Equalization of settlement pattern and size of municipality in Norway

Summary

The municipalities are compensated for objective differences in their need for involuntary costs through the General Grant Purpose Scheme. The settlement pattern and the geographical differences in Norway give us special challenges in a perspective of equalization of expenditure. This paper will give an account of how this objective costs due to settlement pattern and the size of the municipality are treated in the equalization of expenses. Much effort is put into developing criteria that will capture the costs due to the settlement pattern. This paper will account for this work, and also the method applied to determine the weights these criteria should have in the equalization of expenditure (the calculation matrix).

In addition, it is accounted for the vertical grants for the remote areas and Northern Norway. These grants are based on political priorities.

1 Why make allowances to settlement pattern and the size of the municipality in the Grant scheme?

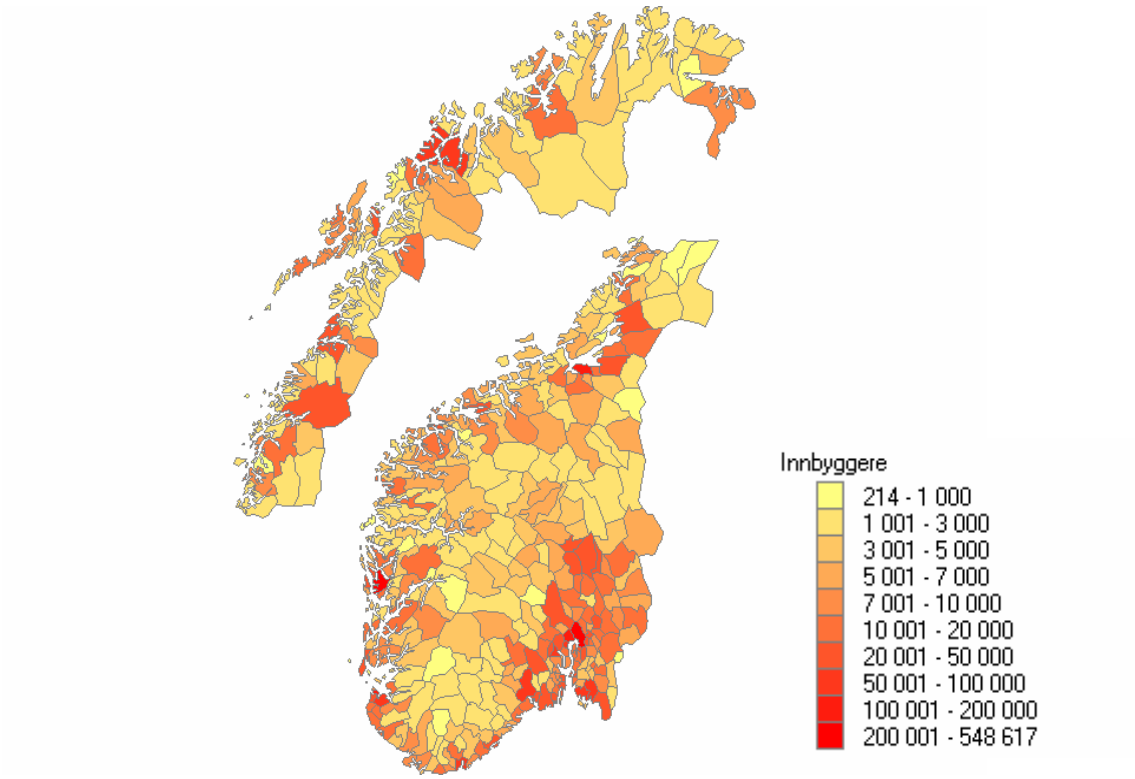
The Norwegian geography and settlement pattern gives special challenges in a perspective of equalization of expenditures. The country is thinly populated, with sparsely inhabited municipalities and long distances to the municipality centre. There are totally 431 municipalities. The smallest one Utsira, an island in the mouth of a fjord, has barely 200 inhabitants and the capital Oslo, has almost 0,6 million.

Facts about Norway:

431 municipalities - Population from about 200 to almost 600 000 inhabitants.
¼ of the whole population of 4,6 million live in the capital-region.
The country is scatterly inhabited. Next to Island Norway has the lowest population density in Europe, with 15 inhabitants per km^2. 44,4 percent of the area is mountains and plateaus and 38,2 percent is woodland.
Coastline:
Mainland without fjords and bays: 2 532 km
Mainland with fjords and bays: 25 148 km
Islands: 83 281 km
Municipal and county finances:
Nearly 70 percent of the revenues during the General Grant Purpose Scheme;
Partly equalisation of local taxes and full compensation for involuntary production costs.
Composition of revenues:
-Local taxes 49 percent
-General grant 19 percent
-Earmarked grants 10 percent
-Fees and charges 15 percent
-Others 7 percent

The equalisation mechanisms in the General Grant Purpose Scheme gives full compensation for involuntary production costs within national welfare services as education, health, financial support for welfare clients and care of the elderly. Settlement pattern and the size of the municipalities are criteria in the distribution formula to secure a fair distribution, and to make small and sparsely inhabited municipalities capable of providing equivalent public services.

In addition there are vertical grants in order to obtain regional policy goals, and not from strictly objective criteria. These are specific grants to the Northern Norway and small and remote municipalities. This extra contribution is supposed to secure good conditions for living in provincial municipalities (*jf. part 4*).



Figur 1: Municipalities and population, Norway

2 Settlement pattern – criteria

Some municipalities have involuntary high costs for primary and secondary schools because of the settlement pattern. There is a need for decentralised school-structure in sparsely inhabited municipalities, because there are limits to how far the pupils have to travel to school. Therefore there will be small schools with relatively many teachers per student in rural areas. In central areas there will be the size of the school that set the limitations. Norwegian primary and secondary schools rarely have more than 400 students. The calculation matrix for primary and secondary education is composed of several criteria for settlement pattern which intercepts involuntarily costs due to these conditions. Much effort is put into developing a valid calculation matrix. The extensive analysis is based upon division of the municipalities into smaller geographical unities (Basic statistical unit and zone) and on information about distances from Norwegian road data bases. The estimations and the annual update are performed by Statistics Norway.

About basic statistical unit and zone:

Basic statistical unit

Each municipality is divided into smaller geographical units, so-called ”basic statistical units”. The division is undertaken by Statistics Norway after determined criteria – i.e as homogeneous units as possible regardless of municipality. There is totally about 15 000 basic statistical units. In every unit it is determined a digital centre. In the further analysis the premises is that the population lives in this centre. Further on are every distance measured according to this digital centre. The municipalities also uses this material when they work out their own plans (area plans, municipality plans etc.).

Zone

The basic statistical units are merged into zones, i.e a geographical connected area of basic statistical units. One zone should have minimum 2 000 inhabitants. There is defined one centre in every zone. In average 2 000 inhabitants enable a medium sized elementary school after Norwegian standard.

Therefore, small municipalities (i.e. fewer than 2 000 inhabitants) only have one zone. The zones are not made from actual services, but out of geography, population and municipality boundaries. Because of the requirement of a minimum number of inhabitants within the zone, respectively sparsely and densely populated municipalities have very different zonation. Sparsely inhabited municipalities will have zones with large rural areas, and therefore long travelling distances. Densely populated municipalities will have zones with small rural areas and short travelling distances.

Based on this data base of zones and basic statistical units there are three criteria, “estimated travel-time”, “zone” and “neighbour”. These are included in the calculation matrix for primary and secondary education .The travel-time-criterion is estimated in minutes, the other two estimates the distances in kilometres. If possible the distances are estimated along a road (if the distance from the centre in the basic statistical unit to a road is short, the distance will be inscribed to the nearest road). At distances across water it is considerate whether there is a ferry-connection or not.

Criterion 1 – Estimated travel-time:
The estimating of this criterion uses the division into basic statistical units, and measures the shortest distance from the digitally determined centre in every basic statistical unit to the municipal centre, i.e. the basic statistical unit where the administration centre in the municipality is situated.

This criterion differs between various sorts of rural municipalities. Sparsely inhabited municipalities with large rural areas, or municipalities with the population on several islands are favoured. These municipalities generally have an extensive area with longer travel time to the municipal centre than the national average. Also the larger cities generally covers large geographical areas. Therefore, this criterion is not sufficient to separate between the large cities and the typical rural municipalities, i.e. the big municipalities will be favoured.

For all except the smallest municipalities it is out of the question to organize the school only in the municipality centre. Most municipalities need a decentralized school-structure, and this is taken into consideration in the estimation of involuntary production costs in the other two criteria (zone and neighbour). These measures are based on a division of the municipalities into zones.

Criterion 2 – Travel distance within the zone
The criterion “travel distance within the zone” (“zone”), is the sum of the distance from the centre of the inhabitants own basic statistical unit to the centre in the zone. The centre in the zone is defined as the basic statistical unit with the highest number of inhabitants. If there are several zones within a municipality, the estimated distances for the different zones are summed up. This criterion is based on the same principles as the criterion “estimated travel-time”.

Criterion 3 – Travel distance to nearest neighbour- basic statistical unit
The criterion “travel distance to nearest neighbour –basic statistical unit” (“neighbour”) is the inhabitants distance from the centre within their own basic unit to the centre in the nearest basic statistical unit (within the same zone), summed up for all the inhabitants in the municipality.

Through the criterion “zone” the municipalities’ higher costs due to the settlement pattern is taken into consideration, base on economy of scale through operating with of average size or large schools.

The ”Neighbour-criterion” is composed with an aim to ensure a more nuanced picture of the settlement in the municipality, and the possible need to decentralize the schools within the zone. If the basic statistic units are extensive, the distance between the basic statistic units will be correspondingly large. The distances therefore can be an obstacle for the municipality to utilize prospective economics of scale. More schools have to be established to have a natural school structure in the municipality.

Statistical analysis shows that the criteria is relatively strongly correlated, but together these criteria gives a good impression of the settlement in the country and takes into consideration the different levels of costs according to the primary school sector.

3 From criteria to weights in the calculation matrix

The calculation matrix estimates the involuntary production costs. If one municipality has an estimated expenditure need above the national average these expenditures are fully compensated. Those with an estimated expenditure need below the average equivalently have to contribute in the financing. In the total calculation matrix for the municipalities, and in the partial calculation matrix for primary and secondary education which is a part of the total calculation matrix, the criteria will have the weights shown in table 1.

Table 1: Weight to the settlement criteria in the calculation matrix for primary school and in the total calculation matrix for the municipalities

Criteria	Weight in the total calculation matrix for the municipalities (percent)	Weight in the calculation matrix for primary and secondary school (percent)
Travelling time	1,5	4,8
Zone	1	3,0
Neighbour	1,1	3,4
Sum	3,6	11,2
Total sum	100	100

Table 1 shows that costs due to settlement patterns are presumed to amount to 3,6 percent of the municipalities total expenditures regarding primary and secondary education, health and care services and the administration sector.

The weights in the calculation matrix are determined through regression analysis. The regression analysis includes every factor that may possibly influence the expenditures. The dependent variable is gross expenditures, and explanatory variables are such as number of children in the age 7-15, socio-economic variables (number of divorced or separated, the death rate etc.).

The analysis of primary and secondary education is different then the analysis on the other sectors. The dependent variable is normed hours of teaching (not gross expenditures). Number of hours of teaching is determined after standards on the size of the school, class-size, teaching-hours a week etc. The variation in hours is analysed by simple multiple regression analysis (I).

(I) $Y_i = a + b_i x_i + c_i z_i + \ldots + e_i$

In addition to the settlement pattern criteria number of inhabitants 6-15 years old is also included in the analysis. All these variables are significant, and are used in the further estimations. To set the weights of the respective criteria in the total calculation matrix, each variables part of the total variation in the dependent variable (Y) thereafter are estimated.

4 Size of the municipality – compensation for diseconomies of scale

The basis criterion

The size of the municipality (number of inhabitants) is of great importance for the costs in municipal production of services. The existence of diseconomies of scale in municipal production of services is well documented. Municipalities with few inhabitants therefore need a higher level of income per capita than municipalities with a larger number of inhabitants to be able to provide an equal standard of the public services.

Generally, the settlement pattern criteria benefits the small municipalities since they often, but not always, are sparsely inhabited. The size of the municipality is however explicit considered in two different ways in the Norwegian system. First, diseconomies of scale are considered through objective criteria in the equalization of expenditures with a scale-criterion (the basis-criterion). Further there is a special grant for small municipalities and grants to municipalities in Northern Norway, these grants are given out of regional policy aims.

Independent of settlement pattern the municipalities are compensated for diseconomies of scale within administration, agricultural issues, environmental issues and primary and secondary education through the basic-criterion. It is presumed that municipalities with few inhabitants need a higher level of income to provide the same services.

Such criteria can be shaped in several ways. In the Norwegian system the criterion is designed in such a way that every municipality get the same amount regardless of the size of the municipality (a lump sum grant). This means that small municipalities get a high amount per capita, and large municipalities get a small amount per capita. Totally the weight is set to 2,5 percent in the total calculation matrix, i.e. it is expected that 2,5 percent of the local governments total expenses to national welfare services are connected with diseconomies of scale**.** The weight is determined through objective analyses. The basic-criterion therefore is an important contribution to giving equal standard of services regardless of the size of the municipality.

Grants for remote regions

A superior political aim is to keep the settlement pattern and maintain the local societies. Like most countries, Norway experiences centralisation and pressure on the suburban areas. In addition to the objective criteria in the calculation matrix (the settlement pattern criteria and the basic-criterion) we have the grants to municipalities in remote regions and Northern Norway. Together these mechanisms shall make sparsely inhabited municipalities, municipalities in remote regions and in the Northern Norway able to provide equal, and partly better, services than municipalities in more central areas.

The grant for the remote regions

Municipalities with less than 3 200 inhabitants and tax income per capita below 110 percent of the average receive the grant for remote regions. This grant is a fixed lump-sum to the municipalities.

The grant to the Northern Norway is a special regional political instrument. This grant should make municipalities and counties in Northern Norway able to provide better services than the rest of the country. The objective for the grant for Northern Norway, which is paid out as a flat per capita amount, is to make possible a higher level of municipal employment in areas with a private sector marked highly dependent on the economic conditions in the marked.

5 Currant work

The calculation matrix for the Norwegian system is now revised. The Government aim to present a white paper to the Storting next spring about the revised General Grant Purpose Scheme. The report from "the Borge-committee" is the basis for the work with the new calculation matrix. They recommended analysing the expenditures to primary and secondary schooling on the basis of actual gross operating expenditures, instead of normed hours of teaching. In the latest years the municipalities have received more freedom and room for local adaptations in how to organise the primary and secondary schooling. Further the Borge-committee recommended including the settlement pattern criteria in the partial calculation matrix for health and care services. Also in this sector there was found a statistic correlation between the variation in municipality costs and the settlement pattern.