

Aviation Strategy

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The regulatory backlash

The world's leading airlines are succeeding in provoking the regulatory authorities into action.

There was a specific reason for the Continental/Northwest link-up, which we covered in the February issue of *Aviation Strategy* at the same time as we commented that a new industry consolidation phase was neither inevitable nor particularly logical. Consequently, American/US Airways and Delta/United announced plans for comprehensive codeshare agreements, covering the domestic market only at present but eventually extending to the international markets.

These new virtual mergers come at a time when the US DoT is formulating new rules governing the US majors' responses to new entrants, essentially limiting the incumbent carriers' ability to match a new entrant's prices and drive it from the market by increasing capacity.

The majors generally regard such actions to be the correct tactic to ward off a threat; regulators tend to regard such action as predatory. Alfred Kahn, the father of US deregulation, has resurfaced and is advising the DoT on its policy; he admits that it is difficult to distinguish between vigorous competition and predation, but insists that the DoT now has to address the issue.

Kahn is arguing that incumbent carriers should not be allowed deliberately to take losses in order to drive out new entrants. And in estimating the costs of the incumbents' responses, regulators should look not just at the marginal cost of filling seats that otherwise would have gone empty, but also at the opportunity cost of not deploying capacity in the airline's most profitable alternative market. (Lots of fun for economists here.)

Given the DoT's stance, Congress's investigation into the antitrust implications of alliances and a general disgruntlement with the level of business fares in the US, the majors are going to have a very difficult time selling their new alliances to the authorities. Although codesharing agreements normally do not attract attention from the regulators, such are the implications of the new alliances that they can and probably will be investigated under the Sherman Act.

First, US airlines have spent a great deal of effort arguing that a reduced number of major carriers in the market did not imply a diminution in the intensity of competition, because competition took place between hubs with the majors battling to route passengers over their own hubs. The implication of the new alliances is that the number of competing hubs will be cut in half. It is not likely that the newly found complementarities between hub systems will stand up to scrutiny.

Second, because these alliances are marketing alliances only, it will not be possible to claim cost benefits in terms of rationalisation and economies of scales which would be passed on to passengers in terms of lower fares (a very weak argument for mergers in any case).

Third, regulators have intermittently worried about implications of FFPs because smaller airlines cannot (*continued on page 2*)

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offer competitive services, leaving the majors with a stranglehold on business travel. The proposed sharing of FFP benefits between the new alliance partners can only aggravate this market distortion.

Fourth, the international dimension seems hardly to have been considered, beyond statements to the effect that code-sharing will not be applied to international routes for the present. But what will the Commission make of the US developments? To take an obvious example, Delta and United are the US partners in two alliances that are supposed to be competing forcefully across the Atlantic. Will the Commission ask for guarantees that the domestic US codesharing will not be extended ever to the Atlantic?

Already there appears to have been another delay in the Commission's ruling on the BA/American alliance, which now may not be revealed until July (encroaching on les grandes vacances in Brussels), partly the result of the Commission attempting to examine the Lufthansa/United case at the same time. Adding US Airways back into the BA/American combine, even in a peripheral role, is certainly not going to speed things up.

Two observations can be made about the current alliance flux:

- In the mid/late-1980s the merger boom in the US was driven by a fear of being left out in the cold, and the same sort of mentality is reappearing today. But whereas some of the mergers that took place then were disastrous (viz Continental, Eastern, Frontier, People Express), the more tentative nature of codesharing alliances today at least greatly reduces the downside. It is also much easier for the US authorities to intervene to dissolve a marketing merger than to try to order the dismantling of a full-scale merger.
- The longer the EC investigation into transatlantic alliances takes, the greater the risks for carriers both presently inside and outside the major groupings. If the EC rules in a way that allows British Airways and American to proceed, they will have more than three years of catching up with Star to do. If the EC decides in such a way that the BA/American alliance becomes impossible, it is very likely that stringent conditions will also be placed on Lufthansa/United, forcing Lufthansa to reverse key elements of the strategy in which it has invested so much.

Preconditions for Euro fare wars?

A key characteristic of the intra-European scheduled market is that none of the incumbents seems to be able to make any money. Whether fast-growing like KLM or nearly stagnant like Air France, whether operating in a fragmented market like British Airways or in a near monopoly like Lufthansa, the AEA carriers all claim that their intra-European/domestic operations are loss-making or at best break even.

This was not seen as too much of a problem for those carriers that operated profitable long-haul networks, as the key role of the European routes was feed. For those carriers with unprofitable long-hauls, the ultimate solution was state aid. Now, finding a solution to intra-European losses has become a priority as low-cost carriers

inexorably expand in Europe.

The Euro-majors have evolved a wide range of strategies aimed at improving the efficiency of their European operations; examples of the main strategies are summarised in the table opposite.

- BA and Lufthansa operate traditional lower cost domestically-based subsidiaries, although BA has been the innovator in transborder investment (through DBA and TAT/Air Liberté) which, it has to be said, has yet to pay off.
- BA was also the first airline to utilise franchised airlines like CityFlyer that take BA's brand into niches too small for the parent airline. Examples of transborder codesharers include Lufthansa/Air Littoral and Air France/Eurowings.
- Go is the first of specifically designed low-cost

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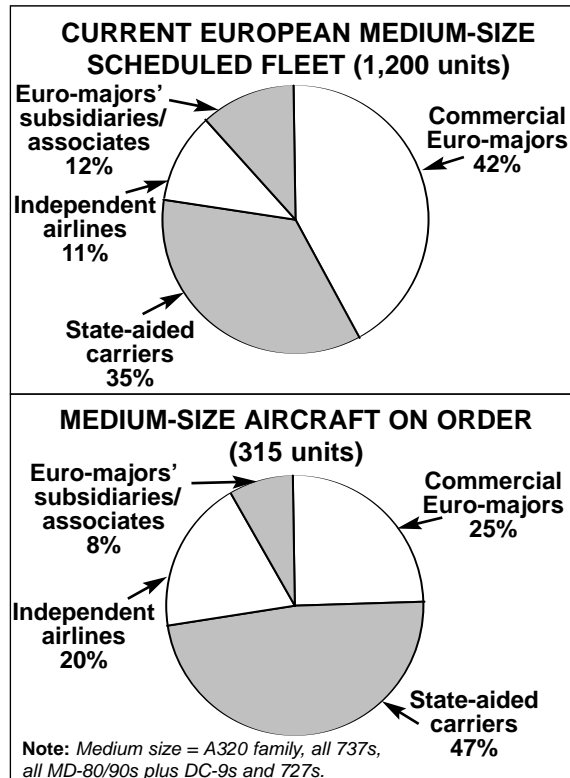
subsidiaries but there are other variations on this strategy - the charter/scheduled hybrid Transavia, for example, or Alitalia's innovative Team concept. Team is a subsidiary that looks identical to the parent but whose employees operate under more commercial wage structures and work rules; the idea is to reverse all Alitalia employees into the subsidiary by the year 2000.

- Finally, Euro-Majors have been seeking cost savings and economies of scale through rationalisation of mainline operations. This takes the form of alliances - between, for example, Lufthansa/KLM - or integration; for example Air France's absorption of Air Inter.

The overall European trend is that the internal market is becoming more diversified at the same time as the long-haul market is becoming more concentrated. The pie charts provide a snapshot of the current structure of the market - we have categorised the scheduled operators of 120-180 seaters in western Europe into commercial Euro-majors, airlines that have received state aid, the lower cost independents (including the likes of British Midland as well as the new entrants) and the Euro-majors' subsidiaries (DBA, KLM uk, etc).

At the most basic level, the 35% of capacity operated by the commercial inadequates must be the prime target for the low-cost carriers, both independents and subsidiaries. The independents represent a larger proportion of the order-book, 20% as against 11% for the existing fleet, but ironically almost half the orderbook is accounted for by recent commitments from Alitalia, Iberia and Sabena. BA's flexi-order for up to 100 aircraft has yet to be awarded.

The leading new entrants, like Ryanair and easyJet, are now moving into a new expansion phase as they start to receive brand-new 737s into their fleets. Because their cost structure will inevitably increase, they will be attempting to accelerate their advances into higher cost, more protected segments of the European market. Hardly any of the 33 non-London routes that the



UK CAA identified in its 1995 benchmark report ("The single European aviation market: Progress so far") as being suitable for third airline competition have seen new entrant carriers. EasyJet's plan for an operation at Geneva is an indicator of future trends.

Last year it looked as if the expansion of low-cost carriers would be restrained by lack of suitable equipment. But now they have access to a new source of supply - aircraft displaced from the Asian fleets. Go's first two 737s came from PAL via GECAS, and the availability of narrowbodies will increase - in the process reversing the upward pressure on prices and rentals.

If there was also to be a downturn, or even a significant slowdown in the rate of intra-European traffic growth, all the conditions would be there for Europe's first full-scale scheduled fare war.

	EUROPEAN MAJORS' MAIN INTRA-EUROPEAN STRATEGIES						
	Domestic subsidiary	Transborder subsidiary	Domestic franchise/codeshare	Transborder codesharer	Low cost subsidiary	European alliance	European consolidation
British Airways	BA Regional	DBA, TAT	CityFlyer	-	Go	-	-
Lufthansa	Cityline	-	-	Air Littoral	-	SAS	-
KLM	-	KLM uk	-	-	Transavia	Alitalia	-
Air France	-	-	Brit-Air	Eurowings	-	-	Air Inter
Alitalia	-	-	Minerva	-	Team	KLM	Avianova

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Regional aircraft manufacturers: an uncertain future?

Regional aircraft manufacturers have had a tough time recently. Here Richard Aboulafia from the US-based Teal Group takes a close look at the state of the industry and considers its prospects.

Historically, the regional aircraft manufacturing market has been a gruesome battleground with too much competition and a lot of government intervention. If the economics of the commercial jet business were twisted, the economics of regional aircraft were completely sprained. Given the number of producers, there was little hope that any of them could make a profit. To the manufacturers, market share was more important than profit anyway.

Efforts at rationalisation were problematic. Bombardier bought Shorts to prevent a competitor to the CRJ, but it didn't prevent Brazil and Indonesia from developing their own regional aircraft. There were few barriers to entering the market.

On the other hand, the past three years have seen companies more willing to merge their regional aircraft operations and to kill money-losing programmes. British Aerospace joined ATR to form AIR, pooling marketing, sales and aircraft support resources. This move, finalised in early 1996, got rid of the disastrous ATP/J61 programme. The money-losing Jetstream followed it last year. However, AIR itself was dissolved in late April, following the partners' disagreement on whether to proceed with a 70-seat jet (ATR was for the project, BAe strongly against).

In early 1996, DASA got rid of Fokker and its \$2.5bn debt, killing the F50 - another failed follow-on. DASA is also looking to dispose of Dornier. In April 1997 Fokker delivered its last few aircraft, including the hopeless F50 and the promising F70. CASA, hoping to concentrate on its military transports, abandoned its ludicrous 3000 proposal. And in a sure sign that things are changing, Saab decided in 1997 to exit the market by the end of the century.

Countries around the world are privatising their state-owned companies, or heading in that direction. And, private businesses throughout the world have decided to follow the Anglo-American model and put profitability ahead of volume and market share. Regional aircraft production is mightily unprofitable. The rational and modern thing to do is abandon new production and turn attention to more profitable after-market support activities plus jetliners, fighters and business jets.

This situation makes alliances problematic. Without a willingness to fund the AIR Jet, AIR became little better than a loose collection of programmes with mixed futures. ATR, Embraer and CASA could join forces, but this would mean exactly nothing unless all the partners wanted to spend their own money on new product development. And these days a regional aircraft division is very unlikely to get several hundred million from a profit-minded corporate parent.

Any new players?

The old way of doing things still prevails in some places. Despite the Asian economic catastrophe, some governments still believe they can confidently direct their nation's economies by command. And the phrase "national aircraft programme" still has a lot of charm.

The countries that avoided disaster in Asia, most notably Taiwan, had the least interest in national transport aircraft. There's a strong lesson here. On the other hand, if IPTN had to rely on private funding it would close up shop overnight.

So, few new players look set to enter the market. After IPTN, the only potential new entrants are India and Turkey, which have vague (and probably doomed) plans to build turboprops. Most of the Asian aerospace wannabes are looking to start with something bigger, usually a 100-seat jet. And they're doomed too.

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Given the relatively low level of US government involvement and support in the aerospace industry, it isn't surprising that very few regional aircraft are produced in the US. Boeing lost money on each plane built by DHC, even when the subsidiary had a full order book. DHC was only viable after Bombardier acquired it, with a lot of Canadian government support.

This left Fairchild and Raytheon (Beech) as the only US regional aircraft manufacturers. Fairchild is only able to stay alive with indirect subsidies, such as US military aircraft purchases, and DASA paying them to take the old Dornier programmes. Beech keeps the 1900 alive due to commonality with its successful King Air business aircraft line (and more US military aircraft purchases).

However, if Fairchild succeeds in making Dornier's 328/428JET programmes profitable, the US will have an important regional family. And if this succeeds, Raytheon could take heart and develop a family of regional jets from 30-80 seats, using composite fuselage technology developed for the Premier One business jet. The next century could therefore see a very different regional aircraft industry in the US.

Any new aircraft?

A new aircraft may not be seen for a very long time; it costs a lot to build a new jet.

Fairchild's \$560m figure for 728JET development is an amusing fantasy - compare it with AIR's far more reasonable \$1.2bn figure for the AIRJet. Both would have new wings and fuselage and are in the same class.

Given the market, a new jet would have to sell for around \$20m per plane. If anyone can build them for that (slightly less, actually), it would still take a 500-unit production run to amortise development costs. This assumes some benign government or corporation provides seed money. These numbers reinforce our pessimism. Regional aircraft programmes are very lucky indeed to sell 500 aircraft.

This is why the regional jets out there are not all-new. The CRJ is an elaboration of the Challenger bizjet. The Emb-145 uses the Emb-120 fuselage. The Avro RJ was designed decades ago as the HS 146, for largely military requirements and with UK government funding.

That leaves simple stretches - the 428JET, for example, is quite doable, and has been accounted for in the 328JET numbers below. As a result of these trends, there's good and bad news. The good news: we are headed in a more rational (and therefore sustainable) direction. No more Saab 2000 total market disasters. The bad news: fewer cool new planes. No more Saab 2000s.

TEAL GROUP REGIONAL AIRCRAFT FORECAST

	1998	1999	2000	2001	2002	2003	2004	2006	2005	2007	Total
AIR/ATR 42/72	46	44	48	48	40	36	40	42	44	50	438
AIR/BAe RJ	23	21	22	20	18	16	16	14	8	6	164
Beech 1900	40	32	32	30	30	30	22	25	30	32	303
Canadair RJ	66	68	45	36	30	24	28	28	26	24	375
Canadair RJ-700	-	-	4	22	30	33	26	17	24	20	176
DHC DHC-8	44	36	34	36	39	42	34	28	32	40	365
Embraer Emb-120	12	14	13	9	10	6	5	2	2	-	73
Embraer Emb-135	2	6	12	12	12	12	10	8	8	10	92
Embraer Emb-145	60	44	40	36	30	25	22	36	41	42	376
Fairchild Do. 328	15	15	12	10	8	8	6	6	4	4	88
Fairchild Do. 328JET	1	2	12	20	21	17	16	16	18	18	141
Fairchild Metro	8	10	6	4	4	-	-	-	-	-	32
IPTN N-250	1	2	1	4	8	10	10	8	8	8	60
Let 610G	1	4	8	14	14	12	12	10	10	10	95
Others	6	7	6	6	4	5	4	4	4	4	50
Saab 340	25	10	-	-	-	-	-	-	-	-	35
Saab 2000	8	6	-	-	-	-	-	-	-	-	14
TOTAL JETS	152	141	135	146	141	127	118	119	125	120	1,324
TOTAL TURBOPROPS	206	180	160	161	157	149	133	125	134	148	1,553
TOTAL UNITS	358	321	295	307	298	276	251	244	259	268	2,877

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The only exception is the Boeing 717, Boeing's misguided attempt to revive Douglas's MD-95 has been accompanied by talk of downsized 70-80 seat versions. This product is largely off-the-shelf, so we have no problems with it reaching the market. But Boeing would have to sell it at a loss-making price, with cost guarantees that compensate for the high operating costs of downsized 122-seat jets. And the airlines would have serious trouble with their unions, which would not accept a DC-9 version flown by low-pay regional subsidiary pilots. So we don't see a regional 717 version either.

Will turboprops survive?

The regional jet menace first reared its threatening head in the late 1980s, when Canadair's RJ programme began. Pundits began to see a regional transport industry transformed by the arrival of 40-80 seat jets. However, in the early 1990s the RJ order book collapsed, the programme lost steam, and several competing programmes fell by the wayside. The jet menace evaporated and smiley faces prevailed at ATR, DHC and other turboprop makers.

But the jet menace came back. The CRJ has become very successful. And while some of the competing programmes stayed dead, Embraer managed to snatch defeat from the jaws of victory and in late 1996 delivered its Emb-145 to Continental Express.

There are over 340 regional jets on backlog, and they aren't just 50-seat designs. Canadair has launched its CRJ-700, a 74-78 seat RJ stretch. Embraer has launched its Emb-135, a 35-seat version of the -145. Fairchild Dornier is desperately trying to reinvent its 33-seat 328 as the imaginatively-named 328JET.

Is this the end for the turboprop? The market is over-reacting: on some routes, turboprops will always have an advantage, and at present relatively little is known about the economics of flying regional jets. Right now, a few carriers are buying smaller jets because they want to promote themselves as an all-jet airline.

Will passengers and operators pay more for a 30-40 seat plane with turbofans, even if it flies only 250 mile routes (the average US regional airline trip length is around 230 miles)?

Also, regional carriers may find their enthusiasm for jets dampened if the majors stop giving them new routes, or if unions keep their scope clauses in place.

Finally, the turboprop numbers are far from grim. There were 54 ATR42/72 and 43 DHC-8 orders in 1997. That's not bad. The only turboprops in trouble are the big ones: Saab's dying 2000, DHC's misguided Dash 8-400 and ATR's 72 have been hit hard by jets, although the latter plane has never tried to go directly up against the jets, and looks set to pull through. The other dead and dying turbofans - Saab's 340, AIR's Jetstream 41 and Fokker's F50 - were never profitable and are the victims of rational corporate decisions.

State of the market

If you ignore their finances (as everyone does), 1997 was good for regional aircraft manufacturers. According to the Teal Group, total turboprop orders in 1997 came to a surprisingly respectable 204 aircraft (slightly more than *Aviation Strategy's* estimate of sales - see March issue). But jets really took off, with orders for 326 planes, including 32 Avro RJs, 156 CRJs, 121 ERJs (as the Embraer jets are now called) and 17 328JETS.

Some historical comparisons: orders in 1996 came to 216 turboprops, plus 150 regional jets. That was comparable with 1995, an equally good year, when 341 regional aircraft were ordered, and 1994, with 337 regional orders. By contrast: only 92 turboprops and 40 jets were ordered in 1993.

Regional aircraft deliveries in 1997 continued at a healthy level, with 201 turboprops and 119 jets, including 31 ERJs, 61 CRJs and 22 Avro RJs.

Looking into the future, the Teal Group is forecasting that the regional aircraft industry will produce 1,324 jets and 1,553 turboprops worth a total of \$40.37bn between 1998 and 2007 (see page 5).

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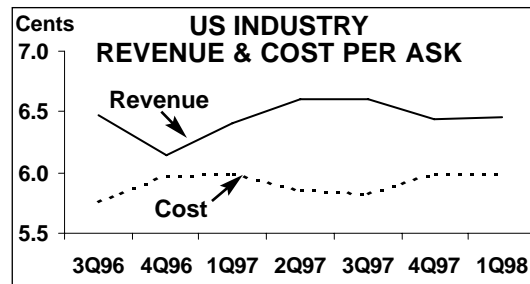
No sign yet of cycle peak in US industry

The profitability of the US industry shows no sign of weakening following another excellent quarter's results.

Combined operating profit for the nine largest airlines for January-March 1998 was \$1,474m, compared with \$1,242m in the first quarter of 1997. Combined net profit in 1Q98 was \$835m, compared with \$731m in January-March 1997.

Key trends were strong demand in the domestic and transatlantic markets - which more than offset weakness in Asia/Pacific routes - and low fuel prices. The major airlines also limited capacity growth, with industry ASK up 1.0% on 1Q97. With industry RPK up 1.2%, overall load factor rose 0.1 points in 1Q98 to 68.3%.

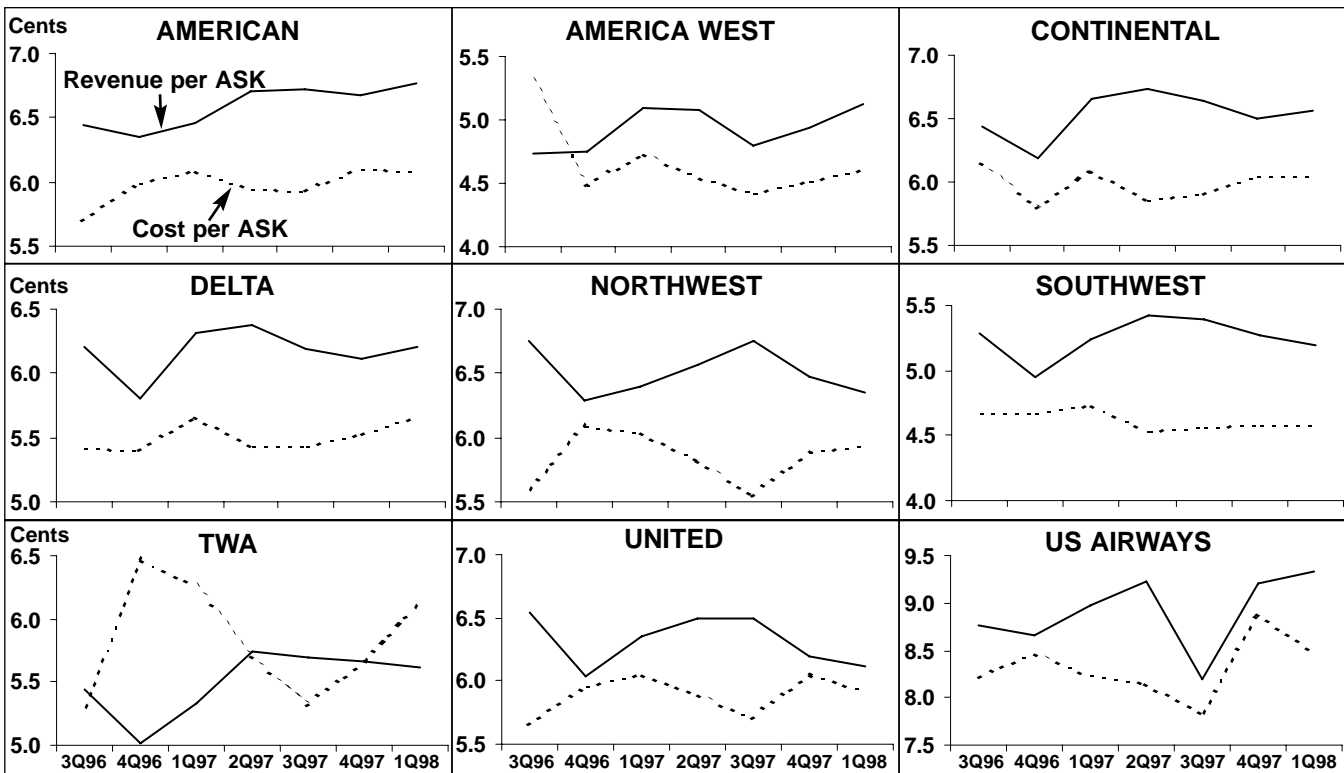
The gap between overall industry revenue and cost per ASK was maintained in the first quarter of the year (see chart, above), although not all the US airlines man-



aged to do the same (see below). The gap narrowed most noticeably at Northwest, which was particularly affected by the Asian downturn - 30% of its revenue comes from routes to the region.

TWA is the only airline among the top nine not to report a profit, although it did manage to reduce the extent of its losses.

Looking ahead to the rest of 1998, airlines expect the strong US economy and low fuel prices to continue.



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KLM and the \$1.1bn bonanza

Through necessity, KLM is probably Europe's leading airline in terms of strategic thinking. Without the intrinsic advantages of British Airways or even Air France, KLM has put a great deal of management effort into predicting how markets will evolve and how the airline can best position itself to exploit these changes.

Some of the strategies KLM has developed have worked out well, such as the Northwest alliance (although not in the way that was expected). Other initiatives have failed totally - a merger with BA mooted in the early 1990s and the Alcazar project, for example. But underlying all of KLM's strategic moves seems to be the imperative of maximising its share of European traffic in order to compensate for the airline's limited domestic market.

Following a doubling of net profits in the first nine months of its 1997/98 financial year, KLM is set to post record results in the full year (see graph, right). 1997/98 results will be boosted by sustained cost-cutting and revenue enhancement programmes, an improving economic climate (including a weak guilder), lower fuel prices, a growth in traffic (up 9% in the first three-quarters of

1997-98) and better demand for business class. KLM predicts that operating profit will surpass the airline's previous record of DFI 772m in 1994/95 (\$481m). But net profit will receive a huge boost - approximately \$810m - from the Northwest share sale.

Northwest cash-in

KLM has now sorted out its disputes with Northwest over their eight-year old alliance. In September 1997 the two airlines signed a 10-year co-operation agreement on the North Atlantic, with a three-year notice period afterwards. Additionally, the alliance was also broadened into other geographical and operational areas - for example, in June all 70,000 European members of Northwest's FFP (WorldPerks) will be transferred to KLM's scheme (Flying Dutchman), although KLM's FFP is not as generous as Northwest's. KLM is also taking over Northwest's European reservations and ticketing.

Prior to this agreement, Northwest contributed \$150m each year to KLM's operating profits, but new synergies such as the merging of revenue management systems, rationalisation of sales and marketing etc, is forecast to increase KLM's bottom-line benefit to \$300m a year.

As part of the September deal Northwest agreed to repurchase KLM's remaining 19% stake in the US airline in four annual tranches, with KLM receiving a total of \$1.2bn as well as substantial book profits. In January 1998 this timetable was replaced by a new agreement, whereby the sale of the last three tranches was accelerated and completed by May 1 this year (although the full effect will be included in the 1997/98 results, released later in May).

In total, in the 1997/98 financial year the sale will give KLM a book profit of \$810m, cash reserves will be boosted by \$758m and KLM will also own \$340m of Northwest senior unsecured notes (redeemable in

KLM GROUP FLEET PLANS			
	Current fleet	Orders (options)	Delivery/retirement schedule/comments
737-300	17	0	
737-400	19	0	
737-800	0	8	Delivery in 1999/2000
747-300	3	0	
747-300 Combi	10	0	
747-400	8	0	
747-400 Combi	11	0	
767-300ER	10	0	
MD-11	9	0	
ATR 72-22	5	0	Operated by KLM uk
Saab 340B	6	0	Operated by KLM cityhopper
Fokker 50	19	0	10 operated by KLM cityhopper, 9 by KLM uk
Fokker 70	10	0	Operated by KLM cityhopper
Fokker 100	20	2	15 operated by Air UK. Two deliveries to KLM uk in late 1998
BAe 146-300	10	0	Operated by KLM uk
TOTAL	157	10 (0)	

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September 1998 and 1999 - see table, page 11). Although the accelerated deal (\$1.1bn in cash and securities) is not quite as generous as the September 1997 agreement, the earlier settlement substantially reduces KLM's risk and gives the airline a big cash pile much earlier than would have been the case.

Focus 2000

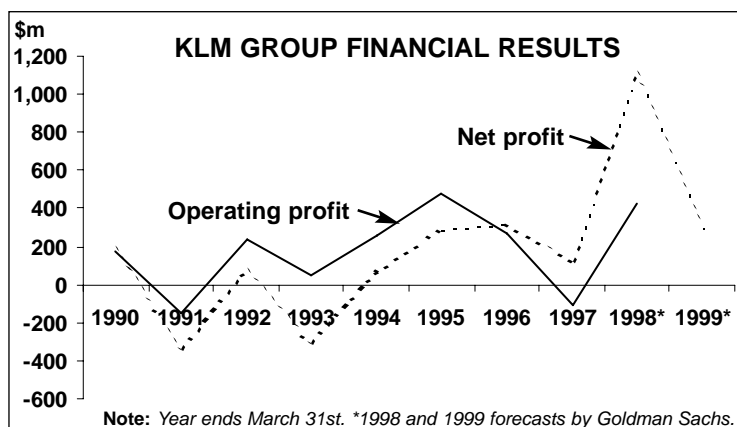
In 1991 KLM started a cost-cutting programme that in five years raised productivity by 60%. But according to the airline, the "limits of such an approach" were reached in 1996, and there was a realisation that KLM's break-even load factor (around 70%) was still too high. Although KLM has certain structural advantages - a well-developed long-haul network and a modern fleet, for example (see table, left) - cost pressure is rising. Yields too, are eroding - see graph, page 10.

Therefore a new programme, called Focus 2000, was launched in November 1996. Its target is to improve operating results by \$769m (DFI 1.5bn) over 3 years, \$513m through increased income and \$256m through cost savings.

"Quick wins" have already been achieved, including a wave system at Schiphol, the closure of unprofitable routes (e.g. to Marseilles, Lusaka and Calgary) and an enhanced revenue management system. KLM is also adopting a more focussed approach to growth, with the emphasis on depth of network rather than spread. Frequencies to popular destinations have therefore been increased.

The results of cost-cutting and revenue enhancement so far are encouraging - in the first half of 1997/98 Focus 2000 improved operating income by \$77m, KLM claims, and at least double that is forecast for the full year.

But according to KLM, Focus 2000 is about more than just cost-cutting, and the programme also has non-financial targets. In particular, KLM talks about introducing a "different way of working", with the airline becoming a simpler, more flexible company. For example, within certain parameters managers are being given responsibility for individual projects that contribute to set targets.



On a larger scale, KLM claims it will introduce its version of process re-engineering - but this is a notoriously difficult practice to adopt in large companies without a systematic rethink about a firm's entire operations. Whether KLM can achieve widespread process re-engineering remains to be seen, and careful explanation of what senior management is trying to achieve will need to be made to staff and unions if the airline is to achieve radical change.

The European challenge

With a small catchment area for O&D traffic, KLM has to concentrate on transfer traffic - and transfer traffic is much more vulnerable to competition than O&D traffic. This competition comes from rival hubs like Heathrow, Frankfurt and Paris. Because of the generally strong market conditions in recent years, more transatlantic city pairs have become viable non-stop operations, and every time one of the European airlines introduces a new direct service it potentially competes with KLM.

In addition, much of KLM's Europe/North America traffic goes through a double hubbing system, with passengers changing aircraft at Schiphol and Detroit or Minnesota. While double hubbing opens up a myriad of destinations to European passengers, these routes are very vulnerable to competition from single hub routes.

KLM claims that its double hub routes will compete with single hub flights through price and service, but the price differential will have to be substantial to persuade passengers to

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change aircraft in the US and Europe when the alternative is just one changeover.

KLM is trying to defend its double hub position through improving the quality of connections at Schiphol (higher frequencies, quicker transfers etc) - in particular by changing from a daily three-peak system at the airport to a multiple peak, or wave system, which double transfer options.

However, this will only temporarily shore up KLM's transfer business as competing hubs will gradually be built up elsewhere in Europe, in addition to traditional rivals. The recent US-France aviation deal, for example, is sure to cream off French passengers who currently take the short-hop to Schiphol; as more US destinations are opened up direct to France, passengers will switch away from Schiphol to routes where they change just once or even fly direct.

A European partner?

As part of a strategy to defend its position in Europe, last year KLM decided to find a major partner. Alitalia was the choice. Although Alitalia had been under political pressure to ally with Air France, KLM managed to beat off the French challenge (and a possible Alitalia-Swissair alliance) by signing a strategic passenger and cargo MoU with Alitalia in December 1997.

Details are sketchy at present, but the basic idea is that KLM and Alitalia will develop a multi-hub system, linking Milan Malpensa, Rome Fiumicino and Schiphol. Equity links appear out of the question at the moment, following KLM's Northwest experience.

Theoretically, the benefits to KLM will be twofold. Firstly, by co-operating with KLM's

partners - Northwest and its new ally, Continental, across the Atlantic - Alitalia should start to attract a greater share of Italian long-haul passengers (at present Alitalia captures just 20% of intercontinental Italian passengers). And, presumably, KLM will gain a slice of this increased revenue at Alitalia and its North American partners. Secondly, there is scope for re-routing some long-haul flights out of Europe via the multi-hub system (Italy to Netherlands to the US east coast, for example, or Netherlands to the Middle East via Milan).

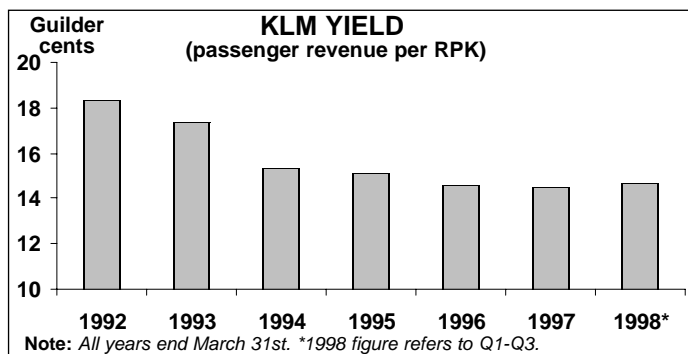
Clearly the two airlines have plenty of work to do in turning the MoU into a workable agreement (the alliance is scheduled to begin in November, once Malpensa opens). The rushed MoU also raises the question of whether Alitalia is the best possible strategic partner in Europe for KLM - or whether it is just the best partner available among the few European airlines not already linked up elsewhere.

However, the full potential of the KLM/Alitalia deal will not be realisable until a US-Italy open skies agreement is signed and some form of antitrust immunity is extended to Northwest and/or Continental.

Low-cost challenge

Even if the Alitalia deal does prove to materially strengthen KLM's European position, the airline also faces the prospect of increasing competition - particularly from low-cost carriers - at what has been, until now, a relatively uncontested home base at Schiphol.

This is part of the reason why KLM launched regional brands in January 1998. Air UK (which is building up its Stansted network) was renamed KLM uk, Air Exel became KLM exel, and they were joined by KLM cityhopper. The regional branding and KLM livery gives greater association with the KLM core brand, and clearer position within the Northwest alliance. The concept also fits neatly into KLM's three tiers of partners: global (Northwest), network (the regional brands and other equity airlines such as Kenya Airways) and individual route partners.



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KLM also has considerable charter interests and, importantly, 15% of revenue comes from cargo. The airline combines cargo and passengers within the same aircraft, but cargo performed badly in 1996/97. Cargo capacity has now been reduced, and KLM intends to focus on more profitable routes.

Elsewhere, KLM claims that it will not be affected too much by the Asian slump, since it completed a rationalisation of its Asia/Pacific route network in 1997. Hence load factor has actually risen in this market in the first three quarters of 1997/98 (see table, above). Planned capacity increases to Indonesia and Hong Kong have been delayed, so that in 1998/99 capacity will rise by just 2% on its Asia/Pacific routes. KLM is helped by the fact that 80% of flights to the region are on 747-400 Combis, allowing cargo to be increased when passenger demand is weak.

KLM is looking for further partners in Asia. In January 1998 an MoU was signed with Malaysia Airlines. A more detailed agreement is due soon, but essentially the deal focuses on linking route networks and codesharing, perhaps even on beyond destinations.

A cash bonanza

The cash that KLM has raised from its Northwest shares is a significant sum, equal to KLM's entire cumulative operating profit in the 1990s. Just how that cash is used will be an important indicator of KLM's strategic intentions.

The airline insists that it will not be rushed into making any decisions, but it has indicated that a buy-back of the Dutch govern-

	Capacity (ATK m)	Change %	Traffic (RTK m)	Change %	Load factor	Change %
North America	2,864	9%	2,332	11%	81.4	+1.8
Asia/Pacific	2,599	3%	2,122	6%	81.6	+2.4
Latin America	1,457	14%	1,108	20%	76.0	+4.1
Europe	952	12%	635	19%	66.7	+4.0
Africa	712	1%	548	10%	77.0	+5.8
Middle East/S. Asia	699	-20%	555	-16%	79.4	+3.4
TOTAL	7,300	9%	9,283	5%	78.6	+2.8

ment's remaining stake in KLM is a possible option. In December 1996 the Dutch government reduced its stake from 38.2% to 25%, but it is tempting for KLM to buy out this remaining portion as not only would KLM join the ranks of BA and Lufthansa as an all-privatised airline, but the price of the outstanding shares would rise.

As the Dutch state's role in guiding KLM is now minimal, the purchase of this stake would mostly bring about a psychological boost to the airline. That boost should not be underestimated, particularly to the ranks of middle management at KLM - some of whom still act as though KLM is a state-owned carrier.

But surely, it could be argued, there are better options available to Leo van Wijk and the rest of KLM's management? The purchase of the Dutch government's stake can be seen as a traditional share buy-back, returning cash to shareholders (via a rise in the share price of the remaining stock). It can be argued that share buy-backs are essentially options for managements with little strategic choice. In effect, KLM would be saying it could find no worthwhile investment for the cash pile elsewhere.

Yet, that may well be the right decision to make. KLM *could* purchase a stake in a European airline, although the experience of Northwest will stay long in the airline's corporate memory. KLM *could* also revamp its European fleet. But, as Guy Kekwick of Goldman Sachs points out, returns on airline investments in Europe are never as profitable as returns on investments elsewhere.

So although investing the \$1.1bn Northwest windfall on KLM's European operations looks tempting, in reality there may not be a profitable enough opportunity available. Defending KLM's vulnerable European transfer traffic via alliances may seem an essentially passive strategy - but it may be the correct one.

Original agreement				
September 29:	1997	1998	1999	2000
Cash	322.5	210	147.5	491
Book profit	210.5	162.5	116	393.5
TOTAL BENEFIT	533	372.5	263.5	884.5
Accelerated agreement				
	Sep 97	May 98		
Cash	322.5	435		
Northwest senior unsecured notes*		340		
Book profit	210.5	600		
TOTAL BENEFIT	533	1,375		
Note: *Redeemable in Sep 98 and Sep 99.				

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Delta: tackling quality, union and alliance challenges

Delta is in excellent financial shape but still struggling to restore service quality and employee morale after its earlier cost-cutting programme. It is expanding aggressively in Latin America and trying to retain its leading position on the North Atlantic. Will its new president and CEO Leo F. Mullin solve the quality problems, appease restless unions and forge a domestic partnership with United?

Only a few years ago Delta was on the brink of extinction with net losses of \$1.7bn in 1991-1994, the bulk of which was accounted for by its Atlantic division following the 1991 purchase of Pan Am's European routes and Frankfurt hub.

After two years of heavy restructuring, the Atlantic routes returned to profitability in 1995. The division is now a solid performer, earning a \$200m operating profit or a 12.7% profit margin in the first nine months of 1997.

In April 1994 Delta launched an ambitious three-year cost-cutting programme, the "Leadership 7.5" project, which aimed to cut unit costs from 9.3 cents per ASM to 7.5 cents by the June 1997 quarter through staff reductions, outsourcing and route cutbacks.

The project turned out to be outstandingly successful. By the end of 1995, Delta had slashed its operating costs by \$1.6bn. Its unit costs (excluding restructuring charges) fell to 8.33 cents in the

June 1996 quarter, making Delta the lowest-cost hub-and-spoke major carrier in the US.

A four-year compromise deal with ALPA, signed in April 1996, contributed another \$340m annual cost savings. Most significantly, the contract enabled Delta to set up a low-cost airline subsidiary, Delta Express, in October 1996, giving it a head-start over competitors in retaining and expanding operations in low-cost markets.

Delta never reached the 7.5-cent unit cost target, as the project was formally abandoned in summer 1996 due to the more pressing need to restore service quality and employee morale. The company had cut too deeply in some areas and its on-time performance had slipped seriously.

Delta was able to switch to a more balanced strategy, focusing on revenues while keeping tight controls over costs, because it had reached all of its financial goals: solid returns to shareholders, a lower debt structure and investment-grade credit ratings.

In calendar-year 1997 Delta earned operating and net profits of \$1.6bn and \$934m respectively (including \$52m special charges). Its profit margins (10.4% and 6.9%) were at the higher end of the range for the major carriers.

While Delta's former CEO Ron Allen was credited for engineering the successful cost-cutting programme and restoring profitability, the persistent service quality and morale problems cost him his job in May 1997. Efforts had been made to correct those problems through insourcing, new recruitment in customer service areas and restoration of some of the pay cuts. But Delta still came ninth out of ten in the DoT's on-time performance rankings in the year ended June 30, 1997.

One of the main reasons behind the appointment of an outsider, Leo F. Mullin, as president and CEO was clearly the hope of finding a fresh approach to handling customer service and employee morale issues. Mullin, a former banker, took up his position in August last year.

As expected, Mullin made service quality his top priority, announcing an agenda for reviving customer service within months of his arrival. Top management changes have been limited to the

DELTA FLEET PLANS

	Current fleet	Orders	Options + rolling options	Delivery/retirement schedule
727-200	131	0		To be retired at about 10 per year
737-200	54	0		
737-300	16	6		
737-6/7/800	0	70	(60+280)	Delivery in September 1998-2006
757-200	91	12	(17+90)	Delivery in 1998/1999
767-200	15	0		
767-300ER	64	12	(10+19)	Delivery in 1998-1999
767-400	0	21	(24+25)	Delivery in 2000-2001
777-200	0	12	(20+30)	Delivery in May 1999-2000
MD-88	120	0		
MD-90	16	0		
MD-11	15	0		To be retired as 777s delivered
L-1011-1	21	0		To be retired over next 1-3 years
L-1011-250	6	0		To be retired over next 1-3 years
L-1011-500	15	0		To be retired over next 1-3 years
TOTAL	564	133	(131+444)	

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replacement of the CFO (November 1997) and the retirements of senior VPs for personnel and marketing in April. These moves reflect other new priorities at Delta: the need to deal sensitively with the interests of ALPA, deter further unionisation and secure alliance partners.

Service quality and labour issues

In November Delta unveiled plans to overhaul, modernise and streamline just about everything: lounges, gates, concourses and work areas at airports, boarding procedures, reservations lines and information technology systems. Mullin also decided to speed up a programme to refurbish aircraft interiors.

Delta now also expects to have state-of-the-art technology capabilities within two years in MIS, revenue accounting, boarding and ticketing - an area where it has trailed competitors.

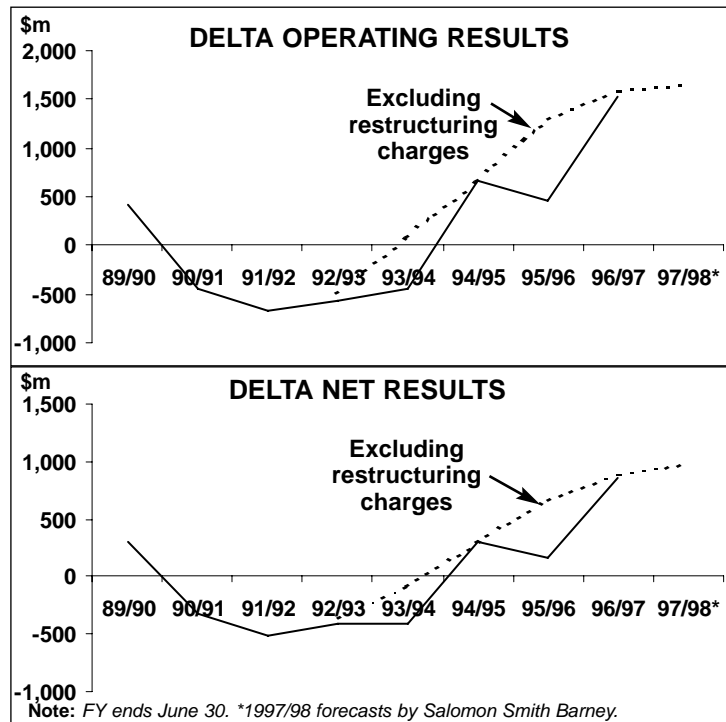
All of this will cost more than budgeted, but at this stage Delta still expects to retain its unit cost advantage over competitors. Its unit costs have been on an upward trend over the past two years, but so have those of the other major carriers.

But Mullin also faces the challenge of dealing with a restless workforce (an area where he is believed to lack expertise), making it all the tougher to retain the hard-won cost efficiencies. Delta's pilots are unhappy about some of the concessions they made in 1996 and are now trying to secure good rates for flying the new-generation 737s. ALPA is also gearing up for new contract negotiations in the run-up to April 2000, when the wages will snap back to the 1996 pre-concession levels.

The past six months have seen much unionisation activity among Delta's mechanics, ramp workers and cabin attendants (only pilots and a handful of dispatchers are unionised at present). In December TWU lost its petition to hold an election among ramp workers, but will no doubt try again. TWU and the Teamsters are wooing the mechanics, while AFA is gaining ground to organise Delta's flight attendants.

Latin American expansion

Mullin's second major move was to give the formal go-ahead to aggressive expansion in Latin America. In early December the carrier announced that it hopes to operate to 21 cities in the region within three or four years.



After serving only Mexico, Delta launched its first South American route (Cincinnati-Atlanta-Sao Paulo-Rio) in June 1997 and began to apply for route licences. Last year the region still accounted for less than 2% of its total revenues.

The initial phase of Delta's expansion focuses on the Atlanta hub, which saw new non-stop 757 services to Guatemala, Panama, El Salvador and Costa Rica, as well as Caracas in Venezuela, in April. Atlanta-Lima operations will begin on July 1.

The carrier has also applied to serve Chile, Argentina, Colombia, Uruguay, Paraguay, Bolivia and Belize, subject to government approval, new bilaterals or amendment of existing ASAs. The services would mainly be operated from Atlanta and the necessary aircraft are already part of Delta's fleet-purchase programme.

Delta is a little late in the game as Continental has already been aggressively challenging American and United in the US-Latin America markets over the past two years. In its efforts to become a major niche player, Delta will try to promote its main hub as a convenient alternative gateway, offering better facilities and faster transfer times than congested Miami. This is a reasonable strategy as about 55% of the Latin America traffic currently using Miami connects to other US points.

Delta can expect to make good profits in the region. In January-September 1997, it earned a

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\$36.2m operating profit in Latin America, representing a 21.6% profit margin.

Access to additional markets will be gained through co-operation with Latin American carriers. Losing Varig (which defected to United's Star Alliance in October) was a major blow, but Delta has since then secured codeshare alliances with Transbrasil and Venezuela's Aeropostal, as well as Air Jamaica. It is also expanding its successful four-year codeshare relationship with Aeromexico.

But the biggest coup was to beat Continental to an equity stake in AeroPeru in March. Delta will acquire a 35% stake in the carrier and enter into a ten-year marketing alliance.

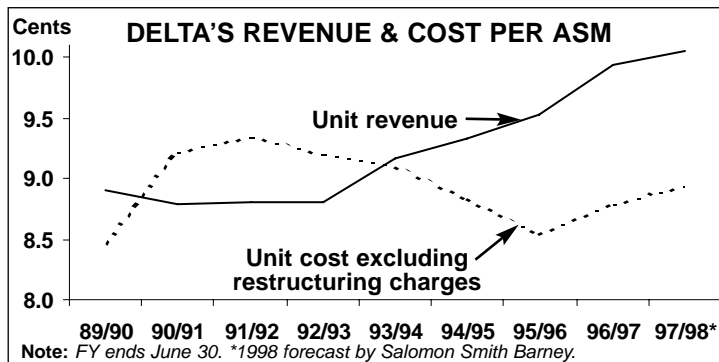
The deal is significant in that it will give Delta access to Lima, one of the most strategically located hubs in South America. It will also help cement the relationship with Aeromexico, which currently holds a 47% stake in AeroPeru, perhaps leading to an exclusive partnership in the vitally important Mexican market and an eventual equity stake in Cintra.

Key hubs and Delta Express

Over the past two years, Delta's domestic strategy, like that of Continental and others, has focused on expanding and improving the economics of its main hubs: Atlanta, Cincinnati, Salt Lake City and New York (JFK).

The carrier's biggest strength is its home base at Atlanta Hartsfield, where it accounts for about 80% of the traffic. Much of the new domestic expansion continues to focus on Atlanta.

The Cincinnati hub will see some expansion this summer, after cutbacks and realignment last year. The Salt Lake City hub will see some further rationalisation (termination of two routes) but new services to Detroit and Newark.



Much of the focus at JFK is on boosting feeder services to international flights, while Portland (Oregon) is now getting new connections that will feed to the new Japan services due this summer.

All the indications are that Delta Express has been a success. Its relatively limited scale of operation (about 150 daily flights at present, utilising 27 737-200s) means that it is not a major profit generator. But it has apparently exceeded all goals for operational reliability, customer satisfaction and profitability.

Delta Express features as a high priority in Delta's strategic plans. In addition to enabling Delta to retain low-cost markets, it is used as a "laboratory for new ideas and innovative process" that can be applied to the whole company.

The venture is again being expanded this spring and summer, partly in response to new competition. For the first time, it will move west of the Mississippi, while some resources will be shifted from the Northeast to the Midwest. The summer schedule will connect 14 points in the Northeast, Midwest and Southwest with Orlando and four other Florida cities.

Asian struggles

Delta has not had much luck recently with its Asian partners. In November Singapore Airlines pulled out of the Global Excellence alliance. Although the two had codeshared only on the New York-Singapore sector, Delta had hoped to use SIA as an anchor for Asian expansion.

Then in March the carrier's hopes of expanding ties with its existing codeshare partner ANA were dashed when the Japanese carrier defected to United's Star alliance. That left Delta with just two (lesser) codeshare partners, Korean and China Southern, while its own Asian services cover only Japan, Korea and India.

On a positive note, Delta will be able to expand its co-operation with Korean under a US-Korea open skies regime (an MoC was signed in late April). Also, the new US-Japan ASA will enable it to enter the Atlanta-Tokyo market (June 3) and link Portland with Osaka and Fukuoka at the end of October.

North Atlantic strength

Since the drastic early 1990s cutbacks, Delta has continued to fine-tune its European operations.

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In early 1997 it discontinued six intra-European and three transatlantic routes out of Frankfurt, where it had increasingly found itself overshadowed by Lufthansa and its alliance partners.

Parallel to the cutbacks, there have been efforts to strengthen the JFK hub with new European flights and more feeder services. This year Delta is terminating its unprofitable JFK-Berlin and JFK-Copenhagen services and introducing services to Warsaw, Stockholm, Stuttgart and Barcelona. These moves have enhanced Delta's already strong position on the North Atlantic and at JFK. In the third quarter of 1997 it earned the highest Atlantic operating profit among the US majors: \$119.3m or 20.3% of revenues.

Codeshare co-operation with Swissair, Sabena and Austrian has developed rapidly since Delta secured antitrust immunity in the US for the Atlantic Excellence alliance in June 1996. There is no doubt that Delta has derived benefits from the alliance. However, the combine is nowhere near as powerful as the Star alliance, the possible BA/American combine or even Northwest/KLM. Add to that Delta's current inability to serve Heathrow, and its strategic position on the North Atlantic looks weaker than what the scale of its own operations would indicate.

Now that the US-France bilateral (which will lead to an open skies agreement) has at last been finalised, Delta can proceed with its planned codeshare with Air France, originally agreed on in 1994. But this deal is not exclusive as Continental has a similar agreement with Air France. Delta would appear to have two possibilities: either attempt to integrate Air France into its existing transatlantic alliance, which would be opposed by Swissair, or commit itself to a comprehensive and, hopefully, immunised alliance with Air France, which would probably involve abandoning its existing European partners.

Fleet restructuring

Delta is one of only two major US carriers (the other one is TWA) likely to achieve further significant cost savings through fleet restructuring and modernisation. There are still 131 727s and 42 L-1011s in the fleet and, with eight distinct aircraft types, much potential for simplification.

Domestic requirements were taken care of in a \$6.7bn 106-aircraft (767/757/737) order signed with Boeing in October 1997, for delivery in 1998-

2006. The aircraft will replace the 727s and the domestic L-1011s and create opportunities for "disciplined" growth.

The deal included 124 options and 414 rolling options (involving lesser commitment) covering the next 20 years. There is much flexibility to adjust the delivery schedule and substitute between aircraft types and models.

The process of replacing the international L-1011 fleet began in January 1996, when Delta ordered 12 767-300ERs for transatlantic routes. Last November it placed a \$1.42bn order for ten 777-200s (options in the October Boeing deal), for delivery by the end of 2000, and in March ordered another two. There are 20 options plus 30 rolling options slated for delivery by 2018. The 777s will essentially replace the MD-11s in transatlantic operations. The new Japan services will take up some of the European MD-11s. Delta expects to utilise mainly 757s and 767s in Latin America, plus possibly MD-11s and 777s in the longer term.

A link-up with United?

Delta's market position is relatively strong because of its dominance at Atlanta, number one position at JFK and on the North Atlantic, good prospects as a niche carrier in Latin America and successful low-cost operation on the East coast.

But the proposed codeshare and marketing alliances between the other US majors (Continental/Northwest and American/US Airways) have made it imperative for Delta to find its own domestic partner.

Delta had expected to link up with Continental but lost out to Northwest. But its talks with United now look likely to lead to a broad global partnership that will combine networks, marketing efforts and FFPs but involve no equity investment.

The two can claim perfectly complementary networks: Delta is strong on the East coast and in the South, United in the Midwest and West. European operations would be likely to be excluded initially, in order to avoid upsetting existing codeshare relationships.

The alliance was expected to be announced in New York on April 24, but certain union-related issues still need to be worked out and there is no guarantee of a successful outcome. Because of its scope, the deal would also test the tolerance of antitrust authorities.

By Heini Nuutinen

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Keeping yield management under control

Yield management is basically a simple idea, but its application can become hideously complicated in practice. In this article Thomas Weyer reviews the development of yield management techniques and comments on how best to measure their success:

The mission of airline yield management is the control of the reservations inventory offered to the flying public. The availability of seats is managed in such a way as to maximise - if possible - the revenue earned at aircraft departure time, given the flight schedule and fare structure.

The ultimate goal of yield management is the improvement of marginal passenger revenue, through an increase of average fares, or an increase in departure load factors, or both. To achieve this, yield management concentrates on three basic functions - over-booking, discount allocation and origin and destination control.

Over-booking

Over-booking is the practice of selling more reservations for a flight than there are seats on the aircraft, attempting to offset the passenger cancellations and no-shows that airlines usually permit without penalty. Thus over-booking attempts to minimise the number of "spoiled" seats - those departing empty at flight time. The practice has its risks: if over-booking levels are too high and more passengers show for a flight than there are seats, penalty costs and ill-will are incurred. Mathematically, yield management attempts to control over-booking to the point at which the benefit of allowing an additional reservation is negated by the marginal cost of an over-sale.

Discount allocation

Most airlines offer two, and sometimes three, distinct classes of service: first class,

business class and economy. Each class is generally distinguished by identifiable features: seat pitch and size, meal service, check-in privileges, and other amenities for which a passenger would expect to pay a higher price.

In the early/mid-1970s, however, airlines began offering discount fares (within specific classes of service), primarily to stimulate latent demand. The primary difference among degrees of discount tended to be time: the earlier the reservation, the greater the magnitude of discount.

Because the industry began offering a range of seat prices, identified by fare code within the reservation record and on the ticket, control of sales by degree of discount was possible. Today, control of the price at which a seat is sold is exercised by the decision whether or not to reject the next seat sale at a discounted price.

On one hand, if the carrier accepts the passenger request for a discounted seat, the discounted price is the amount the carrier will earn. By rejecting the discount request the carrier runs the risk that the seat will fly empty, without generating even the discount revenue.

On the other hand, rejecting the discount request "reserves" the seat for a potential sale at a higher fare code, hopefully generating greater incremental revenue. The decision whether or not to reject a discount sale rests on the probability that a higher fare ticket will be sold.

This probability varies according to the season, day of the week, time of day, closeness to holidays, origin and destination, and the proximity of the impending flight date. The number of potential influences on the probability that a higher fare ticket can be sold appears almost unlimited, and control of these influences boils down to three basic factors:

- The magnitude of future expected demand;

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- The accuracy of the demand forecast, and;
- The probability of sell-up to a higher fare class.

Origin and destination control

The implications of hubbing for yield management are dramatic. By virtue of connection potential at hubs, a single flight carries passengers to multiple destinations. Because of the passenger diversity on a single flight, seat inventory can no longer be optimised by concentrating only on fare code. Within a fare class on a single flight, multiple fare levels represented by multiple destinations and fare combinations compound the complexity of revenue optimisation.

Furthermore, fares are constantly changing as a result of operating cost adjustments, market promotions, and competitive influences. Carried to an extreme, it is possible for any particular flight to have as many different revenue levels as there were sold seats.

To simplify management of the permutations of fares, fare combinations are now grouped into a limited number of "buckets" of similar dollar magnitude. Fare code analysis has therefore given way to fare bucket analysis, the goal of which is the establishment of a reasonable difference between bucket levels. Thus the ability to sell or restrict the sale of seats (by bucket) includes the effect of multiple origin and destination parameters.

Techniques and analysis

Successful implementation of yield management requires an ongoing, periodic forecast of demand based on accurate data. Forecasts are initiated and maintained up to departure time by fare bucket for each flight within the control of the revenue management system.

Traditional yield management systems forecast demand by flight leg (aircraft hop) or by flight segment (passenger haul), as both historical leg and segment data are readily available in the airline reservation system.

• Leg class controls

In this case inventory controls are established by flight leg for each fare class, based on a demand forecast by fare class flowing over the flight leg.

The inventory controls or allocations of seats per fare code may be nested or non-nested. With multiple serial nesting a lower class is nested into the next higher class. This means that seats in a lower valued class will not be made available for sale when a higher valued class is closed for sale.

With multiple parallel nesting each lower fare class is nested into the highest fare class, but there is no nesting of the lower classes into intermediate classes. Hence, with parallel nested controls a lower class may be open for sale while an intermediate (higher) class is closed.

For these two nesting schemes several variations can be applied. For example, on a single flight both serial and parallel controls can be enacted. The obvious advantages of serial controls may be employed for normal traffic, with parallel controls reserved for wholesalers or special promotions.

• Segment class controls

In this case inventory controls are established by segment for each fare class without regard for O&D demand for various passenger types.

With segment class controls total capacity on a given flight leg is partitioned to each of the distinct segments that flow over the leg. For example, consider a flight routing from A to B to C. Capacity is partitioned based on a forecast for A-B, B-C, and A-C. Furthermore, within each segment classes of fares can then be nested either in serial or parallel, whichever the particular case may require.

For airlines operating flights with multiple stops under the same flight number, segment close indicators (SCIs) may prove advantageous in restricting segment classes that are lower valued when demand exists for higher valued segment classes. So, using the previous example, the airline may

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be justified in closing a certain fare class on the A-B leg, but keeping open that same fare class on the A-C leg. The weakness of SCIs is that the technique must be continuously monitored for cancellations.

Under the technique known as segment limits, an inventory cap is placed on the sale of class leg sales. In this manner the airline's inventory control system is permitted to backfill seats should passenger cancellations occur.

• O & D controls

Origin and destination control can be described as "itinerary" control. An itinerary describes a passenger's one-way city pair, including connect points and time of day. Control of sales at the itinerary level is highly complex with the value of the passenger determining reservation availability. The value of the passenger is based on several factors such as itinerary, departure date, class of service (first, business, economy), fare class within class of service, published fare, "confidential" fare, and point of sale.

Levels of sophistication inherent in seat inventory control are illustrated by the following examples:

1. No controls

When the airline's reservations system establishes no controls, the last seat sold will be sold at the lowest fare offered over a particular leg.

2. Leg-class controls

Under leg-class controls inventory value is based on the relative value of the various fare classes, without regard to origin and destination. In this scenario, the last seat sold on a particular leg will occur at the highest fare class, ostensibly to preserve seat availability for higher value multiple leg journeys.

3. Segment class controls

With segment-class controls inventory is controlled based on the relative value of the

various classes by segment. In this scenario, the last seat sold will occur at the highest fare class over the particular segment.

4. Itinerary class controls

Itinerary class controls govern sales based on the relative value of the various itineraries flowing over a specific flight leg. Trade-offs can be made to accept or reject local, through and connecting itineraries. In this scenario, airlines can sell the last seat to the highest valued itinerary class over the entire network that flows over the particular leg.

As stated earlier, the number of permutations and combinations of fare class restrictions under an O&D (itinerary) control method requires simplification before management of the inventory can become effective.

Simplification demanded that the number of fare classes be reduced to a manageable number of buckets, based on customer value. This is accomplished by clustering the various itinerary fare classes into buckets based on the value of the customer to the airline. So a bucket, which consists of several itinerary fare classes, is used to control seat inventory instead of fare class code control.

To an airline then, the value of an itinerary class is the passenger's fare, net of the opportunity costs associated with passengers displaced upline and downline. Thus, passenger itineraries flowing over each flight leg in the network are clustered into a manageable number of buckets.

The clustering process is highly complex, basically consisting of algorithms to minimise the variance of customer values within a bucket, while at the same time maximising the separation between buckets. The buckets are serially nested to make sure that as sales build up in advance of departure time, the lowest fare classes will close automatically.

Performance management

The problem of performance measurement of revenue management is a continu-

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ing source of debate. Above all, airline industry profitability is highly volatile and management reaction time to the vagaries of the marketplace is relatively short. Thus the performance of the current period may not be comparable to the performance of prior similar periods.

But performance measurement statistics do exist. Overall measures of the effectiveness of a yield management system consist of such post-departure statistics as: spoilage, over-sales, load factor, revenue per revenue passenger mile, revenue per available seat mile, flight and fare class closing rate, and spilled revenue. Available pre-departure statistics include advance bookings, group bookings and inventory classes closed.

Month over month and year over year comparisons can be made, with the difficulty however of weeding out the anomalies which render erroneous conclusions. In so far as successful yield management depends on accurate forecasting, errors in demand forecasts, cancellation forecasts and no-show forecasts must be studied by airlines and eliminated to the highest degree possible.

In some instances yield management disciplines, hastily or improperly applied, can lead to detrimental results. Forecast accuracy is critical. Where flights display a wide degree of variability, consideration should be given to exclusion of the flight from the yield management system. Since yield management is an exercise in fine-tuning sold seat inventory, a reasonable degree of stability/predictability is required.

Flights which should be considered for exclusion from the yield management system include those with a high number of legs, flights with legs exhibiting a high degree of load variability such that over-booking and/or spoilage penalties prove to be the norm rather than the exception, and flights with low load factors.

Performance measurement invariably requires benchmarks against which improvement or deterioration can be ascertained. Establishment of yield management benchmarks, or standards against which performance can be judged, is not straightforward.

Too many uncontrollable variables cloud concrete comparisons. As a result, industry yield managers have tended to rely on complex mathematical modelling (simulations, or revenue opportunity models) to attempt to demonstrate the improvements attributable to yield management.

One such simulation is known as the "Min/Max Index". This index is designed to estimate flight revenue under three assumptions.

First, the "minimum" estimates revenue if no controls are in place; or in other words, capacity available for sale equals aircraft capacity. Minimum revenue equals unmanaged class demand times the average class fares. The simulation commences with the lowest fare class and continues until either there is no more demand or the aircraft is full.

Second, the "maximum" estimates ideal achievable revenue assuming perfect forecasts of both demand and no-shows have been made and perfect bucket authorisations have been established. Maximum revenue equals unconstrained class demand times the average class fare. Unlike the minimum, the calculation begins with the highest fare class and continues to the lowest fare class until there is no more demand, or the aircraft is full.

Third, the "actual" represents the revenue realised on the flight.

For analytical purposes actual revenue is expressed as a percentage of possible revenue within the range of minimum to maximum. Yield management controls are judged by historical increases in the percentage.

Again it should be emphasised that yield management is a fine-tuning discipline. Effort then should be concentrated on critical flights, or those flights that usually depart with high load factors.

It is these flights which run the risk of denied boardings due to over-booking, and yet they possess the demand availability for marginal increases in passenger load factor. Non-critical flights, or those with lower load factors, seldom impinge on over-bookings and thus sales at any fare level rarely close.

Aviation Strategy

Macro-trends

EUROPEAN SCHEDULED TRAFFIC																
	Intra-Europe			North Atlantic			Europe-Far East			Total long-haul			Total international			
	ASK bn	RPK bn	LF %	ASK bn	RPK bn	LF %	ASK bn	RPK bn	LF %	ASK bn	RPK bn	LF %	ASK bn	RPK bn	LF %	
1991	114.8	65.2	56.8	120.9	84.3	69.7	80.0	53.1	66.4	267.6	182.0	68.0	397.8	257.9	64.7	
1992	129.6	73.5	56.7	134.5	95.0	70.6	89.4	61.6	68.9	296.8	207.1	69.8	445.8	293.4	65.8	
1993	137.8	79.8	57.9	145.1	102.0	70.3	96.3	68.1	70.7	319.1	223.7	70.1	479.7	318.0	66.3	
1994	144.7	87.7	60.6	150.3	108.8	72.4	102.8	76.1	74.0	334.0	243.6	72.9	503.7	346.7	68.8	
1995	154.8	94.9	61.3	154.1	117.6	76.3	111.1	81.1	73.0	362.6	269.5	74.3	532.8	373.7	70.1	
1996	165.1	100.8	61.1	163.9	126.4	77.1	121.1	88.8	73.3	391.9	292.8	74.7	583.5	410.9	70.4	
1997	174.8	110.9	63.4	176.5	138.2	78.3	130.4	96.9	74.3	419.0	320.5	76.5	621.9	450.2	72.4	
Feb 98	13.5	7.7	56.8	12.7	8.3	65.8	10.4	7.6	73.0	32.3	22.9	71.1	47.9	31.9	66.6	
Ann. chng	8.4%	11.4%	1.6	9.8%	6.7%	-1.9	9.3%	7.8%	-1.1	10.2%	7.7%	-1.6	9.5%	8.2%	-0.8	
Jan-Feb 98	28.2	15.4	54.6	26.6	17.7	66.5	21.8	15.8	72.6	68.1	48.6	71.4	100.8	66.7	66.1	
Ann. chng	8.2%	11.2%	1.5	9.3%	7.6%	-1.1	8.8%	6.5%	-1.5	9.8%	7.9%	-1.3	9.3%	8.3%	-0.6	

Source: AEA

US MAJORS' SCHEDULED TRAFFIC																
	Domestic			North Atlantic			Pacific			Latin America			Total international			
	ASK bn	RPK bn	LF %	ASK bn	RPK bn	LF %	ASK bn	RPK bn	LF %	ASK bn	RPK bn	LF %	ASK bn	RPK bn	LF %	
1990	863.1	523.2	60.6	121.3	84.2	69.4	106.7	75.8	71.0	42.2	26.6	63.0	270.2	186.5	69.0	
1991	835.1	512.7	61.4	108.0	75.2	69.6	117.0	78.5	67.1	44.3	27.4	61.8	269.2	181.0	67.2	
1992	857.8	536.9	62.6	134.4	92.4	68.7	123.1	85.0	69.0	48.0	27.4	57.0	305.4	204.7	67.0	
1993	867.7	538.5	62.1	140.3	97.0	69.2	112.5	79.7	70.8	55.8	32.5	58.2	308.7	209.2	67.8	
1994	886.9	575.6	64.9	136.1	99.5	73.0	107.3	78.2	72.9	56.8	35.2	62.0	300.3	212.9	70.9	
1995	900.4	591.4	65.7	130.4	98.5	75.6	114.3	83.7	73.2	62.1	39.1	63.0	306.7	221.3	72.1	
1996	925.7	634.4	68.5	132.6	101.9	76.8	118.0	89.2	75.6	66.1	42.3	64.0	316.7	233.3	73.7	
1997	953.3	663.7	69.6	103.2*	82.7*	80.1*	92.0*	69.5*	75.5*	52.4*	34.7*	66.2*	331.2	246.5	74.4	
Feb 98	72.8	48.0	65.9										25.3	17.0	67.2	
Ann. chng	0.6%	1.1%	0.4										7.9%	5.1%	-1.8	
Jan-Feb 98	152.4	97.7	64.1										54.3	36.9	68.0	
Ann. chng	0.8%	0.5%	-0.2										7.1%	4.4%	-1.7	

Note: US Majors = American, Alaska, Am. West, Continental, Delta, NWA, Southwest, TWA, United, USAir. *Jan-Sep 97 only. Source: Airlines, ESG.

ICAO WORLD TRAFFIC AND ESG FORECAST

	Domestic			International			Total			Domestic growth rate		International growth rate		Total growth rate	
	ASK bn	RPK bn	LF %	ASK bn	RPK bn	LF %	ASK bn	RPK bn	LF %	ASK %	RPK %	ASK %	RPK %	ASK %	RPK %
1990	1,270	795	62.6	1,527	1,062	69.5	2,797	1,857	66.4	5.8	5.0	9.4	8.9	7.8	7.0
1991	1,267	800	63.2	1,487	998	67.1	2,754	1,798	65.3	-0.3	0.6	-2.6	-6.1	-1.6	-3.2
1992	1,300	840	64.6	1,711	1,149	67.2	3,011	1,989	66.1	2.7	5.0	15.0	15.2	9.4	10.7
1993	1,347	856	63.6	1,790	1,209	67.5	3,137	2,065	65.8	3.6	1.9	4.6	5.2	4.2	3.8
1994	1,403	924	65.8	1,930	1,326	68.7	3,333	2,250	67.5	4.2	7.9	7.8	9.7	6.3	9.0
1995	1,477	980	66.3	2,044	1,424	69.7	3,521	2,404	68.3	5.3	6.1	5.9	7.4	5.6	6.9
1996	1,526	1,046	68.6	2,163	1,537	71.1	3,689	2,583	70.0	3.3	6.7	5.8	7.9	4.8	7.4
*1997	1,585	1,102	69.5	2,305	1,659	72.0	3,890	2,762	71.0	3.9	5.4	6.5	7.9	5.4	6.9
*1998	1,621	1,133	69.9	2,398	1,728	72.1	4,018	2,861	71.2	2.2	2.8	4.1	4.2	3.3	3.6
*1999	1,678	1,170	69.7	2,522	1,812	71.9	4,200	2,982	71.0	3.6	3.3	5.2	4.8	4.5	4.2
*2000	1,757	1,217	69.2	2,686	1,917	71.4	4,443	3,133	70.5	4.7	4.0	6.5	5.8	5.8	5.1
*2001	1,831	1,249	68.2	2,840	1,997	70.3	4,672	3,246	69.5	4.2	2.6	5.8	4.2	5.1	3.6
*2002	1,852	1,244	67.2	2,916	2,023	69.4	4,768	3,267	68.5	1.1	-0.4	2.7	1.3	2.1	0.6

Note: * = Forecast; ICAO traffic includes charters. Source: Airline Monitor.

DEMAND TRENDS (1990=100)

	Real GDP					Real exports					Real imports				
	US	UK	Germany	France	Japan	US	UK	Germany	France	Japan	US	UK	Germany	France	Japan
1991	99	98	101	101	104	106	99	112	104	105	99	95	113	103	97
1992	102	98	102	102	105	113	103	112	109	110	107	101	115	104	96
1993	105	100	100	101	105	117	107	106	109	112	117	104	108	101	96
1994	109	103	103	104	106	126	117	115	115	117	131	110	117	107	104
1995	111	106	105	106	107	137	126	122	123	123	141	115	124	113	119
1996	114	108	107	107	111	152	135	128	128	126	155	124	127	116	132
*1997	118	112	109	110	112	171	144	141	140	139	178	133	135	121	135
*1998	121	115	113	113	113	184	149	154	151	151	198	144	144	128	144
*1999	124	117	116	116	116	196	157	166	161	162	212	152	153	137	153

Note: * = Forecast; Real = inflation adjusted. Source: OECD Economic Outlook, Jan 1997. Real GDP forecast from The Economist poll of forecasts

Aviation Strategy

Macro-trends

COST INDICES (1990=100)

	Europe						US					
	Unit revenue	Unit op. cost	Unit lab. cost	Efficiency	Av. lab. cost	Unit fuel cost	Unit revenue	Unit op. cost	Unit lab. cost	Efficiency	Av. lab. cost	Unit fuel cost
1990	100	100	100	100	100	100	100	100	100	100	100	100
1991	106	109	103	105	108	88	100	102	102	101	103	84
1992	99	103	96	119	114	80	98	100	101	107	108	75
1993	100	100	90	133	118	82	101	98	99	116	115	67
1994	100	98	87	142	123	71	98	94	101	124	125	62
1995	99	97	86	151	128	67	99	93	98	129	127	61
1996	100	101	88	155	135	80	102	94	98	129	126	72
*1997	110	107	85	161	136	84	107	96	102	124	126	71

Note: * = Provisional. European indices = weighted average of BA, Lufthansa and KLM. US indices = American, United and Southwest. Unit revenue = airline revenue per ATK. Unit operating cost = cost per ATK. Unit labour cost = salary, social charges and pension costs per ATK. Efficiency = ATKs per employee. Average labour cost = salary, social costs and pension costs per employee. Unit fuel cost = fuel expenditure and taxes per ATK.

FINANCIAL TRENDS (1990=100)

	Inflation (1990=100)					Exchange rates (against US\$)						LIBOR	
	US	UK	Germany	France	Japan	UK	Germ.	France	Switz.	ECU	Japan	6 month Euro-\$	
1990	100	100	100	100	100	1990	0.563	1.616	5.446	1.389	0.788	144.8	8.27%
1991	104	106	104	103	103	1991	0.567	1.659	5.641	1.434	0.809	134.5	5.91%
1992	107	107	109	106	105	1992	0.570	1.562	5.294	1.406	0.773	126.7	3.84%
1993	111	109	114	108	106	1993	0.666	1.653	5.662	1.477	0.854	111.2	3.36%
1994	113	109	117	110	107	1994	0.653	1.623	5.552	1.367	0.843	102.2	5.06%
1995	117	112	119	112	107	1995	0.634	1.433	4.991	1.182	0.765	94.1	6.12%
1996	120	114	121	113	107	1996	0.641	1.505	5.116	1.236	0.788	108.8	4.48%
1997	122	116	122	114	108	1997	0.611	1.734	5.836	1.451	0.884	121.1	5.85%
*1998	125	119	123	116	109	Apr 1998	0.599	1.790	6.001	1.490	0.906	132.2	5.78%**

Note: * = Forecast, from The Economist. 1990-97 trends from OECD. ** = \$ LIBOR BBA London interbank fixing six month rate.

JET VALUES

	Mid-life value (\$000)		Mid-life value (\$000)		Mid-life value (\$000)		Mid-life value (\$000)
727-200 Adv (HK)	5,400	767-300ER	51,550	L-1011-200/250	11,100	BAe 146-200	5,690
737-200 Adv (HK)	5,680	777-200B	126,000			BAe 146-300	9,920
737-300	19,700			A300B4-200	9,770	RJ-85	19,650
737-400	25,200	MD-82	14,910	A300-600R	58,800	RJ-100	22,640
737-500	18,810	MD-83	20,160	A310-300	26,710		
737-600	30,000	MD-90-30	32,560	A319-100	29,660	F-100	13,420
737-700	36,000	MD-95	28,000	A320-200	33,240		
737-800	43,000	DC-10-30	14,880	A321-100	46,160	Canadair RJ-600	14,660
747-400	108,650	MD-11	79,800	A330-300	84,780		
757-300	65,000			A340-300	96,290	Emb-145	14,650

Note: Values are for the oldest aircraft of this series, in clean "half-life" (i.e. mid way between D checks) condition. **Source:** MBA

JET AND TURBOPROP ORDERS

	Date	Buyer	Order	Price	Engines	Delivery	Other information
Aero Int. (Reg.)	Apr 16	Gill Airways	1 ATR 72-200			2Q98	
Airbus	Apr 27	THY	2 A340-300s			2Q99-00	
	Apr 8	Air Canada	2 A340-500s,				
			3 A340-600s			02	+ 10 options
	Apr 2	Air Lanka	6 A330-200s			4Q99+	
	Apr 1	Edelweiss Air	3 A320s			99	
Boeing	Apr 22	Federal Express	3 MD-11Fs			1Q-2Q99	
	Apr 21	TWA	24 MD-83s	\$1.1bn		2Q-4Q99	
	Apr 14	United	1 747-400,				
			6 767-300s,				
			16 777-200s			1Q99-02	
	Apr 7	KLM	4 737-800s		CFM56-7		
	Apr 1	El Al	2 737-700s				
Bombardier	Apr 15	Wideroe	2 Dash 8-300s	\$27m		3Q98	
	Apr 8	Midway AL	3 CRJ-200ERs	\$63m		1H99	From options
	Apr 3	Sunstate AL	1 Dash 8-200			2Q98	
Embraer	-	-	-	-	-	-	-
Fairchild Dornier	-	-	-	-	-	-	-
Raytheon	-	-	-	-	-	-	-

Note: All prices in US dollars. Only firm orders are included - i.e. MoUs and Lols are excluded. **Source:** Manufacturers.

Aviation Strategy

Micro-trends

	Group revenue	Group costs	Group operating profit	Group net profit	Total ASK	Total RPK	Load factor	Group rev. per total ASK	Group costs per total ASK	Total pax.	Total ATK	Total RTK	Load factor	Group employees
	US\$m	US\$m	US\$m	US\$m	m	m	%	Cents	Cents	000s	m	m	%	
American*														
Jul-Sep 96	4,171	3,691	480	282	64,766.3	45,799.1	70.7	6.44	5.70	20,806	9,726.6	5,265.6	54.1	91,476
Oct-Dec 96	3,967	3,751	216	284	62,503.6	42,194.2	67.5	6.35	6.00	19,528	9,366.1	4,969.5	53.1	91,476
Jan-Mar 97	4,006	3,782	224	152	62,059.4	41,676.0	67.2	6.46	6.09	19,363	9,283.2	4,848.4	52.2	86,246
Apr-Jun 97	4,292	3,812	480	302	64,026.0	45,012.1	70.3	6.70	5.95	20,697	9,482.2	5,241.2	55.3	87,248
Jul-Sep 97	4,377	3,868	509	323	65,093.0	46,943.3	72.1	6.72	5.94	21,343	9,637.3	5,406.0	56.1	87,793
Oct-Dec 97	4,228	3,871	357	208	63,308.3	42,715.7	67.5	6.68	6.11					88,000
Jan-Mar 98	4,223	3,798	425	290	62,405.4	41,846.6	67.1	6.77	6.09					
America West														
Jul-Sep 96	423	476	-53	-46	8,939.7	6,419.5	71.8	4.73	5.32	4,671	1,119.4	682.3	61.0	10,617
Oct-Dec 96	440	415	25	12	9,272.8	6,405.0	69.1	4.75	4.48	4,620	1,162.4	688.1	59.2	10,866
Jan-Mar 97	475	442	33	14	9,318.8	6,408.6	68.8	5.10	4.74	4,590	1,168.8	686.7	58.8	10,592
Apr-Jun 97	478	427	51	23	9,410.5	6,668.9	70.9	5.08	4.54	4,674	1,180.1	712.8	60.4	11,442
Jul-Sep 97	462	425	37	18	9,623.6	6,779.9	70.5	4.80	4.42	4,692	1,205.8	724.3	60.1	11,690
Oct-Dec 97	473	432	41	20	9,573.7	6,219.9	65.0	4.94	4.51	4,375				11,506
Jan-Mar 98	483	434	49	25	9,408.0	5,851.4	62.2	5.13	4.61	4,149				10,820
Continental														
Jul-Sep 96	1,671	1,594	77	18	25,937.1	18,188.3	70.1	6.44	6.15	9,972	2,785.9	1,830.0	65.7	32,706
Oct-Dec 96	1,561	1,462	99	47	25,258.0	16,628.9	65.8	6.18	5.79	9,474	2,803.4	1,732.3	61.8	33,468
Jan-Mar 97	1,698	1,552	146	74	25,478.4	17,526.9	68.8	6.66	6.09	9,739	2,820.6	1,790.5	63.5	33,766
Apr-Jun 97	1,786	1,555	231	128	26,530.9	19,186.1	72.3	6.73	5.86	10,462	3,032.6	1,996.8	65.8	34,672
Jul-Sep 97	1,890	1,683	207	110	28,462.1	20,982.1	73.7	6.64	5.91	10,822	3,331.3	2,206.5	66.2	35,630
Oct-Dec 97	1,839	1,707	132	73	28,278.6	19,400.1	68.6	6.50	6.04	10,188				36,800
Jan-Mar 98	1,854	1,704	150	81	28,199.8	19,427.5	68.9	6.57	6.04	10,072				
Delta														
Jul-Sep 96	3,432	2,994	438	238	55,337.4	40,868.2	73.9	6.20	5.41	25,242	7,677.8	4,623.5	60.2	63,862
Oct-Dec 96	3,197	2,970	227	125	55,030.0	37,664.1	68.4	5.81	5.40	24,625	7,606.7	4,420.7	58.1	63,862
Jan-Mar 97	3,420	3,074	346	189	54,214.1	37,334.2	68.9	6.31	5.67	24,573	7,489.7	4,354.8	58.1	67,851
Apr-Jun 97	3,541	3,022	519	301	55,604.5	41,457.2	74.6	6.37	5.43	26,617	7,777.3	4,798.9	61.7	69,118
Jul-Sep 97	3,552	3,121	431	254	57,424.7	42,783.2	74.5	6.19	5.43	26,478	8,112.8	4,946.2	61.0	69,502
Oct-Dec 97	3,433	3,101	332	190	56,177.4	38,854.9	69.2	6.11	5.52					68,000
Jan-Mar 98			336	195	54,782.3	39,602.7	68.7							
Northwest														
Jul-Sep 96	2,735	2,266	469	254	40,461.0	31,077.4	76.8	6.76	5.60	14,368	6,445.2	4,045.4	62.8	46,994
Oct-Dec 96	2,340	2,265	75	26	37,216.7	26,054.6	70.0	6.29	6.09	12,723	5,965.7	3,566.9	59.8	47,631
Jan-Mar 97	2,376	2,241	135	65	37,102.1	26,702.1	72.0	6.40	6.04	12,661	5,800.7	3,471.3	59.8	47,628
Apr-Jun 97	2,558	2,267	291	136	38,985.3	29,195.9	74.9	6.56	5.82	13,780	6,175.7	3,817.3	61.8	48,025
Jul-Sep 97	2,801	2,298	504	290	41,491.3	32,231.1	77.7	6.75	5.54	14,743	6,587.3	4,189.3	63.6	47,843
Oct-Dec 97	2,491	2,264	227	105	38,465.5	27,791.0	72.2	6.48	5.89					48,984
Jan-Mar 98	2,429	2,272	156	71	38,260.1	27,038.2	70.7	6.35	5.94					
Southwest														
Jul-Sep 96	891	789	103	61	16,865.2	11,801.8	70.0	5.28	4.68	12,847	2,164.7	1,224.4	56.6	22,844
Oct-Dec 96	832	784	48	28	16,802.4	11,431.7	68.0	4.95	4.67	12,795	2,148.9	1,188.4	55.3	23,395
Jan-Mar 97	887	800	87	51	16,926.0	10,513.6	62.1	5.24	4.73	12,046	2,163.7	1,097.2	50.7	23,980
Apr-Jun 97	957	800	156	94	17,672.1	11,288.4	63.9	5.42	4.53	12,722	2,264.0	1,180.6	52.1	24,226
Jul-Sep 97	997	845	152	93	18,494.3	12,176.9	65.8	5.39	4.57	13,019	2,362.1	1,274.1	53.9	24,273
Oct-Dec 97	975	847	128	81	18,501.4	11,654.2	63.0	5.27	4.58	12,612				24,450
Jan-Mar 98	943	831	112	70	18,137.1	11,102.3	61.2	5.20	4.58	11,849				
TWA														
Jul-Sep 96	1,003	977	26	-14	18,426.5	12,919.5	70.1	5.44	5.30	6,381	2,550.6	1,476.5	57.9	26,332
Oct-Dec 96	803	1,036	-232	-263	16,020.4	10,050.2	62.7	5.01	6.47	5,517	2,201.5	1,195.1	54.3	26,578
Jan-Mar 97	762	862	-99	-72	13,772.4	9,129.6	66.3	5.53	6.26	5,345	1,898.2	1,054.3	55.5	25,662
Apr-Jun 97	844	839	6	-14	14,705.8	10,273.7	69.9	5.74	5.71	5,958	2,051.9	1,169.5	57.0	23,490
Jul-Sep 97	908	845	64	6	15,922.4	11,447.0	71.9	5.70	5.31	6,324	2,209.2	1,284.2	58.1	22,539
Oct-Dec 97	813	812	1	-31	14,348.8	9,570.2	66.7	5.67	5.66					22,500
Jan-Mar 98	765	834	-69	-56	13,626.4	9,276.3	68.1	5.61	6.12					
United														
Jul-Sep 96	4,488	3,878	610	340	68,560.4	51,680.9	75.4	6.55	5.66	22,241	9,868.5	6,134.8	62.2	84,579
Oct-Dec 96	3,976	3,923	53	19	65,894.4	45,617.2	69.2	6.03	5.95	19,948	9,505.3	5,615.2	59.1	86,008
Jan-Mar 97	4,121	3,927	194	105	64,832.6	45,296.6	69.9	6.36	6.06	19,683	9,386.1	5,530.0	58.9	86,443
Apr-Jun 97	4,382	3,970	412	242	67,458.0	48,894.2	72.5	6.50	5.89	21,271	9,917.6	6,032.1	60.8	88,939
Jul-Sep 97	4,640	4,077	563	579	71,375.4	53,721.0	75.3	6.50	5.71	22,641	10,566.8	6,561.1	62.1	90,324
Oct-Dec 97	4,235	4,144	91	23	68,364.7	47,419.6	69.4	6.19	6.06	20,623				91,700
Jan-Mar 98	4,055	3,932	123	61	66,393.3	44,613.0	67.2	6.11	5.92					
US Airways														
Jul-Sep 96	2,073	1,941	131	68	23,632.6	16,522.7	69.9	8.77	8.21	14,329	3,297.6	1,806.1	54.8	42,192
Oct-Dec 96	2,052	2,003	49	27	23,684.1	16,146.1	68.2	8.66	8.46	14,412	3,182.8	1,755.7	55.2	43,144
Jan-Mar 97	2,101	1,925	176	153	23,397.6	16,009.3	68.4	8.98	8.23	13,773	3,141.2	1,734.3	55.2	42,225
Apr-Jun 97	2,213	1,957	256	206	24,014.0	17,707.1	73.7	9.22	8.15	15,533	3,234.0	1,911.0	59.1	42,320
Jul-Sep 97	2,115	2,032	83	187	24,070.3	17,668.5	73.4	8.19	7.83	15,080	3,245.5	1,918.0	59.1	42,159
Oct-Dec 97	2,085	2,015	70	479	22,662.2	15,800.1	69.7	9.20	8.89	14,178				41,375
Jan-Mar 98	2,063	1,871	192	98	22,102.1	15,257.8	69.0	9.33	8.47					
ANA														
Jul-Sep 96	4,060	3,846	214	75	36,248.3	23,421.2	64.6	11.20	10.61	20,104				15,914
Oct-Dec 96	SIX MONTH FIGURES													
Jan-Mar 97	3,090	3,160	-69	-40	41,442.7	26,945.8	65.0	7.46	7.62	24,721				15,996
Apr-Jun 97	SIX MONTH FIGURES													
Jul-Sep 97	3,928	3,829	99	50	39,702.7	25,742.0	64.8	9.89	9.65	20,730				
Oct-Dec 97	SIX MONTH FIGURES													
Jan-Mar 98	SIX MONTH FIGURES													
Jul-Sep 96	SIX MONTH FIGURES													
Oct-Dec 96	2,121	1,802	319	280	28,320.0	21,428.0	75.7	7.49	6.35	5,633	5,266.0	3,838.0	72.9	
Jan-Mar 97	SIX MONTH FIGURES													
Apr-Jun 97	2,037	1,858	179	138	28,172.0	20,044.0	71.2	7.23	6.60	5,208	5,074.0	3,613.0	71.2	
Jul-Sep 97	SIX MONTH FIGURES													
Oct-Dec 97	1,921	1,784	137	117	28,932.0	18,917.0	64.4	6.64	6.17	4,810				
Jan-Mar 98	SIX MONTH FIGURES													
JAL														
Jul-Sep 96	5,406	5,269	137	24	54,783.8	38,491.2	70.3	9.87	9.62	15,046	8,254.3	5,406.0	65.5	19,046

Aviation Strategy

Micro-trends

	Group revenue	Group costs	Group operating profit	Group net profit	Total ASK	Total RPK	Load factor	Group rev. per schd. ASK	Group costs per schd. ASK	Total pax.	Total ATK	Total RTK	Load factor	Group employees
	US\$m	US\$m	US\$m	US\$m	m	m	%	Cents	Cents	000s	m	m	%	
Korean Air														
Jul-Sep 96	TWELVE MONTH FIGURES													
Oct-Dec 96	4,341	4,314	27	-249	54,071.5	38,136.6	70.5	8.03	7.98	23,741	10,953.3	8,253.2	75.3	17,139
Jan-Mar 97	TWELVE MONTH FIGURES													
Apr-Jun 97	4,574			-418										
Jul-Sep 97	TWELVE MONTH FIGURES													
Oct-Dec 97	4,574			-418										
Jan-Mar 98	TWELVE MONTH FIGURES													
Jul-Sep 96	TWELVE MONTH FIGURES													
Oct-Dec 96	2,581	2,459	122	132	40,096.9	27,903.7	69.6	6.44	6.13	15,371	6,149.2	3,706.8	60.3	22,546
Jan-Mar 97	SIX MONTH FIGURES													
Apr-Jun 97				18										
Jul-Sep 97	SIX MONTH FIGURES													
Oct-Dec 97				18										
Jan-Mar 98	SIX MONTH FIGURES													
Jul-Sep 96	2,506	2,173	332	398	36,152.9	27,202.4	75.2	6.93	6.01	5,930	6,599.8	4,632.9	70.2	27,259
Oct-Dec 96	SIX MONTH FIGURES													
Jan-Mar 97	2,492	2,205	288	316	37,354.4	27,490.1	73.6	6.67	5.90	6,092	6,901.3	4,879.1	70.7	27,223
Apr-Jun 97	SIX MONTH FIGURES													
Jul-Sep 97	2,549	2,171	379	402	38,125.4	28,216.7	74.0	6.69	5.69	6,135	7,231.0	5,091.5	70.4	27,777
Oct-Dec 97	SIX MONTH FIGURES													
Jan-Mar 98	SIX MONTH FIGURES													
Jul-Sep 96	3,090	2,717	373	134	42,099.0	29,226.0	69.4	7.34	6.45	14,308	5,789.0	3,940.0	68.1	22,136
Oct-Dec 96	821	765	56	59	11,170.0	7,849.0	70.3	7.35	6.84		1,593.0			
Jan-Mar 97	824	777	47	25	11,369.0	8,128.0	71.5	7.25	6.83		1,621.0			
Apr-Jun 97	773	775	-2	11	11,352.0	7,583.0	66.8	6.81	6.83		1,620.0			
Jul-Sep 97	697	672	25	-1,050	11,462.0	7,668.0	66.9	6.08	5.86		1,639.0			
Oct-Dec 97	656	649	7	-661	12,144.0	7,715.0	63.5	5.40	5.34		1,712.0			
Jan-Mar 98	SIX MONTH FIGURES													
Jul-Sep 96	TWELVE MONTH FIGURES													
Oct-Dec 96	8,780	8,563	217	75	77,333.0	58,586.0	75.8	11.35	11.07	16,733*		5,036.0		36,173
Jan-Mar 97	SIX MONTH FIGURES													
Apr-Jun 97	5,224	4,850	374	297			76.1							
Jul-Sep 97	SIX MONTH FIGURES													
Oct-Dec 97														
Jan-Mar 98	SIX MONTH FIGURES													
Jul-Sep 96	5,283	5,238	45	789	50,960.4	34,131.5	68.9	10.37	10.28	23,138	8,167.7	5,674.0	69.5	16,507
Oct-Dec 96	TWELVE MONTH FIGURES													
Jan-Mar 97	5,083	4,878	205	161										
Apr-Jun 97	TWELVE MONTH FIGURES													
Jul-Sep 97														
Oct-Dec 97														
Jan-Mar 98	TWELVE MONTH FIGURES													
Jul-Sep 96	3,560	3,068	493	427	37,693.0	29,179.0	77.4	9.44	8.14	10,432	5,299.0	3,851.0	72.7	59,160
Oct-Dec 96	3,301	3,087	215	154	35,976.0	25,417.0	70.6	9.18	8.58	9,075	5,056.0	3,494.0	69.1	58,911
Jan-Mar 97	3,179	3,130	49	113	36,211.0	25,416.0	70.2	8.78	8.64	9,070	5,057.0	3,456.0	68.3	60,188
Apr-Jun 97	3,624	3,395	229	260	39,697.0	28,756.0	72.4	9.13	8.55	10,613	5,589.0	3,875.0	69.3	60,083
Jul-Sep 97	3,646	3,319	327	244	40,909.0	30,884.0	75.5	8.91	8.11	11,194	5,711.0	4,098.0	71.8	61,321
Oct-Dec 97	3,580	3,436	144	110	40,059.0	26,929.0	67.2	8.94	8.58	9,837	5,618.0	3,791.0	67.5	61,144
Jan-Mar 98	SIX MONTH FIGURES													
Jul-Sep 96	TWELVE MONTH FIGURES													
Oct-Dec 96	4,384	4,120	264	30	36,975.9	25,931.2	70.1	11.86	11.14	14,623	5,252.3	3,216.3	61.2	26,280
Jan-Mar 97	TWELVE MONTH FIGURES													
Apr-Jun 97														
Jul-Sep 97	4,168	3,900	268	126*	37,797.6	27,679.2	73.2	11.03	10.32	15,432				
Oct-Dec 97	TWELVE MONTH FIGURES													
Jan-Mar 98	TWELVE MONTH FIGURES													
Jul-Sep 96	1,680	1,569	111	154	17,296.0	13,820.0	79.9	9.71	9.09		3,075.0	2,373.0	77.2	31,836
Oct-Dec 96	1,483	1,494	-11	-4	16,806.0	12,346.0	73.5	8.82	8.89		3,010.0	2,203.0	73.2	31,866
Jan-Mar 97	1,361	1,444	-83	-153	16,279.0	12,455.0	76.5	8.36	8.87		2,838.0	2,090.0	73.6	31,912
Apr-Jun 97	1,692	1,566	126	99	17,310.0	13,663.0	78.9	9.77	9.05		2,999.0	2,338.0	78.0	34,804
Jul-Sep 97	1,842	1,592	250	438	18,798.0	15,747.0	83.8	9.80	8.47		3,233.0	2,589.0	80.1	34,928
Oct-Dec 97	1,630	1,570	60	23	18,096.0	13,555.0	74.9	9.01	8.68		3,098.0	2,404.0	77.6	35,092
Jan-Mar 98	SIX MONTH FIGURES													
Jul-Sep 96	3,813	3,612	201	210*	30,907.0	23,356.0	75.6	12.34	11.69	11,636	5,420.0	3,909.0	72.1	57,999
Oct-Dec 96	4,369	4,195	174	165*	28,991.0	20,320.0	70.1	15.07	14.47	7,886	5,230.0	3,762.0	71.9	57,999
Jan-Mar 97	3,198	3,198	-1	12*	28,099.0	19,726.0	70.2	11.38	11.38	9,186	4,985.0	3,477.0	69.7	57,291
Apr-Jun 97	3,654	3,463	192	220*	32,109.0	23,465.0	73.1	11.38	10.79	11,618	5,505.0	3,893.0	70.7	57,901
Jul-Sep 97	3,721	3,418	303	321*	33,739.0	26,410.0	78.3	11.03	10.13	12,807	5,787.0	4,298.0	74.3	58,178
Oct-Dec 97	2,684 ^P	2,332 ^P	352 ^P	295 ^P	30,209.0	21,691.0	71.8 ^P	8.88 ^P	7.72	10,839	5,467.0	3,919.0	71.8	
Jan-Mar 98	SIX MONTH FIGURES													
Jul-Sep 96	1,297	1,180	117	41*	8,084.0	5,390.0	66.7	16.04	14.60	5,111				23,622
Oct-Dec 96	1,368	1,231	137	54*	7,678.0	4,688.0	61.1	17.82	16.03	4,948				25,530
Jan-Mar 97	1,133	1,108	24	-36*	7,443.0	4,335.0	58.2	15.22	14.89	4,551				23,440
Apr-Jun 97	1,379	1,151	228	178*	7,962.0	5,392.0	67.7	17.31	14.46	5,617				23,904
Jul-Sep 97	1,244	1,093	151	83*	8,084.0	5,598.0	69.2	15.39	13.52	5,227				24,168
Oct-Dec 97	1,334	1,204	130	63*	7,771.0	4,939.0	63.6	17.17	15.49	5,212				28,716
Jan-Mar 98	SIX MONTH FIGURES													
Jul-Sep 96	SIX MONTH FIGURES													
Oct-Dec 96	1,285	1,348	-63	-355	16,372.6	11,074.0	64.4	7.85	8.23	4,857				10,202
Jan-Mar 97	SIX MONTH FIGURES													
Apr-Jun 97	1,787	1,724	63	76	17,464.4	11,880.7	68.0	10.23	9.87	7,643	3,340.6	2,291.9	68.6	10,163
Jul-Sep 97	SIX MONTH FIGURES													
Oct-Dec 97	2,084	1,946	138	147	18,934.8	13,770.8	72.7	11.01	10.28	6,352	3,536.4	2,538.1	71.8	10,132
Jan-Mar 98	SIX MONTH FIGURES													

Note: Figures may not add up due to rounding. *Pre-tax. **AirLines. ^PProvisional figures only.

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