2011 CORPORATE HEADQUARTERS: AN ANALYSIS OF IMMEDIATE COMMUNITIES

A Thesis

by

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ABSTRACT

While the Bay Area's history has shaped today's culture, there is little written about how corporations affect their immediate communities. This thesis focuses on the largest corporations in the Bay Area to determine if these corporations have any effect on the surrounding communities.

The study focuses on *Fortune 500's* list of Largest Corporations for 2011, and within that list, the top 30 companies located in the nine Bay Area counties. These nine counties include: Alameda County, Contra Costa County, Marin County, Napa Country, San Francisco County, San Mateo County, Santa Clara County, Solano Country, and Sonoma County.

Using each corporations' headquarter address as the reference point, a 1-mile radius surrounding each of the 30 companies was assessed. Data was gathered for the years 2000, 2010, and projected 2015. These data are available via ESRI's Business Analyst Online application, which is accessible through the Texas A&M University Library's website.

Demographic information such as population, income, education, and related characteristics were reviewed. To understand the population's lifestyle and possible implications for real estate development opportunities, the study reviewed the local demographic spending patterns, what these people do for recreation, their occupations, whether they rent or own their home, how they travel to work and their commute times,

and other lifestyle variables. There were 40 variables tested and 53-percent of those variables produced statistically significant results. While the Demographic variable yielded a 56-percent statistical significance rate and the Consumer Spending variable yielded a 43-percent statistical significance rate, the Business variable did not produce any statistical significance. The most significant variables drawn from the reports were Demographics and Income Comparison, House and Home Expenditures, and Recreation Expenditures.

This analysis provides important information regarding whether there is a statistical significance between characteristics within these companies' 1-mile radii and the overall MSA. In the future, if a company would like to expand and build another headquarters, this analysis may provide insight on what metrics to focus on for future development. There may also be important information for future development opportunities around these 30-companies.

DEDICATION

I dedicate my thesis research to my family and friends. A special gratitude to my loving parents, John Conti and Melinda Fouts, who provided the necessary emotional and financial support throughout my academic career. Thank you for being incredible role models, encouraging my dreams, pushing me to do my best work, being my loudest cheerleaders, and instilling perseverance in me from a young age.

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Finally, I dedicate this thesis to my fiancé, Scott Allen, for his unwavering love, support, and patience. Your support provided me with the endurance, strength, and confidence needed to not only complete this research, but also make this an enjoyable process.

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NOMENCLATURE

MSA	Metropolitan Statistical Area
ACS	American Community Survey
SF	San Francisco
BART	Bay Area Rapid Transit
GIS	Geographic Information System
ESRI	Environmental Systems Research Institute

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1. INTRODUCTION

Beginning in 1848, the gold rush led to a large boom in population in California, especially in San Francisco and the surrounding areas (Pederson, no date). Between January 1848 and December 1849, the population of San Francisco increased from 1,000 to 25,000 (Mosier, 2001). During this time, many businesses that exist today were founded to service the growing population, notably Levi Strauss & Co., Ghirardelli, and Wells Fargo. Post-World War II, San Francisco began to expand, spilling over into neighboring counties. With the Bay Area Rapid Transit (BART) system, completed in the early 1970's, movement between counties became simple and customary (Mosier, 2001). Since the early 1970's the Bay Area has been a business epicenter and a place for startup firms and technology companies. Stanford University gave birth to HP in 1939, and other graduating engineers found military work, for example NASA's wind tunnels (Hewlett Packard, 2012). Those projects and early companies eventually evolved into companies we recognize today.

While the Bay Area's history has, in large part, shaped today's culture, there is little written about how these corporations affect their surrounding communities. Business and social lives are continually shaped by products conceived in the Bay Area, for example, iPhones or Facebook pages. But how are the communities affected? The topic of this thesis will focus on the largest corporations in the Bay Area and their effect on the surrounding communities.

The study will begin by focusing on *Fortune 500's* list of Largest Corporations for 2011. The companies are ranked by total revenues for their own fiscal year. Included in the dataset are companies that are incorporated and operate in the U.S. as well as file financial statements with a government agency. The only companies excluded from the dataset are private and do not file with a government agency, are incorporated outside the U.S., and U.S. companies that are owned or controlled by other foreign companies. Other variables that *Fortune* considers are a company's balance sheet and assets, earnings per share, and total return to investors. The top 30 companies located in nine Bay Area counties will be reviewed. These nine counties include: Alameda County, Contra Costa County, Marin County, Napa Country, San Francisco County, San Mateo County, Santa Clara County, Solano Country, and Sonoma County.

Using each corporations' headquarter address as the reference point, the 1-mile radii surrounding these 30 companies will be used to analyze the immediate communities. Data will be gathered for the years 2000, 2010, and 2011, as well as projected data for 2015. These data are available via ESRI's Business Analyst Online application, which is accessible through the Texas A&M University Library's website. Demographic information such as population, income, education, and related characteristics will be reviewed. To understand the population's lifestyle, the study will review what the local demographic spends their money on, what they do for recreation, their occupations, whether they rent or own their home, how they travel to work and their commute times, and other lifestyle variables.

Huge campuses are being designed for Apple Computer in Cupertino, Facebook in Menlo Park, and Google in Mountain View. Apple's campus will house up to 13,000 (City of Cupertino, 2012) employees, and Google provides office space for 2,500 to 3,000 employees, offering retail and entertainment to its workforce as well as other activities close by (Watson, 2010). This analysis will provide important information regarding the influence of these companies and what life is like around them. In the future, if a company would like to expand and build another headquarters, this analysis may provide insight on what metrics to focus on for future development. There may also be real estate tax benefits if these companies can show they have had a positive impact on the surrounding community.

2. LITERATURE REVIEW

2.1 Literature

Corporate birth, expansion, and relocation decisions are based on many economic and locational factors. Some of these factors include revenue, production and distribution costs, procurement costs, corporate tax rate, average wage, supply of business services, and adequate transportation. This literature review found studies indicating that industries tend to collect near businesses with the same specialization and labor force. The reviewed literature can be grouped into three categories. The first category focuses on the clustering and agglomeration of firms. This literature looks at how firms that co-locate can benefit both individually and collectively. The second category concentrates on spillovers and second-tier centers. Data is collected on knowledge transfer between firms, usually leading to the emergence of an entirely new firm. The third category discusses how firms' choose a specific location, how that firm may be affected, and how the surrounding urban form is affected. For the purpose of this research, only literature on corporate headquarter location and effects on surrounding communities were incorporated in this review. Future research for completion of the thesis revolves around companies in San Francisco's metropolitan area. Where possible, literature including the Bay Area and corporate headquarters were used in the literature review.

The basis of this literature review consists of several references listed at the conclusion of this paper. The Texas A&M Library EBSCO Host, Google Scholar, as well as Dr. Saginor who also contributed to the identification and collection of

information. To find information, key words and phrases such as, *corporate headquarters, agglomeration, clustering, spillovers, second-tier centers, community impact, large companies, San Francisco development, Fortune 500, dot-com boom and bust,* and *creative class* were used in attaining the reviewed articles and studies. Today's corporate world is considerably different from corporations dating earlier than the 1960's. The literature reviewed in this study focuses on recent and relevant information. While literature predating 1967 exists, the current literature reviewed, references Mills' agglomeration theory as a driving force. Based on Mills (1967) agglomeration theory, all information in this review was found using references collected from 1967 to present day that either reinforce or expand upon Mills.

2.2 Findings

2.2.1 Agglomeration and Clustering

Once an area offers the adequate foundation for corporate companies to build their headquarters, agglomeration can begin to occur. The theoretical basis for the suggestion that firms group together, comes from Mills (1967) agglomeration theory, discussing that spatial proximity assists in the transfer of informational spillovers and the theory that firms bundle their specialties to reduce transaction and information costs. The study used an aggregative model, which combines multiple models used to measure city size, economic base, housing, and related measures. Additionally, the models assume only three activities take place in urban areas; the production of goods, intra-city transportation, and housing. Mills found that all three types of activity positively

contribute to growth in urban areas. He reported that locational effects on efficiency parameters of increasing returns would justify a city's existence. Although some progress was made, Mills agglomeration theory needs to be expanded upon, by addressing other pertinent factors influencing agglomeration, such as the firm product and industry type.

Porter (1998) updated Mill's theory adding that growing, new technology firms benefit from agglomeration and "synergistic" grouping. He states, "What happens inside companies is important, but clusters reveal that the immediate business environment outside companies plays a vital role as well" (p.78). He contends that, "clusters are geographic concentrations of interconnected companies and institutions in a particular field" (p. 78). Some examples, from which he draws to support his conclusions, are California's wine cluster in Napa, Wall Street's finance cluster, Silicon Valley's technology cluster, and Hollywood's film cluster. He argues that these clusters are alternative ways of organizing the value chain.

Porter explains, despite strong evidence that innovation and competitive success are geographically concentrated; the role of location has been overlooked as to why geographic concentration situates in specific areas. Maintaining a close proximity can actually benefit competitive firms that are dependent on fast-pace product development to meet consumer demand. The proximity of companies fosters better coordination through advantages in efficiency, effectiveness, and flexibility. While these clusters enhance productivity, Porter affirms that they are also essential in a company's continual ability to innovate. Companies are able to learn early about evolving technology, or

other advances in their field. He explains that this competition does not necessarily mean firms strive to beat their competitors through increasing their efficiency in production function, but rather prevailing over the competition through new products and faster reactions to the market. Thus, he argues that the microeconomic foundation, which includes an educated workforce, sufficient physical infrastructure, and laws protecting intellectual property, for firm competition ultimately establishes the overall productivity and competitiveness between firms. This competition is what largely leads to a firm's productivity function.

Eberts and McMillen (1999) reviewed theoretical and empirical literature on agglomeration economies and urban public infrastructure. Linking two concepts, they hypothesized that agglomeration economies exist when firms located in urban areas share a particular public good as an input of production. Business proximity and urban public infrastructure are two externalities that result from a "common labor pool, technical expertise, general knowledge, and personal contacts". Results from the studies they reviewed suggest that spatial proximity and physical infrastructure positively contribute to the productivity of firms in urban areas. Although compelling, the authors believe more research is needed to explore the relationship between urban size, urban public infrastructure, and agglomeration economies.

2.2.2 Spillovers

Jaffe, Trajtenberg, and Henderson (1993) compared geographic locations of patent citations with cited patents, using it as evidence to study how much knowledge

spillovers are geographically localized. To compare the data, the authors had to construct a control sample, "control patent". This sample was created using a "null" hypothesis, which provided the ability to compare the "probability of patents matching the originating patent by geographic location" (p. 581). The authors agreed that case studies and citations of the patents studied, would be very informative about how the knowledge transfer occurs and the degree to which citations correspond to economic externalities. They provided persuasive evidence for the idea that knowledge spillovers are important and that these spillovers decrease with geographic distance. They also found that a considerable amount of the total "flow" of spillovers, affecting a firm's research productivity, comes from outside the firm. Using the location of patent citations as a means for collecting data, they were able to isolate a "paper trail" of knowledge spillovers. Their key results found that patent citations are "highly spatially concentrated", with citations being 5 to 10 times more likely to come from the same Standard Metropolitan Statistical Area (SMSA) as the original patents from the control group.

Another paper looking at knowledge spillover includes Audretsch and Feldman (1996). Audretsch and Feldman examined the link between how industrial activity clusters spatially, and more precisely, connecting geographic concentration to the existence of knowledge externalities. The authors referenced Jaffe et. al., (1993) findings, explaining that innovation in some industries clusters more than others because the production location is spatially concentrated. Using the United States Small Business Administration to compile a database of 8,074 commercial innovations, the

study empirically tested for the importance of geographic location, in particular the significance of knowledge spillovers. The main hypothesis of their paper suggests that, "innovative activity will tend to cluster in industries where new economic knowledge plays an especially important role". They considered the impact of agglomeration on innovation, finding that industries where new economic knowledge plays a more significant role tend to demonstrate a greater degree of "spatial concentration".

Results confirmed that knowledge oriented industries have more spatially concentrated innovative activity in specific industries, which is consistent with the presence of knowledge spillovers (Audretsch and Feldman, 1996). For example, out of the 821 computer innovations recorded, 342, or 41.7 percent, are in California. However, the authors do add that it is not clear whether this is, "attributed to the fact that knowledge externalities are more conducive to innovative activity or simply that the firms are already located within a relatively tight geographic area". They explained that based on their statistical results, it appears that innovative activity inclined to cluster spatially has a greater link to the influence of knowledge spillovers and not purely production's geographic concentration. They concluded with their findings, explaining they found evidence that industries with knowledge spillovers are more prevalent, and have a greater tendency for innovative activity to cluster. Moreover, rather than specifically testing, it was assumed that knowledge externalities are more frequent in industries where new economic knowledge has a greater role. When examining the relationship between knowledge spillovers in an industry where innovative activity clusters spatially, this assumption undermines the generalizability of the overall findings.

Spillovers and innovation in technological clusters have been studied using two different approaches. The first focuses on the role spillovers play in the relationship to clusters. The second focuses on understanding the effects of spillovers occurring in between geographically or technologically close firms and using innovation outputs to capture this trend. Fallah and Ibrahim (2004) expanded on Porter (1998), drawing on current knowledge to understand how knowledge spillovers actually take place. Their conceptual model uses knowledge accessibility as a means for knowledge transfer, distinguishing between knowledge transfer and knowledge spillover. Lastly, they reviewed how tacit knowledge is accessed in technological clusters and how it affects knowledge creation. The paper argues that one of the underlying reasons technology clusters form is through the "repeated use and informal personal contacts with the innovator, particularly when a technology is in the early stages of development". The geographic proximity allows for direct interaction between firm employees. Simply put, a technological cluster is described as a "geographical concentration of technology firms", for example Silicon Valley, as mentioned earlier.

Another aspect affecting the agglomeration of headquarters is the concept of spillovers. Spillovers are defined as, "the unintentional transmission of knowledge to others beyond the intended boundary" (Fallah and Ibrahim, 2004). Any interaction between firms and individuals creates the potential for knowledge exchange. Knowledge exchanged beyond the intended group is considered a "spillover". The difference between knowledge transfer and knowledge spillover, is that knowledge transfer is exchanged with intended people or organizations. By building on existing

literature, Fallah and Ibrahim explored the effect of spillovers within technological clusters of innovation. They classified knowledge from an accessibility perspective, showing how accessibility mechanisms differ when regarding "tacit and explicit knowledge". Direct interaction is needed to transmit social, "non-codified" knowledge, and is therefore more prevalent in technological clusters. Spillovers and knowledge transfer can happen at an "individual, enterprise, or national level" (Fallah and Ibrahim, 2004). While little is known about the mechanisms influencing creativity and increased innovative output, the authors do discuss earlier research showing that clusters do in fact have an effect on innovation, and that spillovers are an important externality, influencing the innovative ability of clusters. The study concludes, explaining that further identification and classification of these influences is needed when assessing to what extent locating in a cluster affects these mechanisms.

As summarized in Rosenthal and Strange (2004), empirical studies agreed that knowledge spillovers might be one of the most important "microfoundations", considering they apply to many areas of economics, including growth and human capital theories. They discussed the empirical literature on the nature and sources of urban increasing returns, focusing on the industrial, geographic, and temporal scope of economic agglomeration economies. Throughout the literature, the idea that agglomeration economies attenuate with distance is reaffirmed. Unfortunately, it is difficult to distinguish knowledge spillovers from other causes. As the authors point out, knowledge is frequently exchanged without being bought or sold, and is more likely to be a complex joint venture between different organizations or individuals. Since

measuring knowledge spillover is complex, often times it is difficult to directly tie agglomeration or productivity to these spillovers, which makes examining the effects on surrounding communities complex. In other words, knowledge spillovers often have informal characteristics that are qualitative and difficult to trace between the original source of the knowledge and the direct spillover. Alternatively, while agglomeration is measured geographically, productivity can be measured in hours, products produced, employment, and related measures, all of which are quantifiable.

2.2.3 Second-Tier Centers

Another effect of knowledge spillovers is what Holloway and Wheeler (1991) called "second-tier" centers. Their paper formed four distinct hypotheses focusing on corporate headquarter dispersal, corporate dominance, changes in corporate dominance based on metropolitan areas, and the associated gains and losses of firms in those metropolitan areas. Their study examined the leading metropolitan areas in the number of *Fortune* magazine's list of major corporations in 1987, and how many firms were gained or lost between 1980 and 1987; the top 4 metropolitan areas, being New York, Chicago, San Francisco, and Los Angeles. New York headquartered firms dominated in total number of *Fortune* firms with assets equally close to five and one-half time the assets of Chicago, the second highest ranking center. They traced detailed information, concerning location shifts of corporations through relocation and merger activities, through individual firms historical record and the Bureau of Labor Statistics.

The results showed that between 1980 and 1987, the four largest metropolitan centers in the nation experienced noticeably large declines, with the greatest net loss at 30 percent in Los Angeles, except San Francisco, which experienced a net increase of firms in the number of *Fortune* firms. The metropolitan areas that gained the most firms, are described these as "second-tier" centers. An example of this is Silicon Valley, which is considered a "second-tier" center from San Francisco. These centers benefited from aggressive firms that actively pursued mergers and acquisitions of similar, smaller firms. Concluding results showed that 67 percent of the firms lost to merger and acquisition activity, merged with or were acquired by firms in secondary centers, supporting the hypothesis that merger and acquisition activity is a direct mechanism to the diffusion of metropolitan dominance (Holloway and Wheeler, 1991). This study demonstrates the importance of inter-metropolitan headquarters relocation and the insecure status of many city centers. The relocation of one corporation may have significant impacts on the surrounding and adjacent areas.

Saxenian (1994) named Silicon Valley, which began as second-tier center, as a "model industrial district", encompassing high growth and innovation rates, which stem from its dense geographic network of technology companies. Saxenian stated, "Silicon Valley has a regional network-based industrial system that promotes collective learning and flexible adjustment among specialist producers of a complex of related technologies". This system of collective learning "spills" from one firm to the next, and eventually new smaller firms form and expand.

Refining Saxenian (1994), Knudsen, Florida, Gates and Stolarick (2007) focused on the role of knowledge spillovers in powering innovation and examined composite population densities and creative occupations to measure "creative-density" as a lone variable. The paper investigated the density of creative workers as the main factor impacting regional innovation. Using statistical analyses, including multivariate regression, they attempted to demonstrate that high densities of creative capital lead to repeated face-to-face interactions, thus facilitating creative spillovers and innovations.

After examining 240 metropolitan areas in the U.S., the authors found that density and creativity affect innovation in metropolitan areas both independently and collectively. Their regression analysis found a significant positive relationship between the density of creative workers and metropolitan patenting activity, suggesting that density is a key factor in both knowledge spillovers and innovation. Their results, "strongly reinforce[d] the extant geographic literature on spillovers and agglomeration", which hypothesized that learning, knowledge creation, and innovation are geographically and spatially correlated. Proximity plays a fundamental role where geography and social science are concerned, and Knudsen, et. al., (2007) research corresponds with that theoretical concept. While this study demonstrates persuasive findings, no measure for "creative density" was actually created, making this study difficult to replicate.

2.2.4 Corporate Business Relocation

When corporate headquarters relocate, do they benefit the community? One would assume that where a company originates or relocates benefits the community on the basis of job creation, income generation, and several other factors. Corporate agglomeration focuses on the concentration of companies without discussing the impact on the surrounding community. Anjomani and Ibewuike (1997) assessed the impact of a corporate headquarters' relocation on a metropolitan area using J.C. Penney's move to the Dallas-Fort Worth area as an example. Their results indicated that, contrary to popular belief, "financial incentives play an important role in business relocation decisions", and that economic factors were the main basis for J.C. Penney's move to Dallas-Fort Worth. When evaluating the financial impacts on surrounding areas, public revenues from affected businesses came from real estate revenues, property tax, and sales tax. Results found that once a business chooses their location for transfer, the impact of that decision is felt by all sectors of the community. Based on the socioeconomic measurements described in the study, the effect of relocations represents a "plus" to individuals (represented by job opportunities) and a "plus" to taxpayers if related governmental costs are less than the revenue. Furthermore, the authors do point out, that cities with a stronger economic foundation experience more of a "ripple effect".

A second strand in the literature discusses information on the gross flows of headquarters of large publicly traded companies during the 1990's. Tyler, Diacon, and Klier (2003) investigated the effects of pure relocations, mergers, and acquisitions on the dispersal of headquarters within metropolitan areas. Numerous city and company

characteristics, such as population, education level, firm entry and exit, firm assets, total employment, and firm actions were used as control variables and were found to influence headquarters location choice a considerable amount in the 1990's. By aggregating data from publicly traded companies for the year's 1990 and 2000, Tyler, et. al., (2003) were able to confirm two trends from previous literature; headquarters "disproportionately" locate in metropolitan areas, and within that group, headquarters continue to disperse towards, "medium-sized, fast growing metropolitan areas". On average, firms entering or exiting a metropolitan area cumulate approximately two-thirds of the total flow activity for the largest 50 Metropolitan Statistical Areas (MSA). While these papers and this case study do show the results of successful corporation relocation, they do not however, provide enough detailed information on the effect of relocations on the surrounding communities.

2.2.5 Home Market Effects

When large corporations are born or relocated, they do impact their surrounding communities Anjomani and Ibewuike (1997). Most of the previous literature focuses on the corporations themselves, looking out towards the community. For example, when large corporations left the City of San Francisco, relocating a few miles south in what is known today as Silicon Valley, how did the dot-com boom impact Silicon Valley's community? Quercia, Stegman, and Davis (2002) however, analyzed the effects of high-tech economic growth on the prevalence of housing problems, including all households and moderate-income working families in major metropolitan areas. Using 1999 survey

data, as well as more recent data, the team found that, “the level of high-tech activity affects, positively and significantly, the incidence of critical housing problems for all households and especially for moderate-income working households” (p. 393).

Despite the assumption that property values would increase in neighborhoods where high-tech companies built their headquarters, benefiting surrounding homeowners, the results demonstrate quite the opposite. The odds of owners living in the “top-ranked high-tech metropolitan areas” experiencing housing problems are roughly 1.7 times greater than homeowners living somewhere else, regardless of tenure (Quercia, et. al., 2002). Mainly focusing on the negative effects of high-tech growth, the team did not thoroughly expand on the positive impacts and how home prices and real estate shifted during their study’s time period.

2.2.6 Locational Factors

Corporations are usually motivated to build or move their headquarters to a certain location based on financial implications, social influences, and/or convenience factors. Strauss-Kahn and Vines (2009) found that headquarters tend to concentrate in certain geographical locations. Their paper analyzes firms' decisions concerning the location of headquarters in the U.S. between 1996 and 2001. Using approximately 30,000 U.S. headquarters, the paper examines specific characteristics of each firm and location. They describe that, “the top 20 urban centers accumulate 75% of the headquarters weighted by sales in the continental U.S.” and the rate of movement was about 5% between their 5-year sample. This information suggests headquarters value

similar geographical attributes and look to locate themselves in areas offering analogous amenities such as efficient transportation, arts, and retail, for example.

Once examining the data, the authors found that headquarters generally choose metropolitan areas having adequate airport facilities, low corporate taxes, low average wages, a good supply of business services, industries with the same specialization, and an agglomeration of other headquarters within the same area. Strauss-Kahn and Vines suggested that metropolitan areas wanting to attract and maintain a large pool of headquarters should improve their airport facilities, lower taxes, and promote the location of business services. For example, a 10% increase in the measure of business services provides a 7-13.5% increase in the probability of choosing a specific location. Also, a one-point rise in corporate tax rate presented a 2.25% decrease in the likelihood that headquarters would choose a location. The paper concluded by mentioning that an increase in recreational amenities and educating the labor force would also help attract large corporate headquarters. While the paper did present some important elements that cities should consider if wanting to attract more headquartered firms, it did not discuss how these amenities impact the surrounding communities.

2.2.7 Shaping Urban Economies

The knowledge base and the previously mentioned spillovers have played an important role in shaping today's urban economies. During the dot-com boom, older urban areas in San Francisco were able to expand and strengthen due to growing economic sectors reliant on a technically educated workforce. As the population and

jobs moved to the suburbs, the inner areas of San Francisco were able to grow. New real estate development opportunities were created in the city's South of Market area (SOMA), due to dot-com activity (Kroll, Lee, and Shams, 2010). With the influx of jobs, the real estate market rose until the 2000-2004 bust. Kroll, et. al., (2010) explained how establishments leaving the City of San Francisco removed many more jobs than establishments moving in added, during both the 1995-2000 boom and 2000-2004 bust periods. It should be noted that these "removed" jobs were not lost, but rather repositioned to locations just outside the city's boundaries. Using the National Establishment Time Series (NETS) database, data on the growth of dot-com businesses affects on San Francisco and surrounding counties was examined. The authors added that 14% of gross job losses were due to establishments leaving the city to second-tier centers like Silicon Valley or the East Bay.

Chevron Corporation is an excellent example of corporate headquarters' locational effect. After nearly a century of calling downtown San Francisco its home, in 2001, the Chevron Corporation moved to its new campus in San Ramon. The Silicon Valley / San Jose Business Journal quoted Chevron Chairman and CEO Dave O'Reilly stating, "While San Francisco is a great location, we need to bring all of our people together". Kroll, et. al., (2010) found that most establishments that moved stayed in the surrounding Bay Area, and of the establishments that left the area, the majority stayed in California, benefiting the neighboring areas. More information is needed on how neighboring areas are benefited by these start-ups and relocations. Data on these

benefits would provide insight on exactly who is affected and what areas of the market are influenced.

2.3 Gaps in the Literature

While there is a significant existing body of literature on corporate headquarters' locational choices, there is little published information regarding the effects on surrounding communities. Although occasionally covered in the press, such as the case of Chevron leaving San Francisco, many aspects of the effects of births and relocations of corporations have not been empirically studied. Despite growing evidence that these corporate births and relocations do impact their communities, it is still not clear how variables such as real estate prices, recreation activities, socioeconomic status, and types of jobs created are altered. This paper uses data from ESRI Business Analyst Online to look at the effects of corporation birth, life, relocation, and death in the nine Bay Area counties, and how agglomeration of the high-tech industry has impacted the local market. The online data will provide insight about changes in commercial and residential real estate prices, recreational activities, population, as well as many other socioeconomic factors. Local businesses income and financial statements are available using the U.S. Securities and Exchange Commission, the California Governor's Office of Business and Economic Development, as well as San Francisco's Office of Economic and Workforce Development databases. Other interesting information made available will be shifts in transportation, recreational expenditures, and fluctuations in the local housing market.

By gathering this data, this study plans to answer the following questions. How do corporate headquarters affect other industries within the area? What roles do they play in the daily and fiscal life of the surrounding population? How is the local surrounding real estate affected over the years? In the future, if a company would like to expand and build another headquarters, this information may provide insight on what metrics to focus on for future development. There may also be real estate tax benefits for these companies if they can exhibit a positive impact on their current surrounding community.

3. EXPERIMENTAL DESIGN

3.1 Introduction to the Study

The first purpose of this research is to add to the collection of empirical studies focusing on corporate headquarters and their surrounding environment. Subsequently, this research primarily focuses on whether areas surrounding corporate headquarters are statistically significant when compared to the overall Metropolitan Statistical Area (MSA). To measure the differences, data was grouped into three categories; Business Reports, Consumer Spending, and Demographics. The study examines *Fortune 500* companies, using the top 30 located in the San Francisco / Bay Area, as its sample size. To test these 30 companies against the greater San Francisco / Bay Area MSA, three separate hypotheses were produced.

3.2 Hypotheses

While developing this study, it became clear that three distinct hypotheses must be taken into consideration. The hypotheses are:

Hypothesis 1

H_1 Demographic data from the 1-mile radii around corporate headquarters is statistically significant when compared to the total MSA.

H_0 Demographic data from the 1-mile radii around corporate headquarters is not statistically significant when compared the total MSA.

Hypothesis 2

H_2 Business data from the 1-mile radii around corporate headquarters is statistically significant when compared to the total MSA.

H_0 Business data from the 1-mile radii around corporate headquarters is not statistically significant when compared the total MSA.

Hypothesis 3

H_3 Consumer spending data from the 1-mile radii around corporate headquarters is statistically significant when compared to the total MSA.

H_0 Consumer spending data from the 1-mile radii around corporate headquarters is not statistically significant when compared the total MSA.

3.3 Sources

Demographic information is the most extensive and includes a Market Profile, Demographic and Income Comparison, Net Worth Profile, and the ACS Population Survey. The Market Profile summarizes specific demographic attributes and consumer-spending patterns in a trade area. The Demographic and Income Profiles summarizes 2010, 2011, and projects 2016 household data to illustrate demographic and income trends. The Net Worth Profile demonstrates households' net worth by calculating a household's total wealth less any debts, including unsecured or secures assets. Lastly, the ACS Population Summary provides home value, education, commute times and

means of transportation to work, employment and occupations, and income and poverty status information.

Using the U.S. Bureau of the Census and the 2000 Census Population and Housing reports, ESRI created the Market Profile, Demographic and Income Comparison, and Net Worth Profile reports. Once the data were collected and reviewed, ESRI generated forecast reports for years 2010 and 2015. The U.S. Census Bureau, 2005 – 2009 American Community Survey report was used to produce the ACS Population Summary.

The business report includes information regarding the number and types of businesses that surround the site, and the number of employees per industry group. This information provides insight into where to locate businesses and services such as restaurants, banks, and hotels. ESRI gathers their business report data using third party information and then makes projections based on the data gathered. The third party information used to create the business report was Infogroup from Omaha, Nebraska, the U.S. Census Bureau, and the Census 2010 Summary File.

The consumer spending information is based on annualized data gathered from the Consumer Expenditure Survey (ESRI, 2013). House, Home, Recreational, and Retail dollar amounts are broken down into sub categories. These reports show the total dollar amount and average amount per household spent on products, services, and entertainment. Also included, is a Spending Potential Index (SPI), which allows the comparison of each 1-mile radius to the U.S. average. Consumers' preferences for products and services are identified and quantified.

ESRI created the Recreation Expenditure, House and Home Expenditures, and Retail Goods and Services Expenditures reports using consumer-spending data derived from the 2006 and 2007 Consumer Expenditure Surveys, established by the Bureau of Labor Statistics. After compiling the data, ESRI used the data to forecast additional data for years 2010, 2011, and 2016.

3.4 Methods

The Wilcoxon Method was implemented to analyze the collected data as an alternative to a t-test. The Wilcoxon signed-rank test is a non-parametric statistical hypothesis test that is used when comparing two related samples or matched samples (SPSS Help Sheets, 2012). The test makes three assumptions: data are paired and come from the same population; each data pair is chosen at random and is independent; and the data are measured on an interval scale (SPSS Help Sheets, 2012).

To test the statistical significance, the mean of each variable was calculated, and then the mean of those 30 companies was tested against the MSA's mean. If alpha was above .05, then the results indicate that there is no statistical significance demonstrating a difference between the means. If alpha was below .05, then there is statistical significance between the means of the MSA and each variable. For the purpose of the test, H_0 means the median difference between the pairs is zero, and H_1, H_2, and H_3 means the median difference is not zero. By using a null hypothesis, the test asses whether or not there is a significance, rather than how much of a significance. The higher alpha, the lower the significance level and vice versa.

3.5 Data

The data for this study was gathered using the top 30 companies on *Fortune 500's* list of Largest Corporations for 2011 that are located in California's Bay Area. There are nine counties in the Bay Area, five of which have *Fortune 500* companies. These five counties include Alameda Count, Contra Costa County, San Francisco County, San Mateo County, and Santa Clara County. For the purpose of this study and to compare companies, data from the San Francisco-Oakland-Fremont, CA MSA and San Jose-Sunnyvale-Santa Clara, CA MSA was also gathered.

The data set for this paper comes from ESRI's Business Analyst Online application, which is a web-based program, which applies GIS technology to extensive demographic, consumer spending, and business data from multiple publicly-available as well as private data sources. This data is accessible through the Texas A&M University Library's website.

The three hypotheses are broken down into eight different reports and then 40 different variables. For all variables, data for year 2010 was collected. However, data for years 2000, 2010, 2011, and project 2015 and 2016 was collected for some variables in an effort to analyze change over time and how companies affect immediate communities. To examine these neighboring areas, data was gathered using a 1-mile radius with the address of each corporations' headquarters as the reference point. Due to the clustering of corporation headquarters studied, a 1-mile radius was the best representation of how each headquarters interacts with its immediate community. In the preliminary phase of the study, both 3 and 5-mile radii were reviewed, but the large

amount of area overlap would have hindered the ability to see statistical significance between company locations.

4. RESULTS AND DISCUSSION

4.1 Introduction

The results shown in the pursuant sections demonstrate a 52 percent statistical significance rate among variables. While there is no statistical significance for the business variable, there is statistical significance for both the demographics and consumer spending variables. This significance suggests that corporate headquarters' location does affect the immediate community. The results are as follows:

Hypothesis 1

H_1 Demographic data from the 1-mile radii around corporate headquarters is statistically significant when compared to the total MSA.

H_0 Demographic data from the 1-mile radii around corporate headquarters is not statistically significant when compared the total MSA.

Result: Can neither reject nor accept the null hypothesis.

Hypothesis 2

H_2 Business data from the 1-mile radii around corporate headquarters is statistically significant when compared to the total MSA.

H_0 Business data from the 1-mile radii around corporate headquarters is not statistically significant when compared the total MSA.

Result: Reject the null hypothesis.

Hypothesis 3

H_3 Consumer spending data from the 1-mile radii around corporate headquarters is statistically significant when compared to the total MSA.

H_0 Consumer spending data from the 1-mile radii around corporate headquarters is not statistically significant when compared the total MSA.

Result: Can neither reject nor accept the null hypothesis.

4.2 Demographics

The demographic variable is comprised of four specific reports. The Market Profile report evaluates household income and values, renter and homeowner dwelling value, education levels, and how individuals travel to work. The Demographic and Income Comparison report assesses owner and renter occupied units for 2010, as well as projects 2015 figures. The Net Worth Profile reports the average net worth of households for the year 2010. Lastly, the ACS Population Summary report quantifies the average amount of people who graduated from high school and/or GED, attained an Associate's Degree, Bachelor's Degree, and either drove alone, carpooled, walked or used public transportation as a means to get to work. Table 1 cumulatively summarizes data for both statistically significant and non-statistically significant demographic variables.

Table 1: Demographics Variables

VARIABLE	REPORT	SPECIFIC VARIABLE	MSA MEAN	COMPANY MEAN	STATISTICAL SIGNIFICANCE
DEMOGRAPHICS					
	Market Profile				
		2000 Median Household Income	$64,163.00	$64,241.73	0.877
		2010 Median Household Income	$84,686.00	$87,597.67	0.572
		2015 Median Household Income	$101,327.00	$101,730.17	0.673
		2000 Median Home Value	$364,897.00	$419,283.37	0.013
		2010 Median Home Value	$528,610.00	$594,009.13	0.008
		2015 Median Home Value	$640,731.00	$690,494.00	0.028
		2000 Average Household Income	$86,649.46	$84,976.86	0.688
		2010 Average Household Income	$115,498.17	$119,405.12	0.453
		2015 Average Household Income	$133,165.53	$135,585.38	0.405
		2000 Owner Occupied Average Home Value	$435,644.42	$459,559.11	0.318
		2000 Specified Renter Occupied Average Rent	$992.97	$1,130.37	0.01
		Enrolled in Nursery/Preschool 2000 Population 3+ by School Enrollment	1.79%	1.42%	0.024
		Bachelor's Degree 2010 Population 25+ by Educational Attainment	26%	30%	0.006
		Drove Alone - Car, Truck, or Van 2000 Workers 16+ by Travel Time to Work	67%	64%	0.992
		Carpooled - Car, Truck, or Van 2000 Workers 16+ by Travel Time to Work	13%	9%	0
		Public Transportation 2000 Workers 16+ by Travel Time to Work	11%	10%	0.688
		Walked 2000 Workers 16+ by Travel Time to Work	3%	11%	0.673
		Worked at Home 2000 Workers 16+ by Travel Time to Work	4%	3%	0.156
		Less than 5 minutes Workers 16+ by Travel Time to Work	1%	2%	0.011
		Average Travel Time to Work (in min) Workers 16+ by Travel Time to Work	29.59	25.02	0

Table 1: Continued

VARIABLE	REPORT	SPECIFIC VARIABLE	MSA MEAN	COMPANY MEAN	STATISTICAL SIGNIFICANCE
DEMOGRAPHICS					
	Demographic and Income Comparison				
		Owner Occupied Housing Units 2010 PERC	56%	41%	0.001
		Renter Occupied Housing Units 2010 PERC	44%	59%	0.001
		Owner Occupied Housing Units 2015 PERC	56%	41%	0.002
		Renter Occupied Housing Units 2015 PERC	44%	59%	0.002
	Net Worth Profile				
		Average Net Worth 2010 Households by Net Worth	$771,155.00	$664,989.93	0.098
	ACS Population Summary				
		High school graduate, GED, or alternative Population Age 25+ Years by Educational Attainment 2010	12%	9%	0
		Associate's degree Population Age 25+ Years by Educational Attainment 2010	5%	5%	0.658
		Bachelor's degree Population Age 25+ Years by Educational Attainment 2010	17%	21%	0
		Drove alone Workers Age 16+ Years by Means of Transportation 2010	31%	30%	0
		Carpooled Workers Age 16+ Years by Means of Transportation	5%	4%	0.03
		Public transportation (excluding taxicab) Workers Age 16+ Years by Means of Transportation	5%	5%	0.688
		Walked Workers Age 16+ Years by Means of Transportation	2%	5%	0

The results shown in Table 1 provide support for the first hypothesis that there is evidence of statistical significance between the MSA and the 30 companies 1-mile radii for Demographics.

There was no statistically significant difference for the median household Income or for the average household income between the MSA and the 30 companies for years 2000, 2010, and 2015. The lack of statistical significance may signify that the entire Bay Area was equally affected by the current economic downturn, regardless of inhabiting near a large company.

There was statistical significance for the median home value for years 2000, 2010, and projected 2015, between the MSA and 30 companies. The statistical significance may reflect the economic crisis of 2008 and how that crash affected the Bay Area. Another factor is the Bay Area's tech boom, occurring around 2010. When large companies, like Facebook, move into a once blighted area, the real estate market may shift.

While there was no statistical significance between the MSA and the 30 companies for the 2000 owner occupied average home value, there was statistical significance for renter occupied average rent. This difference may indicate that the 1-mile radii surrounding the 30 companies had a higher demand for rental units, increasing average rents.

There was statistical significance between the MSA and 30 companies in 2000 for number of individuals enrolled in nursery/preschool and 3 or more years of age, as well as individuals 25 or more years of age with a bachelor's degree. With a dense population of working individuals, these results may suggest that to be employed by one of these companies, individuals are required to have a higher level of education.

In 2000, there was no statistical significance between the MSA and 30-companies 1-mile radii for number of workers who drove alone, used public transportation, or walked to work. Interestingly, there was statistical significance for individuals who carpooled, worked less than 5-minutes from work, and the average travel time (in minutes). Many of the companies in this study provide large busses that pick up their employees in specific carpool locations. This may contribute to the statistical significance in carpooling and average travel time.

There was no statistical significance between the number of workers who worked at home, or the percentage of owner occupied housing units and renter occupied housing in 2000 for the MSA and the 30 companies 1-mile radii.

In 2010, data yielded a statistically significant difference between the means for the percentage of owner occupied housing units and renter occupied housing units for the MSA and the 30 companies 1-mile radii. Also, it is predicted that there will be a statistically significant difference between these variables means in 2015. The statistical significance may reflect growth in the areas where these companies are located, for example Gap, in San Francisco's Financial District.

In 2010, there was no statistically significant difference between the mean for the average net worth of households in the MSA and 30 companies examined in this study.

In 2010, the study shows that there was statistical significance between the mean of the MSA and the 30 companies 1-mile radii for all but two of the ACS population summary variables. While there is statistical significance for the average number of high school graduates and those with a bachelor's degree, there was no statistical

significance for the average number of associate degrees. This may reflect that individuals with a higher educational background are more likely to inhabit areas surrounding these companies. Secondly, the data shows a statistical significance between the numbers of individuals who drove alone, carpooled, and walked to work, but did not show a statistical significance for the average number of individuals utilizing public transportation. These results may reflect the growth of these companies and that they are located in busier areas of town. Also, larger companies are more likely to provide carpooling for their employees, affecting carpool and individual car levels.

4.3 Business

The business variable focuses on the Business Summary report. The Business Summary report evaluates the management of companies and enterprises. Specifically, this report focuses on the number of businesses, and individuals within them, that work in the management of companies and enterprises industry. Table 2 cumulatively summarizes data for both statistically significant and non-statistically significant variables for the Business Summary reports.

Table 2: Business Variable

VARIABLE	REPORT	SPECIFIC VARIABLE	MSA MEAN	COMPANY MEAN	STATISTICAL SIGNIFICANCE
BUSINESS					
	Business Summary				
		MgmtC&E NAICS: Management of Companies & Enterprises	0.00%	0.01%	0.231

The results shown in Table 2 do not provide support for the second hypothesis. There is no evidence of statistical significance between the MSA and the 30-companies 1-mile radii for Business Reports.

For the business summary, the management of companies and enterprises mean showed no statistical significance from the MSA mean, signifying that the average number of businesses in the business of managing companies and enterprises reflects a similar distribution as the surrounding MSA.

4.4 Consumer Spending

The consumer spending variable is comprised of three specific reports. The House and Home Expenditure report evaluates the average amount spend on rented dwellings and owned vacation homes. The Recreation Expenditure report assesses the average amount spent on sports, recreation, and exercise equipment. Lastly, the Retail Goods and Services report quantifies the average amount spent on food, food at home, transportation, and healthcare for the year 2010. Table 3 cumulatively summarizes data for both statistically significant and non-statistically significant variables for the Consumer Spending information reports.

Table 3: Consumer Spending Variables

VARIABLE	REPORT	SPECIFIC VARIABLE	MSA MEAN	COMPANY MEAN	STATISTICAL SIGNIFICANCE
CONSUMER SPENDING					
	House and Home Expenditures				
		RD AAS: Rented Dwellings Average Amount Spent	$17,864.12	$7,576.65	0
		OVH AAS: Owned Vacation Homes Average Amount Spent	$2,285.51	$810.42	0
	Recreation Expenditure				
		SR&EE AAS: Sports, Recreation and Exercise Equipment Average Amount Spent	$282.52	$54.25	0
	Retail Goods and Services				
		Food for 2010 Average Amount Spent	$11,038.24	$11,307.83	0.349
		Food at Home for 2010 Average Amount Spent	$6,383.02	$6,515.63	0.339
		Transportation for 2010 Average Amount Spent	$13,955.87	$14,213.35	0.405
		Health Care for 2010 Average Amount Spent	$4,855.91	$4,863.53	0.704

Table 3 does provide support for the third hypothesis that there is evidence of statistical significance between the MSA and the 30-companies 1-mile radii for Consumer Spending.

The average amount spent per year on rented dwellings and owned vacation homes was statistically significantly different than the MSA's average amount spent. This may reflect that the 1-mile radii around these companies are more active than the MSA and that individuals have a higher spending potential.

The annual average amount spent on sports, recreation, and exercise equipment for the 1-mile radii around the 30 companies is statistically significant from the annual average amount spent in the MSA. This report expresses the average amount spent per household on recreation products and services. With a large influx of high tech

companies, there has been growth in the number of younger, more educated families, which tend to lead more active and healthy lifestyles.

In 2010, the average amount spent on food, food at home, transportation, and health care was not statistically significant between the 30 companies and the MSA. This report shows that the studied companies did not have an effect on the average amount spent per household on retail goods.

4.5 Discussion

The results show that the 1-mile radius around corporate headquarters is statistically significant from the total MSA. Of the 40 variables tested, 21 variables were statistically significant, yielding a 53-percent statistical significance rate among variables. The most significant were Demographics and Income Comparison, House and Home Expenditures, and Recreation Expenditures. Of the variables examined, the statistically significant variables are, 50-percent of the Market Profile variables, all of the Demographic and Income Comparison variables, 70-percent of the ACS Population Summary, all of the House and Home Expenditures, and all of the Recreation Expenditures. The Net Worth Profile, Business Summary report, and Retail Goods and Services reports did not yield statistically significant results.

Home values, occupancy levels, and dwelling expenditures are significant, which may signify an increase in demand to live near these headquarters. Education levels, nursery school attendance figures, recreation expenditures, and means of transportation are significant, which may indicate a younger, more active population with a demand to

locate near these headquarters. This may occur because these individuals work at these companies, or that these areas offer desirable locational factors.

5. CONCLUSION

As discussed in the Literature Review, previous literature focuses on the clustering of firms, why companies choose specific locations, and how these choices have shaped the urban form and home markets. While this existing body of literature is important and relevant, there is little published information regarding the effects headquarter locations has on the surrounding community. A review of the existing literature prompted the following questions. Do corporate headquarters affect other industries within the area? Do corporate headquarters' location participate in the daily and fiscal life of the surrounding population? Is the local surrounding real estate affected? The investigation of these questions may provide insight on what metrics companies should focus on for future development as well as real estate tax benefits as evidence of positive impact.

This study contributes to the literature by empirically investigating the statistical significance of corporate companies' location and their impact immediate communities. The analysis has shown that the MSA and 1-mile radii are statistically significant and is evidence that these corporations do impact their communities, through variables such as socioeconomic status, real estate prices, and consumers' spending activities.

Of the 32 specific variables examined in the demographics variable, 18 displayed statistical significance. The Market Profile report found statistical significance for median home values, average rents, number of bachelor's degrees, number enrolled in nursery school, number of individuals who carpooled to work, as well as overall travel

time to work. The Demographic and Income Comparison report found statistical significance for owner and renter occupied units for both years 2000 and 2015. The Net Worth report found no statistical significance. The ACS Population Summary report found statistical significance for number of high school or GED graduates, number of bachelor's degrees, and means of transportation.

Of the 7 specific variables examined in the consumer spending variable, 3 displayed statistical significance. The House and Home Expenditure report found statistical significance for the average amount spent on rented dwellings and owned vacation homes. The Recreation Expenditure report found statistical significance for the average amount spent on sports, recreation, and exercise equipment. The Retail Goods and Services report found no statistical significance for the average amount spent on food, transportation, and healthcare.

This information is valuable to both developers and corporations. Developers can apply home and rent values, nursery school enrollment figures, number of occupied and average amount spent on rented dwellings units' information when examining the market for new development opportunities. Corporations can utilize information regarding means of transportation, number of individuals who carpool, number enrolled in nursery school, and average amount spent on recreation and supplies, food, transportation, and healthcare, when thinking about what amenities they should offer as a means to market to potential hires as well as what their current employees may need. For example, would carpool buses or an on-campus nursery be a marketable amenity?

Also, corporations can apply average home and rent values to their annual expenditure equation providing a rough estimate of their employees' living costs.

This analysis demonstrates that real estate development opportunities do exist for both developers as well as corporate companies. Developers can use this information as a means to make development choices, whereas companies may use this information as a negotiating tool. For example, the City of San Francisco granted Twitter a payroll tax exemption as a motivation to persuade the company to remain in San Francisco (Shih, 2011). Also, Google is planning a second campus in Mountain View, California. The second campus, "BayView", while still in Mountain View, will be built closer to San Francisco Bay and will have nine buildings totaling 1.1 million square feet (McGee, 2013). While there is no mention of how far Google is in the process of developing BayView, this new Googleplex will offer many eating options through various cafes, and no Googler will be any father than a two-and-a-half-minute walk from the other (McGee, 2013).

Based on the analysis and examples previously mentioned, I recommend developers to examine properties near new or relocated companies. Future demand for apartment or office space may occur in these locations, increasing rent and occupancy levels. Also, companies should exercise this information when negotiating with their local municipality. By providing evidence of a positive effect, corporations may negotiate a deferral of property taxes or other concessions by agreeing to locate in a specific area, as in Twitter's case.

The findings help to further the understanding of the unique relationship between corporate headquarters' location and the immediate communities, providing both developers and companies with valuable information to support them in their future developments and negotiations. This additional insight into the significance of headquarters' locations may help companies, cities, and developers collaborate and advance together. However, several noteworthy questions concerning the amount of statistical significance remain unanswered. Information regarding the amount of statistical significance, whether that significance has positive or negative impact and to whom, and the effects of these impacts over time, is essential in moving forward. Companies would be able to consider whether it is more important to provide an on-campus nursery or carpool busses, and developers would have a clear understanding of whether to entitle land for apartments or single-family homes.

While this study does confirm a statistical significance for specific variables it does not examine to what extent these specific variables display statistical significance. In other words, the amount of statistical significance is important to understand as to recognize the weight each variable carries. The choice made by companies, developers, and cities would greatly benefit from future research identifying the level of impact corporate headquarters' location has on immediate communities.

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