

October 2008

The Impact of International Air Transport Liberalisation on Employment

Final Report for IATA

NERA

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Executive Summary

Purpose of study

This report, by NERA Economic Consulting for IATA, examines the implications of liberalisation for employment in the international air transport industry. It draws on both the lessons from previous aviation industry liberalisations and also the experience of liberalisation in other industries, including telecoms, energy, banking and media.

We consider two main types of liberalisation. The first is a relaxation or removal of current ownership and control restrictions which mean that airlines may lose some of their traffic rights if the level of foreign ownership exceeds a certain cap (currently 25 per cent in the US and 49 per cent in the EU). A relaxation of these restrictions may make it easier for foreign-owned airlines to take over or merge with existing national airlines. And a complete removal of these restrictions may allow foreign-owned airlines to compete directly on routes from which they were previously excluded.

The second is product market liberalisation which opens up routes or markets to new entry. This can lead to very significant gains to consumers, especially in cases where competition was either absent or muted prior to liberalisation. The results may include both stronger competition on existing routes and also new services on routes that previously did not have direct services.

Both kinds of liberalisation may lead to increased pressure on airlines to operate efficiently. This will encourage general measures to improve productivity, and to reduce costs, so that less labour may be required to produce a certain level of output, and wage rates and other conditions of employment may be affected. But liberalisation may also lead to increased demand, either because there are new or better services, or because competition and improved efficiency lead to lower consumer prices which in turn stimulates demand. The employment impacts of such changes may help to offset or outweigh the effects of productivity improvements.

Previous experience of liberalisation

US domestic airline services were liberalised in 1978. Evidence from the economic literature suggests that, compared to what might have happened without deregulation, liberalisation led to a 22 per cent reduction in fares and a 10 per cent improvement in total factor productivity. Total employment by US airlines, which had fallen between 1970 and 1975, rose by 22 per cent over the next 10 years, and by a further 51 per cent between 1985 and 1993. And while wages for airline employees continued to rise, there is some evidence of a reduction in the share of surpluses previously captured by airline employees (perhaps equivalent to 10-15 per cent of wages).

The impact of liberalisation on employment in the other industries we have surveyed is quite varied:

§ employment in the energy industry has generally fallen following liberalisation. This reflects the fact that liberalisation has generally been aimed at improving the efficiency

with which existing outputs are provided to consumers. There is no evidence of substantial changes to wages or conditions of employment;

- § in telecoms industries, in contrast, substantial productivity improvements (due to both market liberalisation and the use of new technology) have been offset by the impact of market entry and significant demand for new services. The overall impacts for industry-wide employment have been roughly neutral, or very slightly negative;
- § similarly in the banking industry, liberalisation in the US market facilitated a number of mergers between banks and other financial institutions. But this does not appear to have led to a decrease in total employment, in part because market entry has led to some new branches and new services being provided;
- § finally, the media industry has experienced a great expansion in the number of radio stations and television channels provided. Employment has increased, though in some cases union power has been diluted as a result of market entry.

Impact of future liberalisation in the airline industry

We have been asked to consider the implications of two further deregulation scenarios, both involving the countries attending the Istanbul meeting (Australia, Brazil, Canada, Chile, EU, India, Mauritius, Morocco, Panama, Peru, Singapore, Switzerland, Turkey, UAE, Uruguay, US).

The first scenario involves a relaxation of ownership and control restrictions, but no further product market liberalisation. This would make it easier for foreign-based organisations (including other airlines) to merge with or take over an airline. In theory, the higher risk of takeover could lead to increased pressure on airlines in these countries to improve their efficiency. In practice, however, since most if not all of the airlines concerned already face competition on at least some of their international routes, and many will face competition (including from low cost carriers) on domestic or regional routes, we would not expect a large impact on output or employment simply because of an increased risk of takeover.

Instead, the main impacts of such liberalisation might be felt by airlines directly involved in two types of merger activity:

- § at present, some mergers (such as Air France-KLM) are structured so as to retain the nationality status of the individual airlines. If liberalisation reduces the need for such measures and allows a more complete integration of the individual airlines' operations, this could well lead to further productivity improvements for the airlines directly affected;
- § in the case of airlines that are performing badly and perhaps facing bankruptcy, liberalisation may increase the ways in which such airlines can be rescued. It would be difficult to quantify this impact, but the effects could be significant in individual countries or areas where a particular airline might otherwise cease trading.

The second liberalisation scenario involves the removal of market access restrictions on all routes between and within this group of countries. While many of these routes may already be liberalised, the removal of all restrictions would be likely to lead to further increases in competition. We have calculated some illustrative estimates of the potential impact of such measures, assuming that they lead to productivity improvements of between 5 and 10 per cent,

and fares reductions of between 10 and 20 per cent, on routes that were not previously liberalised:

- § if there is no change in output, other than to meet the extra demand generated by lower fares, then total employment in the aviation industry might increase by 0.1 to 0.2 per cent;
- § however, if we assume that service levels on newly-liberalised routes increase by between 5 and 10 per cent as a result of market entry, then the increase in aviation industry employment could be between 0.5 and 1.5 per cent.

The fact that even the first set of estimated impacts (ie without any additional increase in service levels) is positive reflects the relatively modest scale of our assumed productivity improvements. We think it is plausible to assume that the change in fares will be larger than the improvement in labour productivity. Significant fares reductions may occur on routes where airlines previously faced relatively weak competition. But efficiency improvements are not route specific, and the scope for future improvements may be quite limited if airlines have already been exposed to strong competition on some of their main routes.

1. Introduction

1.1. Purpose of Study

This report, by NERA Economic Consulting for IATA, examines the implications of liberalisation for employment in the international air transport industry. It draws on both the lessons from previous aviation industry liberalisations and also the experience of liberalisation in other industries, including telecoms, energy, banking and media.

We consider two main types of liberalisation:

- § a relaxation or removal of current ownership and control restrictions which mean that airlines may lose some of their traffic rights if the level of foreign ownership exceeds a certain cap (currently 25 per cent in the US and 49 per cent in the EU); or
- § product market liberalisation which opens up routes or markets to new entry.

In Section 2 we discuss these measures and the different ways that they might affect employment in more detail, before considering in Sections 3 and 4 the experience of previous liberalisations in both international air transport and other sectors.

Drawing on this experience, Section 5 examines the possible effects of future liberalisation, and sets out some illustrative estimates that aim to show the approximate scale of any impacts on employment.

1.2. Current State of Liberalisation

International air transport is still governed by a network of bilateral agreements between individual countries, based on the regulatory framework established by the 1944 Chicago Convention. Among other things, these agreements have very often limited the number of airlines that can serve particular routes, imposed additional restrictions on how traffic rights can be exercised, required regulatory approval for fares, and required the airlines involved to be owned and effectively controlled from the relevant country.

Over time, a number of the restrictions in some individual agreements have been relaxed, and since 1992 a number of countries have agreed bilateral “open skies” agreements which allow full market access on international routes for airlines owned and controlled in either country. And some regional groups of countries have joined together to implement multilateral agreements.

As of 2007, ICAO estimates that about 30 per cent of country pairs with non-stop scheduled services, and over half of the frequencies offered, had been liberalised through either bilateral open skies air service agreements or regional/multilateral liberalisation agreements.¹ The measures vary from expanded traffic rights, through “open skies” agreements to full open aviation areas. Of the 142 bilateral open skies agreements concluded by February 2008, 78 involved the US as one partner.

¹ See ICAO (2007).

Regional liberalisation agreements to date include groupings in the European Union (EU), Latin America, West and Central Africa, East and Southern Africa, the Middle East, South East Asia, Pacific Islands and the Caribbean. The European Union now has a mandate to negotiate air service agreements on behalf of all EU member states. It has negotiated “common aviation area” agreements, integrating a number of neighbouring states into the EU single aviation market, and negotiations are continuing over further liberalisation measures involving services between the EU and the US.

2. The Likely Impacts of Liberalisation on Employment

2.1. Types of Liberalisation

As described in Section 1, air transport services have generally been governed by national controls over domestic air services and bilateral air transport agreements covering international services. Liberalisation of aviation markets has therefore been implemented through a process of relaxing or removing restrictions on domestic services and renegotiating bilateral agreements, in some cases replacing them with new multilateral agreements. This process can lead to two different types of liberalisation:

- § a relaxation of ownership and control restrictions. Many airlines are still partly or wholly owned by national governments, and this in itself limits the extent to which capital market pressures (such as a threat of takeover) may affect those airlines. Even where airlines are privately owned, they may be effectively protected from takeover by foreign entities where this would cause them to lose the traffic rights associated with their previous home country. Thus if an airline is now controlled from a different country, it might be excluded from domestic routes (in cases where access to some or all routes is restricted to national airlines) and/or international routes (where bilateral air transport agreements restrict access to these routes to the national airlines associated with them). A removal of such nationality restrictions, or even a broadening of the criteria that are used to define a nationally-owned or controlled airline, will provide greater freedom for changes to occur without airlines risking a loss of their existing routes;
- § product market liberalisation – a more direct form of liberalisation involves the relaxation or removal of controls on airlines operating certain routes. This can include measures to remove previous controls over schedules, fares or other conditions of service. Importantly, it can also allow new entry onto routes that were previously served by a limited number of carriers.

Each of these is likely to create some pressure for improved performance, though to varying degrees. In the Sections 2.2.1 and 2.2.2 below, we discuss some of the implications of such pressures for levels and terms and conditions of employment. First we consider “direct” impacts, which in broad terms covers changes in the way labour inputs are used to produce the same level and range of outputs as before. Then we move on to consider “indirect” impacts on employment, mainly resulting from changes in output, service quality and market shares. Before that, we assess the route through which each form of liberalisation may lead to such impacts.

2.1.1. Ownership and control restrictions

Depending on the nature of the reforms, a removal or relaxation of ownership and control restrictions:

- § may increase the likelihood that a poorly performing airline will be taken over. An increased threat of takeover could place greater pressure on existing management to improve the airline’s performance. If an airline is performing poorly, and its existing management cannot rectify the situation, then with greater liberalisation there could be

action from shareholders or debt holders to bring in new management, or the airline might be taken over and new managers installed;

- § may create new opportunities for mergers or takeovers where, rather than addressing poor performance, the aim is to exploit potential synergies or economies of scale from running two previously separate airlines as a single entity. In addition, airlines that merge or are taken over may gain from access to a wider pool of potential owners and managers, with more opportunities to benefit from international experience and best practice;
- § may allow very poorly performing airlines to be taken over, whereas previously they might have simply gone bankrupt.

To the extent that such measures also make more or cheaper finance available to particular airlines, this will lower their costs and may allow them to undertake investment (for example, in new routes, or initiatives to improve efficiency or service quality) that might otherwise not have been possible.

Some of the empirical evidence available on the impact of company ownership is focused on the difference between private and public sector ownership. In addition to the impact of shareholder control and possible threats of takeover, this evidence will reflect many other differences between public and private sector firms, for example differences between the quality of management in public and private sectors (which may reflect factors such as constraints on the remuneration of public sector managers) and the additional approvals processes that often apply to investment projects by public sector firms.

In the case of airlines, several studies of the impact of liberalisation have estimated the impact of a change in the level of public sector ownership, as opposed to a simple switch from public to private ownership. This evidence, which is discussed in Section 3 below, is potentially useful as it seeks to isolate the impact of ownership changes as compared to other factors, such as product market competition.

It is important to bear in mind, however, that a relaxation of ownership and control restrictions might be expected to have only a limited additional impact where:

- § airlines are already privately owned, so are subject to shareholder (and lender) oversight and are already at risk of takeover by firms already based in the same country; and
- § airlines are already subject to direct competition, which will also place strong pressure on them to improve performance.

In addition, changes to ownership and control restrictions will have little if any impact on airlines that are substantially state-owned.

There is little evidence available on the likely impact of such incremental changes (as opposed to privatisation, for example). A recent NERA report for the UK Office of Rail Regulation (NERA (2006)) concluded that it was reasonable to assume a positive “but relatively modest” increase (perhaps in the region of 0.5 per cent a year) in the cost efficiency of a monopoly infrastructure provider in response to governance changes that would see it once again exposed to pressure from providers of unsupported debt. But this was for a company not subject to either product market competition or any pressure from shareholders or lenders. We would expect the impact would be much smaller for a company that was

already exposed to product market competition, and/or already exposed to some pressure from shareholders, lenders and potential acquirers (even if restricted to those in the same country).

2.1.2. Product market liberalisation

Product market liberalisation will create even stronger pressures, as incumbent airlines are likely to be exposed to stronger competition (or potential competition) than before. In some cases, this might apply to routes (or entire airlines) that have faced relatively little direct competition in the past. The previous lack of competitive pressure may have allowed incumbent airlines to operate with inefficiently high costs, high fares, inappropriate levels of service quality, or with sub-optimal route networks. Direct competition (or the serious threat of it) on such routes is likely to place stronger pressure on existing airlines to improve cost efficiency and other aspects of their performance than a relaxation of ownership and control restrictions alone. Rather than a possibly distant threat of takeover, poorly performing firms face the risk of an immediate and perhaps significant loss of market share.

In addition to any changes affecting incumbent airlines' services, market entry and increased stronger competition is likely to bring a combination of:

- § increased service levels, as airlines introduce new services in competition with existing carriers on established routes, and may also launch services on completely new routes;
- § changes in service quality, in order better to meet passengers' needs;²
- § innovations in the way that services are provided to end users.

Overall efficiency and customer service may improve through two mechanisms. Stronger competition will place pressure on all firms to improve their own performance. And average efficiency levels in the industry as a whole will improve if less efficient firms lose market share to more efficient competitors.

There is strong evidence of the favourable impacts of product market liberalisation in the airline industry, as described in Section 3 below. This is supported by evidence from a number of other industries,³ though it is important to note that liberalisation has often been implemented alongside other changes, such as the privatisation and/or restructuring of incumbent suppliers. And a number of cross-industry studies of the impact of liberalisation and regulatory reform have also found positive impacts on cost efficiency:

- § Copenhagen Economics (2005) finds a positive effect of market opening on productivity in electricity, post and telecoms markets;
- § Haskel and Szymanski (1993) find that competition has a positive effect on productivity, for 12 UK firms that were privatised after 1972;

² This may not necessarily be an improvement in all aspects of service quality. The emergence of low cost carriers, for example, suggests that certain traditional aspects of service quality were over-provided in the past.

³ Examples include Daßler, Parker and Saal (2002), Pollitt (1997), Ros (1999) and Thomas (2006).

- § Griffith and Harrison (2004) find that privatisation and liberalisation in telecoms and electricity were associated with increases in labour productivity, including in some cases a one-off rise due to initial labour shedding; and
- § Gönenç, Maher and Nicoletti (2001) find evidence of a positive effect of liberalisation on efficiency and quality, and a negative effect on consumer prices in the majority of cases.

2.2. Implications for Employment

2.2.1. Direct impacts

To varying degrees, both types of liberalisation discussed above are likely to lead to a general increase in the pressure on firms to improve their cost efficiency. Managers are likely to review all aspects of the production chain, and look to realise improvements wherever possible. Measures taken as a result of such general pressures are likely to improve productivity across a wide range of activities, meaning that fewer inputs (including labour inputs) will be required to produce a given level of outputs.

If nothing else changes, therefore, liberalisation could lead to productivity improvements which in turn will lead to reductions in total employment in the industry concerned. The size of any such impact will depend on the nature of the liberalisation, the extent to which it leads to increased pressure on existing firms to improve performance, and whether firms still have some inefficiencies that can be driven out.

If there is already relative strong competition between firms in the industry, and if the change in competitive pressure is only small (for example, because the liberalisation involves simply a modest change in ownership and control restrictions), then the size of any reduction in employment may still be small. While significant changes have been observed in some industries simply as a result of privatisation (which can be thought of as a substantial liberalisation of ownership and control restrictions), it is the introduction of competition – either direct competition or a credible threat of market entry and direct competition – that has led to the most significant gains.

In addition to (or instead of) seeking productivity improvement, managers may try to lower labour costs by reducing the effective unit cost that they pay for labour inputs. This may be especially likely in cases where:

- § existing firms have been wholly or partially protected from competition, and workers have captured some of the economic rents generated by the previous monopoly. This might occur through wage rates that are higher than those that would be paid by competitive firms employing similar types of employee, or it might be reflected in other conditions of employment (such as generous holiday allowances or inflexible rostering conditions) that serve to increase the effective cost of labour; and
- § these firms now face competition from efficient entrants, or other firms paying market wages and commercially realistic conditions of employment.

Competitive pressures could therefore lead to lower wage rates (though this may be implemented through low wage rises over a period of time, rather than actual reductions) or reforms to existing labour practices. Again, however, this will depend on the nature of the

liberalisation, the extent to which existing suppliers are already efficient, and the specific circumstances of each industry.

A further way for firms to reduce labour costs is to change the nature of the labour inputs they use. The scope for such changes is likely to vary dramatically from industry to industry. But where the location of production can be easily moved, then firms might seek to switch from “high cost” to “low cost” locations either:

- § where there is very strong pressure on costs, and especially where other firms have already taken such measures or where new competitors are located in low cost locations; or
- § where a relaxation of ownership and control restrictions allows an existing firm to be taken over by an overseas firm that already has production facilities in low cost locations. Unlike general capital market pressures, however, this will only take effect when takeovers actually occur (rather than in response to the mere threat of takeover).

In theory, such changes might be possible if certain ownership and control restrictions were relaxed and this allows airlines from countries with low labour costs to enter markets from which they were previously excluded. We consider in Section 5 below the likelihood of this occurring in practice.

2.2.2. Indirect Impacts

In addition to the pressures to improve efficiency and reduce labour costs, market liberalisation may bring a number of other changes that will also affect employment levels and conditions. These are likely to vary from industry to industry, and probably to a greater extent than the direct impacts described above.

A noticeable feature of some liberalisations is that overall output levels have increased significantly. This is especially likely in the case of product market liberalisation, where new entrants may target markets that have not previously been served, or to supply new products to existing markets. In either case, if total industry output increases following liberalisation, this will increase the required labour input and perhaps offset the impact of productivity improvements. In cases where the supply of certain labour inputs is restricted, an increase in demand could lead to higher rather than lower wage rates following liberalisation.

Even if liberalisation simply results in the same service as before being provided more efficiently, output may increase as a result of efficiency improvements being passed on to consumers in the form of lower prices. Prices may fall as a result of general productivity improvements – covering other inputs as well as labour – and also as a result of any reduction in input costs, again covering all inputs and not just wages. Competition may also put pressure on firms’ profits, which again could result in lower prices. Depending on the elasticity of demand, such price reductions would be expected to lead to increased demand and higher industry-wide output levels, in addition to any direct impact of market entry or the introduction of new services.

Increased competition and market entry may also lead to changes in the quality and range of services offered to consumers. Especially where suppliers have faced little or no competition, there may be innovations in service provision that will make the product more attractive to

consumers. Whether this leads to higher or lower demand for labour will depend on the industry concerned and the nature of the changes in service quality. In some cases, moreover, it may be that service quality changes in different ways, and the impact of liberalisation is to deliver a wider range of different products to consumers than was previously available. As with price reductions, any changes in the level of service quality or the range of products on offer may also lead to increased demand and therefore higher industry-wide output.

Employment levels (and wages and other conditions) may also be affected by changes in market shares that occur following liberalisation. This could have a negative impact on employment, for example if inefficient firms lose market share to more efficient firms that can supply the same outputs using less labour (or cheaper labour).

2.2.3. Overall impact on employment

The total impact on industry-wide employment, following liberalisation, will therefore reflect a number of different factors, including:

- § reductions in the amount of labour required to produce a given output, and perhaps also a reduction in wage rates (or changes to other conditions of employment), as a result of a general increase in the pressure on firms to improve efficiency and reduce costs;
- § possible reductions in labour inputs (or labour costs) if less efficient or high cost firms lose market share to more efficient or low cost firms; and
- § an increase in the demand for labour, as a result of output increases that result from a combination of
 - new services offered by market entrants,
 - higher demand, as efficiency improvements and cost reductions feed through to lower prices, and
 - changes to service quality or increased product differentiation.

The importance of these is likely to vary from industry to industry, and will also vary according to the type of liberalisation and the current competitiveness and market structure of the industry concerned.

3. Liberalisation in International Air Transport

3.1. Summary of Previous Liberalisations

Liberalisation in the international air transport industry has generally occurred through one or both of:

- § relaxing the controls over domestic services within a particular country, for example so that airlines have more freedom to compete with each other, to enter new routes, and to set their own fares and service levels;
- § renegotiating bilateral air transport agreements between two specific countries, so that more airlines can serve some or all of the routes between them.

In some cases, moreover, a number of countries have joined together to implement a wider package of liberalisation, affected through changing both the framework for domestic services within each country and also the general conditions covering services between those countries. And some groups of countries (such as the EU) may negotiate joint air transport agreements with single third party countries.

As described in Section 1 above, a general process of loosening the restrictions in individual international agreements has been in progress for a number of years, and is still continuing. It is difficult, however, to assess the impact of such gradual trends. Instead, in this section we focus on the impact of several more wide-ranging changes, in particular:

- § the major deregulation of US domestic services in 1978, when the Civil Aeronautics Board removed the controls that it had previously exercised over prices and routes. This led, initially, to extensive entry by new airlines and some expansion by existing airlines. The major airlines then rationalised their services through the creation of hub-and-spoke systems, while the number of competitors was reduced through a series of mergers, takeovers and bankruptcies;
- § three liberalisation packages introduced by the European Union. The “first package” in 1987 provided for multiple designation on busy routes and less restrictive capacity sharing agreements. The “second package” in 1990 allowed more flexibility to set fares and improved market access. And the “third package” in 1992 provided freedom to set fares and (by 1997) open access to all intra-EU routes (including domestic services within each EU member state). This resulted in a very significant expansion by low cost airlines, which increased their share of capacity from 1.4 per cent in 1996 to 20.2 per cent in 2003.⁴

3.2. Impact on Wages and Conditions of Employment

Prior to deregulation, the US air transport industry was highly unionised. Hirsch and Macpherson (2000) report that 49 per cent of employees were union members in 1973-78. Following deregulation, which led among other things to increased price and route

⁴ See InterVISTAS-ga² (2006).

competition and facilitated entry (including from non-unionised carriers), union membership fell to 39 per cent by 1997.

US deregulation led to some pressure on wages and other conditions of employment. A number of studies have examined this impact:

- § Gil (1990) reports that while basic wages were cut, increased competitive pressure led to increased productivity and performance payments, and actual income per employee increased;
- § Windle (1991) reports that higher labour costs in 1983 led to a 15.4 per cent unit cost penalty for major US airlines, compared to those from other countries, though this was more than offset by higher productivity, in large part due to the favourable impact on productivity of higher traffic density;
- § Ng and Seabright (2001) examined the costs of twelve EU and seven US airlines over the period from 1982 to 1995, a period which postdates the main US deregulation but covers the process of deregulation and some privatisations in the EU. They found that the opening up of routes to competition from third airlines would reduce the economic rent captured by employees by 3 per cent, and overall airline costs by 2 per cent, and found an even stronger impact from privatisation.⁵ But the impacts of losing or gaining market share from existing competitors were more difficult to estimate (partly because of possible endogeneity problems – higher wages may lead to a loss of market share, rather than the other way round);
- § based on the findings from a number of studies that examine wage declines following US deregulation, Borenstein and Rose (2006) conclude that, prior to deregulation, wage rates may have been 10-15 per cent higher due to labour capturing a share of previous surpluses.⁶

An important general point, however, is that wage rates in the US air transport industry appear to have been relatively slow to adjust. Borenstein and Rose note that wage reductions following deregulation may have been moderated by:

- § the increased cost to airlines of strikes, as a result of the elimination of the Mutual Aid Pact (which had previously provided cross-firm strike insurance); and
- § the increased competitive disadvantage of firms that face strikes in deregulated markets.

Similarly, Hirsch and Macpherson (2000) argue that unions retained substantial bargaining power following deregulation, as a result of the price-driven expansion of the industry, increased employment following the elimination of regulatory efficiencies, as well as possibly the abolition of the Mutual Aid Pact. Wage concessions were obtained where carriers were threatened with bankruptcy (reflecting macroeconomic recessions and fuel price increases, as well as increased competition), and these were also demanded from other carriers.

⁵ Holding competition and market structure constant, their findings suggest that a 10 percentage points reduction in public ownership is associated with a 10 per cent reduction in rents and therefore a 6.5 per cent reduction in costs.

⁶ Borenstein and Rose also note that, in general, rents tended to lead to high costs, rather than supernormal profits.

Over a longer time period, and based on a comparison with movements in wages for workers with similar skills in the rest of the economy, Hirsch and Macpherson estimate that their “adjusted earnings index” for the airline industry fell by about 20% by 1996/7, with much of the decline occurring in the 1990s.⁷ They state that “relative earnings in the industry have fallen since the mid-1980s, but that airline workers remain well paid compared to workers with similar measured characteristics”. They also argue that continued high union membership, the specialised nature of the workforce, sizeable market shares among major carriers, and the vulnerability of the hub system to strikes helped to slow the impact on wages following deregulation.

3.3. Impact on Productivity

There is strong evidence that liberalisation has led to productivity improvements. Among the various studies of productivity following the US deregulation, the most widely quoted is by Caves, Christensen, Tretheway and Windle (1987). Analysing total factor productivity for US and international airlines both before and after liberalisation in the US, they conclude that, in the absence of deregulation, costs in 1983 would have been 10 per cent higher than those observed in practice.

A further potential source of efficiency improvements is the wave of airline mergers (27 in total) that took place between 1985 and 1988. Kim and Singal examined changes in fares for 14 of these mergers. They distinguish between the announcement period and the completion period for each, based on the hypothesis that fares changes in the former were likely to reflect the expected market power of the merged entity, whereas fares changes in the latter were likely to reflect efficiency gains from the merger. Kim and Singal found evidence to support the hypothesis of efficiency gains where the airlines involved shared a hub airport and/or overlapped on some routes. But they did not find evidence of efficiency gains in cases where there was neither a shared hub nor overlapping routes. They also treated mergers involving financially distressed airlines separately, as the evidence suggested that these airlines were initially setting fares well below the industry average.

There is also evidence that productivity has improved as a result of widespread privatisation in the airline industry. Based on the experience of 23 international airlines over the period from 1973 to 1983, Ehrlich, Gallais-Hamonno, Liu and Lutter conclude that full privatisation (ie a reduction of state ownership from 100 per cent to zero) can increase that long run rate of total factor productivity growth by 1.6 to 2.0 per cent a year, with a decline in unit costs of 1.7 to 1.9 per cent a year.

3.4. Impact on Prices and Output

Liberalisation in the US led to both lower fares and higher output. Prior to liberalisation, air fares in the US were regulated by the Civil Aeronautics Board, based on a formula known as the “standard industry fare level”. Using Caves et al’s estimates of the productivity improvements that resulted from liberalisation (see above) plus other adjustments to estimate

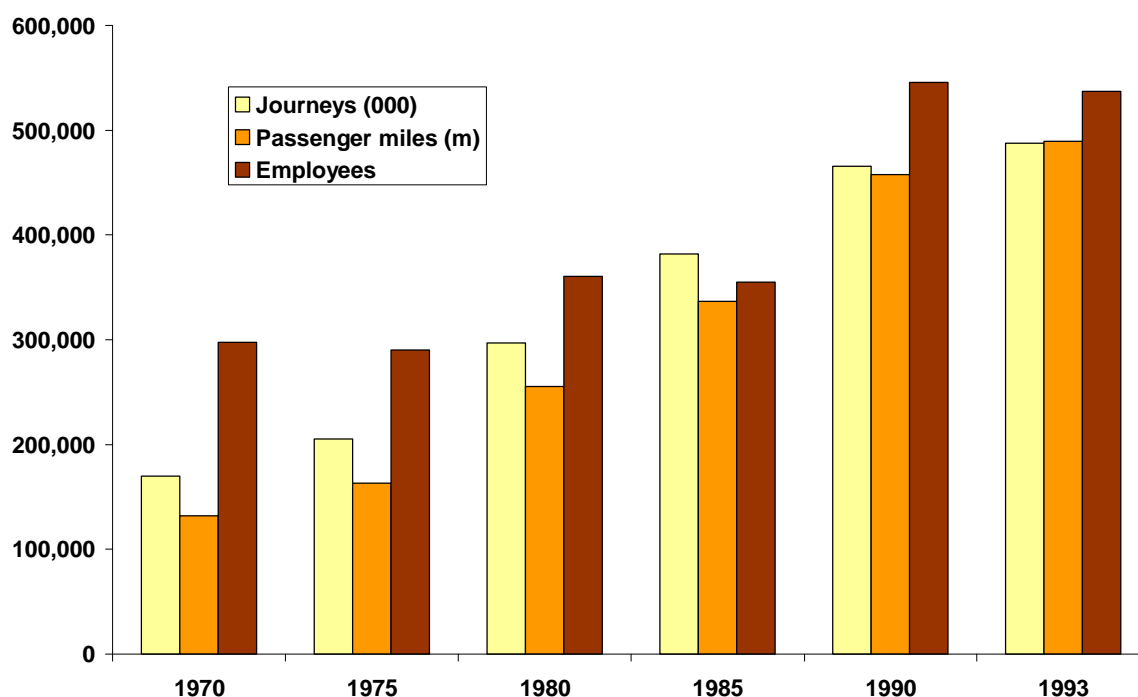
⁷ This is broadly consistent with the results of Card (1996), who found that airline workers’ relative wages declined by about 10 per cent between 1980 and 1990. Note that these studies examine earnings relative to other workers in the US economy, rather than the absolute level of earnings.

what the standard industry fare level might have been, an influential study by Morrison and Winston (1995) estimates that, on average, deregulation led to fares being 22 per cent lower than they would have been without liberalisation.

Following deregulation, there was market entry from new carriers such as People Express and Air Florida, as well as an expansion of services by the incumbent airlines. Service patterns then changed over time, as the larger carriers developed hub and spoke networks, and due to a series of mergers (including 14 between June 1985 and October 1987). Most of the interstate entrants disappeared, with the significant exception of Southwest Airlines, one of the first low cost carriers.

Morrison and Winston provide data which show the changes in output that occurred around the time of deregulation. These are shown, along with total airline employment, in Figure 3.1 below. Both journeys and passenger miles grew at over five per cent a year between 1980 and 1985, despite the economic recession experienced in the early 1980s (US real GDP fell in both 1980 and 1982).

Figure 3.1
US Airlines' Output and Employment



Source: Morrison and Winston (1995), Table 2-1.

A recent study by Gönenç and Nicoletti (2001) presents a range of indicators for routes and airlines around the world that are exposed to different degrees of liberalisation. They conclude that a liberal regulatory environment and low government control yields business fares that are between 20 and 40 per cent lower than expected based on stage length, whereas restrictive air service agreements, government control of airlines and infrastructure access problems can push fares more than 20 per cent above their expected levels for some Atlantic and Europe-Asia routes.

3.5. Overall Impact on Employment

The previous sections have described how liberalisation led to significant fares reductions and output increases, but also general improvements in productivity. It is not possible to reach a definitive conclusion on the net impact of these, and therefore the overall impact of liberalisation on employment, since we do not know how much of the observed increase in output after 1978 might have happened even without liberalisation. As noted above, however:

- § the 22 per cent reduction in fares estimated by Morrison and Winston is likely to have generated a significant increase in demand. Research for IATA has estimated national level price elasticities of -0.8 to -0.9 for domestic services in North America.⁸ Applying these to a 22 per cent fare reduction suggests that this alone would have increased demand by 17 to 20 per cent;
- § there was significant market entry, plus some expansion of incumbent airlines' services. This suggests that the opportunities created by liberalisation will have led to increased demand for labour;
- § the first few years following liberalisation coincided with a period of economic recession or slow growth. The strong growth shown in US airlines' output in the middle period in Figure 3.1, in contrast with the sluggish growth in both the early 1970s and the early 1990s (which also included periods of economic downturn), is strongly suggestive of liberalisation having contributed to significant output growth.

While Figure 3.1 shows that industry-wide employment increased significantly between 1980 and 1990, there was a reduction in the total number of employees during the first five years of this period. This may be because the main impact of productivity improvements on employment levels occurred after (rather than before) 1980.

As with US liberalisation, there is no counterfactual analysis that identifies a "liberalisation impact" in the EU. Like the US, however, it appears that employment levels increased following liberalisation. Ecorys (2008) reports that total employment by airlines of the 15 EU member states that liberalised in the 1990s grew by six per cent between 1997 and 2007, despite the falls in both traffic volumes and employment that occurred after 2001. Within this total, the share of point-to-point carriers (which include low cost carriers) has increased from 20 per cent to approximately 30 per cent. However, the experience of individual member states was more mixed, with growth of 12 per cent in the five largest airline markets (UK, France, Spain, Germany and the Netherlands) between 1997 and 2005 offset by a reduction of 10 per cent in the other 10 markets.

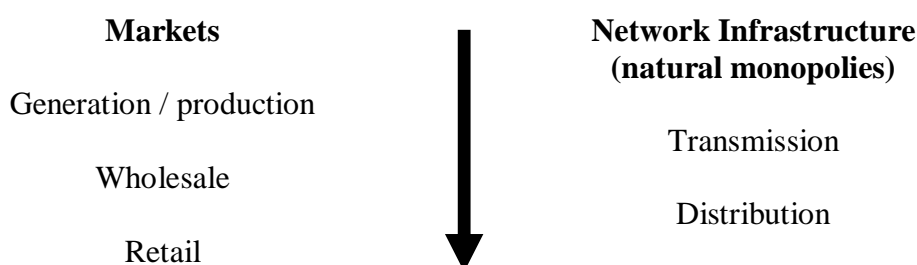
⁸ See InterVISTAS Consulting Inc (2007).

4. Liberalisation in Other Sectors

4.1. Energy

Energy suppliers have traditionally been monopolies on either a national or, within a country, regional level. The network infrastructure has the characteristics of a natural monopoly – it is not economic to have two such companies supplying the same businesses and properties. Competition has therefore been introduced through the production and supply of energy, not through infrastructure provision.

The potential to unbundle energy supply functions is shown in the following figure.



Some liberalisation has focused on introducing competition to power generation (notably the 1978 PURPA reform in the USA). Liberalisation of wholesale and, in particular, retail markets are, however, more comparable to liberalisation of air transport because of the network characteristics of both industries.⁹

Ownership and control liberalisation has also occurred in the energy sector. This has been particularly relevant to the infrastructure companies, where various rationales including security of supply and public interest concerns have meant that restrictions on foreign ownership have been widespread.

4.1.1. Description of liberalisation

Major legislative reform has resulted in liberalisation of energy markets in both the US and EU. In the US, the focus has been on introducing market liberalisation to generation and production. The introduction of competition to retail markets has largely been left to the discretion of individual states. Legislation in the EU, in contrast, has concentrated on retail market reform.

In both the US and EU, formidable barriers to market entry, often brought about by continued vertical integration of incumbent utilities, have limited the extent or effectiveness of competition. Legislative reform continues.

⁹ These different models of liberalisation are presented in Hunt and Shuttleworth, 1996.

4.1.1.1. US electricity industry

Prior to liberalisation, US energy companies were vertically integrated and local monopolies. Many were owned by private investors and were regulated.

Liberalisation was initiated by the Public Utilities Act of 1978 (PURPA). Under this Act, incumbent utilities were required to purchase power on the basis of lowest cost, allowing small companies to enter the power generation market for the first time.

While under PURPA the wholesale agency retained a monopoly, the Energy Policy Act (EPA) of 1992 established a competitive wholesale framework for access to transmission by wholesale power generators.

The EPA marked a major change to the wholesale electricity market. 850 companies were authorised to supply power between 1992 and 2002 (GAO 2005). Some market exits were observed: investor-owned utilities divested about 17 per cent of their generating capacity after 1996.¹⁰ Since 1992 there has been extensive industry consolidation.

The EPA prohibited the federal authorities from ordering a move to retail competition, but permitted individual States to introduce competition in particular retail markets. In 2005, the GAO reported that 18 states were operating restructured retail markets. Further reforms were implemented through the 2005 Energy Act.

4.1.1.2. EU energy sector

The EU's first major legislative package on energy liberalisation came through Council Directives 96/92/EC and 98/30/EC for the electricity and gas industries respectively. These Directives required Member States to open up a certain proportion of their energy markets to retail competition. Member States were permitted considerable flexibility in the way they implemented the legislation, and competition remained muted in a number of markets.

Directives 2003/54 and 2003/55 repealed the earlier directives, and established deadlines for full market opening: 1 July 2004 for business customers and 1 July 2007 for consumers.

¹⁰ Joskow (2006)

Liberalisation of Ownership and Control – the Case of UK Regional Electricity Companies in the UK

The electricity supply industry was privatised in the UK in the 1980s. The electricity distribution function (distributing electricity from the transmission network to end users) was privatised as 12 publicly listed companies, known as Regional Electricity Companies (REC), each with a regional monopoly. As monopolies, these companies were subject to price cap regulation. Initially, they were also responsible for retail supply, which has now been liberalised.

Each company continued to be regulated with respect to ownership and control through the existence of a *golden share*. Under pressure from the European Commission, the UK government abolished the golden share in 1995, allowing the companies to become privately owned, potentially by foreign interests.

Of these twelve original companies, in 2008 only one continues to have shares traded publicly. The remainder are held by a variety of foreign private interests, including French and German utility companies, and a US private investor. The change in ownership has not meant a change in levels of competition in distribution, because the companies continue to be regional monopolies.

The RECs have delivered major improvements in efficiency, though most of these have been associated with privatisation, rather than the ownership and control reforms. Since 2000, productivity improvements have largely been in line with those in the rest of the economy.

4.1.2. Impacts on wages and conditions of employment

There is little evidence of liberalisation having a significant impact on wages or other conditions of employment in the energy sector. In the case of the US, Niederjohn (2004) studied the impact of electricity industry reform on earnings in some detail. On the basis of econometric analysis, he concluded that for most occupations in the industry, including electrical engineers, accountants, electrical installers, book keepers, meter readers, electricians, and production workers, the EPA (which introduced wholesale markets and, to a lesser extent, retail competition) did not have a significant effect on wage levels. Wages were found to be higher for managers, possibly because their roles became more demanding in a newly competitive environment, and were found to fall slightly for one other category (janitors).

There are two possible interpretations of these findings. First, that many electricity industry employees were being paid wages at a competitive, market rate. Or alternatively, that the continued prevalence of monopoly power in large sections of the industry meant that any rents – ie remuneration above a competitive rate - accruing to employees were retained.

In some EU countries, outsourcing has occurred in following energy sector liberalisation (Ecotec 2007). In part this reflects general trends across the wider economy, such as outsourcing of catering, cleaning and IT. But more specialist functions have also been

outsourced, notably maintenance but also the design and construction of networks and facilities.¹¹ Outsourcing has not generally resulted in a fall in wages for the staff concerned.

The UK is the main example of a country where “offshoring” has occurred, primarily with respect to back office work and customer services (Ecotec 2007).

4.1.3. Impact on prices and output

Where liberalisation has resulted in competition, especially in retail markets, the evidence suggests that customers have benefited from lower prices. For example:

- § between 1996 and 2004, real prices fell more in US states with retail competition (which would have been recently introduced) than those without. Econometric analysis estimates the effect of retail residential competition on retail prices to be between 5 and 10 per cent. The corresponding figure for industrial prices is around 5 per cent, but is estimated less precisely (Joskow 2006);
- § Ernst and Young (2006) analysed time series data from the electricity industry and found that the introduction of full competition was associated with a 60 per cent fall in price relative to the case of no competition. They also found strong evidence that competition reduces prices across the EU for all sizes of markets.

It more difficult to tell, however, whether other reforms have led to price reductions. In particular the US Government Accountability Office (2005) reviewed more than 30 studies and found that it was not clear that liberalisation of the wholesale electricity market had delivered price reductions for retail customers. It was not able to determine the extent to which restructuring efforts (including retail market reforms in 18 states) had led to lower electricity prices for consumers.

Similarly, while acknowledging the price reductions that resulted from the initial opening period of energy markets, the European Commission (2008) expressed concern about the lack of integration between national markets, as evidenced by the absence of price convergence across the EU and the low level of cross-border trade.

4.1.4. Impacts on labour productivity

A number of studies provide tentative evidence of liberalisation and / or competition improving labour productivity. There is some uncertainty, however, as to the extent to which liberalisation is the cause of the efficiency gains.

Following the 1992 EPA in the USA, Niederjohn (2004) argues that some of the reduction in employment was driven by efficiency gains resulting from a consolidation wave, and notes that economies of scale can be achieved through, for example, rationalisation of head office functions. Kwoka (2005) claims that acquired firms had higher efficiency than acquiring

¹¹ This has also been a feature in other infrastructure network industries, such as the privatised water companies in the UK and some European rail infrastructure providers.

firms, and that efficiency decreased following mergers.¹² He cites work with Pollitt that finds that between 1994 and 2003, target electric utilities were not poor performers. Thomas (2006) states that there is mixed evidence for the effect of competition on efficiency.

Some US evidence relates to generating companies. In particular:

- § Markiewicz, Rose and Wolfram (2004) found evidence that operating costs of generating plants decreased more in states where there was restructuring to introduce competition than in other states;¹³
- § COMPETE (2007) cites evidence from Fabrizio et al (2007) that the biggest increases in operating efficiency were in investor-owned plants in states that had restructured, whereas the smallest gains came in municipality and cooperative owned plants that had been insulated from competition. This report also cites a large number of other studies that give evidence of the benefits of competition.

Ecotec (2007) observes that there have been major improvements in labour productivity in the electricity, gas and water sectors in the EU from around 1990. These improvements are particularly large from the mid 1990s, but could be generated by factors other than liberalisation.

4.1.5. Impacts on levels of employment

In both the US and the EU, the liberalising reforms have coincided with large reductions in employment. In the EU case in particular, however, it is not clear whether the catalyst for change was liberalisation, preparation for liberalisation, or some other factor such as dissemination of new management practices:

- § US electricity industry employment fell on average more than 10 per cent a year in each of the years 1992 to 1997.¹⁴ In contrast, employment in the industry increased every year from 1976 to 1989, suggesting that the falls in employment can be strongly associated with the impact of EPA reforms of 1992. Statistically, Niederjohn concluded that there is a significant effect of deregulation on employment for most occupations;
- § Ecotec (2007) analysed employment changes in EU countries where reforms had been in place for some time (“advanced open markets”), and found that employment had fallen over the period 1995 to 2004 by between 24 and 34 per cent, compared to an EU average of 24 to 29 per cent. In countries where reforms were new (“open markets”), employment fallen over the same period (pre-reform) by between 26 and 39 per cent, with the exception of Ireland where employment had fallen by only 5 per cent.

4.1.6. Conclusions

Energy markets in both the US and the EU were liberalised in the 1990s. In the US, the main focus of the 1992 Energy Policy Act has been on wholesale markets, though by 2005 18

¹² It is possible for less efficient firms to acquire more efficient firms and still deliver efficiency gains, because often economies of scale can be realised.

¹³ Cited in Joskow (2006).

¹⁴ Bureau of Labor Statistics, cited in Niederjohn (2004).

states had introduced competition to retail markets. In the EU, reform has been through introducing competition to retail markets. In both cases, problems with barriers to entry and other factors have constrained the extent of competition, and more recent legislation has sought to address some of these problems. But where competition has emerged, especially in retail markets, it appears to have led to lower prices for consumers.

Liberalisation in both the US and EU has also coincided with major falls in employment (including some outsourcing), in excess of 20 per cent. There is a clear link between this and liberalisation, though it is possible to argue that some of the fall may be caused by more general industry trends, and not exclusively by liberalisation, particularly as competition has only been introduced into a subset of activities.

The reforms have not been found to result in substantial changes in wages or employment conditions. Outsourcing has been important in some markets, primarily relating to construction and maintenance of network infrastructure.

4.2. Telecoms

Telecommunication services have traditionally been provided national monopoly suppliers. In practice, it is now primarily the “local loop” that has characteristics of a natural monopoly, making introduction of competition for local calls particularly difficult. International calls, and to a lesser extent national calls, can often be routed a variety of ways.

Technological developments in the last few decades have transformed the provision of telecommunication services, including the introduction of cellular mobile and internet based options as well as developments in fixed-line services. This has permitted the introduction of competition in ways that previously would not have been possible.

Tied in with the technological developments, demand for telecommunications has increased substantially. Increasing output has meant that productivity improvements need not necessarily be delivered through redundancies, and so the introduction of competition has not associated with job losses to the same extent as in certain other industries.

In this section we discuss some early examples of liberalisation, in the US and Japan, both of which date back to the 1980s. We also present some findings of econometric analysis applied to a wider group of countries.

4.2.1. US telecoms industry

4.2.1.1. Description of liberalisation

AT&T provided all long-distance service and most local exchange service in the US from the early 20th century. Competition was introduced to a limited extent in 1977. Then AT&T was vertically separated in 1984, with local exchange services now provided by independent local monopolies. AT&T was subject to rate of return regulation until 1989, at which point price cap regulation was introduced.

Following the break-up of AT&T, competition began to develop in the long distance calls market. New operators served 19.8 per cent of the market for national long distance calls in

1984, rising to 48.6 per cent in 1997; they served 5.7 per cent of the market for international calls in 1986, rising to 54.7 per cent in 1997 (OECD 1999).

Other reform in US telecommunications includes the Telecommunications Act (1996), which removed the restrictions on cross-ownership in media and telecoms, and the introduction of the possibility for the Federal Communications Commission to override foreign ownership restrictions. Warf (2003) reports that the 1996 Act prompted a wave of consolidation in the US telecoms and media sector.

4.2.1.2. Impacts on wages and conditions of employment

Market entry was a major contributor to a decline in union membership in US telecommunications, which fell from 55 per cent of the workforce in 1983 (prior to liberalisation) to 29 per cent in 1996 (Peoples 1998). Over the same period, the average rate across other industries (excluding transport) fell from 19 per cent to 14 per cent.¹⁵

While both Peoples (1998) and Hendricks (1994) found that telecommunication wages increased relative to other industries in the early years of liberalisation, in the longer term Peoples (1998) shows that wages in the industry increased broadly in line with the rest of the economy. From 1983 to 1997, wages in telecommunications increased by 7 per cent in real terms, compared to 10 per cent for the rest of the economy.¹⁶

4.2.1.3. Impacts on labour productivity

AT&T's total factor productivity increased by 42.7 per cent between 1977 and 1987. Kwoka (1993) finds that for AT&T, competition accounts for 17 per cent of productivity increases between 1977 and 1987 (so that competition increased productivity by around 7 per cent). The remaining 83 per cent of the productivity increase was due to the impact of economies of scale as output increased. For each percentage point decrease in AT&T's market share, there was a 0.36 per cent improvement in productivity.

Similarly, Gort and Sung (1999) finds a positive net impact of competition on AT&T's efficiency following divestiture. By comparing AT&T to local Bell monopolies with data up to 1991, they argue that competition brings productivity improvements of 1.8 per cent a year over and above that of a monopoly. They state that numerous other papers have found evidence of a beneficial impact of competition following the break-up of AT&T, including Crandall (1989) and Ying and Shin (1993), who find significant positive productivity gains for AT&T and the regional operating companies.

While there is agreement that AT&T experienced large gains in overall productivity during the period, studies report different conclusions on the relative contributions of scale economies, technological change, liberalisation and other factors in generating these improvements. Estimates of the productivity improvements resulting from liberalisation vary from 7 per cent to potentially around 30 per cent over 14 years.

¹⁵ Peoples (1996), Table 1.

¹⁶ Peoples (1996), Table 1.

4.2.1.4. Impacts on employment

Peoples (1998) finds that employment was roughly stable after deregulation, as does Hendricks (1994). This is not inconsistent with substantial increases in productivity because outputs also increased over the same period.

Between 1993 and 2003, employment in US telecommunications increased by an average of 1.1 per cent a year. However, this was the net impact of strong growth between 1993 and 2000, when employment increased from 946,600 to 1,323,400, followed by a reduction to 1,060,000 by 2003.¹⁷

4.2.2. Japanese telecoms industry

4.2.2.1. Description of liberalisation

Prior to liberalisation, NTT was a state-owned corporation with a monopoly on domestic telecommunication services in Japan. KDD was a quasi-private government-regulated corporation with a monopoly on international telecommunication services in Japan.

There have been two important waves of liberalisation of fixed-line telecoms services. The first wave started in 1982, with the recommendation of the Administrative Reform Committee. Legislation was passed in 1984. Following this:

- § competition was introduced in 1985 through three national long distance carriers and two international carriers being granted licences;
- § NTT was “privatised” in 1986, with two thirds of its shares gradually being sold to the Japanese public, and NTT having freedom to determine its own budgets and investment decisions independently of government.

The Ministry of Posts and Telecommunications promoted the establishment of viable competitors to NTT and KDD, especially in areas such as long distance service and special or advanced local services.¹⁸ There was substantial new entry, such that there were 58 Type I Carriers and 770 Type II Carriers in 1989.¹⁹ By 1997 there were 142 Type I carriers.²⁰

Further developments followed in the 1990s, including:²¹

- § the break-up of NTT was announced (into one long distance company and two regional companies, within a holding company), which was announced in 1996; and
- § the removal in 1998 of foreign ownership restrictions for KTT, and restrictions on foreign capital investment for other firms (except of NTT);

¹⁷ OECD (2005)

¹⁸ Oniki et al (1994)

¹⁹ Oniki et al (1994). Type I Carriers own facilities; Type II Carriers lease facilities.

²⁰ OECD (1999).

²¹ OECD (1999)

§ the introduction (also in 1998) of a tariff notification system to replace government regulation of prices for all Type I services, except for NTT's local services which the government continued to regulate.

In addition, from the 1980s onwards, several pieces of legislation have been passed to encourage competition in the mobile telephone market.

By 1997, NTT still provided 98 per cent of local services. Its share of the long distance and cellular markets were 60 per cent and 57 per cent respectively. KTT controlled 63 per cent of the market for international calls.²²

4.2.2.2. Impacts on wages and conditions of employment

Changes in staff remuneration (including wages, overtime payments and bonuses) at NTT are shown in Table 4.1. While other input prices increased much faster before liberalisation than during it, earnings rose faster in the second period (though this also coincided with a period of strong economic growth in Japan).

Table 4.1
Change in Unit Price of NTT Inputs (over five years)

Productivity	1977 to 1982 (Pre-liberalisation)	1982 to 1987 (During liberalisation)
Labour	39%	42%
Materials	18%	5%
Capital	22%	-1%

Source: NERA calculation from Table 7, Oniki, Oum and Stevenson (1994)

4.2.2.3. Impact on prices and output

Prices for telephone services have fallen sharply in the period following liberalisation. This is partly due to productivity improvements delivered by technological change and economies of scale and scope, as outputs have increased. Prices in Japan were regulated until 1998, and price reductions are not particularly marked when compared to prices in other countries. For example, the price of a long distance call fell more sharply in France in the period 1990 to 1997 than it did in Japan.²³

Outputs were increasing substantially, both before and after liberalisation. For example, in the period 1982 to 1987, output is estimated to have increased by around 35 per cent.²⁴

²² OECD (1999).

²³ OECD (1999), Figure 5.

²⁴ NERA calculation from Table 5 of Oniki et al (1994).

4.2.2.4. Impacts on labour productivity

During the period 1958-1982, output growth and technological progress caused substantial growth in NTT's total factor productivity.²⁵ However, the rate of productivity improvements, including capital, material and labour productivity, increased following the start of liberalisation. This is shown in Table 4.2.

Table 4.2
Annualised Improvement in NTT Productivity

Productivity	1977 to 1982 (Pre-liberalisation)	1982 to 1987 (During liberalisation)
Labour	4.31%	8.47%
Materials	0.20%	2.81%
Capital	-2.19%	3.77%
Total factor productivity	0.26%	5.12%

Source: Oniki, Oum and Stevenson (1994)

Oniki et al (1994) argue that, prior to liberalisation, the improvement in overall productivity was mainly due to the increase in output, and they conclude that the impact of liberalisation was to increase productivity by 1.3 per cent a year. However, they note that this is only the direct effect of liberalisation and there may also be an indirect effect if liberalisation led to a more rapid adoption of technological change.

The number of access paths per employee is used by the OECD as an indicator of partial labour productivity.²⁶ In Japan, access paths per employee increased from 240 in 1993 to 516 in 2003, giving a compound annual growth rate of 7.9 per cent for this period.

4.2.3. Global analysis

Li and Xu (2002) used data for up to 160 countries for years 1981 to 1998 to examine the impact of introducing competition and privatisation to the telecommunications sector.²⁷ They concluded that:

§ the telecommunications sector experienced high levels of growth over the period, and over half of this growth could be attributed to total factor productivity improvements resulting from the introduction of competition and privatisation. Competition alone accounted for 30 per cent of the increase in output,²⁸

²⁵ Oniki et al (1994)

²⁶ OECD (2005)

²⁷ By 1998 23 OECD countries had liberalised their telecoms markets (OECD 1999).

²⁸ As total output increased by around 40 per cent, this corresponds to a 12 per cent increase. Li and Xu also attributed other parts of the increase to privatisation alone, or to a combination of both competition and privatisation, as well as to other factors.

- § over 40 per cent of the improvement in labour productivity could be attributed to the introduction of privatisation and competition; and
- § the estimated impact of privatisation was to reduce employment in the sector by 32.5 per cent, compared with an increase of 31.8 per cent due to competition. The combined impact of competition and privatisation was estimated to reduce employment by 5.8 per cent.

Ros (1999) also found that competition increases efficiency, including that mainlines per employee are 29 per cent higher in countries that allow competition (or 43 per cent if endogeneity is corrected for).

A number of other studies, including Boylaud and Nicoletti (2001), Inklaar et al (2008), Madden, Savage and Ng (2003) and Lien and Peng (2001), all conclude that competition (or potential competition) in the telecoms sector has a positive effect on productivity growth.

4.2.4. Conclusions

Telecommunications services started to be liberalised in the US and in Japan in the 1980s. By 1998, 23 OECD countries had liberalised their telecommunication services.²⁹ The process is not straightforward, however, and some form of vertical separation of the incumbent supplier and enhanced market access provisions have often been introduced.

There have also been major technological changes over this period, which have resulted in new products being launched, allowed substantial price reductions for existing services and a great increase in demand for telecommunication services overall. While these factors will have increased productivity, there is strong evidence that the introduction of competition has resulted in substantial further productivity improvements. But the strong output growth has largely offset the impact of higher productivity on levels of employment in the sector.

4.3. Banking

In contrast to energy supply or other network utilities, banking services do not have the characteristics of a natural monopoly, and banks typically operate with at least some degree of competition. Recent developments in customer service, including the growth in telephone and internet banking, have also reduced their reliance on branch networks.

Regulations have, however, been quite prevalent in some areas, including that of ownership and control, often with restrictions on foreign ownership. In the US in particular, regulations also existed to limit the size of individual banks, so that scale economies and economies associated with operating a network of banks were not realised. In the EU, public ownership of banks has been widespread in some countries.

In this section, we examine US banking liberalisation, including the introduction of interstate branches, and the adoption of a single market for banking across the EU.

²⁹ OECD (1999).

4.3.1. US banking sector

4.3.1.1. Description of liberalisation

Prior to the 1970s, banks in the USA were largely prevented from operating from more than one state, and in many states each bank was permitted to operate no more than a single full time branch. There were also tight controls on foreign ownership of banks.

A series of reforms in the 1970s and 1980s permitted banks to operate multiple branches within states, and then in some cases across states. Many restrictions and barriers remained, however. For example, often inter-state banking might only be permitted on a regional level, or through reciprocal agreements. And branching was often restricted to entities called multibank holding companies (MBHC), which prevented some of economies of scale from being realised.

The major change occurred with the Riegle-Neal Interstate Banking and Branching Efficiency Act (IBBEA) of 1994. The Act permitted full interstate banking for both domestic and foreign banks, without the requirement for MBHC, and ultimately allowed nationwide branching.

Following the 1994 Act, concentration at a regional level (at the state level, or across neighbouring states) increased dramatically. Banks entered new markets, but there was not widespread consolidation in local markets, such as within individual towns (Strahan, 2003).

Foreign banks have had a presence in the US for a long time, and indeed they showed strong growth in the late 1970s before their oversight was brought into line with domestic banks through the 1978 International Banking Act. Their importance has gradually increased, however; in 1975 they owned 4.6 of US commercial bank assets, compared to 25 per cent in 1997 (Haupt 1999).

4.3.1.2. Impacts on wages and conditions of employment

There is evidence that liberalisation has reduced wages in some areas, and this is attributed to falls in rent (wages above market rates) resulting from greater competition. The industry was not unionised.

- § Black and Strahan (2001) found that deregulation was associated with industry wages falling by between 4 and 6 per cent. Falls were higher in states with tighter ex ante restrictions on banking expansion, and reductions were higher for low-skilled jobs than higher-skilled jobs and for men relative to women. Jayaratne and Strahan (1998) also found that salaries per worker had fallen;
- § Wozniak (2007) found that bank managers' compensation fell by 20 per cent following reforms, and attributed this to a loss of rent. Compensation remained steady for other staff, though variation between firms increased greatly following liberalisation. Wozniak, in common with Black and Strahan (2001), found that rents, dissipated under deregulation, had accrued disproportionately to men;
- § examining the 1994 reforms specifically, Dick (2006) found the salary per employee to be higher following IBBEA reforms, and attributed this to a service quality increase associated with nationwide branching.

4.3.1.3. Impact on prices and output

From the late 1970s, the industry has experienced large numbers of mergers and a large number of new bank entries (Jeon and Miller 2003). Overall, the number of banking firms fell by approximately 40 per cent between 1984 and 1998, but the number of banking branches grew steadily throughout that time (Rhoades, 2000, cited in Wozniak, 2007). Customers benefited from greater networks, but local competition was retained (Dick 2006).

Dick (2006) found that prices (taking account both interest rates and service fees) fell following the IBBEA reforms, calculating that the spread reduced by 0.6 percentage points. Strahan (2003) and Jayaratne and Strahan (1998) also found that prices fell.

4.3.1.4. Impacts on labour productivity

The evidence does not suggest that reforms led to significant changes in productivity. Peristiani (1996) found that mergers resulted in scale economies for small and medium sized institutions, but not for large institutions. Banks that acquired several other banks within a state were estimated to gain scale efficiencies on average of 4 per cent. But this was counter-balanced by a reduction in X-efficiency (a measure of efficiency relative to a measure of the most efficient bank) for the acquiring firm of 3.5 per cent.

Dick (2006) found that costs increased due to increases in service quality and provision of new services, but that the concentration at regional level meant that some economies of scale could be realised.

4.3.1.5. Impacts on levels of employment

From 1984 to 1998, whilst the number of banking firms fell, the number of bank branches grew steadily. There was no significant decline in employment during this time, apparently because the growth in branches offset the employment losses associated with the introduction of ATMs (Rhoades, 2000, cited in Wozniak, 2007.)

Black and Strahan (2001) found that the deregulation did not have a significant impact on employment, and Wozniak (2007) found that banking employment increased following liberalisation.

4.3.2. EU banking sector

Banking was one of many industries subject to liberalisation through the EU Single Market Programme in the late 1980s and early 1990s. These reforms removed restrictions on foreign ownership and control for EU companies. They also sought to remove barriers to entry to domestic banking markets through measures including the EU-wide Single Banking Licence.

There has been extensive consolidation of banks within domestic markets of EU Member States. The number of banks in the EU decreased by 18 per cent between 1997 and 2003 (Casu and Girardone 2006). Between 1995 and 2000, domestic mergers and acquisitions accounted for 80 per cent of EU M&A in the industry (Molyneux 2003). Since 2000, cross-border mergers and acquisitions have increased significantly (Oxera 2006).

Aside from regulatory reform, barriers to market entry have reduced over time through technological developments, notably internet banking, and through the adoption of a common currency in many member states.

4.3.2.1. Impacts on wages and conditions of employment

Technological developments in internet banking and the increased importance of call centres as the interface for customer services have meant that there is now considerable scope for banking jobs to be located in countries with cheaper labour and weaker employment conditions. This is not associated with the EU Single Market reforms, however.

4.3.2.2. Impact on prices and output

Although the single market reforms to banking have permitted extensive cross-border consolidation, they have also allowed products to be launched in new markets. For example, a number of foreign EU banks provide niche banking services in the UK.³⁰

The European Commission (1997) found some evidence that the Single Market Programme (SMP) led to falls in the prices of loans and deposits (measured as the margins between deposit and loan rates and the three-month inter-bank rate) in some countries. However, in other countries where prices also fell in the post-SMP period, it found only minimal impacts of the SMP on prices.

4.3.2.3. Impacts on labour productivity

There is only weak evidence of improvements in labour productivity following liberalisation. On the basis of a review of previous studies, Angelini and Cetorelli (2003) argue that empirical evidence of scale economies in banking is inconclusive, and so the impacts of consolidation on efficiency are also inconclusive.

Molyneux (2003) argued that the majority of domestic consolidation was cost-driven, with associated cost savings, but there were other rationales for cross-border deals, including earning diversification. The implication is that the cross-border consolidation did not result in material improvements to productivity.

Sager (2006) argues that implementation of the Second Banking Directive (the legislation associated with the single market) increased aggregate banking productivity by 4 per cent, a fairly small amount.

The European Commission (1997) found that there are potential economies of scale for smaller banks in the SMP period. For example, in 1991 for banks with assets up to 10 billion ECU, a 10 per cent increase in output would lead to estimated rise in costs of 9.2 per cent in the UK, 7.8-9.1 per cent in Germany, and 7.5-8.6 per cent in France. Therefore mergers of small banks, in particular, could lead to significant cost savings.

³⁰ Examples include ING Direct and Triodos Bank.

In addition, the European Commission (1997) found evidence for economies of scope for both the largest and the smallest banks in the pre-SMP period. This implies that banks would benefit from expanding their operations following deregulation.

Looking at productivity, however the European Commission (1997) found that the Single Market Programme did lead to some increase in labour productivity, but this was offset by falls in productivity for other inputs so that there was no overall increase in total factor productivity.

4.3.2.4. Impacts on levels of employment

The European Commission (1997) commented that the potential for a reduction in employment is constrained by labour laws in individual member states. While it found a downward trend in banking and credit sector employment between 1990 and 1993 in Belgium, Denmark, France, Portugal, Spain and the UK, it concluded that this reflects general increases in competition and industry restructuring, and that no specific “SMP effect” on employment can be identified. In addition, employment was found to have increased over this period in Germany, Greece and the Netherlands.

4.3.3. Conclusions

Banking reforms, including a relaxation of rules on foreign ownership, have been implemented in both the US and the EU and have the potential to allow network benefits and the realisation of potential economies of scale. Substantial industry consolidation has followed, but new market entry has also been an important feature and output has expanded in many cases.

Some research suggests that the reforms have been associated with productivity improvements, reductions in remuneration and falls in price to consumers. For example, the Single Market programme in the EU was associated with an aggregate 4 per cent increase in bank productivity. But the reforms do not appear to have delivered significant changes in levels of employment, which fell in some EU countries but increased in others.

Both sets of reforms pre-date the development of internet banking and the replacement of branches with call centres in many instances as the main customer focus. These developments increase the potential for banking employees to be located in countries with cheaper labour, which may be facilitated by ownership and control reforms.

4.4. Media

Television and radio services are public goods and, traditionally (and still predominantly), have been delivered free of direct charges to consumers. Except for satellite and cable services, and newer terrestrial subscription channels, television and radio stations have not tended to compete with each other on the basis of price to consumers.

Technological constraints have traditionally limited service output. Regulation has typically taken the form of restrictions on ownership and control (including restrictions on foreign ownership) of the limited number of television channels and radio frequencies that have historically been available, together with provisions on programme standards and content.

Both technological developments and market liberalisation have contributed to allowing an expansion of the number of television channels and radio stations available to the public.

4.4.1. Description of liberalisation

4.4.1.1. New Zealand

In 1989, the state-owned television sector was liberalised. Broadcast frequencies were auctioned, and could subsequently be traded, with no programming requirements or conditions for licences. The state owned incumbent, Broadcasting Corporation, was split into two separate commercial state owned entities.

In 1991, all restrictions on foreign ownership of television channels were removed, following a similar liberalisation of radio stations in 1989.³¹

4.4.1.2. Germany

Commercial radio stations and television channels were permitted for the first time in 1984. Foreign media firms could apply for broadcasting licences or invest in existing German firms. Prior to 1996, a single company could own a maximum of two channels, and no single entity was permitted to have a controlling stake in a channel. These rules were relaxed with the Broadcasting Treaty in 1997.³²

4.4.1.3. USA

In 1981, the Federal Communications Commission deregulated the radio industry, instituting a marketplace model for broadcast regulation. Regulations remained in place constraining the number of radio stations nationally and locally that could be controlled by a single company, but these rules were relaxed during the 1990s.³³

4.4.2. Impacts on wages and conditions of employment

Unions have had a strong presence in many traditional, often state owned, broadcast companies. Their influence may often be weaker in new start up services, and may not necessarily increase when start-up services expand and consolidate.

A major example of this is the US media provider, Clear Channel. Clear Channel has expanded rapidly (with 43 radio stations in 1996, rising to over 1,300 radio stations in 2003, as well as 39 television stations) and is predominantly non-union, though many of the companies it has acquired have union membership (Richardson and Figueroa, 2004).

4.4.3. Impact on output

Liberalisation of ownership and control has tended to coincide with an increase the number of services available, though in some cases this has been followed by a period of consolidation.

³¹ Oxera (2006).

³² Holtz-Bacha (1997).

³³ Bates and Chambers (1999).

In many cases, entrants are providing services to new niche markets. For example, deregulation in New Zealand resulted in a significant increase in the number and variety of youth-oriented radio outlets (Shanahan 2000). Though a large number of smaller providers entered the market after the 1989 liberalisation, competition and subsequent consolidation led to three main groups owning and controlling 80 per cent of commercial radio networks by 1999. Similarly, while a large number of private firms entered the German market following liberalisation,³⁴ by 2004 it had an oligopolistic market structure (Oxera 2006).

Relaxation of ownership restrictions in the US has also resulted in consolidation for radio and television services.³⁵ It has not appeared to change output substantially, however: between 1996 (when relaxation on ownership was introduced) and 2001, the number of radio stations nationally increased slightly from 10,257 to 10,983 (Smith and O’Gorman 2008).

4.4.4. Impacts on labour productivity

Smith and O’Gorman (2008) found that the relaxation of ownership restrictions for US radio services had allowed firms to cluster new stations locally, and that this in turn produced cost savings. It found that costs as a proportion of revenue were 11 per cent lower following the 1992 liberalisation of ownership restrictions, and a further 1 per cent lower following the 1996 liberalisation.

4.4.5. Conclusions

Liberalisation of ownership and control restrictions in the media sector, accompanied by important technological advances, have allowed a great expansion of radio stations and television channels in many countries, increasing the choice available. In some cases, however, initial market entry has tended to be followed by substantial industry consolidation.

³⁴ Holtz-Bacha (1997) reports that liberalisation of German media services resulted in an increased number of television channels and increased demand for programming material.

³⁵ Between 1996 and 2000, the median number of stations for the largest firm at local level increased from four to six, and the mean market concentration locally for the top three firms increased from 41 per cent to 57 per cent (Smith and O’Gorman 2008).

5. Impact of Future Airline Liberalisations

5.1. Context

As noted in Section 1 above, more than half of the frequencies currently offered by airlines have been subject to some form of liberalisation, through either bilateral “open skies” air service agreements or regional/multilateral liberalisation agreements. We might expect this gradual process of liberalisation to continue in future, with further bilateral or regional agreements negotiated that remove market access restrictions and perhaps some ownership and control restrictions, and with a possible extension of existing regional agreements, either to include additional countries or to remove restrictions that survived the first round of liberalisation. But more far reaching changes are also possible.

We have been asked by IATA to consider the implications of two further deregulation scenarios, both involving the countries attending the Istanbul meeting (Australia, Brazil, Canada, Chile, EU, India, Mauritius, Morocco, Panama, Peru, Singapore, Switzerland, Turkey, UAE, Uruguay, US):

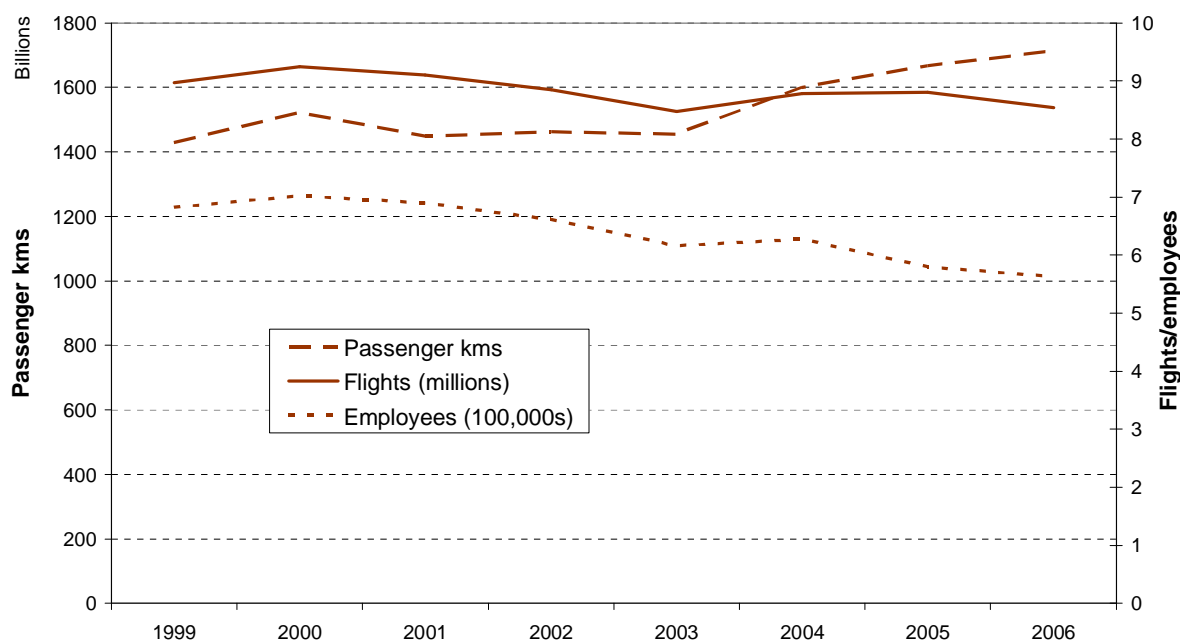
- § the first scenario involves a relaxation of ownership and control restrictions, but no further product market liberalisation. This would make it easier for foreign-based organisations (including other airlines) to merge with or take over an airline;
- § the second involves the removal of market access restrictions on all routes between and within this group of countries. While many of these routes may already be liberalised, the removal of all restrictions would be likely to lead to further increases in competition.

The background to this assessment is that total traffic volumes have risen strongly in recent years, reflecting the recovery from the disruption of 2001 and strong growth in countries such as China and India. Notwithstanding the current uncertain prospects for the world economy and concerns about climate change, in the medium to long term it seems likely that global traffic levels will continue the strong growth that has been experienced for most of the past 50 years.

Figure 5.1 compares recent traffic levels for 40 major airlines with the number of workers employed by these airlines. The sample includes all those airlines for which we had data for the whole period from 1999 to 2006. Even though passenger volumes have grown in recent years, the total number of flights operated by these airlines has declined slightly over the period, and the number of employees has also fallen. However, it is important to note that the experience of these 40 airlines may not be representative of the industry as a whole.³⁶

³⁶ We note in particular that the sample excludes several low cost carriers (such as Ryanair and easyJet) that have experienced strong growth and captured market share from major European airlines in recent years.

Figure 5.1
Passenger kms, Flights and Employment (40 airlines)



Source: NERA calculations from ICAO data

5.2. Lessons From Previous Liberalisations

The experience of previous liberalisations described in Sections 3 and 4 demonstrates how the overall impact for employment depends on the interaction between a number of different changes. While increased competitive pressure can encourage firms to reduce both the size of the workforce and the amount they are paid, this may be offset if liberalisation also leads to higher levels of service or improved service quality, or if demand from consumers increases, for example in response to more competitive pricing.

There are a number of similarities between the international air transport industry and the other industries examined in Section 4. All are strategically and politically important to consumers and businesses in their home markets. Certain aspects of service quality, security and continuity of supply are important in each industry, any major failures may be easy to observe and attract considerable public attention, and most are network industries which are likely to have significant fixed costs. In addition, they require some specialised workers, and their services must be tailored to and, to some extent at least delivered in, specific geographical markets. Compared to manufactured goods which may be produced remotely and shipped to different final markets, this will limit the extent to which production can be moved to different locations in response to market liberalisation.

Table 5.1 summarises some of the most relevant features of each industry, in comparison with international air transport. None of the other industries examined is comparable in all respects to the international air transport industry. Some important features of the international air transport industry, many of which are shared by only one or two of the other industries examined, are that:

- § aviation demand can be quite responsive to service levels. The introduction of new direct services may lead to an increase in demand. And even an increase in frequencies on routes already served may stimulate demand, especially on shorter routes. To some extent, telecoms markets exhibit similar properties, though mainly with the introduction of new services;
- § compared to some of the other industries, demand is relatively price elastic. Thus price reductions following liberalisation, and especially due to the emergence of low cost carriers, have contributed to the significant growth that the industry has enjoyed over recent years. Demand for some new telecoms services may also be relatively price elastic, whereas energy demand is likely to be relatively price inelastic, and many media services are provided free of charge to listeners/viewers
- § market developments have mainly reflected economic (ie final demand) and regulatory factors. In telecoms and media markets, in contrast, rapid technological change has facilitated both a significant expansion in the number of services provided and also the introduction of completely new products;
- § air transport is affected by safety and security requirements to a greater extent than the other industries discussed in Section 4.

Table 5.1: Main Features of Comparator Industries

	International air transport	Energy	Telecoms	Media	Banking
Historical market structure	Oligopoly	Monopoly	Monopoly	Oligopoly	Oligopoly
Historical ownership	Many private	Many private (US) Public (EU)	Mainly public Private (US)	Mainly public	Mainly private
Strategic and political importance	High	Very high	High	Very high	Very high
Economic importance	High	Very high	Very high	Medium	Very high
Network benefits for consumer	Yes	No	Yes	No	Yes
Importance of fixed infrastructure	Low	Medium-high	Medium-high	Low	Low-medium
Has liberalisation included vertical separation?	No	Yes	Yes	No	No
Responsiveness of demand to prices / service levels	High	Low	Medium	n/a	Low-medium
Potential for introduction of new services	High	Low	High	High	Medium
Importance of technological change	Medium	Low	High	High	Medium
Importance of safety / security requirements	Very high	Medium-high	Low	Medium	Medium-high
Importance of location	High	Low	High	Low	Medium-high
Union presence	Medium-high	Medium	Medium-high	Medium-high	Low

Of the other cases examined, the energy and telecoms sectors provide the most useful indication of the impact of introducing competition into industries or parts of the supply chain that were previously served by a single supplier. Overall, there is strong evidence of an improvement in productivity following liberalisation, even if in some cases authors reach different conclusions about how much of this improvement can be attributed to liberalisation and increased competition, rather than other changes.

Many of the estimates of productivity improvements fall into a range from 10 to 30 per cent (or annual changes consistent with this range). This is somewhat higher than the improvement that Caves et al (1987) estimated for the US airline industry (see Section 3.3), and this difference may reflect the greater risk that firms will become inefficient if they face no competition at all, if the demand for their services is relatively unresponsive to changes in price and perhaps service quality, and (in some cases) if the suppliers are publicly-owned. These conditions applied in some energy and telecoms markets, but less so to US airlines.

In the energy sector, these productivity improvements led to a significant reduction in total employment following liberalisation. This is consistent with the nature of energy industry liberalisation, which has mainly served to increase the efficiency with which existing services are supplied to consumers. In developed countries, at least, there is relatively little scope for energy sector liberalisation to deliver new and significantly different products or to expand output very substantially. In telecoms industries, in contrast, productivity improvements were accompanied by a significant increase in output, generally leading to a relatively small (and often positive) impact on total employment.

While the experience of the banking and media sectors is potentially more relevant when assessing the impact of relaxing ownership and control restrictions, the evidence from these sectors is rather mixed and in some cases relatively weak. The impacts on productivity, output and employment have reflected a diverse range of changes, including mergers, market entry, the introduction of new services, and changes to the level of service quality.

5.3. Estimated Impact on Employment

5.3.1. Relaxation of ownership and control restrictions

The first liberalisation scenario we consider is a relaxation of ownership and control restrictions among the countries attending the Istanbul meeting, but no change in restrictions on access to individual routes.

As discussed in Section 2, this will provide greater flexibility for ownership changes to occur without an acquired airline losing significant traffic rights (because it is no longer owned or controlled from its home country). This change might increase the likelihood that airlines could be taken over if the existing managers are perceived to be performing poorly. Or it could facilitate a merger or takeover for strategic reasons, for example because of likely synergies between two airlines.

In theory, the higher risk of takeover for poorly performing airlines could lead to increased pressure on management to improve efficiency. In practice, however, we expect that the

majority of the airlines in the countries affected by this scenario will already face significant competition on at least some of their routes.³⁷ In some cases, this might include low cost carriers operating domestic or regional services. In others, it might be that some major international routes from that country have already been liberalised.

In addition, we note that private sector airlines may already face some risk of takeover. They may be taken over by financial or other non-airline investors based in the same country. Especially in larger markets, and subject to any regulatory approvals required (for example from competition authorities), they might also be taken over by other airlines from the same country.

Overall, therefore, as most airlines will already face both direct competition on at least some of their routes and a risk of takeover from within their own countries, we believe that the simple fact that airlines managers face an increased risk of takeover from foreign organisations will have a relatively minor impact on top of the pressures that they already face.

Where mergers do take place, however, then the implications for productivity and employment will depend on the type of merger. In two specific situations, a relaxation of ownership and control restrictions may encourage mergers that will have a positive impact on productivity or employment:

- § at present, some mergers (such as Air France-KLM) are structured so as to retain the nationality status of the individual airlines. Air France and KLM retain separate identities and have separate management boards, even though they are jointly owned by a single holding company. If liberalisation reduces the need for such measures and allows a more complete integration of the individual airlines' operations, this could well lead to further productivity improvements for the airlines directly affected;
- § liberalisation could also increase the likelihood of a failing airline being "rescued" by being taken over by a foreign-owned airline. The short-term impact of such rescues would almost certainly be to protect jobs that might otherwise be lost to the airline industry. In the longer term, however, the impact is more difficult to assess. In part, it will depend on whether the failing airline improves its performance and remains in business. But it will also depend on the longer term counterfactual case (ie what would have happened in the absence of liberalisation), and whether in time the failing airline's routes might have been taken over by a new and more efficient airline.

In other cases, however, we have not found strong evidence that significant efficiency gains could result from international mergers between airlines, or that a relaxation of ownership and control restrictions would lead to a significant volume of such mergers. Three important factors are:

³⁷ As noted in Section 1, the US reported to be a partner in 78 bilateral "open skies" agreements. Of our estimate of the total traffic associated with countries attending the Istanbul meeting (see Section 5.3.2), more than half represents flows to/from or within North America. This supports the suggestion that most airlines affected by this scenario will already face significant product market competition.

- § Kim and Singal's analysis of US airline mergers (see Section 3) did not find evidence of efficiency benefits in mergers between airlines that neither shared a hub airport nor overlapped on some routes. This casts doubt about whether any material efficiency improvements could be expected from a merger between airlines based in different countries;
- § to the extent that there are efficiency benefits that could be realised through international airline mergers, we might expect that some of them will have already been realised through the major airline alliances that now operate throughout the world;
- § in other industries, international mergers can generate efficiency gains if production can be moved from high cost to low cost locations. This seems very unlikely in the case of airlines, for the reasons set out in a recent report by the UK Civil Aviation Authority (CAA – see Civil Aviation Authority (2004)). Among other things, the CAA argued that airlines need to employ staff at either end of their routes in order to maintain operational efficiency, that there are not large numbers of suitably qualified pilots elsewhere that could take over jobs from EU or US pilots, and that the international regulatory system and the need for skilled labour mean that the phenomenon of “flags of convenience” is unlikely to occur in aviation.

5.3.2. Relaxation of market access restrictions

The second liberalisation scenario we have considered is one where all market access restrictions are removed for services within and between Australia, Brazil, Canada, Chile, EU, India, Mauritius, Morocco, Panama, Peru, Singapore, Switzerland, Turkey, UAE, Uruguay and the US.

As noted above, many of these routes and areas have already been exposed to some form of liberalisation, and this fact will limit the potential impact that further liberalisation might have. Nevertheless, the complete removal of market access restrictions is likely to expose some routes or areas to significantly stronger competition than before.

The implications of such changes for aviation industry employment are uncertain, and depend on the net impact of several different factors:

- § increased competition will put additional pressure on firms to reduce costs, either through improving productivity (and therefore requiring fewer workers to provide a certain level of output) or through reducing wage rates. Productivity improvements across the industry as a whole may also occur if inefficient airlines lose market share to airlines with higher productivity;
- § any reduction in fares will stimulate increased passenger demand. This could lead to increased service levels, and therefore increased labour inputs, on the routes affected;
- § service levels are also likely to increase, initially at least, as a result of entrants introducing new services. While, over time, it is possible that incumbent airlines could reduce their own frequencies in response to entry, previous experience suggests that overall service levels are unlikely to fall and, on some routes at least, could remain significantly higher than those that applied before liberalisation. And service levels will certainly be higher on routes that did not have any direct services at all prior to market entry.

We have carried out some illustrative calculations to show the potential impact of these various possible changes. These calculations take ICAO's industry-wide traffic forecasts for 2016 as a starting point. These forecasts are summarised in Table 5.2, alongside data for 2006 and our own projections of total industry employment (covering both airlines and airports) in 2016.

Further details of our calculations are provided in Appendix B. The employment projections are generated by calculating by the ratio of different types of employee to a relevant output measure (such as passenger kms or aircraft kms) for as wide a sample of airlines in each region as possible, then applying these metrics to total traffic volumes for the region as a whole. For the 2016 projections, we also allowed for productivity improvements of 3 per cent a year between 2006 and 2016.³⁸

³⁸ For comparison, Caves et al (1987) report that US airlines achieved productivity improvements of 3.4 per cent a year between 1975 and 1983, compared with 2.8 per cent a year for non-US airlines.

Table 5.2
Traffic Forecasts and Employment Projections

Market	Passenger kms in 2006 (billions)	Passenger kms in 2016 (billions)	Estimated 2016 employees
Domestic Africa	24.5	43.3	77,917
Domestic Asia/Pacific	396.2	807.3	713,752
Domestic Europe	180.2	260.2	197,934
Domestic Latin America	77.5	140.6	175,675
Domestic Middle East	19.7	31.0	26,206
Domestic North America	890.2	1,191.9	776,351
Europe-Africa	129.4	221.0	105,895
Europe-Asia/Pacific	371.2	649.2	225,433
Europe-Middle East	73.2	135.8	52,343
Intra Africa	19.5	34.9	49,678
Intra Asia/Pacific	304.4	558.2	314,051
Intra Europe	484.5	734.7	470,760
Intra Latin America	27.5	49.3	50,398
Intra Middle East	19.6	34.2	28,409
Intra North America	35.0	50.6	42,707
Mid Atlantic	58.6	102.5	36,176
Middle East-Asia/Pacific	108.9	204.0	88,360
North -Central America/Caribbean	93.9	148.6	100,624
North America-South America	49.9	84.4	43,426
North Atlantic	454.4	723.1	234,837
Other international routes	57.4	95.3	56,118
South Atlantic	82.9	146.1	52,282
Transpacific	312.3	579.4	201,192
Total	4,271.0	7,025.6	4,120,523

Source: ICAO traffic forecasts and NERA analysis

It is important to note that the liberalisation scenario we are considering does not apply to all of the traffic and employees shown above. We estimate that the routes affected account for 51 per cent of passenger kms in 2006, falling to 47 per cent by 2016. As shown in Appendix B, representation in the group of countries attending the Istanbul meeting varies significantly from region to region.

We constructed “low” and “high” cases for the impact of removing market access restrictions. These are not “optimistic” or “pessimistic” scenarios in terms of the overall impact for

aviation industry employment.³⁹ Rather, they depict cases where liberalisation has a relatively large impact or a relatively small impact overall.

The main assumptions we adopted were as follows:

- § proportion of routes not already liberalised – the direct impact of further liberalisation will be felt mainly on routes that have not already been liberalised. ICAO estimates that over 50 per cent of the frequencies currently offered have been liberalised through either bilateral open skies air service agreements or regional/multilateral liberalisation agreements.⁴⁰ While this suggests that somewhere between 45 and 50 per cent of flights are still on routes that have not been liberalised, we would expect this proportion to be lower for the group attending the Istanbul meeting, which includes many of the countries that have been most active in liberalising their own regional and international services. **Our low case and high case assumptions are respectively that either 15 or 30 per cent of traffic within/between the countries attending the Istanbul meeting is on routes that have not yet been liberalised;**
- § the change in fares (on routes not previously liberalised) – as competition generally occurs on a route-by-route basis, it seems reasonable to assume that the impact of liberalising routes that were previously protected from competition could still be very strong. Based mainly on Morrison and Winston’s finding that US liberalisation led to fares being 22 per cent lower than they otherwise would have been,⁴¹ **our low case and high case assumptions are that fares are reduced by respectively 10 or 20 per cent on routes that have not yet been liberalised;**
- § the increase in services necessary to meet this extra demand – for both low and high cases, we apply estimated price elasticities (these vary by route, from -0.4 to -0.9, see Appendix B) to calculate the increase in demand generated by lower fares, and assume that service levels (and hence total industry employment) increase in order to meet this additional demand;
- § the improvement in labour productivity (on routes not previously liberalised) – as noted in Section 5.3.1, many of the airlines affected by our liberalisation scenario already face competition on a number of their routes, and as a result of this we might expect them to have already realised efficiency improvements across many of their activities (and not just the routes on which they face competition). We have therefore based the highest of our assumptions on the cost reductions estimated by Caves et al (1987) following US air transport liberalisation, rather than the larger impacts observed in the energy and telecoms sectors. **Our low case and high case assumptions are that labour productivity improves by respectively 5 or 10 per cent in relation to routes that have not yet been liberalised;** and
- § any further increase in service levels as a result of market entry or expansion by incumbent airlines. The introduction of new services by either entrants or existing

³⁹ An “optimistic” employment scenario, for example, would combine a large fares reduction and resulting output increase (which will increase employment) with only a small improvement in labour productivity.

⁴⁰ See ICAO (2008), Figure 1.

⁴¹ See Section 3.4.

airlines will cause at least a temporary increase in industry output as measured by flights or capacity. Other things being equal, this will increase the total labour inputs required by the industry. Over time these impacts could be reversed if incumbent airlines reduce their frequencies in response to entry or if new routes prove unprofitable. And some of the additional capacity provided will simply contribute to meeting the extra demand generated by lower fares. Nevertheless, it is possible that market entry or expansion to serve new routes will lead to additional demands for labour, over and above those described above. **As an addition to our low and high cases, we have examined cases where service levels increase by an additional 5 or 10 per cent following liberalisation.**

Table 5.3 shows the results of these illustrative calculations. In all cases, the result is a net increase in total aviation industry employment, as the jobs created in order to meet the demand generated by lower fares outweigh the job losses as a result of productivity improvements. However, the results differ slightly between regions, reflecting among other things differences in the likely increase in demand as a result of lower fares. In the high case without any additional increase in output, there might be a small reduction (0.2 per cent or less) in employment in particular regions, which is more than offset by larger increases in employment elsewhere.

If liberalisation leads to an additional increase in output, either because of market entry or because existing airlines serve new routes, then this will lead to a further increase in industry-wide employment. These impacts more than offset the possible reductions in employment in particular regions noted above, so that the net effect on employment is positive in all regions.

Table 5.3
Summary of Results

	% change in employment	change in number of employees
Low case	+ 0.1%	+ 2,982
High case	+ 0.2%	+ 8,096
Low case with 5% additional increase in output	+ 0.4%	+ 16,199
High case with 10% additional increase in output	+ 1.5%	+ 61,176

Source: NERA analysis

The relatively modest size of the estimated impacts on industry-wide employment reflects the fact that this liberalisation scenario covers a specific group of countries, rather than the industry as a whole, and many of the routes involved have already been liberalised. For particular routes that are liberalised as a result of the scenario we have modelled, the estimated impacts on employment (assuming no additional increase in output) range from -1.9 to +2.4 per cent in the low case, and from -4.1 to +4.0 per cent in the high case. If there is an additional increase in output, however, then the impacts on individual routes are all positive, ranging from +2.1 to +6.8 per cent in the low case, and from +3.7 to +13.0 per cent in the high case.

6. Concluding Comments

While the liberalisation of network industries has generally resulted in significant benefits for consumers, the implications for employees have been more mixed. In those industries where liberalisation has helped firms to introduce new services or to serve new markets, total employment has often increased or else remained relatively stable. In contrast, where liberalisation has simply enabled the same services as before to be delivered more cost-efficiently, total employment has fallen as a result of productivity improvements.

In principle, further liberalisation of the air transport industry creates both threats and opportunities for employees. The main threats are simply that liberalisation will place extra pressure on managers to reduce costs, and they will implement measures that lead to either job cuts or wage reductions. The likely impact will be greatest, of course, for those airlines that may still be operating inefficiently or paying their workers wages that are significantly above market rates.

There is little doubt, however, that liberalisation has helped to sustain the significant growth that the air transport industry has enjoyed over recent years. Air transport differs from many other network industries in that demand is relatively responsive to both fares reductions and improvements in service levels. Liberalisation can play a major role in ensuring that new, attractive and competitively-priced services continue to be provided, and that the industry as a whole has a vibrant and dynamic future.

One possible form of liberalisation is a relaxation of ownership and control restrictions. In theory this could pave the way for cross-border takeovers of airlines. This could lead to productivity improvements where mergers that would have previously been structured so as to retain each airline's national status can be implemented more fully, and may help to avoid (or reduce) a loss of employment where it allows a failing airline to be "rescued". But the beneficial impacts would be restricted to the particular airlines involved in any such mergers, and there is little evidence to suggest the increased threat of takeover would place significantly greater pressure on other airline managers, especially in comparison with the pressures that result from the direct competition that most of them face already.

Further liberalisation of market access restrictions is more likely to lead to significant changes. The overall impact on employment will depend on the interaction between productivity improvements which may reduce the demand for labour, and increased service levels which will increase the demand for labour. Increased service levels may result from market entry or the introduction of new routes, or from increased demand that is generated by fares reductions.

Our illustrative calculations suggest that the impacts of liberalisation on total employment could well be positive. In part, this is because of the relatively modest scale of our assumed productivity improvements, even where liberalisation leads to quite substantial fares reductions. But this simply reflects the fact that fares are set on a route-by-route basis, so significant reductions may still occur on routes where competition has previously been weak. In contrast, efficiency improvements are not route specific, and the scope for future improvements may be quite limited if airlines have already been exposed to strong competition on some of their main routes.

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Appendix B. Data and Assumptions

This appendix sets out the data sources and assumptions used as model inputs.

B.1. Data sources

B.1.1. Traffic

We used ICAO Traffic Forecast 2006-2036 as traffic data for our model year of 2016. These data are disaggregated by different markets, broadly based on the following world regions:

- § Africa
- § Asia/Pacific
- § Europe
- § Latin America
- § Middle East
- § North America

Separate markets are represented for:

- § domestic flights within each region,
- § intra-regional international flights, and
- § international flights between regions.

We also used data on passenger kms, aircraft kms, and passengers from the ICAO module 'Commercial Air Carriers – Traffic' for a variety of purposes. These data are disaggregated by airline and some flight categories (for example international versus domestic).

B.1.2. Employment

We derived employment for each of the air transport markets using airline personnel data from the ICAO module 'Commercial Air Carriers – Personnel'. These data are disaggregated by categories including airline and six categories of personnel.

We used airport personnel data from TRL (2006), "Airport Performance Indicators 2006" as the basis for determined airport employment. These data are for a sample of airports and we used employment relating to core airport activities, which TRL estimated.

B.2. Modelling assumptions

B.2.1. Affected traffic

The liberalisation scenarios apply to Istanbul Meeting Countries only.

To calculate the proportion of traffic affected in our liberalisation scenarios, we use the ICAO module ‘Commercial Air Carriers – Traffic’.⁴² We assume that the sample of airlines included in these data are representative of the market as a whole, and calculate the proportion of affected traffic based on country of registration. This gives the following result:

Table B.1
Affected Traffic Proportions

Region	Istanbul Meeting Countries Proportion	
	Aircraft Kms	Passenger Kms
Africa	9%	12%
Asia/Pacific	21%	23%
Europe	87%	90%
Latin America	59%	57%
Middle East	35%	45%
North America	100%	100%

Source: NERA calculations using ICAO ‘Commercial Air Carriers – Traffic’

We apply the proportion of passenger kms affected to total traffic in each ICAO market order to measure the proportion of traffic affected.

B.2.2. Employment

We used employment data from ICAO and TRL and air transport output data from ICAO to establish ratios of employees to various measures of air transport output. We then applied these ratios to the traffic forecasts in order to estimate the number of employees associated with each market being modelled.

B.2.2.1. Employment ratios for airport personnel

We used data from TRL (2006) to calculate ratios of output (number of airport passengers) to core airport employment. We calculated separate ratios for different world regions: Africa, Asia/Pacific, Europe and North America. We considered the sample size for the remaining regions of the Middle East and Latin America/Caribbean to be too small to compute a reliable ratio, and instead we used ratios based on data from the other regions.

B.2.2.2. Employment ratios for airline personnel

We calculated employment ratios for airline staff using ICAO personnel data for 2007. We used ratios relating output to employment for the following ICAO categories:

§ pilots, co-pilots and other flight crew (aircraft kms),

⁴² The countries under consideration are: Australia, Brazil, Canada, Chile, the EU, India, Mauritius, Morocco, Panama, Peru, Singapore, Switzerland, Turkey, UAE, Uruguay and the US.

- § cabin crew (passenger kms),
- § maintenance and overhaul personnel (aircraft kms),
- § ticketing and sales personnel (passengers), and
- § all other personnel (aircraft kms).

We then computed separate ratios for each of the different world regions, on the basis of the nationality of the airlines concerned.

B.2.2.3. Forecasting employment

We used the ratios of number of staff to measures of air transport output, computed by region, and then applied these to the ICAO traffic forecasts to obtain estimates of numbers of employees associated with each of the air transport markets. The ratios were derived from 2006 and 2007 data, and we adjusted these to reflect productivity improvements that might be expected to occur between 2006 and 2016, in the absence of further liberalisation.

B.3. Elasticities

We used price elasticities and elasticities relating output to employment to calculate the impact on employment of changes to price and output under liberalisation.

B.3.1. Price elasticities

The price (air fare) elasticity of demand measures the ratio of the percentage change in demand in response to a percentage change in price.

We use demand elasticities based on estimates prepared for IATA.⁴³ We combined these elasticities to correspond to the markets used in the ICAO traffic forecasts. These are shown in Table B.2:⁴⁴

⁴³ InterVISTAS (2007), “Estimating Air Travel Demand Elasticities: Final Report”. Prepared for IATA.

⁴⁴ For routes with no associated elasticity, a base supra-national demand elasticity is used. Short-haul elasticities are used for domestic markets, and long-haul elasticities for all other traffic.

Table B.2
Price Elasticity of Demand

Market	Price elasticity of demand
Domestic Africa	-0.4
Domestic Asia/Pacific	-0.6
Domestic Europe	-0.9
Domestic Latin America	-0.8
Domestic Middle East	-0.6
Domestic North America	-0.7
Europe-Africa	-0.6
Europe-Asia/Pacific	-0.5
Europe-Middle East	-0.6
Intra Africa	-0.4
Intra Asia/Pacific	-0.6
Intra Europe	-0.9
Intra Latin America	-0.8
Intra Middle East	-0.6
Intra North America	-0.7
Mid Atlantic	-0.7
Middle East-Asia/Pacific	-0.6
North America-Central America/Caribbean	-0.6
North America-South America	-0.6
North Atlantic	-0.7
Other international routes	-0.6
South Atlantic	-0.7

Source: NERA interpretation of InterVISTAS (2007)

B.3.2. Elasticities of employment with respect to output

The elasticity of employment with respect to output measures the ratio of the percentage change in employment to the percentage change in output.

For pilots, co-pilots and other flight crew, and cabin crew, we assumed that the elasticity of employment is one. For maintenance and overhaul personnel, ticketing and sales personnel, all other airline personnel, and airport employees, we used an output elasticity of employment of 0.8. This is based on interpretation of sources relating employment and output.⁴⁵

⁴⁵ See Maiden (1995), "Proof of Evidence: Forecasting - Heathrow Terminal 5 Enquiry and MMC (1996), "BAA plc: A report on the economic regulation of the London airports companies (Heathrow Airport Ltd, Gatwick Airport Ltd and Stansted Airport Ltd)"

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