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Source: *GeoJournal*, Vol. 71, No. 1, Airline networks and urban systems (2008), pp. 67-81

Published by: [Springer](#)

Stable URL: <http://www.jstor.org/stable/41148239>

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The effects of air transportation on the movement of labor

Kenneth John Button · Henry Vega

Published online: 9 February 2008
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Abstract The effects of the deregulation of airlines markets and the new technologies that have been introduced into air transportation have been heavily studied. Much of this analysis has been on the impacts on the industry and the immediate welfare implications for passengers and, to a lesser extent, cargo consignors. This study looks at the longer-term effects of the modern air transportation system on labor markets and labor migration. The growth of the service sector, the emergence of more flexible manufacturing techniques, the reduction in trade-barriers, and the creation of more sophisticated financial markets have led to greater mobility in production and in capital movement. This has been explored to some extent. Labor is, however, also more mobile - for example, since the admission of Poland to the European Union some 465,000 Polish workers have joined the UK labor market. Air transportation facilitates easier migration, makes short-term, long-distance migration viable, and allows migrants to maintain contact with their home country. Within larger countries, such as the US, there has also been a growth in long distance “week-day” migration as spouses work in different parts of the country to be reunited at weekends. The study makes use of aggregate data to look at trends in

international labor movements particularly concerning the European situation, and, to a lesser extent, at recent developments within the US. It is concerned both with what is going on in terms of the use being made of air transportation by migrants and the light that this may shed on migration theory.

Keywords Migration · Air transport · Labor markets · Economic development

Introduction

The 1970s saw the beginning of a transformation of air transportation markets. Beginning with the deregulation of air-freight movements in 1977 and then the passing of the Airline Deregulation Act affecting passenger airlines in 1978, the US domestic airline market moved from one having regulated fares and market entry to one more akin to economists’ concepts of competition whereby any carrier fit, able and willing could provide services (Morrison 1989). Similar reforms have gradually spread around the world with freer economic structures emerging within many domestic markets, internationally, and within large trading blocs, most notably within the European Union in the 1990s (Button 2004).

The implications of these reforms on the immediate welfare of passengers and cargo consignors have been extensively studied, as have the effects that they

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have had on the supplying industries, including not just the airlines but also airline labor markets, airports, aircraft manufacturers, air traffic control, and information systems providers.¹ There has been some micro level assessment of the longer-term effects of these reforms, most notably by public authorities when conducting airport investment analysis and by commercial manufactures such as Boeing and Airbus when considering investment in new airframe models, but the larger implications for factor markets, and general land-use developments have been explored much less. The core of the academic work on these reforms has thus centered mainly on the immediate implications for airline users and the various elements of the air transportation supply chain.

Air transportation, however, would seem to be having a particular and more important effect on labor markets than the narrow airport and other economic impact studies are embracing, and these wider effects are certainly not included in the forecasting models used by airframe manufacturers.² It is not just air transportation that has changed over the past 30 years, but markets and technology more generally have also gone through several important forms of metamorphoses.

The growth of the service sector, the emergence of more flexible manufacturing techniques, the reduction in trade-barriers, and the creation of more sophisticated financial markets have led to greater mobility in production and in capital movement. In particular, labor markets have become more malleable and workers more mobile. This has been explored to some extent in general terms - for example, since the admission of Poland to the European Union (EU) in 2004 some 465,000 Polish workers have joined the UK

labor market³—but mainly from the perspective of its economic implications for national and regional GDP or in terms of the social problems that may arise. There has been little done recently looking at the role of transportation innovations.⁴

Air transportation facilitates easier migration of workers, makes it possible for short-term migration, and allows migrants to maintain contact with their home country (Lassen 2006). Within larger countries, such as the US, there has also been a growth in long distance “week-day” migration as spouses work in different parts of the country to be reunited at weekends. Even within countries there is mobility over time as new workers seek better employment opportunities (Hatton and Tani 2005). As Manolo Abella (2002) has pointed out, “International migration of skilled persons has assumed increased importance in recent years reflecting the impact of globalization, revival of growth in the world economy and the explosive growth in the information and communications technology.”

Our interest here is to look at how the new air transportation environment has affected two particular features of the labor market: First, complete (or at least long-term) migration of workers, and second, and to a smaller degree, extra long-distance commuting behavior.⁵ The emphasis is on the primary effects of air transportation in facilitating migration. It is not concerned with the secondary effects of air transportation in terms of the relocation of businesses or stimulating particular industries, such as tourism, that may subsequently lead to changes in levels of

¹ The literature on these effects is extensive—see Button and Stough (2000) for an overview. The book also contains a large bibliography of work in the field. Academic journals such as the *Journal of Air Transport Management* and the *Journal of Transport Economics and Policy* have regularly carried articles on these topics.

² There has been a number of general studies on the role that air transport plays on industrial location and development but most have implicitly looked at capital rather than labor movements, see for example Button et al. (1999).

³ This is an estimate and includes short-term migration. The UK Office of National Statistics (web site <http://www.statistics.gov.uk/>) provides periodic data on migration but given the flexibility of the European labor market this offers broad approximations of trends. For example, it is weak regarding duration of employment and on the movement of self-employed labor.

⁴ In the past there has been considerable interest in the role of transportation in facilitating labor migration, for example in terms of examining the role of shipping development in the forced migration of slaves from Africa to the Americas and of convicts from the UK to Australia, and of voluntary migration as facilitated by such as the transcontinental American railroads.

⁵ While the study focuses on “labor migration”, most official data concerns migration as a whole. This is normally defined as individuals living outside their county of birth for more than a year. This data misses illegal migration, although it is sometimes estimated, and a number of groups, such as students, who may live in a country for an extended period but are not considered immigrants.

labor migration, or in the role of air transportation in leading to retirees and others simply moving home.⁶

Labor migration takes place for a multiplicity of reasons and changes in air transportation markets are unlikely to have a large aggregate effect. Where there may be important impacts are in particular sectors of the labor market or in particular geographical corridors. This has often coursed debates about the implications of migration on the local economy, not least in places such as the UK where the influx of migrants has been sudden and unexpected.⁷ There is also a growing interest amongst economists in the wider role of transportation in factor mobility for designing policy responses to conditions where endogenous growth seems to dominate (Button 1998). The paper pulls together data and case studies of relevance to isolate the nature and scale of the interactions between transportation and labor migration. The results are inevitably piecemeal and should thus be taken as indicative of trends rather than a complete picture of what is going on.

Migration theory and transportation

Pattern of migrations

Labor migration is growing and about 3% of the World's population has been living outside of their country of birth for one year (Table 1). While it is a long-standing phenomenon it still is not fully understood.⁸ In part this is because it is closely tied with economic growth theory and, in general, economists have not been very successful in explaining the

⁶ Low airfares and services to secondary airports in Europe have stimulated, for example, an extensive migration of retirees from cooler countries such as the UK to Spain, Portugal, France, and Italy. For example, in 2005, 224,841 British people were registered in Spain, 136,766 having an EU residence card, and some 75,000–100,000 were estimated by the Spanish government to reside there (Barclays-IESE Barometer 2005).

⁷ There have been a number of major studies of the implications of recent migration on the UK economy, including, Dustmann et al. (2005), UK Home Office, (2007), and Blanchflower et al. (2007).

⁸ This is not to say that various aspects of the topic have not been studied—e.g. Borjas (2003) looked at immigration policies in the US, Walmsley and Winters (2005) at fostering South-North migration, Lucas (2005) at economic development, Stark (2003) on the “brain drain”, and Rauch (2001) at international trade.

relative growth performance of different regions or cities. People are largely economic animals and respond to the stimuli offered at various locations when deciding where to locate. Migrants also are far from homogeneous, and while the focus here is on labor that tends to react to income and employment stimuli, many individuals migrant to retire or to seek a more conducive social or political environment in which to live. Unfortunately the data available often do not conveniently separate out these motivations.

Understanding changes in the relative sizes of these economic stimuli over time becomes important to the understanding of labor migration. Added to this are the transactions costs involved in relocation; migration is not a free good, and there can be significant opportunity costs, both material and psychological, to be considered. It is with regard to these transaction costs that the developments in the air transportation market have relevance.

The role of transportation in carrying migrants depends on a variety of factors, but given the nature of the mode, the distance involved and the income of the migrants are critical factors. Much of the migration today is related to the transition economies of Europe (Goedings 1999) and to more traditional developing countries—the World Bank estimates are that in 2005, two in every five migrants reside in a developing country, and most have come from developing countries (Table 2).⁹ Most of this is relatively short-distance and between countries with contiguous borders. It, therefore, seems that air transportation places a relatively insignificant role for this large group.

In cases of movement between developing and higher income countries there may be more scope for migration by air transportation. While the two largest single corridors for migration—Mexico to the US and Bangladesh to India—are mainly served by surface modes, geography means that the next three largest corridors—Turkey to Germany, India to the United Arab Emirates, and the Philippines to the US—inevitably have significant flows carried by air transportation (Ratha and Shaw 2007).

⁹ This is often called “South-South migration” as opposed to “South-North migration” that traditionally describes movements from developing to developed countries. Of the South-South migration, 80% is between countries with contiguous borders and 65% of the remainder is between countries with the 40th percentile of countries ranked by distance.

Table 1 World migrants

Year	Estimated number of international migrants at mid-year (both sexes)
1960	75,463,352
1965	78,443,933
1970	81,335,779
1975	86,789,304
1980	99,275,898
1985	111,013,230
1990	154,945,333
1995	165,080,235
2000	176,735,772
2005	190,633,564

Source: International Labour Organisation

Table 2 Stock of migrants by origin and destination (in millions)

Migrants from	Migrants in			Total
	Developing countries	High-income OECD countries	High-income non-OECD countries	
Developing countries	73.9	61.8	20.1	155.8
High-income OECD countries	3.4	25.5	1.2	30.1
High-income non-OECD countries	0.8	3.6	0.3	4.7
Total	78.0	90.9	21.6	191.0

Source: Ratha and Shaw (2007)

The pattern of labor migration has also varied over time and can differ between corridors. Migration of workers from Asian countries, for example, shifted from a predominantly Middle East bound flow to an intra-Asian flow in the 1990s. Labor migration in Asia is mostly employed on fixed-term contracts representing temporary migration, although permanent or settled migration still takes place on a limited scale to Australia and New Zealand. Most Asian migrant workers are unskilled or semi-skilled such as construction workers and female domestic workers (Chalamwong 2004).

Taking another case, the Philippines sends over half a million workers every year on temporary migrations (Alburo and Abella 2002) but in the 1990s changes

occurred in the destination they went to and the characteristics of Filipino workers sent abroad. From the mid-1970s until the early 1980s there was a concentration of Middle East countries that became the prime destinations but subsequently countries in Southeast and East Asia have been the destinations of workers (see papers in Arnold and Shah 1986). This also signaled some change of worker profile. The initial exodus to the Middle East was dominated by construction workers, but the shifts to Hong Kong, Japan, Taiwan, Singapore, and other Asian countries have witnessed flows of entertainers, electrical and electronics workers, domestic workers, and professionals.

Transportation costs in migration theory

Traditional economic trade theory *a la* David Ricardo paid little attention to the costs of moving goods when considering matters of comparative advantage. This has largely also been true of factor movements, including that of labor. The more recent analysis of trade, and in particular the development of the New Trade Theory by the likes of Paul Krugman (1990) has brought about a reassessment of the importance of, amongst other things, transportation costs in trade, and with this an interest in the role of modern transportation forms such as aviation in the movement of factors of production.

That the amount of air transportation has grown significantly over the past two decades is irrefutable (Table 3). But there have been significant changes in the types of service offered with the advent of price discrimination in fares and increasing role played by low-cost carriers¹⁰, together with wider geographical networks of services and the greater use of secondary airports, making the mode accessible to a larger market. What is not clear, however, is exactly what that means for our understanding of labor migration in theoretical terms.¹¹

¹⁰ For example, the number of intra-European passengers carried by low-cost carriers was in 2005, a 16-fold increase over 1996, compared to 47.2 million by full services carriers and 25 million by conventional charter carriers, although definitional issues make the airline classifications a little murky (UK Civil Aviation Authority 2006).

¹¹ Not discussed here are matters of causality. High demands for labor migration may have brought forth additional air services rather than air services being one of the drivers behind migratory trends.

Table 3 Global passenger air transportation trends

Year	1985	1990	1995	2000	2001	2002	2003	2004	2005
Revenue passenger kilometers (millions)	1573	2182	2567	3381	3290	3279	3304	3754	4018

Source: International Civil Aviation Organisation¹²

There are two broad theories of migration and these can be illustrated by Fig. 1 (Hart 1975a, b).¹³ We assume there to be two regions, A and B. A has high income and low unemployment whilst B is the mirror image of this.¹⁴ The classical economic model assumes that with zero costs of migration and a homogeneous labor force, labor will move from B to A seeking work and higher pay whereas, on the assumption of uniform commercial risk across regions, capital will move from A to B where it can be combined with abundant, cheap labor to maximize returns. Wages will fall in A, unemployment increase, and the return on capital will rise as the labor supply increases and capital becomes scarcer. The additional capital and decreasing labor force in B will push down the marginal return on investment and concurrently push up wages. The process continues until labor costs and employment levels are equalized.¹⁵ This equalization is achieved in a world of zero factor transportation costs; essentially it is devoid of any real geographical consideration.

The alternative approach is essentially Keynesian in its orientation and in its modern form is linked to the New Growth Theory and people such as Lucas (1990). Taking the initial starting positions for our two regions, this approach argues that not only will equalization of real wages and employment levels not be attained but that there may be cases where they diverge further. Labor mobility may be impeded by

the various costs of migration—embracing social and search costs as well as simple financial costs—and heterogeneity in the labor market—the jobs available in region A not being compatible with the skills of labor in region B. Equally, capital does not move from region A to B because of the higher returns and less uncertainty that are to be found in regions that already have a high level of prosperity and can exploit economies of scale. The more contemporary form of the theory pays particular attention to the endogenous growth that occurs in regions that have an established high-skilled work force and the ability to further develop their knowledge based industries.

The original formulation of this type of model in the 1960s put emphasis on the scale economies enjoyed by prosperous regions with a larger capital base (Kaldor 1970). Lucas and others have more recently, as the nature of industry has evolved, switched to emphasize the ability of advanced, knowledge-based economies to continually push forward the technology envelope and forge ahead of other regions. Florida (2002) has added to these ideas by arguing that “creative classes” having preference for where they live, and that the attributes required to attract and retain them are more likely found in regions with an established high income and educated labor force. In either the older or more recent formulations of this framework, the implications are often circular-and-cumulative causation; essentially richer regions get richer and poorer regions, poorer.

The role of transportation in these two broad models is different. In the classic framework it is considered, as in classic trade theory, to be ubiquitous and free. In the Keynesian style model it is seen as a major transactions cost that affects clearing in the labor markets. Here transportation costs are considered important in the labor mobility decision but the labor market per se is largely seen as clearing in most other respects. There is also an underlying assumption that in the short-term there are potential mismatches between available pools of labor skills and the demand for different types of labor but in the long-term this is resolved both through migration and

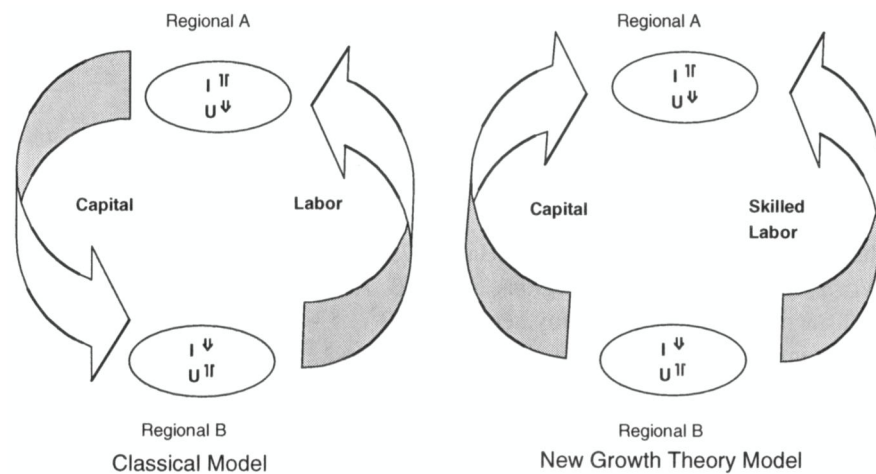
¹² The ICAO website (<http://www.icao.int/>) provides both data on international air transportation trends and forecasts.

¹³ These theories only relate to the narrow economic motivations for migration and do not include socio-political theories covering such things as military disruptions and forced migration. Pellegrini and Fotheringham (2002) offer a comprehensive summary of spatial choice models of migration.

¹⁴ Because of market clearing assumptions the pure classical model would be driven only by income differentials.

¹⁵ Strictly with full market clearing there is no unemployment in this type of model, labor movements being determined by real relative wages. The unemployment effect is added to indicate possible imperfections in the short-term labor markets in the two regions.

Fig. 1 Simplified theories of migration



natural adjustments to the endogenous labor bases of each labor market.

Putting a little more flesh onto the factors that cause migration in whatever form, there are combinations of forces at play that push and pull individuals. Expressing things in a quasi-gravity model approach, the relative push and pull factors are in practice not simply job opportunities and wage differences (which tend to dominate market clearing neo-classical models) but can embrace social, political, and economic considerations, quality of life factors including political freedom, cost of living, levels of taxation, safety and security concerns, and perceptions of the respective governments' performances. Equally, the cost of migration, while it may include financial travel cost can also embrace information seeking cost, and the psychological cost of leaving family, friends, and culture (Weyerbrock 1995).

Air transportation and types of migration

While many of the more traditional analyses have tended to treat migration as some sort of generic concept, in fact it can take a variety of forms and there have been important changes in their relative roles over the past 30 years. Indeed, the diversity of forms has been widened as institutional barriers to migration have receded with the formation of the EU and other free market areas and information about employment opportunities has increased with the advent of modern communications, but developments

in transportation technology and institutions have also played a role.

Traditionally, migrants may do one of three things: stay in the same host country forever (permanent settlers), go somewhere else (remigration), or go back to their country of origin after a period.¹⁶ But these definitions raise some problems in a more globalized world and one where mobility is easier. In the past migrants to countries had little choice but to become permanent settlers. Besides those sent to penal colonies where returning was simply not tolerated, transportation was extremely expensive and in very limited supply. This has now changed with the advent of cheap air transportation.

While it can be important, at the outset it must be emphasized that the role of air transportation in facilitating migration has sometimes been exaggerated in previous studies. Petzinger (1996), for example, was clearly exercising journalist license when stating "Just one Pan Am route from San Juan to New York accounted for the vast majority of the five million Puerto Ricans who moved to the United States in the post war years...." The annual migration to the US from Puerto Rico in the 1950s was only 45,000 and in the 1960s this fell to about 20,000 as Operation Bootstrap sought to build up the Commonwealth's local economy, and the number continued to hover around that level thereafter (Rodríguez no date). By 1980 the entire Puerto Rican population in the US was less than two million, and

¹⁶ These are often target workers who return home once a certain amount of money has been saved or skills attained.

even by the 2000 US census was still less than 4 million.¹⁷ In addition, many migrants also used sea and land transportation for their travel.¹⁸

There are other issues to consider when looking at contemporary data; for example, are skilled workers living abroad for a period genuine migrants? It seems that often a definite answer is not possible. Bhorat et al. (2002) suggests that the status of skilled migrants is often uncertain. Moreover, “the meaning of emigration as a definite loss or not to the originating economy, is debatable”. In the case of South Africa, for instance, only one out of three skilled emigrants from that country to the US stay permanently.

While in the past these types of “migrants” have been seen as guest workers and, as for example in Germany in the 1970s, were often not very highly skilled (Chin 2007), this has changed in many places.¹⁹ There has also been some attempt to liberalize the temporary movement of service workers under the General Agreement on Trade and Services, but implementation has been piecemeal although it has focused largely on high-level personnel that are more likely to use air transportation if they become temporary migrants (Winter et al. 2003).

While it is often difficult in migration studies to isolate the importance of these effects in decision-making, in some cases some connections can be inferred. Although quantification proved difficult, in empirical research on migration, Saxenian (2002) for example, found in a study of foreign-born

professionals working in Silicon Valley, California in 1999 that many saw it as a temporary home with the ultimate intent of returning home; air transportation being the factor making this possible. A well-known limitation of flow data is that it does not provide information on the durability of the time spent abroad. There have, however, been a number of case studies. In his work on the Caribbean, Thomas-Hope (1999), for example, looked at the pattern of short-term migration by Jamaicans and found that short-term contractual workers tended to return after the contract was complete. Of the professionals that left Kingston, 60.4% returned after less than 5 years overseas. In contrast, those doing casual work, farmers and unskilled labor, stayed until the end of their working lives; say after 25–35 years.

There have been changes also in the duration of “stay” of migrants over time. In the period from 1990 to 2004, for example, Leven (2006) found that Poland’s permanent emigration declined to a relatively low level, where it has remained. Some of the key reasons for this pattern are the interplay of factors such as the elimination of travel restrictions to and from Poland, less favorable real exchange rates for Polish currency, wage differentials, rising domestic unemployment, and the rapid increase of temporary, as opposed to permanent, migrants. With the possible exception of the medical professionals, college graduates, for example, are not likely to become permanent migrants.

One obvious reason for these various changes in behavior patterns have been modifications to the variety of costs associated with migration. The costs of being a long-term temporary worker can be considerable (Sjastaad 1962).

The changes caused by cheaper air transportation

It was not long ago that air transportation was seen as the prerogative of the wealthy and of no real relevance to the long-term movement of labor. For example, the mainstream literature on labor migration focused on the role of the railways in facilitating the domestic 19th century east-west migration in the US, and cheap shipping from the 1840s, to partly explain the possibility of international migration to the US, while Australia and the UK supported cheap passage for its immigrants in the post World War II period.

¹⁷ For details visit <http://www.census.gov/>. Pan Am ceased operation in 1991 under Chapter 11 bankruptcy.

¹⁸ One referee of this paper also pointed to the role of air transport in moving European colonial administrators, military officials, agriculturalists, and entrepreneurs to far outposts of empire in the 1930s. In fact the numbers involved were small. Britain, for example, administered its Indian empire with about 1,200 civil servants (many Anglo-Indians) and an army of about 20,000, and the vast majority traveled by sea. In terms of hard numbers, Pirie (2004) estimates that in total 46,330 people used Britain’s Imperial Airways’ empire air services between 1930 and 1939 to take them to destinations in the largest empire the world has known, and many were high-income individuals simply visiting the dominions as tourists or to slaughter big game.

¹⁹ There are still significant flows of unskilled temporary migrants that have become institutionalized in some cases. Canada, for example has the Seasonal Agricultural Worker Program that in 2006 allowed 13,000 workers to come from Mexico (880 in occupations requiring a lower level of formal training). These workers all had to travel by air transportation.

The theories underlying these analyses are, with modifications, potentially relevant for studying air transportation's role today.

Gateways, corridors and air transportation

Until the mid 1900s, the traditional flow of migrants passed through some form of geographical “gateway” or institution; it is no accident that Ellis Island in New York has been maintained as a national monument. Transportation is a network industry and it is, therefore, natural to think in terms of the role that it may play both in terms of stimulating economic development along links and at the various nodal points. Historians, for example, have long viewed the migration passages that existed in prehistoric times as important for the spread of civilization as it emerged and subsequent trade routes as facilitating economic progress. Those living at nodes in the networks—Hirth (1978) calls them “gateway communities”—benefited from the flows passing through their areas and could exercise control over them. The flows along these routes allowed communities to develop their comparative advantages and also led to the creation of a trading class to manage the movement itself.

These gateways have gradually moved farther apart as it has become easier for migrants to both pass-through them and, as transportation systems have evolved, to transverse the distance between them. Figure 2 represents the traditional view of gateways (Burghardt 1971). In the US context, for example, the two gateway cities may be seen as New York on one coast and San Francisco on the other in the mid-1800s. Once into the country, migrants would move into the hinterland, often through a hub such as Chicago. Railroads largely facilitated this movement. The nature of maritime transportation at the time, as well as institutional controls, led to this pattern of behavior. The gateways proved challenging barriers to cross and, while migration was extensive, it was not easy and reverse-migration, or visits to family left behind, proved almost impossible for the vast majority of individuals even if they did succeed in their new land.²⁰

²⁰ There is also the issue of the extent to which migrants remain at a gateway and “push-out” existing workers that are forced to migrate internally to other parts of the country. Card and DiNardo (2000) provides a study of this potential effect.

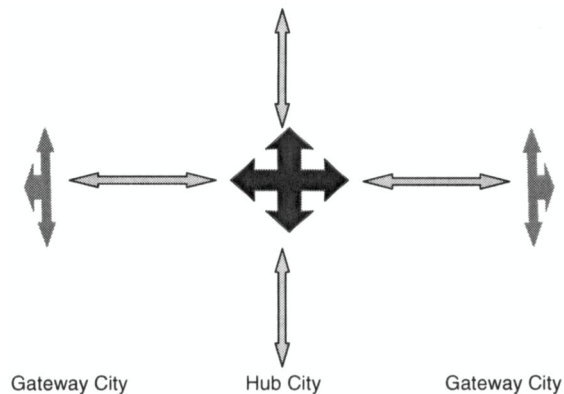
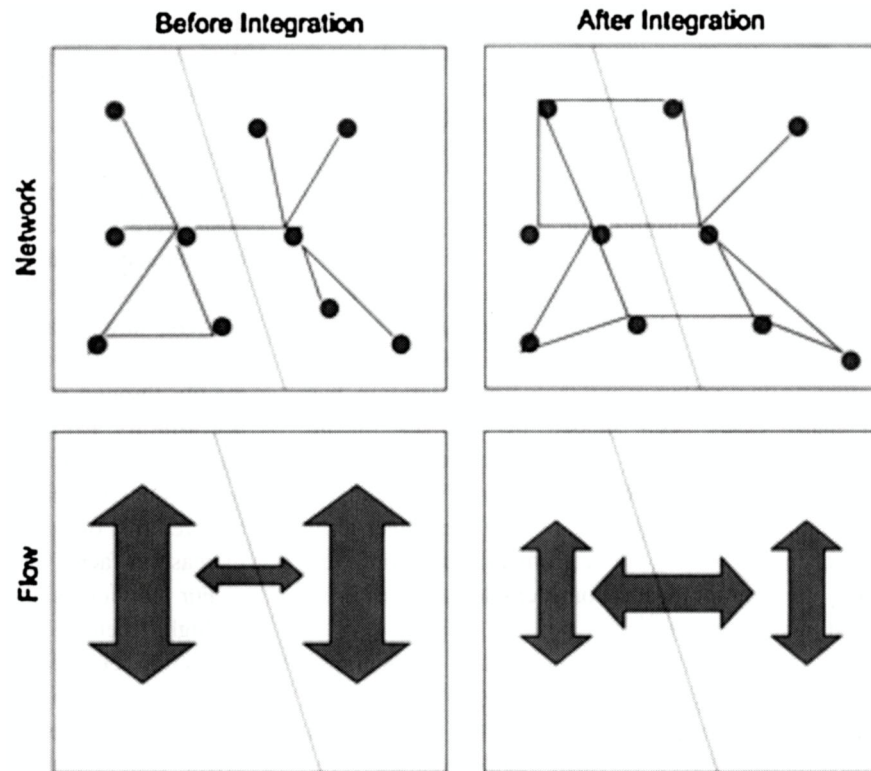


Fig. 2 The notion of gateways

The institutional and technical changes that have taken place, particularly over the past three decades, have changed this picture dramatically. The speed and flexibility of air transportation have both effectively shortened in generalized cost terms the “distance” between recipient countries, such as the US and those sending immigrants, and, since the widespread liberalization of national domestic air services after the 1978 Airline Deregulation Act, between settling locations within the recipient country. It has also, and remaining with the US since the initiation of the US Open Skies policy in 1979, provided many more gateways into the country. The development of both more liberal bilateral air service agreements between individual EU countries and non-members, and the emergence of the single internal air market has, de facto, had the same effect in Europe.

Figure 3 offers a simplified picture of the types of effects that this has had.²¹ The left side of the diagram shows the limited gateways (the line crossing the dashed “international border”) that existed previous to the emergence of more air transportation services and the types of internal movements that took place. The upper part of this side of the figure shows that the bulk of labor migration was internal to the countries prior to the border relaxation and involved only limited international mobility.

²¹ For a much more detailed discussion of the role of transportation in the context of gateways and how this is changing, see Rodrigue et al. (2006).

Fig. 3 Impact of opening more gateways

Relaxing the border constraint (say through a more liberal international air transportation agreement) not only opens more crossing points but also eases strains on existing border crossings. The advent of domestic aviation reforms in both countries also stimulated more domestic labor mobility of various types, including long distance commuting, as air-fares fell with the advent of low-cost carriers (“no-frills carriers” in the European vernacular) and more services came on-line. Internationally, in Europe, labor movements crossed more border points that, especially as carriers such as Ryanair and other low-cost airlines chose to serve secondary and regional airports, in turn, further affected the nature and pattern of internal migration although in the European case because of distances, the latter generally involved surface modes.²²

²² For an example of a simulation of the effects of removing an international air transportation “border” on both cross-border movements and those internal to “domestic” markets see the studies of the potential implications of the Open Skies air service agreement between the US and the EU (e.g. Brattle Group 2002; Booz Allen Hamilton 2007).

In addition, these cross border flows can also change in nature with more movement of temporary migrants and more back and forth movements of longer-stayers as migrants take advantage of low fares to revisit their homelands. The result of these interacting forces has been a relative growth in international migration (conceptualized in the lower elements of Fig. 3.)

The effects of changes in transportation often need, however, to be taken in the context of other developments. In many cases, including large parts of the EU and the US, freer labor markets and lower cost transportation have allowed workers to select their permanent place of work, but even where labor mobility is still restricted, the high demands for particular types of labor have led to governments opening institutional gateways to those with the required skills.²³ The result is that the nature of labor migration has changed in recent decades (King 2002), including a shift from longer-term to more temporary

²³ Some of these, such as the US HB2 Visa system, are designed specifically to fill skill gaps with migrants leaving after a designated period.

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.

Quantifying air transportation effects

Air transportation seems to be in many cases a facilitator of these changes. Labor migration, both in its scale and changing composition, including greater emphasis on circulation and temporary migration, has in many cases been shaped by changes in the availability, frequency and costs of air travel. It makes the initial migration itself more viable and, by facilitating cheap return trips, reduces the longer-term social costs of being away from kith and kin even when the migrant locates considerable distances from traditional gateways.²⁴

Saxenian's study, for instance, found that Chinese and Indian immigrants accounted for 14% of Silicon Valley's total employment and that the foreign-born professionals travel to their native country for business at least yearly, and that 5% of those surveyed make the trip five times or more per year, although there are national differences. Twenty percent of Taiwanese immigrants in Silicon Valley, for example, return home for business two to four times a year compared to 9% of Indians and 8% of mainland Chinese. The latter are known among local Chinese as "astronauts" because they appear to spend their lives in airplanes.²⁵ But even those that do return retain ties with the US; return-skilled-Indian migrants are establishing business relationships and starting new companies while maintaining their social and professional ties to the US facilitated by international air transportation. Similarly, thousands of US-educated Chinese engineers returned from Silicon Valley to Taiwan annually in the early 1990s,

and more recently, there has been a growth of transnational communities linking Silicon Valley and China, notably Hsinchu and Shanghai.

The reforms in air transportation regulation have overcome many of the previous limitations of air transportation as a significant form of mass mobility; costs were a significant barrier to air travel as were the frequency and convenience attributes. Low-cost airlines, and their knock-on effects on the legacy carriers, have changed this. As a result they have impacted on labor markets in several ways, but mainly through reducing travel costs and increasing accessibility. Effectively, they reduce the transaction costs of international labor migration and, all else being equal, by shifting the balance between the costs and returns of migration have contributed to the increase in factor mobility (Michaels 2007).

For individuals, the cost of being away from home is high (mental and physical stress, the cost of separation, etc.), for others the cost of traveling may be more important. For all, air transportation lowers total migration costs. Some can visit relatives more often. Others can at least afford getting to their destination. There is also the induced demand for migration that is made possible by lower air transportation costs. Agricultural Mexican workers could not, for example, move to Canada to work temporarily if it were not for air transportation because obtaining transit visas to travel via the US can prove very difficult for low-income individuals.

There seems to be a change in attitudes towards flying as low-cost services have grown. Low-fare services available from a local airport seem to be changing consumers' perceptions about flying generally and consequently are having an effect on travel patterns. In many cases, as with Ryanair in Europe that serves numerous small airports with radial structures of routes, it is not simply about vacations and visiting a second home but also seems to stimulate people to apply for jobs abroad and may facilitate working far from home. Wizz Air, the Hungarian air carrier, is a leader among several low-cost airlines transporting plane-loads of Poles, Hungarians and others to Western Europe with one-way fares starting at less than €20 (about \$26), including taxes (Michaels 2007). Nearly one million East Europeans have moved to Britain, Ireland, Sweden, Germany and other member countries since the EU expanded from 15 to 25 nations in 2004.

²⁴ Improvements in telecommunications have added to the ability to retain close ties with the "homeland" and are closely linked to the effects of air transportation (Vertovec 2004).

²⁵ The international migration literature has identified a variety of factors that influence these observed patterns of return migration behavior, most notably non-economic factors such as patriotic and social ties to home and a lack of assimilation into the host society (Waldorf 1995).

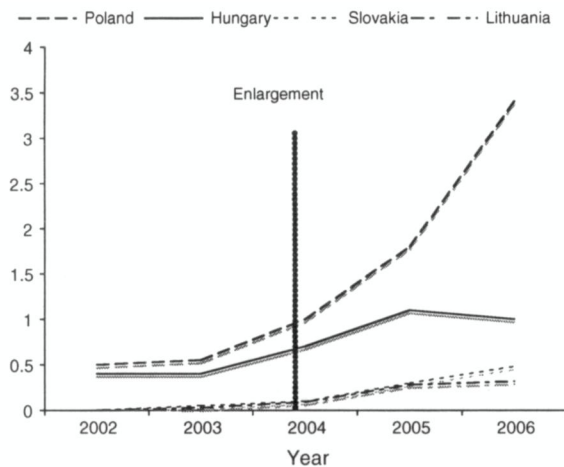


Fig. 4 Air travel between the UK and selected transition economies

Figure 4 provides an indication of the increased air traffic between several of the new EU member countries with significant migrant flows into the UK on routes where there have been expansions of low-cost carrier activity; not only Wizz but also Centralwings (a subsidiary of Lot Polish Airlines), the Slovenian carrier SkyEurope Airways and others. Just taking Poland as an example of service growth, in 2000 there were five scheduled services between Poland and the UK; by 2006 this had grown to 27 scheduled services linking 12 Polish cities and 12 UK airports (UK Civil Aviation Authority 2006).

While the causality between changes in the airline market and labor migration patterns is not all unidirectional,²⁶ workers are increasingly participating in labor markets far from home and airlines have responded by creating an informal new travel category alongside the traditional business, leisure, and “visiting friends and relatives” traffic breakdown. Airlines often call this “ethnic traffic” to reflect the cultural diversity of this type of traffic. Many carriers have even adapted their business models to cater for these ethnic travelers because of the relative reliability and predictability pattern of their demands which

²⁶ In some cases more abundant and cheaper air travel may have reduced movement of certain categories of potential migrants. There is, for example, anecdotal evidence that individuals in the higher income countries of Europe are visiting the new member states for medical and dental treatment where costs are much lower thus tempering the flow of doctors and dentists to the former (Silver 2007).

offset the relatively cheap fares paid. “Ethnic travelers” are for instance highly regarded by low-cost airlines like Wizz and SkyEurope Airways.

While official statistics do not capture this particular sub-class of traveler, one can glean some indication of the growth in this ethnic traffic, at least in Europe, by looking at the conventional “visiting friends and relatives” (VFR); most of the growth being migrants making visits to their homeland. Table 4 takes the two primarily low-cost UK airports, Stansted and Luton, and compares the number of inbound passengers for 2000 and 2005. As can be seen, VFR traffic grew by 198% over the period to become the largest single component of inbound traffic. At the national, UK level a similar picture emerges with VFR traffic growing from less than 2.5% of EU passengers in 1997 (when there were 15 member countries to about 15% by 2005 (albeit with 25 members).

Air transportation and long-distance commuting

There have been significant changes in demographic patterns over the past 40 years that affect the context in which residential/work place decisions are made. Portes (1996) suggested the existence of transnational communities—a community that spans borders and boasts as its key assets shared information, trust, and contacts. This has led to a more flexible economic structure and often involves longer distances between home and work and between spouses for part of the time. This type of behavior is not migration in the traditional sense, but involves an extended, regular commute and, often, spending parts of the week away from home.²⁷

While explicit data on the extent of long-distance commuting involving air travel is small,²⁸ some indication of its importance can be seen indirectly in

²⁷ Overall there are over 400 million long distance business trips, 16% of all business trips, made a year in the US, but many of these cannot be defined as commuting since they are irregular and with individuals going to a diversity of destinations. Of trips of 100 miles or more, 13% were made by air in 2001, with an average distance of 2,080 miles.

²⁸ Most US studies of long-distance commuting normally define it as commutes of over 90 min or 50 miles. Air travel makes little impact on most trips of this length but cuts in for much longer commutes of several hundred miles or more.

Table 4 Inbound passengers from the European Union to the UK using Stansted and Luton airports

Passenger type	Passengers 2000 (million)	Passengers 2005 (million)	2000–2005 change (%)	Percentage of total in 2000 (%)	Percentage of total in 2005 (%)
Business	0.9	1.8	98	22	17
Leisure	1.6	4.0	150	39	38
Visiting friends & relatives	1.6	4.8	198	39	45

Source: UK Civil Aviation Authority (2006)

the growth rate of extended-stay hotels in the US and, slower, elsewhere. These hotels, that trace their ancestry back to the opening of Marriott's residence Inn in 1974, are normally defined as hotels where guests stay for more than five nights and that do not offer ancillary services such as bars, restaurants, and portage. It is estimated that up to 20% of US hotel stays are over five days and extended stay hotels account for most of this type of accommodation (240,000 rooms). While not all are regular "commuters" and not all use the low-cost air services to travel to their accommodation, many do.

Thomas-Hope (2002) reports that in the Caribbean region, the livelihoods of the migrants are not always nor necessarily bound to one location, and people conduct different aspects of their lives in different places at different times in their lifecycle. Some skilled persons commute between Jamaica and the US, maintaining homes in both places. Commuting between Caribbean countries and North America is not uncommon and the Internet has now ushered in new opportunities of this nature.²⁹ Caribbean migration has evolved over time with characteristics and a dynamic that tend to perpetuate the process rather than to exhaust it. These characteristics relate to the intrinsic circularity of the movements associated with migration and the existence of transnational communities.

The implications for theory

The developments in air transportation technology, and the shift in the way its regulation is viewed, have for certain markets reduced mobility costs and in that way have facilitated migration. This has not only

²⁹ For example, American Airlines has long targeted migrants from the Dominican Republic living in New York City.

been in terms of the immediate costs of migration (and possible reverse migration) but also regarding easier accessibility to original locations to visit kith and kin and for the latter to visit migrants. An important academic question involves whether these trends, albeit imperfectly measured, help define the most realistic migration models.

These effects could, in a general sense be taken as consistent with both the classic and New Growth Theory frameworks seen in Fig 1. The differentiating feature is the type of migrant that is being considered. Reducing air transportation costs in general would help lubricate migration channels in the classic model stimulating a mass movement of largely semi- or unskilled labor to respond to regional variations in income and employment opportunities. In contrast, the labor migrations that reinforce endogenous growth are those of skilled, and in particular "knowledge workers", that involve movement of significant human capital that often exhibits public good attributes.³⁰ In essence the distinction involves a matter of degree—have air transportation costs fallen sufficiently to have removed it as a serious impediment for mass movements of labor or only enough to allow another tranche of highly skilled workers to overcome a hurdle to move?

The lowering of air transportation costs over the past 25 years has clearly benefitted the semi- and unskilled workers, making migration affordable and reducing the costs of making location mistakes. In Europe, for example, low-cost airlines such as Ryanair have for some time been offering fares that are easily affordable—often below €1 before taxation

³⁰ We make no judgment here about whether migration of this type of worker is detrimental to the originating region. It could well be for example that repatriation of remittances could provide an investment base for the originating region's economy to take-off (Kuhn and McAusland 2006).

that effectively remove air transportation considerations from the cost function associated with migrating.³¹ Importantly, in many cases labor has taken advantage of low-cost air services, most notably within Europe, to relocate. While it is also true that there have been significant movements by air transportation of knowledge workers over this period, both between countries and in the case of the US, internally, this has neither been special, in the sense that other types of workers were excluded, nor has it led to only unidirectional movements of workers.³²

Conclusions

Labor migration has always been with us, but its magnitude and nature have changed with time. Transportation has also been a factor influencing migration patterns, and technology and institutional changes in air transportation would seem to be having an impact on longer labor movements just as the advent of steam ships and railways did in the nineteenth century. Conducting econometric, or even simple statistical analysis, of the links between changes in the air transportation market and long-term trends in labor mobility is, however, difficult because of the paucity of suitable data, the accompanying shifts in other causal factors, and the relative newness of the phenomena. Information at this time can only really be gleaned by pulling together insights from case studies and broad data series. It would seem important, however, to mine this information not only from the perspective of making policy decision, but also to see if it can help develop better models of migration, and with that spatial economic development.

The factors driving current trends in labor migration are diverse, and it is certain that recent developments in air transportation are not the strongest amongst them. Nevertheless, air transportation,

and particularly low-cost air transportation, has been a facilitator for the increasingly spatially dynamic global labor market. It not only makes long-distance initial permanent migration less costly, but limits the social costs by allowing regular visits to friends and family (or *vice-versa*). It allows temporary migration that is often favored by recipient countries as a way of circumventing short-term labor shortages without the cultural and other tensions that can arise with large scale permanent movements of workers. Additionally, cheaper and more extensive air transportation services have been a component in the growth of long-distance commuting, often involving workers spending large parts of the week away from their places of residence. In a broader sense, all of this moves the spatial economy to the type of model that David Ricardo deployed with transportation not being a major impediment to geographical labor mobility.

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³¹ Button (2005) offers some comparisons between the costs of various modes of transportation in Europe.

³² The trend towards outsourcing some knowledge-based jobs, for example, meant workers stayed in the home region but worked electronically elsewhere. Recent evidence indicates the nature and durability of this form of outsourcing is more complex than originally thought (Becker 2007).

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