Working Paper No. 40/02

From a regulated duopoly to a private monopoly; The deregulation of the Norwegian airline industry

by

Frode Steen and Lars Sørgard

SNF-Project No. 8300
SIP – Nærings og konkurransepolitikk

This project is financed by The Research Council of Norway

INSTITUTE FOR RESEARCH IN ECONOMICS AND BUSINESS ADMINISTRATION
BERGEN, JULY 2002
ISSN 0803-4028

From a regulated duopoly to a private monopoly; The deregulation of the Norwegian airline industry*

Frode Steen and Lars Sørgard

Department of Economics,

Norwegian School of Economics and Business Administration,

Helleveien 30, N-5045 Bergen, Norway

SNF-8300: Industrial and Competiton Policy

Project financed by the Norwegian Research Council

This version: May 27, 2002

Abstract

We explain the economics of deregulation in the Norwegian market. We observed a transition from a regulated duopoly prior to 1994 to a monopolised airline market in 2001. We explain how eight years of deregulation and competition led to this outcome. In particular we discuss and model a feature of the Norwegian airline market that was one of the main factors behind the merger; the competition on the large customer contracts. We explain how these contracts led to Bertrand-like competition on the large customers and a prisoner's dilemma situation for the airline companies. They operated costly excess capacity, they did not price discriminate correctly according to the demand elasticities, and they lost a lot of revenue from fierce competition for the large customers. The merger solved all these problems. Then within the present competitive situation, which resembles the situation in most European countries with one large dominating flag-carrier, we discuss some measures we believe may create future domestic competition. We focus on the anticompetitive effect of frequent flyer programs, but also discuss issues like airport charges, airport handling and predatory behaviour. Finally, we briefly comment upon the future situation and the European low-cost-no-frills 'revolution'.

*We are grateful to Gorm Grønnevet for valuable comments and suggestions.

1. Introduction

The Norwegian airline market was deregulated eight years ago. Prior to the deregulation we had a regulated duopoly where Scandinavian Airlines (SAS) and Braathens (BU) divided the market between themselves. It was predicted that deregulation would trigger competition on prices. It did not, at least not in the business segment. Business fares remained high, and even increased considerably the last couple of years. We did not experience increased flexibility in departure times, but rather a clustering of flights. Capacity increased considerably, and planes were half empty. By May 2001, Braathens was almost bankrupt, and six months later SAS was permitted to buy Braathens. Deregulation had led to a monopolised Norwegian airline market. What had happened? What went wrong? And, in particular - are there any lessons to be learnt from the Norwegian experience?

In this article we will try to explain the economics of deregulation in the Norwegian market. In particular we will discuss and model a particular feature of the Norwegian airline market that was one of the main factors behind the merger; the competition on the large customer contracts. Then within the present competitive situation, which resembles the situation in most European countries with one large dominating flag-carrier, we discuss some measures we believe may create future domestic competition. We will focus on the anticompetitive effect of frequent flyer programs, but also discuss issues like airport charges, airport handling and predatory behaviour. Finally, we will briefly comment upon the future situation and the European low-cost-no-frills 'revolution'.

2. The first four years of deregulation – from monopoly to peaceful co-existence

2.1 Prices

After April 1994 all national carriers were free to enter on all of the main city-pairs in Norway. However, no new entrants arrived, only SAS and BU continued to transport the routes. Although we observed some competition on prices in the leisure segment – larger number of and to some extent lower prices on restricted tickets – we did not observe any price changes on the flexible tickets offered for the business segment.

There are several reasons that can explain the lack of price competition in the business segment. First, there is a potential for collusive behaviour in this particular industry. There are

only two active firms, and until April 1997 foreign firms were not permitted to serve domestic routes in Norway. Price changes are either to be announced in the press or through the Amadeus computer booking system, which in both cases will quickly be observed by the rival. Hence, both firms can quickly respond to the rival's price changes.

Second, for those routes where both firms did have flights, there exists a system for co-ordinating prices – so-called interlining. The firms are permitted to consult each other concerning price setting. To allow for late changes of flight schedules for normal (no discount) tickets, from one airline to another, the airlines have «transferable» prices. To implement such a policy, the firms are permitted to meet regularly to inform each other concerning future prices. Hence, there exists an institutional pre-play communication system where each firm can inform its rival about its future prices on normal tickets.

Third, the two firms had initially almost equal market shares in the domestic market. Then it was natural to continue with the initial market sharing in the deregulated system. In fact, there were only rather minor changes in the market shares on each route as well as in the total market shares after deregulation. On 24 out of the 32 city-pair routes, the initial monopoly carrier continued to be a monopolist. For the remaining eight routes, the pre-deregulation dominant firm continued to have a dominant position. On average, the dominant firm had a 13 percentage points' reduction in market share on these eight routes, and it had no less than 60% market share on any of the routes in the deregulated regime.[1]

Fourth, the firms have signalled an aggressive response to any move by their rival. In particular, each firm matches the rival's offer. For example, prior to deregulation Braathens introduced a discount ticket named *Billy* to match SAS' discount ticket *Jackpot* and set a price NOK five below the *Jackpot* price. SAS responded immediately by reducing its *Jackpot* price by NOK five. A statement by a representative for Braathens suggests that this is a deliberate policy for the firms in question: '*We will match any offer by SAS within an hour, and we can not accept that SAS has cheaper discount tickets than what we have' [our translation] (C. Fougli to Dagens Næringsliv, 20.01.1994).* Such an apparently aggressive behaviour is analogous to the introduction of a meet-competition clause. An explanation of this principle, that also may serve as an illustration of the companies' strategy, was provided by Audun

[1]The exception is the route Bodø-Tromsø, where each had two non-stop flights both before and after April 1994.

Tjomsland, the public relations manager for Braathens: *'The two Norwegian firms on Norwegian routes, Braathens and SAS, are of equal size and can follow each other during a price war. The firm that starts a price war will quickly be followed by the rival firm, so that the firm that starts a war will have an advantage only for a day or two. Accordingly, the firms are reluctant to trigger a price war.' [our translation] (Bergens Tidende, 31.07.1995).*

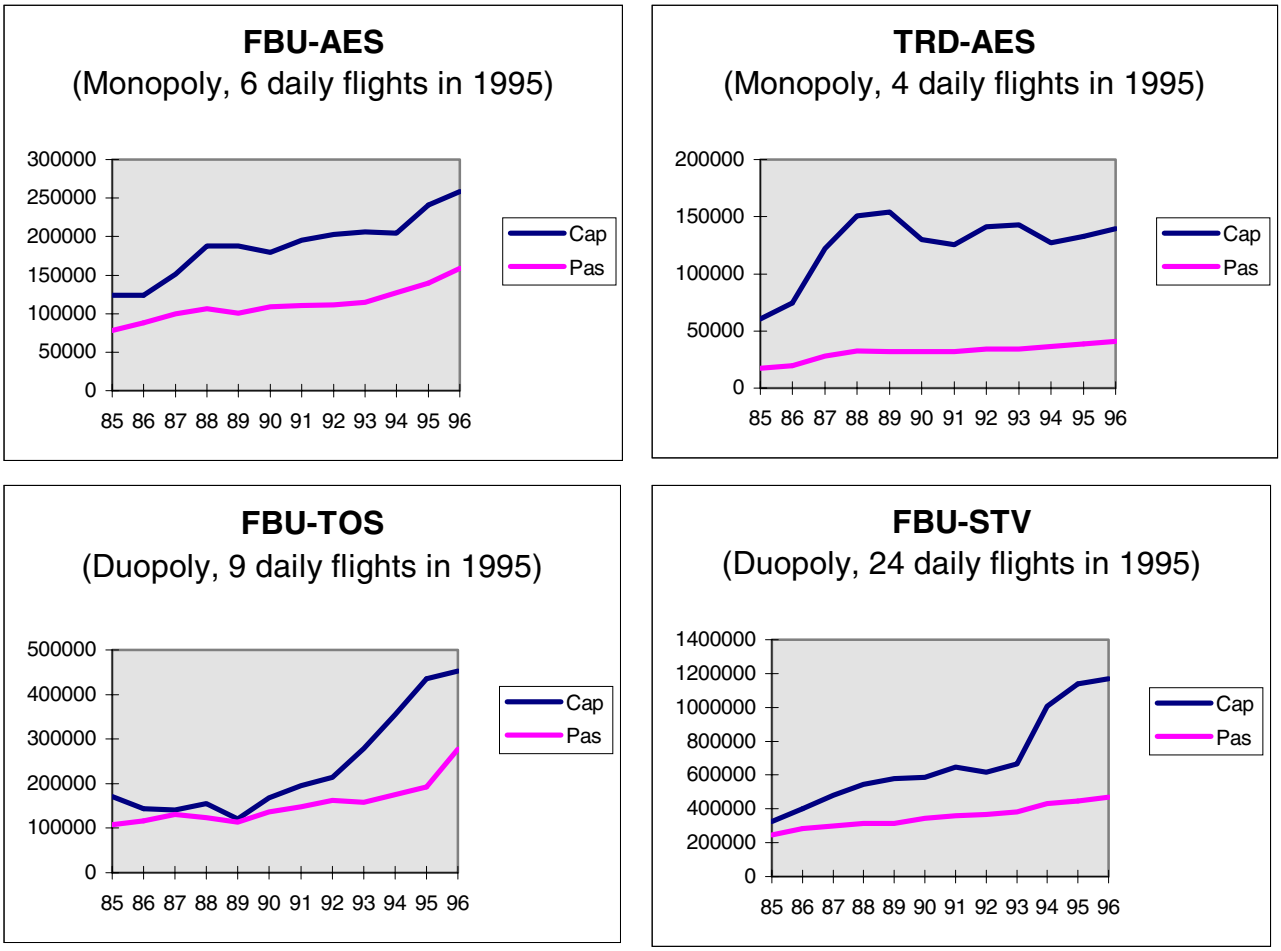
2.2 Clustering of departure times

After deregulation we saw a clustering on flights. The companies competed on location of flights on routes where both carriers were present. On these routes we saw a clear pattern of parallel flights, where both companies had flights located very close in time. This pattern has been shown econometrically to be systematic on the competition routes (Salvanes, Steen and Sørgard, 2000a). The clustering was particularly present in the morning and afternoon hours when most of the travellers are business travellers. This is reasonable all the time the collusion on prices was most evident in the full price segment. In this segment the companies did not have to worry that clustering of departure times would intensify price competition. They could therefore concentrate on maximizing market shares by locating close to their rival. The study also indicates that it is the entrant that clusters, *i.e.*, locates close to its rival. This competition on flight departures has also been shown in other markets like the US market (Borenstein and Netz, 1999).

2.3 Capacity

On the duopoly routes both carriers increased capacity significantly after deregulation. This is illustrated in Figure 2. On the monopoly routes, where the other carrier did not enter, we saw an increase in capacity after deregulation as well (see Oslo-Ålesund and Trondheim-Ålesund in Figure 2). However, on the duopoly routes the capacity increased more than the growth in passengers, particularly on the largest route (see Oslo-Stavanger in Figure 2). This was found to be a systematic pattern when using econometric tests across the major routes in Norway (Salvanes, Steen and Sørgard, 2000b). This increase in capacity can be seen as an intensified battle for market shares between the two companies, in particular in the business segment. In this segment the frequency of flights is an important determinant of market shares. However, since both companies increased capacity the market shares did not change. The result was lower capacity utilisation (lower cabin factor), higher costs and a prisoner's dilemma situation. Hence, the deregulation had at this point not resulted in lower prices, but a larger capacity that was costly to both companies.

Figure 1 Development in Capacity and passengers in the period 1985 to 1997 (Source: Salvanes, Steen og Sørgard 2000b)



This picture is also reflected in the companies operating profits. In 1994 and 1995 both companies had large surpluses, but by the first quarter of 1996 the financial results aggravated: *'Braathens explains this [poor result] with an increased competition. The firm has increased its capacity, but it has not helped much. The growth results in an increase in employment and other costs of production [our translation] (Dagens Næringsliv, 10.05.1996).* Also SAS tried to deal with the new situation: *'Among the initiatives are recruitment on the ground and in the cabin, adjustment of time-scheduling of flights, an increase in capacity amounting to 400,000 seats annually, better food on business class between Norway and other countries, ... [our translation] (Bergens Tidende, 09.03.1996).* Hence, also the companies themselves seemed to describe their situation as a prisoner's dilemma situation.

Although there was no fierce price competition in the business travellers' segment following deregulation, casual observations suggest that the increased capacity led to more price

competition in the leisure segment, where the firms offered discounted tickets. As mentioned above, the two firms competed on price with identical kinds of offers like Billy and Jackpot, respectively. These were discounted tickets with restrictions that made them unattractive for business travellers. There are numerous other examples of discounted tickets with restrictions, where the firms matched the rival firm's offer. For example, in the summer of 96 SAS and Braathens both introduced both 50th anniversary tickets, which also were discount tickets with restrictions. These ticket types were new, and designed to be very restrictive in order to prevent cannibalisation of the business segment.

3. The last four years of deregulation: New airport, new slots, new entrant and new competition

In 1998 several important events changed the competitive environment. A new entrant arrived, and a new main airport in Oslo, Gardermoen, was inaugurated. The slot capacity on the former main airport Fornebu had been exhausted in 1998.The slot capacity at Gardermoen allowed both expansion and new entry.

3.1 Color air

The new entrant, Color Air, started its operation in the summer of 1998, but it was first at the opening of Gardermoen in October that Color Air launched its full capacity in the Norwegian market. Even though Color Air was a low-cost-no-frills concept, Braathens and SAS did not primarily meet the new competition with lower prices. Instead they continued to increase their capacity. Hence, the competitive picture did not change, only escalate. We got more capacity, more empty seats and somewhat more price competition in the leisure segment. In total, ten new airplanes entered the Norwegian market after the Gardermoen opening, only three of them were operated by Color Air.[2] It is interesting to note that it was particularly SAS that was most aggressive in itscapacity build-up. Several statements from the company can indicate that this was part of a strategy to squeeze Color Air out the market. The managing director of SAS, Jan Stenberg, said in May 1999: '*SAS has no intention of reducing the excess capacity in the domestic market. The plan is to aim for more aggressive price advertising campaigns in the Norwegian market. … I think it is a question about only a few months before Color Air will be leaving the market [our translation] (NTB-press release May 7. 1999).'*

[2] One airplane can be used for a maximum of 16 hours a day in the Norwegian network. Hence, ten new airplanes into the market were a considerable increase of capacity. In particular since we already had excess capacity on several routes.

The very same day the deputy managing director of SAS, Vagn Sørensen, states: *'This is a question of who is going to give in first, and SAS is very persevering. Our aim is to gain market shares in the Norwegian domestic market – which we will do. [our translation] (Dagbladet, May 7. 1999).* This implies that SAS was willing to suffer financial losses for a period – which they themselves verified to be doing in this period – to obtain reduced future competition. This can at least look like predatory behaviour.

Four months later SAS' prophecies were fulfilled – Color Air was bankrupt. Now Braathens and SAS used media to undertake a coordinated reduction in capacity. Just after the bankruptcy we could read: *'SAS has on several occasions announced that it will reduce their capacity if Braathens start reducing theirs. [our translation] (Bergens Tidende, 12.11. 1999).* Braathens answers and makes reductions in capacity: *'Braathens reduces its capacity to save money and increase profitability. …The capacity will be reduced by 7% [our translation] (NTB,27.10.1999).* We could now observe a "ping pong" game:

- *'SAS made public that starting November 15. it would reduce capacity…'* .
- *From November 2, Braathens will reduce by 16 flights per day.*
- *'SAS uses its axe – three daily roundtrips between Oslo and Bergen, Trondheim and Stavanger are removed.*

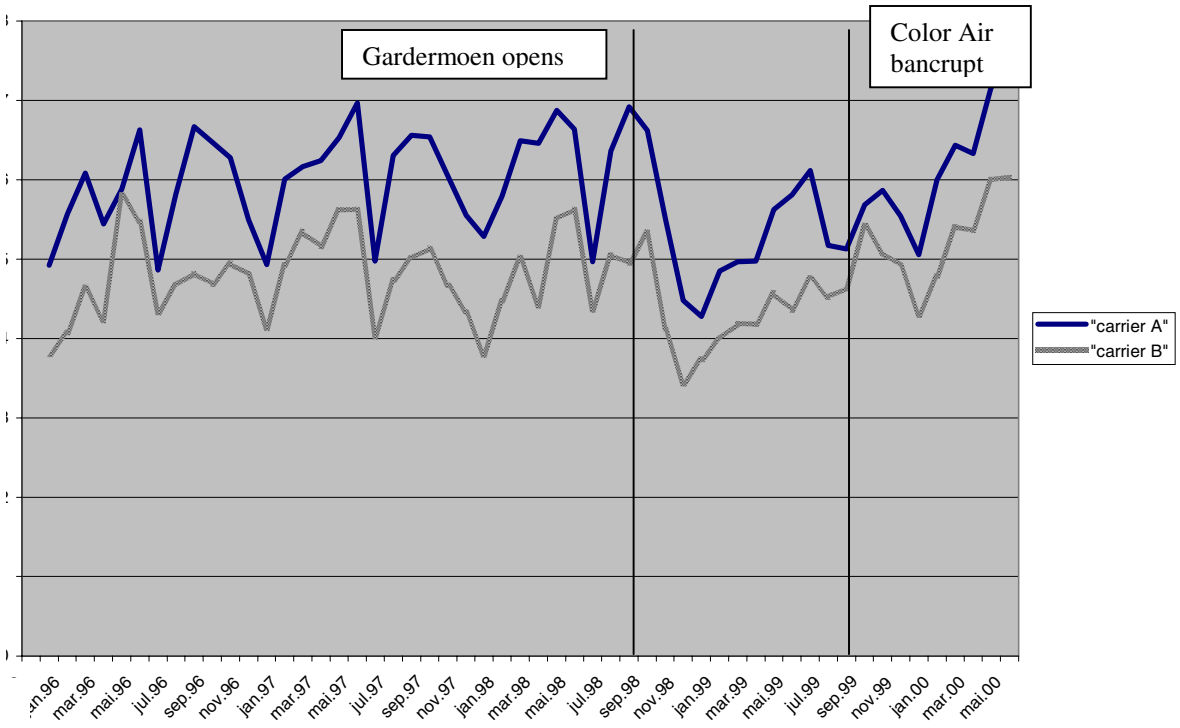
[our translations] (Nettavisen, Bergens Tidende, 19.11. 1999)

Already in the spring of 2000, seven out of the ten new airplanes that entered in October 1998 had been removed from the market. Only on the route between Oslo and Bergen alone 600,000 seats had been removed, something that correspond to 46% of the passengers travelling this route in 1998. This indicates that the capacity utilization by May 2000 had returned to the level we had before the Gardermoen opening. This can also be seen from the numbers also when undertaking systematic econometric tests of several routes (Steen and Sørgard, 2001). We still had capacity competition, but not as aggressive as when Color Air was in the market. Hence, there is still a capacity coordination incentive to merge, a monopoly will not be forced to live with this high capacity.

In Figure 2 the development in capacity utilisation (load factor) in the period January 1996 to May 2000 is shown for a representative Norwegian duopoly route. As can bee seen from the figure, the load factor had returned to the 1996 level during the spring of 2000. This pattern

was parallel for both carriers. Actually, the load factor increased even more during the next 12 months.

Figure 2 The development in capacity utilisation (load factor) in the period January 1996 to May 2000 on a representative Norwegian duopoly route.



3.2 New competition – large customer contracts

During these last four years of deregulation we saw another important feature of the competitive situation emerge, this was the effect of an increasing number of large customer contracts. A large customer contract is a contract between a large customer and one of the carriers, where all employees from this firm will travel with this carrier at a contracted price. The contract will specify a percentage reduction in the full (C) price ticket. The typical contract will be a combination of discounts on different routes and a discount according to the customer's total travel volume in the domestic network. The latter implies that the company only has a contract with one of the two carriers. The contracts are secret and have strict conditions written into the contracts, which makes the secrecy conditions mandatory for both parties.

This kind of contract can lead to very intense rivalry on prices. This is an 'all-or-nothing' competition. If the carrier loses one large customer to the other carrier it loses a lot of

passenger volume, and since the price cost margin is positive, a lot of profits. Hence, each carrier faces a very high own price elasticity of demand in this large customer market. This gives strong incentives to undercut your rival's price, and might lead to price very close to marginal costs (Bertrand-like competition).

These contracts were available already in 1994, but first in 1998 did they gain importance, both in terms of number of contracts, and in terms of discount size. There are several explanations for this gradual increase. First, the companies had less of a problem with excess capacity in the first deregulation period, and were therefore less tempted to act aggressively in this market. When Gardermoen opened, both companies had the possibility to increase their capacity on all routes, also the smaller ones, and both could thereby offer a full domestic network. This in itself led to more competition on large customer contracts since all large customers were now potential large customers for both carriers.

Furthermore, we know from other markets with this kind of secret large customer contracts – in particular the Swedish diesel and petrol market – that one often experiences an escalation of discounts and number of contracts over time. One possible reason for such a development follows from the intertemporal nature of these contracts. A contract will be renegotiated after a period of time, and due to the competition between the two carriers and the secrecy nature of these contracts discounts tend to increase over time. In 2000, the carriers had around 300 contracts, more than a doubling from 1998. The discounts were also large by 2000. The largest discounts were increased to more than 50% of the C-price ticket by the year 2000: *'According to information obtained by Dagens Næringsliv, some of the large customer discounts are in the order of 50% on certain routes. Normally the discounts are in the range of 5-50% relative to C-price. [our translation] (Dagens Næringsliv 12.09.2001).* This escalation of discounts was due to having two competing carriers on the full domestic network. The SAS' large customer contracts' responsible, Stein Bemer, stated: *' We hope to reduce the discount level.… it is evident that a possible merger [with Braathens] would provide better measures to achieve this goal, … When the competitive picture changes some of our large customers will not have the same bargaining power to obtain as large discounts and bonuses as they used to have.' . [our translation] (Dagens Næringsliv 12.09.2001).*

The discounts also differed considerably according to competitive situation on the different routes. The largest discounts could be observed on routes where there was a large asymmetry

between the carriers' market shares. The smallest carrier was typically willing to give very large discounts to gain market shares on these routes. Accordingly, on monopoly routes the discounts were smaller.

3.2.1 A simple large customer contracts price model

We now turn to a more subtle effect of these large customer contracts, namely the level of the full price ticket (C-price). To do so we introduce a simple model. We assume that the carriers via the interline prices were able to collude on price and therefore act as a de facto price cartel. To simplify further, let us assume that the large customers only buy C-price tickets. Demand is given by $X = A - P$, where P is the price before any discounts and A measures the customers' maximum willingness to pay. Furthermore, let s be the share of the consumers that has a large customer contract, and let r denote the average discount (in absolute terms) in the large customer contract. The two carriers will have the following profit function:[3]

$$\Pi = (P - c)(A - P)[1 - s] + (P - c - r)(A - P + r)s$$

The optimal gross (non-discounted) C-price will then be:

$$P^* = \frac{A + c + 2rs}{2}$$

Not surprisingly, the optimal price increases in costs (c) and willingness to pay (A). More interesting is the effect of the large customer contracts. The higher the number of large customer contracts (s) the larger will the C-price become, and the higher the discounts are (r), the higher is the optimal price. The reason for this is quite straightforward, through an increase in the ordinary C-price the companies can regain some of the discount given in the large customer contracts. The larger the discounts are and the more large customer contracts the carriers sign, the stronger the incentive to increase prices. The problem with this strategy

[3]An alternative would be to assume that the discount was a percentage discount rather than an absolute discount. It is straightforward to show that a percentage discount has the same qualitative effects as an absolute discount. It can also be shown that if the large customers only act according to the full non-discounted price rather then the net-discounted price the large customer contracts will have less effect on the level of the C-price.

is that customers *without* large customer contracts will face too high prices. Actually, the price will be even higher than the ordinary monopoly price for C-class tickets.

In Table 1 we have shown how the large customer contracts will affect the gross (non-discounted) price for different combinations of discount level and share of large customer contracts. The large customer discounts have a significant effect on the gross price. For instance, if the discount amounts to ¾ of the original price-cost margin the gross price will increase by 20% if 40% of the full-price customers have large customer contracts. This seems to be a quite reasonable scenario. Observed discounts were in the order of 50% of the C-price for several large customer contracts, and we know that nearly half of the business travellers had some sort of large customer contracts.

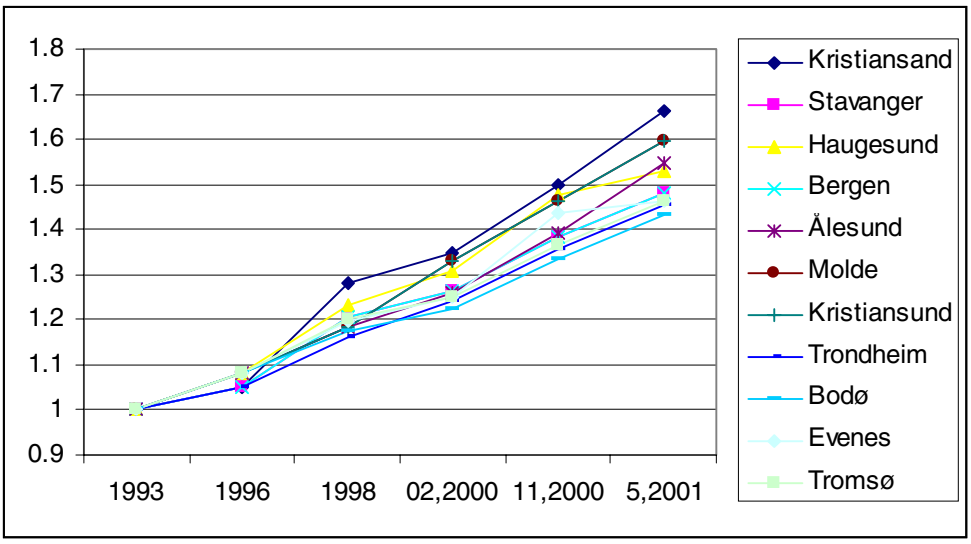
Table 1 The effects of the large customer contracts on the gross (non-discounted) price (= P_0) predicted from our theoretical model

		s			
		0.1	0.2	0.4	0.6
$r/(P_0 - c)$	0.25	2%	3%	7%	10%
	0.5	3%	7%	13%	20%
	0.75	5%	10%	20%	27%
	1	7%	13%	27%	40%

According to our simple model, the increased importance of large customer contracts we have seen the last part of the deregulation period, led to higher C-prices. This is also what we observe when we look at the C-price development. The C-price has increased considerably. In Figure 3 we have shown the development in the C-price on some routes. The increase in C-price is quite probably correlated to the increased importance of the large customer contracts. In the period from 1998 to May 2001 when Braathens and SAS announced their merger, the prices increased by an average of more than 27%. Compared to the development in the general CPI or other transport forms such as car, boat or train the price increase for these groups has been in the order of 10-20%. Thus leaving more than ten percentage points "extra" price increase in airlines.[4]

[4] Using monthly data for ten Norwegian routes over the period January 1996 to May 2001, we find that when we include variables such as the number of large customer contracts or the total revenue that accrues to these

Figure 3 Normalised nominal development in prices on 11 Oslo routes in the period 1993 to May 2001 (Source : Norwegian travel agents, C-prices net of taxes).



It is quite obvious that the discounts in these contracts are the outcome of competition rather than deliberate price discrimination. As is well known from theory of third degree price discrimination, a firm would find it profitable to set a high price in a segment with price inelastic demand, and a low price in a segment with price elastic demand. However, we observed the opposite in the Norwegian airline industry. Large discounts were given to firms who typically buy flexible tickets. Such a firm's demand is typically price inelastic.

A merger will as we heard from the SAS' large customer contracts' responsible, Stein Bemer '*reduce the discount level'*. A reasonable benchmark is Sweden. Here SAS has approximately 90% of the market and the Swedish large customer discounts are in the range of 10-15%. If we look at the losses attributed to the Norwegian large customer discounts in 1999 and 2000, they amounted to between 5-10% of the revenue from the Norwegian routes.[5] These losses will disappear after a merger.

Not only prices are affected by the large customer contracts, also capacity is indirectly dependent on the large customer contracts. To be able to compete on the contracts both carriers had to sustain a large parallel network. Hence, not only did they compete on market

contracts in a dynamic price model we find that these variables have a positive and significant effect on the C-price level (Steen and Sørgard, 2001).

[5] Here we have attributed all revenue loss due to discounts as losses. Clearly a higher large customer price would have led to a smaller passenger volume, but still the numbers presented show that these figures represent dramatic losses to the carriers.

shares by sustaining a too high capacity level in general on the large routes, the large customer contracts made the carriers sustain unprofitable parallel flights also on smaller routes. In sum: Excess capacity was inevitable.

4. Why did the companies merge?

We have observed competition after deregulation, but the problem for the Norwegian customers has been that the carriers competed along the wrong dimensions. The lack of price competition in the business segment led to competition on location and capacity. Those who benefited were the passengers in the leisure segment since the supply of low-price tickets increased. The most important segment, however, the business travellers, could only use these tickets to a very small degree since discounted tickets are restricted in use and do not comply with a business traveller's needs.

The business travellers within the large companies started to benefit from the large customer discounts towards the end of the period we are looking at, enjoying large discounts after 1999. Those without any large customer contracts, however, received no discounts, and even had to pay an extra premium due to the unfortunate relationship between the large customer contracts and the C-price.

The carriers did not gain from the situation. They operated costly excess capacity, they did not price discriminate correctly according to the demand elasticities, and they lost a lot of revenue from fierce competition for the large customers. After years of competition and several strategic mistakes Braathens was close to bankruptcy in 2001. It had tried to fight against SAS in Sweden and had lost, it struggled to sustain its market shares in Norway, and its new "*back-best*" concept had been a failure.[6][7] SAS had shown both economic strength and willingness to "bleed" in the battle against Color Air. Braathens might have felt that it would be the next victim in this "war". At the same time a merger will solve all the described problems for the carriers, they can reduce capacity and divide the market, and they can eliminate the

[6] Braathens introduced the "curtain" also on domestic flights. The full price passengers were given better service and were seated in the front of the plane. The M-class passengers were not served any food and had to sit behind the curtain. This concept was not well received by the Norwegian passengers, and in 2001 Braathens removed the curtain again.These days, SAS is announcing that it will remove the curtain also on inter-Scandinavian flights.

[7] The losses in Sweden were primarily a result of the purchase of Malmø Aviation and the losses from the route between Oslo and Stockholm.

competition to win the large customers. Hence, with a weak Braathens and a very particular competitive situation there were strong incentives to merge. The strongest of these was clearly the effect of the large customer contracts.

Interesting to note is that after the merger we now see a significant reduction of capacity after April 2002. Fewer discounted tickets are available, we observe less clustering of flights, and the signals from the large companies tell a story about reduced large customer discounts when renegotiation is undertaken. In sum, Norway has become European, *a monopolised flag carrier is dominating the domestic market.*

5. What can be done to achieve future competition?

We will focus at four different dimensions of this market in which we believe that reasonably simple measures can be used to ensure future competition. The most important feature is the frequent flyer programs. However, we will also look into airport charges, handling and predatory behaviour.

5.1 Frequent flyer programs

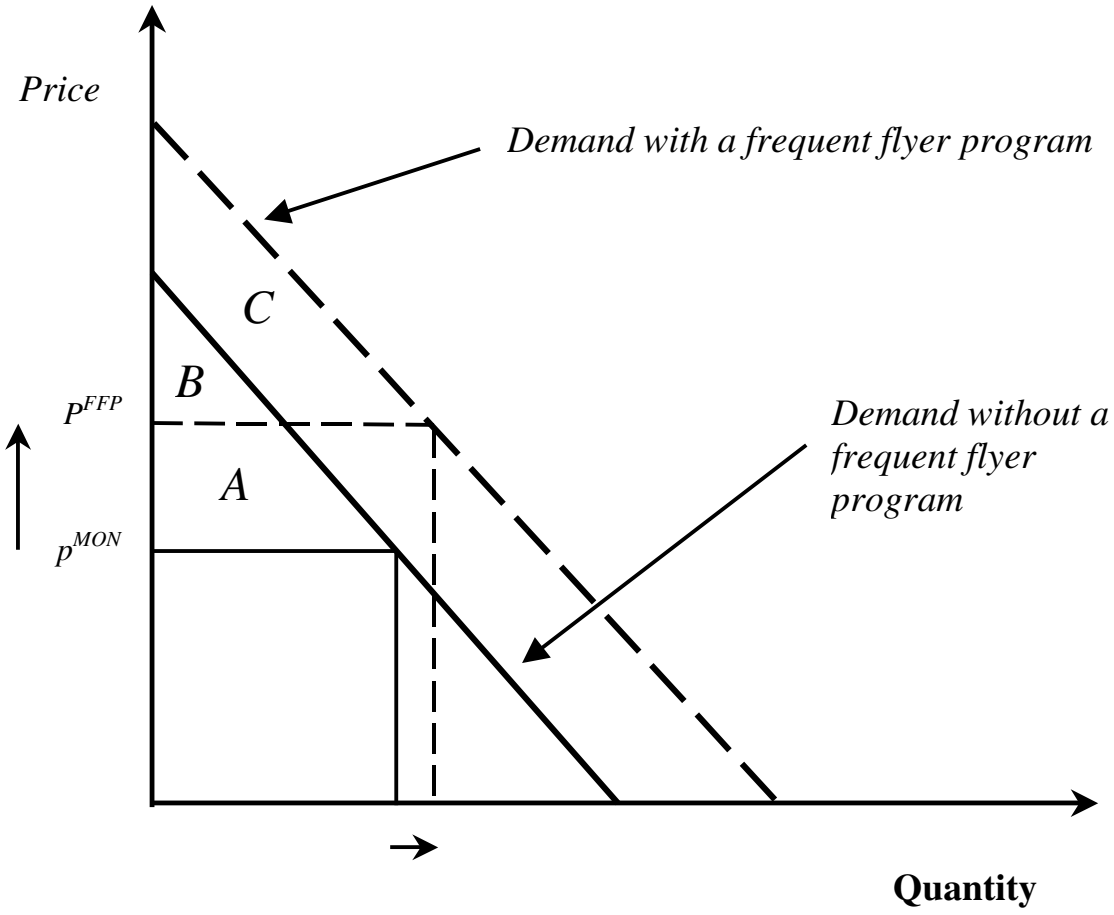
Frequent flyer programs can be regarded as a quantity discount: by purchasing a certain amount of a good, one receives one unit of the good for free. In this Section we analyse the welfare effect of such a particular price discrimination scheme. We start out by analyzing monopoly, and then discuss how our conclusions may change when we have a competitive setting.[8]

5.1.2 Frequent flyer programs in a monopolized market

The effects for the consumer in a monopolized market are illustrated in Figure 4.

[8]The analysis we present here draws heavily on Steen and Sørgard (2002).

Figure 4 The welfare effects of a frequent flyer program with monopoly



The solid line is the demand if there is no frequent flyer program. If we introduce a frequent flyer program, then the demand expands from the solid to the dotted line in Figure 4. One way to see this, is to consider the consumers' willingness to pay. For a given quantity, the consumers will have a higher willingness to pay. The reason is that the consumers now receive an additional amount or, more precisely, an option on an additional amount of the good in the future. Therefore, the demand curve shifts upward.

An increase in the willingness to pay is of importance for the firm's price setting. The firm can extract part of the increase in consumer surplus by increasing the price. This is illustrated in Figure 4 with the price increase from p^{MON} to p^{FFP} in Figure 4.

What are the effects for the consumers of the introduction of a frequent flyer program? With no frequent flyer program the consumer surplus is $A + B$ in Figure 4. From the Figure we see that after the introduction of the frequent flyer program the consumer surplus is $B + C$. Then

we see that the effect for the consumers of the introduction of a frequent flyer program is ambiguous. On the one hand s/he has a higher willingness to pay for the good, since it includes an option for a free unit in the future. On the other hand, the consumer is hurt by the price increase triggered by the introduction of the frequent flyer program. We see from Figure 4 that the consumers are worse off after the introduction of the frequent flyer program if $A > C$.

The introduction of a frequent flyer program is analogous to an increase in quality for the good in question. As shown in Spence (1975), a quality increase has an ambiguous effect on the consumer surplus. The basic reason is that the consumers care about how a quality change affects the *total* willingness to pay, while the firm cares about how quality affects the marginal willingness to pay. There is no mechanism that can assure that these two effects coincide. Hence, there is no reason to expect that the market outcome leads to the quality level the consumers would prefer.

The above analysis shows that from a consumer point of view the frequent flyer program has an ambiguous effect in monopoly. However, there are two important aspects that are left out of the analysis so far. First, the incentive structure for the consumers. In the airline industry we often observe that the person that buys the product is actually not paying for it. An employee buys the air ticket, while the employer pays for it. However, the frequent flyer program is an individual program. It implies that the employee buys an air ticket, receives the frequent flyer bonus, and the employer pays for the ticket. Obviously, there are some potential incentive problems in such a system. The employee has no strong incentives to make a cost efficient decisions concerning travelling. On the contrary, each employee can receive larger bonuses from the frequent flyer program if s/he travels more and travels more expensively than what s/he would otherwise have chosen to do. This is an argument saying that such a system may lead to excess consumption of this particular good, and thereby an excess cost burden for firms and for society at large.

5.2.2 Frequent flyer programs and competition or potential competition

We have so far assumed monopoly. If there are more than one active firm, or one active and one potential firm, it is important to discuss how a frequent flyer program affects competition.

In the literature, it is pointed out that frequent flyer programs are loyalty programs.[9] The consumers become loyal to one firm, in order to accumulate frequent flyer bonus from this particular firm. One might say that *ex ante* homogenous goods (an airline flight from A to B) become differentiated *ex post*. This leads to consumer lock-in. On the other hand, firms compete more aggressively to attract new consumers that can become loyal. Although the net effect is ambiguous in theory, in his survey Klemperer (1995) concludes that loyalty programs typically are detrimental to welfare:

'While there are exceptions to these conclusions, they suggest a presumption that public policy should discourage activities that increase consumer switching costs (such as airlines' frequent flyer programs), and encourage activities that reduce them' (p. 536).

According to his conclusion, frequent flyer programs are expected to have anticompetitive effects. In particular, there is reason to be aware of the possible effect in a setting with one (or a few) established firm(s) and a potential entrant. If established firms have many members in their frequent flyer programs, an entrant can find it difficult to capture those consumers that are more or less loyal to the established firms. According to Farrell and Klemperer (2001) switching costs (as the frequent flyer programs increase) seem more likely to lower than raise efficiency, so when firms favour switching costs, the reason is often that they enhance monopoly or oligopoly power by directly raising prices or by inhibiting new entry.

A related problem is the network effect. If the dominating firm has a larger network, and since most customers travel on different destinations, the frequent flyer program of the dominant carrier will always be more attractive since the non-linearities in membership benefits (e.g., gold-member benefits versus silver-member benefits) make it more attractive to travel with the carrier operating the largest network (Carns and Galbraith, 1990).

5.1.3 Should we ban Frequent flyer programs domestically?

Several countries are becoming aware of the anti-competitive effects of the frequent flyer programs. In Sweden they have banned frequent flyer programs on competition routes. In Germany they have opened the established frequent flyer programs for new entrants, and in

[9]See, for example, Klemperer (1984, 1995) and Carns and Galbraith (1990).

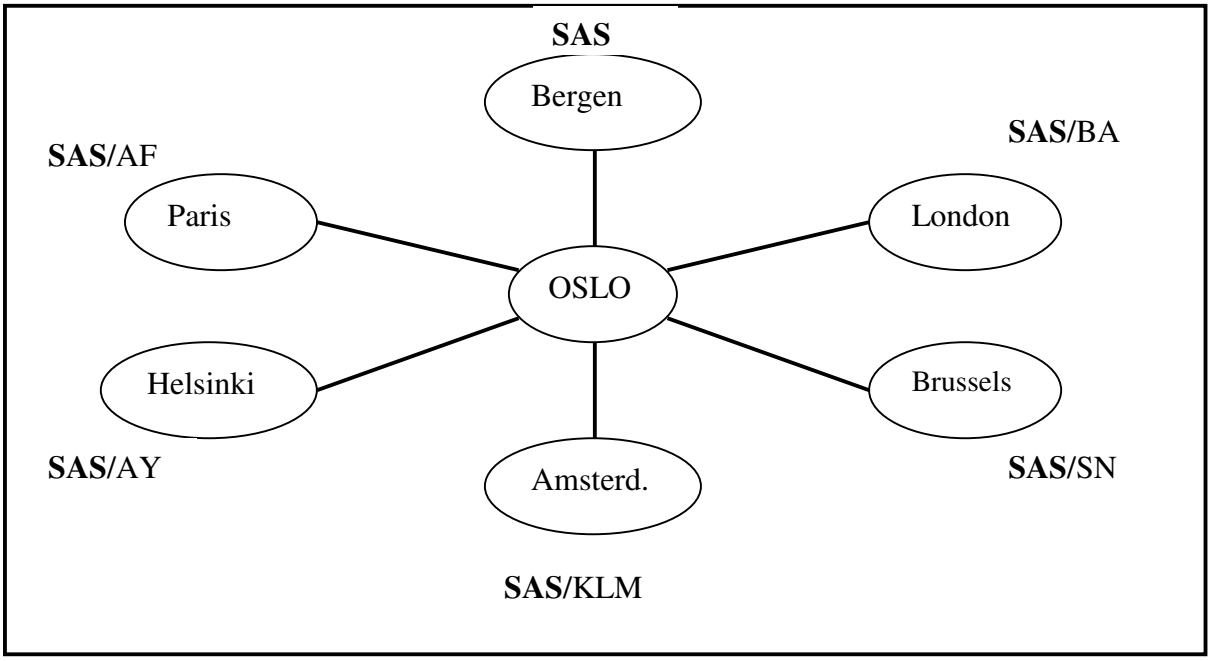
Norway the competition authorities have proposed to ban frequent flyer points on all domestic routes. There are arguments in favour of all of these three solutions. The Swedish regulation accounts for the disadvantageous effects of frequent flyer programs on single routes. However, the network effect might make most of the customers loyal to the dominant firm, SAS, regardless of the regulation on the route level. The German regulation solves the network problem, but has inherently some problems when it comes to implementation. If the entrant is a small independent carrier, the opening of Lufthansa's frequent flyer program (Eurobonus) is unproblematic. However, if the entrant is connected to another large alliance as for instance One World, it is not unproblematic to combine this with earning of points in the Star alliance which Lufthansa is part of. The proposed Norwegian solution also solves this problem, but might be more problematic in the sense of reducing the relative competitiveness of SAS when compared to other European carriers that are allowed to have domestic frequent flyer programs.

However, even the most restrictive regulation scheme proposed by Norway will not remove all the loyalty of the Norwegian customers. Due to the international network operated by SAS from Scandinavia, there will still be consumer-lock-in effects. This is illustrated in Figure 5.

A customer living in Oslo will have several options when travelling internationally. For instance, if s/he wants to go to London s/he can either use SAS or British Airways, or to Amsterdam s/he can choose between KLM and SAS. Apparently, s/he is free to choose something else than SAS. However, as long as s/he is travelling more than two routes in the illustrated network s/he will always go by SAS. SAS is the only carrier that will take the customer to several international destinations.[10] Hence, even without any domestic frequent flyer program the Norwegian consumers will be locked into SAS.

[10] A customer can of course choose to go via KLM's hub in Amsterdam to London, or via British Airways hub in London to Amsterdam, but these alternatives are both inferior to a direct connection.

Figure 5 Domestic frequent flyer programs and consumer-lock-in effects on international destinations.



Given that the frequent flyer programs are important entry barriers and probably are detrimental to welfare, one could argue that these should be banned. If we also consider the costs of these programs, we find an additional argument against frequent flyer programs. Swedish competition authorities have calculated the frequent flyer programs to increase prices by 10% . Hence, we will argue that these programs should be banned on a European level in the domestic markets.

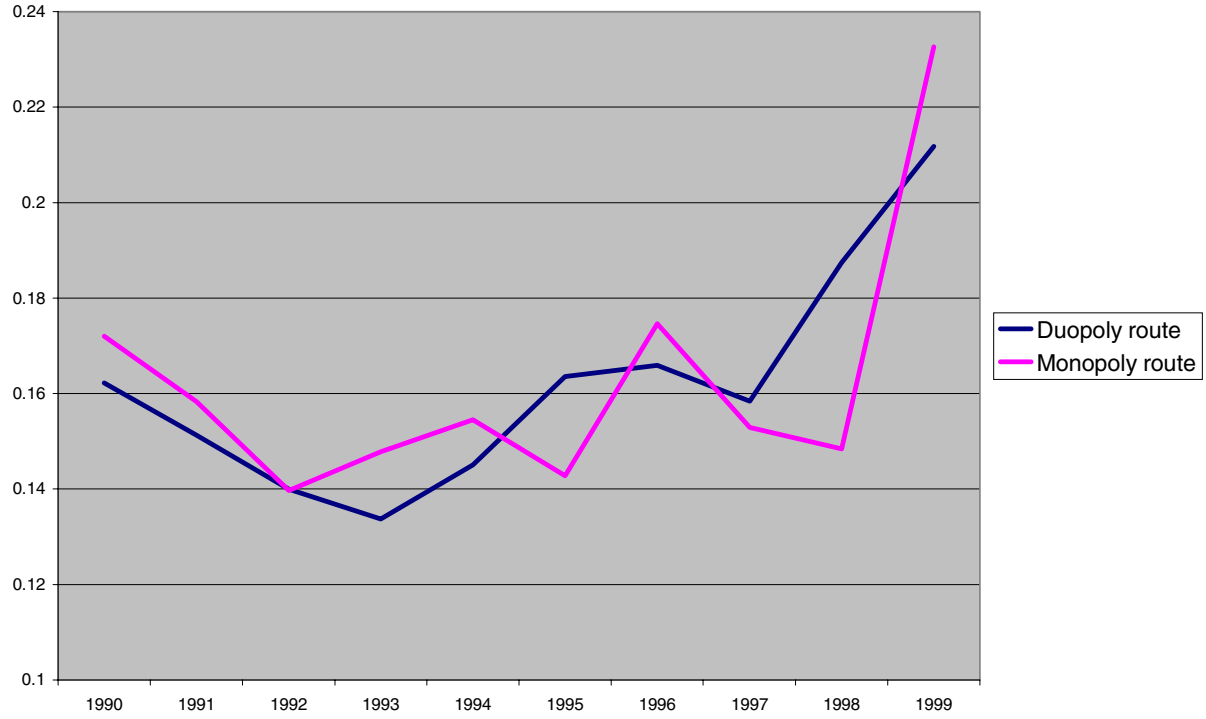
A possible worry will be whether imposing a disadvantagous regulation on the European airlines will worsen their competitive situation as compared to the North American and Asian competitors on international flights. As long as all the flag carriers dominate the international routes out of their home markets (refer Figure 5), the domestic consumers will still be loyal towards their local flag carriers to a certain degree.

5.2 Charges

Airline charges are regulated by the International Civil Aviation Organization (ICAO). In general, only charges that can be verified from infrastructure costs of the airports are accepted. However, several countries like Norway have implemented environmentally

motivated charges that according to the ICAO rules are more like taxes. This has increased the financial burden of the airlines, and might increase the entry barriers in this market.

Figure 6 Airline charges and taxes as share of total revenue on two representative routes in Norway during the period 1990 to 1999.

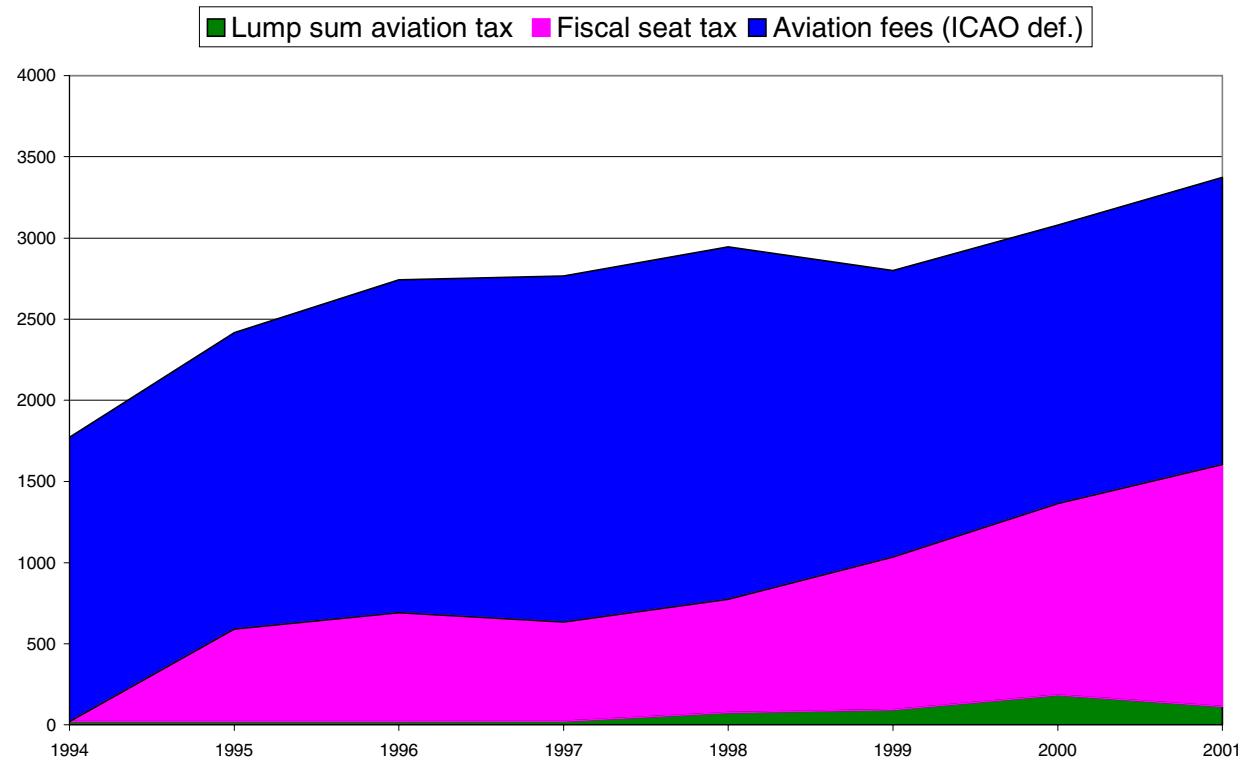


In Figure 6 we have shown the numbers for two representative routes in Norway. We see that all charges and tax account for around 15% of revenue. The charges increase over the period and by 1999 they increase by nearly ten percentage points. In Figure 7 we decompose charges and taxes. Interestingly enough, aviation charges have a constant or even decreasing share over the period. However, the fiscal seat tax and the lump sum aviation tax have increased from nothing to account for nearly as much as the charges. Hence, the increase in aviation fees is basically solely explained by taxes.

In Norway the government removed the fiscal seat tax after April 1, 2002. The argument is that this will ease entry. This is good, but also very convenient for the monopolist SAS. A monopoly could of course sustain a higher financial burden than a competitive regime. One solution is to make charges dynamic in the sense that they are reduced with entry, or even asymmetric in size to induce entry.

Another issue is how these charges are determined. Today most airports do not differentiate charges according to service level. The new low-cost-no-frills carriers are not interested in the full service offered by these airports. They accept a lower service level for their passengers in order to save costs. Hence, to induce entry one possibility is to differentiate on charges to induce more low-cost entry in the European market.

Figure 7 Decomposition of Norwegian aviation charges and tax over the period 1994 to 2001.



5.3 Handling

At most airports the airline companies handle their own aircrafts. Only at the largest airports the EU competition rules enforce an independent handling firm. Since an entrant must buy its handling services from its competitor(s) this might increase the cost and work as an entry barrier. For instance, when Color Air entered the Norwegian market it used SAS to handle their aircrafts. This implied that SAS knew everything about Color Air, it knew how many passengers Color Air had on each route, and knew thereby its load factor. This was probably advantageous to SAS. For instance, this way it could measure the effect of its own actions, i.e., how large was the effect of increased SAS capacity on Color Air's load factor, etc.

Another issue is the price the entering carrier has to pay. In Norway there are now three companies that handle aircrafts, all owned by SAS. Hence, the following announcement from the regional airline Widerøe seems a bit strange: *'Widerøe won the KLM contract (handling in Bergen) in fierce competition with SAS and Braathens' [our translation] (Press release 24.01.2002).* Is it likely that SAS will allow its companies to be in *fierce* internal competition? Or, alternatively, what is the 'going rate' for handling for a competing entrant?

We believe it is important that handling is independent of the carriers. This way entrants have a reel possibility of obtaining competitive prices on their handling.[11]

5.4 Predatory Behaviour

A problem we have seen in several cases in airlines is predatory behaviour. Often the established carrier meets an entrant with very aggressive behaviour. SAS capacity build up when Color Air entered the Norwegian market is only one example. In Sweden SAS reduced prices on competition routes in the 90s, and increased them again as their competitors either were bought by SAS or left the market. On the routes between Australia and New Zealand a low cost firm called Kiwi was forced out of the market by Quantas and Air New Zealand (Hazledine, Green and Haugh, 2001). In Germany Lufthansa reduced their prices substantially to compete with Go-Fly and Deutsche BA on the routes between Munich-London/Stansted and Munich-Frankfurt. As soon as the rival companies abandoned the routes, Lufthansa increased prices again.

This is a problem in airlines as well as other industries. The problem is twofold. First, it is difficult to prove predatory pricing. Second, if proven, the rival firm is by then very often bankrupt or has left the market for other reasons. Hence, the likelihood of an *ex post* penalty is not enough to discipline the established firms.

In Germany we now have a more present case where the competition authorities have regulated Lufthansa's prices to protect the entrant from possible predatory pricing. Here a small low-cost firm, Germania, started operating scheduled flight services between Berlin (Tegel) and Frankfurt (Main) on November 12, 2001. The company offered tickets at 99 € for

[11] There might also be some advantages for the carriers. Recently, SAS announced that they would outsource their handling to save costs. The incentives to be cost efficient in a monopoly are not very strong.

a one-way fully-flexible and rebookable flight. The conditions essentially correspond to DHL's economy tarriffs suitable for business travellers. Lufthansa reacted to this by also introducing a fully-flexible economy tariff at 200 € for a return ticket. Compared to the old tariff, the price fell from 486 € to 200 €, an almost 60% decrease in price. Since Lufthansa is including services not provided by Germania, like catering, frequent flyer points and three times as many flights, the new 200 € price is clearly undercutting Germania's price of 99 €.

The Bundeskartellamt in Germany decided February 18, 2002, that Lufthansa must charge at least 35 € more than Germania on a one-way ticket for the next two years.[12] This is to prevent too tough competition. The 35 € are meant to cover the extra services provided by Lufthansa. Hence, here we have a case where the competition authorities react quickly to probable predatory pricing, and impose more or less an *ex ante* rule. We believe that there are lessons to be learnt from this case. First, reactions need to be enforced quickly. Second, *ex ante* regulation might be more efficient than *ex post* regulation.[13]

6. The future competition in Europe: Low-cost no frills?

Above we saw how the competition in Norway led to a monopolised market. In particular we saw how the effects of the large customer contracts forced the companies to merge to get out of a prisoner's dilemma situation with too much capacity and a screwed price structure. The Norwegian market now resembles most European markets with one large dominating flag-carrier. The question is therefore how to promote new competition - and from where this new competition will emerge?

In 1994 less then three million passengers used low-cost-no-frills carriers in Europe. In 1999 the number had increased to 17.5 million (Doganis, 2001). Ryan air transported most of these passengers. The low-cost-no-frills carriers have experienced higher growth rates than all the traditional flag carriers, and they increase in popularity among the passengers. A questionnaire from 1999 concluded strongly in favour of the low-cost carriers: 19,000 passengers in the UK would rather reccomend low-cost-no-frills carriers to British Airways.

[12] Announcement from Bundeskartellamt, Bonn, 19.02.2002: "Bundeskartellamt prohibits Lufthansa from hindering its rival Germania".
[13] There is a literature on predation and competition, see for instance Farrell and Katz (2001) for a discussion of predation in network markets.

Ryan Air is copying the Soutwest model from the US. Soutwest was the first low-cost-no-frills company, and has during the last 35 years grown to become the fifth largest carrier in the US in terms of passengers. They have had the highest growth rate, and been profitable in every year of operations. During this period all of the larger US airlines recorded substantial losses for several years. Soutwest and Ryan Air are aiming for the leisure market, operating on smaller airports often located a considerable distance from the cities they serve. Only in very few cases they traffic hubs. Their frequency are often low, with relatively few daily flights. Other successful companies like Easy Jet is aiming also for the business segment. They are operating on the main airports and with higher flight frequencies, both important aspects in the business segment. The common factor for all of these low-cost-no-frills companies is that they operate at cost levels which are 25-40% below those of their major competitors.

The low-cost-no-frills are specializing on the short and medium haul routes. The long haul routes are predominantly operated by the traditional carriers. This is, not a problem within Europe however. Most of the "domestic" routes are short or medium haul.

Although increasing, the market share of the low-cost-no-frills in total has only around five % in Europe in 2001. In the UK and also between the UK and Europe where Ryan Air has its "home market" the low-cost-no-frills market share is in the order of 20%.[14] The question is therefore whether we can anticipate these figures also outside the UK. This depends on several factors, but is related to all four factors discussed above: frequent flyer programs, airport charges, handling and possible predatory behaviour. Of these, charges have been the main focus of the low-cost-no-frills carriers. They lobby for lower absolute charges, and service differentiated charges.

An additional factor is the possibility of interlining with the flag-carriers, but not with the low-cost-no-frills carriers. If you want to go from Oslo to New York you might like to go by Ryan Air to London and then using British Airways from London to New York. The problem is that today you will be charged for two independent tickets. This raises the combined price, so you might end up with British Airways also between Oslo and London. This can be solved

[14] These numbers were presented by Andrew Sentance, chief economist in British Airways at CEPR's roundtable conferance in Barcelona May 3, 2002.

by enforcing the flag carriers to accept competitive transfer prices also for the low-cost-no-frills carriers.

As long as the future competition seems to be closely connected to the destiny of the low-cost-no-frills carriers, it is important to focus on those issues that are important to achieve entry from these carriers. We believe that in particular frequent flyer programs and charges are important to consider to obtain more competition. Hence, the competitive challenge is there – but where are the antitrust people?

References

Borenstein, S. and J. Netz, 1999, 'Why do All Flights Leave at 8am? Competition and Departure-Time Differentiation in Airline Markets, *International Journal of Industrial Organization*, 17, 611-640.

Carns, R. D. og J. W. Galbraith (1990): 'Artificial Compatibility, Barriers to Entry, and Frequent Flyer Programs, *Canadian Journal of Economics*, 23: 807-16.

Doganis R. (2001) 'The airline business in the 21st century'

Farrell J. and M.L., Katz (2001) 'Competition or predation? Schumpeterian rivalry in network markets' University of California at Berkeley.

Farrell J. and P. Klemperer (2002) 'Coordination and lock-in: Competition with switching costs and network effects' will be published in the Handbook of Industrial Organization Vol. III.

Hazledine T., H. Green and D. Haugh (2001) 'The smoking gun? Competition and predation in the trans-tasman airtravel market' Department of Economics, University of Auckland, New Zealand.

Klemperer, P. (1984): Collusion via switching costs: How frequent flyer programs, trading stamps, and technology choices aid collusion', Research paper 786, Stanford Graduate School of Business.

Klemperer, P. (1995): 'Competition when consumers have switching costs: An overview with applications to industrial organization, macroeconomics, and international trade', *Review of Economic Studies*, 62: 515-539.

Salvanes, K. G., F. Steen og L. Sørgard (2000a): Hotelling in the Air? Flight Departures in Norway', Department of Economics, Norwegian School of Economics and Business Administration.

Salvanes, K. G., F. Steen og L. Sørgard (2000b): 'Collude, Compete, or Both? Deregulation in the Norwegian Airline Industry', Department of Economics, Norwegian School of Economics and Business Administration.

Spence, M. (1975): 'Monopoly, quality and regulation', *Bell Journal of Economics*, 6: 417-429.

Steen, F. and L. Sørgard (2001): 'price discrimination in the airline industry' Report written for the Norwegian Competition Authorities, January 2002.

Steen, F. and L. Sørgard (2001): 'Konkurranse versus monopol i norsk luftfart' (Competition versus Monopoly in the Norwegian Airline Industry), confidential report submitted to the Norwegian Competition Authorities, October 2001.