

# ASSESSING THE PERIPHERAL STATUS OF LOCAL AIRPORTS

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## ABSTRACT

The European Union (EU) has defined seven regions as outermost (or ultra-peripheral), of which three are located near the European mainland (the Azores, Madeira and the Canary Islands). These regions benefit from certain relaxations in EU law to promote economic development such as extended duration on tendered contracts for subsidised air transport routes subject to public service obligation. This article aims to determine the peripheral status of Norwegian municipalities hosting airports with subsidized air transport routes in order to assess whether they qualify for a similar extension of contract length. Evidently, a majority of the route areas can be classified as equally or more peripheral than the outermost regions. The method for assessment can be transferred to PSO-routes in other peripheral regions of the EU as well as for considering relaxation of other laws promoting the development of such areas.

Keywords: public service obligation, subsidy, air transport, peripheral regions, remoteness, tendering duration

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## 1. INTRODUCTION

Since the establishment of common European regulations for air transport by implementation of the “third package”, the air passenger transport market has been increasingly liberalized and opened up for competition (Stevens, 2004). Air transport is important for enabling small communities to develop socially and economically (e.g. Halpern and Bråthen, 2011; Smyth et al., 2012). In order to prevent small communities from losing air transport services they previously enjoyed, it was arranged for public procurement of services by the public service obligation (PSO) program (e.g. Reynolds-Feighan, 1995).

In 2008 EU adopted common rules for operations of air services in regulation<sup>1</sup> 1008/2008 of the European Parliament and of the Council (CEC, 2008a). The new rules consolidate and replace earlier regulations with respect to licensing, market access and fares<sup>2</sup>. Regulation 1008/2008 expands the duration of the contracts from three to four years, with optional five-year contracts for EU’s most peripheral regions. It is argued, e.g. by the Norwegian Competition Authority (2010) that a longer contract period will reduce the uncertainty for the operators, so that more competitors will find it attractive to compete for the tendered contracts. This is considered an advantage for the economic development of these regions since authorities can choose between more bidders and select the best offer. These outermost regions of EU, also called “ultra-peripheral regions”, are governed by the Treaty establishing the European Community Article 299 (EUR-LEX, 2009).

Even though not a member of the European Union (EU), Norway is committed to implementing EU law according to the European Economic Area (EEA) treaty. Consequently, all PSO-contracts for air transport routes receiving state aid are tendered on the open market and in Norway with a high level of transparency (Williams, 2005). The duration of the tendered PSO-contracts in Norway has followed the EU regulations. Traditionally, the rounds of competition have taken place every third year. In accordance with the new regulations (CEC, 2008a), the Norwegian Ministry of Transport and Communications(MTC) extended the duration to four years in the most recent tendering round starting 1<sup>st</sup> April. Additionally, the PSO-contracts for air transport in the northern part of Norway took advantage of the option of five-year duration being restricted to ultra-peripheral regions only.

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<sup>1</sup> A regulation is an EU decision that directly binds all member states and citizens in the whole of the EU.

<sup>2</sup> Council Regulations No 2407/92 of 23 July 1992 on the licensing of air carriers (CEC, 1992a), No 2408/92 of 23 July 1992 on access of Community air carriers to intra-Community air routes (CEC, 1992b), and No 2409/92 of 23 July 1992 on fares and rates for air services (CEC, 1992c) are consolidated and substantially changed in regulation No 1008/2008(CEC, 2008a).

According to Bråthen (2011), there is no unambiguous definition of remoteness for airports. Hence, there is no existing framework for assessing whether a region is sufficiently peripheral to take advantage of the relaxations of laws intended for the outermost regions only. However, factors such as peripheral location, small market, presence of mountains, insularity and generally poor infrastructure are identified as indicators of remoteness by Halpern and Bråthen (2011).

The aim of this paper is twofold. First, the criteria for being classified as outermost regions of Europe given in Article 299 of the Treaty are operationalised with reference to air transport of passengers. Second, an assessment is given whether the regions currently receiving state aid for PSO-routes in Norway satisfy the criteria relevant for application of five-year contracts granted only to regions classified as outermost. This discussion thereby addresses the arguments for introducing extended duration on contracts in northern Norway. The demonstration of assessing peripheral status is transferable to PSO-routes in other remote regions of the EU as well as for relaxation of other laws to promote the development of these regions.

Section 2 briefly presents Article 299 of the Treaty establishing the European Community regulating the outermost regions of EU and the regions that are affected by these laws. Then the criteria in Article 299 (2) of the Treaty are operationalised in Section 3 and applied on Norwegian airports and areas receiving state aid for PSO-routes in Section 4. Finally, conclusions and implications are presented in Section 5.

## 2. SPECIAL TREATMENT TO THE OUTERMOST REGIONS

### *2.1 Article 299 of the Treaty*

The outermost regions may benefit from specific measures laid down in Article 299 of the Treaty establishing the European Community (EC Treaty). This article acknowledges their considerable structural disadvantages. The arguments for giving special treatment to these regions are stated in Article 299 (2) as follows:

*"... taking account of the structural social and economic situation of the French overseas departments, the Azores, Madeira and the Canary Islands, which is compounded by their remoteness, insularity, small size, difficult topography and climate, economic dependence on a few products, the permanence and combination of which severely restrain their development, the Council, acting by a qualified majority on a proposal from the Commission*

*and after consulting the European Parliament, shall adopt specific measures aimed, in particular, at laying down the conditions of application of the present Treaty to those regions, including common policies. ..."* Citation from EC Treaty Article 299 (2).

Hence, according to Article 299 (2) the special characteristics of the outermost regions can be related to remoteness, insularity, small size, difficult topography and climate and economic dependence on a few products. All five dimensions influence the demand for transport of passengers by air. Hence, these are all relevant dimensions to study when aiming to compare today's outermost regions with the Norwegian regions receiving state financial aid for air transport.

Article 299 further provides for the possibility of adopting specific measures to assist the regions as long as there is an objective need to promote their economic and social development. The measure in question for this study is the possibility of using state aid to establish and maintain air transport routes to the outermost regions. State aid for scheduled air services follow regulation 1008/2008 (CEC, 2008a) where Article 16 (9) specifically states that outermost regions are allowed a five-year duration on contracts, rather than the normal contract duration of four years. The longer contract period reduces uncertainty for operators and, could thus, lead to more competition for the contracts concerned.

## *2.2 The Outermost Regions*

The insularity, tropical climate, topography, distance from mainland Europe and proximity to less developed third countries all constitute obstacles to the development of the outermost regions of Europe (CEC, 2008b). Despite a generally high population density, they are of relatively modest demographic, economic and territorial importance for the European Union as a whole. Their difficulty in achieving economies of scale and generating profits from major investments, coupled with low wages and often very high unemployment, make these most remote regions amongst the poorest in the Union.

The Portuguese autonomous region of Azores is located in the Atlantic Ocean with a population of 246,000. Unemployment has increased the last few years from 2.5% in 2002 (CEC, 2008b) to about 11.7% in 2011 (CEC, 2012). Farming and fishing are the key industries of the Azorean economy. The distance from the local capital of Ponta Delgada to Lisbon on the mainland is 1,450 km. There are PSO-routes to nine airports within the Azores

archipelago (Ponta Delgada, Horta, Corvo, Flores, Pico, Santa Maria, Terceira, São Jorge and Graciosa). The 22 PSO-routes include flights both inter-island and to the capital of Lisbon (CEC, 2009). In addition, one PSO-route regards transport to Madeira. Air transport from the main airport Nordela Airport (PDL) to Lisbon takes 2h 05min (non-stop).

The Spanish autonomous community of The Canary Islands is situated in the Atlantic Ocean at the north-west coast of Africa. The climate varies from sub-tropical vegetation to volcanic semi-deserts, with the topographical characteristics of cliffs and sand dunes. The archipelago had in 2011 a population of 2,125,000 and an unemployment rate of 29.6% (CEC, 2012) up from 11.1% in 2002 (CEC, 2008b). Tourism and tropical agriculture make up the key trades of the Canary Islands economy. The distance from the local capital of Las Palmas to Madrid on the mainland is 1,760 km. There are PSO-routes to eight airports within the Canary Islands (Gran-Canaria, Tenerife South, Tenerife North, Fuerteventura, El Hierro, Lanzarote, La Palma and La Gomera). The 13 PSO-routes only include inter-island flights (CEC, 2009). Air transport from Gran Canaria Airport (LPA) to Madrid takes 2h 40min (non-stop). Each major island in the archipelago is serviced by its own airport.

The Portuguese autonomous region of Madeira is located in the Atlantic Ocean with a population of 268,000. Unemployment has increased considerably the last few years from 2.5% in 2002 (CEC, 2008b) to 14.3% in the last quarter of 2011 (CEC, 2012). The free-zone of Madeira is a tax-privileged economic area. The service sector and tourism offer the greatest contributions to the Madeiran economy. The distance from the local capital of Funchal to Lisbon on the mainland is 965 km. There are PSO-routes to two airports within the Madeira archipelago (Funchal and Porto Santo). The PSO-routes include flights between the two islands, to the Azores and to the capital of Lisbon (CEC, 2009). Air transport from Madeira Airport (FNC) to Lisbon takes 1h 35min (non-stop).

The four French Overseas Departments defined as outermost regions are located in South America, the Caribbean Sea and the Indian Ocean. Generally, these regions have a higher unemployment rate, a longer distance to the capital and more exotic agricultural products as compared to the other outermost EU regions located in Europe.

It is clear that the outermost regions of EU are not a homogenous group. The French Overseas Departments are characterised by considerably longer distances to Europe and different economic activity than the regions located in the Atlantic Ocean. Based on their

location in Europe and distance to capital, the Azores, Madeira and The Canary Islands are more suitable for comparison with the Norwegian regions receiving state aid for air transport of passengers.

### *2.3 The Outermost Regions and Peripheral Status*

The three outermost regions located close to the European mainland have many similarities with respect to the peripheral dimensions presented in section 2.1. Generally, the Azores, Madeira and the Canaries can be related to the five dimensions of peripheral status by:

- *Remoteness*: there are few transport alternatives and long travel distances to the mainland capital (about 2h 5min flight time on average from local capital).
- *Insularity*: the regions are islands.
- *Size*: the regions have relatively high population density and supports populations of considerable size (average population per airport of about 120,000).
- *Topography and climate*: the regions are characterised by volcanic activity and mountains. Climate is subtropical with location in open sea.
- *Economy*: the regions have experienced a rapid growth in unemployment rate the last few years (increasing from an average of 5.4% in 2002 to about 18.5% in 2011). Key industries are tourism and exotic primary goods. Relaxed tax rules provide favourable conditions for businesses.

The above description forms the basis for assessing the peripheral status of the Norwegian local airports with PSO-routes. When suggesting the peripheral status of the Norwegian regions, highest weight is put on the remoteness dimension. However, two regions with the same characteristics of remoteness (i.e. distance and travel time to capital) can be given different peripheral statuses based on special cases of the other dimensions. Other things equal, characteristics such as low population, tough weather conditions and dependence on few products are considered as indicators that a region is more peripheral.

### 3. OPERATIONALIZATION OF ARTICLE 299

The characteristics of the outermost regions are only generally referred to in Article 299 (2) of the Treaty. There is, therefore, a need to operationalize the five dimensions of the Article in order to assess the peripheral status of the Norwegian airports and compare them to the regions currently holding the status of "outermost". Still, it is not possible to define absolute

rules when assessing the dimensions and the overall assessment of peripheral status is to some degree subject to our best judgement. The assessment of each dimension of peripheral status compared to the three outermost regions of EU located in Europe is given according to a five-graded scale where:

- 2 is considerably less peripheral than the current outermost regions.
- 1 is less peripheral than the current outermost regions.
- 0 is equally peripheral as the outermost regions.
- +1 is more peripheral than the current outermost regions.
- +2 is considerably more peripheral than the current outermost regions.

Consequently, for each route area the five dimensions are assessed on a scale ranging from -2 (considerably less peripheral) to 2 (considerably more peripheral) where the value 0 indicates that the region is equally peripheral as the outermost regions. A relevant question is at which level a variable is considerably different from another. For the metric variables it is assumed that limit values for classifying a metric variable as less and more is  $\pm 25\%$  and considerably less and more is  $\pm 50\%$ . For the ordinal variables special characteristics that influence air transport is included in the assessment.

Categorizations on graded scales are commonly used to assess characteristics of products and services and corresponds broadly speaking with what is usually referred to as gap analyses (e.g. Dutka, 1994). Such an ordinal scale does have its limitations with respect to econometric analysis, in that it produces non-metric data (Hair et al., 1998). It is, however, clear that grade 2 is more peripheral than grade 1. In the following analyses it is assumed that the differences between the grades are perceived by the respondents as equal, so that average values can be calculated.

### *3.1 The Five Dimensions*

This section defines how each dimension presented in section 2.1 is operationalised to assess the peripheral status of Norwegian local airports.

#### *a. Remoteness*

This dimension indicates the region's degree of remoteness with regard to transport both to the closest airport connected to the main network and to Oslo Airport, Gardermoen (OSL). OSL is situated close to the capital city of Norway and is the national hub for both domestic and international flights. Remoteness could also consider characteristics of alternative

transport modes, including private car and public transport, from the population centre of the local airport to the closest main airport and the national hub can be considered. Remoteness is considered the most important characteristic when assessing the peripheral status of a region and counts 40% in the overall assessment.

In the following analyses remoteness is indicated by travel time from local airport to national main airport, where lower travel time represents an advantage. When assuming average travel time between main airports in the outermost regions to mainland of 125 minutes and using the argued limit values of  $\pm 25\%$  and  $\pm 50\%$ , the intervals qualifying for the grades -2, -1, 0, 1 and 2 are less than 60 min., between 60 min. and 95 min., between 95 min. and 155 min. and more than 190 min., respectively.

#### *b. Insularity*

Insularity addresses the specific challenges facing population and business communities located on islands. It is measured by whether the airport and local settlement is located on an island and whether the local settlement surrounding the airport faces "island-like" challenges for any alternative transport modes (e.g. dependence on ferries over fjords). The categories qualifying for the grades -2, -1 and 0 are "Mainland", "Island-like" and "Island", respectively.

#### *c. Size*

This dimension addresses the specific challenges of small communities with regard to size and can be measured by surface area, population and traffic figures. In cases of low population, and thereby few passengers, there is often a need for state aid in order to uphold a certain minimum level of offered routes. In the following analysis population is used as indicator for size, where higher population is considered to be better. Advantages of population as measure are that it indicates travel activity and is relatively stable over time. Taking into consideration that the average population related to an airport in the outermost regions are 120,000 persons and the argued limit values, the intervals qualifying for the grades -2, -1, 0, 1 and 2 are populations of more than 180,000, between 180,000 and 150,000, between 150,000 and 90,000, between 90,000 and 60,000, and less than 60,000, respectively.



#### d. Topography and climate

This dimension addresses the specific challenges related to difficult topography and climate which impose problems to transport. In many cases, the topography implies that air transport is indeed the only efficient way of transport from regional settlements to the county centre or capital. With respect to Norwegian climate, problems relate to rough weather conditions along the coast and in particular the winter weather with snow and low temperatures. These problems are specifically related to the high uncertainty of alternative transport modes due to cancelling of ferry departures and closed roads over mountain passes.

Topography can be measured by the presence of mountains, sea or fjords in the region of the local airport and the problems caused by topography related to passenger transport. Climate can be measured by brief characteristics of the climate, review of temperature and its variation over the year (The Norwegian Meteorological Institute, 2009) and a description of region specific challenges caused by climate with regard to passenger transport (not just air transport). Topography and climate is classified by the characteristics presenting problems (if any) for efficient and reliable passenger transport.

It is assumed that plains impose fewer problems for transport than mountains and that inland climate impose fewer problems than coastal climate. Hence, regions categorized by either plains or inland (or both) are better off than the current outermost regions. On the other hand, the harsh winters in the northern parts of Norway are considered as disadvantages for these regions.

#### e. Economy

Regions depending on few products are often characterized by primary industries or cornerstone industries. The economic activity of regions with unilateral industries is more vulnerable than that of versatile economies. The characteristics of the economy can be measured by demographic indicators of the region such as unemployment, workforce participation and average gross income.<sup>3</sup>

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<sup>3</sup> In 2010 Norway had an unemployment rate at about 3.1%, workforce participation at 71.9% and average gross income of 38,100 NOK per month (Statistics Norway, 2011). 1 EUR ≈ 8 NOK.

In the following analysis the unemployment rate is used as indicator for economic activity and is only measured for the municipality that hosts the local airport (Statistics Norway, 2012). The benefits of using unemployment are the consistency between regions and close correlation to economic activity in a region. A disadvantage is that it has changed considerably in a short period of time since the start of the financial crisis. A critical question is thereby how short-term fluctuations in economic activity should be related to long-term decisions on airport infrastructure. If taking the perspective that the financial crisis in Europe is a temporary phenomenon and that the economy will eventually normalize to the post crisis condition, it would be advisable to use unemployment figures dating back to the years preceding 2008. This is of course a question of debate. Moreover, with relevance to the topic of this paper being the extension of contract duration to five years, it is reasonable to assume that the pre-financial crisis situation formed the basis for the regulation (CEC, 2008). Consequently, we find it most reasonable to use the figures presented by CEC (2008) which dates back to 2002 and derives an average unemployment running at 5.4% for the three outermost regions in question. Hence, the unemployment rates qualifying for the grades -2, -1, 0, 1 and 2 are less than 2.7%, between 2.7% and 4.0%, between 4.0% and 6.7%, between 6.7% and 8.1% and more than 8.1%, respectively.

### *3.2 Overall Assessment*

An overall assessment comprising all five dimensions can be calculated for each region in order to position the degree of peripheral characteristics of the Norwegian PSO-routes areas relative to the current outer-most regions in EU. Similar to the assessment of the five individual dimensions, the overall assessment is given according to a five-graded scale ranging the peripheral status relative to the current outermost regions from considerably less (-2) to considerably more (2). The overall assessment is a weighted average of the five dimensions where "remoteness" counts 40%, while the remaining four factors count 15% each. Remoteness is given higher weight since it can be regarded as the main peripheral indicator. The results when using equal weight for all dimensions will also be commented on. The average values are rounded to the nearest integer.

As a consequence of these grades, airports given the score 0 or higher may be considered located within an outermost region and should, thereby, be granted five-year tendered contracts. This classification should, however, not be used as a mandatory rule. It may, in many cases, be reasonable to follow the same tendering rules for larger regions or the

country as a whole, even though airports belonging to different peripheral categories are included. The reasonability of larger regions is based on both the efficiency of administration routines at the regulator and reduced entry barriers for the airline companies.

Moreover, we will emphasize that these assessments are based on our understanding of the concept "outermost regions". Even though we argue that our criteria are reasonable and that we present our conclusions based on local knowledge of the Norwegian airports, other operationalizations of the concept and Article 299 (2) may result in different conclusions on the margin.

#### 4. PERIPHERAL STATUS OF PSO-ROUTES IN NORWAY

##### *4.1 Route Areas in the Norwegian Airport Network*

Transport in Norway suffers from difficult topography, long distances and rural settlements. A way of meeting these infrastructure challenges was the establishment of a network of local airports with short runways starting at the end of the 1960's. Today, Norway is amongst the countries in Europe with the highest air transport dependence (Williams et al., 2007) and holds, according to the European Commission (CEC, 2009), about 20 % of all restricted PSO-routes in Europe.<sup>4</sup>

The state owns and operates the majority of airports in Norway through the wholly owned company Avinor. Larger airports constitute the main network with routes operated according to commercial principles, while PSO-routes are established between local airports and some of the larger airports including Oslo. Lian (2010) provides further details regarding the local airport network in Norway and the challenges related to maintaining a route network including so many small airports is discussed by Mathisen and Solvoll (2012).

In Norway, the MTC is responsible for the tendering of state aided PSO-routes in Norway. The PSO-routes are divided into route areas including one or more airports. Contract details and subsidy requirements for the active tendering contracts are presented in Table 1 for a total of 22 route areas (tendering regions).<sup>5</sup> It is clear from Table 1 that the total subsidy

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<sup>4</sup> See e.g. Williams and Pagliari (2004) for details about the development of PSO routes in Europe.

<sup>5</sup> Information on the tendered contracts can be found in protocols made available by the Norwegian Ministry of Transport and Communication (2009, 2010a, 2010b, 2012a, 2012b).

amount exceeds NOK 600 million per year. Three route areas include more than one local airport, of which one was active from 1<sup>st</sup> April 2012 and two were initiated two years earlier.

Table 1 – Details about the Contracts for the Norwegian Route Areas

Route area	Contract	Duration	Subsidy (NOK 1000)		Carrier <sup>a</sup>
			Period	Annually	
Lakselv	Apr. 2012 - Apr. 2017	5 years	40,472	8,094	WF
Andenes	Apr. 2012 - Apr. 2017	5 years	59,302	11,860	WF
Harstad/Narvik	Apr. 2012 - Apr. 2017	5 years	78,012	15,602	WF
Svolvær	Temporary <sup>b</sup>	5 years	172,566	34,513	WF
Leknes	Temporary <sup>b</sup>	5 years	127,353	25,471	WF
Røst	Temporary <sup>b</sup>	5 years	91,034	18,207	WF
Narvik	Temporary <sup>b</sup>	5 years	91,813	18,363	WF
Brønnøysund	Apr. 2012 - Apr. 2017	5 years	63,552	12,710	WF
Sandnessjøen	Apr. 2012 - Apr. 2017	5 years	82,714	16,543	WF
Mo i Rana	Apr. 2012 - Apr. 2017	5 years	166,246	33,249	WF
Mosjøen	Apr. 2012 - Apr. 2017	5 years	137,998	27,600	WF
Namsos&Rørvik	Apr. 2012 - Apr. 2017	5 years	216,315	43,263	WF
Florø <sup>c</sup>	Apr. 2012 - Apr. 2016	4 years	0	0	WF
Førde	Apr. 2012 - Apr. 2016	4 years	56,535	14,134	WF
Sogndal	Apr. 2012 - Apr. 2016	4 years	78,320	19,580	WF
Sandane	Apr. 2012 - Apr. 2016	4 years	185,462	46,366	WF
Ørsta-Volda	Apr. 2012 - Apr. 2016	4 years	135,681	33,920	WF
Fagernes	Apr. 2012 - Apr. 2016	4 years	41,900	10,475	NF
Røros <sup>d</sup>	Dec. 2012 - Apr. 2016	3 years	56,000	16,800	WF
Værøy	Aug. 2011 - Aug. 2014	3 years	95,832	31,944	LT
Vadsø, Vardø, Båtsfjord, Berlevåg, Mehamn, Honningsvåg, Hammerfest	Apr. 2010 - Apr. 2013	3 years	531,411	177,137	WF
Hasvik& Sørkjosen	Apr. 2010 - Apr. 2013	3 years	60,660	20,220	WF

<sup>a</sup> Abbreviations: WF - Widerøe's Flyveselskap AS, NF - North Flying A/S, LT- Lufttransport AS

<sup>b</sup> It was revealed that the winner of the contract could not fulfil all requirements and routes are temporarily operated by WF with compensation equal to the second lowest bid.

<sup>c</sup> A complaint was put forward for the use of market power when WF won the contract requiring no subsidies.

<sup>d</sup> The contract was originally intended to start at 1<sup>st</sup> April 2012, but it was withdrawn and presented again with a new set of specifications.

For the most recent round starting 1<sup>st</sup> April 2012 a total of 12 out of the 19 route areas initiated 5 year contracts. The three route areas currently operating 3 year contracts are located in the northern part of Norway and will probably change duration to 5 year in the future. The Norwegian state, in the shape of the MTC, wishes to make applicable five-year

duration on tendered contracts for regional air transport in Norway (Kjærland et al., 2009). It is assumed that a longer contract period will reduce the uncertainty for the operators, so that more competitors will find it attractive to compete for the tendered contracts. It is, however, out of scope for this study to assess whether the extended duration on contracts actually has led to better air transport services or reduced subsidy requirements.

In the last tendering round eight companies competed and two were chosen to operate route areas. Widerøes Flyveselskap AS (WF) is in a unique position with a fleet of airplanes specifically suited for the short runways in Norway. There are a limited number of planes that can operate the 799 meter runways, called Short Take Off and Landing (STOL), which is common for the local airports. Therefore, WF is usually the only bidder on these tenders. The competition increases for airports with longer runways. Finally, the helicopter route at Værøy is operated by Lufttransport AS (LT), holding a fleet of both helicopters and planes.

#### *4.2 Comparison of Norwegian Route Areas and EU's Outermost Regions*

The characteristics of the Norwegian regions according to the operationalization of the five dimensions in Section 3.1 are given in Table 2 sorted geographically from south to north. The parameters remoteness, size and economy are represented by metric values, while insularity and topography and climate are ordinal values. As explained in Section 3.1, remoteness is represented by travel time to national main airport, size by the population in the catchment area, and economy by the unemployment rate (in 2002) of the municipality hosting the airport.

For the three regions in Table 2 including more than one airport only the characteristics of the most peripheral one is presented. More specifically, Rørvik, Hasvik and Vardø are the most peripheral airports within their respective regions. All other route areas include only one airport. For each region Table 3 presents how the information in Table 2 qualifies for the grades presented in section 3.1. Furthermore, the assessments of overall peripheral status for the 22 route areas are presented in Table 3 following the model lined out in section 3.2. Regions are generally more peripheral in the northern part of the country. This can primarily be justified by increased distance and travel time to the capital. The northern regions are also characterised by a harsher climate (winter problems), fewer transport alternatives and a considerably lower population density compared to the southern regions.

Table 2 – Details about the Peripheral Dimensions for the Norwegian Route Areas

<i>Route area</i>	<i>Remoteness<sup>a</sup> (travel time)</i>	<i>Insularity</i>	<i>Size<sup>a</sup> (population)</i>	<i>Topography and Climate</i>	<i>Economy (unemployment)</i>
Fagernes	30	Mainland	20,000	Mountain, inland	1.2%
Florø	70	Island-like	16,000	Plains, coast	2.9%
Førde	60	Mainland	32,000	Mountain, coast	2.0%
Sogndal	45	Mainland	28,000	Mountain, inland	1.6%
Sandane	85	Mainland	28,000	Mountain, coast	1.4%
Ørsta-Volda	60	Mainland	33,000	Mountain, coast	2.6%
Røros	50	Mainland	21,000	Mountain, inland	1.9%
Namsos&Rørvik <sup>b</sup>	120	Island	10,000	Plains, coast, harsh winter	3.8%
Brønnøysund	130	Island-like	13,000	Plains, coast, harsh winter	3.0%
Sandnessjøen	180	Island	13,000	Mountain, coast, harsh winter	4.2%
Mo i Rana	150	Mainland	34,000	Mountain, inland, harsh winter	4.2%
Mosjøen	135	Mainland	16,000	Mountain, inland, harsh winter	2.3%
Røst	150	Island	1,000	Plains, coast, harsh winter	3.4%
Værøy	240	Island	1,000	Mountain, coast, harsh winter	7.3%
Leknes	145	Mainland	13,000	Hilly, coast, harsh winter	4.7%
Svolvær	155	Mainland	9,000	Mountain, coast, harsh winter	5.2%
Narvik	210	Mainland	23,000	Mountain, coast, harsh winter	1.9%
Harstad/Narvik	105	Mainland	50,000	Plains, coast, harsh winter	2.8%
Andenes	180	Island	5,000	Plains, coast, harsh winter	2.5%
Hasvik&Sørkjosen <sup>b</sup>	180	Island	1,000	Hilly, coast, harsh winter	7.5%
Lakselv	200	Mainland	7,000	Plains, inland, harsh winter	4.2%
Vadsø, Vardø, Båtsfjord, Berlevåg, Mehamn, Honningsvåg & Hammerfest <sup>b</sup>	275	Island	1,000	Mountains, coast, harsh winter	11.4%

<sup>a</sup> Rounded to nearest 5 minutes (travel time) and thousand (population).

<sup>b</sup> Values are reported only for the most peripheral airport within this route area.

The overall assessments in Table 3 suggests that one and six route areas are considerably less (-2) and less (-1) peripheral than the outermost regions, respectively. These regions are characterised by relatively versatile economic activity, a short distance to the main hub of OSL and access to alternative transport modes. A total of six route areas are given a peripheral status equal to the outermost regions (0). This mainly concerns airports located close to the larger towns in the northern part of Norway. Moreover, eight and one route areas are classified as more (+1) and considerably more (+2) peripheral than the outermost

regions, respectively. These regions are ultra-peripheral in a European context with a location in rural areas with harsh climate and low population density. They are characterised by few transport alternatives and long travel time to the capital and possess economic activity based on primary industries (mainly fishery). However, these regions generally have a close proximity to local airports due to the distributed structure of the regional airport network (Lian et al., 2005).

It is evident from Table 3 that the whole scale from -2 to +2 is used for "Remoteness" and "Economy". According to the definition "Insularity" can only be equal or less peripheral, while size is +2 for all regions due to the low population in these route areas. The most peripheral score that can be obtained for "Topography and climate" is +1 if the region is characterised by mountains and coastal areas and is located in the northern part of the country where the winter is harsh. The overall score ranges from -2 to +2. The least peripheral route areas, Fagernes and Sogndal, have overall scores of -1.3 which should indicate the value -1. However, Fagernes is rounded to -2 due to its close proximity to the main airport of Norway, which in practice makes it an alternative airport for the population in the catchment area.

Compared to the Norwegian route areas, the outermost regions of EU located in Europe are generally characterised by:

- Higher remoteness when it comes to the lack of alternative transport modes, but not with respect to distance and travel time to the capital.
- Higher insularity because they are all islands.
- Larger both in size and population.
- Fairly similar characteristics of topography with many mountains.
- Tougher climate with respect to being located at open sea, but not with respect to low temperature and other winter climate problems.
- Fairly similar characteristics of economic activity with dependence on primary industries and tourism, but the unemployment rate is generally higher.

There are, consequently, both pros (longer travel time and lower population) and cons (more transport alternatives) for giving the impact areas of all the Norwegian airports with PSO-routes the status of outermost regions.

Table 3 – Assessment of Peripheral Status of Norwegian PSO-Route Areas Compared to the Outermost Regions located near the European Mainland <sup>a</sup>

Part of Norway	East	West	West	West	West	West	Middle	Middle	North	North	North	North	North	North	North	North	North	North	North	North	North	North
Overall assessment	-2	-1	-1	-1	-1	-1	-1	0	0	+1	0	0	+1	+1	+1	+1	0	0	+1	+1	+1	+2
Economy (15%)	-2	-1	-2	-2	-2	-2	-2	-1	-1	0	0	-2	-1	1	0	0	-2	-1	-2	1	1	2
Topography and climate (15%)	-1	-1	0	-1	0	0	-1	0	0	+1	0	0	+1	+1	+1	+1	+1	0	+1	+1	+1	+1
Size (15%)	+2	+2	+2	+2	+2	+2	+2	+2	+2	+2	+2	+2	+2	+2	+2	+2	+2	+2	+2	+2	+2	+2
Insularity (15%)	-2	-1	-2	-2	-2	-2	-2	0	-1	0	-2	-2	0	0	0	0	-2	-2	0	0	-2	0
Remoteness (40%)	-2	-1	-1	-2	-1	-1	-2	0	0	+1	1	0	+1	+1	+1	+1	+1	0	+2	+2	+2	+2
Route area	Fagernes <sup>b</sup>	Florø	Førde	Sogndal	Sandane	Ørsta-Volda	Røros	Namsos and Rørvik <sup>c</sup>	Brønnøysund	Sandnessjøen	Mo i Rana	Mosjøen	Røst	Værøy	Leknes	Svolvær	Narvik	Harstad/Narvik	Andenes	Hasvik and Sørkjosen <sup>c</sup>	Lakselv	Vadsø, Vardø, Båtsfjord, Berlevåg, Mehamn, Honningsvåg and Hammerfest <sup>b</sup>

<sup>a</sup> A five graded scale where -2 is considerably less, -1 is less, 0 is equal to, +1 is more and +2 is considerably more peripheral than the outermost regions located in Europe.

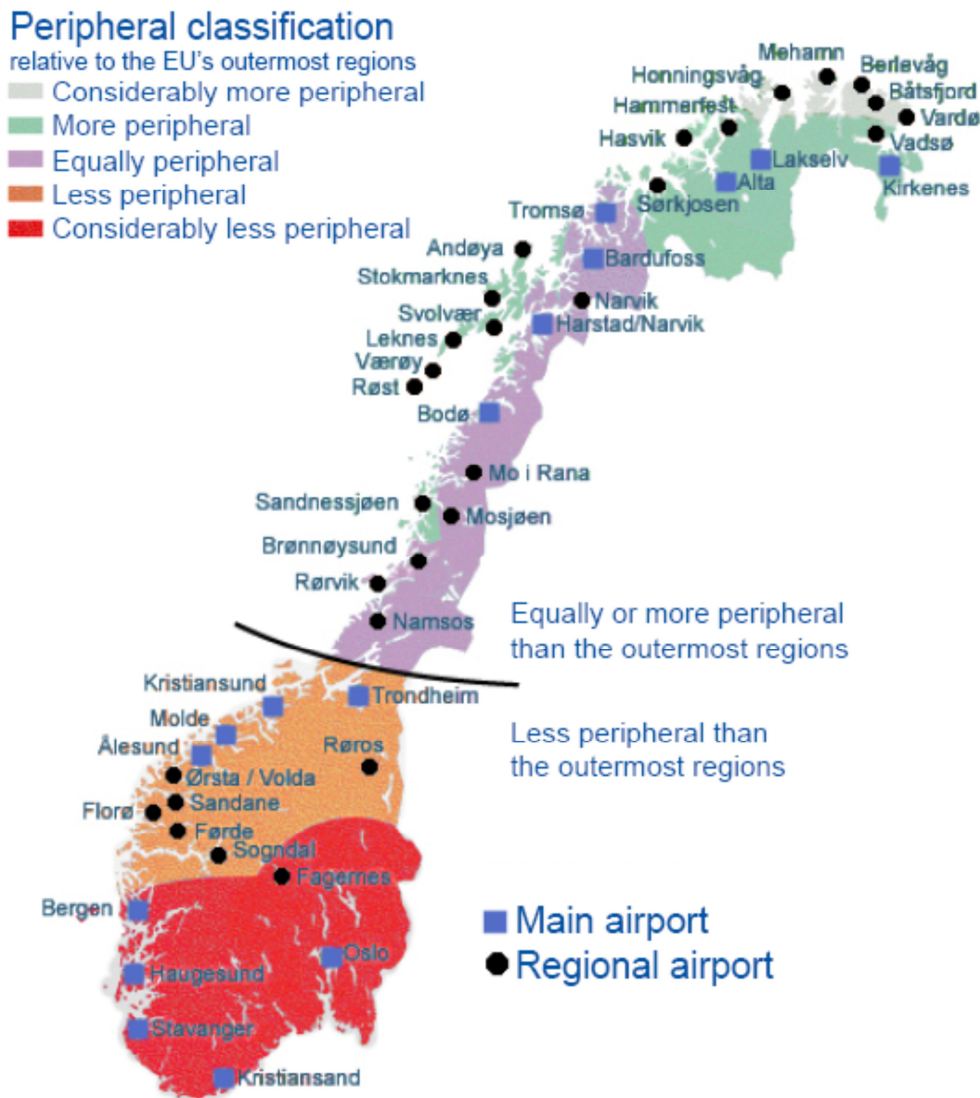
<sup>b</sup> The overall assessment is rounded to -2 due to its close proximity to the national main airport.

<sup>c</sup> Only the most peripheral airport within the route area is considered.



The majority of the airports are, according to Table 3, equally or more peripheral than the outermost regions. Hence, if a common rule should be implemented, it would be advisable to define all PSO-routes as peripheral to an extent similar to the comparable outermost regions. A single rule would improve handling of the tendering competitions for the regulator and simplify the procedures for the air transport companies.

Figure 1 - Peripheral Classification of the Norwegian Airports with PSO-Routes



If such a uniform rule is not possible, there are indeed patterns for the peripheral status of the areas throughout the country that can be used to separate them. It is illustrated in Figure 1 how a simple classification would distinguish on whether the airport is located in the north or not. This implies separating Middle Norway such that the route area of Namsos/Rørвик belongs to the north, while Rørvik belongs to the other category. The municipalities in the Northern part of Norway generally hold route areas that can be

considered as equally or more peripheral than the EU's outermost regions located in Europe. Route areas in the Eastern and Western part of Norway are generally less peripheral than the EU's outermost regions. Such a two part separation suggests the introduction of five-year contracts for route areas in the four northernmost counties and four-year contracts for route areas in all other counties.

In Table 3 it is assumed that "Remoteness" is given a higher weight than the other dimensions. A simple sensitivity analysis can be performed by assuming that all dimensions are given the same weight (20%). The only change is that the most northern region including Vadsø, Vardø etc. qualifies for the overall score +1 instead of +2. Hence, the number of regions being equally or more peripheral than the current outermost regions is the same and the conclusions are unchanged. Also, the sensitivity of the results can be commented on with respect to the limit values for the metric variables defining when categories are less/more and considerably less/more. If assuming reduced values for the limits to  $\pm 10\%$  (less/more) and  $\pm 20\%$  (considerably less/more), the variation in overall grade increases and three regions qualify for +2. If assuming increased values for the limits to  $\pm 40\%$  (less/more) and  $\pm 80\%$  (considerably less/more), the variation in overall grade is reduced and more regions qualify for the grade 0. Still, the most northern region is +2. In both cases the country is split between the north being equally or more peripheral and the south being less peripheral. Hence, the conclusions appear to be relatively robust.

## 5. CONCLUSIONS, IMPLICATIONS AND LIMITATIONS

The European Union has defined seven regions as outermost (or ultra-peripheral) of which three are located near the European mainland (the Azores, Madeira and the Canary Islands). These regions benefit from certain relaxations in EU law, amongst other things, implying extended duration from four to five years on tendered contracts in the scheduled regional air transport industry (routes subject to Public Service Obligation (PSO)). The Norwegian transport authorities want to apply five-year contracts on PSO-routes because this would reduce uncertainty for air transport companies and thereby stimulate a higher number of bidders to participate in the tender competitions. In the most recent tendering round starting 1<sup>st</sup> April 2012, five-year contracts were introduced for the PSO-routes located in the northern part of Norway.

A framework is presented to determine the peripheral status of Norwegian municipalities hosting airports with subsidized air transport routes relative to the current outermost regions of the European Union. Using a five graded scale the peripheral status is assessed by remoteness, insularity, size, topography and climate and economic dependence which are all indicators addressed in Article 299 of the EC Treaty. It is then discussed whether the regions currently receiving state aid for PSO-routes in Norway satisfy the criteria relevant for the application of five-year contracts which is restricted to outermost regions only.

The counties in the northern part of Norway generally consist of route areas that can be considered equally peripheral to or more peripheral than the EU's outermost regions located in Europe. Route areas in the Eastern and Western part of Norway are generally less peripheral than the EU's outermost regions. A sensitivity analysis attributing different weights to the five variables comprising the overall assessment shows that this conclusion is relatively robust. Consequently, our analysis of the peripheral status of local airports supports the extended contract duration implemented in the most recent round of tendered contracts for PSO-routes in northern Norway. The most important arguments supporting the view that the route areas in northern parts of Norway satisfy the criteria for classification of outermost regions are:

- Long travel distance and long travel time from the regions to the capital city of Oslo.
- Few alternatives to air transport.
- Difficult topography and tough coastal climate with particular problems for passenger transport related to winter climate.
- Economic dependence on few products and a population with a low average income compared to the country average.

It should be specified that the rules of regulation 1008/2008 allowing five-year tendering periods in the air passenger transport industry do not include Norway. In the same way as other overseas countries and territories (OCTs) related to EU, the peripheral regions of Norway do not form part of the outermost regions, and are not given these modifications of the law. Exceptions do, however, exist granting some peripheral regions of EU such as the Åland Islands some of the same modifications of the law as the outermost regions. It is, therefore, not unjust that air transport of passengers in peripheral regions of Norway are granted some modifications of the law with respect to the duration of tendered contracts, if this is reasonable and well justified. Similar arguments can be made for other remote regions

of Europe. It should, however, be emphasised that even though the adopted framework is reasonable, the valuation of each dimension is subject to our best judgement.

The possible juridical questions raised by such a modification of Commission law are not addressed in this study. Nor are the consequences of extended duration on the degree of competition. It is important to bear in mind that this article aims to provide a basis for assessing the peripheral status of the Norwegian local airports in relation to air transport of passengers. The results may differ in the cases of other services or products. Still, an approach similar to what is presented in this article should be applicable for assessment of peripheral status also with respect to relaxations of other types of regulations currently available to outermost regions only.

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