The Geography of Air Passenger Volume and Local Employment Patterns by U.S. Metropolitan Core Area: 1973-1996

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Abstract:

The purpose of this paper is to determine if a statistically significant relationship exists between administrative and auxiliary employment levels and air passenger volume for the top 50 urban-airport complexes in the United States from 1973 to 1996. The goal of this paper is a fairly modest one — to refine and expand the current literature's focus by conducting a broader investigation of the links that exist between air passenger volume and employment levels within local economies. Based on data from the Federal Aviation Administration (FAA) and the US Census Bureau County Business Patterns, the major findings of this paper were that the correlation between administrative and auxiliary employment and enplaned passenger volume over time are statistically significant at the 1% level.

Keywords: air transport | economic development | metropolitan areas | air transport management | air passenger volume

Article:

1. Introduction

Since the Airline Deregulation Act of 1978, air transportation passenger volume has increased dramatically in the United States. By 1998, US air passenger volume had risen to a total of just over 600 million passengers — an increase of more than 300% on the comparable figures for 1973 (Air Transport Association, 1999). These statistics suggest a radical shift in the absolute and relative geography of air passenger volume at US airports, but it is less clear what forces are behind these rapid growth patterns ‘on the ground’ in terms of the corresponding shifts in the composition of local and regional labor markets.

A considerable proportion of airline passengers in the United States travel for business purposes suggesting that a close relationship exists between business activity on the ground and airline

networks in the skies. Even with recent technological innovations that minimize the need for direct face-to-face contact, many economic sectors still rely heavily on direct contact with colleagues, suppliers, customers, and other key employees. Administrative and auxiliary employers are a classic example of just such a sector where the knowledge-economy proclivities of such workers inevitably trigger disproportionately higher propensities to fly (Debbage, 1999; Ivy et al., 1995). The administrative and auxiliary sector primarily consists of workers engaged in activities such as management, research and development, financial services and supporting services such as accounting and data processing. In related research, Button and Taylor (2000) cite consultant reports that suggest that those employed in 'new economy' activities like information technology, biotechnology, electronics, and management services will fly over 1.6 times as much as those in traditional industries. In 1996, the adminstrative and auxiliary sector accounted for 1.64 million workers (or 4.2% of the labor force) in the top 50 metropolitan core economies under study in this paper. More importantly, some of the fastest-growing economies in the United States generated a disproportionately significant administrative and auxiliary sector (e.g., in 1996 this included: Atlanta — 8.2% of the labor force, Memphis — approximately 9.75%, and Portland — 8.8%).

Given this context, the purpose of this paper is to determine if a statistically significant relationship exists between administrative and auxiliary employment levels and air passenger volume for the top 50 urban-airport complexes in the United States from 1973 to 1996. The goal of this paper is a fairly modest one — to refine and expand the current literature's focus by conducting a broader investigation of the links that exist between air passenger volume and employment levels within local economies.

2. Previous studies

Transport has long been seen as a strong positive influence on economic development (Bell and Feitelson, 1991; Button and Lall, 1999; Button et al., 1999; Button and Taylor, 2000; Debbage, 1999; Goetz, 1992; Irwin and Kasarda, 1991; Ivy et al., 1995; Van den Berg et al., 1996). However, the exact role that transportation plays in shaping growth and economic development patterns, and how to assess the interactive effects of one on the other, are still the subject of much debate. The links that exist between transportation and economic development can be both direct and indirect. For example, efficient transport networks can facilitate low shipping costs that can allow wider markets to be served and that can also induce economies of scale, scope, and density in an extensive range of activities. Examples of more indirect links include the employment creation induced when constructing transportation infrastructure projects and the multiplier effects triggered by the large inputs of raw material and labor needed for construction.

According to Bell and Feitelson (1991), an efficient transportation network serves two primary purposes in any urban hierarchy — it facilitates the movement of goods and services and it allows for the movement of key employees in a timely and reliable manner. These assets can be critical for those elements of the administrative and auxiliary sector that require frequent and direct contact with key personnel in other metropolitan markets, since an efficient air transportation network can expedite such transactions. However, the debate about whether transportation guarantees or simply allows for the possibility of economic development in general — and employment in particular — continues in the literature.

Developing a better understanding of how air transportation networks can shape local employment patterns is critical because the dominant form of long-distance passenger transportation in the US is air transportation. In an analysis of US urban areas from 1950 to 1986, Goetz (1992) found that prior growth in the population and employment levels of metropolitan areas partly explained subsequently higher levels of air passengers per capita. In attempting to better understand these growth patterns over time, Irwin and Kasarda (1991) were concerned with the changing ‘centrality’ of America's major airports. They argued that just as industries and people were leaving the Northeast/Midwest manufacturing belt region for the South/West sunbelt regions, a similar shift was occurring in the growth of airline network systems over time. By contrast, Smith and Timberlake (1998) focused on the role of air passenger volume and origin-destination links in identifying world cities in the global transportation network, and they argued that cities with major airports play critical roles in serving as “key points of exchange in the world economy”.

In simplistic terms, distance still seems to matter because knowledge is more easily exchanged as the level of shared experiences increases — a phenomenon that Nooteboom (1999) refers to as ‘cultural proximity’. Furthermore, cultural proximity can be enhanced by spatial proximity between firms, suppliers, and customers. Nooteboom argues that important keys to knowledge exchange (such as reputation, bonding and trust) are best achieved when the spatial, cognitive and cultural distances are minimized. Such a phenomenon can be particularly crucial for administrative and auxiliary employees that are involved in collaborative research and development activities that demand frequent face-to-face contacts.

Although agglomerative or highly clustered urban markets were traditionally intended to minimize transportation and labor costs, Porter (1998) has argued that contemporary metropolitan cluster advantages now “rest on information, transaction costs, complementarities, and incentives as well as ‘public’ goods that result from both public and private investments”. It is suggested in this paper that airports are part of Porter's ‘public goods’ equation because many

airports are operated and managed by quasi-public airport authorities, and they can often exaggerate the competitive advantages of large metropolitan markets like New York or Los Angeles.

Airports can serve the regional or local agglomeration in at least three fundamentally different ways — by providing access to the air transportation system, by acting as a local employment generator, and by triggering or encouraging additional off-site jobs as ancillary and complementary businesses cluster close to the airport location. According to Van den Berg et al. (1996), airport regions are becoming attractive locations for businesses in their own right, making them potential centers of economic growth with a capacity for significant spin-off effects.

Better understanding the role that airports play in any urban agglomeration is critical because the 'accessibility through airports' issue has assumed an elevated role in answering the 'how' and 'where' of the geography of economic activity in the American economy. Irwin and Kasarda (1991) examined the empirical relationships that existed between airline networks and overall employment growth rates in 104 US metropolitan areas between 1950 and 1980. They argued that accessibility levels have changed constantly as new transportation innovations (e.g., rail, car, jet engine) have reshaped the competitive advantage of the US spatial economy. Irwin and Kasarda also suggested that in the post-world war 2 era, air transportation substantially reduced frictional constraints to long-distance economic interaction to the point that new locational advantages were created for some metropolitan areas, particularly for the manufacturing and producer service sectors of the US economy. They concluded that "changes in air transportation have altered the competitive advantages of metropolitan areas, and not the reverse" (Irwin and Kasarda, 1991) particularly in markets that are centrally located relative to existing airline networks.

Button and Lall (1999) confirmed that the direction of causation was from air service availability to employment growth in an analysis of how US hub airports with international gateways correlate to ''new economy'' employment levels in the local economy. Supporting evidence is provided by Button et al. (1999) in a study of hi-tech employment in hub airport markets where the authors found that "hubs create employment rather than airlines selecting cities as hubs simply because they are already dynamic". However, Button and Taylor (2000) temper these findings by suggesting that the benefits of additional international airline connections on ''new economy'' employment levels are not infinite.

What was less clear in all this research was how these changes over time in airline services influenced more specific sectors of the local economy, especially industries highly sensitive to changes in airline connectivity levels like the administrative and auxiliary sector? Fortunately, some research has already been conducted in this area.

Ivy et al. (1995) argued that changes in air service connectivity can lead to corresponding changes in administrative and auxiliary employment levels (or what they referred to as ‘‘professional employment’’). They demonstrated that “significant statistical relationships exist between changes in connectivity and professional employment” (Ivy et al., 1995). They also argued that although large cities are commonly associated with a number of negative characteristics such as higher land costs, higher taxes, and increased competition for professional labor, they remain attractive both to firms and professionals because of the advantages rendered by urban agglomerative economies. Locating in a metropolitan area can give companies “an ample supply of professional workers, a wide variety of suppliers, services, and information, not to mention the all-important infrastructure… [including] airports with frequent air service to a large variety of destinations” (Ivy et al., 1995). According to Ivy et al. (1995), the volume, variety and frequency of air service is important because “access to a large number of destinations facilitates face-to-face interaction and helps satisfy corporate travel needs”. They suggested that frequent face-to-face contact can be especially important in the administrative and auxiliary sector to the point that significant restructuring in the urban air transportation network can fundamentally influence the locational patterns of this particular sector of the economy.

Debbage (1999) confirmed some of the early research conducted by Ivy et al. (1995) by analyzing the changing administrative and auxiliary employment levels and airport passenger volume for the 10 largest airports in the US Carolinas. Debbage (1999) concluded that the host counties which “experienced significant gains in air passenger volume and air service connectivity also experienced comparable gains in the employment levels of administrative and auxiliary workers, particularly in the manufacturing sector”.

However, the research conducted thus far connecting administrative and auxiliary employment levels to airport-airline operations has had its limitations. Ivy et al. (1995) limited their study to an analysis of airline route connectivity and not airport passenger volume, while Debbage (1999) limited his analysis to just the US Carolinas. This paper will attempt to expand and update this research agenda by studying the 50 largest metropolitan markets in the United States in terms of air passenger volume from 1973 through 1996 to determine if changes in air passenger volume correspond to changes in administrative and auxiliary employment levels over time. By focusing on passenger volume, some insight is provided on the scale of service provided at specific

airports rather than the variety of destinations served. Furthermore, passenger volume serves as a reasonable proxy for seat capacity with the assumption that large, sophisticated urban agglomerations will offer substantive hub operations that accentuate the significance of economies of scale, scope, and density.

3. Definitions and data sources

According to the U.S. Department of Transportation (1996) and U.S. Department of Transportation (1996), the top 50 US airports accounted for approximately 83% of total passenger enplanements in 1996. The data set in this paper, however, consists of the top 50 airport complexes in the United States, and not merely the top 50 individual airports, to better reflect the flight and airport choices available to an administrative and auxiliary worker in any given metropolitan market (e.g., the New York area includes JFK, La Guardia, and Newark Airports). Enplaned passenger volumes were collected from the US Federal Aviation Administration (1973), Federal Aviation Administration (1983) and Federal Aviation Administration (1996) where an enplaned passenger is defined as any “revenue passenger boarding an aircraft” (FAA, 1996).

Administrative and auxiliary employment data were collected from the U.S (1973), U.S (1983) and U.S. Bureau of the Census (1996)County Business Patterns for the host counties that make-up each of the 50 largest urban-airport complexes under study. If the local built-up area surrounding an urban-airport complex had multiple airports in multiple counties then the employment levels were aggregated for the chosen counties (e.g., the New York area included JFK and La Guardia airports in Queens County and Newark Airport in both Essex and Union Counties, NJ). A second concern arose when the major airports for an area were located in a largely peripheral, suburban county that was outside the built-up urbanized area where the chosen county did not completely capture the local labor market. As a result, additional contiguous counties were added to the data set where deemed necessary to more accurately reflect the employment composition of the local economy (e.g., the New York area included not just Queens, Essex , and Union counties, but also New York County to capture the significant number of administrative and auxiliary workers that live and work in Manhattan even though New York's major airports are in neighboring Queens and New Jersey).

Administrative and auxiliary employment is defined in the Office of Management and Budget Standard Industrial Classification Manual as any establishment primarily engaged in performing management, supervision, general administrative functions, and supporting services for other establishments of the same company, rather than for the general public or other business firms.

Specific examples of auxiliary establishments include central offices, executive offices, corporate offices, regional offices, marketing, accounting, public relations, budget, bookkeeping, data processing, research and development, testing laboratories, advertising, but also warehousing, and milk-receiving stations. In this paper, data were collected on total aggregate administrative and auxiliary employment levels in each urban-airport complex plus data on manufacturing-specific administrative and auxiliary employment levels (which commonly account for one-third of all administrative and auxiliary employment in most metropolitan markets).

In order to capture the changing relationship between air passenger volume and administrative and auxiliary employment over time, data were collected for 5 years either side of the 1978 Airline Deregulation Act (i.e., 1973 and 1983). The most current data available at the time of writing was also included in the data set (i.e., 1996). By way of a final caveat, it should be noted that in some cases the published data for administrative and auxiliary employment were reported as a data range for reasons of confidentiality. In those cases, the midpoint of the range was used to calculate correlation coefficients and mean values in an attempt to minimize error and bias.

4. Findings

Fig. 1 illustrates the geography of the largest urban-airport complexes by enplaned passenger volume for 1973 and 1996. In 1973, a select few places captured a disproportionate share of the air passenger market. These included the Chicago area at just under 16 million enplaned passengers (including both O'Hare and Midway) and the New York area with just over 18 million enplaned passengers (i.e., JFK — 7.4 million, La Guardia — 7.1 million, and Newark — 3.5 million). Collectively, the 50 urban-airport complexes under study accounted for just under 151 million enplaned passengers or 80% of all enplanements nationwide. By contrast, in 1996 the 50 largest urban-airport complexes in the United States accounted for approximately 488 million passengers or roughly 87% of all US enplanements suggesting that the airports under study had elevated their market share of the total traffic base (i.e., 1973 — 80%, 1983 — 85%), and indicating that an on-going process of spatial concentration was at play.

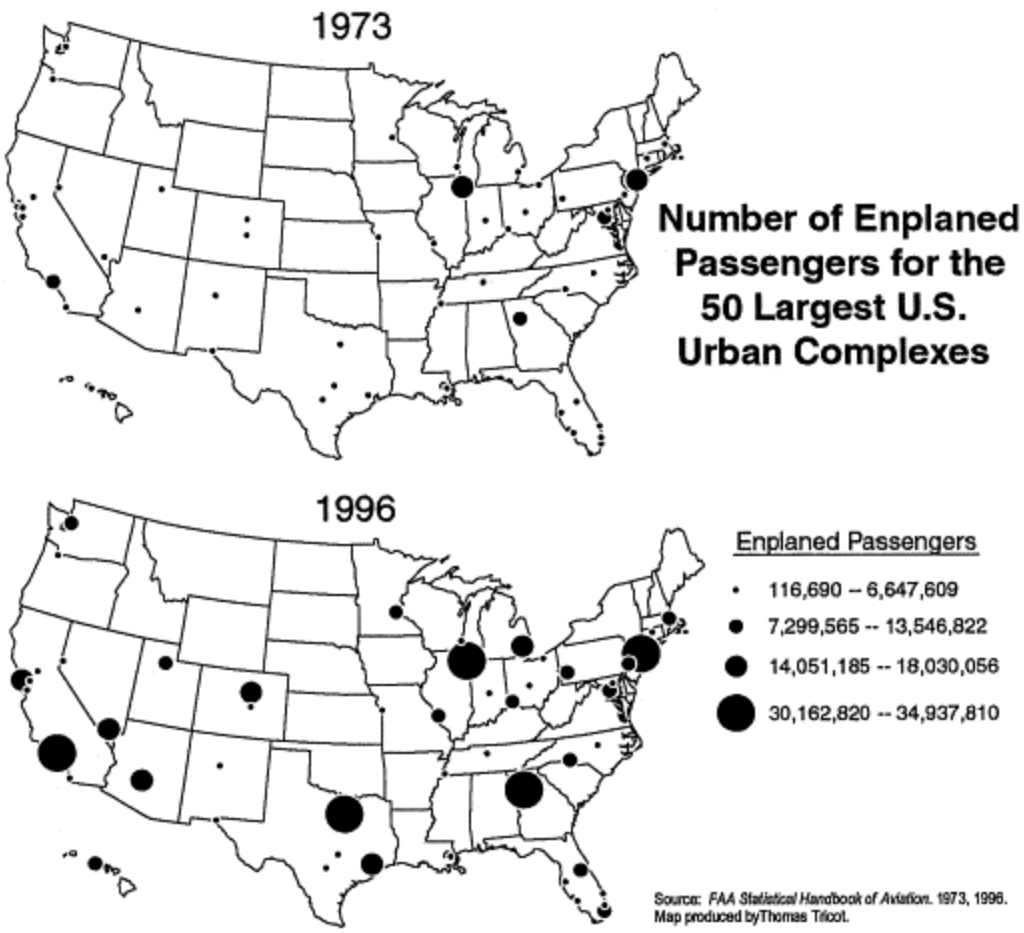

Fig. 1. Total enplaned passenger volume for the 50 largest US urban-airport complexes: 1973–1996.

By contrast, the market share (%) of the five largest urban-airport complexes dropped slightly from 1973 to 1996, indicating that a process of spatial deconcentration was also underway as the forces of deregulation unleashed new competitive advantages in locations such as Atlanta, Dallas, Denver, Houston, Las Vegas, Los Angeles, and Phoenix. What is less clear is whether or not these profound geographic shifts in air passenger volume corresponded to equivalent shifts in the administrative and auxiliary sector of the nation's economy.

Fig. 2 illustrates the geography of administrative and auxiliary employment for the 50 largest urban-airport complexes in the United States for 1973 and 1996. In 1973, the top five urban-airport complexes in terms of total administrative and auxiliary employment included the New York–Newark area with a total of 188,000 administrative and auxiliary employees accounting for 6.3% of total employment in the area. By contrast, the second-placed Chicago area (which included both Cook and Dupage Counties, and O'Hare and Midway airports) generated approximately 176,000 administrative and auxiliary workers or 7.5% of total employment.

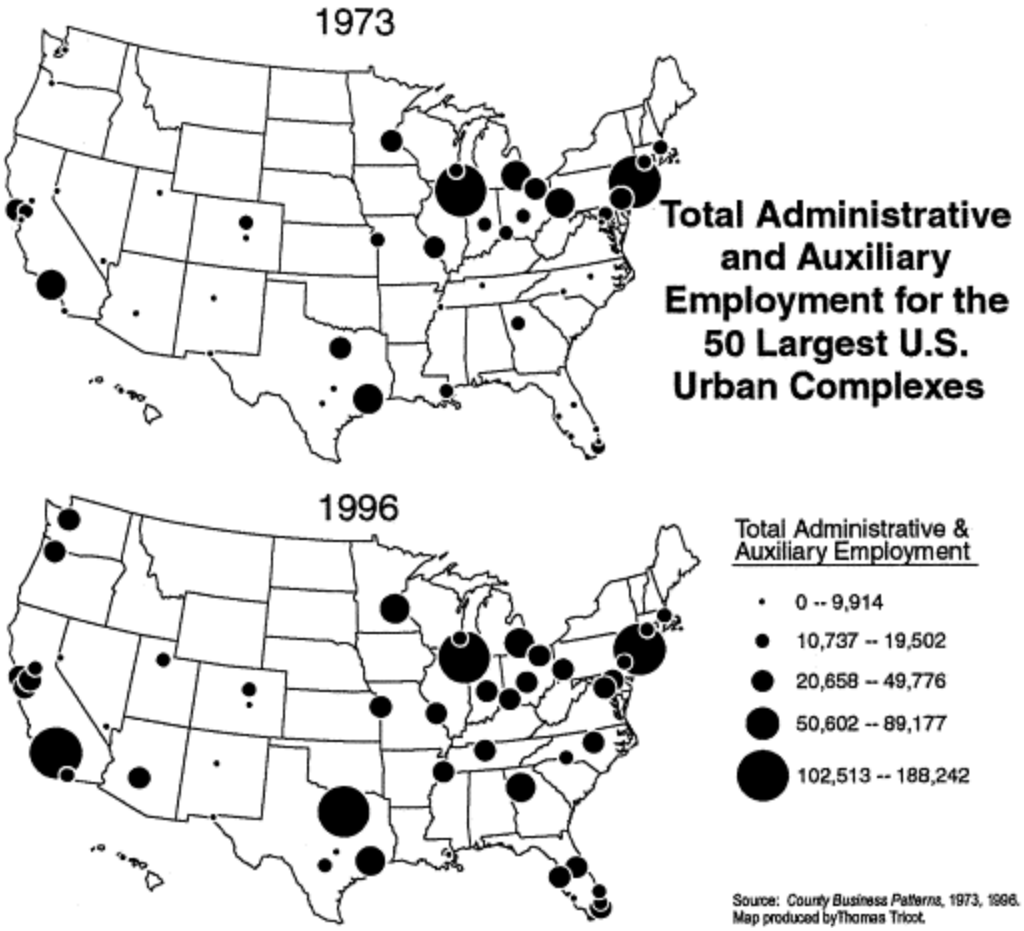

Fig. 2. Total administrative and auxiliary employment for the 50 largest US urban-airport complexes: 1973 and 1996.

Although one might expect the most heavily trafficked air passenger markets to have the largest total employment centers, this is not always the case as compared to the geography of the administrative and auxiliary hierarchy. For example, the third and fifth largest administrative and auxiliary employment markets in 1973 were the Detroit urban area (i.e., Wayne County) which generated 84,000 administrative and auxiliary employees and the Greater Pittsburgh area (i.e., Allegheny County) which generated approximately 57,000 equivalent workers. In both Detroit (9% of total employment) and Pittsburgh (10.4%), the administrative and auxiliary sector was proportionally more important to the local economy than it was for either New York (6.3%) or Chicago (7.5%). Furthermore, a noticeably greater proportion of the administrative and auxiliary workers in both Detroit and Pittsburgh were employed in manufacturing-related activities (i.e., 6.9 and 7.9%, respectively, compared to just 4% in New York and 2.9% in Chicago). However, neither Pittsburgh nor Detroit ranked in the 1973 top 10 in terms of air passenger volume suggesting that good air transport is not always required to attract industry to an area. Both Pittsburgh and Detroit developed single-sector propulsive industries early on in the 1900s (i.e., the steel industry and automobile production, respectively), and these industries were spatially

fixed, and thus, less likely to be influenced by changing levels of airline connectivity relative to more ‘‘footloose’’ industries. Furthermore, both the steel and automobile industry developed largely before the era where air transportation played such a critical role in shaping the growth of large, metropolitan economies.

By contrast, the Los Angeles urban area (described as Los Angeles, San Bernardino and Orange Counties in this study so as to include LAX, Ontario International, John Wayne Airport, and Hollywood-Burbank Airport) seemed to behave in a more conventional fashion in terms of its placement in the urban hierarchy. The Los Angeles area ranked fourth in both enplaned passenger volume (i.e., 9 million) and total number of administrative and auxiliary workers (i.e., 72,860 employees in 1973). However, the administrative and auxiliary sector played a less significant role in the highly diversified Los Angeles economy accounting for only 2.4% of total employment compared to 6.3% of all employment in the New York area.

Perhaps the most striking finding is the stagnant administrative and auxiliary sector in the Atlanta market (i.e., Clayton and Fulton County) relative to its third-placed ranking in terms of air passenger volume. In 1973, Atlanta ranked 13th in administrative and auxiliary employment generation with 18,834 workers (or 4.4% of total employment). Although the ‘‘new South’’ was to emerge in subsequent years, the Atlanta market did not appear to have a sufficiently skilled labor pool to generate a healthy number of administrative and auxiliary workers. Furthermore, much of the traffic base in Atlanta was reliant on connecting passengers, and thus, local originating traffic was not as significant as in other metropolitan markets. Such findings are a reminder that significant air passenger volume is not a guarantor of a prosperous regional economy, although things were about to change for Atlanta and other places.

In 1973, mean administrative and auxiliary employment levels for the 50 urban areas under study was 21,216 workers but this had increased in 1983 by more than 150% to an average of 33,803 workers by urban area. In 1983, the major employment centers for administrative and auxiliary workers remained New York and Chicago which hovered just under the 200,000 mark much like in 1973 even though both areas experienced significant increases in air passenger volume. Perhaps the most interesting departure from the employment hierarchy established in 1973 was the rapid rise of the Los Angeles urban area with a total of approximately 170,000 administrative and auxiliary workers in 1983 (compared to only 72,860 in 1973). It appeared that large, sophisticated urban agglomerations like New York, Chicago, and especially Los Angeles tended to attract additional economic activity through a process of circular and cumulative causation whereby economic growth in a region was essentially self-sustaining. Endogenous growth theorists have argued that a significant element of this accelerated growth process is

infrastructural investment. Consequently, the proliferation of both established and new airport operations in the Los Angeles area (e.g., LAX, Orange County/John Wayne Airport, Ontario International, and Hollywood-Burbank Airport) all seemed to act to exaggerate the competitive advantage of administrative and auxiliary establishments based in Los Angeles. However, the links between administrative and auxiliary employment levels and air passenger volume are not straightforward, especially given the stagnant administrative and auxiliary employment growth rates in New York and Chicago from 1973 to 1983, even though air passenger volume increased significantly in both cities over the same time period.

Additionally, the first signs of deindustrialization began to creep into the data set as Pittsburgh experienced a noticeable decline in administrative and auxiliary workers from 57,000 in 1973 to 44,500 in 1983 (a 22% decline). The decrease in administrative and auxiliary workers in Pittsburgh occurred even though air passenger volume increased from 3.6 to 5.5 million and US Airways (formerly Allegheny Airlines) began to develop a substantial hub operation out of the Pittsburgh Airport. Traditionally, the major propulsive industry in Pittsburgh has been the steel industry and related manufacturing industries. Employers in traditional industries like these tend to have a lower propensity to fly relative to ‘‘new economy’’ activities like information technology, electronics and various administrative and auxiliary functions where a premium is placed on face-to-face contact and collaboration. Some of this rationale may partly explain the discrepancy between rising air passenger volume and declining numbers of administrative and auxiliary workers in the Pittsburgh market. As the US Airways hub was developed in Pittsburgh, the proportion of connecting traffic began to rise such that much of the growth in passenger volume had little to do with events in the local economy. Meanwhile, the manufacturing-related administrative and auxiliary sector in Pittsburgh downsized and experienced a period of significant job losses.

Having said this, a significant proportion of administrative and auxiliary workers still tend to be engaged in manufacturing-related activities (commonly one-third of all such workers). Consequently, as America experienced significant manufacturing job losses between 1983 and 1996, the administrative and auxiliary sector experienced similar net declines, though to a lesser degree. By 1996, the mean administrative and auxiliary employment levels for the urban areas under study in this paper dropped slightly to 33,324 workers. The Los Angeles area had emerged as the leading employment center for administrative and auxiliary workers with nearly 160,000 workers, although the sector still only accounted for a small proportion of total employment (i.e., 3.2%).

In 1996, three emerging ‘‘hot-spots’’ of administrative and auxiliary employment were Atlanta (58,001), San Jose (49,776), and Seattle (47,778). Both San Jose and Seattle had only modest airport operations relative to the other urban areas under study, although American Airlines developed a mini-hub operation in San Jose during the late 1980s. Both Silicon-Chip Valley in San Jose and Microsoft in Seattle no doubt helped both regions to sustain above average administrative and auxiliary employment levels. In San Jose, 66% of all administrative and auxiliary employment were manufacturing-related — a national anomaly.

At a national scale, Fig. 2 reveals that the geographic distribution of administrative and auxiliary employment had spatially de-concentrated away from the traditional northeastern manufacturing belt for places in the sunbelt states (Atlanta, Dallas, Memphis, and Florida) and the West Coast (Los Angeles, Portland, Seattle, and San Jose). For example, from 1983 to 1996, Memphis gained approximately 27,000 administrative and auxiliary workers — a 250% increase on 1983 levels — and the highest percentage growth rate in the study. It is difficult not to conclude that the establishment of both the FedEx and Northwest Airlines hub operations in Memphis played some role in triggering this employment growth.

Although a cursory examination of Fig. 1 and Fig. 2 seem to indicate that the geographic changes in air passenger volume mimic corresponding changes in administrative and auxiliary employment levels over time, the experiences in Atlanta, Pittsburgh and other places raise concerns about the systematic nature of this relationship.

To overcome some of these concerns, a Pearson's Product Moment Correlation Coefficient was calculated between the two variables with the assumption that as air passenger volume increases, administrative and auxiliary employment levels will increase in a similar fashion. The correlation coefficient was significant at the 1% level for all 3 years under study (i.e., 1973 — 0.84, 1983 — 0.83, 1996 — 0.83). The high, stable and positive correlation coefficients suggest that a strong and predictable linear relationship exists between air passenger volume and administrative and auxiliary employment over time. A visual inspection of the scatter diagram for 1973 (Fig. 3) illustrates the dominance of New York and Chicago and the vitality of manufacturing cities like Detroit and Pittsburgh. Atlanta stands out as an anomaly because it has been unable to generate administrative and auxiliary employment opportunities at the rate expected for the volume of air passengers generated by Atlanta Hartsfield Airport. The corresponding scatter diagram for 1996 (Fig. 4) suggests that the hierarchy of administrative and auxiliary employment centers appeared relatively stable, although the rapid ascendancy of select ‘sunspots’ in the Sunbelt and West Coast was apparent (e.g., Dallas-Fort Worth, Houston, Los Angeles, and San Jose). The changing competitive landscape in the airline industry during the post-deregulation era and the

evolution of new fortress hub-and-spoke systems in places like Dallas (American, Delta, and Southwest Airlines) and Houston (Continental Airlines) may partly account for the significant employment gains in these metropolitan areas.

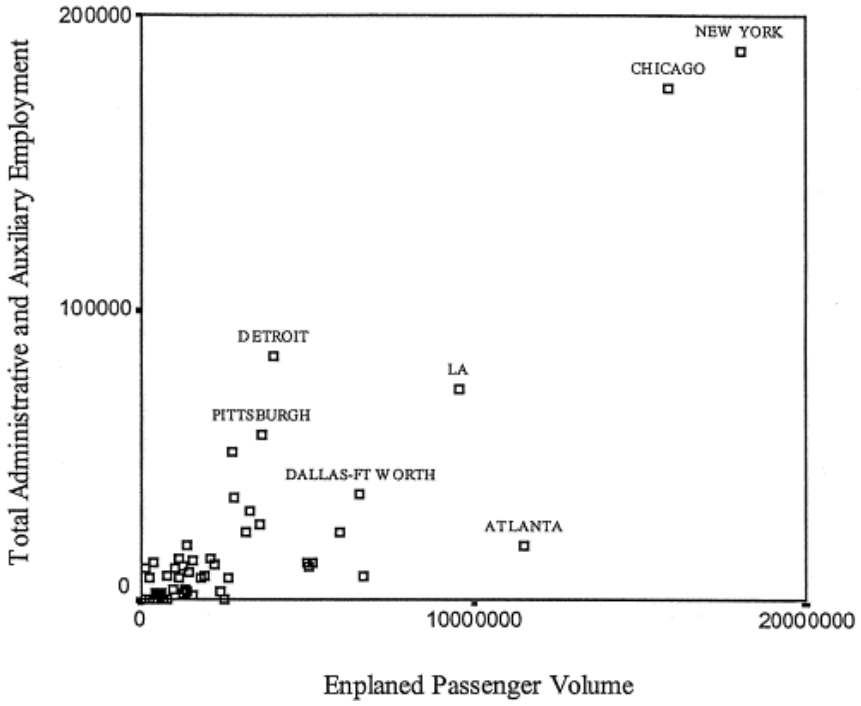

Fig. 3. Scatter diagram of air passengers and employment by urban-airport complex, 1973.

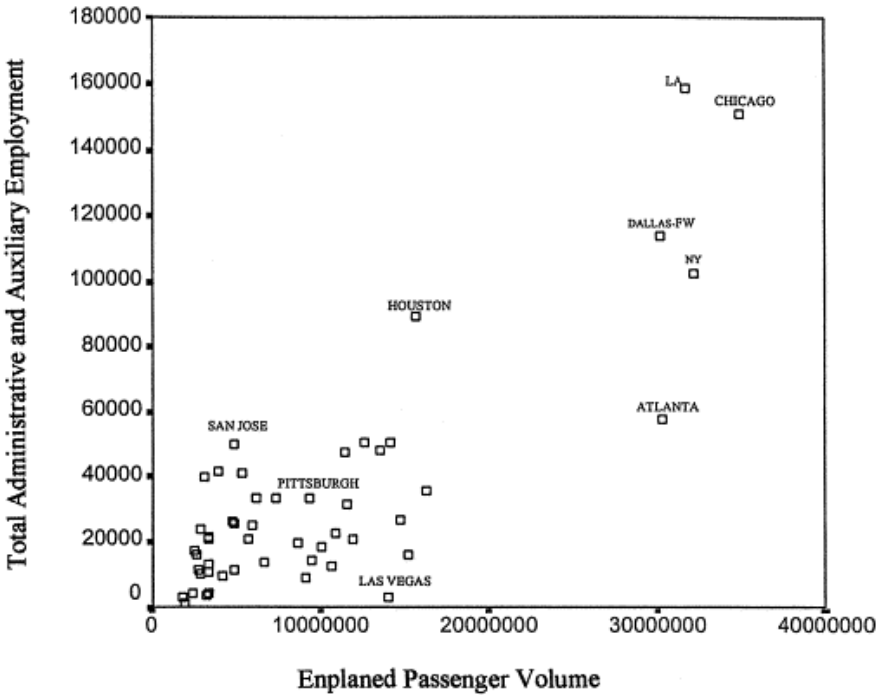

Fig. 4. Scatter diagram of air passengers and employment by urban-airport complex, 1996.

However, although activity at any airport are closely connected to the complex web of urban and regional economic activity surrounding the airport region, the case of Las Vegas highlights the difficulties encountered when making generalizations on causality. Although the Las Vegas airport handled almost 15 million passengers in 1996, it generated far fewer administrative and auxiliary workers than expected. Some of the explanation may lie with the substantial tourism companies and hotel/casino complexes that dominate the local economy. Although the tourist economy in Las Vegas generated a substantial volume of visitors by air, it failed to spin-off a significant number of additional employment opportunities, hence the negligible manufacturing-based administrative and auxiliary sector in Las Vegas.

5. Conclusion

The initial findings in this paper seem to confirm some of the earlier suppositions put forth by Debbage (1999), Button and Lall (1999), Button et al. (1999), Button and Taylor (2000), Goetz (1992), Irwin and Kasarda (1991), and Ivy et al. (1995). Statistically significant links exist between air transportation and economic development, particularly as measured by the ability of certain metropolitan areas to generate employment opportunities in those sectors of the economy that stimulate unusually high propensities to fly due to the crucial importance of face-to-face contact and direct collaboration.

As administrative and auxiliary-related jobs and industries shifted away from the traditional manufacturing centers of the Northeast and Midwest to the South and West, the air transportation network appeared to experience a similar geographic shift as it broadened into a more deconcentrated air transportation network system. The findings in this paper also suggest that while a turbulent ‘‘job-churn’’ created a dramatically different geography of both employment and air passenger volume by place, the two variables were closely linked over time. Air passenger volume behaves much like airline connectivity in mimicking the administrative and auxiliary employment hierarchy of the largest metropolitan markets of the United States and the connections between the two variables appear to be remarkably stable over time. Left unanswered is the thorny ‘‘chicken or egg’’ issue — this paper made no attempt to unravel the complex casual links that may exist between administrative and auxiliary employment and air passenger volume, although considerable evidence exists to suggest that air transportation services can directly influence employment levels in this sector of the economy.

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