio	Coefficient	Robust Std. Err.	t-ratio
Density cutp	5811.538 *	3228.262	1.80	6231.847 **	2480.401	2.51
Taxable inc	-0.055	0.040	-1.37	-0.057	0.040	-1.42
Young	3.564	39.044	0.09	3.879	38.938	0.10
Old 92-95	-59.950	55.558	-1.08	-57.642	55.396	-1.04
Pop density	-7.929 **	3.460	-2.29	-8.059 **	3.453	-2.33
No of obs.	255 × 4 = 1020			No of obs.	255 × 4 = 1020	
R^2 : within	0.75			R^2 : within	0.75	
: between	0.10			: between	0.10	
: overall	0.13			: overall	0.13	
F(8,757)	285.32			F(8,757)	286.31	

Notes: Results from within-estimations. Constant and time dummies included in both regressions. * denotes significance at the 10% level, and ** denotes significance at the 5% level.

²³ When using kernel density estimators it has turned out that the choice of kernel is not that important, but that the choice of bandwidth is. Therefore, two different bandwidths have been used in the estimations, the first one is the default chosen by STATA. This is the width that would minimize the mean integrated square error if data were in fact Gaussian and a Gaussian kernel were used. In our case this width is approximately 0.55-0.80. In the case of multimodal and highly skewed densities, this width is usually too wide and tends to oversmooth the distributions. Therefore, the kernel estimations have also been performed using a bandwidth which is 0.04 units shorter than the "optimal" length. Doing this, it turns out that the estimated densities are very similar to those yielded by the wider bandwidth. Results from these estimations are therefore excluded from the paper but are available upon request.

²⁴ Results from the factor analysis and the accompanying distributions are given in Appendix A3.

Looking at these results we see that the variable that measures the density at the cutpoints enters positively and significantly (at the ten-percent level for the estimations using “regression” scores and at the five-percent level for the estimations using Bartlett scores) as predicted from theory. Taxable income enters with a negative sign, but we cannot reject that its impact is zero (when testing at the ten-percent level). Of the control variables, it is only the population density that enters with a significant effect; the more sparsely populated the municipality is, the more grants does it receive. The fact that the control variables are insignificant in this case, but not in the earlier one, is probably a result of the presence of fixed effects together with the shorter time period and hence the smaller across time-variation in these variables. As opposed to the former subsection, where it was found that tactics does not matter (at least from a statistical significance view), the results in this subsection indicate that tactics matters. The higher the density at the cutpoint in a municipality, the larger are the intergovernmental grants to that municipality.

How large is this impact? Comparing the effect for the municipalities with the highest respectively lowest value on the density at the cutpoint, and using the results from the Bartlett scores estimations, we find that in 1994 (1995) the impact was 330 SEK (420 SEK) per capita in the municipality with the highest density and 40 SEK (65 SEK) in the municipality with the lowest density. In 1994 (1995), the municipality with the highest density thus received approximately 350 (290) SEK more in per capita grants than the municipality with the lowest density. In order for a difference in income to have the same effect, it has to be 6200 (5100) SEK per capita. The effects of the densities at the cutpoints are hence not unimportant.

Finally, it is worth noting that just as the results in the former subsection rest on some assumptions, so do the results from this subsection. Specifically, it is assumed that the latent variable describing ideological preferences can be expressed as a linear combination of variables from the Swedish Election Studies. Furthermore, the results rely on the assumption that all municipalities in one constituency, although they have different cutpoints, share the same distribution of ideological preferences.

6.3 Estimations using the Closeness Proxy, 1992-1995

The findings in section 6.2 hence differ from the findings in section 6.1, where another variable was used when measuring the density at the cutpoints. Is this difference a consequence of the shorter time period or an indication that the assumptions of symmetric and single peaked preferences are not fulfilled? In order to investigate this, I have estimated the model for the period 1992-1995 using the closeness proxy instead of the estimated densities. The results, which are given in *Table 6*, indicate that the differing results are not an effect of the different time periods; the distance between the vote shares of the two blocs does not enter significantly for this shorter time period either. However, it still enters with the expected sign. Looking at the summary statistics in *Table 2* we can conclude that the different significance levels for the two variables may depend on the larger variation of the variable used in *Table 5* than in the one in *Table 6*. Also, for the latter variable (DIFF BLOCS) the between variation, that is variation across municipalities, makes up the largest part of the overall variation. Since the model in *Table 6* controls for municipality specific fixed effects, it might be the case that these capture most of the variation in the DIFF BLOC variable. For the estimated densities at the cutpoint, on the other hand, the within variation is considerable.

Table 6. Results from estimations using closeness of the election as proxy for political power, 1992-1995.

Variable	Coefficient	Robust Std. Err.	t-ratio
Difference blocs	-2.171	1.678	-1.29
Taxable income	-0.056	0.041	-1.38
Young	6.572	38.750	0.17
Old 92-95	-58.036	55.648	-1.04
Pop density	-7.715 **	3.416	-2.26
No of obs.		255 × 4 = 1020	
R^2 : within		0.75	
: between		0.10	
: overall		0.13	
F(8,757)		284.75	

Notes: Results from within-estimations. Constant and time dummies included in both regressions. * denotes significance at the 10% level, and ** denotes significance at the 5% level.

4. Summary and Conclusions

In this paper, the determinants of intergovernmental grants in Sweden 1981-1995 have been studied using a panel of 255 Swedish municipalities. As a starting point, a theoretical voting model, from which testable implications are derived, is set up. There are two parties caring about power, facing an election. Voters observe the election promises made by the parties, and decide which party to support, taking into account how these election promises affect their own consumption. However, voters are also assumed to have party specific preferences that are not dependent on the parties announced transfer schemes but are effects of, e.g., ideological preferences. Two testable implications follow from the theoretical model: large grants are to be expected in municipalities where *i*) there are many swing voters (i.e. the density at the cutpoint is high), and *ii*) income is low.

Two different ways of measuring the densities at the cutpoints have been used. The first one builds on the fact that, given that the distributions of ideological preferences are symmetric and single peaked, there is a one to one correspondence between the density at the cutpoint and the closeness of the election. In addition to this proxy that has been used in earlier studies, an alternative method of measuring the number of swing voters is proposed and used. This second method relaxes the assumptions of symmetry and single-peakedness and instead assumes that voters' ideological preferences can be expressed as linear combinations of answers given by voters in the Swedish Election Studies. Using factor analysis methods on this survey data, the latent variable that influences the voters' voting decisions has been captured and a univariate kernel density estimator has thereafter been used in order to estimate the distributions of these ideological preferences.

When testing the empirical implications of the theoretical model, it has been found that:

- (i) In the case where the distributions of ideological preferences are estimated, the densities at the cutpoints have a positive and significant impact on grants, indicating that tactics does

matter, Closeness of the election, on the other hand, has no effect on transfers; it is true that the closer the race is, the more grants does the municipality receive, but this effect is not statistically significant. If we look at the estimated distributions themselves (given in Appendix A3) we see that these are not symmetric and single-peaked and it is therefore not surprising that the two methods yield different results.

- (ii) Welfare aspects are important; poor regions and regions with large shares of population either young or old receive larger grants. Furthermore, higher grants are directed to sparsely populated regions. These effects are somewhat more pronounced for the longer period than for the shorter.

What conclusions can be drawn from the results above? Are intergovernmental grants tactical or not? The results in the paper point in the direction of a *yes* or a *maybe*; the two political variables used seem to indicate that this is the case, even though one of them is insignificant. In order to decide which of the two answers that is the most correct one, we must decide which set of assumptions that is most likely to be fulfilled. I see no reason to expect the distributions of ideological preferences to be single-peaked and symmetric and consider the assumptions behind factor analysis less severe. I would therefore be more inclined to believe in the results from the latter section, even though some caution certainly is needed having in mind the relatively few observations available. The results in the paper hence indicate that grants to lower level governments are directed to municipalities where many votes could potentially be won and that, when choosing their election promises, parties take tactical as well as welfare aspects into consideration.

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Appendix

A.1 Key to the Swedish Parties

Leftist Party

Name in Swedish: Vänsterpartiet

Abbreviation: V

Ideological location: left wing (former communist)

Party Leader: Lars Werner 1975 - 1993, Gudrun Schyman 1993 -

Election results: 1982: 5.6 %, 1985: 5.4 %, 1988: 5.8 %, 1991: 4.5 % and 1994: 6.2 %

Green Party

Name in Swedish: Miljöpartiet de gröna

Abbreviation: Mp

Ideological location: green/new politics

Party Leader: No formal leader

Election results: 1982: 1.7%, 1985: 1.5 %, 1988: 5.5 %, 1991 3.4 % and 1994: 5.0%

Social Democrats

Name in Swedish: Socialdemokratiska Arbetarpartiet

Abbreviation: S

Ideological location: social democrats (labor)

Party Leader: Olof Palme 1969 - 1986, Ingvar Carlsson 1986 - 1996

Election results: 1982: 45.6 %, 1985: 44.7 %, 1988: 43.2 %, 1991: 37.7 % and 1994: 45.3%

Center Party

Name in Swedish: Centerpartiet

Abbreviation: C

Ideological location: non-socialist, farmers

Party Leader: Thorbjörn Fälldin 1971 - 1985, Karin Söder 1985 - 1986, Olof Johansson 1987 - 1998

Election results: 1982: 15.5 %, 1985: 12.4 %²⁵, 1988: 11.3 %, 1991: 8.5 % and 1994 7.7 %

Liberal Party

Name in Swedish: Folkpartiet Liberalerna

Abbreviation: Fp

Ideological location: liberal

Party Leader: Ola Ullsten 1978 - 1983, Bengt Westerberg 1983 - 1995

Election results: 1982: 5.9 %, 1985: 14.2 %, 1988: 12.2%, 1991: 9.1% and 1994: 7.2%

Conservative Party

Name in Swedish: Moderata Samlingspartiet

Abbreviation: M

Ideological location: conservative

Party Leader: Ulf Adelsohn 1981 - 1986, Carl Bildt 1986 - 1999

Election results: 1982: 23.6 %, 1985: 21.3 %, 1988: 18.3 %, 1991: 21.9 % and 1994: 22.4 %

Christian Democratic Party

Name in Swedish: Kristdemokratiska Samhällspartiet

Abbreviation: Kd

Ideological location: christian democratic (conservative)

Party Leader: Alf Svensson 1973 -

Election results: 1982: 1.9 %, 1988: 2.9 %, 1991 7.1 % and 1994: 4.1%

New Democracy

Name in Swedish: Ny Demokrati

Abbreviation: NyD

Ideological location: right wing populists

Party Leader: Ian Wachtmeiser 1991-1994, Harriet Colliander 1994, Vivianne Franzén 1994 - 1997

Election results: 1991: 6.7 % and 1994: 1.2%

²⁵ Joint election campaign with Kd.

A.2 Data appendix

Out of the original 288 municipalities 33 were discarded for the following reasons:

- i) Municipalities involved in fusion or divisions: 117, 127, 128, 187, 461, 480, 488, 1535, 1583, 1603, 1660, 1814, 1880, 2417, 2418, 2403, 2460.
- ii) Municipalities handling tasks that are normally handled by the counties: 980, 1280, 1480
- iii) Municipalities for which missing values are observed in 1994: 2518.
- iv) Municipalities for which missing values are observed in 1995: 482, 604, 1121, 1167, 1419, 1582, 1643, 2026, 2034, 2039, 2303, 2506.

All variables besides CUTPOINT DENSITY are obtained from Statistics Sweden. The variable CUTPOINT DENSITY is estimated using data from "The Swedish Election Studies", which are large surveys performed every election year since 1956. The data sets are handled and distributed by the Swedish Social Science Data Service (SSD) at Göteborg University. The 1991- and the 1994-study were performed by Mikael Gilljam and Sören Holmberg at the Department of Political Science, Göteborg University. Among the many questions available I have picked out variables which I believe capture peoples' preferences. These variables are presented in *Table A.1* and *Table A.2*. Respondents are observable at the level of constituency for the parliament. In 1991 there were 28 constituencies and in 1994 there were 29. For 1991 there are 2467 observations available and for 1994 the number of observations is 2296.

Table A.1 Questions asked in the Swedish Election Study 1991.

Variable	Question	Range
VAR 88	On a scale from dislike strongly to like strongly, where would you place the Center Party (C)?	-5, -4, -3, -2, -1, 0, 1, 2, 3, 4, 5
VAR 89	On a scale from dislike strongly to like strongly, where would you place the Conservative Party (M)?	-5, -4, -3, -2, -1, 0, 1, 2, 3, 4, 5
VAR 90	On a scale from dislike strongly to like strongly, where would you place the Leftist Party (V)?	-5, -4, -3, -2, -1, 0, 1, 2, 3, 4, 5
VAR 91	On a scale from dislike strongly to like strongly, where would you place the Liberal Party (Fp)?	-5, -4, -3, -2, -1, 0, 1, 2, 3, 4, 5
VAR 92	On a scale from dislike strongly to like strongly, where would you place the Social Democrats (S)?	-5, -4, -3, -2, -1, 0, 1, 2, 3, 4, 5
VAR 93	On a scale from dislike strongly to like strongly, where would you place the Green Party (Mp)?	-5, -4, -3, -2, -1, 0, 1, 2, 3, 4, 5
VAR 94	On a scale from dislike strongly to like strongly, where would you place the Christian Democratic Party (Kds)?	-5, -4, -3, -2, -1, 0, 1, 2, 3, 4, 5
VAR 95	On a scale from dislike strongly to like strongly, where would you place New Democracy (NyD)?	-5, -4, -3, -2, -1, 0, 1, 2, 3, 4, 5
VAR 96	On a scale from dislike strongly to like strongly, where would you place Olof Johansson (party leader C)?	-5, -4, -3, -2, -1, 0, 1, 2, 3, 4, 5
VAR 97	On a scale from dislike strongly to like strongly, where would you place Carl Bildt (party leader M)?	-5, -4, -3, -2, -1, 0, 1, 2, 3, 4, 5
VAR 98	On a scale from dislike strongly to like strongly, where would you place Lars Werner (party leader Vp)?	-5, -4, -3, -2, -1, 0, 1, 2, 3, 4, 5
VAR 99	On a scale from dislike strongly to like strongly, where would you place Bengt Westerberg (party leader Fp)?	-5, -4, -3, -2, -1, 0, 1, 2, 3, 4, 5
VAR 100	On a scale from dislike strongly to like strongly, where would you place Ingvar Carlsson (party leader S)?	-5, -4, -3, -2, -1, 0, 1, 2, 3, 4, 5
VAR 101	On a scale from dislike strongly to like strongly, where would you place Alf Svensson (party leader Kd)?	-5, -4, -3, -2, -1, 0, 1, 2, 3, 4, 5
VAR 103	On a scale from dislike strongly to like strongly, where would you place Ian Wachtmeister (party leader NyD)?	-5, -4, -3, -2, -1, 0, 1, 2, 3, 4, 5
VAR 104	On a scale from dislike strongly to like strongly, where would you place Bert Karlsson (NyD)?	-5, -4, -3, -2, -1, 0, 1, 2, 3, 4, 5
VAR 370	Comparing your own current economic situation to what it was two or three years ago, has it improved, remained about the same or has it got worse?	-1, 0, 1
VAR 371	How has, in your opinion, the Swedish economy changed in the last two or three years? Has it improved, remained about the same or has it got worse?	-1, 0, 1
VAR 373	The Swedish economy has got worse in recent years. Is, in your opinion, the economic policies of the Social Democratic government a very important reason (2), a fairly important reason (1), a not particularly important reason (-1), or no reason (-2) behind the Swedish economic crisis?	-2, -1, 0, 1, 2
VAR 383	How do you think the economic problems in Sweden would have developed if in recent years we had a government with only Bourgeois parties and no Social Democrats? Much worse (2), a bit worse (1), about as it is now (0), a bit less economic problems (1), much less/no economic problems at all (2).	-2, -1, 0, 1, 2
VAR 449	Constituency, election to the parliament	There are 28 constituencies

Table A.2 Questions asked in the Swedish Election Study 1994.

Variable	Question	Range
VAR 88	On a scale from dislike strongly to like strongly, where would you place the Center Party (C)?	-5, -4, -3, -2, -1, 0, 1, 2, 3, 4, 5
VAR 89	On a scale from dislike strongly to like strongly, where would you place the Conservative Party (M)?	-5, -4, -3, -2, -1, 0, 1, 2, 3, 4, 5
VAR 90	On a scale from dislike strongly to like strongly, where would you place the Leftist Party (V)?	-5, -4, -3, -2, -1, 0, 1, 2, 3, 4, 5
VAR 91	On a scale from dislike strongly to like strongly, where would you place the Liberal Party (Fp)?	-5, -4, -3, -2, -1, 0, 1, 2, 3, 4, 5
VAR 92	On a scale from dislike strongly to like strongly, where would you place the Social Democrats (S)?	-5, -4, -3, -2, -1, 0, 1, 2, 3, 4, 5
VAR 93	On a scale from dislike strongly to like strongly, where would you place the Green Party (Mp)?	-5, -4, -3, -2, -1, 0, 1, 2, 3, 4, 5
VAR 94	On a scale from dislike strongly to like strongly, where would you place the Christian Democratic Party (Kds)?	-5, -4, -3, -2, -1, 0, 1, 2, 3, 4, 5
VAR 95	On a scale from dislike strongly to like strongly, where would you place New Democracy (NyD)?	-5, -4, -3, -2, -1, 0, 1, 2, 3, 4, 5
VAR 96	On a scale from dislike strongly to like strongly, where would you place Olof Johansson (party leader C)?	-5, -4, -3, -2, -1, 0, 1, 2, 3, 4, 5
VAR 97	On a scale from dislike strongly to like strongly, where would you place Carl Bildt (party leader M)?	-5, -4, -3, -2, -1, 0, 1, 2, 3, 4, 5
VAR 98	On a scale from dislike strongly to like strongly, where would you place Gudrun Schyman (party leader Vp)?	-5, -4, -3, -2, -1, 0, 1, 2, 3, 4, 5
VAR 99	On a scale from dislike strongly to like strongly, where would you place Bengt Westerberg (party leader Fp)?	-5, -4, -3, -2, -1, 0, 1, 2, 3, 4, 5
VAR 100	On a scale from dislike strongly to like strongly, where would you place Ingvar Carlsson (party leader S)?	-5, -4, -3, -2, -1, 0, 1, 2, 3, 4, 5
VAR 101	On a scale from dislike strongly to like strongly, where would you place Birger Schlaug ("språkrör" Mp)?	-5, -4, -3, -2, -1, 0, 1, 2, 3, 4, 5
VAR 102	On a scale from dislike strongly to like strongly, where would you place Alf Svensson (party leader Kd)?	-5, -4, -3, -2, -1, 0, 1, 2, 3, 4, 5
VAR 103	On a scale from dislike strongly to like strongly, where would you place Vivianne Franzén (party leader NyD)?	-5, -4, -3, -2, -1, 0, 1, 2, 3, 4, 5
VAR 104	On a scale from dislike strongly to like strongly, where would you place Ann Wibble (Fp)?	-5, -4, -3, -2, -1, 0, 1, 2, 3, 4, 5
VAR 105	On a scale from dislike strongly to like strongly, where would you place Mona Sahlin (S)?	-5, -4, -3, -2, -1, 0, 1, 2, 3, 4, 5
VAR 380	Comparing your own current economic situation to what it was two or three years ago, has it improved, remained about the same or has it got worse?	-1, 0, 1
VAR 381	How has, in your opinion, the Swedish economy changed in the last two or three years? Has it improved, remained about the same or has it got worse?	-1, 0, 1
VAR 510	Constituency, election to the parliament	There are 29 constituencies

A.3 Estimating ideological preferences by factor analysis.

All estimations are performed in STATA 5.0. The results from factor analysis are presented in *Table A.3* and *Table A.4*. The estimated distributions of bias in favor of the socialist block are given in *Figure A.1* and *Figure A.2* for the base case (the regression method in the factor analysis and "optimal" bandwidths in the kernel density estimations).

Table A.3 Factor analysis, 1991.

	Factor loading	Uniqueness	Score	Bartlett Score
C	0.02373	0.99944	0.00204	0.09836
M	0.85662	0.26622	0.27671	0.1236
Fp	0.39333	0.84529	0.04	0.10239
Kd	0.50866	0.74126	0.059	0.1054
S	-0.71355	0.49082	-0.12497	-0.11391
V	-0.64845	0.57949	-0.0962	-0.11067
Mp	-0.29971	0.91017	-0.02832	-0.10063
NyD	0.52296	0.72653	0.0619	0.10585
Olof Johansson	-0.12075	0.98542	-0.01053	-0.09871
Carl Bildt	0.80034	0.35947	0.19143	0.11929
Lars Werner	-0.3799	0.85568	-0.03818	-0.1021
Bengt Westerberg	0.27908	0.92211	0.02603	0.10032
Ingvar Carlsson	-0.59022	0.65163	-0.07789	-0.10822
Alf Svensson	0.46326	0.78539	0.05072	0.10409
Ian Wachtmeister	0.54409	0.70398	0.06648	0.10655
Bert Karlsson	0.36233	0.86872	0.03585	0.10175
private economy	0.09351	0.99126	0.00811	0.09856
Swedish economy	0.22887	0.94762	0.02077	0.09966
crises conservatives	0.71918	0.48276	0.12807	0.11422
crises socialists	0.59157	0.65004	0.07825	0.10828
Variance	5.23671			
Log likelihood	-6871.3453			

Table A.4 Factor analysis, 1994.

	Factor loading	Uniqueness	Score	Bartlett Score
M	0.86037	0.2597	0.29471	0.13296
Fp	0.1744	0.96958	0.01602	0.10633
C	0.20945	0.95613	0.0195	0.1067
Kd	0.55457	0.69245	0.07127	0.11471
S	-0.73679	0.45717	-0.14347	-0.12363
V	-0.67132	0.54934	-0.10876	-0.11989
Mp	-0.40985	0.83202	-0.04384	-0.11025
NyD	0.27807	0.92268	0.02683	0.10762
Carl Bildt	0.79034	0.37533	0.18736	0.12724
Olof Johansson	0.04423	0.99804	0.00394	0.10557
Bengt Westerberg	0.04116	0.99831	0.00367	0.10557
Ann Wibble	0.66908	0.55232	0.1078	0.11977
Alf Svensson	0.54438	0.70365	0.06884	0.11433
Ingvar Carlsson	-0.62202	0.6131	-0.09027	-0.1175
Mona Sahlin	-0.60318	0.63619	-0.08437	-0.11667
Birger Schlaug	-0.32923	0.89161	-0.03286	-0.1085
Vivianne Franzén	0.18573	0.96551	0.01712	0.10644
Gudrun Schyman	-0.45721	0.79097	-0.05143	-0.11151
private economy	0.13692	0.98125	0.01242	0.10602
Swedish economy	0.1694	0.9713	0.01552	0.10629
Variance	4.88332			
Log likelihood	-6206.096			

Figure A.1 Distributions of bias in favor of the socialist block, 1991.

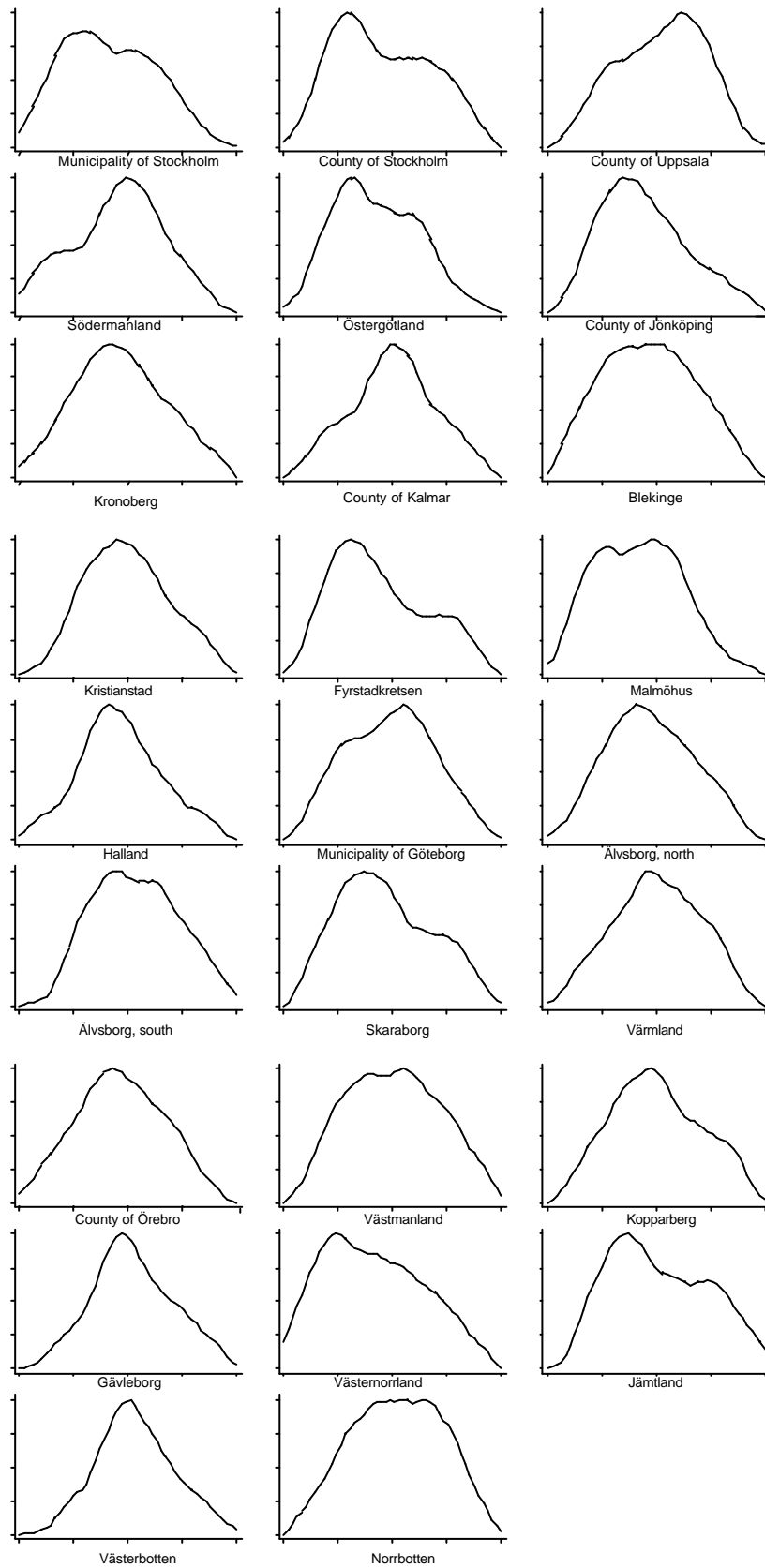


Figure A.2 Distributions of bias in favor of the socialist block, 1994.

