Langørgen, Audun; Rønningen, Dag

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Audun Langørgen and Dag Rønningen

Local government preferences, individual needs, and the allocation of social assistance

Abstract:
Governments that pursue welfare and equalization goals frequently target cash transfers to individuals that suffer from limited economic opportunities and poverty. To achieve the desired allocation of welfare benefits, evaluation of individual needs is thus required. However, the political support for redistribution may vary across communities and governments, depending on ideology of the dominant political parties, political power of interest groups, and geographic, cultural and social diversity within the community. The purpose of this paper is to analyze the allocation of social assistance to individuals by local governments in Norway. Available data on individual characteristics as well as variables at the municipal level allow us to separate the impact of individual needs from the impact of different local government treatment. The results show that priorities across individuals are affected by characteristics that capture individual economic opportunities and needs, whereas theories that suggest different priorities between local governments find little support.

Keywords: Social assistance, Income distribution, Local public finance

JEL classification: D31, H72

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Address: Audun Langørgen, Statistics Norway, Research Department, P.O. Box 8131 Dep, N-0033 Oslo, Norway. Telephone: +4721094997. Fax: +4721090040. E-mail: audun.langorgen@ssb.no

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1. Introduction

The extensive use in many countries of cash transfers from governments to individuals is motivated by redistribution from the rich to the poor and/or social insurance to make lifetime careers safer. Welfare transfers are subject to different degrees of targeting, in the range from universalism to transfers that are means-tested for each individual. There is a vast literature analyzing universal redistributive subsidies and transfers that are targeted to a specified subset of the population.[1] The majority of these studies rely on the assumption that targeted transfers are equally distributed within the group of beneficiaries, whereas minor attention has been paid to the study of public transfers that are means-tested and targeted at the individual level. In the latter case the government has to determine total spending as well as allocation of transfers on individuals.

Researchers and public sector practitioners typically advocate divergent views on distributional policies. Economists argue that politicians may pursue policies that are socially inefficient by biasing policy in the favor of lobby groups or "responsive" voter groups, while pressure groups have strong incentives to extract public benefits for themselves and send the bill to taxpayers. Politicians and bureaucrats, on the other hand, may want to emphasize the credibility and legitimacy of public services and transfers. They argue that the allocation of public transfers should not be arbitrary or corrupt, but should be based on legal regulations and professional evaluation of the individual need for welfare benefits.

The purpose of this paper is to provide an analysis where these two perspectives are combined. To this end we utilize data for social assistance in Norway, where the responsibility for social assistance to citizens with low incomes is decentralized to the local government level. Although the provision of social assistance is regulated by the Social Services Act, local governments have considerable discretion to accept or reject applicants, and to determine the level and distribution of cash transfers. Thus, social assistance is an important instrument for income redistribution at the local government level in Norway.

Hypotheses about variation in political support for redistribution across municipalities are derived from three different theories. The ideology/partisan model emphasizes the impact of representatives' ideology and the party composition in local government councils. The pressure group/stakeholder model focuses on the competing claims of different age groups over a fixed local government budget,

[1] For an overview, see Persson and Tabellini (2000).

since - besides of social assistance - local governments in Norway also provide services like primary education and care for the elderly. The distance/diversity model states that a majority of citizens has preferences for redistribution to the poor, while the intensity of these preferences tends to decrease with geographical, social and cultural diversity within the local jurisdiction.

In addition to these political theories there are also other possible explanations for variation in local government spending on social assistance. Local governments in Norway face a budget constraint, where the available resources are used to provide different services and social assistance to the poor. Thus the total exogenous income is constraining the choice set of local governments. If social assistance is a normal good, then it follows that transfer payments increase in response to increased local government incomes. By contrast, higher unit costs in local government service production may reduce the supply of social assistance.

Different priorities of social assistance across municipalities may also arise from differences in the social and demographic composition of the population. These differences may give rise to different individual economic opportunities and need for social assistance. Moreover, the community opportunity hypothesis makes the observation that the local need for social assistance is not entirely captured by individual characteristics, since the opportunities for economic self-support also depend on the distribution of human capital and other characteristics of the local environment.

An advantage of the approach in the present paper is that the empirical model is derived directly from the theoretical model. Moreover, the analysis combines individual-specific data with data at the municipal level, and this makes it possible to disentangle the impact of recipient needs from the impact of local preferences for redistribution. While recipient needs are captured by individual-specific variables, the impact of variation in political support for redistribution is captured by municipal-specific variables.

Our rich set of information, which includes data for 2.5 million individuals and 435 municipalities in 1998, provides a suitable setting for testing different hypotheses about local government behavior. Analyses that exclusively utilize data on the municipal level may create confusion when estimates are either interpreted as the impact of local preferences on redistribution, or as the impact of national norms and regulations prescribing that welfare benefits should be allocated according to recipient need. A multi-level analysis makes it possible to discriminate between hypotheses that concern priorities across individuals as opposed to priorities across municipalities.

The paper is organized as follows. Section 2 elaborates a theory of local government decision-making with particular focus on the distribution of cash transfers for individuals. Theories that may explain municipality level variation in political support for redistribution are discussed in Section 3. The empirical model is specified in Section 4, and the estimation results are reported in Section 5. In Section 6 inequality in the personal income distribution in Norway is decomposed by expected and residual variation in social assistance and other sources of income. A brief summary and conclusion is given in Section 7.

2. A community preference model of targeted transfers

Means-testing signifies that welfare benefits are allocated on the basis of evaluation of need or the economic opportunities of citizens to provide for themselves. Thus, benefits are targeted to individuals (or families) and depend on individual characteristics. The common view in political economics is that narrowly defined groups have strong incentives to extract public benefits for themselves when the cost is diffused in society at large. However, the heterogeneity and lack of organization of the poor implies that they have low ability to accomplish coordinated political action. In the case of targeted transfers based on criteria that are individual-specific rather than group-specific, potential recipients also have conflicting interests, since they are competing over a limited pool of available public funds. Furthermore, since the distribution of benefits are determined by local governments by procedures of means-testing, the probability of receiving benefits is supposed to increase with decreasing means. Thus, we assume that local governments pay benefits to those who satisfy specified criteria.

In addition to social assistance, local governments in Norway also provide public services. These services are assumed to be targeted towards different socio-demographic groups, with equal distribution of benefits within each group. This assumption is adopted to simplify the modeling framework. Otherwise it would be required to specify the distribution of in-kind benefits on individuals. Moreover, this assumption works as a reasonable approximation for the education sector, since primary schools are obligatory for children in the age group 6-15 years. Education is one of the major services provided by municipalities in Norway. For other service sectors we do not know the exact distribution of services on individuals, but we are able to define recipient groups by socio-demographic characteristics.

The model is based on the "community preference" approach, which assumes that a local authority can be treated like a household that maximizes utility under a given budget constraint.[2] A further discussion of whose preferences are represented in local government decision-making is provided in Section 3. Local government preferences (U_j) are assumed to include the production of services and the allocation of cash benefits on individuals as arguments,[3] and are specified as a Stone-Geary utility function

$$U_j = (1-\beta)\log\left(\frac{x_j}{n_j} - \gamma_j\right) + \frac{1}{n_j}\sum_{i=1}^{n_j}\beta\left[\log\left(s_{ij} - \alpha_{ij}\right)\right], \tag{2.1}$$

where $\gamma_j \leq \frac{x_j}{n_j}$ and $\alpha_{ij} \leq s_{ij}\ \forall(i,j)$. Service output is given by x_j, and n_j is the number of residents in municipality j. Social assistance to individual i in municipality j is denoted by s_{ij}, and α_{ij} is the minimum requirement of social assistance, which is also called *subsistence expenditure*. The minimum required quantity of service output per capita is captured by γ_j. The parameter β is the marginal budget share of social assistance, which is assumed constant. For simplicity the model includes social assistance transfers and only one sector for service production. Preferences for high service output and high welfare transfers are defined on a per capita basis to make municipalities of different size comparable. The local government budget constraint on a per capita basis is defined by

$$\frac{y_j}{n_j} = \frac{p_j x_j}{n_j} + \frac{1}{n_j}\sum_{i=1}^{n_j} s_{ij}\ , \tag{2.2}$$

where local government incomes, y_j, are given as exogenous grants from the central government, and the price per unit of services in municipality j is p_j. It is assumed that $x_j > 0$ and $s_{ij} \geqslant 0$, which means that corner solutions are allowed for social assistance. Utility maximization subject to the budget constraint is formulated as a Kuhn-Tucker maximization problem

[2] For a discussion of the community preference model, see Wildasin (1986).
[3] This model is similar to the model used by Langørgen (2004), where the purpose is to analyze the distribution of in-kind benefits in local public home-care services. The present paper employs the model as a basis for analyzing the distribution of cash transfers, and includes an extensive analysis of the political support for redistribution.

(2.3) $$L = (1-\beta)\log\left(\frac{x_j}{n_j} - \gamma_j\right) + \frac{1}{n_j}\sum_{i=1}^{n_j}\beta\left[\log(s_{ij} - \alpha_{ij})\right] + \lambda\left(\frac{y_j}{n_j} - \frac{p_j x_j}{n_j} - \frac{1}{n_j}\sum_{i=1}^{n_j} s_{ij}\right),$$

where the first order conditions are given by

(2.4a) $$\frac{\partial L}{\partial\left(\frac{x_j}{n_j}\right)} = \frac{1-\beta}{\frac{x_j}{n_j} - \gamma_j} - \lambda p_j = 0,$$

(2.4b) $$\frac{\partial L}{\partial s_{ij}} = \frac{\beta}{s_{ij} - \alpha_{ij}} - \lambda \leqslant 0,$$

(2.4c) $$\frac{\partial L}{\partial \lambda} = \frac{y_j}{n_j} - \frac{p_j x_j}{n_j} - \frac{1}{n_j}\sum_{i=1}^{n_j} s_{ij} = 0.$$

From (2.4a)-(2.4c) we get the following supply function for social assistance[4]

(2.5) $$s_{ij} = \max\left[\alpha_{ij} + \beta\left(\frac{y_j}{n_j} - p_j\gamma_j - \frac{1}{n_j}\sum_{i=1}^{n_j}\alpha_{ij}\right), 0\right].$$

The model is a linear expenditure system (LES) with potential corner solutions. *Discretionary income* per capita is defined by exogenous income above the sum of subsistence expenditures, and is given by $y_j^* = \frac{y_j}{n_j} - p_j\gamma_j - \frac{1}{n_j}\sum_{i=1}^{n_j}\alpha_{ij}$. Individual i in municipality j may receive social assistance if the subsistence expenditure for this individual is positive, or if discretionary income is positive in the municipality. To account for heterogeneity, we introduce $\mathbf{z_{1i}}$ as a vector of individual-specific variables and $\mathbf{t_j}$ as a vector of municipality-specific variables. Furthermore, subsistence expenditures are assumed to vary as functions of these variables, as specified by the function $\alpha_{ij} = \mathbf{z_i\alpha_1} + \mathbf{t_j\theta}$, where $\boldsymbol{\alpha_1}$ and $\boldsymbol{\theta}$ are vectors of parameters. By inserting y_j^* and the specification of α_{ij} in equation (2.5) the supply of social assistance is given by

(2.6) $$s_{ij} = \max[\mathbf{z_{1i}\alpha_1} + \mathbf{t_j\theta} + \beta y_j^*, 0] = \max[\mathbf{z_{1i}\alpha_1} + \mathbf{z_{2j}\alpha_2}, 0].$$

[4] We assume that the allocation of social assistance is entirely determined from the supply-side. The model could be extended to account for the choices of individuals as to whether or not to apply for social assistance. However, since there is no available register of applicants, we do not include such a role for the demand-side.

The expected cash transfer to individual i in municipality j is increasing with individual need, per capita discretionary income and support for redistribution in the local community. Variables in the vector $\mathbf{z_{1i}}$ capture individual economic opportunities and need for social assistance, while variables in the vector $\mathbf{t_j}$ capture variation in the political support for redistribution within different municipalities, and are justified on the basis of alternative theories discussed in Section 3. Due to heterogeneity across municipalities in total per capita subsistence expenditures ($p_j\gamma_j + \frac{1}{n_j}\sum_i \alpha_{ij}$), discretionary income (y_j^*) is a function of both municipal income and municipality-specific variables that affect expenditure needs. Note that in (2.6) the variables on the municipal level are included in the vector $\mathbf{z_{2j}} = (\mathbf{t_j}, y_j^*)$, with a corresponding vector of parameters $\boldsymbol{\alpha_2} = (\boldsymbol{\theta}', \beta)'$.

3. Political support for social assistance

Social assistance in Norway is targeted to a small minority on the basis of means-testing. Low voter participation among the poor implies that their welfare is not expected to be heavily weighted by vote-share maximizing political parties. Moreover, the beneficiaries are not a well-organized group, which is able to form a lobby or to be agenda setter. Thus it seems that the obligation of local governments to provide social assistance has been introduced because the general electorate has preferences for redistribution to the poor. This may happen if voters are altruistic or if welfare policy is seen as a social insurance scheme, designed to make lifetime careers safer.

This section provides a brief discussion of three political theories that are based on different assumptions about how local government preferences are formed. Different hypotheses are derived with respect to which types of communities are expected to provide high or low political support for redistribution. Furthermore, a fourth category of hypotheses explains priorities across municipalities by higher need/support for social assistance in communities that provide bad economic opportunities, which means that the population in each municipality is considered as a peer group.

3.1 The ideology/partisanship model

Many empirical analyses of voting behavior have found significant ideology and partisan effects, see e.g. Kau and Rubin (2002).[5] Partisan effects may occur in representative democracy when politicians are directly motivated by the policy outcomes. In cases where commitment to a policy platform ahead of the elections is not binding, the candidates' ideological preferences influence the policy outcome, since a dominant party or coalition of parties is able to implement its preferred policy after the elections. Moreover, in legislative bargaining within a parliamentary system, parties with agenda setting power are able to tilt the policy outcome in the direction of their preferred alternative, see Romer and Rosenthal (1978) and Baron and Ferejohn (1989).

Elections for local government councils are held every fourth year in Norway. Voters are represented by political parties in proportion to shares of the votes in a multi-party system. In most cases policy conflict is organized along a traditional left-right dimension, where the division between socialists and non-socialists is important for coalition building to form a majority of representatives. Consequently we include the share of representatives from socialist parties as a variable that explains the political support for social assistance. Such welfare benefits are in line with the socialist program for redistribution from the rich to the poor. Thus, the local governments' priority of social assistance is expected to increase with the share of socialist representatives, assuming that the distribution of need and economic opportunities is properly controlled for at the individual level.

3.2 The pressure group/stakeholder model

A large share of local government services in Norway is targeted towards different age groups. While kindergartens and primary education provide benefits for families with children, municipal health care and care for the elderly is first and foremost given to the elderly. Thus, Borge and Rattsø (1995) assume that different age groups are rivals, since they have conflicting claims over the allocation of a fixed local government budget on different services. Different age groups are fighting for pieces of a given pie.

Becker (1983) argues that the political influence of pressure groups can be expanded by expenditures of time and money on campaign contributions, political advertising, and in other ways that exert political pressure. Craig and Inman (1986) assume that the desired allocation of local public

[5] Partisan effects are also found in studies of local government behavior in Norway, see Borge (1995) and Aaberge and Langørgen (2003).

expenditures is a weighted average of each interest group's preferred outcome. The preferences of different interest groups are weighted by their numerical strength. We may extend this model to account for the political priority of social assistance. A high share of elderly or children in the population is then expected to reduce the political support for social assistance. The reason for this is that the elderly and families with children have a higher stake in services targeted to the old and the young than in social assistance where the recipient group is rather small and heterogeneous.

An alternative interpretation of the competing claims of different recipient groups is that a high share of elderly or children simply increases the subsistence expenditures required to provide a minimum standard of public services. Aaberge and Langørgen (2003) estimate local government subsistence expenditures within a linear expenditure system that includes 8 service sectors. Thus, to control for the impact of minimum service standards, we adjust the exogenous income of local governments for estimated subsistence expenditures.[6] Any additional impacts of the population shares of children or elderly are consequently interpreted within the pressure group/stakeholder model.

3.3 The distance/diversity model

In the fiscal federalism literature redistribution is typically viewed as a task of the central government. However, in most federal countries local governments do have some discretion in redistribution policy. The main theoretical argument for this is that redistribution may be a local public good (Pauly, 1973). This is true when voters have other-regarding motivations that reflect altruism or fairness considerations, and when there is a spatial dimension in the motivation for redistribution. Localness means that the rich care more about the poor when they live nearby. An alternative interpretation is that the majority is willing to support the poor in order to reduce crime and other negative externalities from poverty. Furthermore, it is likely that such externalities tend to decrease with the distance to the problem. Thus the support for local government redistribution decreases with spatial distances between residents within local jurisdictions. This line of argument has been extended by Ashworth et al. (2002) to include social, cultural and political distances between local residents. They find that increasing local distances imply less redistribution by local governments.

In the Norwegian setting several measures of geographical, social and cultural distances are available. Geographical distances are captured by average traveling time to the municipal center. Social and

[6] Subsistence expenditures vary as a function of variables that account for aggregate needs and unit costs in different service sectors.

cultural distance is proxied by the spread in the education level and the share of immigrants with a remote cultural background (from non-industrialized countries). Moreover, we include the gross migration per capita since a high population turnover is expected to reduce social cohesion and support for local redistribution. We also include population size to test the hypothesis that there is more support for social assistance in smaller municipalities, since a larger share of the residents is unknown to each other in larger communities.

3.4 Community opportunity

The Social Services Act in Norway obliges local governments to support individuals and families that lack the necessary means for a decent living. Thus, the probability of receiving social assistance depends on individual characteristics that constrain the economic opportunities of each individual. However, the economic opportunities of individuals are also likely to be affected by characteristics of the local environment. Consequently one may treat the population in each municipality as a peer group. High quality of the peer group increases the economic opportunities and decreases the probability of receiving social assistance for each individual. In a municipality with a low quality of the peer group the risk of becoming a social assistance client is relatively high, which may yield higher need for social assistance.

The quality of the peer group is measured by the share of the adult population with a low education level, the share of the adult population receiving disablement benefits from the central government, the local rate of unemployment, the number of alcohol related hospitalizations per capita, the population growth 1993-1998, and the share of the adult population in the age group 67 years and above. Higher population growth is assumed to imply better economic opportunities, while higher levels of the other variables means that economic opportunities are worse. Note that the community opportunity hypothesis implies that a high share of elderly reduces economic opportunities and increases social assistance, whereas the pressure group/stakeholder model assumes that a high share of elderly increases the political support for services that are targeted towards the elderly. The support for social assistance is consequently reduced, since most clients belong to younger age groups.

4. Empirical model

4.1. A stochastic model for the supply of social assistance

In Section 2 the municipal supply function of social assistance was derived from maximization of the utility function of the municipality, given a fixed budget constraint. Thus, the municipalities have preferences for transfers of social assistance to their residents. In this sense, giving social assistance to some individuals generates utility for the municipality. In addition to the observable characteristics the model for supply of social assistance is extended to include unobservable characteristics, ε_{ij}. These unobservable characteristics are supposed to be stochastic. Thus the empirical specification of the supply function for social assistance to individual i living in municipality j is given by the following Tobit model

$$(4.1) \quad S_{ij} = \max\left(\mathbf{z_{1i}}\boldsymbol{\alpha_1} + \mathbf{z_{2j}}\boldsymbol{\alpha_2} + \varepsilon_{ij},\ 0\right), \qquad \varepsilon_{ij} \mid \mathbf{z_{1i}}, \mathbf{z_{2j}} \sim \text{NIID}\left(0, \sigma^2\right) \qquad \begin{matrix} i = 1,\ldots\ldots\ldots, n_j \\ j = 1,\ldots\ldots\ldots, m \end{matrix}$$

where $\mathbf{z_{1i}}$ and $\mathbf{z_{2j}}$ denote individual-specific and municipality-specific variables, respectively. The error term ε_{ij} is assumed to be independent of $\mathbf{z_{1i}}$ and $\mathbf{z_{2j}}$ and to be normally distributed. As can be seen from (2.6) and (4.1) the empirical model is closely connected to the theoretical model in Section 2. The parameters of the model are estimated on the basis of maximum likelihood, see the Appendix.

To simplify notation we define the vectors $\mathbf{z_{ij}} = (\mathbf{z_{1i}}, \mathbf{z_{2j}})$ and $\boldsymbol{\alpha} = (\boldsymbol{\alpha_1}', \boldsymbol{\alpha_2}')'$, which include all the variables in the model and the corresponding parameters. Quantities of particular importance are the conditional expected amount of social assistance, $\mathrm{E}\left(S_{ij} \mid \mathbf{z_{ij}}\right)$, and the conditional probability of receiving social assistance, $\mathrm{P}\left(S_{ij} > 0 \mid \mathbf{z_{ij}}\right)$. From equation (4.1) it follows that

$$(4.2) \quad \mathrm{E}\left(S_{ij} \mid \mathbf{z_{ij}}\right) = \boldsymbol{\Phi}\left(\mathbf{z_{ij}}\boldsymbol{\alpha}/\sigma\right)\mathbf{z_{ij}}\boldsymbol{\alpha} + \sigma\,\boldsymbol{\varphi}\left(\mathbf{z_{ij}}\boldsymbol{\alpha}/\sigma\right),$$

where $\boldsymbol{\varphi}(\cdot)$ is the standard normal density and $\boldsymbol{\Phi}(\cdot)$ is the standard normal cumulative distribution function. Furthermore, it follows that the conditional probability of receiving social assistance is given by

$$(4.3) \quad \mathrm{P}\left(S_{ij} > 0 \mid \mathbf{z_{ij}}\right) = \mathrm{P}\left(\varepsilon_{ij} > -\mathbf{z_{ij}}\boldsymbol{\alpha} \mid \mathbf{z_{ij}}\right) = \mathrm{P}\left(\varepsilon_{ij}/\sigma > -\mathbf{z_{ij}}\boldsymbol{\alpha}/\sigma \mid \mathbf{z_{ij}}\right) = \boldsymbol{\Phi}\left(\mathbf{z_{ij}}\boldsymbol{\alpha}/\sigma\right).$$

4.2 Heterogeneous individuals and municipalities

In order to estimate the model in (4.1), we have to specify the variables ($\mathbf{z_{1i}}$) that account for the individual need for social assistance, and the variables ($\mathbf{z_{2j}}$) that account for economic constraints and priorities on the municipal level. The need for social assistance depends on the frequency of bad economic opportunities that varies across subgroups in the population. Thus it is relevant to focus on characteristics that may discriminate between individuals according to economic opportunities. Such characteristics are age, gender, education level, country background, family status, disablement status, unemployment status and maintenance payment status. Empirical evidence suggests that the following statuses increase the expected social assistance transfer: young, male, single or single parent, poorly educated, immigrant with background from non-industrialized country, disabled, long-term unemployed, and separated/divorced parent that pays for child maintenance. Basic statistics for the individual-specific variables are shown in Table 4.1. The table shows the proportion with different characteristics in the population and among recipients of social assistance, and the proportion of each subgroup that receives social assistance, and the average amount of received social assistance for the different groups.

Disability pension and basic and supplementary benefits are parts of the National Insurance Scheme in Norway. Persons that have lost the ability to work because of illness or disablement get a disability pension. The basic benefit compensates for extraordinary expenses because of illness or disablement. When the diagnosis implies a need for more help and care at home one may also receive supplementary benefit. Persons that are not counted as disabled may receive basic and supplementary benefits.

When parents are separated or divorced, one of the parents are usually given the main responsibility for the children and the children live with this parent. However, the other parent (normally the father) has the legal duty to provide economic support for the children (and their mother). Thus, one of the parents is paying maintenance support to the other (divorced) family members. Such expenditures may affect the payer's standard of living and may yield a higher need for social assistance.

Table 4.1. Distribution of individual characteristics and social assistance, 1998

Variable	Group/State	Frequency distribution in percent of pop.	Frequency distribution of recipients	Percent of subpopulation that are recipients	Average received social assistance (NOK)
Gender	Female	49.4	46.2	3.7	800
	Male	50.6	53.8	4.2	1 240
Country background	Norwegian	92.6	84.2	3.6	860
	Western countries	5.3	7.3	5.4	1 640
	Non-Western countries	2.1	8.5	16.2	6 980
Education level	Lower education	17.0	27.6	6.4	1 770
	Medium education	56.5	65.5	4.6	1 580
	Higher education	26.5	6.9	1.0	250
Family status	Single	24.1	52.2	8.5	2 470
	Married without children	15.0	2.6	0.7	180
	Married with children	44.8	15.6	1.4	350
	Mother with children	7.6	20.2	10.5	2 140
	Father with children	1.7	2.6	6.0	1 410
	Cohab., at least one common child	6.8	6.9	4.0	810
Age group	Below 30 years	22.8	37.5	6.5	1 500
	30-45 years	36.9	40.6	4.3	1 270
	45-66 years	40.4	21.9	2.1	530
Basic and supplem. benefit	Basic and supplem. benefit	3.0	5.9	7.6	1 210
	No basic and supplem. benefit	97.0	94.1	3.8	1 020
Child maintenance	Pay maintenance	4.9	16.0	12.9	2 350
	Do not pay maintenance	95.1	84.0	3.5	960
Disability	Disabled	9.4	15.7	6.6	850
	Not disabled	90.6	84.3	3.7	1 040
Long-term unemployed	Long-term unemployed	5.3	27.1	20.2	5 720
	Not long-term unemployed	94.7	72.9	3.0	760

Variables that capture local political support for redistribution were discussed in Section 3 above. Moreover, the subsistence expenditure for social assistance is also expected to increase with the local price level of housing, since local governments are supposed to compensate recipients for higher costs in the local housing market.

The theoretical model in Section 2 suggests that the supply of social assistance depends on per capita discretionary incomes as defined within the linear expenditure system. Discretionary incomes are defined by exogenous incomes above a subsistence expenditure level, which means that exogenous incomes are adjusted for estimated costs to provide a standard package of public services.

In order to identify discretionary incomes it is necessary to estimate a simultaneous model that accounts for local public service production as well as social assistance. Aaberge and Langørgen (2003) have estimated discretionary incomes on the basis of a linear expenditure system that includes eight different service sectors.[7] The analysis takes into account heterogeneity in sector-specific subsistence expenditures, which are assumed to vary with a number of socio-demographic and geographic variables. Since the analysis by Aaberge and Langørgen (2003) is exclusively based on data that are municipality-specific, their analysis does not account for the allocation of social assistance on individuals. However, we utilize this previous study to derive estimates of discretionary incomes for Norwegian municipalities in 1998. An advantage of this approach is that the partial model for social assistance that is estimated below is consistent with a more general, structural and simultaneous model for local government behavior.

Table 4.2. Summary statistics for variables on the municipal level, 1998

Variable	N*	Mean	Std Dev	Minimum	Maximum
Discretionary income per capita (1000 NOK)	434	9.84	8.31	0.00	80.71
Average municipal housing price per square meter (1000 NOK)	434	5.07	1.47	3.33	13.77
Percent socialists in the local government council	434	37.37	14.10	0.00	82.80
Population share 0-15 years	434	0.21	0.02	0.15	0.30
Population share 67 years and above	434	0.16	0.04	0.07	0.28
Average traveling time to the municipal center (minutes)	434	13.76	10.91	0.52	108.98
Spread in the education level (standard deviation in years of schooling)	434	2.22	0.21	1.81	3.23
Population share of non-western immigrants	434	0.00	0.01	0.00	0.05
Gross migration per capita	434	0.09	0.03	0.05	0.18
Population share with low education	434	0.08	0.02	0.03	0.17
Population growth 1996-1998	434	-0.27	4.70	-14.67	17.28
Unemployment rate (percent)	434	1.06	0.56	0.24	4.39
Population share that is disabled	434	0.06	0.02	0.02	0.11
Alcohol related hospitalizations per inhabitant	429	0.0012	0.0007	0.0001	0.0043
Inverse population size (in 1000 inhabitants)	434	0.34	0.34	0.00	2.92
The logarithm of the population	434	8.47	1.07	5.84	13.12

* All municipalities in Norway are included, except the smallest municipality (Utsira).

Summary statistics for all the municipality level variables used in the analysis are presented in Table 4.2. As can be seen from the table these variables indicate that there is substantial observable heterogeneity across municipalities. Thus, these variables are potential sources of differing priorities of social assistance across communities.

[7] The major part of local government incomes in Norway is general grants-in-aid from the central government and local income and property taxes. The tax rates as well as the tax bases are determined by the central government. For this reason both grants and tax incomes are treated as exogenous in the model.

5. Empirical results

The analysis is based on Norwegian data for individuals aged 16-66 years (children are supported by their parents and the elderly are supported by the national pension system). The data set is a cross-section of individuals and municipalities in 1998. Three alternative Tobit models are estimated:[8]

1. Model 1 uses only the individual characteristics as explanatory variables. The individual characteristics explain variation in the individual need for social assistance.
2. In Model 2 the same individual characteristics are included, and explanatory variables on the municipal level are also included.
3. Model 3 is a model with individual characteristics as explanatory variables and a dummy variable for each municipality except for Oslo, which is the reference municipality in this regression.

The estimated coefficients for the individual characteristics are displayed in Table 5.1 for the three models, whereas the estimated coefficients for the municipal characteristics in Model 2 are presented in Table 5.3.

5.1 Priorities across individuals

The estimation results for the individual characteristics in Table 5.1 demonstrate that the three different Tobit models yield coefficients that are quite stable in sign and magnitude. The sign of the coefficients shows the direction of the effect on social assistance. Each of the coefficients are statistically significant at the 5 percent significance level. The table shows that males have higher probability of receiving social assistance and that they receive more assistance than females. Furthermore, non-western immigrants receive more social assistance than Norwegians and immigrants with a western country background. People with low education receive more social assistance than those with higher education. We have divided the population into six different family categories. The three statuses that receive relatively high amounts of social assistance are singles, lone mothers with children, and lone fathers with children. Married couples tend to receive small amounts of social assistance. It is found that persons below 30 years of age receive more social assistance than those above 30 years of age. Moreover, people with basic and supplementary benefits, those paying child maintenance benefits, the disabled and the long-term unemployed receive more social assistance than people not having such characteristics.

[8] The results for the probability of receiving social assistance using a logit model with the same explanatory variables are shown in the Appendix.

Table 5.1. Tobit regressions. Coefficients for the individual characteristics

Dependent variable: Received social assistance (in 1000 NOK)

Variable	Group/State	Model 1	Model 2	Model 3
Constant		-151.48	-139.01	-147.41
Gender	Female	0.00	0.00	0.00
	Male	8.50	8.60	8.60
Country background	Norwegian	0.00	0.00	0.00
	Western countries	13.72	13.27	13.02
	Non-Western countries	49.02	47.77	47.47
Education level	Lower education	17.53	17.52	17.49
	Medium education	0.00	0.00	0.00
	Higher education	-33.81	-34.27	-34.28
Family status	Single	57.49	56.92	56.92
	Married without children	0.00	0.00	0.00
	Married with children	11.70	12.21	12.33
	Mother with children	53.03	52.88	52.98
	Father with children	42.04	42.10	42.17
	Cohabitation with at least one common child	30.59	30.70	30.99
Age group	Below 30 years	7.56	7.60	7.60
	30-45 years	0.00	0.00	0.00
	45-66 years	-19.60	-19.54	-19.48
Basic and supplementary benefit	Have basic and supplementary benefit	2.95	2.92	3.03
	Have no basic and supplementary benefit	0.00	0.00	0.00
Child maintenance	Pay maintenance	25.38	25.32	25.15
	Do not pay maintenance	0.00	0.00	0.00
Disability	Disabled	17.60	17.44	17.32
	Not disabled	0.00	0.00	0.00
Long-term unemployed	Long-term unemployed	49.72	49.29	49.30
	Not long-term unemployed	0.00	0.00	0.00
Scale (σ)		59.04	58.93	58.63
Log Likelihood		-757135	-755920	-754822
Pseudo R^2		0.07	0.07	0.07
Number of individuals		2529612	2526737	2529507
Number of municipalities		435	429*	434

* Data for alcohol-related hospitalizations are missing in 6 municipalities.

Table 5.2. Average expected social assistance and probability of receiving social assistance by population subgroups

Dependent variable: Received social assistance (in 1000 NOK)		Model 2	
		1000 NOK	Percent
Variable	Group/State	E(S|**z**)	P(S>0|**z**)*100
Constant		1.11	3.8
Gender	Female	1.00	3.5
	Male	1.21	4.1
Country background	Norwegian	0.95	3.4
	Western countries	1.64	5.4
	Non-Western countries	6.63	17.3
Education level	Lower education	1.87	6.1
	Medium education	1.28	4.4
	Higher education	0.24	1.0
Family status	Single	2.54	8.3
	Married without children	0.15	0.7
	Married with children	0.33	1.4
	Mother with children	3.05	9.6
	Father with children	1.66	5.8
	Cohabitation with at least one common child	0.98	3.7
Age group	Below 30 years	1.87	6.1
	30-45 years	1.25	4.2
	45-66 years	0.54	2.1
Basic and supplementary benefit	Have basic and supplementary benefit	2.29	7.2
	Have no basic and supplementary benefit	1.07	3.7
Child maintenance	Pay maintenance	3.79	11.5
	Do not pay maintenance	0.97	3.4
Disability	Disabled	1.76	5.9
	Not disabled	1.04	3.6
Long-term unemployed	Long-term unemployed	6.93	18.8
	Not long-term unemployed	0.78	3.0
Scale (σ)		58.93	
Log Likelihood		-755920.49	
Pseudo R^2		0.07	
Number of individuals		2526737	
Number of communities		429	

Table 5.2 displays the expected social assistance and estimated probabilities for the respective population subgroups calculated from the estimated coefficients of Model 2. Comparing Tables 4.1 and 5.2 it is found that the estimated probabilities predict the observed frequencies of recipients fairly well for different subpopulations. Moreover, the model predictions for expected social assistance are fairly close to the reported average levels for different population subgroups in Table 4.1. One exception is disability status where those not disabled on average receive more social assistance than the disabled, while our model predicts higher expected social assistance for the disabled.

Table 5.2 shows that the estimated probabilities and expected payments are particularly high for non-western immigrants and long-term unemployed. About one out of five persons with these characteristics receive social assistance. Their expected social assistance is about six times the average expected social assistance. People paying maintenance, lone mothers with children and singles are other groups with a high probability of receiving social assistance. About one out of ten in these groups receive social assistance. They also receive a larger amount of social assistance than the average level. Married persons have a low probability of receiving social assistance. They also have an expected level of social assistance fairly below the average level. People above 45 years of age and those not long-term employed have substantially lower probabilities of receiving social assistance than the population average.

5.3. Priorities across municipalities

Effects of variables on the municipality level are displayed in Table 5.3. The results are based on Model 2. As can be seen from the log likelihood and the pseudo R^2 for the different models in Table 5.1, the community variables have low explanatory power. Moreover, some of the coefficients are not statistically significant. The statistically insignificant coefficients include the coefficients for the housing price level in the community, traveling distance to the municipal center, spread in the education level and the population share above 66 years of age. The other coefficients are significantly different from zero at the 5 percent significance level. However, it is relevant to focus mainly on economic significance, measured by the elasticity of a one percent change in one of the municipal variables, when everything else is constant. The formula used to calculate the elasticity is given in the Appendix.

At the core of the analysis is the question of whether or not the different political theories are supported by the estimation results. According to the ideology/partisanship model we would expect that the community should give more social assistance the higher the share of socialist representatives in the local government council. The results of Table 5.3 yield little support for this hypothesis, since the elasticity is rather low, indicating no economic significant effect of this variable.

The pressure group/stakeholder model implies a negative relationship between the share of children/elderly in the population and social assistance. Table 5.3 shows that the coefficient for the share of elderly has a positive sign, but with low statistical and economic significance. When it comes to the share of children in the population, the coefficient is negative as assumed from the hypothesis.

The elasticity also indicates that this effect is of some magnitude. A one percent increase in the share of children between 0 and 15 years of age gives on average a reduction of 0.64 percent in expected social assistance. Thus, the pressure group model is supported for families with children.

Table 5.3. Tobit estimates and elasticities for the municipality level variables

Dependent variable: Received social assistance (in 1000 NOK)	Model 2		
Variable	Coefficient	Standard error	Elasticity
Constant	-139.01	4.77	
Discretionary income per capita (1000 NOK)	-0.16	0.03	-0.05
Average municipal housing price per square meter (1000 NOK)	0.13	0.11	0.03
Ideology/partisanship			
Percent socialists in the local government council	0.03	0.01	0.04
Pressure groups/stakeholders			
Population share 0-15 years	-89.31	11.15	-0.64
Population share 67 years and above	7.86	7.96	0.04
Distance/diversity			
Average traveling time to the municipal center (minutes)	-0.02	0.02	-0.01
Spread in the educational level (standard deviation in years of schooling)	0.20	0.72	0.02
Population share of non-western immigrants	-44.95	17.58	-0.02
Gross migration per capita	-12.81	5.60	-0.04
Community opportunity			
Population share with low education	-61.16	9.00	-0.14
Population growth 1993-1998 per capita	0.20	0.05	0.02
Unemployment rate (percent)	4.37	0.32	0.17
Population share that is disabled	75.89	10.41	0.14
Alcohol related hospitalizations per inhabitant	139.75	193.49	0.01
Population share 67 years and above	7.86	7.96	0.04
Scale (σ)	58.93		
Log Likelihood	-755920		
Pseudo R^2	0.07		
Number of individuals	2526737		
Number of municipalities	429		

From the distance/diversity model the hypothesis is that geographical, social and cultural distances are negatively related to the priority of local redistribution. The average travel distance to the local municipal center is used to measure the impact of geographical distances. The coefficient for this

variable is negative but not statistically significant. The elasticity also shows low economic significance.

The social distance within a municipality is measured by the spread in education level and the gross rate of migration. A large spread in the education level implies that the distance between the inhabitants is large along the social dimension, while a higher gross migration per capita also implies higher social distances. The elasticities for these variables are quite low, so their economic significance is low.

Cultural distance is measured by the share of immigrants from non-western countries. The hypothesis is that a higher share of immigrants with a remote cultural background lowers the preferences for local redistribution through social assistance. The coefficient for this variable is negative, but it is not of any economic significance.

The community opportunity hypothesis states that the need for social assistance is higher in communities with bad economic opportunities, and is captured by the population share with low education, share of the population above 66 years of age, population share of disabled, population growth, unemployment rate and alcohol related hospitalizations. There is some support for this hypothesis as concerns the share of disabled and unemployed, although the elasticities are rather low for these variables.

Discretionary income per capita is included to estimate the income elasticity of social assistance. The coefficient for this variable is negative and the elasticity is low. This implies that discretionary income is not allocated to social assistance, and the support for local redistribution does not differ between "rich" and "poor" municipalities. Furthermore, the coefficient for the average housing price in the municipality is both statistically and economically insignificant. Thus, the results do not support the hypothesis that higher housing prices are compensated by higher social assistance payments.

5.4. Analysis of expected social assistance for a reference person

We define a reference person in the analysis by the following individual characteristics: Male, Norwegian country background, low education level, single, age below 30 years, receives no basic and supplementary benefit, pays no maintenance, is not disabled and is not long-term unemployed.
For a reference person the expected social assistance varies only as a function of municipality. The municipality level variation in expected social assistance is picked up by the municipality dummies in

Model 3. Thus, Model 3 is used to simulate the expected social assistance for the reference person in each municipality. The average amount of expected social assistance for the reference person is NOK 4400 with a standard deviation of NOK 1200. The minimum and maximum values are NOK 1000 and NOK 9000, respectively.[9]

Table 5.4. Ordinary least squares regressions for the reference person*

Dependent variable: Expected social assistance (in 1000 NOK) for the reference person				
	Model A		Model B	
Variable	Coefficient	t-value	Coefficient	t-value
Constant	1.32	0.59	2.74	1.43
Discretionary income per capita (1000 NOK)	-0.01	-1.11	-0.01	-1.11
Average municipal housing price per square meter (1000 NOK)	-0.07	-0.95	-0.02	-0.34
Ideology/partisanship				
Percent socialists in the local government council	0.01	1.12	0.01	1.13
Pressure groups/stakeholders				
Population share 0-15 years	-1.56	-0.34	-2.32	-0.52
Population share 67 years and above	4.79	1.38	4.14	1.29
Distance/diversity				
Average traveling time to the municipal center (minutes)	-0.01	-1.46	-0.01	-1.48
Spread in the educational level (standard deviation in years of schooling)	0.04	0.11	0.13	0.35
Population share of non-western immigrants	0.82	0.06	4.33	0.32
Gross migration per capita	6.48	1.96	4.94	1.68
Inverse population size (in 1000 inhabitants)	0.33	0.90		
The logarithm of the population	0.17	1.24		
Community opportunity				
Population share with low education	-8.06	-2.20	-8.10	-2.23
Population growth 1993-1998 per capita	0.01	0.50	0.01	0.63
Unemployment rate (percent)	0.44	3.33	0.47	3.60
Population share that is disabled	15.18	3.29	15.91	3.48
Alcohol related hospitalizations per inhabitant	65.41	0.75	73.76	0.86
R^2-adjusted	0.13		0.13	
Number of communities	429		429	

* The reference person: Male, 16-30 years of age, single, Norwegian, lower education, pays no maintenance, receives no basic and supplementary benefit, is not disabled and is not long-term unemployed.

To further examine if there are any differences in priorities between municipalities, explanatory variables on the municipal level are included in regression models of expected social assistance for the reference person. The results are displayed in Table 5.4. The variables inverse population size and the logarithm of the population are included in Model A, but not in Model B. The results from these regressions are much in line with the results from the Tobit regressions in Section 5.3. The various political theories of distribution find little support, while there is some support for the community

[9] For comparison, the distribution of incomes after taxes is reported in Table 5.5.

opportunity hypothesis. The coefficients for the unemployment rate and the share of disabled are statistically significant with the expected positive signs. Since residents in municipalities with high rates of unemployment or disablement may face bad economic opportunities, the reference person's need for social assistance is higher in such municipalities. Moreover, this result is found to be robust with respect to the choice of reference person.[10]

6. Decomposition of private incomes by income components

Social assistance is included as a component in the definition of *private incomes after taxes*, which is the conventional definition of income in analyses of income inequality in Norway. Based on the econometric analysis in this paper we are able to further decompose social assistance for each individual on expected social assistance $E(S_{ij} \mid \mathbf{z_{ij}})$ and a residual term $s_{ij} - E(S_{ij} \mid \mathbf{z_{ij}})$. Thus, incomes after taxes are decomposed on expected social assistance, residual social assistance, and other income sources. Other income sources include market incomes, cash transfers from the central government, and taxes (which are deducted). The decomposition on expected and residual social assistance is based on Model 3 with municipality fixed effects.

Table 5.5. Average incomes after taxes by deciles and income components, NOK 1998

Decile	Incomes after taxes	Expected social assistance	Residual social assistance	Other income sources
Decile 1	87 150	3 090	1 920	82 150
Decile 2	139 710	2 220	-100	137 590
Decile 3	166 460	1 480	-290	165 260
Decile 4	187 570	1 150	-390	186 810
Decile 5	206 870	930	-340	206 280
Decile 6	226 290	760	-280	225 820
Decile 7	247 540	630	-250	247 160
Decile 8	273 460	540	-210	273 130
Decile 9	311 560	470	-210	311 290
Decile 10	501 110	390	-210	500 930
All deciles	234 770	1 170	-40	233 640

In the empirical analysis above a large part of the variation in social assistance is left unexplained. The explanatory power of the Tobit model is not significantly higher in the model with municipality dummies. Since these fixed effects capture the impact of different priorities across municipalities, the unexplained variation is not due to unobserved heterogeneity at the municipal level. Thus, the unexplained variation could either be purely random, or result from unobserved heterogeneity in recipient needs, or result from a distribution that is unjust or corrupt. The official aim of social assistance is to alleviate poverty and contribute to lower income inequality. To achieve a legitimate

[10] The regression model has been tested on six different reference persons, where the reference persons have been chosen to represent different types of clients.

distribution it is thus required that social assistance should be concentrated in the lower deciles of incomes after taxes.

Table 5.5 shows that expected social assistance is decreasing with higher deciles of incomes after taxes. Moreover, the average residual social assistance is positive in the first decile, and is negative in all higher deciles. The residual component is distributed in a fashion that is strongly equalizing, and is thus likely to be related to unobserved heterogeneity in recipient needs. Yet, some caution is required in the interpretation of this result, since incomes after taxes are affected by individual choices, and clients may reduce their labor supply in response to granted social assistance. Individuals with a high productive potential may act strategically to receive social assistance by concealing their true economic opportunities, although they must be willing to reduce their productive effort and standard of living in order to be treated as clients. An aspect worth to mention is that there is a positive average amount of social assistance in all decile groups, meaning that also some people with high incomes receive social assistance.

7. Summary and conclusion

The purpose of this paper is to explain variation in local government redistribution policies while controlling for needs and economic opportunities in the local population. Discrete-continuous models for the allocation of social assistance on individuals are estimated, where the expected social assistance is assumed to vary as a function of individual and municipal characteristics. The individual characteristics account for variation in needs and economic opportunities, while the municipal characteristics account for variation in community opportunity and political support for redistribution. Different political theories are tested to account for partisan politics, interest group pressures and local support for redistribution. By including individual characteristics as well as variables on the municipal level we are able to separate the impact of individual needs from the impact of different priorities across municipalities. For instance, a high population share of ethnic minorities in a municipality may increase the need for welfare transfers *and* reduce the political support for redistribution. The estimation results show that the first effect is significant while the latter is not.

The political theories that explain different priorities across municipalities find little support in the empirical analysis. By contrast, the results show that social assistance payments received by individuals who have low education level, background from non-western countries, suffer from disablement or long-term unemployment, or belong to families with a single adult (with or without

children) are relatively high. Consequently the evaluation of needs seems to be a crucial factor behind the distribution of social assistance, which may imply that the scope for local government priorities is limited by legal regulations. This conclusion is supported by the fact that social assistance is relatively high among families with low private incomes after taxes. Moreover, the unexplained residual variation in social assistance is distributed to the benefit of the 10 percent of the population with the lowest incomes after taxes.

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Appendix

Maximum likelihood estimation

The log-likelihood function for the Tobit model is

$$\log L = \sum_{s_{ij}>0} -\frac{1}{2}\left[\log(2\pi) + \log\sigma^2 + \frac{(s_{ij}-\mathbf{z_{ij}\alpha})^2}{\sigma^2}\right] + \sum_{s_{ij}=0}\log\left[1-\Phi\left(\frac{\mathbf{z_{ij}\alpha}}{\sigma}\right)\right]$$

Olsen (1978) reparameterized this log-likelihood function by letting $\boldsymbol{\gamma} = \boldsymbol{\alpha}/\sigma$ and $\theta = 1/\sigma$.

The maximum likelihood estimators are obtained by maximizing log L with respect to $\boldsymbol{\gamma}$ and θ.

$$\log L = \sum_{s_{ij}>0} -\frac{1}{2}\left[\log(2\pi) - \log\theta^2 + (\theta s_{ij} - \mathbf{z_{ij}\gamma})^2\right] + \sum_{s_{ij}=0}\log\left[1-\Phi(\mathbf{z_{ij}\gamma})\right]$$

The parameters of the original model can then be recovered by using that $\sigma = 1/\theta$ and $\boldsymbol{\alpha} = \boldsymbol{\gamma}/\theta$.

Elasticities

It is of interest to examine the effects of marginal changes in the exogenous variables on the municipal level on the expected value of social assistance and the probability of receiving social assistance. Equation (4.2) shows the expression for the expected amount of social assistance conditional on the explanatory variables. The elasticity of $E(S|\mathbf{z})$ with respect to z_k is given by

$$\text{(A.3)} \quad \frac{\partial \log E(S|\mathbf{z})}{\partial \log z_k} = \Phi(\mathbf{z}\hat{\boldsymbol{\alpha}}/\hat{\sigma})\frac{\hat{\alpha}_k z_k}{\Phi(\mathbf{z}\hat{\boldsymbol{\alpha}}/\hat{\sigma})\mathbf{z}\hat{\boldsymbol{\alpha}} + \hat{\sigma}\,\phi(\mathbf{z}\hat{\boldsymbol{\alpha}}/\hat{\sigma})},$$

where z_k is the value of a continuous explanatory variable k that varies across municipalities, and $\hat{\alpha}_k$ is the corresponding estimated coefficient. To simplify the notation indices for individual i and municipality j have been omitted in equation (A.3). The expression $\Phi(\mathbf{z_{ij}}\hat{\boldsymbol{\alpha}}/\hat{\sigma})$ is the estimated probability of observing positive social assistance given the explanatory variables. The estimated probability is in the interval (0,1) and has a positive value. Moreover, the denominator in (A.3) is the conditional expected social assistance, which is positive. Thus, the sign of the elasticity of the explanatory variables on the expected amount of social assistance is the same as for the coefficient $\hat{\alpha}_k$.

Likewise from (4.3) the elasticity of $P(S>0\,|\,\mathbf{z})$ with respect to z_k is calculated

$$(A.4)\quad \frac{\partial \log P(S>0\,|\,\mathbf{z})}{\partial \log\ z_k} = \phi(\mathbf{z}\hat{\boldsymbol{\alpha}}/\hat{\sigma})\frac{\hat{\alpha}_k\ z_k}{\hat{\sigma}\,\Phi(\mathbf{z}\hat{\boldsymbol{\alpha}}/\hat{\sigma})}$$

The normal probability density $\phi(\mathbf{z}\hat{\boldsymbol{\alpha}}/\hat{\sigma})$ is positive, and the sign of the elasticity of the probability of receiving social assistance with respect to z_k is thus the same as the sign of the coefficient $\hat{\alpha}_k$.

Logit estimations

Table A1. Logit regressions. Coefficients for the individual characteristics

Dependent variable: Received social assistance, w=1 if $s_{ij}>0$, not receiving social assistance, w=0 if $s_{ij}=0$

Variable	Group/State	Model 1	Model 2	Model 3
Constant		-5.13	-4.85	-5.09
Gender	Female	0	0	0
	Male	0.27	0.27	0.27
Country background	Norwegian	0	0	0
	Western countries	0.43	0.42	0.42
	Non-Western countries	1.49	1.48	1.47
Education level	Lower education	0.61	0.62	0.62
	Medium education	0	0	0
	Higher education	-1.31	-1.31	-1.32
Family status	Single	2.26	2.25	2.25
	Married without children	0	0	0
	Married with children	0.56	0.58	0.58
	Mother with children	2.12	2.12	2.13
	Father with children	1.74	1.74	1.75
	Cohabitation with at least one common child	1.34	1.34	1.36
Age group	Below 30 years	0.33	0.33	0.33
	30-45 years	0	0	0
	45-66 years	-0.72	-0.72	-0.73
Basic and supplementary benefit	Recipient	0.02	0.02	0.02
	Non-recipient	0	0	0
Child maintenance	Pay maintenance	0.96	0.96	0.96
	Do not pay maintenance	0	0	0
Disability	Disabled	0.79	0.78	0.78
	Not disabled	0	0	0
Long-term unemployed	Long-term unemployed	1.72	1.71	1.72
	Not long-term unemployed	0	0	0
-2 LOG Likelihood		657908	656308	653508
Pseudo R^2		0.07	0.07	0.07
Number of individuals		2529612	2526737	2529507
Number of communities		435	429	434

All the coefficients, except the one for basic and supplementary benefit, are statistically significant.

Table A2. Average probability of receiving social assistance by population subgroups

Dependent variable: Received social assistance, w=1 if $s_{ij}>0$, not receiving social assistance, w=0 if $s_{ij}=0$		Model 2
Variable	Group/State	Percent $P(s_{ij}>0\|\mathbf{z})*100$
Constant		3.93
Gender	Female	3.68
	Male	4.17
Country background	Norwegian	3.57
	Western countries	5.39
	Non-Western countries	16.19
Education level	Lower education	6.36
	Medium education	4.56
	Higher education	1.02
Family status	Single	8.49
	Married without children	0.67
	Married with children	1.37
	Mother with children	10.48
	Father with children	5.99
	Cohabitation with at least one common child	3.96
Age group	Below 30 years	6.47
	30-45 years	4.32
	45-66 years	2.13
Basic and supplementary benefit	Have basic and supplementary benefit	7.63
	Have no basic and supplementary benefit	3.81
Child maintenance	Pay maintenance	12.89
	Do not pay maintenance	3.47
Disability	Disabled	6.57
	Not disabled	3.65
Long-term unemployed	Long-term unemployed	20.18
	Not long-term unemployed	3.02
-2 LOG Likelihood		656308
Pseudo R^2		0.07
Number of individuals		2526737
Number of communities		429

Table A3. Logit estimates and elasticities for the variables on the municipal level

Dependent variable: Received social assistance, w=1 if s_{ij}>0, not receiving social assistance, w=0 if s_{ij}=0		Model 2	
Variable	Coefficient	Standard error	Elasticity
Constant	-4.85	0.17	
Discretionary income per capita (1000 NOK)	-0.0061	0.0012	-0.0506
Ideology/partisanship			
Percent socialist in the local government council	0.0009	0.0004	0.0370
Pressure Groups/stakeholders			
Population share of 0-15 years	-2.4946	0.3822	-0.5224
Population share 67 years and above	0.5477	0.2812	0.0766
Distance/Diversity			
Average traveling time to the municipal center (minutes)	-0.0002	0.0006	-0.0030
Spread in the educational level (standard deviation in years of schooling)	0.0045	0.0246	0.0112
Population share of non-western immigrants	-1.9593	0.5010	-0.0219
Gross migration per capita	-0.2660	0.2018	-0.0250
Community opportunity			
Population share with low education	-2.4121	0.3157	-0.1597
Population growth 1993-1998 per capita	0.0046	0.0018	0.0135
Unemployment rate (percent)	0.1642	0.0111	0.1865
Population share that is disabled	2.7978	0.3667	0.1547
Alcohol related hospitalizations per inhabitant	15.2075	6.7850	0.0198
Population share 67 years and above	0.5477	0.2812	0.0766
-2 LOG L	656508		
Pseudo R^2	0.07		
Number of individuals	2526737		
Number of communities	429		

Table A4. OLS regressions of the probability of receiving social assistance for the reference person*

Dependent variable: Probability of receiving social assistance for the reference person						
	Model A		Model B		Model C	
Variabel	Coefficient	t-value	Coefficient	t-value	Coefficient	t-value
Constant	0.06868	0.91	0.08828	1.38	0.08147	1.33
Discretionary income per capita (1000 NOK)	-0.000273	-0.86	-0.00023	-0.88	-0.00022	-0.84
Ideology/partisanship						
Percent socialist in the local government council	0.000211	1.29	0.0002	1.29	0.00021	1.30
Mean price of housing in the community	-0.0015	-0.60	-0.0008	-0.38		
Pressure groups/stakeholders						
Population share of 0-15 years	0.0065	0.04	-0.00137	-0.01	0.01246	0.09
Population share 67 years and above	0.17875	1.55	0.17317	1.61	0.18322	1.76
Distance/Diversity						
Average traveling time to the municipal center (minutes)	-0.00034	-1.77	-0.00034	-1.82	-0.00035	-1.88
Spread in the educational level (std. in years of schooling)	-0.00361	-0.28	-0.0026	-0.21	-0.00382	-0.32
Population share of non-western immigrants	0.08601	0.19	0.13545	0.30	0.0992	0.23
Gross migration per capita	0.20747	1.88	0.18791	1.91	0.18576	1.90
Inverse population (in 1000 inhabitants)	0.00557	0.46				
The logarithm of the population	0.00245	0.53				
Community opportunity						
Population share with low education	-0.31238	-2.55	-0.31114	-2.57	-0.30521	-2.55
Population growth 1993-1998 per capita	0.0001	0.14	0.00013	0.18	0.00004	0.06
Unemployment rate (percent)	0.01676	3.81	0.01716	3.97	0.01733	4.03
Population share that is disabled	0.57641	3.74	0.58628	3.85	0.59552	3.96
Alcohol related hospitalizations per inhabitant	2.47972	0.86	2.56971	0.90	2.58946	0.90
R^2-adjusted	0.1497		0.1531		0.1549	
Number of communities	429		429		429	

* The reference person: Male, 16-30 years of age, single, Norwegian, lower education, pays no maintenance, receives no basic and supplementary benefit, is not disabled and is not long-term unemployed.

Variables

Individual characteristics

Gender

Male and female

Country background

Norwegians: People from Norway.

Western countries: Immigrants from Europe, Australia or North-America.

Non-Western countries: Immigrants from countries in Asia, Africa, Latin- and South-America or Turkey.

Education level

Lower education: 0 - 9 years of schooling

Medium education: 10 - 12 years of schooling

Higher education: Above 12 years of schooling

Family status

Single

Married without children

Married with children

Mother with children

Father with children

Cohabitation with at least one common child

Age groups

Below 30 years

30-44 years

45-66 years

Basic and supplementary benefit

Basic benefit is given to people having significant extra expenses because of a permanent disease or disablement

Supplementary benefit is given to people in need of special care or help at home because of a disease or disablement

Pays maintenance

Maintenance for own children when one is not living together with the children

Disablement status

Permanently ill or disabled

Long-term unemployed

Persons registered as unemployed for at least 2 years (our definition in this paper)

Municipal level variables

Discretionary income per capita (1000 NOK)

Tax income and contributions from the central government minus estimated expenditure needs

Average municipal housing price per square meter (1000 NOK)

Average municipal housing price per square meter in 1000 NOK for used freeholder houses in 1998. We group municipalities with few houses sold by counties to handle uncertainty due to few observations (houses sold) in small municipalities.

Percent socialists in the local government council

Percent share of politicians in the local government council representing parties on the political left

Average traveling time to the municipal center (minutes)

Average traveling distance, measured in minutes, from home to the municipal center for the inhabitants in the municipality

Spread in the educational level (standard deviation in years of schooling)

A measure of the spread in years of schooling calculated as the standard deviation of years of schooling

Population share of non-western immigrants

Population share of immigrants from countries in Asia, Africa, Latin- and South-America or Turkey

Population share with low education

Population share of residents with 9 years of schooling or less

Population growth 1993-1998

Gross migration per capita

Number of persons moving in or out of the municipality in percent of the inhabitants. Calculated as the average for the last 10 years

Population share 67 years and above

Unemployment rate (percent)

People 0-59 years unemployed in the municipality in percent of the inhabitants

Population share that is disabled

Share of people in the municipality that are disabled in percent of inhabitants

Alcohol related hospitalizations per inhabitant

Number of hospitalizations due to alcohol related diagnoses during the period 1996-1998 per capita

Inverse population size

1000 / population size.

The logarithm of the population

log (population)

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