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It has been suggested that certain sectors of employment play a key role in stimulating air passenger enplanements, one of these being the creative class. It is hypothesized in this thesis that there will be a positive correlation between the creative class and passenger enplanements by metropolitan area, with a specific focus on the super-creative core. Certain sectors of the super-creative core, such as computer and mathematical occupations, are expected to more significant role than others in fueling passenger air traffic. However, this thesis also recognizes that it is possible that key control variables will replace super-creative core employment as being important for driving passenger air traffic. Moreover, it is also hypothesized that the above relationships will diminish during the 2009 recession, but rise again during the post-recession era. The data for this analysis was collected from the Federal Aviation Administration, the US Bureau of Labor Statistics, and the US Census for the years 2008 through 2013. While the regression showed only the beginnings of a relationship between passenger enplanements and the super-creative core, it was discovered that arts, entertainment, sports, and media occupations was the key sector of the super-creative core in relation to air passenger enplanements. However, for four out of six years, the control variable of average annual wage was most important to this relationship. The 2009 recession appeared to play a role in the aforementioned correlations as well.

CREATIVE CLASS EMPLOYMENT

AND PASSENGER AIR TRAFFIC

BY MSA: 2008-2013

by

Erin Elisabeth Klinger

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CHAPTER I

INTRODUCTION

Air travel is one of the fastest-growing forms of transportation in the United States. According to the Federal Aviation Administration (FAA), there were a total of over 712 million passenger enplanements in the FAA-defined large, medium, and small airport hubs in 2013 alone (Federal Aviation Administration, 2013). For example, total passenger enplanements increased 2.95 percent from 2013 to 2014, whereas from 2012 to 2013 the percent increase was only 0.97 percent (Federal Aviation Administration, 2014; Federal Aviation Administration, 2013).

Airports are also a critical factor for determining a city's economic growth potential. According to Cidell (2006), the economy of a city will grow substantially when air travel is a substantive part of the local economy. Furthermore, Cidell (2006, p.3) argues that "the more passenger boardings an airport has, whether originating in that city or transferring, the greater the population and economic growth of that city." For example, Chicago's O'Hare Airport, one of the largest in the United States, generated an additional 290,205 jobs at the airport alone, with almost 700,000 supplementary jobs generated in the city's central business district (Cidell, 2006). Brueckner (2002) also discovered a positive relationship existed between enplanements and economic growth, finding that for every 10 percent increase in passenger enplanements in a metropolitan area, employment in service-related industries rose approximately 1 percent as well.

Given the positive correlations found in prior research, it makes sense that when the economy floundered in the Great Recession of 2009, enplanements dropped significantly as well. In 2008, prior to the recession, total passenger enplanements numbered nearly 712 million and the average unemployment rate was 5.8 percent (Federal Aviation Administration, 2008; Bureau of Labor Statistics, 2015). However, in 2009, during the peak of the recession, enplanements had dropped significantly to approximately 674 million, a decrease of over 37 million passengers, while the unemployment rate had risen substantially to an average of 9.3 percent nation-wide (Federal Aviation Administration, 2009; Bureau of Labor Statistics, 2015). In addition, following the recession, when the unemployment rate slowly began to decrease, enplanements began a gradual increase as well. For example, in 2011, total enplanements had risen again back to over 700 million, and the unemployment rate had decreased slightly to an average of 8.94 percent (Federal Aviation Administration, 2011; Bureau of Labor Statistics, 2015). It is for this reason that the years under consideration in this thesis are 2008 to 2013, allowing for a complete examination of the effects the recession may have had on this relationship.

Much like air travel, the creative class represents the most rapidly expanding employment sector in the United States. At its core, the creative class includes those employed in science, architecture, and education, among other fields, while also encompassing a broader group of creative professionals employed in finance, law, and the like (Florida, 2011). Even during times of economic downturn, such as the recent recession, the total number of creative workers increased in size, particularly when

compared with their counterparts in the working and service classes. According to Florida (2011), the creative class grew by 2.8 million workers (7.2 percent) from the years 2001 to 2010. Comparatively, the number of employees in the working class decreased by approximately 6 million workers (20 percent) over this same time period (Florida, 2011). These upsurges raise the idea that the creative class might constitute a significant portion of urban economic growth. Thus, cities might be curious as to how and why creative workers flock to and inhabit any given place.

Therefore, this thesis will investigate whether or not a connection exists between creative class employment and passenger enplanements for airport hubs defined as large, medium, or small by the FAA from the years 2008 to 2013. In particular, creative class employment is analyzed for 106 different metropolitan areas for each of the six years under consideration. It is hypothesized that there will be a positive correlation between super-creative core employment and air travel, and that certain sectors of the super-creative core – such as computer and mathematical occupations – will have a more compelling relationship with air passenger enplanements. However, it is also possible that key "control" variables – included to account for the larger economic base beyond creative class occupations – will replace super-creative core employment as important for stimulating enplanements. It is also expected that these relationships will diminish during the Great Recession but then demonstrate an increase during the post-Recession era. The goal of this thesis will ultimately be to expand upon the current research being conducted on the correlations that exist between economic development and passenger air traffic.

CHAPTER II

LITERATURE REVIEW

2.0. Air Travel and Economic Development.

The presence of an airport can be a compelling predictor of economic growth in an area. The relationship between air traffic and economic development has been found to be statistically significant across several studies. (Cidell, 2006; Brueckner, 2003; Green, 2007; Irwin & Kasarda, 1991; Debbage, 1999). Cidell (2006), for example, states that as passenger boardings at an airport increase, so too will the economic growth and population of that airport's city – regardless of whether the air traffic is comprised of originating or connecting passengers. Brueckner (2003) found that higher levels of air traffic are associated with increased employment levels and the attraction of new firms to a metropolitan area. Furthermore, Green (2007) discovered that both passenger boardings and passenger originations per capita for the largest metropolitan areas in the United States were significant indicators of population and employment growth in those regions.

Irwin and Kasarda (1991) analyzed the effects of a rapidly changing air transport system – during a period of emergent air traffic – on metropolitan employment growth in the United States. They discovered that increased and differing airline centrality across the time period under consideration demonstrated similar effects on employment growth (Irwin and Kasarda, 1991). While it could also be possible that increased employment

growth led to increased airline centrality, rather than the other way around, results demonstrated that this was not actually the case.

Debbage (1999) offered two further explanations for why passenger air traffic can impact the economy. First, additional economic development can be spurred by the airport itself as a result of facility construction and employment creation (Debbage, 1999). Second, a region's economy can also be affected by the air route network. Moreover, due to an "increased emphasis on just-in-time inventory and … the rapid transportation of small quantities of high-value goods" high quality air service is important for regional economies as well (Debbage, 1999, p. 212).

Ivy et al. (1995) examined reasons why different types of firms might choose to locate in one area over another. Their research showed that the nonstandard activities of a firm (such as research and development and marketing) are typically located in metropolitan areas due to the unique sets of labor skills that are often found in such places (Ivy et al., 1995). In these types of firms, face-to-face interaction is important. This is as opposed to manufacturing or labor-intensive operations, where the employment centers are often located in nonurban or peripheral areas (Ivy et al., 1995). The reason firms locate in this manner is because "metropolitan areas provide firms with … professional workers, a wide variety of suppliers, services, and information … [and] airports with frequent air service to a large variety of destinations. Access to a large number of destinations facilitates face-to-face interaction and helps satisfy corporate travel needs" (Ivy et al., 1995, p. 167). Firms often locate so as to have access to nearby transportation facilities, which includes airports as mentioned above.

This is particularly true in businesses that rely heavily on the face-to-face exchange of information.

2.1. Air Travel and the 2009 Recession.

If air traffic is an important part of economic development, then it would stand to reason that a drastic event such as the recent Great Recession would have significant consequences for this relationship. One of the effects the recession had was a significant decrease in overall passenger air traffic. In North American and European airports, the recession led to a 5 percent drop in 2009 passenger air traffic; and in the United States alone, airports handled 5.3 percent fewer passengers in 2009 than they did in 2008 (Buyck, 2010). Between 2008 and 2009, when the economy was at its lowest point, airlines in the United States had lost 32 million domestic passengers (Buyck, 2010). This decline was the worst seen since World War II (Franke & John, 2011).

Pearce (2012) examined the condition of the airline industry subsequent to the 2009 recession. Developed countries such as the United States were the slowest to rebound following the drastic economic downturn. Since air passengers originating from developed countries are relatively important for air travel as a whole, the increased rebound time shown in places like the United States factors in to how air transport markets have recovered worldwide post-recession (Pearce, 2012). Furthermore, the recent economic collapse has been referred to as a "balance-sheet" recession, where debt and decreased value of assets led to drops in consumer spending and bank lending (Pearce 2012).

"Balance-sheet" recessions such as this one often have a long-lasting impact on air travel by virtue of their definition.

When economic growth is hindered from recovery following a recession, a slow growth in air travel will result as well. Not only was the entirety of the economy in countries like the United States left in distinct disequilibrium due to the recession, people's individual finances remained in disarray as well. Like the rest of the economy, households too lingered in a state of balance-sheet disequilibrium due to a combination of debt accumulation and asset price collapse (Pearce, 2012). This volatility, in turn, did not leave much discretionary income for individuals to spend on air travel.

Due to a combination of the factors mentioned above, the air freight market was the first to rebound following the recession. International Freight Tonne Kilometers (FTKs) by air began to rise from their low point several months before the rest of the world's economy, a pattern that is typical of periods after a recession (Pearce, 2012). Air travel, on the other hand, did not recover until well after air freight had done so, which again, is a sequence of events that often transpires following economic downturns because of decreased discretionary spending. Premium air travel was more severely affected – falling by 25 percent – and took longer to recover than did economy travel, mainly as a result of the higher cost of a business or first class seat (Pearce, 2012; Dobruszkes & Van Hamme, 2011). While economy travel did fall by 10 percent during its lowest point, it had fully recovered to its pre-recession level by March 2010 (Pearce, 2012). Economy fares also showed a 10 percent decrease during the recession. The recession also caused airlines to experience a 14.4 percent decrease in revenues which

lead to a $9.9 billion overall loss (Buyck, 2010). Passenger load factors also decreased significantly during the recession due to a collapse in demand. However, airlines were able to use capacity cuts to cause a rebound above pre-recession levels for passenger load factors, and this rehabilitation continued after demand had risen again in the later months of 2009 (Pearce, 2012).

While airlines may still seem to be showing the effects of the recession, the situation appears to slowly be improving. Cash flows increased during 2010 and the economic situation for airlines has recently improved (Pearce, 2012). Economic bailouts from the government for banking institutions helped to stimulate the economy, which in turn also aided the recovery of air travel since there was more unrestricted money to be spent. Surprisingly, after the recession, air travel began to rise back to pre-recession levels only a year and a half after the low point of the recession in early 2009 (Pearce, 2012). The first half of 2010 even began to see a slow increase in overall passenger air traffic (Buyck, 2010). For example, midway through 2011, revenue passenger miles had risen 2.9 percent, and average total yield exhibited a slight increase as well (Karp, 2011). Furthermore, major airlines finally started to see a profit again in the second quarter of 2011 (Karp, 2011).

2.2. Employment and Air Travel.

In order to more thoroughly examine how air travel can affect the economy, and vice versa, it is necessary to narrow the discussion of the economy and air travel to look at specific sectors of employment. Different classes of employment will have varying

travel patterns from others. For example, people employed in the high-technology sector will display a higher propensity to fly than those in the services sector. This type of pattern has also been seen with administrative and auxiliary employment as well as with professional, scientific, and technical employment. These patterns can often be attributed to these sectors possessing a greater need for face-to-face contact with other employees.

Irwin and Kasarda (1991) examined how airline centrality relates to employment in the manufacturing industry as well as to producer services. Prior to airline deregulation, airline centrality was connected with regions that were known centers of manufacturing. However, when industry experienced a shift from the so-called "Frostbelt" regions to "Sunbelt" regions, airline centrality did as well, demonstrating that air traffic has a tendency to concentrate in areas where employment is located (Irwin & Kasarda, 1991). Airline centrality was also positively correlated with increased employment in producer services (Irwin & Kasarda, 1991).

Brueckner (2003) hypothesized that heightened levels of enplanements would affect employment in a metropolitan area in the same year, rather than in successive years. As expected, metropolitan areas with a hub airport experienced greater degrees of air traffic. Results also showed that increased air traffic exhibited a substantial effect on total employment in a metropolitan area. A 10 percent rise in air traffic advanced total employment by nearly 1 percent (Brueckner, 2003). This correlation allows one to infer that more sizable levels of enplanements will thus attract new employment to a metropolitan area and encourage established firms to increase their employment shares as well. However, when narrowing the focus to analyze just goods-related employment,

Brueckner (2003) discovered that air traffic did not show a significant effect on employment in this sector of the workforce. This is most likely because these workers possess less of a need for face-to-face contact than those employed in other industries. On the other hand, air traffic did seem to affect employment in the service industry. Brueckner (2003) found that a 10 percent increase in air traffic would cause employment in service-related industries to rise by 1.1 percent.

Debbage and Delk (2001) analyzed the relationship between administrative and auxiliary employment and air travel. As many business people must fly for work, it stands to reason that there would be a close connection between business location and air traffic. Included in this generic class of "business people" are those employed in information technology (IT), biotechnology, and the aforementioned administrative and auxiliary sector. As one might expect, those employed in IT and the biotech industry are more likely to fly than those employed in more traditional industries (Debbage & Delk, 2001). Furthermore, administrative and auxiliary employees are also more likely to fly than others. This could prove to be important because some of the fastest-growing cities economy-wise have an inordinately large share of administrative and auxiliary employment (Debbage & Delk, 2001).

Debbage and Delk (2001) confirmed the above relationship between administrative and auxiliary employment and air travel. Their analysis demonstrated that there is a strong correlation between administrative and auxiliary employment and air passenger traffic that stays predictable over time (Debbage & Delk, 2001). Generally, increased air traffic will lead to a similar rise in administrative and auxiliary employment;

however, employment does not necessarily require air travel in order to be attracted to a particular area (Debbage & Delk, 2001).

Ivy et al. (1995) also analyzed the relationship between growth in air transportation and the expansion of administrative and auxiliary employment. They discovered that a change in air connectivity will lead to a change in administrative and auxiliary employment, rather than the other way around – i.e. a change in employment leading to a change in air connectivity (Ivy et al., 1995). A two-fold explanation for the above findings was offered. Increased connectivity could make a location more desirable to firms wishing to establish their companies there; however, increased employment could also lead to a rise in demand for greater air connectivity (Ivy et al., 1995). These increases in connectivity were particularly apparent in metropolitan areas where an airport hub is present, such as Charlotte, North Carolina; Minneapolis-St. Paul, Minnesota; and Atlanta, Georgia (Ivy et al., 1995). However, this relationship could be influenced by other factors, such as the position of the city in the air service network or status as an airport hub (Ivy et al., 1995).

Debbage (1999) looked at how the economy had developed since airline deregulation – with an emphasis on administrative and auxiliary employment – in the US Carolina region. His findings indicated that as the economy in the US Carolinas shifted from manufacturing to high-technology employment, the propensity of workers to fly increased (Debbage, 1999). Increased connectivity in the Carolinas, in particular due to the presence of hub airports in the region, caused an increase in professional employment levels. Notably, as hub operations in North Carolina developed, the counties in which the

hub airports are situated have significantly increased their total amount of professional workers when compared to the rest of the state, with five counties containing two-thirds of the state's entire administrative and auxiliary workforce (Debbage, 1999). Specific examples were given of Charlotte Douglas (currently a hub for American Airlines/the former US Airways) and Raleigh-Durham International (formerly a hub for American Airlines) airports. Administrative and auxiliary employment grew in Charlotte as the city was developing itself as a hub for US Airways circa 1995, nearly doubling to 5360 administrative and auxiliary employees in a 12-year time period (Debbage, 1999). Moreover, the rapid increase in air traffic at Raleigh-Durham International Airport in the same time frame led to a similar increase in administrative and auxiliary employment, which can be seen in particular in the region's Research Triangle Park (Debbage, 1999). Overall, locations with increased air connectivity and passenger air traffic also showed heightened levels of administrative and auxiliary employment.

Button et al. (1999) examined how high-technology employment is related to hub airport location. Hub airlines (such as Delta or American Airlines) tend to target business passengers due to their decreased sensitivity to changes in ticket fares. However, while less fare sensitive, business travelers still have higher demands for other quality of service factors that are typified by a hub airport, such as a proliferation of direct, non-stop flights to a wide variety of destinations. It was thus hypothesized that hub cities would demonstrate increased economic performance over their non-hub counterparts because of the increased presence of business travelers, in particular those in the high-technology sector (Button et al., 1999). Their findings indicated that those employed in the high-

technology sector fly 1.6 times as often as those employed in other industries, which has a lot to do with the amount of face-to-face interaction needed to conduct everyday activities (Button et al., 1999). Furthermore, the presence of a hub airport in a metropolitan statistical area (MSA) explains any variations in high-technology employment at a statistically significant level (Button et al., 1999). In simpler terms, the presence of a hub airport increases high-technology employment in that region by over 12,000 total jobs (Button et al., 1999).

Case studies of four different airports were conducted for further analysis. These included Cincinnati-Northern Kentucky International Airport, a hub for Delta Airlines; Pittsburgh International Airport, a hub for US Airways; and Nashville and Milwaukee airports, both considered non-hubs. Button et al. (1999) discovered that high-technology employment had grown even more in the two study areas with hub airports. Thus, if a city is a hub for an airline, it will most likely attract more high-technology employment than does a similar non-hub city. Moreover, the relationship between economic development and air traffic tended to be greater for cities with an airport hub than it does for cities without one (Button et al., 1999).

Liu et al. (2006) sought to determine the characteristics of a metropolitan area that best determine where major air traffic markets will locate. As expected and as has been found in other research, the spatial distribution of the major air traffic markets and the spatial distribution of the largest populated metropolitan areas are closely related. Moreover, the largest air traffic markets also have a greater percentage of workers employed in professional, scientific, and technical (PST) services and information

technology (Liu et al., 2006). After using a logistic regression to determine the relationship between all the variables, Liu et al. (2006) discovered that for every 1 percent increase in PST services and management sector activities, the likelihood that a metropolitan area will have a major air traffic market will increase by 194 percent. However, less populous areas such as San Jose, CA – where Silicon Valley is located – demonstrate a higher propensity to fly and a greater probability of having a major air traffic market despite the fact that the city was not one of the largest metropolitan areas included in the study. This is most likely due to the abundance of skilled workers located there who necessitate a greater amount of face-to-face contact in their everyday work (Liu et al., 2006).

Alkaabi and Debbage (2007) examined the relationship between PST and high-technology employment and passenger enplanements in metropolitan areas with a FAA-defined hub. Previous research has suggested that increased connectivity will lead to a similar rise in employment growth, leading to the assumption that a rise in demand for skilled workers will cause a similar rise in demand for air travel. Alkaabi and Debbage (2007) held a similar hypothesis to the above, believing that as the number of passenger enplanements grew, so to would employment share in both the PST and high-technology employment sectors. The findings indicated that metropolitan areas with a low number of passenger enplanements typically had similarly low numbers of PST firms, while metropolitan areas with higher numbers of enplanements consistently had a larger number of PST firms, with expected outliers such as New York and Chicago (Alkaabi & Debbage, 2007). These results show a significant relationship exists between passenger

enplanements and the number of PST firms in a metropolitan statistical area (Alkaabi & Debbage, 2007). However, the above relationship was not always true for each of the metropolitan areas under consideration. For example, in hub airports such as Atlanta's Hartsfield-Jackson International Airport and Dallas's Dallas-Fort Worth and Love Field airports, much of the passenger traffic is connecting traffic, and PST employment levels were lower than expected, which implies that airports with a greater percentage of the overall total enplanements may not always create a larger number of PST firms (Alkaabi and Debbage, 2007). This points to the idea that the relationship between passenger enplanements and PST employment is not always clear cut. A similar relationship existed between high-technology firms and passenger enplanements. While the correlation was not as strong as that for PST employment, a strong connection did still persist between the two.

The linkage between percentage of PST employment and passenger enplanements was comparable to that found between the number of PST firms and air traffic. Metropolitan areas with a lower number of enplanements often have a lower percentage of PST employment, and vice versa (Alkaabi and Debbage, 2007). Areas such as Huntsville, Alabama (where a major NASA facility is located) and Albuquerque, New Mexico (home to the University of New Mexico as well as several other important PST firms) stood out as outliers since they produced a large number of PST workers despite having low air passenger demand (Alkaabi and Debbage, 2007). Like with the number of PST firms and passenger enplanements, a significant relationship also existed between passenger air traffic and the percent of PST employment (Alkaabi & Debbage, 2007).

However, the relationship between the percent of high-technology employment and air traffic was not as strong, which is most likely due to the total number of high-technology workers being fewer and thus less able to "fundamentally shape the metropolitan economy or overall air transport demand" (Alkaabi & Debbage, 2007, p. 129).

Levi (2015) also examined the relationship between PST employment and passenger enplanements, looking in particular at the years 2009 and 2012 as well as any changes that may have occurred between the two years. As expected from previous research, areas such as Atlanta, Chicago, and Dallas-Fort Worth had a higher share of air passengers than others, due to their status as airline hubs (Levi, 2015). However, only one of these cities – Atlanta – was ranked in the top ten for share of overall PST employment in 2012 (Levi, 2015). Moreover, Atlanta was able to maintain its share of PST employment from 2009 to 2012, suggesting that the increased connectivity the area experiences due to its status as Delta Airlines' largest hub airport may lead to an increased share of overall PST employment. Other areas that maintained their share of PST employment over the three-year time period included Washington, DC; San Francisco, CA; and Huntsville, AL (Levi, 2015). Since these areas were able to sustain their overall percentage of PST employment following the Great Recession in 2009, it is possible that the industries encompassed by the PST sector are more resilient during times of economic downturn than others (Levi, 2015).

After executing a multiple regression analysis on the dependent variable of total enplanements for 2009, Levi (2015) found that "for every additional 1000 workers employed in PST service jobs, an additional 94 enplaned passengers could be expected

(p. 38). Moreover, the dispersion of PST employment was similar to that for total enplanements, with higher amounts of workers located in the BosWash megalopolis area in the Northeast United States and in the San Francisco and Los Angeles areas in the west (Levi, 2015). The 2012 regression model was similar to that for 2009. Here, Levi (2015) discovered that "for each additional 1000 PST workers, an additional 117 enplaned passengers could be expected", an increase of 23 passengers from 2009 (p. 42). Like in 2009, the locations of PST employment and passenger enplanements were closely related. Additionally, areas of substantial PST employment did not change significantly from 2009 to 2012, with the exception of slight increases in the San Francisco and Atlanta areas (Levi, 2015). These areas also increased their total enplanements during the three-year time span. The models for the two years were complementary, suggesting that the PST sector is able to maintain its strength, even during times of diminished economic activity. Overall, an increase in PST workers in an area led to an increase in passenger enplanements for an area, suggesting that PST workers are a "driver of economic growth" (Levi, 2015, p. 51).

Although a significant amount of literature exists connecting air passenger demand to the PST and high-technology sectors, it is less clear if the relationship endures when examining that part of the labor pool that Richard Florida at the University of Toronto coined the creative class. The thesis will now turn to a full discussion of these potential connections.

2.3. Air Travel and the Creative Class.

As previously mentioned in the Introduction, the creative class encompasses both a core of workers employed in "science and engineering, architecture and design, education, arts, music, and entertainment" as well as a more extensive group of creative professionals employed in "business and finance, law, health care, and related fields" (Florida, 2011, p. 8). According to Florida (2011), the core of the creative class can bolster the economy by generating new creative content, ideas, and technology; while the function of the creative professionals is to solve problems that necessitate high levels of education and capital. The creative class is distinct from other employment sectors, such as the service and working classes, in one primary manner. Those employed in the service and working classes are "paid to do routine, mostly physical work, whereas those in the creative class are paid to use their minds – the full scope of their cognitive and social skills" (Florida, 2011, p. 9). Creative workers tend to be more mobile than others and are heavily concentrated in metropolitan areas, with some cities retaining a greater number of creative workers than others. Areas like San Jose, California – the location of Silicon Valley – and Raleigh-Durham, North Carolina – home of the area's Research Triangle Park – are examples of regions where a higher than normal number of creative class members are located (Florida, 2011).

In recent years, cities have begun to focus on how to create job opportunities involving the creative class rather than on opportunities for the manufacturing sector as has previously been the case. Neal (2012) sought to answer a question that has long been targeted in the literature: that of whether people follow jobs or vice versa. However, his

research differed from prior studies in two key ways. First. Neal (2012) focused solely on creative, rather than total, employment, reflecting the recent trend towards the creation of job opportunities for the creative class. Furthermore, he chose to use air traffic as his explanatory variable over population, which allows for a better explanation of answering the question of do jobs follow people, or do people follow jobs (Neal, 2012). Thus, the central question of Neal's research becomes whether air passengers follow creative jobs, or rather the reverse.

It should come as no surprise that, in general, cities with higher levels of air traffic often have more employment opportunities. Typically, employment has been found to follow air traffic, suggesting that regions could use air traffic as a way to increase economic growth (Neal, 2012). Since the creative class is a unique group that differs from traditional employment sectors, such as manufacturing and services, in several key ways, it is important to examine how this unparalleled sector of workers uses the air transport system.

Neal (2012) offered two hypotheses that might explain the relationship between air traffic and the creative class. The first, the flow generation hypothesis, suggests that increased opportunities for creative employment will generate increased levels of air transport flows (Neal, 2012). These enhanced enplanements typically occur because several different groups of passengers each have their own relationship with the creative economy, such as tourists and consumers of creative products (Neal, 2012). The flow generation hypothesis thus specifies that air passengers will follow creative jobs. On the other hand, the structural advantage hypothesis states that areas with increased levels of

air traffic provide a key environment in which creative jobs are able to flourish (Neal, 2012). This is because large numbers of people entering a city are able to provide three key resources – consumers, information, and workers – that are necessary for sustaining creative activities in that particular location (Neal, 2012). Thus, the structural advantage hypothesis is the reverse of the flow generation hypothesis and articulates that creative employment follows air traffic.

Neal's (2012) analysis examined a portion of Florida's creative core – arts, design, entertainment, sports, and media occupations – and their relationship with passenger air traffic. His findings initially indicated support for the flow generation hypothesis; however, this relationship varied from year to year. For example, in 2003, for every new creative job in a city, 11.3 additional air passengers were generated; yet in other years, air traffic actually decreased when more creative jobs were introduced (Neal, 2012). The same held true for the structural advantage hypothesis.

Upon further examination, the effects of the two hypotheses were found to be inversely related. When additional air traffic was attracted to an area by creative employment, the reverse was not true; and when creative jobs were enhanced by further air traffic, the opposite was not true either (Neal, 2012). The question of what could possibly be causing this inverse relationship was thus raised. One key explanation could be the state of the economy. When the economy of the nation was in a period of downturn was also when creative employment drew additional air traffic to a city (Neal, 2012). Therefore, air passengers may only seek out creative jobs in times of economic distress. Similar results were found regarding the structural advantage hypothesis (Neal, 2012).

Air traffic increased creative employment only when the economy was in a period of growth (Neal, 2012). Hence, creative workers only follow air traffic during times of economic prosperity. The above findings suggest that the economy is the key force explaining the relationship between employment and enplanements. Each of Neal's (2012) hypotheses was supported during different economic periods. Not only did air traffic follow creative employment, but the reverse was also found to be true. The two processes were both significant, just at different times (Neal, 2012). I will now turn to a fuller discussion of the methods utilized in this thesis.

CHAPTER III

RESEARCH DESIGN

Previous literature indicated that a relationship exists between passenger enplanements and creative class employment, as well as between enplanements and other sectors of employment. The purpose of this thesis then is to expand upon the research started by Neal (2012) to look at whether employment in Florida's (2011) super-creative core is systematically related to passenger enplanements. It is hypothesized that:

- H1 – Employment in the super-creative core is positively related to total air passenger enplanements.
- H2 – Certain sectors of the super-creative core, e.g. computer and mathematical occupations, will have a stronger relationship with air passenger enplanements.
- H3 – Key control variables may be of greater importance in stimulating air passenger enplanements than super-creative core employment.
- H4 – The above relationships will decrease during the Great Recession but increase again during the post-Recession era.

Passenger enplanement data will be collected for large, medium, and small hub airports for the six years from 2008 to 2013, based on the Federal Aviation Administration's (FAA) hub classification system for the airports that are included in

these categories for the aforementioned years (Table 3.1.1). Information for non-hub airports will not be included in the data set for this thesis. Total passenger enplanements are defined as the total number of revenue passengers boarding an aircraft, including originating, stopover, and transfer passengers.

Table 3.1.1. Federal Aviation Administration Hub Definitions

Large Hub	1% or More of Total Air Traffic in U.S.
Medium Hub	At least 0.25% but less than 1% of Total Air Traffic in U.S.
Small Hub	At least 0.05% but less than 0.25% of Total Air Traffic in U.S.
Non-Hub	Less than 0.05% of Total Air Traffic in U.S.

Each metropolitan area will contain at least one airport. Enplanement data was combined in cases where a metropolitan area was host to more than one airport. For example, the Dallas-Fort Worth metropolitan area included both Dallas-Fort Worth International and Dallas Love Field Airport. For a full list of these combined metropolitan areas, refer to table 3.1.2.

Total employment data will be collected from the U.S. Bureau of Labor Statistics' *Metropolitan and Nonmetropolitan Area Occupational Employment and Wage Estimates* for each of the 106 metropolitan areas. The chosen sectors comprise what Florida (2011) called the "super-creative core."

Table 3.1.2. List of Combined Metropolitan Areas and Airports.

Metropolitan Area	Cities Included	Airports Included
Los Angeles, CA	Los Angeles, Burbank, Long Beach, Ontario, Santa Ana/Anaheim	LAX, BUR, LGB, ONT, SNA
San Francisco, CA	San Francisco, Oakland	SFO, OAK
Washington, DC	Washington, DC, Alexandria, VA, Baltimore, MD	IAD, DCA, BWI
Orlando, FL	Orlando, Sanford	MCO, SFB
Tampa, FL	Tampa, Clearwater	TPA, PIE
Chicago, IL	Chicago	ORD, MDW
New York, NY	New York City, White Plains, Islip, Newark, NJ	JFK, LGA, EWR, HPN, ISP
Dallas, TX	Dallas, Ft. Worth	DFW, DAL
Houston, TX	Houston	IAH, HOU
Virginia Beach, VA	Virginia Beach, Newport News, Norfolk	ORF, PHF

Those employed in the super-creative core are typically involved in "producing new designs that are readily transferable and widely useful" (Florida, 2011, p. 38). Typical super-creative core occupations include engineers, professors, artists, and researchers, among others. Employment data for 2008 through 2013 will be collected for each metropolitan area based on the Standard Occupational Classification (SOC) System and will thus include the following creative class designations based on Florida's definition of the super-creative core: Computer and Mathematical Occupations (SOC 15-0000); Architecture and Engineering Occupations (SOC 17-0000); Life, Physical, and Social Science Occupations (SOC 19-0000); Education, Training, and Library Occupations

(SOC 25-0000); and Arts, Entertainment, Sports, and Media Occupations (SOC 27-0000). Unlike previous studies, such as Alkaabi and Debbage (2007) and Levi (2015), which examined employment as defined by the North American Industry Classification System (NAICS), SOC codes represent the individual occupation rather than the industry type. Using SOC data thus allows for a better estimation of how individual workers are using air travel.

Employment data, much like enplanements, was also combined in cases where an airport serviced more than one metropolitan area. Examples in this case include North Carolina's Triangle region, including the Raleigh-Cary and Durham-Chapel Hill metropolitan areas; as well as the state's Triad region, which includes the Greensboro and Winston-Salem metropolitan areas. A summary of this information can be viewed in Table 3.1.3.

Table 3.1.3. List of Metropolitan Areas with Combined Employment Data.

Metropolitan Areas	Airports Included
Greensboro-High Point, NC; Winston-Salem, NC	GSO
Raleigh-Cary, NC; Durham-Chapel Hill, NC	RDU

The total number of workers for each of the aforementioned classes of employment will then be divided by overall total employment for each of the 106 metropolitan areas in order to determine the percent share of total employment that each sector of the super-creative core occupies. If collinearity is detected between independent

variables, the variable that has less correlation with the dependent variable will be omitted from the results. Three "control" variables will also be included that account for the larger economic base beyond just the individual creative class occupations. Table 3.1.4 details every variable that will be used in the analysis as well as their sources. Data for each of the variables listed will be collected for each year from 2008 to 2013 for each of the 106 metropolitan areas.

Table 3.1.4. All Variables for Years 2008 to 2013 for Each Metropolitan Area.

Variable	Source
Passenger enplanements by airport (number)	Federal Aviation Administration
Population (in 1000s)	United States Census Bureau
Average annual wage (dollar)	United States Census Bureau
Percent of population age 25+ with a 4 year degree	United States Census Bureau
Relative total creative class employment	United States Bureau of Labor Statistics
Computer and Mathematical Occupations (SOC 15-0000) Percent Share of Total Employment	United States Bureau of Labor Statistics
Architecture and Engineering Occupations (SOC 17-0000) Percent Share of Total Employment	United States Bureau of Labor Statistics
Life, Physical, and Social Science Occupations (SOC 19-0000) Percent Share of Total Employment	United States Bureau of Labor Statistics
Education, Training, and Library Occupations (SOC 25-0000) Percent Share of Total Employment	United States Bureau of Labor Statistics
Arts, Entertainment, Sports, and Media Occupations (SOC 27-0000) Percent Share of Total Employment	United States Bureau of Labor Statistics

CHAPTER IV

FINDINGS

4.0. Enplanements.

As mentioned in the preceding section, the term “enplaned passenger” refers to a person boarding an aircraft, taking into account both originating and connecting traffic. Thus, total air passenger enplanements are defined as the sum of all passenger boardings in a given metropolitan area, even if the passenger did not originate their trip in that particular airport.

All airports analyzed in this study were FAA-defined hubs for all six years under consideration. The FAA classifies airports as either large, medium, or small hubs, or as non-hubs based on their percent share of the overall number of passenger enplanements. Large hubs retain 1% or more of all passenger boardings in the United States; medium hubs hold 0.25-0.99%; while small hubs have 0.05-0.249% (Federal Aviation Administration, 2015). Non-hubs, then, have less than a 0.05 percent share of the overall number of air passenger enplanements and will not be included in this discussion.

In general, metropolitan areas that are densely populated also tend to have a greater number of enplanements. For example, in 2008, the New York metropolitan area, which consists of JFK, LGA, EWR, HPN, and ISP airports, had over 54.7 million enplaned passengers, the highest in the United States that year. It was followed by

Atlanta, GA's Hartsfield-Jackson International Airport, which had approximately 43.7 million passenger enplanements. On the other hand, Panama City, FL, had the lowest number of enplaned passengers, with just over 161,000. By 2013, the New York metropolitan area had increased its number of enplanements to over 57 million, remaining the largest airport complex in the nation. Atlanta's Hartsfield-Jackson International Airport stayed the nation's second-largest destination with approximately 47 million enplanements. However, the nation's smallest airport in terms of enplanements changed to Amarillo, TX, with approximately 370,000 passengers. Table 4.0.1 lists the ten metropolitan areas with the greatest number of enplanements for 2008, while table 4.0.2 lists the same for 2013. The areas demarcated with an asterisk indicate the presence of a major domestic airline hub in that metropolitan area.

Table 4.0.1. Top Ten Metropolitan Areas with the Highest Enplanements in 2008. Asterisks indicate a major domestic airline hub.

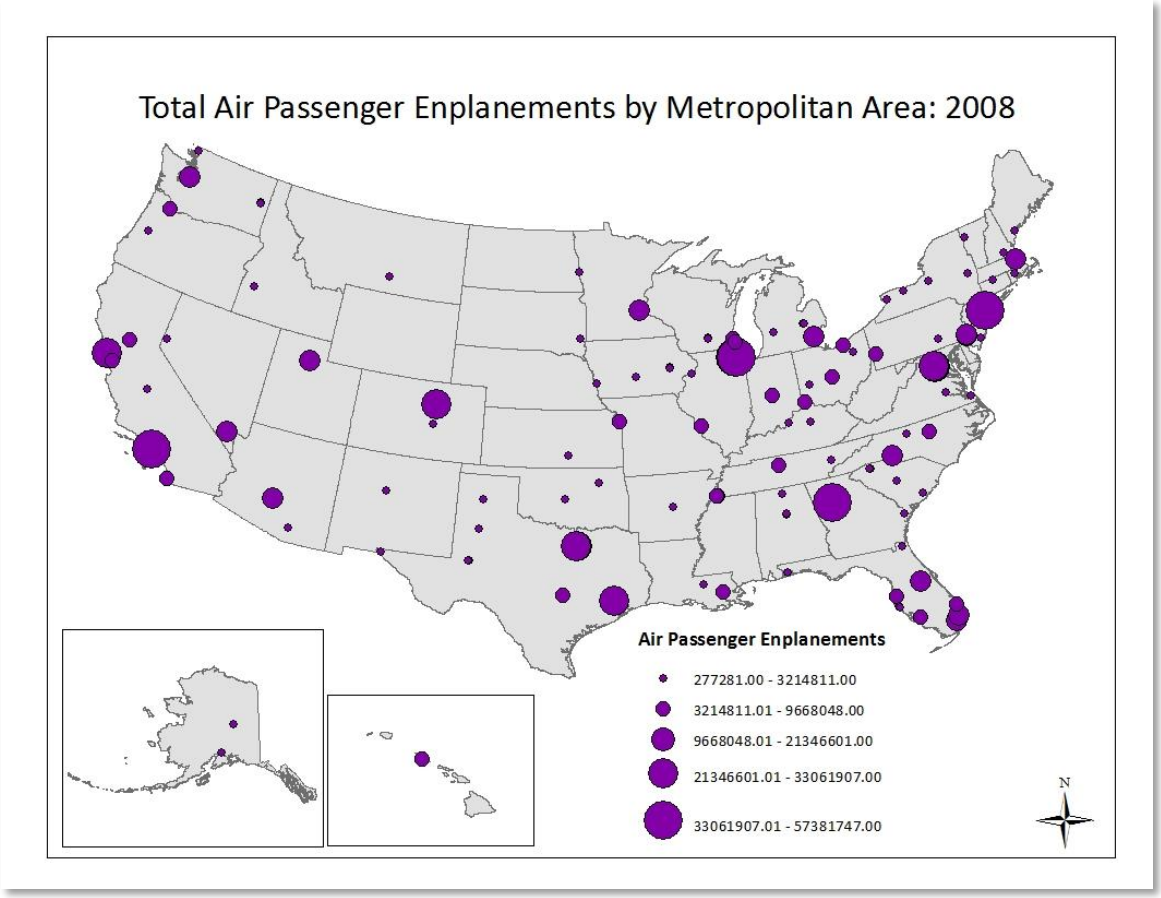
Metropolitan Area	Total Air Passenger Enplanements
1. New York, NY*	54741362
2. Atlanta, GA*	43761280
3. Chicago, IL*	41705374
4. Los Angeles, CA	40384505
5. Dallas-Fort Worth, TX*	31241261
6. Washington, DC	30268466
7. Denver, CO*	24287939
8. Houston, TX*	24277805
9. San Francisco, CA	23719575
10. Las Vegas, NV	21024443

Table 4.0.2. Top Ten Metropolitan Areas with the Highest Enplanements in 2013. Asterisks indicate a major domestic airline hub.

Metropolitan Area	Total Air Passenger Enplanements
1. New York, NY*	57381747
2. Atlanta, GA*	45308407
3. Los Angeles, CA	42292835
4. Chicago, IL*	42238481
5. Dallas-Ft. Worth, TX*	33061907
6. Washington, DC	31541758
7. San Francisco, CA	26475342
8. Denver, CO*	25496885
9. Houston, TX*	24329800
10. Charlotte, NC*	21346601

Figure 4.0.1 depicts the total number of passenger enplanements for 2008. This year, the total number of enplaned passengers for all airports in the study was approximately 694.8 million, while the average number of enplanements was approximately 6.61 million passengers. However, several metropolitan areas retained an unequal percentage of air passenger enplanements. The three largest domestic airport operations included Atlanta's Hartsfield-Jackson International Airport, a fortress hub for Delta Airlines; Chicago's O'Hare International Airport, a hub for United Airlines; and Dallas-Fort Worth's DFW International Airport, a fortress hub for American Airlines. Interestingly, the average number of total enplanements was far fewer than the same measurement in metropolitan areas such as the aforementioned Atlanta or Dallas-Fort Worth. On the other hand, metropolitan areas such as New York, NY and Los Angeles, CA had a higher share of enplanements possibly because their airports function as major international gateways that facilitate both domestic and international air traffic.

Figure 4.0.1. Total Air Passenger Enplanements by Metropolitan Area for 2008.



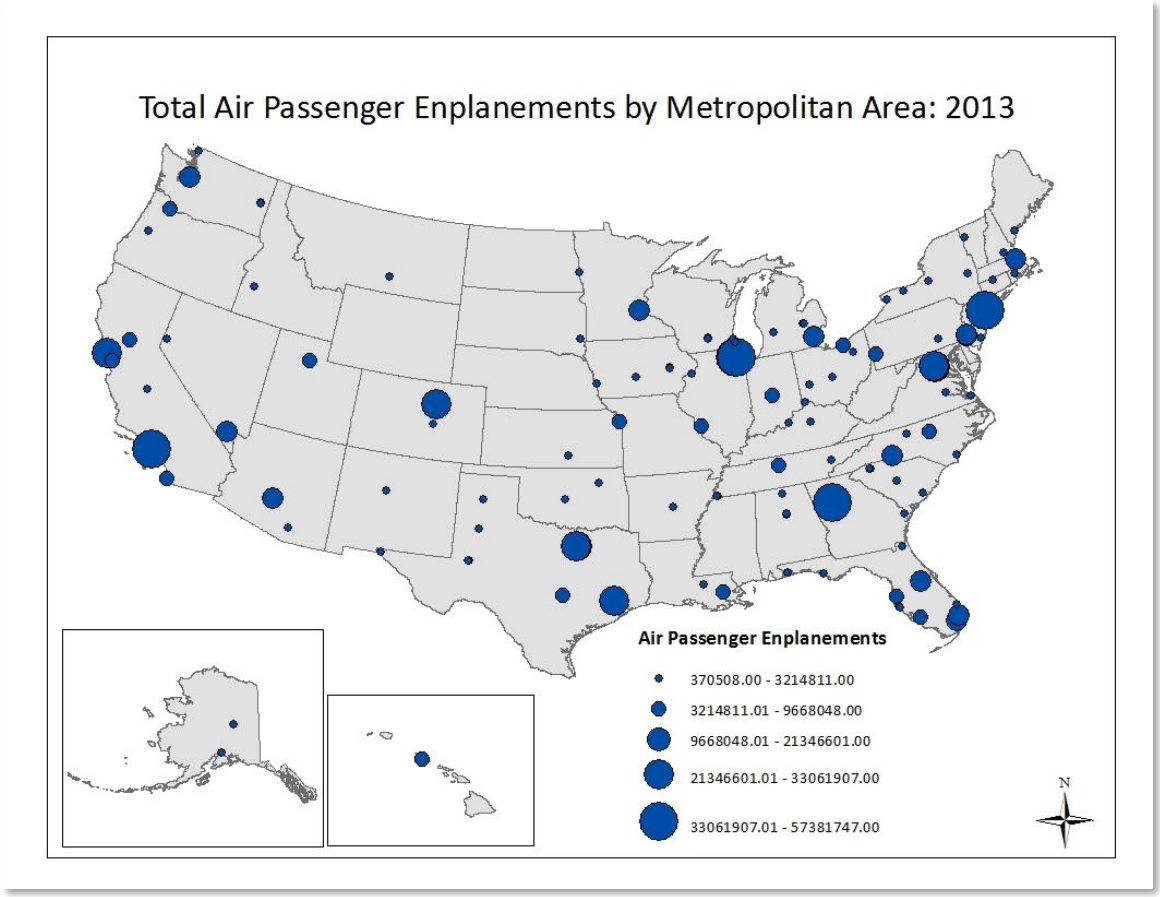
Oftentimes, the increased share of traffic that fortress hub and international gateway airports possess is due to the higher amounts of connecting traffic that they provide. For example, as of November 2015, American Airlines operated 84.7 percent of the flights at DFW International Airport (Dallas Fort Worth International Airport, 2015). Since DFW International Airport is American Airlines' largest hub, many of the passengers enplaned in this metropolitan area are making their way to another city, using the DFW Airport as a stopover on their way to their final destination. Likewise, as of

October 2015, Delta Airlines operated 73.8 percent of the flights out of Atlanta's Hartsfield-Jackson International Airport (Bureau of Transportation Statistics, 2015).

Figure 4.0.2 shows the total number of passenger enplanements by metropolitan area for 2013. Overall, this map is remarkably similar to the one from 2008. However, total passenger enplanements rose to just over 697 million, a total increase of nearly 2.6 million passengers. The average number of enplanements for this year also demonstrated a slight increase from 2008 to just over 6.61 million enplaned passengers. The airports discussed previously as being airline fortress hubs (DFW, Chicago's O'Hare, and Atlanta's Hartsfield-Jackson) still held a disproportionate share of the overall amount of air traffic. In 2013, the Dallas-Fort Worth, Chicago, and Atlanta metropolitan areas accounted for 17.3 percent of total US enplanements for all 106 metropolitan areas considered in this study. In 2008, this number was slightly lower at 16.8 percent.

It is also important to examine which metropolitan areas had the largest increases and decreases in total enplanements between 2008 and 2013. Most of the airports in the metropolitan areas with the top ten increases in enplanements are either key fortress hubs for a major airline or international gateway hubs. For example, Charlotte, NC – the metropolitan area with the greatest increase in enplanements – is a key fortress hub for American Airlines. Miami, FL, the metropolitan area with the second-largest increase, is also a hub for American Airlines; while San Francisco, CA, with the third-largest increase in enplanements, is an international gateway hub.

Figure 4.0.2. Total Air Passenger Enplanements by Metropolitan Area for 2013.



Other metropolitan areas on the list below, such as Boston, MA and Washington, DC are neither key fortress hubs nor international gateway hubs, but rather they are both large, populous areas that also house a substantial number of super-creative core workers as a percentage of their overall workforce. For example, in 2013, the super-creative core represented 17.8 percent of the Boston metropolitan area's total workforce; while in Washington, DC, this number was 18.8 percent. The complete list of the ten metropolitan areas with the largest increases in total enplanements between 2008 and 2013 is depicted in Table 4.0.3.

Table 4.0.3. Top Ten Metropolitan Areas with the Largest Increases in Total Enplanements from 2008 to 2013.

Metropolitan Area	Overall Increase
1. Charlotte, NC	4065176
2. Miami, FL	3042601
3. San Francisco, CA	2755767
4. New York, NY	2640385
5. Boston, MA	1989664
6. Los Angeles, CA	1908330
7. Dallas-Fort Worth, TX	1820646
8. Atlanta, GA	1547127
9. Washington, DC	1273292
10. Denver, CO	1208946

It is also worth noting which metropolitan areas had significant decreases in total enplanements during the same time period. Cincinnati/Northern Kentucky International (CVG) Airport in Cincinnati, OH had the largest decrease of nearly 4 million passengers. While CVG today remains the eighth largest hub for Delta Airlines, since the company merged with Northwest Airlines in 2008, they have reduced hub operations in Cincinnati by 63 percent (Scovel, 2012). Similarly, in Memphis, TN – the metropolitan area with the second largest decrease at just over 3 million enplanements – Delta began the process of scaling back flights at the airport upon their merger with Northwest Airlines and later decided to entirely de-hub the airport, with an overall capacity reduction of 22 percent between 2007 and 2012 (Scovel, 2012). On the other hand, Detroit Metropolitan Airport, with an overall decrease of approximately 1.3 million enplanements, suffered greatly due to the 2009 financial crisis. Similar issues occurred in Las Vegas, NV, where US Airways cut capacity by nearly 40 percent in 2011; and Cleveland, OH, which deteriorated

because of Continental Airlines' merger with United. The full list of the ten metropolitan areas with the largest decreases in total enplanements can be viewed in Table 4.0.4.

Table 4.0.4. Top Ten Metropolitan Areas with the Largest Decreases in Total Enplanements from 2008 to 2013.

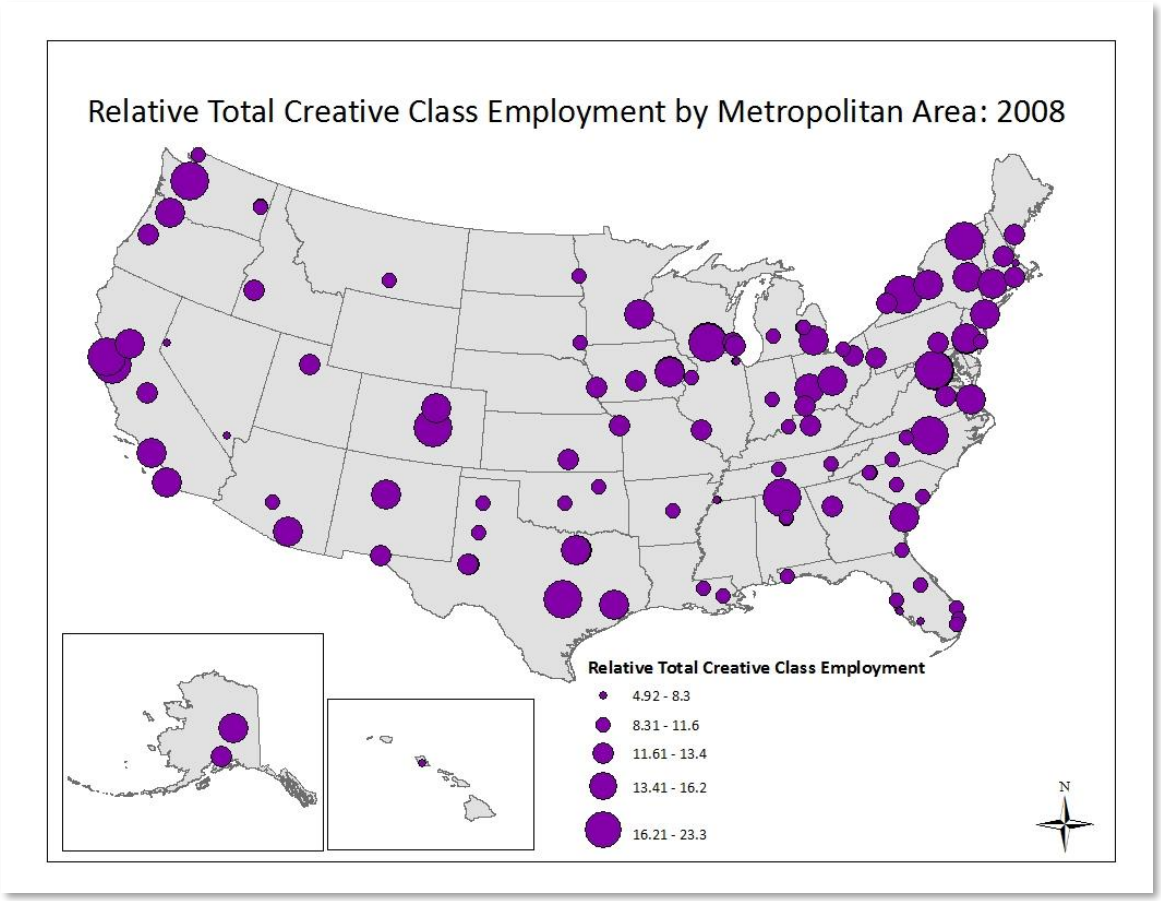
Metropolitan Area	Overall Decrease
1. Cincinnati, OH	-3872223
2. Memphis, TN	-3075815
3. Detroit, MI	-1314651
4. Las Vegas, NV	-1078264
5. Cleveland, OH	-1012177
6. Philadelphia, PA	-858907
7. Sacramento, CA	-731626
8. Virginia Beach, VA	-730132
9. Albuquerque, NM	-681188
10. Milwaukee, WI	-646522

4.1. Creative Class Employment.

As a whole, the overall distribution of total super-creative core employment was remarkably similar to that for total enplanements for both 2008 and 2013, with a few notable exceptions. Areas that possessed the greatest number of total passenger enplanements in 2008, such as the New York, Atlanta, and Los Angeles metropolitan areas, also maintained a larger percentage of creative workers, as might be expected due to their population size. Hence, rather than look at absolute numbers of creative class workers in a metropolitan area, it is more appropriate to examine a location's share of super-creative core employment as relative to overall total employment. This change

causes cities such as San Jose, CA and Huntsville, AL to stand out as controlling a large percentage of creative workers yet having a lower number of total enplanements. This anomaly is because each of the aforementioned metropolitan areas are home to firms that typically employ a large number of creative class workers, a matter to be discussed in detail below. The distribution of the number of super-creative core employees relative to overall total employment for 2008 is depicted in Figure 4.1.1.

Figure 4.1.1. Relative Total Creative Class Employment by Metropolitan Area for 2008.



San Jose, CA is located in Silicon Valley, and is home to many of the world's largest high-technology companies, such as Apple, Google, and Netflix. Huntsville, AL, on the other hand, is the site of NASA's George C. Marshall Space Flight Center and is widely known as being a major center for high technology. Other areas that demonstrate this type of effect include the Raleigh-Durham metropolitan area in North Carolina, home to Research Triangle Park; Seattle, WA, headquarters of Amazon.com and nearby Microsoft; Colorado Springs, CO, home of Verizon Business headquarters as well as the University of Colorado – Colorado Springs; and Burlington, VT, where the University of Vermont is situated. A complete list of the top ten metropolitan areas for super-creative core employment as relative to total employment for 2008 can be seen in Table 4.1.1.

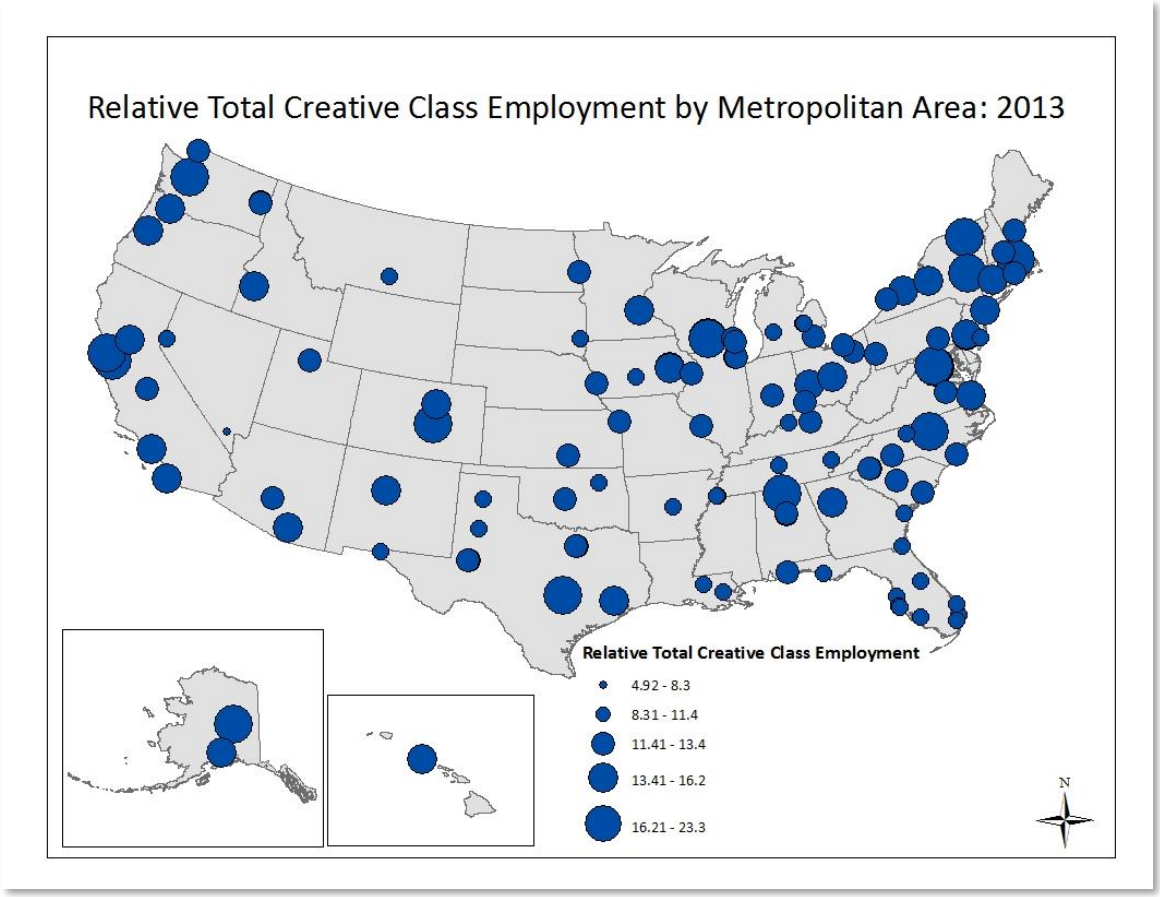
Table 4.1.1. Top Ten Metropolitan Areas with the Highest Relative Super-Creative Core Employment for 2008.

Metropolitan Area	Total Super-Creative Core Employment
San Jose, CA	23.3
Huntsville, AL	20.7
Washington, DC	18.3
Austin, TX	18.3
Boston, MA	17.9
Raleigh-Durham, NC	17.7
Seattle, WA	17.5
Burlington, VT	17.4
Colorado Springs, CO	16.7
Rochester, NY	16.6

Average percent for all MSAs (n=106) = 12.46.

Similar results were found when examining the distribution of relative super-creative core employment for 2013. This dispersion is depicted in Figure 4.1.2.

Figure 4.1.2. Relative Total Creative Class Employment by Metropolitan Area for 2013.



Once again, cities with a greater number of enplanements, such as Los Angeles, CA; Washington, DC; and Atlanta, GA were also found to have a higher proportion of creative workers, which, as previously discussed, is most likely because of the fact that these cities, by virtue of them being larger than others, possess a greater percentage of the overall workforce in general.

Again, metropolitan areas like Raleigh-Durham, NC; Huntsville, AL; and San Jose, CA stand out for having an abundant number of creative workers yet a lower

number of total passenger enplanements. The complete list of the ten metropolitan areas with the greatest relative creative class employment for 2013 can be viewed in Table 4.1.2.

Table 4.1.2. Top Ten Metropolitan Areas with the Highest Relative Super-Creative Core Employment for 2013.

Metropolitan Area	Total Super Creative-Core Employment
San Jose, CA	24.4
Huntsville, AL	20.5
Seattle, WA	19.7
Washington, DC	18.8
Boston, MA	17.8
Madison, WI	17.8
Burlington, VT	17.2
San Francisco, CA	17.2
Fairbanks, AK	17.0
Colorado Springs, CO	16.8

Average percent for all MSAs (n=106) = 12.87.

It is also worth noting which metropolitan areas had the largest increase in their relative share of super-creative core employment between 2008 and 2013. Interestingly, Panama City, FL had the largest overall gain of 3.62 percent. However, this irregularity is most likely due to the overall number of employees there decreasing slightly within this particular time frame, which in turn caused the percent share of creative employment to rise. More traditionally, Seattle, WA had the second largest increase in relative creative class employment, with 2.27 percent. As previously mentioned, Seattle, WA is home to many high-technology companies that house a large number of creative class workers. Firms such as Microsoft and Amazon.com all locate their headquarters either directly in

or nearby the Seattle metropolitan area. In recent years, Seattle has also begun to welcome the cloud computing sector of several companies, such as Amazon Web Services and CenturyLink (Hardy, 2014). On the other hand, Honolulu, the metropolitan area with the third-largest increase, is the home of a number of colleges and universities, such as the University of Hawaii at Manoa and Hawaii Pacific University. A complete ranking of the ten metropolitan areas with the largest increase of relative super-creative core employment can be viewed in Table 4.1.3.

Table 4.1.3. Top Ten Metropolitan Areas with the Largest Increases in Relative Super-Creative Core Employment from 2008 to 2013.

Metropolitan Area	Overall Increase
1. Panama City, FL	3.62
2. Seattle, WA	2.27
3. Honolulu, HI	2.14
4. Des Moines, IA	1.89
5. Phoenix, AZ	1.79
6. Memphis, TN	1.70
7. Atlantic City, NJ	1.54
8. Fairbanks, AK	1.50
9. Birmingham, AL	1.48
10. Charleston, SC	1.42

It is also necessary to look at the metropolitan areas that demonstrated substantial decreases in relative super-creative core employment. The metropolitan area with the largest overall decrease was El Paso, TX, with a drop in super-creative core employment of 2.22 percent. Between 2008 and 2013, overall employment in El Paso increased by approximately 9000 workers, while employment in the super-creative core marginally

declined in each of the five sectors. Intriguingly, Austin, TX, one of the top ten metropolitan areas with the highest relative share of super-creative core employment in 2008, demonstrated the second-largest decrease in the same number between 2008 and 2013, with a reduction of -1.74 percent. However, in the ranking of relative share of creative employment, Austin still holds the thirteenth position in 2013, illustrating that creative workers still play an important role in the area's economy despite a substantial decline in the relative percentage of creative workers since 2008. Raleigh-Durham, NC, another one of the top ten metropolitan areas for relative share of super-creative core employment in 2008, is also in the list of top ten decreases between 2008 and 2013. However, this loss was less than one percent, and, like Austin, in 2013 the Raleigh-Durham area remains close to the top ten for relative share of creative class employment, in the twelfth position. A complete list of the metropolitan areas with the largest decreases in relative share of super-creative core employment can be viewed below in Table 4.1.4.

Table 4.1.4. Top Ten Metropolitan Areas with the Largest Decreases in Relative Super-Creative Core Employment from 2008 to 2013.

Metropolitan Area	Overall Decrease
1. El Paso, TX	-2.22
2. Austin, TX	-1.74
3. Davenport, IA	-1.41
4. Miami, FL	-1.31
5. Flint, MI	-1.27
6. Bradenton, FL	-1.15
7. Dallas-Fort Worth, TX	-1.07
8. Raleigh-Durham, NC	-0.99
9. West Palm Beach, FL	-0.96
10. Cedar Rapids, IA	-0.91

4.2. Regression Analysis.

Stepwise regression analysis was performed on the dependent variable (Total Enplanements) for all independent variables for years 2008 through 2013 using IBM SPSS software. Stepwise regression utilizes an algorithm that is capable of sifting through a large number of independent variables by continuously adding and removing variables in order to achieve the most parsimonious and rigorous solution. This allowed for an assessment of the significance of the relationship between the independent and dependent variables, as well as any correlations between the two. Degrees of collinearity were measured and analyzed between the independent variables, and among those pairs of independent variables that exhibited high levels of collinearity, the one with the lowest measure of correlation with the dependent variable was excluded.

4.3. Stepwise Regression Model for 2013.

While a stepwise regression analysis was executed for all six years under consideration, this thesis will focus specifically on the year 2013. The complete model for 2013 is depicted in Table 4.3.1. The stepwise regression analysis revealed a model that best represents the connection between air passenger enplanements and super-creative core employment by metropolitan area for 2013. The final model (n=106) has an R^2 of 0.265 and is defined by the following equation:

$$\textit{Enplanements} = -21641156.6 + 199.82\ \textit{WAGE} + 1092370.21\ \textit{SAM} + 353214.67\ \textit{SCM}$$

WAGE = Average Annual Wage

SAM = Arts, Entertainment, Sports, and Media Occupations (SOC 27-0000)

SCM = Computer and Mathematical Occupations (SOC 15-0000)

The final model is significant at the 0.05 level. Multicollinearity between independent variables in the final model was low. Details regarding the regression model for 2013 are depicted below in Table 4.3.1.

Table 4.3.1. Final Regression Model of the Relationship between the Super-Creative Core and Passenger Enplanements by Metropolitan Area, 2013.

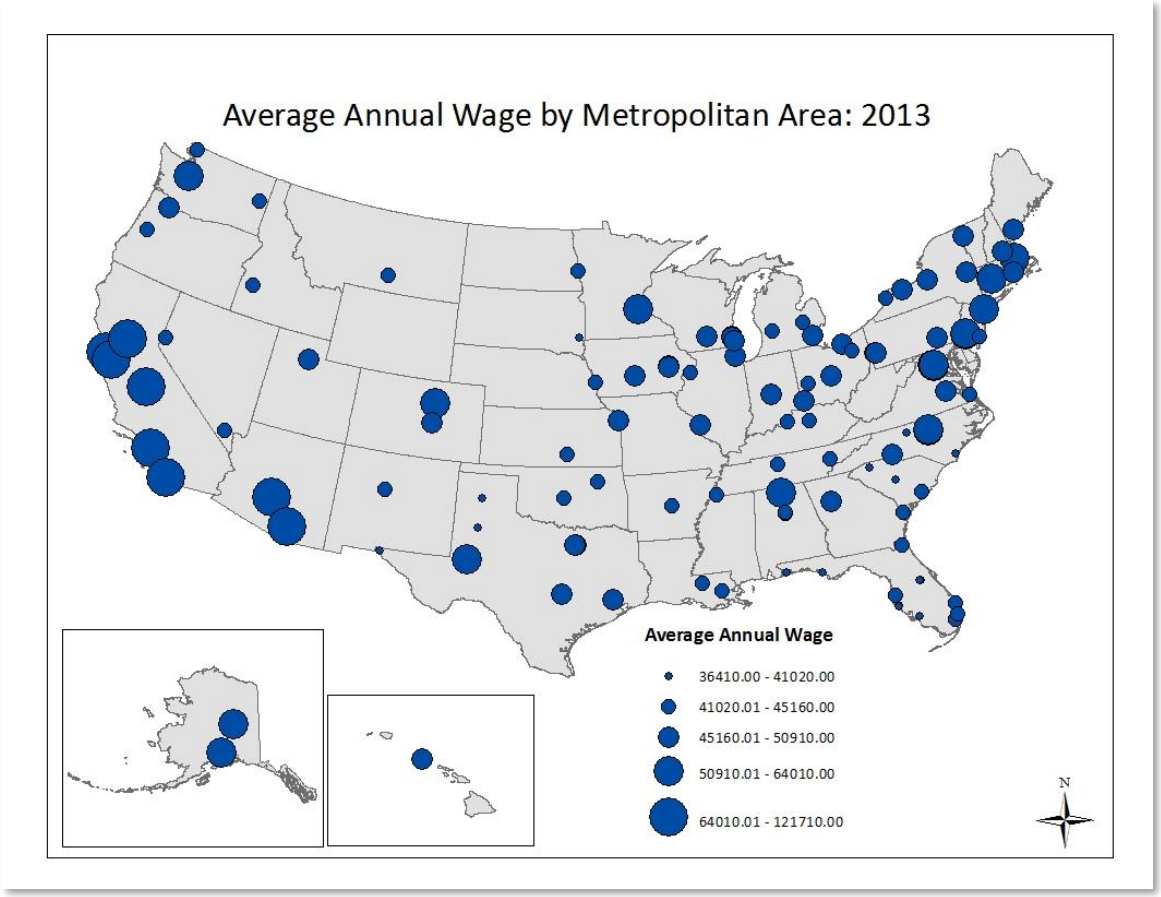
Variables	Unstandardized Coefficients		Standardized Coefficients	t	p-value
		Std. Error			
Constant	-21641156.6	4759698.64		-4.547	0.000
Average Annual Wage	199.82	61.68	0.288	3.24	0.002
Arts, Entertainment, Sports, and Media Occupations (SOC 27-0000)	1092370.21	294847.95	0.315	3.705	0.000
Computer and Mathematical Occupations (SOC 15-0000)	353214.67	135480.6	0.232	2.607	0.010

In the 2013 model, average annual wage was the variable most closely related to passenger air traffic. Here, it is indicated that for each additional dollar earned annually,

another 200 enplaned passengers could be expected. Moreover, for each additional percent of workers employed in arts, entertainment, sports, and media occupations, passenger enplanements will increase by approximately 1.1 million passengers. Finally, for every additional percent of workers employed in computer and mathematical occupations, passenger enplanements will rise by just over 350,000 persons.

Interestingly, a "control" variable – included to account for the larger economic base beyond the individual creative class occupations – annual average wage, was the first to appear in the model, offering supporting for the third hypothesis and indicating its importance in predicting passenger enplanements. Granted, this should come as no surprise given that the current average price of domestic air fare is 392 dollars, a cost that could seem steep to a large proportion of the population, as the overall average annual wage for the United States in 2013 was $49,482 (Annual US Domestic Average Itinerary Fare, 2014; Bureau of Labor Statistics, 2014). However, many of the metropolitan areas with the highest average wages are similar to those that house occupations that require higher skills. If average wage is indicative of the skill required to perform high-quality work in one's occupation, then the job itself can also be deemed to be of the utmost quality. Thus, a number of the metropolitan areas with the highest annual wages are also areas with a high percentage of jobs in the computer and mathematics industry, often regarded as one of the fastest-growing and most optimal fields to work in. The overall distribution of average annual wage by metropolitan area for 2013 is illustrated in Figure 4.3.1.

Figure 4.3.1. The Distribution of Average Annual Wage by Metropolitan Area for 2013.



The San Francisco, CA metropolitan area had the highest average annual wage, at $121,710, followed by San Jose, CA with an average wage of $112,220. As previously mentioned, several high-technology companies are located in each of these metropolitan areas. In 2013, the average annual wage in the entire United States for computer and mathematical occupations alone was $82,010 (Bureau of Labor Statistics, 2014). In San Francisco, this number was $101,150, and in San Jose, it was $115,870 (Bureau of Labor Statistics, 2014). It is ultimately difficult to know for sure whether the two are correlated

without conducting a regression analysis specific to these two variables, but on the surface, it would seem as if areas with a high average annual wage also have a high percentage of workers employed in computer and mathematical occupations. The next four metropolitan areas with the highest average annual wages in 2013 were all located in California as well. Notably, the BosWash megalopolis area also housed several cities with high average wages. Conversely, areas with the lowest average annual wages, such as Myrtle Beach, SC ($32,820) and Panama City, FL ($37,310), also had lower numbers of enplanements (823,294 and 391,763, respectively). The complete list of the ten metropolitan areas with the highest average annual wages for 2013 can be viewed in Table 4.3.2.

Table 4.3.2. Top Ten Metropolitan Areas with the Highest Average Annual Wage for 2013.

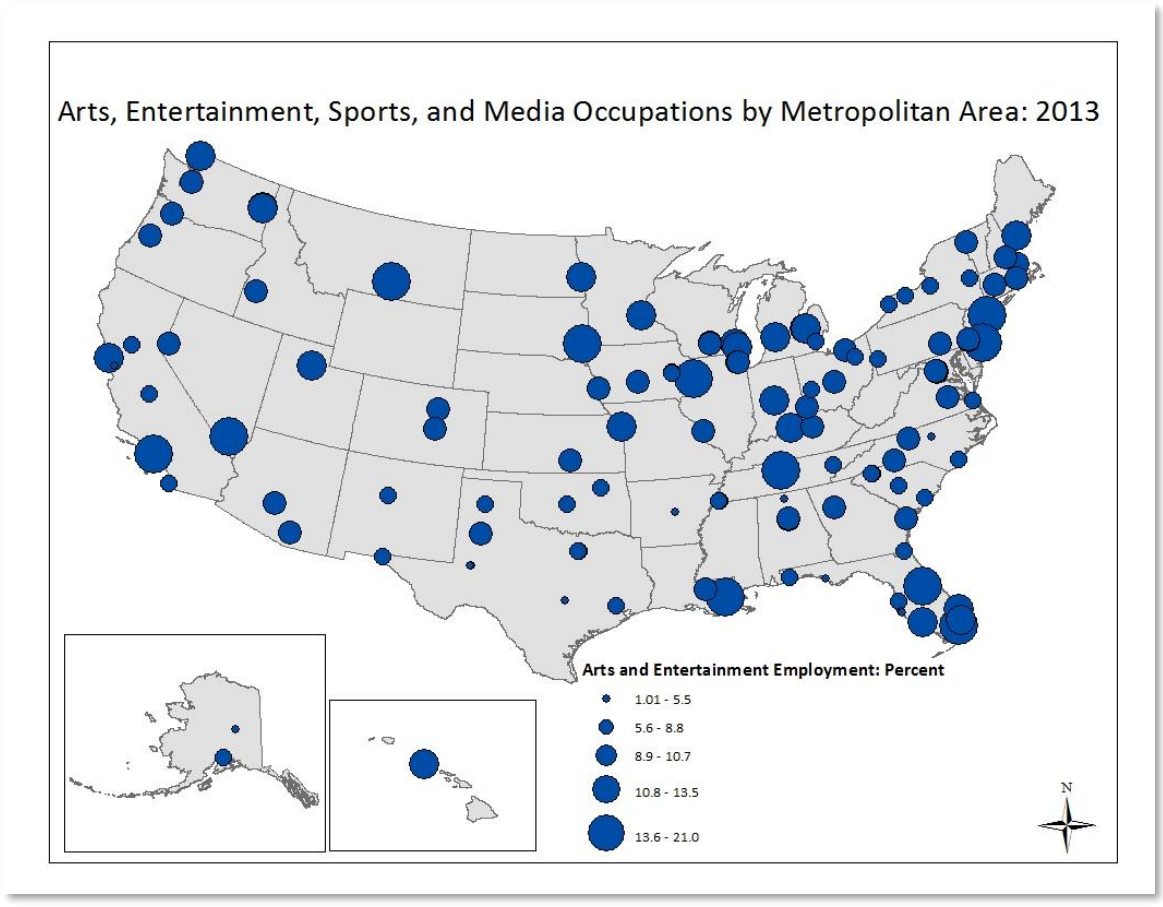
Metropolitan Area	Average Annual Wage (in dollars)
1. San Francisco, CA	121,710
2. San Jose, CA	112,220
3. Los Angeles, CA	107,780
4. San Diego, CA	101,420
5. Sacramento, CA	101,290
6. Fresno, CA	86,120
7. Phoenix, AZ	85,580
8. Tucson, AZ	80,450
9. Boston, MA	64,010
10. Washington, DC	59,175

Surprisingly, as one might expect, it is not the total number of super-creative core workers as relative to overall employment in a metropolitan area that matters most in relation to passenger enplanements. Rather, it is the specific type of super-creative core

employment in detail that is important. However, the curiosity here is that it is not the class of super-creative core employment that you might expect to be the key sector influencing passenger enplanements. One would think first of computer and mathematical occupations as being the sector of the super-creative core that would cause passenger enplanements to increase the most. Instead, it is arts, entertainment, sports, and media occupations – a rather diverse category – that play a key role in driving passenger enplanements. It is quite possibly because this category is so diverse that workers encompassed in it are flying more. When looking at the sector in general, one might not expect some of its parts – i.e. arts professionals – to fly enough to make any difference regarding passenger enplanements. However, when examining the other classes of employment involved in this particular sector, you see industries such as entertainment and sports where workers fly quite often for their professions. Furthermore, industries such as entertainment and sports are likely to stimulate air traffic from people outside of their sector. For example, the recent Super Bowl 50 brought in increased numbers of enplanements to San Francisco International and surrounding airports from flyers who had little to do with the sports industry. This idea also recalls Neal's (2012) study of the relationship between arts, entertainment, sports, and media occupations and passenger enplanements. His flow generation hypothesis, which stated that "cities with high levels of employment in creative occupations generate flows of people by air transport," offered two key reasons why the above is the case (p. 2695). First, cities with extensive creative class populations frequently attract greater numbers of tourists as well as other consumers of creative product; and secondly, creative class employees will generally be drawn to

metropolitan areas with larger creative class populations as “exhibitors and performers in local galleries and venues” (Neal, 2012, p. 2695). Thus, Neal’s (2012) flow generation hypothesis strengthens the idea of the importance of the arts and entertainment industry in the relationship with passenger enplanements. The overall distribution of employment in the arts and entertainment industry can be viewed in Figure 4.3.2.

Figure 4.3.2. The Distribution of Employment in Arts, Entertainment, Sports and Media Occupations by Metropolitan Area, 2013.



Las Vegas, NV stands out as the metropolitan area with the highest percentage of workers employed in the arts and entertainment industry, with 21 percent of super-creative core employees working in this sector. This is not wholly unexpected, as Las Vegas houses the infamous Las Vegas Strip, where a number of casinos and other such entertainment complexes are located. Predictably, the Los Angeles, CA metropolitan area has the second-largest number of workers employed in this sector at 18.4 percent. As the Los Angeles area is home to not only Hollywood, an important site for the entertainment business, but also several sports teams, such as Major League Baseball's Los Angeles Angels and Los Angeles Dodgers and the National Basketball Association's Los Angeles Lakers, the higher percentage of arts, entertainment, sports, and media occupations located here should be anticipated. Sioux Falls, SD, on the other hand, seems an atypical metropolitan area to include on this list – indeed, it is most likely included simply because the overall number of super-creative core workers in the area is so low. The complete list of the ten metropolitan areas with the highest percentage of workers employed in this particular portion of the super-creative core can be viewed below in Table 4.3.3.

As was done previously with both total passenger enplanements and relative super-creative core percentages, it is important to examine which metropolitan areas demonstrated the greatest increases between 2008 and 2013 in the percentage of workers employed in the arts and entertainment industry. Curiously, the Tucson, AZ metropolitan area showed the largest overall increase at 2.03 percent.

Table 4.3.3. Top Ten Metropolitan Areas with the Highest Percentage of Workers Employed in Arts, Entertainment, Sports, and Media Occupations.

Metropolitan Area	Percentage of Workers Employed in SOC 27-0000
1. Las Vegas, NV	21.0
2. Los Angeles, CA	18.4
3. New York, NY	18.3
4. Sioux Falls, SD	17.2
5. Myrtle Beach, SC	16.8
6. New Orleans, LA	15.8
7. Atlantic City, NJ	14.9
8. Nashville, TN	14.9
9. Orlando, FL	14.6
10. Miami, FL	14.5

Average percent for all MSAs (n=106) = 9.88.

While not generally thought of as a mecca for workers employed in this particular industry, Tucson does host several arts and culture festivals – such as the Tucson Folk Festival and the Fourth Avenue Street Fair – each year, and is home to numerous museums and tourist attractions as well, like the Mission San Xavier del Bac. Furthermore, college sports are also important in Tucson, particularly NCAA basketball and football. The University of Arizona, home of the Arizona Wildcats, is located in Tucson. Not only is the basketball team popular with local residents, but several times in recent years they have made it to the final rounds of the NCAA March Madness tournament. Thus, the players, coaches, and other personnel associated with the team, as well as their fans, fly often to the areas where the games are located. As could be expected, the New York metropolitan area had the second-largest increase, with 1.79

percent. According to Forman (2015) at the city's Center for an Urban Future, employment in film and television production has increased 53 percent since the report was last published in 2005; while performed arts has risen 26 percent and visual arts 24 percent. Furthermore, New York has the third-largest overall arts and entertainment industry percentage for 2013, with 18.3 percent of super-creative core workers employed in this sector. Meanwhile, the inclusion in this list of areas like Lubbock, TX seems unusual, but can be explained. Lubbock, TX has an active arts community, with the Texas Commission on the Arts naming the Lubbock Cultural District as one of seven in Texas in 2009 (Pedigo, 2010). Moreover, cultural activities have increased recently, now including events such as the Lubbock Arts Festival and the Flatland Film Festival (Pedigo, 2010). The complete list of the ten metropolitan areas where the percentage of workers employed in the arts, entertainment, sports, and media industry increased the most since 2008 is detailed in Table 4.3.4.

Table 4.3.4. Top Ten Metropolitan Areas with the Highest Increase in Percentage of Workers Employed in Arts, Entertainment, Sports, and Media Occupations versus 2008.

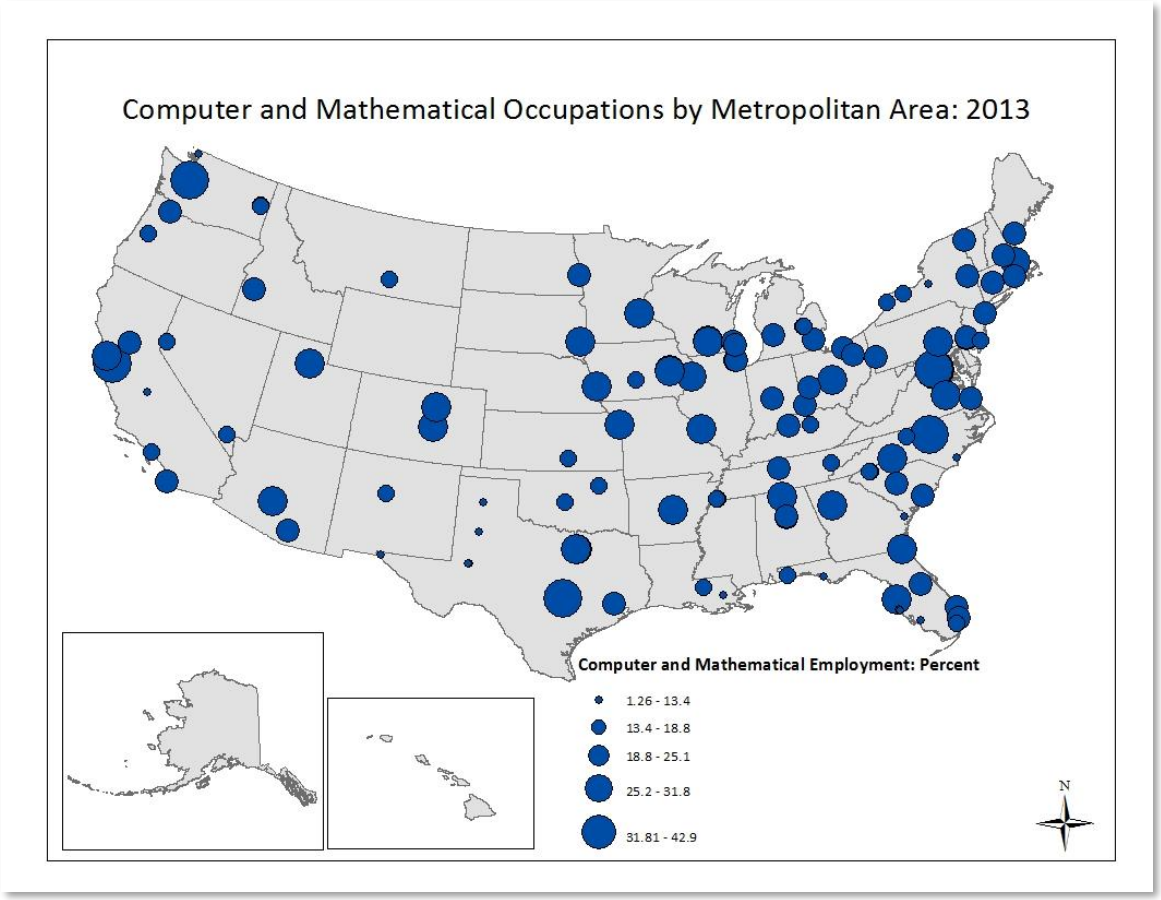
Metropolitan Area	Overall Increase
1. Tucson, AZ	2.03
2. New York, NY	1.79
3. New Orleans, LA	1.69
4. West Palm Beach, FL	1.66
5. Flint, MI	1.46
6. Baton Rouge, LA	1.15
7. Bellingham, WA	1.01
8. Manchester, NH	0.96
9. Lubbock, TX	0.89
10. Las Vegas, NV	0.87

However, the importance of the arts and entertainment industry as discussed above is not to say that computer and mathematical occupations do not make a difference in driving passenger enplanements. Interestingly, though, this particular sector of the super-creative core appears as the third variable in the model, despite their high income ($82,010 annually in 2013 versus $55,580 for those employed in arts and entertainment professions). Even though nationwide, there are more workers employed in computer and mathematical occupations than there are in arts and entertainment occupations (3,696,180 in contrast to 1,758,310), these workers tend to be concentrated in just a few specific metropolitan areas – for example, San Jose, CA and Seattle, WA – rather than evenly distributed throughout the entire United States. Thus, even though these workers oftentimes display a higher propensity to fly than those employed in other sectors of the creative class, the reason this sector does not display as great an effect on passenger enplanements may be due to the unequal distribution of workers. Moreover, whereas arts and entertainment professions have a tendency to create enplanements extraneous to the sector, enplanements for computer and mathematical occupations are usually concentrated solely within the industry itself. The overall distribution of workers employed in the computer and mathematical industry is depicted in Figure 4.3.3.

The San Jose, CA metropolitan area had the greatest proportion of workers employed in computer and mathematical occupations, with 42.9 percent of super-creative core workers there employed in this industry. As previously discussed, several high-technology companies – such as Adobe, Ebay, and Samsung – have their headquarters located in San Jose, which aids in increasing the area's share of employment in computer

and mathematical occupations. Seattle, WA had the second-highest percentage of employees working in the computer industry at 40.5 percent.

Figure 4.3.3. The Distribution of Employment in Computer and Mathematical Occupations by Metropolitan Area, 2013.



Again, this high number is due to several high-technology companies, among them Amazon.com and Microsoft, having located in the area. Notably, the Raleigh-Durham, NC metropolitan area has the fourth-largest percentage of workers employed in this particular industry, with 33.9 percent, due to the presence of Research Triangle Park.

Huntsville, AL and Colorado Springs, CO, at first glance, may seem like inconsistencies in a listing of the highest percentage of workers employed in computer and mathematical occupations. However, as previously mentioned, NASA's Marshall Space Flight Center is situated in Huntsville, AL. This facility, along with Cummings Research Park, facilitates a number of high-technology jobs. Moreover, Cummings Research Park is the second-largest of its kind in the country (Huntsville Chamber of Commerce, 2013). Colorado Springs, on the other hand, has several notable high-technology companies located in the area, including Verizon Business and Hewlett-Packard. The complete list of the ten metropolitan areas with the highest percentage of workers employed in computer and mathematical occupations can be viewed below in Table 4.3.5. Markedly, with a few exceptions, this list is quite similar to the one for relative super-creative core employment as a whole.

It is also worthwhile to examine which metropolitan areas showed substantial increases in employment in computer and mathematical occupations from 2008 to 2013. Several of these metropolitan areas, such as Seattle, WA, San Jose, CA, and San Francisco, CA are undoubtedly expected to be in the above list due to the known presence of high-technology companies in the area. On the other hand, the presence of cities such as Grand Rapids, MI and Jacksonville, FL seems unusual. West Michigan, where the Grand Rapids metropolitan area is situated, produced 22 of the "fastest-growing private companies" in 2013 (Evans, 2013). Among these companies were EBW Electronics and ITS Partners, both noted high-technology firms (Evans, 2013).

Table 4.3.5. Top Ten Metropolitan Areas with the Highest Percentage of Workers Employed in Computer and Mathematical Occupations.

Metropolitan Area	Percentage of Workers Employed in SOC 15-0000
1. San Jose, CA	42.9
2. Seattle, WA	40.5
3. Washington, DC	35.7
4. Raleigh, NC	33.9
5. Austin, TX	32.6
6. Huntsville, AL	31.8
7. San Francisco, CA	31.0
8. Boston, MA	30.8
9. Colorado Springs, CO	30.7
10. Dallas-Fort Worth, TX	30.6

Average for all MSAs (n=106) = 21.4.

Jacksonville, FL also produced several rapid-growth high technology companies, such as the Health Clinical Informatics Group, a manufacturer of health-care related technology; and Pragmatic Works, a consulting and software development company (Clinton, 2013). The complete list of the ten metropolitan areas where the percentage of workers employed in computer and mathematical occupations has increased the most following 2008 is reproduced in Table 4.3.6.

Table 4.3.6. Top Ten Metropolitan Areas with the Highest Increase in Percentage of Workers Employed in Computer and Mathematical Occupations versus 2008.

Metropolitan Area	Overall Increase
1. Madison, WI	8.2
2. Grand Rapids, MI	7.3
3. Seattle, WA	7.1
4. Austin, TX	6.8
5. Jacksonville, FL	6.7
6. Charlotte, NC	6.2
7. San Francisco, CA	6.1
8. San Jose, CA	5.2
9. Atlanta, GA	5.2
10. Phoenix, AZ	5.0

4.4. Regression Models for 2008 to 2012.

As this thesis analyzed the relationship between passenger enplanements and creative class employment for all years from 2008 to 2013, it is also essential to briefly examine the models from the years preceding 2013. These models can be seen below in Table 4.4.1.

There are three key variables that featured the most prominently in the models throughout all six years. First and foremost of these variables is the percent of super-creative core employment in arts, entertainment, sports, and media occupations. This variable, which appears in all six years with a positive correlation, is critical for the relationship with passenger enplanements. Unlike many of the other sectors, which typically generate enplanements that are concentrated with those who are employed in the industry, arts and entertainment employment oftentimes produces air traffic that is extraneous to the sector. Thus, people are flying that are not necessarily arts and

entertainment employees, but that are those going to consume the product that people working in that industry create.

Table 4.4.1. Regression Models and R^2 Values for Years 2008 to 2013.

Year	Predictor Variables	Coefficient of Determination (R^2)
2013	+ve Average Annual Wage +ve Percent Arts and Entertainment Employ. +ve Percent Computer and Mathematical Employ.	0.265
2012	+ve Average Annual Wage +ve Percent Arts and Entertainment Employ. -ve Percent Education, Training, and Library Employ. -ve Total Super-Creative Core Employ. as relative to Total Employ. (%) +ve Population Change (%)	0.419
2011	+ve Percent Arts and Entertainment Employ. -ve Percent Education, Training, and Library Employ.	0.318
2010	+ve Average Annual Wage +ve Percent Arts and Entertainment Employ. -ve Percent Education, Training, and Library Employ. -ve Population Change (%)	0.332
2009	+ve Average Annual Wage +ve Percent Arts and Entertainment Employ.	0.153
2008	+ve Percent Computer and Mathematical Employ. +ve Percent Arts and Entertainment Employ.	0.158

Moreover, metropolitan areas with a higher percentage of employment in the arts and entertainment industry – such as Los Angeles, LA and New York, NY – are oftentimes noteworthy tourist destinations as well as more populous cities, each of which will generate greater numbers of enplanements for that area.

The "control" variable, average annual wage enters in the model for four different years and is always the first variable presented when it occurs. This demonstrates the relative importance of salary in determining who flies. As discussed in the preceding section, average annual wage is most likely an important predictor variable due to the increasing cost of air fares. Generally, areas with higher average annual wages, such as San Francisco or Los Angeles, CA, had greater numbers of enplanements, while metropolitan areas with lower average annual wages also had lower amounts of air traffic. Presumably, this relationship is due to the probability that those who obtain lower pay are less likely to fly than those who earn substantially more. Furthermore, average wages are highest in industries such as computers and mathematics that are often required to travel more frequently for their professions.

Finally, while it only factors into the models for two years – 2008 and 2013 – employment in computer and mathematical occupations is also important to the relationship with passenger enplanements. While the demand for basic technology services remained high during the recession of 2009, demand for more advanced uses of technology suffered because consumers became more cost-conscious (Thomson, 2009). Had the recession not occurred, it is possible that this variable would have shown more of an impact during the years in between 2008 and 2013. Moreover, those employed in

computer and mathematical occupations demonstrate a need to travel more frequently for their professions, thus further establishing the importance this industry has in predicting passenger enplanements.

It is also worth noting how education, training, and library occupations only occurs in the models in a negative relationship with passenger enplanements. Education as an industry is a blunt instrument. It encompasses far too many levels and is an incredibly diverse and extraordinarily large category, even including those employed in grades K through 12. Nationally, in 2012, the most recent year this variable appears in any of the models, there were 5,393,670 workers employed as preschool, primary, secondary, and special education teachers. These employees constituted 4.1 of the workforce nation-wide. When disaggregated to the metropolitan area level, this variable often comprised the largest sector of the super-creative core. Moreover, the average wage for education, training, and library occupations nationally was only $51,210. Again, those who earn less are usually less likely to fly. Additionally, throughout all six years, the Bureau of Labor Statistics often underreported data in this sector for several metropolitan areas. This skewing of data may also have factored into this variable's relationship with passenger enplanements.

What is most important to observe here is that despite the 2009 recession, the models remained consistent throughout all six years. Percent arts and entertainment employment and percent computer and mathematics employment factored into the models in both 2008 and 2013. Arts and entertainment employment was also one of the greatest predictors of air traffic in each of the six years. Other variables entered into the

models stayed consistent as well. Percent education, training, and library employment routinely had a distinct negative correlation with passenger enplanements when appearing in a model, while average annual wage always had a strong positive relationship with air traffic. Furthermore, out of a total of nine variables, only six factored into any of the equations; and of these six variables, half were entered into the regression equations for more than two of the six years. All of the above are reasons that point to the stability of the six models despite the recession that occurred in 2009. However, despite this consistency, the creative class SOC codes did not do as well as Levi's (2015) NAICS approach, and only accounted for one-third of the variation in enplanements at best. For example, the R-squared value for 2013 was only 0.265. This discrepancy can likely be accounted for by the absence of the use of PST employment as a variable. It is likely that had this thesis examined the industry type using NAICS codes, rather than SOC codes to analyze the individual occupation, the R-squared value would have been higher throughout all six years. This is but one of the reasons that further study is needed.

CHAPTER V

CONCLUSION

City officials are constantly questioning how they can make their area's economy more viable. The answer to this dilemma lies with air travel, one of the fastest-growing forms of transportation in the United States. Previous research has indicated that airports are essential when determining the potential a city has to grow and thrive economically (Cidell, 2006; Bruckner, 2003; Green, 2007; Irwin & Kasarda, 1991; Debbage, 1999). Air travel is of particular importance in recent times because of the increased need that several employment sectors have for face-to-face interactions. These sectors, such as high-technology and professional, scientific, and technical employment – both a part of the larger creative class – each influence both enplanements and a city's economy in striking ways (Alkaabi & Debbage, 2007; Debbage and Delk, 2001; Levi, 2015). Moreover, the creative class, like air travel, is the United States' most rapidly expanding sector of employment. Thus, since city officials are concerned with how best to bolster their area's economy, they should also be interested in how and why creative workers are attracted to a particular place.

This thesis echoed the findings of previous studies. Larger metropolitan areas, such as New York, NY and Atlanta, GA, typically had the highest numbers of enplanements. This was true throughout all six years considered in this thesis. However, the recession did exhibit a substantial effect on enplanements, with a decrease of over 50

million enplaned passengers between 2008 and 2009. Despite this significant overall decrease, enplanements in airports designated as air fortress hubs for an airline did not alter dramatically. In both 2008 and 2013, airline fortress hubs such as Dallas's Dallas-Fort Worth International Airport and Atlanta's Hartsfield-Jackson International Airport held a disproportionate share of the overall amount of air traffic.

Interestingly, though, areas with the highest percentage of super-creative core workers varied considerably from those that had the greatest numbers of passenger enplanements. Metropolitan areas such as San Jose, CA and Huntsville, AL each stood out as having a large percentage of super-creative core workers yet a lower number of total air passenger enplanements. The above was true for both 2008 and 2013, as well as for the years in between. These areas are home to firms that employ a large number of creative workers; for example, San Jose – which is located in Silicon Valley – is home to Apple and Google, while Huntsville houses NASA's George C. Marshall Space Flight Center. Notably, for both 2008 and 2013, the top ten metropolitan areas with the highest relative super-creative core employment and the top ten metropolitan areas with the largest numbers of passenger enplanements only shared two cities in common – San Francisco, CA and Washington, DC, both of which are also home to a number of high-technology firms.

Unfortunately, while employment in the super-creative core was positively related to total air passenger enplanements for each of the six years under consideration, it did not demonstrate nearly as sizable of an effect as was originally hypothesized. However, in 2013, as well as in the other five years, arts, entertainment, sports, and media

occupations – a rather diverse category – was the most important sector of the super-creative core for stimulating air passenger enplanements. It is quite possibly this diversity that leads to increased air traffic. More likely, though, the industries encompassed in this sector of the super-creative core are more likely to trigger additional air traffic from those working outside of their sector. While it was originally expected that computer and mathematical occupations would be the sector that most influenced passenger enplanements, the fact that arts, entertainment, sports, and media occupations was the sector with the greatest influence for all six years still offers support for the second hypothesis. Interestingly, average annual wage, one of three control variables, entered in the model for four of the six years and was always the first variable presented when it did occur, showing that oftentimes, control variables were more important than super-creative core employment in predicting air passenger enplanements.

The most significant change over time concerns the relationship between computer and mathematical occupations and passenger enplanements. This sector of the super-creative core factored into the model for only two of the six years – 2008 and 2013. Notably, these years reflect both the pre-Recession and post-Recession eras. It is possible that had the 2009 Recession not occurred, this variable would have demonstrated more of an impact on the years between 2008 and 2013, particularly as those employed in this sector often need to travel more frequently for their occupations. More importantly, despite the 2009 Recession, the models remained stable throughout all six years. Arts, entertainment, sports, and media occupations were one of the most important predictors of air traffic in every year, and average annual wage demonstrated a similar effect.

Moreover, only two-thirds of the variables ever entered into the regression models, and of these variables, half were entered into the equations for more than two of years. Thus, while the Recession did show substantial impacts on certain sectors of the super-creative core, the relationship between the creative class and passenger enplanements remains durable despite this unfortunate economic downturn.

While this thesis did find the beginnings of a relationship between the super-creative core and passenger enplanements, there are still questions that need to be addressed in future research. From 2008 to 2013, the super-creative core displayed extraordinary resilience despite an economic struggle. However, as the economic recovery period is still occurring, it would be interesting to see how the super-creative core fares during a time period in which the economy is booming. Perhaps the relationship between super-creative core employment and passenger enplanements would increase were the economy fully recovered. Moreover, the last year that was analyzed for this study was 2013, as that was the last year for which data was available at the time. As this thesis was being written, data became available for 2014. Thus, an update that would include data for the most recent year possible would also be a worthwhile undertaking. This thesis also only includes the super-creative core. As previously mentioned, the creative class consists of not only the super-creative core, but also a broader group of creative professionals employed in industries such as finance and law. Therefore, similar research should be conducted in the future that would encompass the entirety of the creative class. Finally, this thesis focused solely on the United States. Future analysis

should be extended to include areas such as Europe and Asia to determine whether or not the American experience is replicable to other countries and continents.

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