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THE EFFECTS OF CHANGE IN GRANTS-IN-AID REGIME AND CUTS ON GRANTS ON MUNICIPALITIES' EXPENDITURES IN FINLAND

ABSTRACT: In this preliminary paper the effects of change in grants-in-aid system and grant cutbacks on the municipalities' operating expenditures are examined using two panel data sets: 1986-1992 covering the matching grants system and 1994-1996, covering the new general grants system. The paper compares the effects of grants in these two grant systems. The effect of matching grants system to municipal expenditures is found to be highly stimulative. The estimations using data from general grant system show that the effect of the grants to operating expenditures is considerably lower than in the matching grant system. This supports the hypotheses that the change from matching grants system to general grants system and the cuts on grants constrain municipalities' propensity to consume the aided services.

1 Introduction

One common thing to all countries is that there are fiscal disparities among the local level governments and that the need to equalize these differences exists. Residents of municipalities with considerably lower tax base or higher than average costs, can face substantially higher tax burden or lower levels of services than the residents in wealthier municipalities without central government intervention. The empirical research has often concentrated in defining the effect of grants-in-aid to municipalities when allocating increases in aid. The concept of fiscal illusion and the flypaper effect have been been under several studies (see Dollery & Worthington, 1996, for a summary). The flypaper effect means that the categorical lump-sum grants increase public expenditure by more than an equivalent increase in income from other sources (Courant, Gramlich & Rubinfeld, 1979). The empirical findings on the whole have been supporting the flypaper effect hypothesis (Grossman 1990; Marshall, 1991).

On the other hand, the research on the effects of aid cutbacks to municipalities has not been very common. Nevertheless, in many countries the grants-in-aid have been subject to cuts or switching from matching grants-in-aid system to general grants system during the past decade or so (for example Finland and Sweden). Fiscal disparities among municipalities are reduced if grants to municipalities are allocated so that the municipalities with higher need-capacity gaps are favoured. On the other hand, if the cuts on grants are executed so that the municipalities with relatively weak fiscal positions suffer the most, then the aid cutbacks will increase fiscal disparities. The cutback strategy can be designed so that the weakest municipalities would not suffer too much, but the general result of aid cutbacks is that the fiscal disparities will increase (Rescowsky & Schwartz, 1990).

Although the subject of aid cutbacks has not been very popular in local government research, some empirical research has been done. Studying 281 municipalities for the years 1985 and 1990 in Sweden, Aronsson & Wikström (1994) found that when changing from matching grants-in-aid system to general grants system, the expenditures will be cut sharply, especially in the municipalities that have been major beneficiaries. According to Boyne (1990), however, the negative effect on expenditures is considerably smaller when the grants are cut.

There has been some research to determine the effect of grants-in-aid and some demographic variables on the municipalities' expenditures in Finland (Moisio 1994; Oulasvirta 1996, 107-125;). In these studies both cross-sectional data was used. The studies showed the existence of stimulative effect of the grants to municipalities' expenditures in the old system. In the econometric models where total expenditures and total operating costs per capita were the dependent variables, the grants-in-aid per capita got estimates significantly greater than one. These results proved the connection between municipalities' expenditures and state grants, which has been widely discussed in the theoretical local government literature. In this paper a further attempt to estimate the municipal expenditure model with panel data and estimation methods is carried out.

The cuts on grants in Finland have not been under research, however. This paper is the first attempt to define the effects of aid cutbacks and the effects of changing the grants system in Finland in the traditional grants-expenditures framework. The results presented here are preliminary, as a lot remains to be done with the modelling and econometric analysis of the data for aid cutbacks. Nevertheless, in this paper an attempt is made to describe the effect of the grants-in-aid system in Finland during two different grants-in-aid systems, namely the system in 1980s that was based on matching grants and the present system that is based on general grants and precalculated costs of municipalities. The stimulative effect of the grants-in-aid system in Finland in the 1980s and the problems that the present system has inherited from that time are also discussed.

2 A short history of the municipalities' role in public sector and the grants-in-aid system in finland

2.1 The old grants-in-aid system

The regional administration[i] in Finland has traditionally been an integral part of the central government administration. The municipalities, however, have been rather independent in their decisionmaking. Since the 1960s the division of responsibilities between the local level and central government has been clear: local level produces basic services that are decided nationally and the central level takes care of redistributive tasks and policy formulation. Most

of the social, health and basic education services have traditionally been organized by the municipalities. The enlargement of public sector since the mid-1960s and the political needs for an equal production of services in different parts of Finland have resulted in the rapid growth of municipalities‘ economy and personnel (see table 1 below). The enlarged services of the local government also called for an extensive and comprehensive grants-in-aid system.

The municipal finances in Finland have been based on independent taxation, central government grants-in-aid, loans, fees and sales revenues. Municipal income tax is a flat rate tax on the earned income of individuals and the tax rate is set annually in advance for the following year in each municipality by the municipal council on the basis of the municipal budget. In 1998 the tax rate varies between 15.0 and 19.75 % according to the municipality, with an average rate of 17.55 %. The average tax rate has been steadily increasing during the last decades. Table 2 shows the development of the main components of the municipal finance since 1950:

Table 1 ***The development of municipalities' personnel (number of persons) 1950-1995***[ii]

YEAR	Municipalities	State
1950	97 000	146 000
1960	137 000	177 000
1970	194 000	187 000
1980	337 000	226 000
1985	400 000	230 000
1990	466 000	216 000
1995	455 000	165 000

Table 2 **Municipal finances during 1950-1996**[iii]

	1950	1960	1970	1980	1990	1995	1996 estimated
Tax incomes	50,8	50,4	54,4	40,2	39,4	40,7	45,0
Loans	11,5	5,2	5,3	3,9	4,5	1,7	2,0
Grants-in-aid	17,5	15,0	15,3	18,2	23,0	28,0	23,0
Other incomes	20,2	29,4	25,0	37,7	33,1	30,6	30,0
Total	100	100	100	100	100	100	100

Since the beginning of the 1970s and until the year 1993 the grants-in-aid consisted mostly of specific categorical matching grants. In the end of the 1980s 99% of all grants to municipali-

ties were this type. The evaluation of the financial base of the municipalities was also part of the grants-in-aid system.[iv] This evaluation, which was decided yearly by the Ministry of the Interior, formed the redistributive policy base of the central government. The municipalities were divided into 10 groups and the higher the group of the municipality the less state support it received. Each year in the evaluation it was decided which municipalities were risen or lowered in the classification. The grants-in-aid system had separate matching grant rates for each service-category for the 10 classes.

The meaning of the evaluation system was to guarantee a certain financial base for all municipalities. Equality among the citizens located in different municipalities was one of the most important principles in grants-in-aid policy. This meant that the matching rates of the grants were highest in the municipalities with lowest population densities, lowest tax bases and highest tax rates. Of course, this kind of system was effective in redistributing the welfare among the municipalities as the poor municipalities received aid and the wealthy municipalities actually financed it. Over the time period 1980-1992 an increasing number of the municipalities ended up in the lowest 4 groups in the classification, that were getting the largest amounts of grants.

The system was criticised, however, becouse the evaluation system seemed to handle municipalities with similar financial base differently and that it was giving too much weight for the municipalities that organized the services inefficiently. As the grants-in-aid system was based almost completely on matching grants, the municipality did not always have to look for the most inexpensive way to organize the services.

The complexity and variety of the compensation percentages in different services was also criticised. The system had so many compensation scales for different services, that simply the administrative problems became quite big. In addition, the problem was also that municipalities were stimulated to opt for policies resulting in higher compensation rates. This was not always optimal for the grantor's point of view. Yet another problem from the state's point of view was that as most of the grants were matching, it was difficult for the Ministry of Finance to define the state budget for the following year.

It is quite clear that the kind of grants-in-aid system that Finland had until the year 1993 and that leaned mostly on matching categorical grants, was a highly stimulative one. For some time the stimulation of the municipalities' services/expenditures was perhaps the meaning of the system. But in the 1980s the system seemed to have become an automatic expenditure system that no-one was controlling. Several attempts to reform the system were made in the 1980s, but the basic problems remained. Finally, in the beginning of the 1990s the planning of a fundamental reform could begin. That reform was implemented from the beginning of the year 1993. The reform will be briefly discussed in the following section.

2.2 The reform of the grants-in-aid system

One can say that in the beginning of the 1990s the building of the Nordic welfare state in Finland had come to an end. One can also say that due to recession, from the beginning of the 1990s of the state has been forced to actively seek for more effective ways to organize the public services, both in state and municipal level. In practice the reform of the grants-in-aid system to municipalities in 1993 meant that most of the grants that the municipalities received were no longer matching.

Since the beginning of 1993, the grants-in-aid have been based on the so called calculated expenditures in health, social welfare and education sectors that together form the majority of the services eligible for state grants-in-aid. The ”calculated expenditures” meant roughly that a unit cost for each municipal service is precalculated in the associated ministries and then payed to each municipality after being weighted by the classification of the municipalities and some special coefficients describing the municipalities financial strength. A new feature of the reformed grants-in-aid system is also that the system depends more on general grants than before, when they were only 1-2% of all grants-in-aid. The structure of different types of grants in the first year of the reform (1993) is described in the table below:

Table 3 The structure of grants in 1993[v].

GRANT	%
General grants	14,9
Grants for social welfare and health care	50,5
Grants for education and culture	28,9
Other operating cost eligible grants	3,3
Investment grants	2,4
Total	*100*

The meaning of the reform was to simplify the system and to give the municipalities an incentive to act cost-effectively. As the new grants are not matching and earmarked like before, the municipalities are expected to be more encouraged to seek for the most inexpensive methods to provide the services. Also, if some savings are made in some category, the municipality can now decide itself how to spend the saved ”extra” money. The table below summarizes the factors that are used to define the need for state assistance.

Table 4 The factors that are used to calculate grants

THE NEW GRANTS-IN-AID SYSTEM 1993-	
Grant	**The variables and factors used in the calculation of the grant**
Social welfare and health services	- classification of the municipalities (abandoned 1996) - the age-class distribution - the parameter describing sickness in the municipality - the area of the municipality - population density - unemployment level. - special coefficient for small municipalities in the coastal area.
Education and cultural services	- classification of the municipalities (abandoned 1996) - number of students - number of hours of lessons - population in the municipality - the percentage of Swedish speakers
General grants	- the classification of the municipalities (abandoned 1996) - the area of the municipality - population density - the percentage of Swedish speakers
Contribution to the tax base	- if the municipality’s tax base is lower than 85-95% of the mean level in all municipalities (the percentage used depends on the municipality’s population density)

Since the year 1996 the evaluation system was abandoned. The redistribution among the municipalities is now done by harmonizing the tax base among the municipalities by guaranteeing each municipality 90% of the average tax base. This has secured a stable economic base for the poorest municipalities.

3 The empirical examination of the two grants-in-aid periods[vi]

In this section the operating expenditures per capita are regressed on grants and some demographic and economic variables under two different grants in aid systems using panel data[vii], covering years 1986-1992 and 1994-1996. [viii] The first period contains 455 municipalities and the latter period consists of 435 municipalities. The main focus in this study is towards the grants-in-aid effects on expenditures. The results of the other variables below are only briefly commented.

The dependent variable is *operating expenditures per capita* (E) (in the latter period the variable is net operating costs). As was already mentioned, the municipalities take care of most of the education, health and social services, and these also form the largest part of the municipalities‘ budgets. The largest share of the operating expenditures are wages.

The grants-in-aid per capita (GIA) has been a very important component in the municipalities‘ finances for the period 1986-1992 and also for the period 1994-1996. The importance of the grants for the municipalities has been steadily growing over time (see appendix). After the reform took place, the economic recession has forced the central government to cut the amount of grants: from the year 1993 to 1996 the grants to municipal sector decreased by 18,4 percentage points (1993-95 Statistics Finland; 1996 Federation of Finnish Municipalities).[ix] While in the 1980s the central government monitored municipalities’ expenditures by changing laws concerning the responsibilities of municipalities and by restricting municipalities’ ability to tax, in the 1990s the central government has taken more direct measures such as cutting the grants-in-aid.

The tax base- variable (T) consists mainly of incomes of the population. The *long term loans per capita* - variable (L) has been included in the regressors to be able to see the effect of borrowing in the municipalities` expenditures.

In the grant system also some simple demographic variables were used to describe the municipalities` need for state assistance. The selection of these variables was mainly done without extensive research or testing of the actual significance in explaining the cost levels of the municipalities. It was nevertheless the common belief, that for example the *land area* (AR) of

the municipality would desribe the need for assistance, becouse it was expected that the larger the municipality the harder and more costly it is to provide services for the population. Another varible used was the *number of inhabitants* (N) in the municipality: the lower the number of municipality, the higher was the matching rate for grants. To this group belongs also the *population density* (PD), that was used in grants system with the expectation that the lower the figure the higher are the costs. Variable *urban* (URBAN) describes the level of urbanization of the municipality[x]. This variable is needed becouse the population density may give false picture: in a municipality with low population and/or large area most of the people may live in a small area.

By using the *share of socialist representatives in municipal council* - variable (S) tests the left's widely assumed political need to create more publicly provided services. As for the age structure, three different groups were taken into estimations as a percentage of the total population, mainly becouse *under six years* (I_6) old children need daycare services that can be costly to provide, *under 14 year* olds (I_{14}) is a group that need both the daycare and comprehensive school services. Most *over 75 year* olds (I_{75}) on the other hand need a lot of health and social services. The *unemployment* (U) level describes the need for financial support for families in the municipality.

Due to data availability, the period 1986-1992 was estimated using more variables than the latter period. The full model is then:

$$E_i = b_0 + b_1GIA + b_2N + b_3AR + b_4PD + b_5T + b_6L + b_7Urban + b_8I_6 + b_9I_{14} + b_{10}I_{75+} + b_{11}U + b_{12}S + u_i,$$

where u_i is the error term.

4 The results

4.1 Matching grants-in-aid system

This period covered the years 1986-1992. The Chow-test for poolability showed that the beta estimates of the explanatory variables were not stable over different years.[xi] This result casts serious doubt about the possibility of pooling the data. However while testing heteroscedas-

ticity[xii] and model specification[xiii] in the year by year estimations it was discovered that there is both heteroscedasticity and model specification problem. This can mean that Chow-test is not necessarily reliable test for pooling. For this reason, the following steps were carried out in the estimations:

1. **The model is estimated using both *within*- and error component two stage least squares (*EC2SLS*)-methods**
2. **Also the yearly estimations are carried out (see appendix)**
3. **The results from steps 1 and 2 are compared**

The final conclusions are made using steps 1-3

After *within* and *EC2SLS*-estimations[xiv] it was discovered that for some variables the estimation results differed considerably between these two methods. This could be the result of two things: firstly it could be that the error component model assumption of no correlation between the right hand side variables and the error term is not acceptable in this case. Secondly, it is possible that the model is not correctly specified. If the problem of correlation was true, the estimates of error component model would be biased and inconsistent.

At the same time, however, the estimates of *within*-estimation would be both unbiased and consistent, becouse within-method erases the fixed effects. If one sees considerable differences in the estimation results between these two methods using Hausman test, it is suggested in the econometric litterature[xv] that *within*-method should be used. In the Hausman test the H_0 means that the hypothesis $E(u_{it}|X_{it})=0$ is true and the opposite hypothesis means that it is not true. When these tests were carried out using this data the Hausman test rejected the zero hypothesis. This is why the final estimation method was chosen to be *within*-method (for the Hausman test results, see appendix table A5). The results of the estimations are shown in tables 2 and 3. In each table, there are results for three different models: model 1 consists of 14 explanatory variables, models 2 and 3 there are 13 and 12 explanatory variables so that in model 2 the squared population is removed and in model 3 the *under six year olds* share is removed. The squared population is removed becouse it is not significant and share of *under six years old* -variable is removed becouse it was necessary to see how the share of *under 14 years old*-variable would survive on its own.

In the following the estimation results are commented for each explanatory variable:

GIA (grants-in-aid) had significant estimate larger than one. The results show the stimulative effect that the grants have had in the period 1986-1992. This result confirms the earlier results of Oulasvirta (1996) and Moisio (1994) that were estimated with cross-section data. This result is also supported by studies that have found causal relationship from grants to expenditures.[xvi] It can then be that the grants-in-aid system, not the need, has stimulated the expenditures. The average effect has been 1.21-1.25 FIM for each 1 FIM of state grants.

The ***population*** (N) has a small positive effect on operating expenditures. The estimate for population squared (negative) suggests that there could exist nonlinear relationship with the expenditures. However, this variable correlates quite strongly with population density (0.74) so it is quite clear that this population-estimate reacts strongly to the removal of population density.

The population density (PD) is normally expected to have U-shaped relationship with expenditures, since the common belief is that the expenditures are higher both in low and high population density municipalities. In Finland, there is some research evidence that high population density and on the other hand high rate of rural population correlates positively with the expenditures for different services.[xvii] The PD squared did get significant positive values using within-method. Therefore it is suggested that the higher the population density the higher the expenditures. Furthermore, the population density rises the expenditures with increasing rate.

The tax base (T) and ***long term loans per capita*** (L) were control variables in the estimations. These variables got estimates that described the average tax rate and the expenditures of borrowing in the municipalities expenditures in the municipalities.

Urban - variable has a nonlinear U-shaped effect on expenditures in the panel models. This variable explains poorly the operating expenditures.

The share of under six years old population % (I_6) explained operating expenditures very well. It can then be concluded that the large share of children means higher operating expenditures.

The share of under fourteen years old population % (I_{14}) got a negative estimate which was somewhat surprising. It must be concluded at least that this age group does not have an increasing effect on municipalities´expenditures.

The share of over seventyfive years old population % (I_{75}) increases operating expenditures. The variable is clearly strongest of the three age group variables.

The unemployment rate (U) does have positive effect on operating expenditures. Unemployment therefore increases the need for services.

The share of socialist representatives in the council % (S) seemed not to have significant effect on expenditures. However, according to the coefficients it can be speculated that the large number of socialists actually decrease the municipalities´operating expenditures.

Table 5 ***Fixed effects Within-estimation: dependent variable operating expenditures***

	Malli 1		**Malli 2**		**Malli 3**	
	Coef.	**White's heteroscedastic t-value**	**Coef.**	**White's heteroscedastic t-value**	**Coef.**	**White's heteroscedastic t-value**
GIA	1.25	32.31	1.24	32.53	1.21	33.85
N	0.17	1.34	0.10	1.92	0.10	1.90
N^2	0.00	-0.61				
PD	7.70	0.38	18.42	2.06	18.51	2.06
PD^2	0.01	1.31	0.01	2.17	0.01	2.14
T	0.16	17.55	0.16	17.90	0.16	18.68
L	0.15	6.74	0.15	6.77	0.15	7.15
Urban	-14.58	-1.68	-15.05	-1.75	-12.82	-1.50
$Urban^2$	0.03	0.31	0.04	0.39	0.01	0.16
I_6	156.60	2.47	157.64	2.49		
I_{14}	-238.12	-5.83	-238.32	-5.84	-159.09	-6.43
I_{75+}	214.45	3.20	212.19	3.19	201.33	3.06
U	68.02	9.80	68.42	9.93	70.02	10.37
S	-4.16	-0.40	-4.19	-0.41	-3.32	-0.33
constant	-566.88	-0.85	-396.30	-0.64	-466.84	-0.75
R^2	0.95		0.95		0.95	

Finally, when estimating the model year by year it was discovered that the economic variables (grants-in-aid, tax base and long term loans) explained expenditures quite well: the estimates were reasonably stable over the years and were quite close to the panel estimates. However, some of the demografic variables got estimates that were either unstable or not significant over the years.

4.2 The new grants-in-aid system

The period in this model covers the years 1994-1996. The data consists of 435 municipalities and the dependent variable is net operating expenditures, which means that the expenditures are net of user fees.

Again the Chow-test rejected the time stability of the beta estimates of the explanatory variables. The yearly estimates can be seen in the appendix. The Hausman test showed also here that the correct estimation method was fixed effects model. The repeated testing of poolability with different models, years and variables resulted one model that passed the poolability tests. This model was estimated using two stage least squares with lagged grants as instrumental variable and can be seen in the table below.

Table 6 ***Fixed effects Within-estimation (with 2SLS): dependent variable net operating expenditures***

	Coefficient	**t-value**
GIA	.9382585	7.098
AR	-7.056596	-2.918
L	.8653654	13.069
U	686.1535	8.141
cons	-2562.318	-1.124
F	164.38 (4,866)	
R2	0.4316	

By comparing the yearly regressions with the pooled regression one can see that the GIA estimate is smaller in pooled model than the average yearly estimate. Also, the GIA-estimate is clearly smaller than with the dataset 1986-1992. This result would support the hypothesis that the change from matching to more general types of grants has resulted in less responsive expenditure behavior of the municipalities.

5 Conclusion

On the whole the models estimated did quite well in explaining the total and operating expenditures. The stimulative effect of matching grants in the period 1986-92 was verified. One explanation to this is that the municipalities have been plainly maximizing the amount of state aid.

Most of the demographic variables used to estimate the expenditures passed the tests well. Also, most of the variables got estimates of expected sign. The results show that the greater the population density and urbanisation, the higher the expenditures. This result is contrary to the criterion used in the grants-in-aid system, where low population density mean more grants. The high share of children and old people and unemployment seem to increase operating expenditures. The higher the rate of socialists, the lower are the operating expenditures, this result is not significant though. The unstability of the estimates of some of the demographic variables in different years casts doubt on some of the results, however.

The estimations with the new data set showed that the effect of the grants to operating expenditures is considerably lower than in the previous grant system. This supports the hypotheses that the change from matching grants system to general grants system and the cuts on grants constrain municipalities' propensity to consume aided services. The effect of cutbacks could not be separated from the change of grant system with these estimations, however. A further study using differences of the variables could perhaps give more light to this issue.

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Statistics Finland Municipalities` economy 1964-1994

Notes

[i] The regional administration units consist of 5 provinces, 20 counties and 452 municipalities.
[ii] Selvitysmiehen raportti kuntataloudesta 1993, 10; Central Statistical Bureau 1996.
[iii] Statistics Finland, Kuntien talous 1964-1991 and The Association of Finnish Local Authorities 1996 (1995 and 1996 figures).
[iv] The evaluation took place by looking at the municipalities‘ net expenditures and tax incomes per capita, the growth/decrease of population, local tax rate compared to the average tax rate in all municipalities and some special circumstances creating extraordinary burden to the municipality’s economy.
[v] Oulasvirta 1996, 163.
[vi] Due to space limitations the data summary is not presented in this paper. The summary will be available upon request.
[vii] Panel data offers certain advantages over traditional pure cross section or time series data. The most obvious advantage is that the number of observations is much larger in panel data. This is likely to produce more reliable parameter estimates and alleviate the problem of multicollinearity: when the explanatory variables vary in two dimensions they are less likely to be highly correlated. The use of panel data may also eliminate or reduce estimation bias. See for instance Mátyas and Sevestre 1992, and the references given there.
[viii] Statistics Finland 1985-1996.
[ix] At the year 1990 price level.
[x] Criterion by Statistics Finland
[xi] The testing was done using the full model (see below) and the results showed that the F-test values were greater than the 5% significance values so the hypothesis of $\beta_i = \beta$ could be rejected.
[xii] Cook-Weisberg-test. See for example STATA-manual p. 377 and the litterature mentioned there..
[xiii] Ramsey RESET-test.
[xiv] The 2SLS-method was used, becouse GIA-variable is an endogenous variable. Lagged grants-in-aid were used as instrument
[xv] See for example Hsiao (1986) and Baltagi (1995), xv, who suggest test developed by Hausman (1978) to define if there are significant differences between the error component and within-methods that could be a sign of the problems in question.
[xvi] See for example Moisio & Kangasharju (1997) and Dahlberg & Johansson (1996).
[xvii] See Pyy (1996), p. 29.

A1 Yearly 2SLS-regressions for full model for the old grant system[xvii]

	1986		1987		1988		1989		1990		1991		1992	
	Coef.	t-value	Coef.	t-value	Coef.	t-value	Coef.	t-value	Coef.	t-value	Coef.	t-value	Coef.	t-value
GIA	1.157	17.897	1.223	17.021	1.186	18.528	1.095	17.689	1.197	19.606	1.173	12.690	1.322	20.290
N	0.019	1.384	0.021	1.386	0.014	0.911	0.018	1.278	0.021	1.179	0.026	1.380	0.002	0.094
N^2	0.000	-0.036	0.000	-0.010	0.000	0.246	0.000	0.124	0.000	0.457	0.000	-0.011	0.000	1.187
AR	0.037	0.333	-0.006	-0.052	0.094	0.665	0.134	0.829	-0.038	-0.536	-0.012	-0.146	0.033	0.440
PD	3.782	1.483	3.855	1.368	3.417	1.164	3.950	1.390	6.301	1.791	4.936	1.377	7.148	2.030
AT^2	-0.002	-0.906	-0.002	-0.940	-0.003	-0.952	-0.003	-1.039	-0.005	-1.365	-0.003	-0.840	-0.006	-1.700
T	0.149	6.484	0.182	7.184	0.175	7.095	0.179	7.526	0.202	8.314	0.201	5.167	0.260	10.057
L	0.288	5.178	0.211	4.060	0.219	4.289	0.218	4.939	0.247	5.208	0.272	5.603	0.245	6.778
Urban	35.538	2.717	29.183	2.530	20.511	1.577	39.714	2.650	12.685	0.777	-9.801	-0.441	9.687	0.503
$Urban^2$	-0.009	-0.067	0.075	0.552	0.257	1.719	0.121	0.763	0.238	1.365	0.412	1.968	0.227	1.160
I_6	7.779	0.074	-91.381	-0.852	11.554	0.094	2.403	0.019	18.469	0.130	32.942	0.191	-271.915	-1.727
I_{14}	-47.418	-0.752	16.116	0.255	-85.891	-1.268	-39.832	-0.561	-51.013	-0.629	-184.554	-1.671	-86.299	-0.890
I_{75+}	79.104	1.060	178.399	2.772	153.818	2.153	288.284	4.767	181.668	2.275	-26.639	-0.283	-29.628	-0.388
U	43.280	1.306	85.481	2.127	102.137	2.353	224.621	4.148	199.805	3.197	87.630	1.663	27.741	0.855
S	10.978	1.714	4.609	0.678	-4.530	-0.640	-0.960	-0.128	10.757	1.350	14.360	1.635	11.804	1.402
const.	-2116.190	-1.345	-4446.085	-2.663	-2838.725	-1.494	-5381.302	-2.746	-6125.198	-2.544	-834.614	-0.210	-3891.950	-1.439
R^2	0.7494		0.7563		0.7693		0.7929		0.7963		0.7524		0.7545	
RESET	F(3, 3166) =15.59 Prob > F =0.0000		F(3, 3166) =14.86 Prob > F = 0.0000		F(3, 3166) = 6.75 Prob > F = 0.0000		F(3, 3166) =14.21 Prob > F = 0.0000		F(3, 3166) =12.22 Prob > F = 0.0000		F(3, 3166) = 8.53 Prob > F = 0.0000		F(3, 3166) =10.12 Prob > F = 0.0000	

A2 Yearly 2SLS-regressions for full model for the new grant system

	1994		**1995**		**1996**	
	Coef.	t-values	Coef.	t-values	Coef.	t-values
GIA	1.779131	3.603	.9827088	14.567	1.022998	10.381
N	.0356934	1.660	.015598	1.773	.0115453	1.258
N2	8.33e-09	0.098	-2.88e-08	-0.949	-2.71e-08	-0.779
AR	-.1490165	-0.582	.103989	1.507	.0635339	1.035
PD	-2.2203	-0.679	-3.423316	-1.929	-.8615291	-0.519
PD2	-.0009839	-0.369	.0012458	1.176	.0003959	0.351
T	.3562331	3.013	.1581834	8.441	.1420741	6.757
L	.0422461	0.577	.0131429	0.391	.027791	0.885
URBAN	4.904643	0.091	19.38541	1.110	-9.759156	-0.757
URBAN2	.0629555	0.142	-.0671058	-0.453	.180314	1.505
U	72.21059	1.671	97.7859	6.023	53.36415	3.629
cons	-13454.34	-1.372	-2411.337	-1.483	-378.5446	-0.203
F	226.11 (11,423)		74.26 (11,423)		69.84 (11,423)	
R2	0.40		0.70		0.71	