



Marginal costs pricing of airport operations in Norway



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ABSTRACT

The article first reviews the charge scheme used to finance the airport infrastructure in Norway. Then an econometric approach is taken using empirical data for production and costs from 2007 to 2009 in order to derive long-run marginal costs for passengers and air traffic movements at Norwegian airports using panel data analysis. The marginal costs are then applied as the basis for a revised airport charge scheme designed to meet the principle of maximizing social benefits. The results suggest that there should be a shift towards a relatively higher charge for passengers compared to air traffic movements.

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1. Introduction

Airport infrastructure is, in most countries, financed by airport charges put on the services produced at the airport, together with revenues from commercial activities (Losada, Eraso, & Garcia, 2012). The international air transport organizations aim for standardization of airport charges (Martin-Cejas, 1997) and ICAO (2009) has a general policy stating that charges, amongst other things, should be based on costs and also be non-discriminatory. Most airports charge both passengers (*PAX*) and air traffic movements (*ATM*), but there are variations with respect to the distribution of charges between *PAX* and *ATM*, both between countries and type of airport ownership.

Most Norwegian airports are operated by the state-owned company Avinor (see e.g. Lian, 2010) according to commercial principles. The network does not in total require state subsidies, but there is quite substantial cross-subsidization between the largest airports and those located in rural areas. Total operating costs vary considerably between the airports, due to different size and amount of traffic, and so does their cost efficiency (see e.g. GAP, 2012).

Many earlier studies of costs in airport operations have focused on analyzing efficiency and economies of scale (e.g. Martín, Román, & Voltes-Dorta, 2011; Pels, Nijkamp, & Rietveld, 2003). The aim of this article is to analyze the Norwegian airports' costs structure, using panel data models and subsequently derive the marginal cost of serving passengers and aeroplanes. The new panel data estimates enable better estimates of long-run marginal costs which, according to the social-welfare maximization principles (see e.g. Button, 2010), should be used as the basis for the national fare scheme. Taking the marginal cost estimations as a starting point, the article suggests a revised scheme for aviation charges designed according to the principles of welfare economics. The study is, in contrast to most other analyses of costs carried out in the transport industry, not an efficiency study, but rather focuses on providing new and better estimates on the actual costs of producing the current transport services.

The article first provides a brief presentation of the Norwegian airport infrastructure with special focus on how it is currently financed in Section 2. Then, Section 3 presents an econometric model suitable for studying long-run marginal costs at Norwegian airports using panel data analysis. Next, Section 4 gives details about the data set, presents model results and derives marginal costs for *PAX* and *ATM*. The results are applied in new schemes for airport charges in Section 5 where the cost of raising public funds also is taken into account. Finally, possible implications for air transport companies, passengers and the

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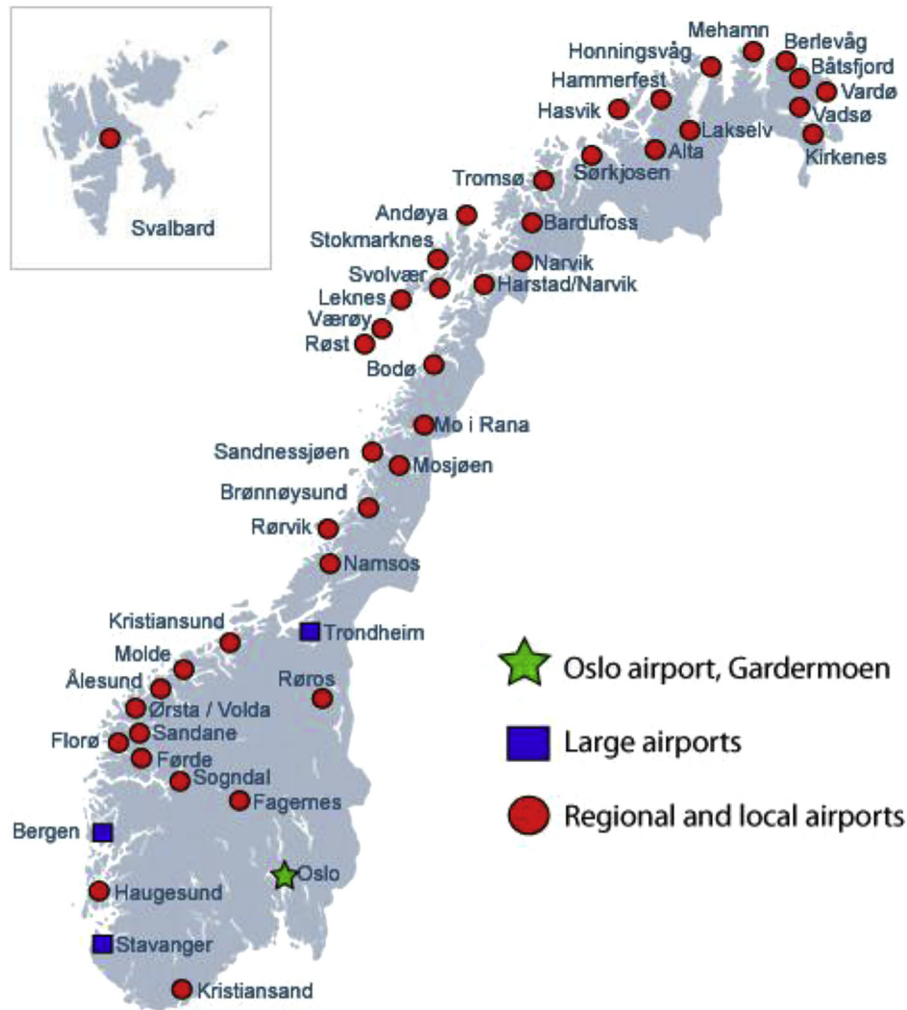


Fig. 1. Norwegian airports owned by Avinor.
Source: Avinor.

authorities by implementing these airport charges are briefly discussed in Section 6.

2. Norwegian airport network and airport charges

2.1. The Norwegian airport structure

Today Norway is amongst the countries in Europe with the highest air transport dependence (Williams, Fewings, & Fuglum, 2007). While Norway in 2003 had a domestic air trip rate per capita of 2.27, most European countries had less than one third of this value. Moreover, Williams et al. (2007) show that Norway has the highest number of commercial airports with short runways (<1000 m) in Europe.¹ Many of these airports have low traffic and are located in areas which can be classified as peripheral (Kjærland & Mathisen, 2012).

Consequently, in order to maintain satisfying provision of routes, the Norwegian Ministry of Transport and Communications procures air transport services from many of these airports through a public service obligation (PSO) system. Norway is, according to

the European Commission (2009), a dominating 'PSO-country' in Europe holding nearly 20% of all restricted PSO-routes. In 2009 the government used about NOK 574² million to subsidize PSO-operations to and from these airports (St. prp. 42, 2008–2009). The subsidized contracts are awarded as net contracts using competitive tendering every fourth or fifth year.³ The PSO regulations give the winning operator exclusive rights to operate the defined routes with a determined frequency, size of aircraft, maximum fare level, and social discounts. In 2013 almost all Norwegian PSO-routes are operated by Widerøes, the largest regional airline company in Scandinavia.

The state, through the wholly owned company Avinor, owns and operates 46 airports throughout Norway with a total annual traffic of about 44 million passengers (PAX) in 2012 (Avinor, 2013). Avinor organizes the airports into three groups in which the main airport of Norway (OSL), located near the capital city Oslo, makes up the first 'group', the three other large airports located near the cities of Bergen, Stavanger and Trondheim make up the second group and the remaining 42 airports make up the third group as illustrated in Fig. 1.

¹ Short Take-Off and Landing (STOL) planes such as Bombardier Dash-8 100 (DHC-8) operate on local airports with runways as short as 800 m. Local airports with sufficiently long runways are operated by jet planes.

² € 1 ≈ NOK 8.

³ In the southern part of Norway the contract length is four years while it is five years in Northern Norway (see e.g. Kjærland & Mathisen, 2012).

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