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Express coaches: An up-hill battle after liberalization?

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Abstract

Express coach services have thrived in Norway following the stepwise liberalization that started in the mid-1990s. However, recent years have witnessed consolidation, stagnation, and, sometimes, decline in the Norwegian express coach market.

In this paper, we study this process of rapid growth which turned into gradual decline in Norway. Looking at factors contributing to this development, we investigate intermodal competition with local public transport, air, car and rail; and the effects of increased public-sector involvement - both as a passenger transport provider and as an infrastructure provider.

This paper relies on three data sources and methods: 1) National travel survey data 2) Historical market data and 3) Case studies.

Our main findings are that, following liberalization, express coach services were mainly established in markets underserved by other modes, where express coaches had lower operating costs as well as generalized costs than the available alternatives. These markets have gradually been provided with better alternative transport services: For the long-distance coach lines, competition from low-cost air carriers has been significant. For shorter lines, improved road infrastructure and rail services have increased competition by private cars and rail. Also, initiatives to increase and improve local public transport have impacted the express coach industry.

Keywords

Long-distance passenger transport; Express coaches; Liberalization; Intermodal competition

JEL classification

G34; L98; L92; R41

1. Introduction

Is long-distance public transport commercially viable in rural and remote areas? In this paper, we study the development of the express coach market in southern Norway following liberalization. Norway is an interesting country to study because it is something of an 'extreme case' in terms of long distances and low population density in large parts of the country, and because regulation policies have changed considerably during the recent decades. What can policy-makers learn from these experiences?

Norway's geography is unique, with many small and mid-sized rural towns and communities located along a long coast with several long fjords. The southern part has a relative large number of mid-sized and small towns, mostly located along the coast, combined with a mountainous landscape in the inner parts. This setting creates challenges for scheduled transport, in particular to provide services linking geographically relatively isolated communities and more central areas of the country. The advantage of this geography is that many communities are linked either by a coastal road or a road following the valley, giving 'natural' routes for public transport to follow, much as in the case for Switzerland (Petersen, 2016). However, the Norwegian valleys are typically longer, and with a much lower population density than the Swiss case. Map 1, Map 2 detail the geography of southern Norway.



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Map 1. Railway lines in Southern Norway, with major express coach destinations named.



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Map 2. Railway lines in South-East Norway, with major express coach destinations highlighted.¹

Most of the Norwegian local public transport network is organized and subsidized by regional governments, and is focused on serving local needs within the 19 regions (*fylker*). Local rail services are provided, and subsidized, by the central government around the major cities (Aarhaug et al., 2017, Longva & Osland, 2010).

Transport between regions is largely commercial, and the dominant mode for longer distances (above 250 km) is, besides the private car, commercial air transport, although rail services also exist. Regional transport is also dominated by private car. However, in particular in southeastern Norway, rail services, which are subsidized by the central government, have significant shares of the intermediate distance markets. Intermediate distances are in this context defined as crossing regional borders, but

not crossing the central mountains, typically between 75 km and 250 km. There is also a market for subsidized air transport and, the focus of this paper, commercial express coach services.

Norway has a long history of operating commercial express coach services that provide a long-distance service to communities which are accessible by road, but not rail. However, it was not until the two waves of liberalization in 1998 and 2003 that express coaches became a significant transport mode. The liberalization reforms included removing restrictions against operating express coaches in parallel with railways and the local governments' right to deny licenses.

The effects of these liberalization waves have been studied by [Aarhaug and Fearnley \(2016\)](#), [Leiren and Fearnley \(2008\)](#) and [Alexandersson et al. \(2010\)](#) amongst others. These studies have identified a rapid growth in the number of operators and lines operated, immediately following liberalization, following an 'S-shape' pattern in line with theory for how a new technology enters a new market. Similar findings from a similar liberalization process include [Augustin et al. \(2014\)](#) and [Dürr and Hüscherlath \(2017\)](#) from Germany, and [Blayac and Bougette \(2017\)](#) from France. [Aarhaug and Fearnley \(2016\)](#) also point out that the initial rapid expansion of these services was followed by a longer period of consolidation, with few new lines, and stable operations, in line with the findings in [White and Robbins \(2012\)](#) from Britain.

In this article, we use the term 'line' to describe a particular service along a given route marketed as a distinct unit, either with a separate number or name, as used by the industry. This means that when three different companies have services along the same route, as the case is between Oslo and Kristiansand, this is categorised as three 'lines'. However, when one company operates a group of services with smaller variations (some departures making detours to serve an airport, or a smaller community), but operated under a common name, and mainly following the same route, this is categorised as a single 'line'.

This paper describes some of the historical developments, but focuses on the changing intermodal competition that has happened since express coach travel peaked (in terms of number of passengers) in Norway in 2007/2008. This process illustrates some of the underlying economic factors which cause the challenges faced by express coaches as a mode.

2. Empirical, historical and theoretical context

2.1. Transport markets over longer distances in Norway

Based on data from the National Travel Survey 2013/2014, (NTS; [Hjorthol, Engebretsen, & Uteng, 2014](#)), we have analysed some of the characteristics of express bus passengers and passengers on other travel modes in Norway for trips longer than 100 km. The sample comprises of travel reports for approximately 47 000 trips longer than 100 km in Norway, of which around 1750 were made by coach. The modal share of coaches (and busses) for trips longer than 100 km, in 2013/14, was 4 percent, down from 6 percent in 2005 and 2009 ([Hjorthol et al., 2014](#)).

Table 1 shows the average values of each characteristic. These show a higher share of women among coach and train passengers than among other travellers, and also a higher share of young people (<35 years), students and people with low income (<NOK 400 000, about € 43 000²).

Table 1. Characteristics of travellers on trips longer than 100 km, by mode.

| | Car | Bus | Train | Air | All |
|-----------------------|---------|---------|---------|---------|---------|
| | (means) | (means) | (means) | (means) | (means) |
| Woman | 0.47 | 0.58 | 0.58 | 0.47 | 0.48 |
| Mean age | 47.04 | 43.91 | 42.63 | 42.93 | 45.45 |
| Age < 35 years | 0.27 | 0.44 | 0.41 | 0.34 | 0.30 |
| Age > 66 years | 0.15 | 0.22 | 0.13 | 0.08 | 0.13 |
| Student | 0.10 | 0.22 | 0.19 | 0.12 | 0.12 |
| Not working full time | 0.39 | 0.57 | 0.47 | 0.29 | 0.37 |
| Income < 400 000 NOK | 0.09 | 0.22 | 0.18 | 0.10 | 0.10 |
| Work-related trip | 0.10 | 0.15 | 0.25 | 0.29 | 0.17 |
| Major city | 0.41 | 0.37 | 0.43 | 0.53 | 0.44 |
| Rural | 0.24 | 0.24 | 0.15 | 0.15 | 0.21 |
| Observations | 30816 | 1757 | 2328 | 12330 | 47231 |

Note: Trips are weighted based on geography, age, season and weekday (cf. [Gregersen, 2017](#)).

However, coach passengers also differ from train passengers. A higher share among coach passengers has reached the retirement age (>66 years) or is not working full time. Coach passengers are also somewhat more likely to have low income or live in a rural area, and somewhat less likely to live in a major city.

When looking at trip purpose, only 15 percent of coach passengers are on a work-related trip (business trip or trip to/from work). This is considerably lower than among train and air passengers. However, the share among car travellers is even lower, reflecting that long-distance car trips are often leisure trips.

The profile of the typical Norwegian express coach passengers is thus women, in their student or in retirement age, with reduced work engagement and somewhat lower personal income than the average Norwegian. They also travel more for leisure trips rather than work related trips, and are living in a rural area apart from the four biggest cities, more so than the average travelers.

Several of these characteristics are likely to be correlated. To assess the importance of each characteristic and evaluate statistical significance, we have estimated a logit model shown in [Table 2](#). This shows the impact of each characteristic on the choice of coach over all other modes (columns 1 and 2) and on the choice of coach over train (column 3 and 4). Since age group and working status are likely to be highly correlated (cf. [Appendix Table A.1](#)), we estimate models both with and without the age group variables.

Table 2. Effects of traveller characteristics on the choice of coach. Logit model.

| | (1) Coach vs. rest | (2) Coach vs. rest | (3) Coach vs. train | (4) Coach vs. train |
|--------------------------------|----------------------|----------------------|----------------------|----------------------|
| Woman | 0.382*** (0.083) | 0.352*** (0.083) | -0.068 (0.103) | -0.100 (0.103) |
| Age | 0.007 (0.006) | -0.002 (0.004) | 0.007 (0.007) | 0.003 (0.004) |
| Age < 35 years | 0.836*** (0.161) | | 0.482** (0.213) | |
| Age > 66 years | 0.614*** (0.162) | | 0.446** (0.211) | |
| Student | 0.264 (0.184) | 0.319* (0.190) | 0.084 (0.228) | 0.091 (0.226) |
| Not working full time | 0.362*** (0.125) | 0.748*** (0.100) | 0.008 (0.163) | 0.191 (0.147) |
| Income < 400 000 NOK | 0.545*** (0.103) | | -0.002 (0.139) | |
| Work-related trip | 0.352*** (0.110) | 0.298*** (0.109) | -0.471*** (0.136) | -0.529*** (0.135) |
| Major city | -0.320*** (0.081) | -0.298*** (0.081) | -0.139 (0.105) | -0.146 (0.105) |
| Rural | 0.006 (0.119) | -0.011 (0.118) | 0.510*** (0.171) | 0.499*** (0.171) |
| Pseudo R-squared | 0.05 | 0.03 | 0.03 | 0.02 |
| Number of observations | 47231 | 47231 | 4085 | 4085 |

Note: Trips are weighted based on geography, age, season and weekday (cf. [Gregersen, 2017](#)). * p < 0.1, **p < 0.05, ***p < 0.01. Robust standard errors in parentheses.

These results largely confirm the findings from [Table 2](#). One exception is that not working full time or having low income does not have a significant impact on probability of using coach over train (columns 3 and 4). However, when dropping the income variable, the effect of not working full time goes in the expected direction. The effect of living outside the major cities is also non-significant when only comparing coach and train passengers.

This simple regression model does not take into account that the choice set in terms of available travel modes differs between trip origins and destination. Hence, the estimated effects of the included characteristics probably reflect both demand and supply. In any case, the results illustrate that express coaches serve different markets than other modes of travel and are important for the mobility of some specific segments of the population.

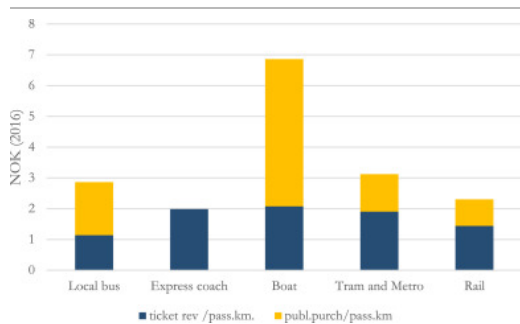
One might conclude that coach travel is chosen because of a lower ticket price or travel cost, in particular by people who may have more available time, and less income, than a full-time worker. It appears that other modes of transport are more likely to be used when the traveller has higher income, has full-time employment, or travels for work-related reasons. The closest in profile is the train traveller, who has somewhat similar characteristics as the bus passenger. Train and bus passengers also face comparable travel cost.

2.2. The Norwegian express coach industry

The term “express coach” was introduced by the Norwegian industry. It describes bus transport crossing regional borders, i.e. a bus which serves two or more of Norway’s 19 regions (*fylker*).³ The definition excludes coach services that only serve a single destination, such as airport express services, however airports are transport hubs and therefore also served as an intermediary destination by express coach services. The Norwegian definition is similar to the definitions used in, e.g., Italy and Sweden, although the latter also includes a minimum route length of 100 km (*van de Velde, 2009*), but differs from definitions that purely relate to distance or, as in the UK, passenger trip length (>15 miles measured in a straight line; *White, 2001*). The typical Norwegian express coach has a high average speed and few stops compared to local bus services, and is with few exceptions operated on a commercial basis (*Aarhaug & Fearnley, 2016*).

The Norwegian express coach market was long dominated by the marketing company *Nor-way bussekspress (NBE)*. NBE was jointly owned by some 20 plus coach companies in 2012. When it was founded in 1988, it was owned by 52 companies. In 2016, it was owned by 12 bus and coach companies of which some are fully owned subsidiaries of other bus and coach companies owning shares in NBE. In total, the owners NBE represent nine different parent companies, eight of which are Norwegian owned. Four of these have municipalities as majority owners and four by private investors. NBE’s brand domination was ended on the 1st of May 2013, when *Nettbuss*, the largest single company within NBE, withdrew and started operation under its own brand, *Nettbuss ekspress*. In 2017, the market shares, in terms of number of lines operated by the different companies, are roughly split 50-50 between the two. NBE operates more lines, while *Nettbuss* express has more heavily trafficked lines (*Thompson, 2017*).

Compared with other public transport modes, express coaches operate with no or close to no public subsidies (*Fig. 1*).



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Fig. 1. Ticket revenue and public purchase (i.e. subsidy) per passenger km (national averages).⁴

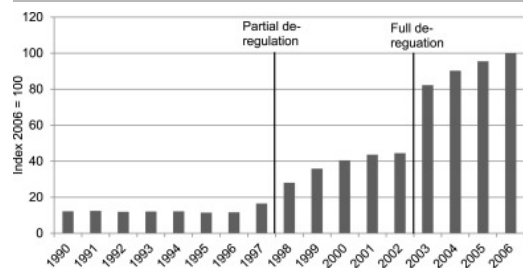
Fig. 1 illustrates that the express coaches offer the cheapest passenger kilometres among public transport modes in Norway, and that unlike other modes, the express coach services receive negligible public subsidies. Cheap passenger kilometres are in part a result of relatively high occupancy rates, long distances and high cost efficiency.

2.3. Rapid growth following deregulation

Although there has been a long history of long distance express coach operation in Norway, deregulation massively increased the express coach markets in Norway. In the 1980s, most express coach routes were extended local routes. Operators with area licenses in neighbouring regions cooperated and joined their licenses in order to operate through-services. Such cooperation was a de facto requirement for establishing express coach routes pre-deregulation (*Leiren & Fearnley, 2008*). This regulation was first lifted in limited areas in 1999 when consideration of passengers’ benefit became the important consideration. Then, in 2003, entry regulation was abolished all together for services crossing regional borders, which is the official definition of express coaches in Norway (*Leiren et al., 2008*).

Rapid growth followed deregulation, mostly by the addition of new lines. This included both medium-distance lines, in particular *Nettbuss*’ “*TIMEkspressen*” and long-distance lines. The development in passengers followed a similar path as the development in the number of lines, growing from 2 million in 2000 to 5,6 million in 2007 (*Aarhaug & Fearnley, 2016*). Both the increase in

numbers of passengers carried and in the number of lines offered followed an 'S'-curved development of rapid growth towards saturation, as shown in Fig. 2.



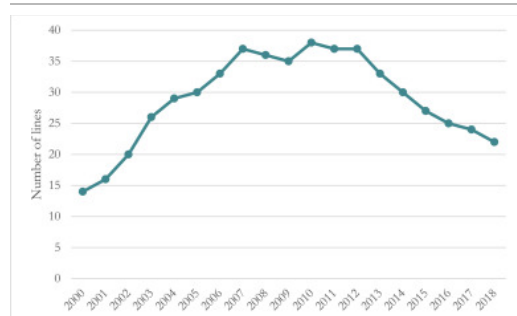
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Fig. 2. Index of passenger development, selected lines. 2006 = 100 (Data Source: [Leiren et al., 2008](#)).

2.4. Consolidation following growth

The rapid growth in the express coach markets, observed immediately after deregulation, slowed down. Since 2007–2008, there has been stagnation or negative growth both in terms of the number of passengers and the number of lines. Many lines report poor earnings and the number of companies involved in express coach operation drops. In particular, Nettbuss express' service TIMEkspresen has lost significant passenger numbers. [Thompson \(2017\)](#) reports a drop of 70 percent, from 4,6 million passengers in 2011 to 1,4 million passengers in 2016.

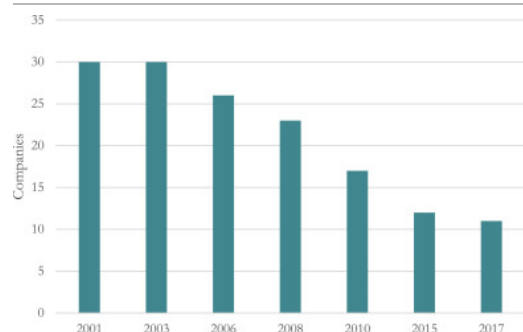
[Fig. 3](#) shows the number of express coach lines in operation between 2000 and 2018. There was a rapid growth in the number of lines following deregulation, and then a decline from 2012 onwards.



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Fig. 3. Number of express coach lines in operation.⁵

[Fig. 4](#) shows the number of independent express coach operators in the Norwegian market. The number has dropped significantly from 2003 to 2015. However, there has been little change in the number of companies since 2015. Only one smaller company has ended its express coach operation, selling its express coach services to a major company. The company still exists but operates only on tendered local public transport contracts and the market for tourist coach services. The major change in ownership structure between 2000 and 2015 is mostly the result of major companies (in particular Nettbuss, Torghatten and Boreal) acquiring smaller local bus companies. Our study indicates that this reduction and consolidation only to a very limited degree is a result of express coach market developments.



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Fig. 4. Number of independent bus/coach companies with express coach lines.

As of 2017, none of the companies operating express coach services had this as their sole service. Most of the companies are heavily involved in local bus transport, which is mostly done on competitive tendering contracts awarded by regional governments. Other companies are also operating tourist coach services and freight. In parallel to this, the market for local subsidized bus services has gone through a similar structural change of reduced numbers of active companies (see [Mathisen & Solvoll, 2008](#)), as a part of a market consolidation phase.

2.5. Increased intermodal competition and reduced market shares

In terms of market developments and intermodal competition, there have been three major changes in Norway that have had a direct effect on the express coach market.

First, the air carrier *Norwegian* started operating domestic low-cost lines in September 2002. This changed the competitive market on most major longer distance intercity relations. In particular, this is the case for travel between the major cities in the relatively populous southern Norway (e.g. Oslo-Bergen, Oslo-Stavanger, Oslo-Ålesund, Oslo-Trondheim, etc.). Air fares dropped on relations with more than one operator ([Thune-Larsen & Farstad, 2016](#)).

Second, public transport has in general attracted massive political attention in Norway. Public transport has in part been used as a tool to brand regional governments' role in service provision and the central government's role in the provision of rail services and highways. This has translated into rapidly increasing public funding of public transport operations and infrastructure. To a certain degree this increase in public spending has been at the expense of commercial operators. Five express coach lines have been replaced by lines operated by regional governments between 2015 and 2017. The regional governments typically take over an express coach line by first including a new line serving the same relations, with a similar stop pattern as the existing commercial express coach service, in its gross contract tenders for local public transport. This is then offered to the public as part of the Public Transport Authority's (PTA) service network and with subsidized fares. The PTA fares are typically substantially cheaper than the commercial fares, with better transfer possibilities to other modes or lines. As a consequence, the PTA service will be preferred by a significantly large proportion of passengers, rendering the commercial service unprofitable. In terms of service quality and frequency, there is limited evidence on any difference between PTA operated and commercial coaches on the same corridors. However, in some ways the service has been reduced, as the direct through-going line has been replaced with a PTA-internal line that requires a transfer to train, e.g. to go to Oslo, instead of the coach service going all the way.

Between December 2012 and December 2014 there was a massive increase in medium-distance passenger rail service levels. New railway lines have been introduced, and the upgrading of the central rail tunnel in Oslo has alleviated capacity restrictions on the rail network. Following this, the operating frequency has been increased on the medium-distance rail network, in particular in the Greater Oslo area. This has included offering more frequent and faster rail services to areas where there previously was an overlap in catchment area between rail and express coach services.

Third, there has been a massive increase in government spending on road construction, with new dual carriageways opened, particularly in the south-east. This has improved the road network, and although many of these new roads are tolled, they have contributed to increased competitiveness for the private car on medium-distance and long-distance trips. Better roads change the intermodal competition between car and express coach in favour of the car, by three mechanisms. First, the travel time savings are greater for car than for express coaches, as the express coaches are limited to 80 km/h, while private cars frequently can travel legally at 110 km/h, resulting in greater time savings for car users. Second, since new roads typically bypass city and town centres, which the express bus must serve, this requires more deviations and detours from the faster road. Third, which we elaborate on in the next section, the value of each unit of time saving is greater for car users compared with express coach users.

3. Competition and generalized costs

One way to assess the market potential of different modes of transport and the degree of competition between them is to look at generalized costs (GC) of using each mode for a representative traveller undertaking a certain trip.⁶ GC consist of monetary costs as well as time costs and other disutilities from making a trip, all measured in monetary terms. In addition, there will be an alternative-specific constant term that represents preferences for each mode that are not captured by the included trip attributes.

In reality, travellers are heterogeneous and their preferences differ. Therefore, they will not all choose the mode that has the lowest average GC. However, if a mode has substantially higher GC than its alternatives, this would indicate a low market potential. If, however, another mode is very close to the mode having the lowest GC, it would indicate tight competition between these modes.

The value of travel time savings (VTTS) varies between trip purposes and transport modes. If we segment into (1) business trips, (2) trips to and from work and (3) leisure trips, VTTS is highest for business trips and lowest for leisure trips. Other things equal, this implies that car, which is a faster and more flexible mode, is preferred over coach on business trips and trips to and from work. At the same time, car occupancy is lower on such trips, and the monetary costs per traveller are therefore higher. Coach (and train) is also less costly for travellers going to and from work because these typically buy season tickets.⁷ Hence, coach

might compete with car in this segment if service frequency is sufficiently high and the coach stops close to the home and workplace locations.

VTTS also differs between modes of transport. The problem with using GC, based on official VTTS figures, to capture competition between modes of transport is that these differences in VTTS between modes partly reflect that the travellers are different: Public transit users typically have lower income (cf. section 2.1) and therefore lower VTTS. Flügel (2014) uses data from a stated choice experiment designed to separate out this effect. He finds that even when comparing between modes for the same traveller, VTTS is lower on coach trips than car trips. This suggests that travellers do not care as much about the trip time when going by coach, because they do not have to focus on driving and can do other activities while traveling. These results are reproduced in Table 3.

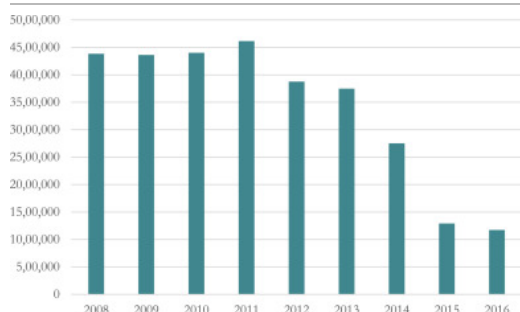
Table 3. Value of travel time savings (euro/hour) of travellers when using their current mode and an alternative mode of travel (Flügel, 2014). Private trips longer than 100 km.

| Current mode | Switch to | | | |
|--------------|-----------|-------|-------|------|
| | Car | Coach | Train | Air |
| Car | 18.8 | 17.0 | 18.8 | 36.1 |
| Coach | 15.4 | 11.8 | 11.3 | 17.5 |
| Train | 19.9 | 13.6 | 14.3 | 22.2 |
| Air | 19.1 | 11.2 | 12.1 | 26.0 |

This implies that a highway improvement that results in shorter travel time will increase the competitiveness of car relative to a coach operating on the same road, because the time reduction is worth more on car trips. On the other hand, highway improvements make coaches more competitive vis-à-vis trains.

4. Cases

One of the most well-known success stories of the Norwegian express coach industry has been the TIMEkspressen brand. At its peak in 2011, it operated 14 lines. The TIMEkspressen brand has been used on medium to long distance lines (75–200 km), served with a high frequency (TIMEkspressen translates to the 'hourly express'). This product has been most directly affected by increased intermodal competition. The total annual number of passengers for all TIMEkspressen lines between 2008 and 2016 is shown in Fig. 5.



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Fig. 5. Annual number of passengers on TIMEkspressen lines (Nettbuss).

Fig. 5 can be divided in two time periods. From 2008 to 2011, there was limited growth and high levels of service. From 2012 to 2016, the number of passengers has dropped dramatically. This passenger drop has been followed by a similar development in the number of lines operated by TIMEkspressen. These developments were also experienced by NBE (Table 3) and in total (Fig. 3).

Table 4 illustrates the fact that out of the total of 16 lines that have been in operation under the TIMEkspressen brand, only four are still running. Another six lines are in operation as services offered by PTAs (as lines 6 and 7 were joined and replaced by line 12 before the regional government included it in its tendered services), and further four lines are no longer in operation and have not been replaced. Out of a total of 26 NBE lines in operation in 2012, only 10 remain in operation under the NBE brand in February 2018. A further five are still in operation, but no longer branded as part of NBE. And three are at least partially replaced with PTA organized services. Five of the NBE line discontinuations can be directly linked with competition from low cost air carriers.

Table 4. Status of the different lines, TIMEkspressen and NBE, February 2018.

| Line | Name/Route | Status | Comment |
|--|---|------------------------------|--|
| TIMEkspresen (Nettbuss), medium distance | | | |
| 1 | Notodden-Kongsberg-Drammen-Oslo | Still in operation | Rebranded NX1 2018 |
| 2 | (Charlottenberg) Kongsvinger-Skarnes-Oslo | Discontinued 2016 | Competition with rail - described separately |
| 3 | (Halden) Sarpsborg-Moss-Oslo | Still in operation | Reduced service |
| 4 | Hønefoss-Oslo | Discontinued 2015 | Replaced by PTA-service |
| 5 | Arendal-Kristiansand | Discontinued 2013 | Replaced by PTA-service |
| 6 | Stjørdal-Trondheim | | Replaced by line 12 |
| 6 | Hvaler-Fredrikstad-Oslo | Still in operation | |
| 7 | Støren-Melhus-Trondheim | | Replaced by line 12 |
| 7 | Åsgårdstrand-Horten-Oslo | Discontinued 2012 | Competition with rail/car |
| 8 | Tjøme-Tønsberg-Oslo | Discontinued 2015 | Competition with rail/car |
| 9 | Mysen-Askim-Oslo | Discontinued 2014 | In part replaced by PTA-service |
| 10 | Vikersund-Drammen-Oslo | Discontinued 2014 | In part replaced by PTA-service |
| 11 | Volda-Ålesund-Molde-Kristiansund | Discontinued 2015 | Replaced by PTA-service |
| 12 | Stjørdal-Trondheim-Fannrem | Discontinued 2011 | Replaced by PTA-service |
| 14 | Stavern-Larvik-Sandefjord-Oslo | Discontinued 2017 | Competition with rail/car |
| 15 | Gjøvik-Skreia-Gardermoen-Oslo | Still in operation | Rebranded NX15 May 2017 |
| NOR-WAY Bussekspress lines (NBE), long distance | | | |
| 130 | Trysilkekspressen | Still in operation | |
| 135 | Østerdalsekspressen | Discontinued 2012/13 | competition with air |
| 141 | Lavprisekspressen Oslo-Trondheim | Still in operation | no longer branded NBE |
| 142 | Dag- og Nattekspressen | Discontinued 2012/13 | competition with air |
| 145/6 | Møre-ekspressen | Cut back, still in operation | competition with air ^a => to Nettbuss |
| 147 | Nordfjordekspressen | Discontinued 2013 | competition with air |
| 148 | Gudbrandsdalekspressen | Discontinued 2013 | In part replaced by PTA-service |
| 160/1/3 | Valdreslekspressen | Still in operation | |
| 162 | Øst-Vest Xpressen | Still in operation | |
| 170 | Sogn og Fjordaneekspressen | Still in operation | => to Nettbuss |
| 175 | Hallingbussen | Cut back, still in operation | => to Nettbuss in cooperation with PTA |
| 180 | Haukeliekspressen | Still in operation | |
| 182 | Telemarkekspressen | Still in operation | |
| 185 | Oslo-Rjukan | Still in operation | |
| 190 | Sørlandsekspressen | Still in operation | => Nettbuss |
| 191 | Lavprisekspressen Oslo-Sørlandet | Still in operation | no longer branded NBE |
| 192 | Konkurrenten.no | Still in operation | |
| 194 | Grenlandsekspressen | Still in operation | |
| 221 | Setesdalekspressen | Discontinued 2015 | Replaced by PTA-service |
| 300 | Sør-Vest ekspressen | Still in operation | |
| 320 | Suleskarekspressen | Discontinued 2012 | |
| 400 | Kystbussen | still in operation | |
| 430/1 | Fjordekspressen | still in operation | |
| 450 | Sognebussen | still in operation | => Nettbuss |

| Line | Name/Route | Status | Comment |
|------|-----------------------|-------------------|---------------------------------|
| 611 | Røros-ekspressen | Discontinued 2013 | |
| 630 | Mørelinjen o/Surnadal | Discontinued 2013 | Competition with air |
| 670 | Namsos-Trondheim | Discontinued 2018 | In part replaced by PTA-service |

a

Mørelinjen 145 and Nordfjordekspressen 147, were joined to form a new line NX146 (operated by Nettbuss outside NBE), after the original 146 was discontinued. The number of services were reduced.

The TIMEkspressen lines that have discontinued service, and not been replaced by a regional public service between 2012 and 2017, all faced competition from rail, along key sections of their market. The lines that have been replaced by PTA-organized local services, have a common feature in that they serve markets where local traffic, within a region, is dominating their market. This suggests that the commercial activity is a victim of its own success, in being replaced by a non-commercial service. For the NBE lines, which cover longer distances and often are inter-regional services, competition from air transport has also been an important factor.

4.1. The story of TE2

A case where an express coach service that was highly successful in the 2000s has lost out in recent years, is the *TIMEkspressen line 2 (TE2)* between Oslo (the capital) and Kongsvinger. Kongsvinger has about 12 000 inhabitants, but closer to 20 000 when including surrounding areas, and is situated close to the Swedish border east of Oslo. This line is roughly 100 km long, and was in 2010 operated with 160 departures per direction per week, which is a high frequency in a Norwegian express coach context. At the time, it had about 441 000 passengers per year. It operated along the main roads E6 and RV2 and it was operated commercially, without subsidies. However, it was not excessively profitable. Its revenues per kilometre was just below average for its category of lines in 2010.⁸

Roughly in parallel with the TE2 line, there is a railway line, *Kongsvingerbanen*. A key difference is that the rail line runs on the south side of the river Glomma, while the TE2 line ran on the northern side. The northern side is more populated. The Kongsvingerbanen railway line commenced operation in 1862 and is a single-track railway, forming part of the link between Oslo and Stockholm. As the line is relatively old, the operating speed is modest, giving a scheduled operating time of about 1 h 30 min⁹, roughly equal to the scheduled time of the TE2 coach line (which varies between 1 h 35 min and 1 h 40 min).

The major change in intermodal competition between rail and coach came as part of the introduction of the new railway schedule R2012 in December 2012. This increased the number of train departures between Oslo and Kongsvinger from 61 departures per direction per week to 135 departures per direction per week. This increase in traffic was followed by an increase in subsidies, to about NOK 153 mill per year in 2013,¹⁰ an increase of almost NOK 40 million. The subsidy is also linked to other passenger traffic along the Kongsvinger line, not only endpoint to endpoint.

Since Oslo was one of Europe's fastest growing cities in the period 2004–2014 ([Eurostat, 2017](#)), road congestion also got worse over the period. In 2015, typical delays of 30 min each direction during peak hours were reported by the express coach operator.¹¹

TE2 Kongsvinger ceased operations on the 30th of April 2016 after 16 years of operation.¹² In the official statement, the closure was a result of economic losses due to falling traffic volumes since 2013, mainly due to competition with rail following the implementation of the new framework schedule R2012 and increased congestion around Oslo.

Looking at the changes from a commuter's point of view, the price difference between the coach and the train is insignificant. Also, the differences in travel time are small. Neither price or travel time is affected by the new railway schedule. The change in the difference in GC stems from the increase in rail frequency. This constitutes a reduction of rail GC of about 10 percent.

Still, using the official VTTS, GC indicates tight competition between the two modes also after the increase in rail frequency. Ignoring the alternative-specific constant, most passengers would enjoy a lower GC choosing the coach, at least until the frequency of the coach service was reduced. However, interviews with passengers on the line indicate that the VTTS difference between the coach and train in question is larger than indicated by the findings of [Flügel \(2014\)](#). The stated difference is that at least some of the commuters, who were not able to work on the coach can work on the train.

5. Discussion

5.1. Underlying economic challenges for express coaches

In the rapid expansions that followed each liberalization step, express coaches filled a niche in the transport system by offering high quality scheduled transport to areas previously underserved by public transport. These services proved to be highly successful. However, they were in general not very profitable, compared to other industries ([Thompson, 2017](#)).

Looking at the generalized cost of some of the routes offered by the express coaches, they had a clear advantage compared to other modes during the mid-2000s. In particular, they offered new mobility opportunities for persons without access to private cars and for rural dwellers that did not enjoy the benefits of rail and air city-to-city services. As wealth and car ownership grew in the period, this market segment has become smaller. GNP per capita increased by 133 percent from 1998 to 2014 ([Statistics Norway, 2018a](#)), while car ownership grew from 481 cars per 1000 inhabitants in 2003 to 590 cars per 1000 inhabitants in 2016 ([Statistics Norway, 2018b](#)). Also, although there is a population growth in general in Norway, there is a strong link between population size in an area and population development ([Aarhaug & Gundersen, 2017](#)). Areas with low populations experience negative population growth, reducing the overall size and hence the revenue base of some key express coach markets.

5.2. Possibilities for supporting express coaches

The passenger profile identified in section 2.1, together with express coaches' geographical scope which covers areas not otherwise properly served by public transport, suggest that express coaches represent lifeline services to vulnerable population groups which would otherwise be deprived of their mobility needs. A healthy and thriving express coach industry would help safeguard their welfare and mobility. However, as we have shown, the industry suffers stagnation, decline and deficit. As a public mode of transport which, in contrast to all other land transit modes in Norway, receives no subsidies or preferential treatment,¹³ it is both timely and well worth looking into ways to support their operations. The alternative may well be further retraction of routes and services to the detriment of vulnerable population groups and geographically challenged communities. [Aarhaug and Fearnley \(2016\)](#) suggest in fact that express coaches, with only very limited public support, can make long distance passenger transport more efficient and more sustainable.

However, it is not straightforward, neither within the Norwegian deregulated setting nor according to European-wide state aid and procurement legislation, to devise efficient and general funding (or support) instruments. While it is beyond the scope of this paper to elaborate the details of a funding scheme, we will briefly highlight a few possibilities with some mileage. It is important that a support scheme is competition-neutral and facilitates a level playing field for all operators. An important factor in this respect is the need for support schemes to be non-discriminating and not represent illegal state aid.

For a policy to be non-discriminating, the funding must be universally available to any express coach operator that fulfils a set of requirements. For state aid to be legal, it must be transparent and not give any particular operator an advantage over another, but be available to all operators. In general, it should not cause excess profits to be earned, for example by reimbursing more than the actual cost of production. Having regards to these requirements, the following forms of support¹⁴ would likely help the sector grow rather than stagnate, at a very moderate cost compared with the levels of subsidy that go to competing modes of rail and local public transport.

Prohibit local governments from limiting express coaches' access to local markets when they form a natural section of an express coach route. Currently, several local governments support their subsidized local bus services by preventing express coaches from picking up local passengers ([Aarhaug & Fearnley, 2016](#)). Till now, this has mostly affected marginal lines. In one case, it caused an express coach route to close down.

Allow free and within-capacity unrestricted access to terminals and stops. Currently, the sector claims to be paying NOK 70 million annually in road and terminal fees, in addition to ferry charges ([Thompson, 2017](#)).

Universal rights to social rebate reimbursements. In Norway, the railways are reimbursed for their rebates by the state. Local bus fares are subject to some mandatory (national) social rebates, like students, old age pensioners and military personnel, as well as rebates that vary between regions (e.g., dogs and children) ([Krogstad et al., 2012](#)). Several express coach lines offer similar rebates to their passengers but do not receive reimbursement. The implication of what we documented in section 2.1 is that the typical express coach passenger would in fact likely be eligible for social rebates on competing and subsidized public transport. A universal right for any scheduled express coach operator to have their social rebates reimbursed would therefore be a well-targeted and cost-efficient means of supporting the mobility of vulnerable population groups and to sustain attractive service levels across the country.

A reimbursement scheme might take several forms, but a universal, standard contribution per passenger-kilometre of social rebated travel would be a fairly manageable start. At the other end of the scale, the [UK DfT \(2016\)](#) "No Better, No Worse Off" approach to reimbursement of bus operators for concessionary travel requires detailed data and analysis of revenues lost and costs incurred as a result of mandatory concessionary fares.

A moderate mileage compensation. In line with the principles of performance-based quality contracts in local bus operations, it would be possible to design support schemes which rewards express coach operators on a per bus-kilometre basis ([Bekken, Longva, Fearnley, Osland, & Frøysadal, 2006](#); [Fearnley, Bekken, & Norheim, 2004](#)). Well designed, such a scheme would incentivize an operator to offer more and/or better services than it would otherwise have done. In this way, the commercial operator would behave in a more social welfare-maximizing way. The mileage subsidy must clearly be less than the marginal cost of express cost operations such that the operator depends on strong market orientation and passenger revenues. A support scheme of this kind, once the tariffs are decided, would be simple to administer and would apply to any express coach route with its licenses in order.

While these are some alternative ways to support express coaches, there are numerous other ways of supporting the industry, which are in use or have been in use in different contexts. That includes, among others, fuel duty rebate and preferential VAT treatment. The important point made here, is that there are several feasible ways to support the express coach industry.

5.3. Summary discussion

History has shown that the express coach industry represents a cost-efficient alternative to heavily subsidized public transport modes. With their market orientation and high load factors, express coaches represent an environmentally friendly travel option, that also offers mobility to persons without alternatives. In the context of increased fiscal efficiency and environmental focus, it is a paradox that express coaches are facing increasing competition from less environmentally-friendly (private car) and heavily subsidized (rail) travel options.

The structural market developments, with increased wealth, increasingly urban settlement patterns and better infrastructure, work against the express coach industry, but with little change from year to year. This fits well with data on the overall development of the industry. The rapid changes experienced in the case of the TIMEkspressen concept cannot be described by these developments. Here, direct competition with either subsidized local buses or rail, is a more likely explanation. This points to the policy questions of who are best positioned to provide transport services: private companies or public authorities. Also, it raises the question of whether the express coaches became a victim of their own success.

However, including the express coach lines into the local public transport system, with through-ticketing and related services can be an advantage for passengers. Also, subsidies allow for higher social welfare. As a result, the transfer of a commercial express coach line to the PTA would typically result in unchanged or better service to most passengers. But from an express coach company's point of view, the long-term effect of PTAs creating subsidized lines in parallel with commercial services limits the attractiveness of investing in creating such services. This may result in express coach companies becoming less willing to invest in new markets. As shown in section 5.2, there are other options available for the authorities for including and stimulating express coach services supporting market initiatives instead of creating a duplicate service on a gross tendered contract. Some of these deserve more attention, as the express coaches mainly provide very cost-efficient mobility.

Lessons from the Norwegian cases are that, although liberalization has resulted in a thriving new service, express coaches are still an inferior travel option. With increasing wages and improved infrastructure, express coaches lose ground. When rail services are subsidized and in direct competition with the coach services, people choose rail. This can be seen as evidence that there is little need to offer laws protecting rail from competition from express coaches. If the quality of the rail service is matching or even just approaching the service offered by coaches, rail is often preferred. Norwegian experiences rather point towards questioning the need to provide high levels of subsidies for rail services for relations that can be served more cheaply and without subsidies using coach.

6. Conclusions

When established, the express coaches filled a niche in the Norwegian transport system. In this study, we find that this niche is gradually becoming smaller, both because of underlying societal trends, such as centralisation and increased wealth, but also from policy decisions at the national and regional level. At the national level, the central government increases railway subsidies, also where the rail service is in competition with a coach service. At the regional level, regional governments decide to include the lines served by the express coaches in their subsidized, tendered local public transport network. We also note that infrastructure investments, in particular more and improved motorways, reduces the competitive advantage of coaches vis-à-vis the car.

The underlying development, with centralisation, better infrastructure and increased wealth, creates an up-hill battle for the express coaches. However, as the express coaches offer cost-effective transport services, and also provide life-line type services in rural areas and to persons without private car access, there are economic rationales to support these services. This article has outlined a few possible ways to support express coaches so that they can continue to provide mobility to vulnerable, and in different ways challenged, parts of the population.

Appendix B. Supplementary data

The following is the supplementary data related to this article:

Appendix.

Table A.1. Correlation between traveller characteristics. Trips longer than 100 km, all modes.

| | Woman | Age | Age <35 | Age >66 | Student | Not working | Low income | Work-related | Major city | |
|-------------------|-------|-------|---------|---------|---------|-------------|------------|--------------|------------|---|
| Woman | 1,00 | | | | | | | | | ▲ |
| Age | -0,03 | 1,00 | | | | | | | | |
| Age <35 | 0,02 | -0,79 | 1,00 | | | | | | | |
| Age >66 | -0,02 | 0,62 | -0,26 | 1,00 | | | | | | ▼ |

| | Woman | Age | Age <35 | Age >66 | Student | Not working | Low income | Work-related | Major city |
|--------------------|-------|-------|---------|---------|---------|-------------|------------|--------------|------------|
| Student | 0,05 | -0,53 | 0,53 | -0,14 | 1,00 | | | | |
| Not working | 0,13 | 0,13 | 0,12 | 0,48 | 0,45 | 1,00 | | | |
| Low income | 0,08 | -0,03 | 0,14 | 0,11 | 0,16 | 0,21 | 1,00 | | |
| Work-rel. | -0,14 | -0,04 | -0,05 | -0,14 | -0,13 | -0,26 | -0,08 | 1,00 | |
| Major city | 0,02 | -0,06 | 0,03 | -0,04 | 0,03 | -0,06 | 0,00 | -0,01 | 1,00 |
| Rural | -0,02 | 0,04 | -0,04 | 0,04 | 0,00 | 0,06 | 0,01 | 0,02 | -0,46 |

Trips are weighted based on geography, age, season and weekday (cf. [Gregersen, 2017](#)).

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Research data for this article

 Data not available / Data will be made available on request

 [About research data](#) 

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¹ We use railways to help readability of the map, as there exists no pre-coded map layer with express coach lines in databases we have access to.

² The current exchange rate between NOK and EUR is about NOK 9,3 to EUR 1, however during the time period studied here (2001–2018) the exchange rates have varied between 7,4 and 9,4 (Norges Bank, 2018).

³ The two regions Oslo and Akershus co-operate in the provision of local public transportation.

⁴ Based on data from Statistics Norway, and Ministry of transport and communications. Public purchase of rail does not include costs related to infrastructure.

⁵ This figure is based on data from Aarhaug, Christiansen, and Fearnley (2011), supplemented with information collected from the major operators for the period 2011–2018. This means that services that only were in operation for a short period of time, outside the umbrellas of NBE or Nettbuss, and not in operation in 2017/18, are missing from the dataset.

- ⁶ For a recent critique of the use of generalized costs in travel demand analysis, see [Wardman and Toner \(2018\)](#).
- ⁷ Travelers making daily trips to and from work might also take into account the full cost of driving their private car to a larger extent than travelers making an irregular business or leisure trip, which is considered 'marginal'.
- ⁸ Based on data collected by [Aarhaug et al. \(2011\)](#).
- ⁹ After a number of minor improvements and reduced number of stops the running time in 2017 is 1 h 20 min.
- ¹⁰ <https://www.regjeringen.no/contentassets/05806a234d254506aeede855b9d60748/nsvkjopsavtale2012c3.pdf>.
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- ¹³ Some few express coach lines receive support for serving local markets and accepting local fares in agreement with the regional governments. Scheduled buses are in general exempted from road tolls.
- ¹⁴ The Confederation of Norwegian Transport businesses, NHO Transport, advocates several of these policies, as outlined in [Thompson \(2017\)](#) and [NHO Transport \(2017\)](#).

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