EXAMINING THE WIDER CONTEXT OF RAIL-AIR COMPETITION BETWEEN SCOTLAND AND ENGLAND & WALES

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INTRODUCTION

There is a keen interest in Scotland for promoting the use of rail for journeys to the rest of Great Britain (England & Wales), which would otherwise be undertaken by air [1]. The Scottish Government's planning document *Scotland's Railways* notes, "We expect the [rail] industry to deliver service that … ensures that rail is a real alternative to [cross-border] air travel [2]. Scottish politicians have also expressed their concern. At a meeting of a rail freight forum in April 2006, the-then Transport Minister, Tavish Scott, expressed his concern "at the environmental consequences of 140 flights a day from Scotland to London" [3]. There is also the continuing thinking in many quarters about high-speed rail, especially in terms of the additional connectivity to London it would provide. In *Scotland's Railways*, it is stated that, "… [while] responsibility for cross border trains rests with the Department for Transport (DfT) … we will work with DfT to achieve … in the long-term, a high speed link between Scotland and London" [4].

However, the data of the *Scottish Transport Statistics* shows that rail's share of that cross-border market could be greater. Total cross-border rail travel in the 2006/07 year has been estimated at 5.6m trips [5]. This is in the context of a total domestic cross-border air travel task of a further 12.07m trips to all destinations within England & Wales [6]; hence giving rail a market share of about 32 percent. So it is clear that there is 'headroom' available for rail to grow its market, and market share.

The following question arises from this analysis: what do the market figures mean for the Scottish Ministers' goals? Accordingly, this paper is structured in three parts. The first part reviews the data on market size for both rail and air, in particular emphasising that what we see as the cross-border 'market' is in fact made up of separate sub-markets which over time have behaved in different ways. The second part of this paper reviews the wider context of the cross-border travel task – in particular, arguing that domestic cross-border travel must be seen in the context of the cross-border movements outwith Scotland; as it is now also clear that the domestic market is being affected by changes in overall travel patterns. The third part of this paper concludes it by commenting on where our efforts in promoting rail should now be focussed.

1. THE OVERALL PATTERNS OF DEMAND

1.1 Data sources

We start with collating the data. The rail data were supplied by the Office of Rail Regulation, and are published each year in table 8.4 of the *Scottish Transport Statistics*. The airline data are from Table 9.2 of the same document, for the airports of Edinburgh, Glasgow, Aberdeen, and Inverness; plus some of the domestic demand via Glasgow Prestwick (the remaining demand, Prestwick-Stansted, is treated as 'foreign destination' travel, as Stansted serves as a *de facto* hub airport for Ryanair, for onward travel to Europe). There is some travel Dundee-London included as well [7]. The data have also had netted out an allowance for the inter-lined (transfers) traffic in the London airports system (for example, someone flying Edinburgh-London before flying onwards to Asia). This is in order that as much as possible, we are comparing apples with apples; otherwise rail's market share is mis-represented if we include in the aviation data, domestic traffics from Scotland for which rail cannot practically compete.

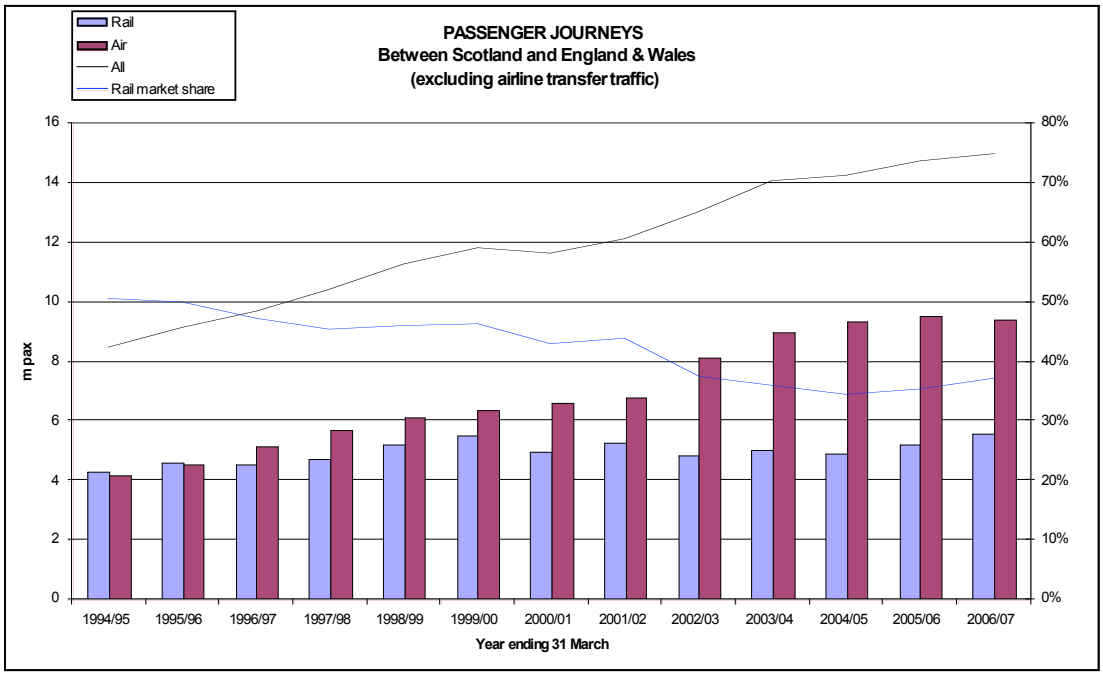
Table 1 Domestic cross-border rail and air travel, to or from Scotland

		Year ending March …												
[Row]	**Rail data:**	1995	1996	1997	1998	1999	2000	2001	2002	2003	2004	2005	2006	2007
[1]	North of England	1,945	2,099	2,167	2,339	2,517	2,712	2,562	2,805	2,795	2,987	3,002	3,265	3,494
[2]	Central England	682	730	709	717	745	787	693	724	596	568	559	598	637
[3]	London	1,158	1,232	1,190	1,180	1,469	1,514	1,302	1,348	1,147	1,156	1,069	1,105	1,183
[4]	The South	487	507	472	467	459	470	418	404	325	305	257	247	242
[5]	*subtotal*	4,272	4,568	4,537	4,703	5,190	5,483	4,974	5,281	4,862	5,015	4,888	5,216	5,556
	Airline data:													
[6]	North of England	452	494	509	528	568	528	556	596	685	696	724	792	806
[7]	Central England	599	673	696	747	796	823	841	804	1,209	1,697	1,648	1,619	1,678
[8]	London	1,970	2,155	2,584	2,944	3,104	3,277	3,448	3,465	3,975	4,098	4,213	4,201	4,026
[9]	The South	1,161	1,244	1,329	1,465	1,623	1,711	1,782	1,932	2,266	2,513	2,774	2,910	2,893
[10]	*subtotal*	4,182	4,565	5,118	5,684	6,090	6,339	6,627	6,797	8,135	9,002	9,359	9,522	9,404
	How the London airport data are derived: pre-scaling, and as per *Scottish Transport Statistics*													
[11]	Heathrow	3,396	3,567	3,599	3,521	3,396	3,323	3,485	3,193	3,566	3,634	3,902	3,817	3,504
[12]	Gatwick	507	556	696	806	1,061	1,052	1,066	1,044	1,418	1,638	1,623	1,578	1,645
[13]	London City	0	0	21	88	130	131	257	241	183	194	243	288	365
[14]	Luton	0	39	369	656	711	927	1,076	1,250	1,287	1,232	1,191	1,187	1,107
[15]	Stansted	266	335	614	751	765	984	932	1,369	1,544	1,599	1,487	1,462	1,401
[16]	*subtotal*	4,170	4,497	5,298	5,822	6,062	6,416	6,816	7,098	7,999	8,297	8,447	8,332	8,022
	Then, post-scaling to net out the interlined (transfers) traffic:													
[17]	Heathrow	2,377	2,497	2,519	2,465	2,377	2,326	2,440	2,235	2,496	2,544	2,732	2,672	2,453
[18]	Gatwick	406	445	557	644	849	842	853	835	1,134	1,310	1,299	1,263	1,316
[19]	London City	0	0	21	88	130	131	257	241	183	194	243	288	365
[20]	Luton	0	33	313	558	605	788	914	1,063	1,094	1,047	1,012	1,009	941
[21]	Stansted	186	234	286	362	380	495	359	541	595	614	628	670	652
[22]	*subtotal*	2,970	3,209	3,696	4,117	4,340	4,581	4,823	4,915	5,503	5,710	5,913	5,901	5,726
[23]	Then, a netout of air traffic to/from the south of England	1,000	1,054	1,112	1,173	1,236	1,304	1,375	1,450	1,529	1,612	1,700	1,700	1,700
[24]	Final total, as-above	1,970	2,155	2,584	2,944	3,104	3,277	3,448	3,465	3,975	4,098	4,213	4,201	4,026
[25]	Rail market share	50.5%	50.0%	47.0%	45.3%	46.0%	46.4%	42.9%	43.7%	37.4%	35.8%	34.3%	35.4%	37.1%
[26]	Total interlined (transfers) traffic	1,200	1,288	1,602	1,705	1,722	1,835	1,993	2,183	2,496	2,587	2,534	2,431	2,295
	Non-northern market	1995	1996	1997	1998	1999	2000	2001	2002	2003	2004	2005	2006	2007
[27]	- Rail	2,327	2,469	2,370	2,365	2,673	2,771	2,412	2,476	2,067	2,028	1,886	1,951	2,062
[28]	- Air	3,730	4,072	4,609	5,156	5,522	5,811	6,071	6,201	7,450	8,307	8,636	8,730	8,598
	subtotal	6,057	6,541	6,980	7,521	8,195	8,582	8,483	8,677	9,517	10,335	10,521	10,680	10,660
[29]	Rail market share	38%	38%	34%	31%	33%	32%	28%	29%	22%	20%	18%	18%	19%
[30]	Annual growth rate		8%	7%	8%	9%	5%	-1%	2%	10%	9%	1.8%	1.5%	-0.2%
	Northern market	1995	1996	1997	1998	1999	2000	2001	2002	2003	2004	2005	2006	2007
[31]	- Rail	1,945	2,099	2,167	2,339	2,517	2,712	2,562	2,805	2,795	2,987	3,002	3,265	3,494
[32]	- Air	452	494	509	528	568	528	556	596	685	696	724	792	806
[33]	*subtotal*	2,397	2,593	2,675	2,866	3,084	3,240	3,117	3,401	3,480	3,682	3,726	4,058	4,300
[34]	Rail market share	81%	81%	81%	82%	82%	84%	82%	82%	80%	81%	81%	80%	81%
[35]	Annual growth rate		8%	3%	7%	8%	5%	-4%	9%	2%	6%	1.2%	8.9%	6.0%

The data used in Charts 1-4 and 6 below are derived within this table.

Chart 1 following illustrates the overall pattern of demand for cross-border domestic travel between Scotland and England & Wales. What this shows is a consistent growth in the market from 8.4m trips per year in 1994/95 to nearly 15m trips in the year to March 2007 (77 percent). This growth has been generated for the most part by the overall economic growth within Scotland in this time. Over seventy percent of the air trips have been reported as being of Scottish origin [8], so the bulk of the travel task is about Scottish residents going overseas and returning, rather than non-Scottish residents visiting Scotland

Chart 1



What is also clear from the presentation of these data is that rail has consistently been losing market share; although it decreased sharply after 2001, it is clear that market share had been under some pressure even before then – and this was in a period in which rail's *total* market was actually growing quite strongly (refer to rows [5] and [25] in Table 1 above). To understand what has been happening, we need to analyse the rail market in terms of the separate geographical origin-destination pairs. The ORR reports the annual traffic between eleven separate regions (Scotland, Wales, and nine in England). These have been grouped as follows: "Northern" (Northumbria & Newcastle, Yorkshire, Manchester & the north-west); "Central" (Wales, the West Mid-lands, the East Midlands and East Anglia); London; and the South (south-east and south-west).

Chart 2A following illustrates the size of the rail markets, comparing 1994/95 with 2006/07. Two elements of it are striking. The first is the extent to which travel to or from the North of England comprises nearly two-thirds of the overall rail market; the second, the extent to which this sub-market has managed to grow at a time when everything else has remained static or even declined. As can be seen, it is the proverbial 'game of two halves'.

Chart 2A

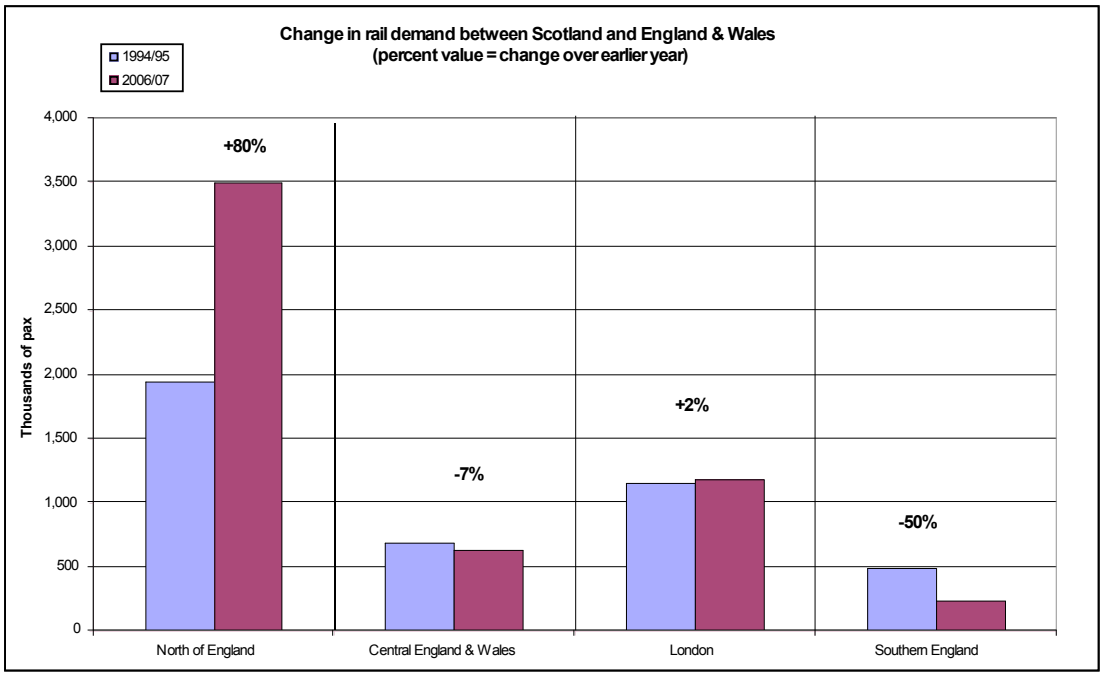
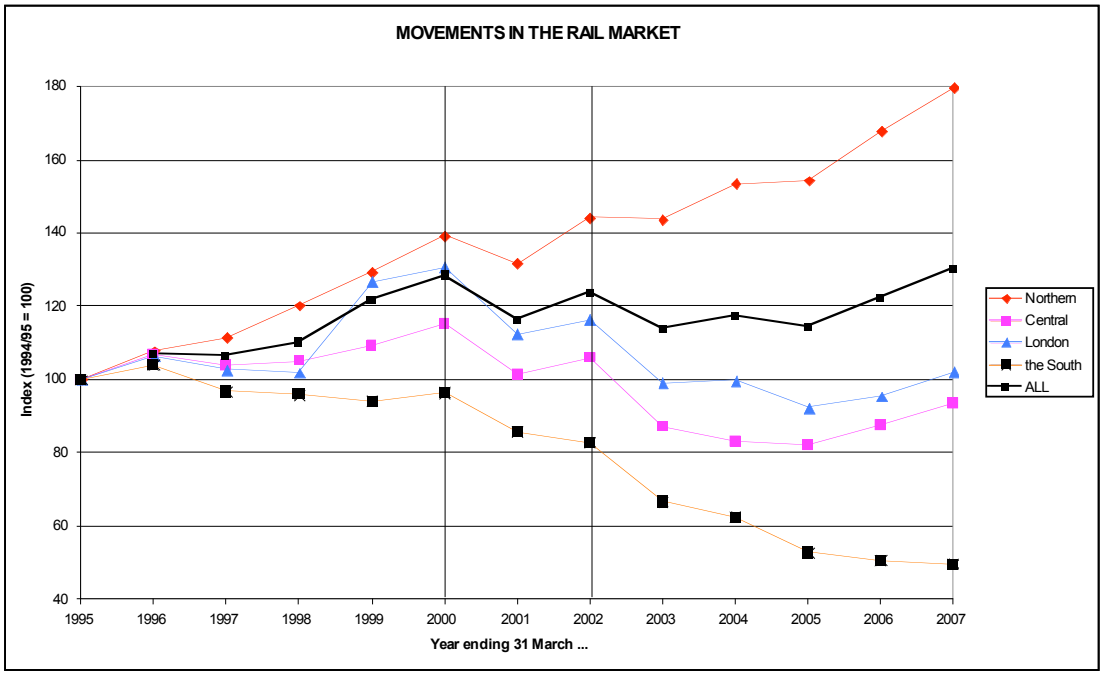


Chart 2B below shows the trends in each market over time, relative to 1994/95. The sharp decline after March 2000 reflects the effects in that year of the Hatfield disaster in October 2000, although there was something of a recovery in the following year.

Chart 2B



We now turn to broadening our understanding of the rest of the market, by examining the equivalent information for air travel, as illustrated in Charts 3A and 3B.

Chart 3A

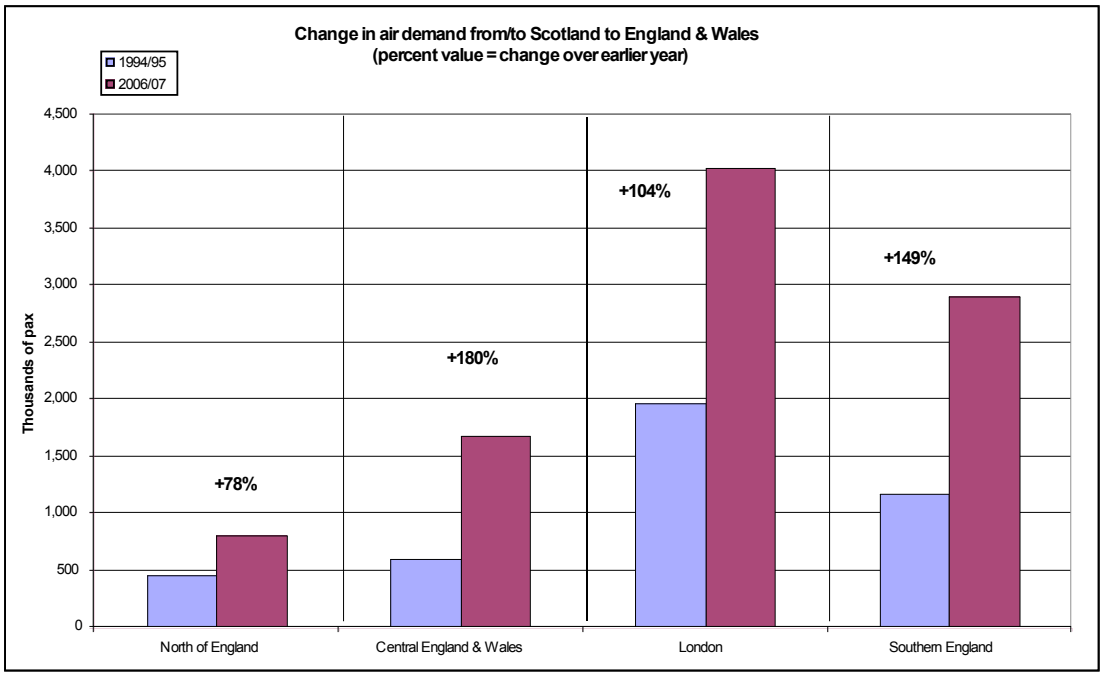
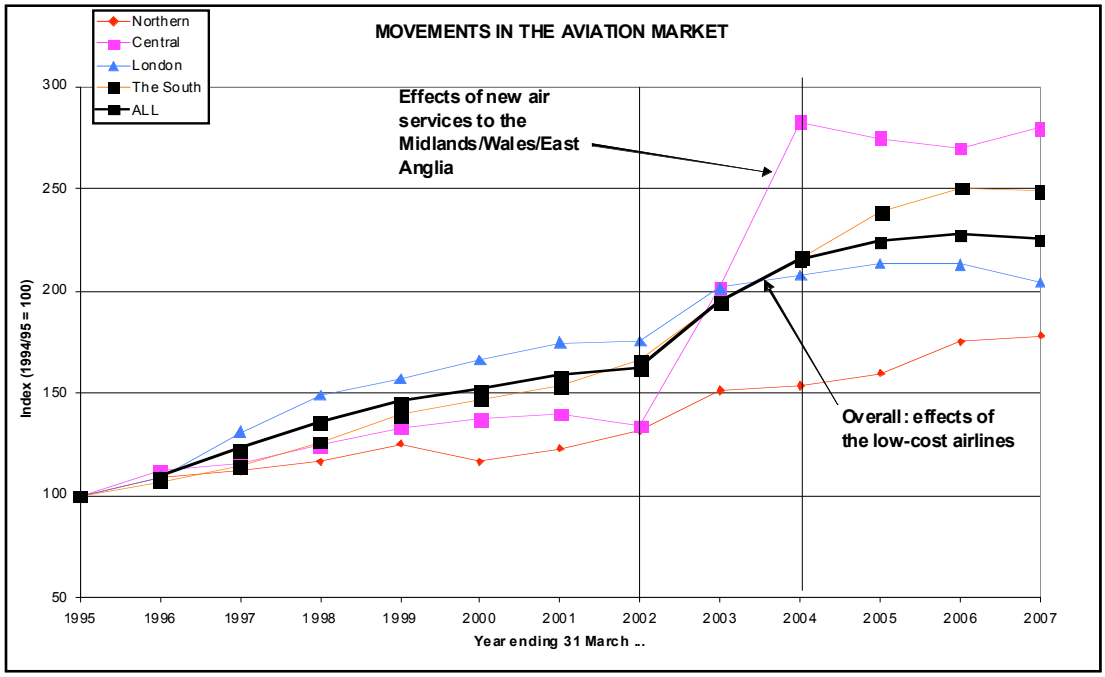


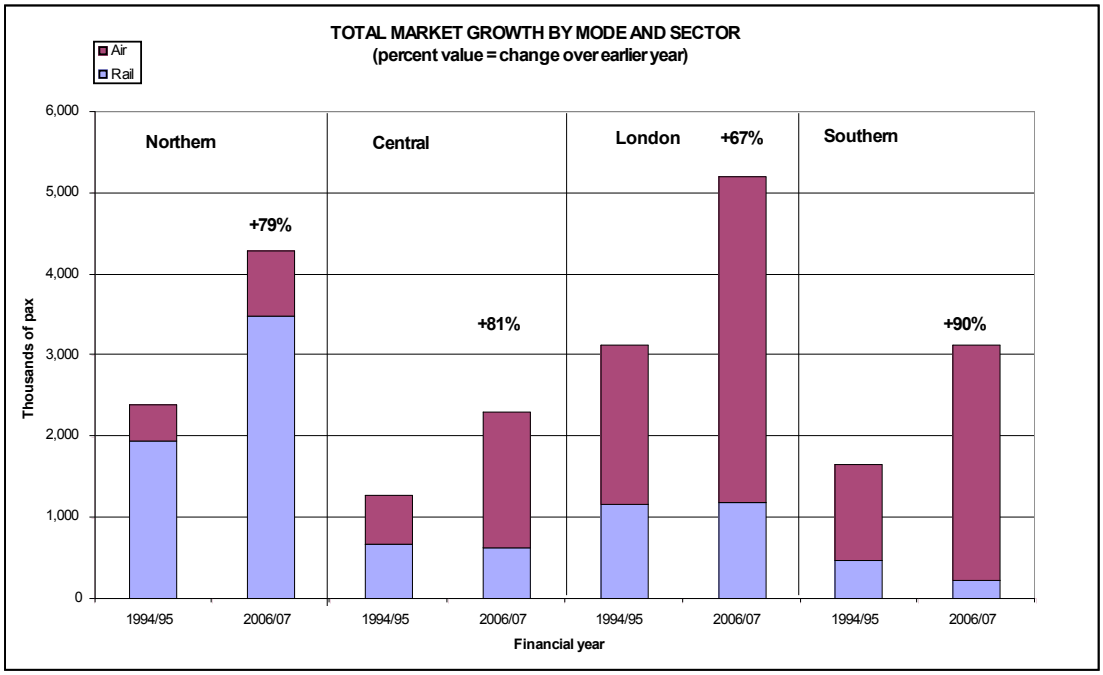
Chart 3B



While there is a broad spread of results in the different markets relative to 1995, the spread is nowhere near as extensive as for rail. It is also clear from the above that the Hatfield disaster in October 2000 (ie. in the 31 March 2001 year) did not lead to a substantial increase in the number of long-distance trips taken by air, which suggests that at the time, long-distance rail demand was significantly suppressed, rather than diverted. The sharp growth after 2002 shows the effect of the arrival of the low-cost airlines, as well as new services into the 'central' catchment (that is, the Midlands/East Anglia/Wales).

We can also add the modes together to see what has happened in the overall markets. Chart 4 provides a comparison between where the markets were in 1994/95 and where they were in 2006/07.

Chart 4



The growth in each of the submarkets has been reasonably consistent in percentage terms (the overall growth is 77 percent, 30 percent for the rail mode and therefore 125 percent for the air mode). What is also clear from the above is that once we get out of the North of England, rail's share of the market has not grown, although the *total* markets have grown substantially.

The principal reason for this change in market share, from both diversion of current trips and generation of new trips, has been movements in rail and airfares over this period. Chart 5A below [9] shows that between January 1995 and January 2007, the average of all fares on the long-distance franchises, increased in nominal terms by about 75 percent. The average of all standard fares on the long-distance franchises increased in nominal terms by 64 percent [10]. Airfares, on the other hand, were six percent lower in nominal terms in January 2007, than where they were in January 1995. They increased, although at a rate lower than rail fares, for some years but after January 2001, fell sharply. This fall was from the arrival of the low-cost carriers in the domestic British airline market. This is illustrated in Chart 5A below.

(Source: Office of Rail Regulation, *National Rail Trends*, chart 5.1, for the airfares information (recast from 1995 and updated to January 2007); with data from Table 5.1 for the long-distance rail fares super-imposed).

Chart 5A

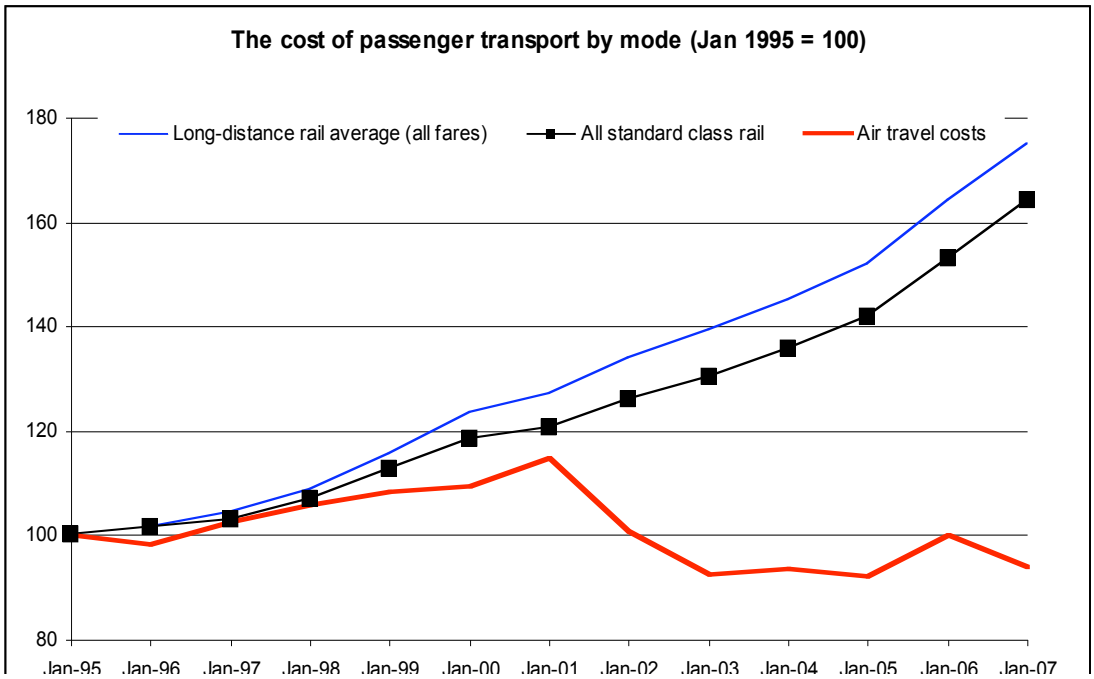


Chart 5B

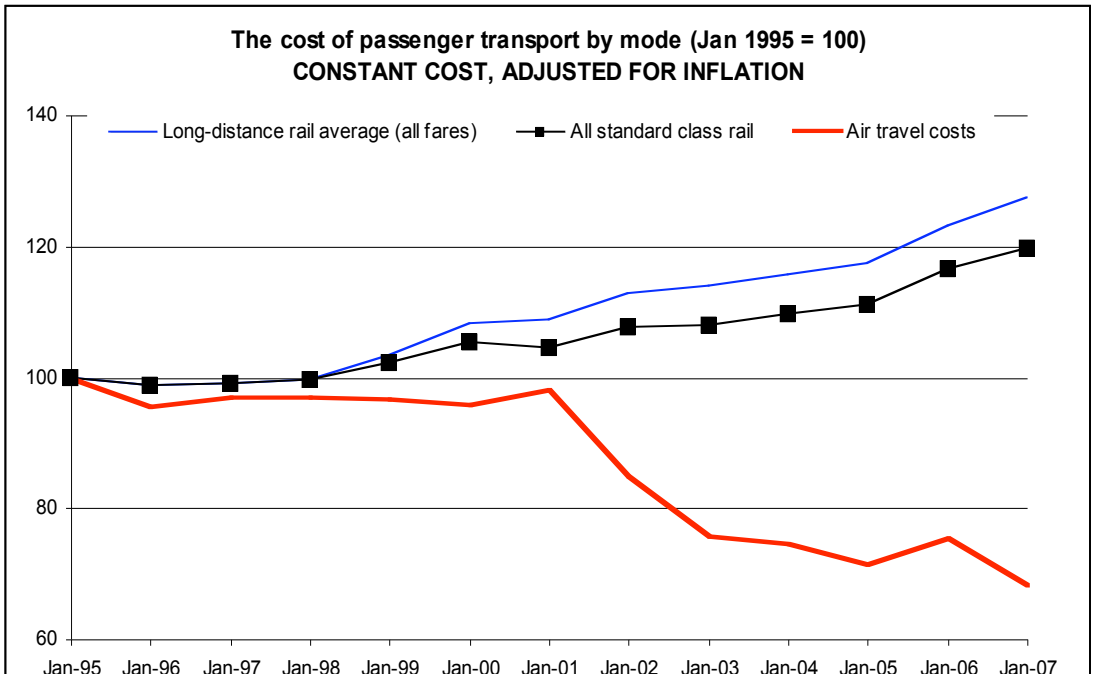


Chart 5B shows the same data corrected for price inflation. In real terms, the average of all fares on the long-distance franchises increased over 27 percent over this period, and the average of all standard fares on the long-distance franchises increased nearly twenty percent. On the other hand, airfares fell in real terms by at least thirty percent, the decline commencing after January 2001. The situation for the January 2008 year, is that both rail and airfares have increased in the last year by about five percent nominally, or 3 percent or so in real terms (source: *Office of National Statistics* press release, "Detailed CPI figures, 15 January 2008", which is the source for the data used

by the ORR). Two things must be stressed here: first, that fares policy for the cross-border franchises is controlled by Westminster, not the Scottish Government; and second, the higher fares are paying for additional investment which in time will strengthen rail's competitive position.

What is also clear from Chart 4 above that the market into Northern England has behaved in a very different way than demand into the other markets (most of the airline traffic shown there is to Manchester). This raises the question as to why. Now, it is clear that if the rail journey is around three and a half hours, rail will have eighty percent of the non-car market. For a four and a half hour rail journey such as Scotland-London, on the other hand, the airlines will have about seventy-five percent of that non-car market. So, I would argue that the critical factor in understanding the different markets, is whether or not a destination is within four hours by rail from Scotland's Central Belt. The 'tipping point' is the Edinburgh-Manchester sector, about four hours by rail, where the modal split seems to be about evenly divided.

As well, traffic into the North of England market has continued to grow over the last few years, whereas traffic growth into the rest of Great Britain has levelled off (refer rows [30] and [35] of Table 1 above). It is not just different modal/competitive conditions at work here but different market conditions as well. Chart 6A illustrates the market situation for travel to the north of England; Chart 6B illustrates the market situation for travel to the remainder of Great Britain; and, for comparison, Chart 6C below shows the situation for London

Chart 6A

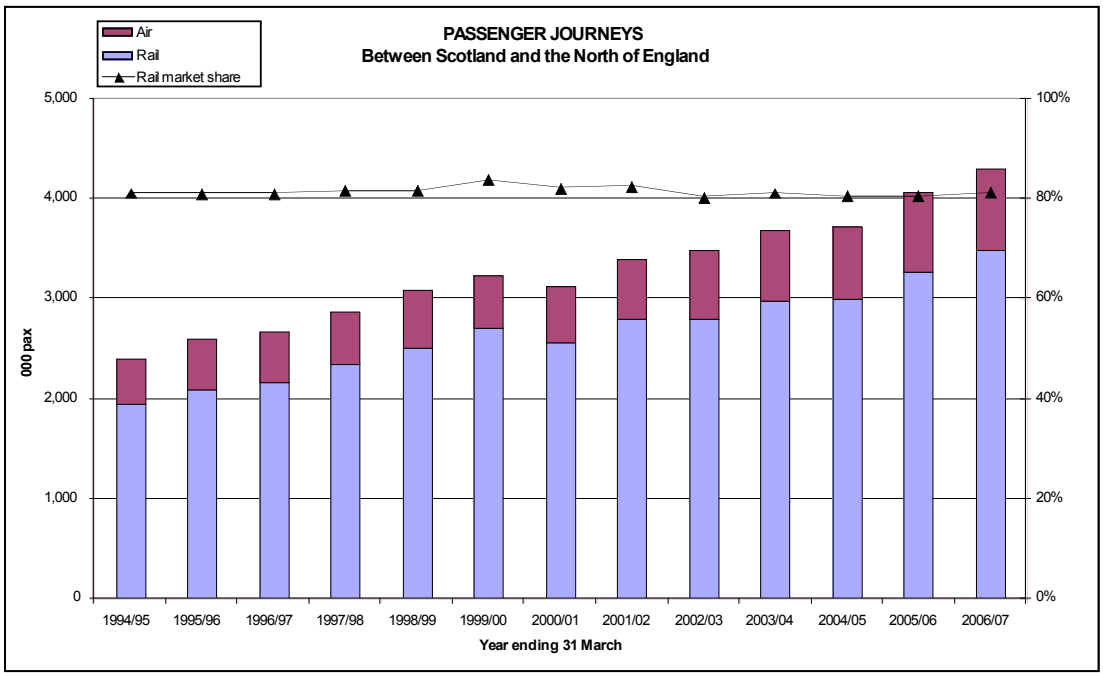


Chart 6B

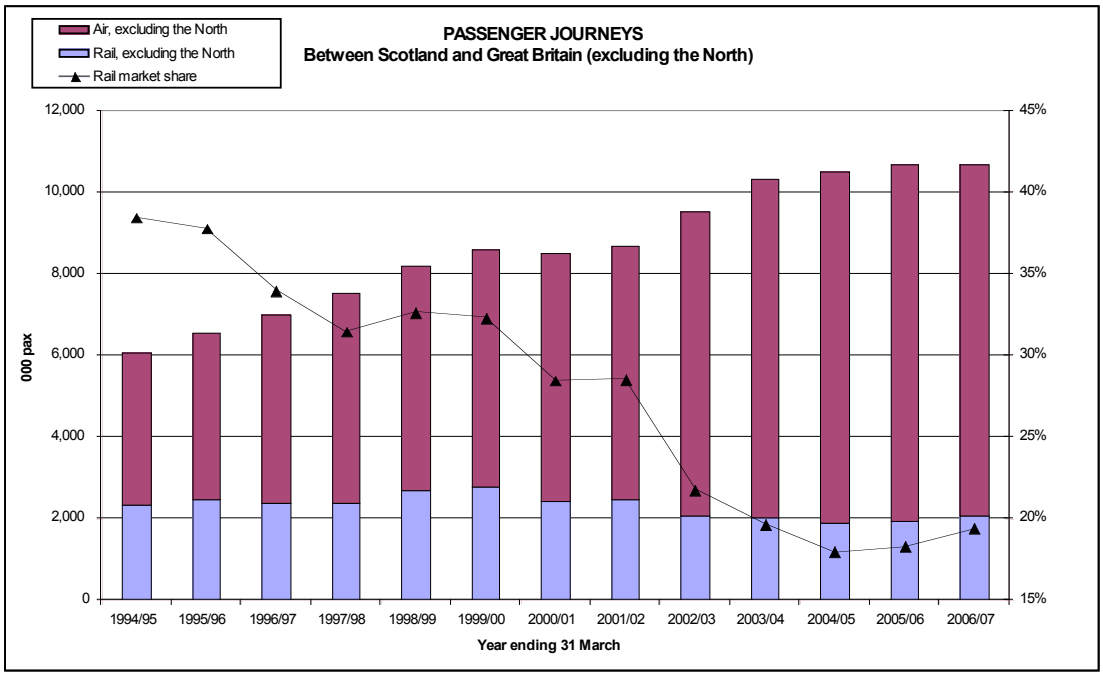
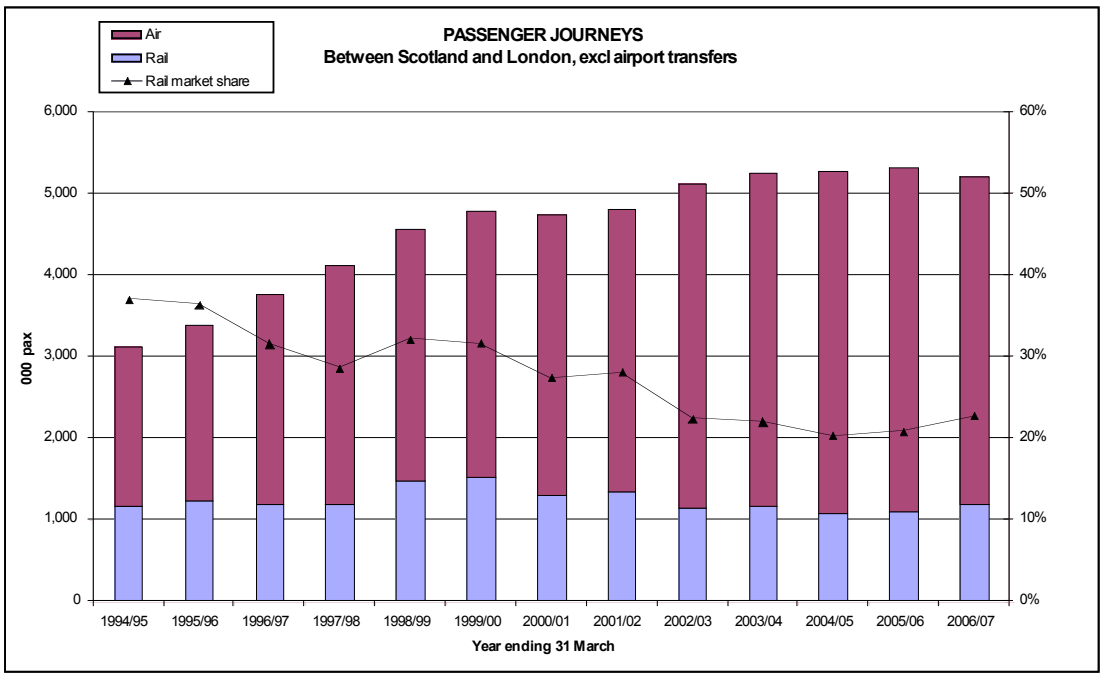
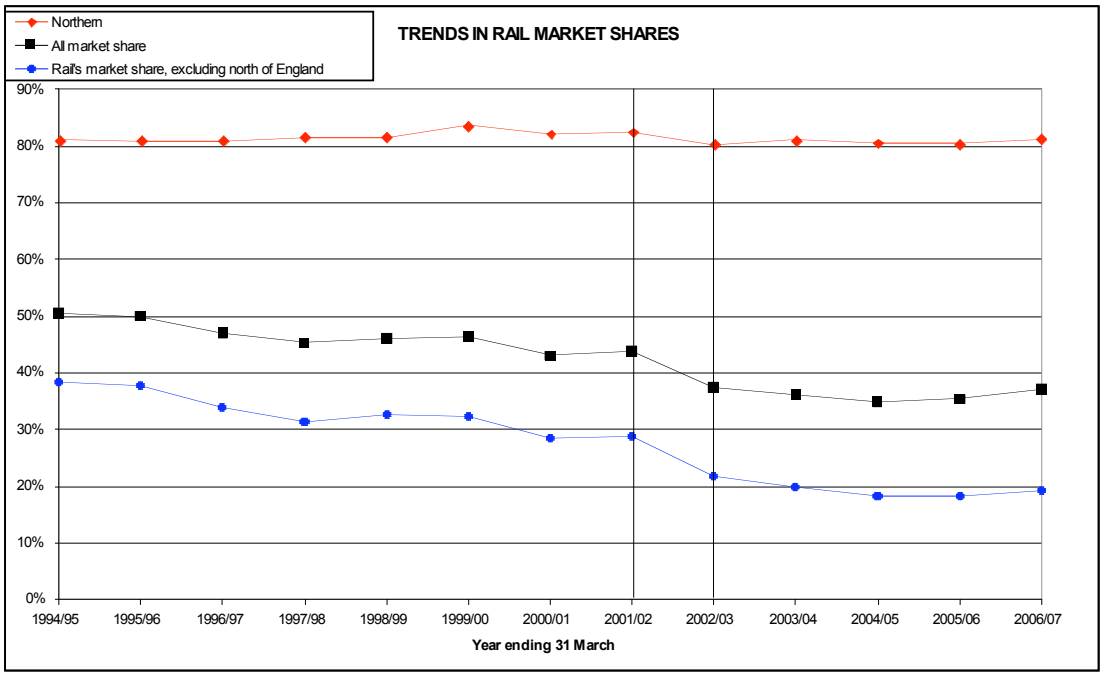


Chart 6C



So, if we sum up the information on changes in rail's market share, we can consistently distinguish the North from the other markets. This suggests that we have a quite-separate market for travel from Scotland to the North of England; it is not affected by airline competition to any particular degree, and it is continuing to grow. Nor does it seem to be affected by competition from other markets so as a result can be 'put to one side' in terms of any policy analysis. A comparison of market share is shown in Chart 6D following.

Chart 6D



That is, as airfares have fallen relative to rail fares, this has led to a decrease in rail's market share outwith the North of England. The correlation is clear enough, and while correlation is not necessarily causality, it is not hard to show that once a journey is outwith the four-hour 'window' in which rail has market preference, changes in relative fare levels have translated into changes in market share. On the other hand, fares become much less of an issue once journey time is back within the four-hour 'window'. This, of course, is looking at the market in the aggregate; people will sometimes choose a particular travel mode despite it not being the fastest or the cheapest.

1.2 Commentary

Two separate questions must be unravelled here. The first is the question of the growth in market *size*. Clearly, this is a function of the growth in the real economy. The Scottish economy has grown by about a quarter in real terms over the last dozen years [11] and this has translated into a fairly strong growth in demand for transport services, and not just in cross-border travel (travel within Scotland on First Scotrail services, for example, has grown in this period by 56 percent [12]).

The second question is one of rail's market *share*. Once the market for travel into the North is put off to one side, we can see the effect of airline competition. Although the individual markets grew at a fairly consistent rate (see Chart 4A above) rail's share of those markets was another matter. What is also clear is that rail's share was under pressure from the start, declining from 40 percent to 30 percent by the March 2001 year. This was probably from the airlines adding new services, especially to the Midlands. It then declined very sharply (another full ten percent in the 2002/03 year) down to the level, around 20 percent of the market, where it has remained since. (The overall market share for rail has picked up in the last two years because of growth in the market into the north of England).

1.3 Diverted, generated and exogenous growth in traffic

What is important for any analysis, is to both understand and distinguish the changes in market share which have occurred over the period. The following analysis for the rail market attempts to unravel how and where the growth in the air market has come from. So, again excluding the North of England (because the market dynamics are very different), the total aviation market grew from 3.7m to 8.65m passengers between 1995 and 2007, an additional 4.9m passengers. When the airlines saw their traffic volumes grow so sharply during 2002 and 2003 – in that time, their volumes grew 31 percent, and a further 5 percent the following year – was it because their lower fares were *diverting* traffic off rail, or because the lower fares were *generating* traffic that would not have moved on rail anyway? And how should this analysis take into account that the economy was growing strongly over this period as well?

We start by acknowledging that the strong economy of the last few years has translated straight into growth in demand for transport. If 2 percent growth in the economy year-on-year, translates into 4 percent growth in transport demand – expressing a demand function that is strongly income-elastic, as most transport demand is – then this growth will add up to 50 percent market growth over ten years (assumes cumulative growth). This means that if everything else had been held equal, we would have expected either mode to have grown 50 percent over thus time ([1], [2] in Table 2 below).

The actual situation is shown in row [3] showing quite a bit of variance on what had been expected ([5]). The total market, at 10.6m trips, was some 17 percent larger than one might have expected (10.6m v 9.1m trips). On top of that, rail was much smaller than one would have expected if the total market had grown with everything else held equal. And the market growth includes a growth in the airline mode of 4.9m trips over the 1994/95 total [4], which was some 3m trips greater than expected [5].

Rows 6, 6.1 – 6.3 of Table 2 show that if we:

- distribute the loss from rail back into the airlines' market, which seems logical given what is known about the change in relative and absolute fares;
- assume the actual growth over expected growth in the *total* market is from the lower airfares; and then,
- add the 50 percent (on 1994/95) that was likely in terms of overall economic growth,

the sources of the growth become quite clear:

Table 2 Change in the cross-border travel market

	Market situation (ex traffic to the North of England)	Market size 000s of pax			
		Rail	**Air**	**Both**	
1.	Situation in 1994/95	2,327	3,730	6,057	
2.	Expected situation in 2006/07 – assuming 50 percent exogenous growth	3,491	5,595	9,085	
		+1,164	+1,865	+3,028	
3.	Actual situation	2,062	8,598	10,660	
4.	Variance on 1994/95 actual	-265	**4,868**	4,603	[3] – [1]
5.	Variance on expected 2006/07	-1,428	3,003	1,575	[3] – [2]
6.	Hence, airline growth comprised:				
6.1	– from rail	+	1,428		[5]
6.2	– from lower airfares	+	1,575		[5]
6.3	– from economic (exogenous) growth	+	1,865		[2] – [1], for air
7.	[as per Row 4]	=	**4,868**		= [3] – [1], for air – QED

So, lower airfares did a lot to shift travel off rail, and also generate new trips. But the role of exogenous growth (that is, a stronger economy leading to growth in the market) should not be forgotten either. By itself, that added some 3m passengers to the total market, with the lower airfares adding another 1.6 trips net to the market, with (in terms of market share) the airlines also benefitting from a further 1.4m trips that rail would have carried had the fare regime not changed. Thus, the market grew 50 percent from growth in the economy, and the remaining 27 percent from reductions in fares.

1.4 Short-term trends

Rail's market share of the cross-border market has visibly improved over the last couple of years (from 35 to 37 percent of the market), for these reasons:

- Strong numerical growth in rail traffic between Scotland and the North has lifted the situation overall;
- Outwith the North rail volumes have grown fairly strongly as well, 9 percent in two years (refer Table 1), at a time when airline volumes over comparable corridors have remained static. Rail's market share has increased slightly, by 18 to 19.4 percent
- To London, rail's market share has grown (20 to 23 percent), although this has been helped by a decline in airline numbers. Some of this is a function of the congestion in the London airport system.

There is now evidence for England that the combination of airline security disruptions and the general increased 'impedance' of using airline service, has served to move some passengers back to rail. A recent report from the UK Civil Aviation Authority has commented: [13]

… Air industry representatives interviewed suggested that security restrictions have had a particularly severe effect on shorter-distance routes where rail services provide an attractive alternative to air services. Domestic services tend to have a higher proportion of business travellers than international services, and journey time is often of particular importance to these passengers. This seems to be borne out by the data in Figure 3-10, which plots annual growth in domestic air traffic against rail journey duration and proportion of business passengers for the city pairs in Table A1-1 in Annex 1, where there is a rail alternative.

What this also confirms is that if travel time on services can be reduced to within the four-hour 'window' it is very likely that the trains will be able to recover the market share lost to the airlines. Change in operating procedures, faster trains, and services which are both more frequent and more direct, all provide a way to achieve this. With that in mind, the improvements to the West Coast Main Line will reduce travel times between Glasgow and London significantly, which can only help rail's market situation.

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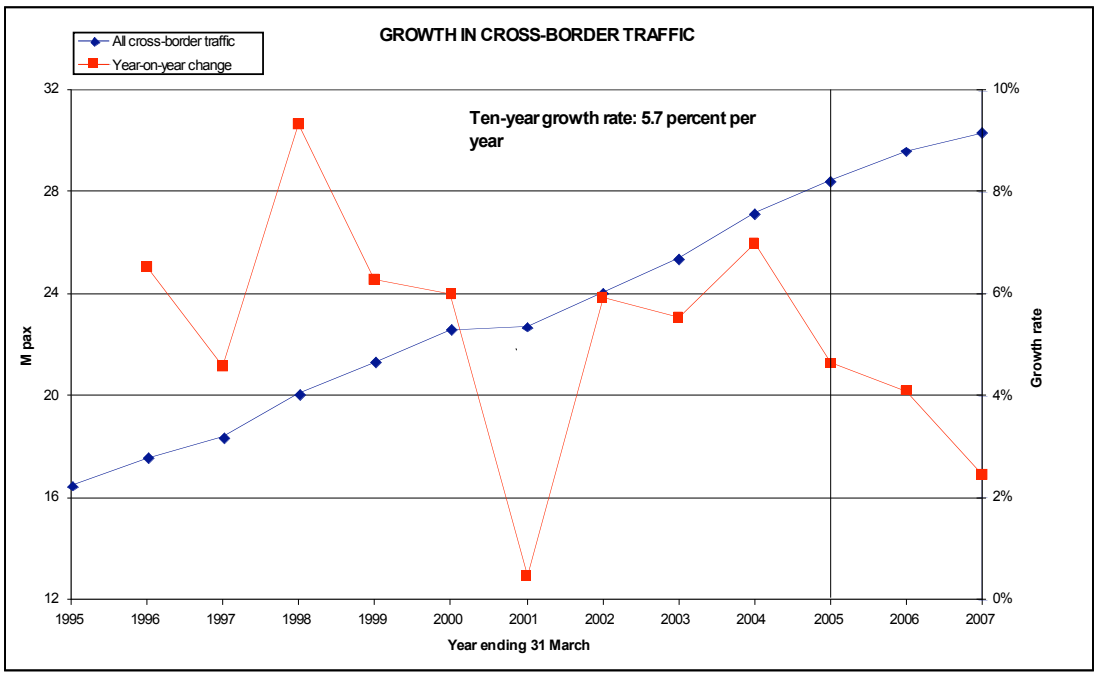
2. THE OVERALL CROSS-BORDER TRAVEL MARKET

The cross-border market outwith Scotland comprises much more than travel between Scotland and the remainder of Great Britain. There is travel between Scotland and Northern Ireland, and also travel between Scotland and the rest of the world (that is, outwith the United Kingdom). We now turn to look at the effects of this market on the domestic travel market. Chart 7 following shows the sum of all cross-border travel outwith Scotland (excluding coach traffic, which still accounts for some 300,000 trips per year [14], about one percent of the market). This growth is consistent with the growth in the Scottish economy over this period. The total travel pattern is clearly far more stable than are the individual cases for rail or even air: a steady growth over the twelve years under investigation, although with some variation in annual growth rates. The economy has grown at the rate of about 2 percent per year in real terms over this period [15]; which has translated into the five-six percent per year growth in cross-border travel (84 percent over 12 years). If we assume that the 25 percent growth in the economy has led to the market growing 56 percent, then the remainder of the growth (28 percent) has come from lower fares. So, for the twelve years 1995/2007 the relation would thus be:

$$\Delta\text{cross-border travel} = \Delta\text{ScottishGVA}^2 \qquad \textbf{[1]}$$

which is consistent with what we know about the sensitivity of demand for travel to income effects. [16] Demand for total cross-border traffic is more sensitive to income effects than is domestic cross-border travel.

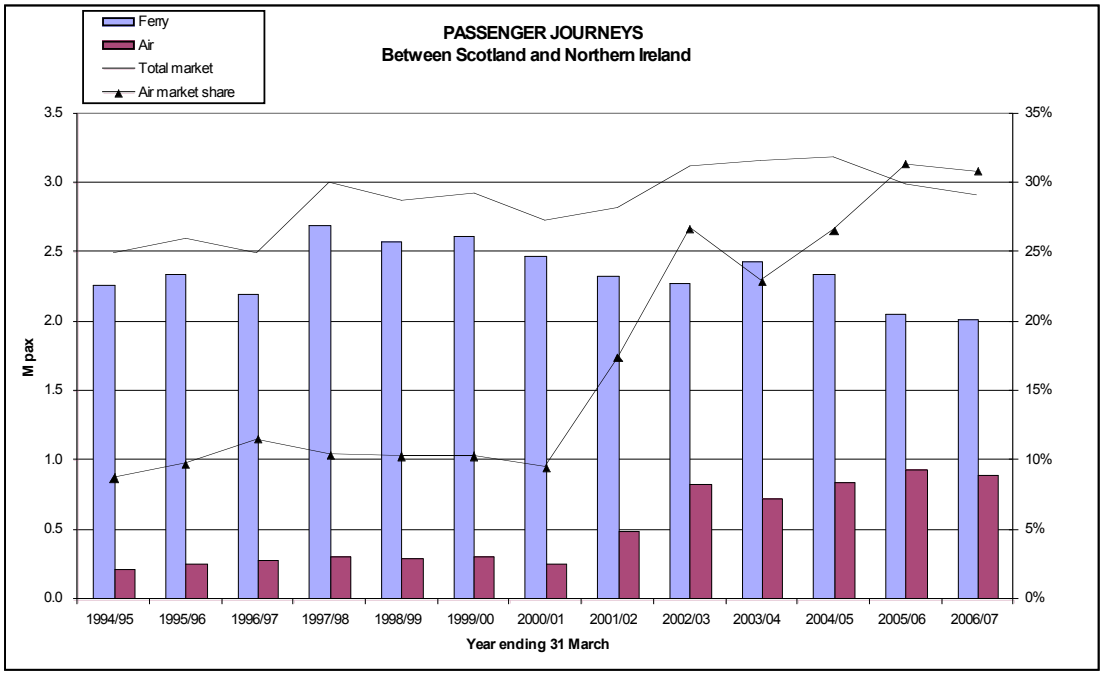
Chart 7



(Source: the data in this Chart is from Table S4 of the *Scottish Transport Statistics* but for consistency, using the ORR-sourced data for rail instead of the rail data they use there). The decline in the rate of growth is probably a function of the airfares increases within the last few years.

However, this steady growth overall has not been evenly experienced across market sectors, as the market between Scotland and Northern Ireland illustrates strongly (see Chart 8 following). Two aspects of this market will stand out. First, there is the overall trend – although it grew for some years before 2000, it has been static since then; and indeed in the last two-three years the market (which from the Scottish end is mostly focussed on Glasgow) has been in decline. Second, has been the growth in the airlines' share of the market – for years, stuck at around ten percent of the total traffic, it now has thirty percent and that value has been climbing steadily for some years.

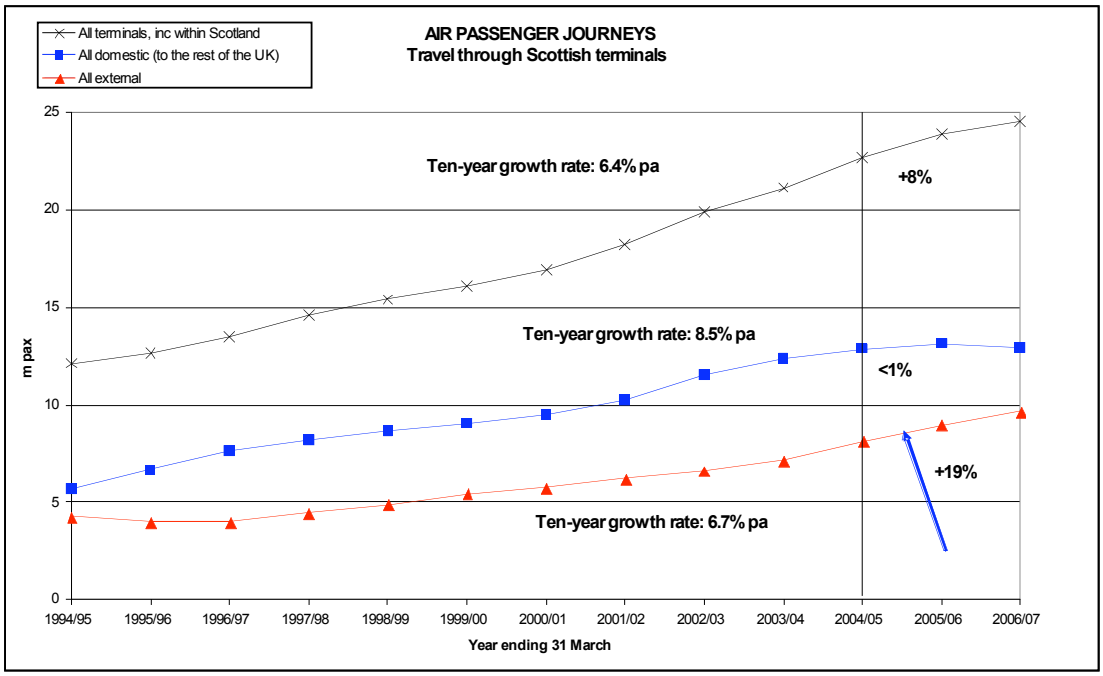
Chart 8



(Sources: the data in this Chart are taken from Table S4 of the *Scottish Transport Statistics*, for the Scotland/Northern Ireland ferries, and from Table 9.2 for the airport flows).

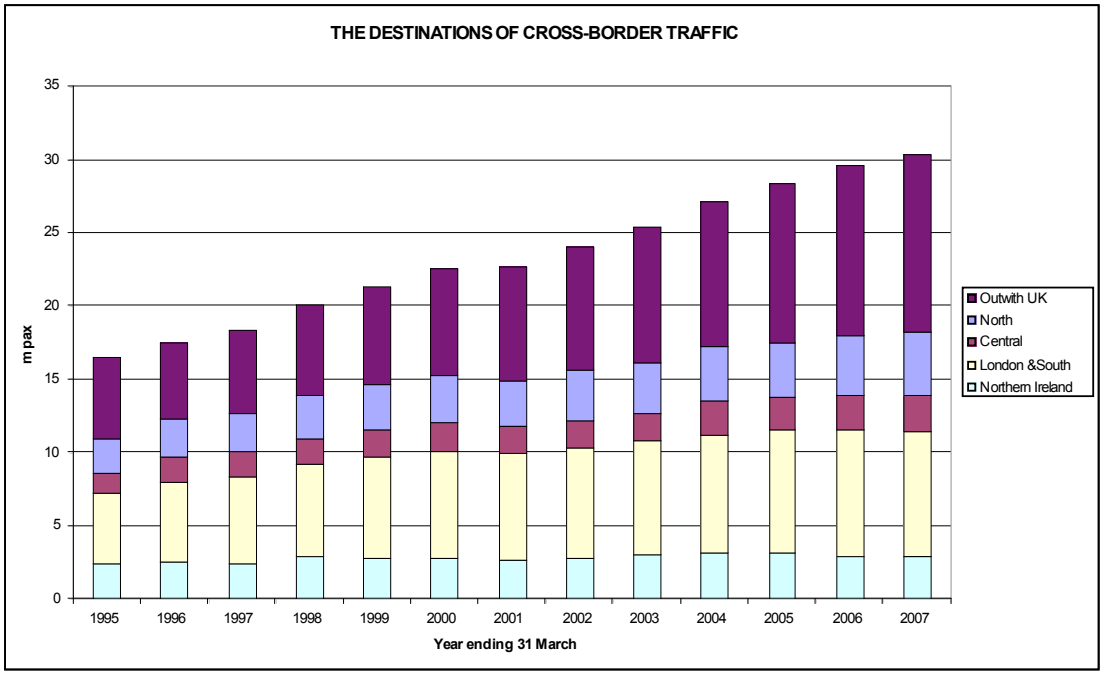
That said, what is also clear are the changes within that market as time has progressed, reflecting shifts in the travelling market's preferences. If the whole market is growing, as are the total flows through the Scottish airport system (chart 9 following), while at the same time domestic travel levels are static – then where is the growth coming from? The answer, clearly, is in direct international trips, which includes a small number by ferry between Rosyth and Zeebrugge. This growth in international travel is clear in charts 10a and 10b below, which takes the information in chart 7 and re-analyses it by destination.

Chart 9



(Source: *Scottish Transport Statistics*, Table S4 (for the within-UK and international traffic breakdown) and Table 9.1 (for total terminals traffic, which includes that traffic within Scotland proper)).

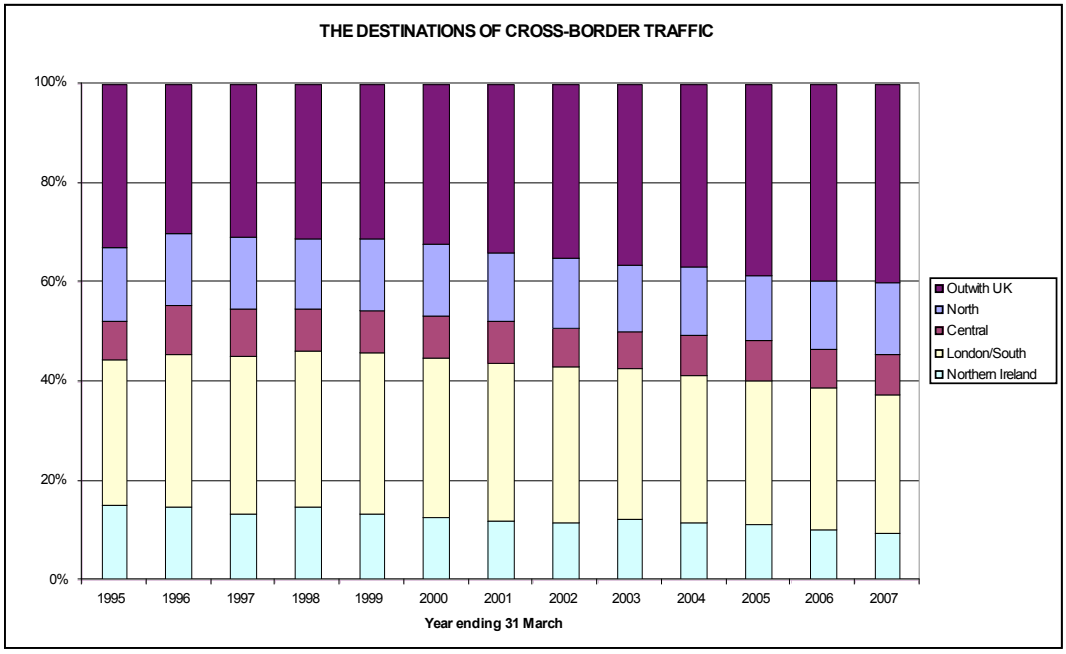
Chart 10a



This chart and the one following include as 'travel to outwith the UK', those passengers who go through a London-area airport before flying further afield. Chart 10b illustrates the way that direct international travel now comprises over forty percent of the Scottish cross-border travel task, and that this task

has grown steadily over the years (in 1994/95 it was about a third of the total travel market share).

Chart 10b



(Sources: as for Chart 7. Note both the increasing share for traffic outwith the UK, and the decline over time in the share of the market for Northern Ireland).

2.1 Commentary

It is clear that the market is shifting. Domestic markets have levelled out in their growth; international markets are continuing to grow, especially where direct air services are in place (eg. Glasgow-Dubai). While growth in the economy clearly explains the overall change, the variations within the market are surely significant as well. These changes come about through changes in market preference, which over time have a substantial effect. This is clear from the analysis for Northern Ireland.

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3. CONCLUSION

Policymakers need to take account of changing market dynamics when considering the likely effect a policy intervention. In the case of the domestic travel market between Scotland and England & Wales, this means that we concentrate on reducing rail travel time, as this is the intervention to which the market will most readily respond. Travel time can be reduced through a variety of means: retiming of services, more services (greater frequency), and more direct services, thus eliminating transfers as much as possible; as transfers, in any transport mode, do provide what is sometimes-considerable impedance to choice of that mode. As an approach this is also consistent with the views of *Scotland's Railways*, which has identified reductions in rail travel time as an important initiative [17].

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NB the 'Scottish Executive' is now known as the "Scottish Government".

Endnotes

[1] See, for example, Jolin Warren's paper to this conference.
[2] *Scotland's Railways*, para. 6.2
[3] Author's recollection, supported from an unpublished record of meeting.
[4] *Scotland's Railways*, para. 8.8. See also *Scotland's National Transport Strategy*, para 97.
[5] As-advised by the Office of Rail Regulation. The data for 2006/07 will be formally published shortly (the estimate is based on the known overall rates of growth during 2006/07). The confirmed value for 2005/06 is 5.2m cross-border trips. Readers of this paper are welcome to get in touch with its author directly for an update once the final data have been supplied.
[6] Refer *Scottish Transport Statistics*, December 2007, Table S4. The value of 12.07m trips is calculated from the 12.96m trips reported in the Table, less some 895,000 air trips between Scotland and Northern Ireland; which must logically be netted out to allow a measurement of like-with-like.
[7] *Scottish Transport Statistics*, Table 9.1
[8] These data are taken from the Friends of the Earth Scotland/Transform Scotland report, "Parliamentary Briefing on the Air Route Development Fund", 17th January 2006. The report and its sources can be accessed here: http://www.foe-scotland.org.uk/publications/PB_RDF_briefing.pdf
[9] This chart is taken from the ORR's *National Rail Trends*, Chart 5.1, with the information for long-distance rail fares super-imposed from the data in table 5.1 of the same publication
[10] The higher index for long-distance fares includes the rates for first class traffic, which as Table 5.1 now shows, have more than doubled in nominal terms since January 1995. The index for 'standard' fares includes the regulated fares on the long-distance franchises.
[11] Growth in the Scottish economy can be illustrated from these data from the ONS: http://www.statistics.gov.uk/pdfdir/gva1206.pdf, and http://www.statistics.gov.uk/downloads/theme_compendia/regional_snapshot_2006/SubregionalGVA.xls
[12] Refer *Scottish Transport Statistics*, Table 8.3.
[13] UK Civil Aviation Authority, *Recent Trends in Growth of UK air passenger demand*, January 2008.
[14] Author's estimate, based on a count of the number of coaches run.
[15] As-reported in *The Scotsman*, Sat 8 Dec 2007, accessed here: http://money.scotsman.com/scotsman/articles/articledisplay.jsp?section=Mortgages&article_id=8675198
[16] The equivalent relationship in the rail industry's PDFH (Passenger Demand Forecasting Handbook) employs an exponent for this relationship of 1.5. Following the model form of **[1]**, an exponent of 1.8 implies that the 25 percent growth in the economy, would generate a fifty percent growth in the market (as per the situation for all domestic travel).
[17] Refer *Scotland's Railways*, paras 7.3 and 7.6; and para. 81 of Scotland's National Transport Strategy