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### **AIR TRAVEL REREGULATION AND REGIONAL ECONOMIES IN EUROPE: UNINTENDED AND FORSEEN CONSEQUENCES FOR PRODUCTIVITY**

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## **ABSTRACT**

Air travel reregulation has had major and essentially unintended and unforeseen consequences for regional productivity levels in Europe. This paper explores how these impacts have been articulated through flows of labour migrants, knowledge, business connectivity/investment, and mobile markets, especially tourism. It seeks to develop a conceptual framework for examining the productivity consequences of changes brought about by the growth of Low Cost Airtravel in particular, and especially how these can be understood in terms of dichotomies of direct versus indirect, foreseen versus unforeseen, and intended versus unintended effects. The overall impact is to redraw the map of accessibility and economic flows in Europe, contributing to the emergence of new divisions of labour, and to reshaping of the process of uneven regional development.

**KEY WORDS:**                      Air travel        Regulation        Productivity  
   Knowledge        Tourism            Migration

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## INTRODUCTION

A number of measures to deregulate – or, more precisely, to re-regulate – air travel in Europe since the 1980s have sought to increase competition, with the intention of realising lower prices and welfare gains for air travellers. These intended consequences have been realised, most notably through the spectacular growth of new market entrants, the low cost airlines (LCAs). The outcome has been well documented, and largely foreseen, increases in the scale of air travel and the creation of new geographies of air travel and accessibility. These have resulted in a number of unintended and unforeseen consequences for regional economies, which have been surprisingly under-researched. This paper explores these issues through the lens of productivity levels and differentials.

While this paper is mainly an attempt to provide a conceptual framework for analysing these regional productivity impacts, it addresses a topic of increasing policy relevance. The unforeseen productivity consequences of air travel reregulation has implicitly and belatedly been recognized, for example, in the focus on airport development in the strategies of UK regional development agencies, notably the Route Development Fund of the Scottish Development Agency (Civil Aviation Authorities 2005: xiv, 97). It is also evident in the subsidies provided by regional authorities to low cost carriers, as exemplified by the dispute between Ryanair and the European Commission over whether these were anti-competitive in the case of its operations from Charleroi airport (Francis *et al* 2006: 88).

In essence, this is a question about how changes in accessibility and connectivity impact on the competitiveness of regions (drawing on Porter 1990). As Docherty (2004: 341) argues: 'The most successful regions have class-leading transport and ICT infrastructure to move goods, services, information and people securely, quickly and efficiently. Particularly for knowledge intensive industries, the presence of direct international air links to key global centres of innovation is regarded as critical.' LCAs represent innovations which potentially can bring about incremental or disruptive changes in productivity levels and in the competitiveness of regional economies.

The relationship between regional productivity and changes in accessibility, resulting from the growth of LCAs in Europe, does not lend itself to easy generalisation. Air travel reregulation was conceived of in terms of an abstract European travel space, whereas its

consequences for productivity only become apparent as they are mediated in both time and space. In the simplest terms, and putting aside institutional considerations, a local economic space is constituted as a unique combination of production factors: namely labour, capital and 'other factors of production', (including knowledge). These production factors are neither immobile nor immutable, and economic geography increasingly emphasises the notion of 'economies of flows' (Hudson 2004). Our focus, therefore, is not so much on predicting regional outcomes, as on understanding changes in economic relationships resultant from changes in air travel flows. Of course, 'air travel' is a 'black box' and chaotic concept (Sayer 1992) in terms of understanding shifting regional economic relationships and productivity. For air travel is differentially constituted in terms of the mobility of labour migrants, mobile markets (including tourists), knowledge and business connectivity/investment. With this as our starting point, the paper addresses three main research questions:

- a) What are the unintended and unforeseen impacts of air travel reregulation on inter-regional flows of mobile markets, investment, labour and knowledge?
- b) How do these shifts in economic flows mediate regional productivity levels?
- c) Is it possible to provide a conceptual framework for analysing the unforeseen and unintended regional productivity consequences of air travel reregulation?

The paper is developed through three sections that consider a broad conceptual framework, the intended consequences for productivity in the air travel industry, and the unintended and unforeseen consequences for productivity in local and regional economies. Although mainly conceptual in focus, it also draws on the fragmented empirical evidence available on changes in air travel flows resultant on LCA growth in Europe.

## **A BROAD CONCEPTUAL FRAMEWORK**

In order to frame the following discussion, this section of the paper focuses on three aspects of a broad conceptual framework: regulation, economies of flows, and productivity. This is informed by our earlier argument about the need to understand productivity levels in regional economies in context of 'spaces of flows'.

## ***Regulation and local economies***

Research on productivity differentials has identified regulation as a significant influence in explaining the productivity gap between the UK and the USA (ESRC 2004; Helm 2001). Air travel only constitutes one element of this broader regulatory framework, and it has received scant attention in research on regional economies (see Docherty 2004), let alone regional productivity differentials. However, disentangling the links between airline reregulation and regional productivity levels is problematic for three reasons.

- a) Regulation is multi-level and, echoing Amin's (2002) comments about scales, these are 'folded in' on each other (AMIN, 2002). The impacts of reregulation on productivity at one level are mediated by regulatory changes, or lack of changes, at other levels, whilst regulations at one level may be driven by, or be partially constituted, by regulations at other levels. For example, EU directives on air travel liberalization may be folded into national level regulations, but their impact may be significantly mediated if local planning controls constrain the expansion of air services. This can be a source of significant spatiality and temporality in the unfolding consequences of reregulation.
- b) Regulation is constrained or effected through interlocking spheres of directly-related activities, which make its impacts highly contingent on parallel regulatory measures. Thus the impacts of the reregulation of rights of carriage are mediated by the need for parallel reregulation in other spheres, such as baggage handling, ticketing and competition law. These are largely foreseen and can be incorporated into an overall regulatory strategy.
- c) Regulation is also shaped by apparently unconnected, or generic, arenas of regulation: for example, environmental protection or employment laws drafted for non-specific purposes.

The folding together of different regulatory levels mean that 'geography matters' (Massey 1984). Because regulation or reregulation do not occur in a vacuum the consequences, whether intended or unintended, are place and time specific. For example, the introduction of LCAs had a different and far more radical impact on the geography of air travel connectivity in the 2000s than in the 1990s (Graham 1998; Francis *et al* 2006). LCAs have also had earlier and more geographically widespread impacts on regional economies in,

say, the UK and Ireland than in France and Germany (UKCAA 2004). And the impacts on Stanstead have been different to those on, say, Exeter or Glasgow.

### **Regional 'economies of flows'**

There are competing conceptualisations of the relationships between flows and spaces (in this case how regional economies are understood). This paper is influenced by Massey's (1994: 154) view that places are constituted of local and more spatially stretched relationships, that is that they are 'articulated moments in networks of social relations and understandings'. Social and economic relationships are – at least temporarily – locked into particular places (Allen *et al* 1998). By extension we can understand regional economies (and indeed productivity levels) as being constituted in terms of particular flows (of human capital, mobile markets, knowledge and financial capital).

These flows and the way they are fixed or articulated in regional economies are in constant flux, due to a number of incremental and disruptive innovations. One such (institutional) innovation is air travel reregulation which influences factor mobility and, as a consequence, how factors are combined in production. In particular, reregulation influences transaction costs, and the extent to which labour, knowledge, mobile markets and business connectivity/investment are sourced within the region or inter-regionally (see the parallel arguments about infrastructure, Johansson and Karlsson 1994). While probably not the major driver of changing flows of production factors in most, if not all, regional economies, air travel reregulation can impact significantly on particular places and at particular times.

In terms of regional productivity levels, the main flows that are of interest are:

- a) Trade: particularly where customers are mobile as in tourism, but also just-in-time deliveries (although many LCAs do not carry cargo, speeding up turn around, and intensifying the use of capital assets).
- b) Labour migration: both the volume of flows, and their changing composition, including greater emphasis on circulation and temporary migration, are potentially shaped by changes in the availability, frequency and costs of air travel.
- c) Capital. The links between LCAs and capital flows in the wider regional economy are complex. However, the introduction of LCAs at particular airports can influence urbanization economies, business connectivity, and perceptions of regional

economies, leading to shifts in inward investment. These can all be understood in terms of total factor productivity as can knowledge flows.

- d) Knowledge: Depending on the importance of tacit as opposed to codified knowledge (Polanyi 1966), and the role of face-to-face contacts in knowledge transfers (Bunnell and Coe 2001), LCAs can influence the acquisition and transfer of knowledge across regional boundaries, either intra- or inter-company.

LCAs have the potential to shape 'local and distanced relationships' (Massey 1994) in respect of each of these flows. However, this does not mean that there is a simple linear relationship between an increase in particular flows and productivity levels. In part this is because of the need to take into account additionality and substitution effects. Is LCA travel merely a substitute for other forms of travel, or does it increase total travel volumes, or regional connectivity in material terms. However, as discussed in the following section, the links between changing flows and productivity involve further complexities.

### **Regional productivity**

Productivity is essentially a measure of the relationship between inputs and outputs, whether for individual firms, or for aggregates such as local, regional or national economies. It is notable that the Porter and Ketels' (2003: 11) review of UK productivity highlighted 'intermediate indicators of many other microeconomic attributes of an economy' as contributing to the 'productivity gap': capital intensity, labour force skills and total factor productivity (including knowledge and regulation).

Although air travel reregulation was only directly concerned with air travel itself, this has also influenced factor mobility, which has wider regional productivity implications. In particular, reregulation can be directly related to changes in key mobilities – of mobile markets, business connectivity/investment, labour and knowledge. These can be mapped directly onto what Porter and Ketels (2003) termed the intermediate indicators of productivity differentials: capital intensity, labour force skills, and total factor productivity.

Of course, Porter and Ketels were discussing economies at the national level, whereas this paper focuses on the regional level. This is a significant difference. Enhanced levels of accessibility do boost productivity levels in a national economy, of course, but real

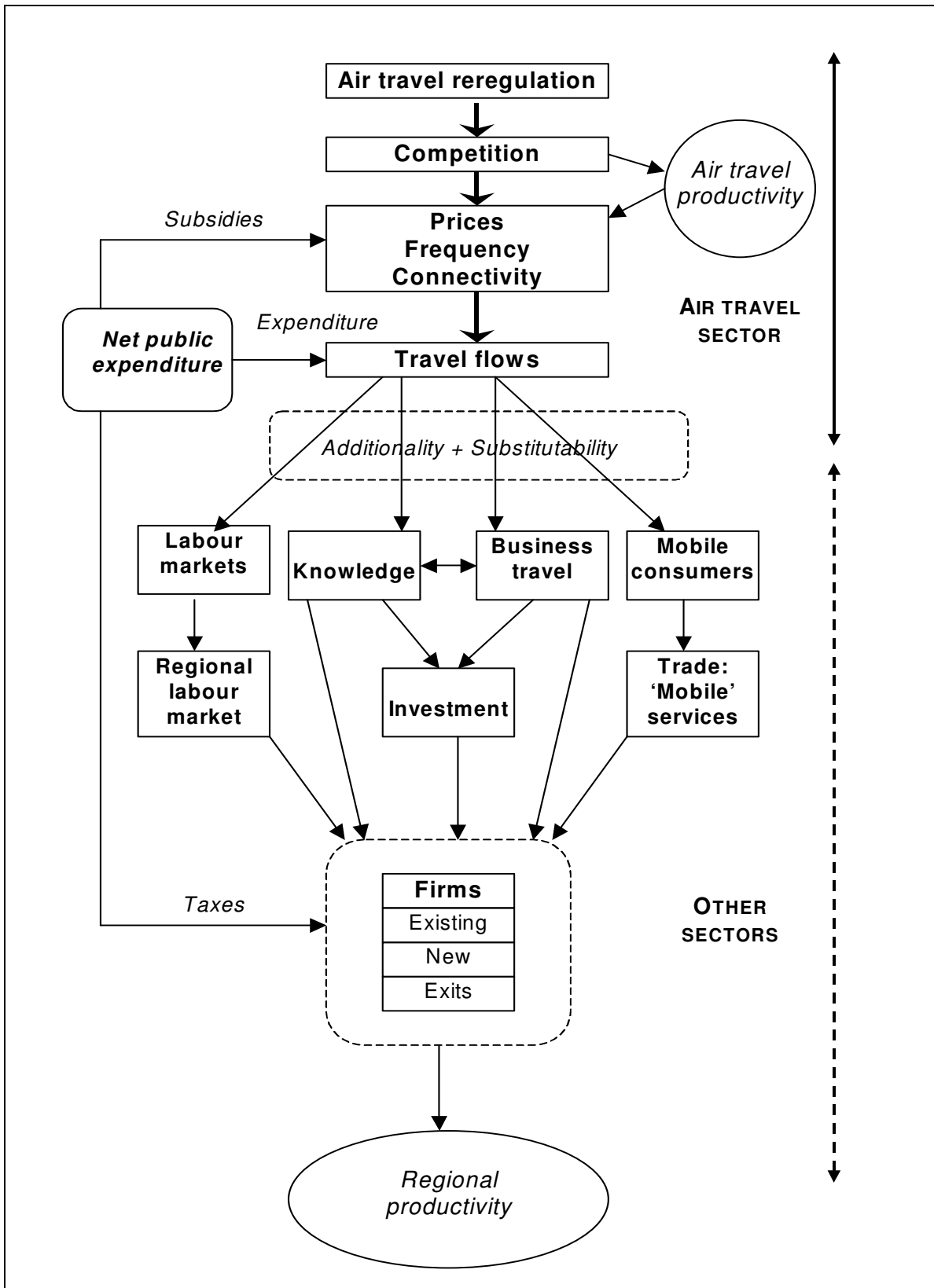
exchange rate movements would counterbalance this in the longer term. However, while regional economies are influenced by nationally driven exchange rate movements, their productivity shifts are partially disconnected from these (see Dwyer *et al*, 2000 on the example of inbound tourism). Hence the uneven impact of air travel deregulation may redistribute factors inter-regionally, with consequences for inter-regional productivity differentials. At the root of this is how reductions in transaction costs increase potential factor flows, strengthening competition and creating enhanced opportunities to realise economies of scale and of scope, amongst other productivity-related effects.

Some of the idealised productivity consequences are displayed in Figure 1 and are summarised below:

- a) Direct and intended impacts on airlines
- b) Indirect and (largely) intended impacts on factor flows
- c) Indirect and unintended impacts on other forms of transport
- d) Indirect and unforeseen impacts on regional labour markets and mobile product markets (especially tourism), and on the regional business environment (linked to investment flows)
- e) Indirect and unforeseen impacts on individual firms
- f) Indirect and unforeseen impacts on expenditures on other products/services as a result of increased real incomes..
- g) Indirect and unforeseen impacts on public investment in airports, in reducing resulting congestion etc. balanced against increases in taxes.

The first indirect effect is on factor flows, the central focus of this paper. These changes in flows involve both additionality and substitution effects, so that other travel sectors are also affected. Flows of labour migrants impact on labour markets, flows of mobile consumers (tourists etc) impact on markets for products and services, and flows of knowledge, and inter-regional business travel, impact on the business environment, influencing investment flows. These have consequences for productivity levels in individual firms, and networks of firms, as discussed in the next section of the paper. Moreover, reductions in fares increase real incomes, which may be spent on further travel or on other products/services or is saved – which again have differential productivity effects. Finally, there are impacts on public expenditure:

Figure 1 Air travel re-regulation, economic flows and productivity



increased expenditure on airports, roads, to reduce resulting congestion costs etc are counterbalanced by increased tax yields in a more productive regional economy. But that still poses questions about the opportunity costs of public expenditures related to LCAs as opposed to other measures to enhance regional productivity levels.

The resulting, unintended changes in productivity levels in regional economies also have feedback effects in the form of further unintended productivity consequences for particular airlines. This will operate in two ways. Either through increased regional productivity levels leading to higher demand for LCA services, or in LCAs being about to capture some of the gains in increased productivity in the region through subsidies negotiated with regional governments. Both effects are further mediated by whether the LCA has a monopolistic position at a particular airport, or whether there is competition amongst air lines. However, such indirect impacts lie outside the scope of this paper, which focuses on how changes in factor flows impact on regional productivity.

#### **AIR TRAVEL REREGULATION: INTENDED PRODUCTIVITY CONSEQUENCES**

Air transport in the EU was liberalised in three stages between 1987 and 1997. The third package of measures, in July 1992, was the most radical: as of April 1997, all EU carriers would have open access to virtually all routes within the EU (freedom of cabotage). The liberalisation measures intended to ensure that 'air fares should normally be determined freely by market forces' (Council Regulation 2409/92). Further liberalisation initiatives targeted the scarcity and cost of infrastructure, which had been identified as a major cause of the high costs of European air travel. From January 1999, the ground handling market was liberalised for third parties at Community airports (Directive 96/67). This helped reduce operating costs and improved the quality of services. The fragmentation of air traffic management systems was addressed through the 'Open European Sky' regulations (Regulation 549-552/2004). And non-discriminatory and transparent use of computerised reservations systems was introduced by Council Regulation 2299/89. Papatheodorou (2002: 384) summarized the competition logic behind this reregulation in terms of: 'the presumption of competition working in thick markets and the significance of contestability .... on thin routes. Under deregulation a multitude of new entrants in popular markets would induce carriers to actively compete'.

Air travel reregulation has stimulated significant increases in new entrants, the Low Cost Airlines (LCAs). This has resulted in substantial welfare gains for individual travellers, associated with higher frequencies, new point-to-point and hub-spokes connections, and cheaper fares. By 2004 some 60 new entrant and charter/regional airlines had applied the low fares model to varying degrees in Europe (European Low Fares Airlines Association 2004).

The intended competition (and productivity) outcomes were not always realised. First, competition was often reduced at hub airports Renken *et al*, 2004: 233), as leading existing carriers used the new freedoms to increase their dominance over these. Secondly, routes with limited traffic may only support a single carrier with a monopoly (Papatheodorou 2002). Thirdly, the benefits were initially realised largely by hub airports that increased their connectivity (O'Connell 2006: 60-62; Graham 1998: 90). This was hardly the creation of a new economic landscape. The Civil Aviation Authority (2005: 2) summarised the reasons why the impact of liberalization was initially limited in the UK:

First, there was the usual time lag between the removal of regulatory restrictions and the exploitation of new opportunities by airlines. New entrants or expanding airlines needed time to build their fleets and to respond to the success of the first movers. Second, liberalization affected the denser London markets sooner than thinner regional markets. Finally, it took time for consumers to change their existing patterns of behaviour and to respond fully to the new offers available in the marketplace.

While 'hub' airports had mostly benefited from reregulation in the 1990s, competition strengthened in the early 2000s (Frenken *at al* 2004). This was related, in part, to increased flights (especially by LCAs) from regional airports. Hence, reregulation did eventually create a new geography of air travel, as LCAs expanded in less-favoured regions, initially in a few countries, but increasingly across Europe.

While the rationale for reregulation was expressed in terms of competition, productivity changes were implicit, and sometimes explicit, in this. In practice, reregulation has had major, and largely intended, consequences in increasing productivity in the air travel sector, effected both through new entrants having higher productivity than exiting firms,

and through reorganization within the 'legacy carriers'. The role of LCAs is underlined by their accounting for 90 million of the 183 million increase in passenger seats, 1995- 2004 (Dobruszkes 2006: 262), more than half the total.

LCAs achieved intended direct increases in productivity levels in labour and total factor productivity via several innovations (Dobruszkes 2006):

- Economies of density (maximizing flying time for each airplane), which are more important than economies of scale. Turnaround can be as short as 25 minutes, partly due to using smaller, uncongested airports.
- Pressurising the workforce: paying lower wages but expecting longer working hours than legacy carriers.
- High seat occupancy rates, related to pricing strategies.
- Additional optimization and cost reduction measures including: standardised fleets of cost efficient aircraft; increased numbers of seats per aircraft; standardization of services; bypassing travel agents; and revenues from reservation centres (charging for premium rate services).

Although their precise business model is variable, LCAs mostly focus on minimising costs in service delivery (Civil Aviation Authority 2005: 62), with labour productivity gains being particularly significant. In reality, it is difficult to isolate the exact sources of cost and price reduction: but it has been estimated that a 15 percent decrease in prices per passenger kilometre after reregulation in Australia could be ascribed to higher load and density factors, while a further 3-9 percent reduction was due to increased long distance travel, savings in administrative costs, reductions in profitability (not major), and the dynamic efficiency effects of microeconomic reforms. These gains can be linked to reregulation, although broader macro-economic economic shifts were also significant (Goetz and Graham 2004). In contrast, regional productivity consequences are more blurred.

## **UNINTENDED AND UNFORESEEN PRODUCTIVITY CONSEQUENCES FOR REGIONAL ECONOMIES**

It can be difficult to differentiate between the intended and unintended consequences of reregulation, because of post-rationalization in most attendant discourses. For example, the EU's Committee Of The Regions (2004) observed that:

“[t]he availability of regional air services, and in particular low-cost air services, operating from regional airports improves access to the global economy. This, coupled with the lower labour costs and facilities costs associated with the more remote regions, can encourage the business community to locate new economic investment within the region. Existing businesses in the region could develop their market share by being able to reach other parts of the Member State, the EU and the rest of the world”

The Committee concluded that the overall regional economic impacts should be considered under four headings: direct, indirect, induced and catalytic impacts. The first three related mainly to the air travel industry, while catalytic impacts relate to productivity changes in other businesses, and attracting inward investment and tourism. While the first three were largely foreseen and predicted, this did not apply to catalytic impacts. Rather, as emphasised earlier, the discourses surrounding liberalization were couched largely in terms of competition without reference to the contingencies of time and place, or to wider economic benefits.

Relatively few studies have quantified these catalytic impacts in employment or income terms, let alone the consequences for productivity. Most estimates are produced by lobby groups, with few details being made available of their methodologies. For example, the Airports Council International estimated that, on average, 950 on-site jobs are created at airports and 1,100 regionally for every 1 million passengers carried (quoted in European Low Fares Airlines Association 2004). Even though such estimates have to be approached cautiously, they are indicative of the substantial wider regional economic impacts of reregulation. In another study, Harkfoort *et al* (2004) estimated the employment income multiplier for Amsterdam airport. While they recognised the importance of forward linkages (creating an attractive business environment), these were particularly difficult to quantify:

'There is no doubt that expansion of airport activity has an impact on the numbers of firms locating in the area, the number of visitors to conferences, the number of tourists and so on, but in many cases it is hard to find a causal relationship...' (p601). This is the background against which this paper examines how the growth of LCAs, linked to reregulation, has impacted on regional productivity levels. In the absence of reliable estimates of productivity impacts, we focus instead on the consequences of changes in particular flows.

## **Labour markets**

The price, the skills and the flexibility of labour are significant in productivity, and all these aspects of regional labour markets are mediated by migration. The question is whether migration is significantly influenced by the introduction of LCA services. There has, of course, been a long history of labour migration in Europe (mainly south-to-north in the 1950s-1970s, but increasingly complex thereafter), which pre-dates air travel reregulation. However, the nature of labour migration has changed in recent decades (King 2002), including a shift from longer-term to more temporary migration, sequential migration, and cycles of migration. There has also been an increase in long-distance commuting, involving regular return trips home, whether weekly or at some longer interval. Arguably, LCAs may have facilitated such changes.

LCAs can impact on labour markets in several ways, but mainly through reducing travel costs and increasing accessibility. Effectively, they reduce the transaction costs of international labour migration and, all else being equal, the resultant shift in the balance between the costs and returns of migration (Sjastaad 1962) should increase mobility. This is most likely to be significant under particular conditions:

- a) costs are a significant barrier to air travel;
- b) the frequency and convenience of air travel are an obstacle to air travel; and, linked to this,
- c) the availability of cheaper, more frequent or more accessible air travel makes new forms of mobility (punctuated by more frequent return visits) possible for individuals who otherwise would not have been able or willing to engage in traditional longer-stay migration.

There are no reliable estimates of the extent to which LCAs have contributed to changes in either the scale or the nature of labour migration and mobility. However, the Civil Aviation Authority (2005: 68) argues that there are causal links:

Low-fare services from a local airport seem to be changing consumers' perceptions about flying generally and consequently are having an effect on travel patterns. As well as second homes, these services may encourage people to apply for jobs abroad, or may facilitate working far from home'.

The impacts on productivity are difficult to predict even on an a priori basis, let alone empirically. The productivity outcomes depend on: a) the effects on wages and costs, b) the filling of particular (skills) or generalised labour markets shortages, and c) raising or lowering aggregate skill levels in the destination regional economy. There is considerable research on these issues, relating to human capital theories, mainly at the national level (for example, Dustmann *et al* 2003a; Dustmann *et al* 2003b). However, there is little explicit evidence on productivity impacts at the national, let alone the regional level. In part this is because the transfer of skills via migration is not only a matter of changes in aggregate levels of human capital in the destination, but also about the social recognition of these skills, and whether migrants have sufficient encultured and embedded knowledge to maximise their embodied and embrained knowledge (Williams 2006). This relates to the wider debates about brain waste versus brain gain (International Labour Organization 2002). But it is reasonable to argue that LCA-induced migration is more likely to have a significant impact on productivity in those regional economies where there are substantial skills gaps, such as in the UK (Porter and Ketels 2003). The scale of that impact will depend on the extent to which particular types of labour migrants, in terms of skills, were deterred by the higher transaction costs of migration prior to the introduction of LCAs – and this is also little researched.

Finally, the existence of considerable differences in the skills gap between countries and between regions is consistent with our emphasis on the spatiality of the impacts of reregulation on productivity. The importance of temporality is also evident. Most econometric evidence for the UK suggests there is a time lag before workers can maximise the return to their human capital, due to having to learn about local practices and

institutions, or acquire language competency (Dustmann 1994). There are likely to be similar time lags before the full consequences for regional productivity are realised.

### ***Business travel and tacit knowledge***

Networks are fundamental to knowledge transfers, and knowledge transfers are key components of total factor productivity. However, there are competing theories of knowledge networking, including both localised learning (Maskell and Malmberg 1999) and essentially non-localised networks, for example communities of practice (Wenger 1998). In reality, most firms probably draw on several overlapping networks, at different scales ranging from the local to the international. The key question is whether proximity is critical for establishing the trust that is essential for effective knowledge transfers, and how extra-regional mobility relates to this. Amin (2002: 393-4) argues that physical proximity and localized face-to-face contacts are not essential for trust-based relationships. Instead, intimacy may be achieved, and trust fostered, through frequent and regular contacts enabled by distanced networks of communication and travel, and the interweaving of physically proximate and telemediated contacts. In contrast, Allen (2000: 28) stresses that human mobility is important to effect localized networking: 'the translation of ideas and practices .... (is) likely to involve people moving to and through local contexts, to which they bring their own blend of tacit and codified knowledges'. There is surprisingly little empirical evidence as to the relative importance of proximity-based versus distanced knowledge transfers, but these are likely to be complex and variable at the level of the individual, the firm and the regional economy.

LCAs potentially have consequences for the frequency of face-to-face contacts, reshaping knowledge-sharing networks, and the efficiency of knowledge transfer. These may be articulated via increased intra- or inter-firm mobility, or attendance at conferences, exhibitions or other 'knowledge events', as a result of lower transaction costs, more frequent and new air connections. Whether this is significant depends on assumptions about: a) additionality and substitution effects (in relation to other transport forms); b) the importance of face-to-face contacts in specific jobs and industries (see below); and c) corporate strategies for disseminating and applying knowledge. Where these assumptions are met, then arguably air travel reregulation has significant consequences for productivity, which are articulated through a reconfiguration of external economies of scale. In

summary, reregulation has changed the geography of business travel and the channels of tacit knowledge transfer, and hence total factor productivity.

The reconfiguration of external economies of scale has sectorally variable implications. Air travel is particularly important for knowledge-intensive activities (Button and Taylor 2000). Such activities are unevenly distributed – for example, in the USA, 70% of such employment is located in just 50 of the 321 Metropolitan Standard Areas. Given estimates that those employed in the ‘new economy’ are 1.6 times as likely to take flights for business purposes than those in traditional industries, due to greater reliance on personal contacts, changes in transaction costs following reregulation are especially likely to influence the distribution of such activities. Button and Taylor (2000) demonstrate that the expansion of air services stimulated growth in the ‘new economy’ in the USA, with the critical factors being the range of destinations connected, and service quality. Another example is provided by The Recruitment Zone, a recruitment consultancy with offices in Edinburgh and London, amongst other locations. Before the introduction of LCA services, the firm paid up to £350 for return air tickets to London, but EasyJet offered a similar service for under £100. The reduced transaction costs allowed The Recruitment Zone to move staff around their offices for training, or on weekly placements. And this also encouraged them open a branch in Bratislava (The Scotsman 1.06.05).

Assuming that the knowledge intensive ‘new economy’ has higher productivity levels than traditional industries, this has regional implications. But knowledge is important to productivity in all sectors, both ‘new’ and ‘traditional’, so that air travel reregulation may have generalised consequences for productivity.

### ***Inward investment, business connectivity and business travel***

LCAs are not only the preserve of cost minimizing tourists. Rather, as the Civil Aviation Authority (2005: 65) argues, business passengers also seek lower fares as well as of reliability: ‘No-frills airlines have created this expectation and have removed the perception that business air travel, or indeed travel on regional routes, or even scheduled flights generally, has to be expensive.’ As a result, ‘the distinction between no-frills and the existing full-service airlines has now become more blurred’. The utilization of LCAs for business travel is evident in comparative data on legacy-carrier and LCA passengers (Civil

Aviation Authority 2005: 65-6). For example, the proportion of business travellers is 39% on BA's Manchester – Amsterdam route, compared to 34% on Easyjet's Liverpool – Amsterdam route; and 44% on BA flights from Gatwick to Edinburgh, compared to 39% on Easyjet flights on the same route. Of course, there may be substitution effects, with LCAs only providing a low cost substitute for flights that would otherwise have been taken on legacy carriers. But there is also evidence of additionality effects: a passenger survey at Budapest airport found that 8% of outward, and 5% of inward, business passengers would not have travelled in the absence of low cost LCA services (KPMG 2005). Although a minority, this is a significant additionality effect.

How does air travel reregulation influence regional productivity levels in this context? Most obviously it reduces companies' business travel costs, and Carson Wagonlit Travel (2003) provide evidence of this. They argue that LCAs had a maximum of about 8% of the European business travel market, bringing 56% cost savings on average to travel between the city pairs they served, resulting in net total saving of 3-5% in corporate travel budgets. This is a relatively small average saving, but will be more substantial for particular companies and regions. In addition, the study may have underestimated the reliance of business travel on LCAs (see below). But, in any case, there is a measurable impact on operating costs, and therefore potentially on total factor productivity.

Beyond this, LCAs may attract inward investment in two main ways: through contributing positively to the regional image, and influencing inter- and intra-firm linkages. First, LCA services may change the image of a regional economy, enhance external awareness of its business environment, and generate inward investment. The Civil Aviation Authority (2005: ix) argues this is significant: '... as realization of low cost travel potential increased so the profile of the airlines, airports and regions concerned also increased'.

Secondly, LCAs can influence the search spaces of potential investors for whom minimum levels of accessibility (in horizontal or vertical linkages) are important locational factors. They can also mediate the linkages (and the productivity) of existing firms. As noted in the previous section, these effects are sector specific. Button and Taylor (2000) found that the availability of direct international services was the third most important factor in the location decisions of firms in Atlanta. Moreover, there had been a sharp increase in inward foreign investment from specific countries after the introduction of non-stop flights to these. They

also report that air transportation was the third most important factor in the location decisions of a survey of companies in Europe. Studies of particular firms in Amsterdam and Zurich have also established the importance of air connectivity for their operations. SkyEurope's Bratislava-Paris link helped to persuade PSA Peugeot Citroen to build a car assembly plant in Trnava (Slovakia), while the same company started a Bratislava-Stuttgart service mainly in order to connect Volkswagen's Bratislava plant to its German HQ. Prague's new air connections were an important factor in DHL's 2004 decision to build an IT centre in Czechoslovakia (Financial Times 9.12.05; <http://firstnews.com.ua/en/trans/trans.html?id=136090>).

Although both effects are potentially important, neither should be exaggerated. This was recognized by the Civil Aviation Authority (2005: 2):

While an enhanced network of air services from a region would be likely to be conducive to economic growth, it is unlikely *alone* to be an effective tool for driving economic development. It can, however, make a particular city or region more attractive, at the margin, than another as a location for business.

Nevertheless, inward investment has important implications for regional productivity levels in two ways. First, the entry of new firms is instrumental in increasing aggregate productivity levels, and LCAs may increase the number of new entrant firms in a regional economy. Secondly, there are particular advantages relating to external (especially foreign) ownership. There is a long-established argument that foreign investment has higher productivity because it necessarily has knowledge, and other, advantages (Hymer 1960), which yields an absolute ownership-specific advantage over host country firms. In this model, production implicitly is organised vertically, with knowledge creation being concentrated in the home country and distributed internationally. Although this is a very specific, and hierarchical model of the transnational company, alternative corporate models based on more diffuse management strategies to harvest dispersed knowledge also have ownership advantages (Bartlett and Ghosal 1989). This knowledge advantage underpins higher productivity in foreign owned firms, and there is broad evidence to support this in studies of productivity in the UK (ESRC 2004).

### ***Mobile consumers and markets***

LCAs also offer a direct means of accessing markets, and this can be either in the form of air freighting goods or transporting mobile markets (notably tourists) to the firms. Air freight is more likely to be significant in the deliveries of highly perishable goods, or high-value, low-weight goods. It may also play a part in just-in-time deliveries to markets. The resultant reduction in inventory costs, or the widening of markets, can significantly reduce production and distribution costs, and contribute to enhanced productivity. However, because LCAs rely on rapid turnaround of their aircraft, they mostly do not play a (significant) role in the transportation of goods. Reregulation may have influenced the costs and availability of specialised air transport services for this purpose, but our focus here is on the LCAs.

Therefore, in many – and perhaps most – regional economies, the main trade impacts are associated with mobile markets. These can take a number of forms, including the transportation of customers to utilise personal service providers in another region or country. For example, the availability of low cost flights has generated a fly-to-dentist market from northern to Eastern Europe, where dental costs are much lower (Financial Times 9.12.05). However, the main role of LCAs in relation to mobile markets lies in their contribution to increasing tourism flows (both inwards and outwards), though reducing travel costs and increasing accessibility. ‘Tourism demand is quite price elastic, and aviation liberalization has brought down fares, thus increasing tourism overall, and often, altering patterns of tourism’ (Forsyth 2006: 3). The overall net effect for any region depends on: a) the balance between inflows and outflows of tourists; and b) additional effects, that is the extent to which these are new flows or involve substitution in the mode of transport used by tourists.

There are three potential consequences for productivity. First, the overall outcome is a net increase - or decrease – in market size in any one region, and this may impact on productivity via scale economies, or stimulating new (higher productivity) entrants to the sector. Secondly, a more refined version of this argument takes into account not only tourism volumes but also the composition of tourism flows and market segmentation, and whether this results in net increases or decreases in tourist spending. The attraction of additional higher spending tourists would – all else being equal - lead to higher sales per employee in existing tourism firms, or to the entry of new (higher productivity) firms to serve

expanding market segments. Thirdly, LCAs may change the temporal distribution of tourism arrivals (European Low Fares Airlines Association 2004: 26): their flights are year round compared to the more seasonal services provided by charters, and they incentivise mid-week travel. As a result, they provide a more secure and more temporally constant flow of tourists and income to tourism establishments. This is critical in an industry where services are highly perishable (the use of tourist bed nights or theme park rides can not be deferred by the providers) (Shaw and Williams 2004: 21-24). Consequently, the resultant temporal change in market conditions enable firms to reorganize production more efficiently, increasing outputs in relation to both fixed and variable inputs.

Given these potential productivity impacts, the key issue is the extent of the additionality effects of LCAs. The Civil Aviation Authority (2005: ix) argues that there is a positive circular relationships between supply and demand: the provision of low cost services generated demand, increases the propensity to fly. This view is echoed by the European Low Fares Airlines Association (2004: 26) who argue that LCA services have increased the number of new tourist destinations directly accessible by air, boosting inter-regional tourism, as passengers travelling on holiday are generally reluctant to use connecting flights through congested hub airports. The same report quotes research which demonstrates that an estimated 42% of the passengers on LCAs (for whatever trip purpose) are new, and that almost three quarters of these would not otherwise have travelled. Although this figure seems rather high, a survey by KPMG (2005) at Budapest airport found that about one quarter of outbound leisure travellers on LCAs would not have travelled otherwise: 21% of those visiting friends and relatives, and 33% of those going on holiday. The comparable figures for inbound leisure travellers on LCAs were 14% and 16%. There are, therefore, substantial additionality effects for destination regions, which – as argued earlier – feed through into productivity. Whether there are corresponding negative effects for other regions is more complex: is the new holiday (using the LCA) in place of a holiday that would have been taken in the home, or some other, region? And even if not, has the additional expenditure incurred been diverted from alternative consumption or from savings. These complexities emphasise the spatiality of the unforeseen and unintended productivity consequences of the growth of LCAs.

### ***Regional productivity impacts: a summary***

Although the temporality and spatiality of the regional productivity impacts of LCA expansion as a consequence of air travel reregulation have been emphasised in this paper, it is possible to draw together some of the main impacts in an idealised form (Table 1). In particular, we seek to summarise the complex array of direct and indirect, intended and unintended, and foreseen and unforeseen effects across two temporal scales: the timing of the delivery of these effects, and their durability.

The direct and intended productivity implications were increased competition and reduced air fares, both of which were realised although – due to initial increased concentration and single air line dominance at hub airports – the former was only realised in the medium term. Both have positive effects on productivity. The indirect and unforeseen consequences were competition for other forms of transport (for example, ferries and rail) and increased travel volumes. The former arguably added to pressures to increase productivity in competing transport modes, while this paper has argued that the effects of the latter need to be considered in terms of disaggregated flows.

Table 1: Idealised impacts of LCCs on regional externalities for individual firms

General effect	Regional externality	Timing of delivery		Duration term		
		Sooner	Later	Short	Medium	Long
+Increases in labour migration	Labour market costs, flexibility and skills supply		X		X	
+Increases in tacit knowledge transfer	Knowledge and learning capacity		X			X
+ Increases in business connectivity	Access to markets and suppliers, and inter-regional networking potential	X				X
+ Increases in inward investment	Knowledge capacity, and regional image		X		X	
+ Increases in mobile markets (tourism)	Access to markets	X				X
- Overall increase in travel leads to congestion	Reduced accessibility		X			X

The indirect, unintended and unforeseen impacts are evident in the specific flows of labour migrants, tacit knowledge, business travel, inward investment, and mobile markets (especially tourism). Arguably, increases in business travel and tourism were realised relatively quickly, compared to these other impacts. shorter term, while the other impacts took longer to be realised. Over time, the comparative advantages of regions in terms of labour migration and inward investment could be expected to decline, due to competition from other regions, so these are considered to have medium term durability. In aggregate, these produce, later rather than sooner, substantial and durable productivity effects. Finally, we have added the diffusion of diseases and the incidence of congestion costs to indicate that not all the outcomes of LCA expansion have positive implications for productivity.

These economic effects are, of course, highly contingent and impact differently on sectors according to their markets, reliance on business connectivity and tacit knowledge transfers,

and labour versus capital intensity. Arguably, the overall winners were new entrants, labour intensive industries and knowledge intensive industries, and those serving inbound tourism. And also smaller and medium sized enterprises which had relatively modest travel budgets, compared to transnational corporations. But any such tendencies are played out through time and space.

## **CONCLUSIONS: AIR TRAVEL LIBERALIZATION AND REGIONAL PRODUCTIVITY LEVELS**

The reregulation of air travel has had a number of direct impacts, the most spectacular of which has been the growth of LCAs. This has effectively redrawn the map of accessibility and travel costs across Europe, although the process has been highly uneven both spatially and temporally. These shifts have had unforeseen and unintended impacts on firm and regional productivity levels, consequent on changes in flows of labour migration, mobile markets (especially tourism), business connectivity/investment and knowledge. This is consistent with the notion of 'economies of flows' (Hudson 2004), and with the increasing emphasis placed on air travel as an instrument of local and regional development strategies. There is a dearth of research on the link between lower cost air travel and productivity levels in the non-air travel sectors, but the exploratory analysis in this paper has identified several important issues.

First, LCA activity is highly uneven regionally (European Low Fares Airlines Association 2004) because of the criteria which determine prospective route selection: long term cost minimisation; availability of efficient facilities; and geographic, demographic and strategic considerations. The number of businesses in a regional economy in the early growth phase is another factor in selection (Ryanair 2005). Those regions deemed 'not prospective' by LCAs may lag in the changing map of accessibility, and – we have argued - this may contribute to regional productivity differentials. In other words, there is a need to consider the spatiality of reregulation, and indeed of the complex interfolding of different levels of regulation. As a broad generalization, core regions (with hub airports) were the initial winners, but peripheral regions (via direct inter-city connections) were the longer term winners in the new map of accessibility.

Secondly, the unforeseen consequences also had a distinctive temporality. Interestingly, Graham (1998) writing in the late 1990s thought that there had been little change in the regional distribution of accessibility and connectivity. But, subsequently, there has been strong growth in point-to-point connections between previously unconnected airports. More recent commentaries have noted significant changes in levels of accessibility, but at the same time a tendency for greater differentials. For example, Bowen (2002: 425) writes that ‘.. the deregulation of the airline industry has tended to reinforce the disparity in access among gateways in global airline networks.’ It is also true that there are persistent problems of non-contestability (monopolies) on some routes, although a single carrier providing a link may be preferable to firms and workers than no link on a particular route. Papatheodorou (2002: 387, emphasis added) considers this a significant issue, and argues for new forms of reregulation to counter non-contestability, and ensure that productivity gains are realised:

The competition authorities should face the failure of contestability conditions in peripheral destinations through price reregulation of the monopolies where services are sustainable and if such a decision is approved by the European Commission. *To avoid the side effects of the previous system, price regulation should explicitly provide productivity incentives.*

Thirdly, while recognizing the importance of non-contestability on some routes, the overall effects of reregulation have been to increase absolute levels of accessibility in many European regions, even if relative differentials have widened. There is some limited evidence available from LCAs, and from consultancy reports, on the impact of low cost air travel on passenger volumes and – exceptionally – on different market segments. LCAs are changing travel habits, generating additional air travel, rather than merely substituting for flights with legacy carriers. On that basis, LCAs provide a new geography of air travel in Europe, distinguished by lower costs, new connections, and new frequencies of services (whether daily, weekly, or seasonally). These are mediating the proximate versus distanced relationships that distinguish economies as spaces of flows, especially in respect of labour migration/mobility, knowledge transactions, business connectivity, inward investment, and mobile (tourism) markets. There remains little detailed empirical analysis of these changing flows.

There is even less evidence available on how these shifting flows influence regional productivity. While there have been estimates of the aggregate effects on employment, spending or investment, there have not been – to the best of our knowledge – any attempts to analyse the regional productivity consequences. Therefore, this paper has been limited to exploring some of the ways in which productivity impacts can be conceptualised for each of these distinctive flows. Assuming additionality effects in each case, or at least reductions in the transaction costs of existing flows, key issues have been highlighted relating to the volumes and levels of labour skills, tacit knowledge transactions, inward investment and foreign ownership, and the balance between inbound and outbound tourism.

This paper has not sought to identify or predict the impacts on productivity in particular regions. These flows are locked into particular places (Allen *et al* 1998) so that the productivity impacts are determined by, amongst others, existing economic structures, existing productivity levels, the under-utilisation of resources, and the potential to realise dynamic gains through micro changes in individual companies (see Forsyth 2006 on tourism flows). These complex changes in productivity, and the interfolding of different levels of regulation, requires substantial empirical research which, in the absence of insightful secondary statistics, need relatively expensive primary data collection. Ideally, such research would be longitudinal, focussing on a period of significant change in LCA services and resultant productivity consequences. Given the growing awareness of the role of air travel and airports in regional development strategies, such consequences are increasingly likely to be foreseen rather than unforeseen. But if they are to become predicted rather than unpredicted, this will require substantial empirical research.

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