

**The Redistribution of Corporations and Their Talent Across the United States:
Analyzing the Emerging Trend of Demographic and Corporate Migration from Gateway
Markets to Smaller Ones**

by

Barclay Macfarlane

B.A., Highest Honors in History, 2011

University of North Carolina at Chapel Hill

**Submitted to the Program in Real Estate Development in Conjunction with the Center for Real Estate in
Partial Fulfillment of the Requirements for the Degree of Master of Science in Real Estate Development**

at the

Massachusetts Institute of Technology

February 2021

©2021 Barclay Macfarlane

All rights reserved

The author hereby grants to MIT permission to reproduce and to distribute publicly paper and electronic copies of this thesis document in whole or in part in any medium now known or hereafter created.

Signature of Author _____

MIT Center for Real Estate

January 8, 2021

Certified by _____

Jennifer Cookke

Faculty, MIT Center for Real Estate

Thesis Supervisor

Accepted by _____

Professor Siqi Zheng

Samuel Tak Lee Professor of Urban and Real Estate

Sustainability

Faculty Director, Center for Real Estate & Sustainable

Urbanization Lab

**The Redistribution of Corporations and Their Talent Across the United States:
Analyzing the Emerging Trend of Demographic and Corporate Migration from Gateway
Markets to Smaller Ones**

by

Barclay Macfarlane

**Submitted to the Program in Real Estate Development in Conjunction with the Center for Real Estate on
January 8, 2021 in Partial Fulfillment of the Requirements for the Degree of Master of Science in Real Estate
Development**

ABSTRACT

Corporations and their employees, often referred to as talent, have historically been concentrated in gateway markets in the United States. In particular, the San Francisco and New York metro areas have become ubiquitous hubs for the technology and financial services industries, respectively. These markets, however, are becoming increasingly expensive and cost prohibitive for employers and employees alike, spurring the migration of both parties to smaller markets. Smaller markets provide corporations the opportunity to better align employee incomes and costs-of-living, often while providing cost savings to corporations and a better quality of life to employees. Corporations' propensity to position headcount and footprint growth in non-gateway markets is increasing, both driven by and driving further demographic migration to these smaller markets. The growth of firms outside of gateway markets will provide opportunities for smaller markets to participate in future corporate growth. This thesis studies recent population and corporate migration trends to these emerging hub markets, evaluates the various factors that corporations consider when deciding how and where to physically grow their footprints, and evaluates the resulting pattern of corporate development in these new hub markets, aiming to provide a level of understanding to developers and investors performing diligence these new markets for investment. COVID-19 will likely accelerate these trends as workforce distribution becomes more commonplace, driven by the COVID-disruption-forced implementation of more sophisticated, strategic real estate planning at corporations across the technology and financial services industries. These corporations' quickly-evolving policies regarding remote work and telecommuting, employee demands to live in more affordable and livable markets, and corporate desires to reduce personnel, operating, and tax expenses, will result in further distribution of corporations and their talent across the country.

**Thesis Supervisor: Jennifer Cookke
Title: Faculty, MIT Center for Real Estate**

TABLE OF CONTENTS

- I. Introduction
 - a. Comment on Industry Focus
 - b. Comment on Data
- II. Demographic and Corporate Distribution Across the United States
 - a. Comment on Market Classifications
 - b. Demographic Distribution
 - c. Corporate Distribution
 - i. Historical Corporate Agglomeration
 - ii. Impact of Technology on Corporate Agglomeration
 - iii. Recent Corporate Activity in Emerging Hub Markets
 - d. The Creation of Hub Markets
- III. Unpacking Corporate Real Estate Strategy
 - a. Real Estate Strategy as a Function of Corporate Size and Organization
 - b. The Role of Real Estate in Corporate Operations
 - c. Corporate Location Selection Process and Considerations
 - i. The Selection Process
 - ii. Market Considerations: Room to Grow
 - 1. Economic and Business Climates
 - 2. Demographic Trends and Access to Talent
 - iii. Financial Considerations: Cost of Doing Business
 - 1. Hard Costs: Real Estate and Personnel
 - 2. Taxes and Incentives
 - iv. Operational Considerations: Continuity and Scaling
 - 1. Autonomy and “Un-Pluggability”
 - 2. Logistics and Infrastructure
 - v. Quality of Life and Cost of Living: Talent Management
 - vi. Pulling it All Together: Two Case Studies
- IV. The Result: Emerging Hub Markets
 - a. New Hub Markets for the Technology Industry
 - i. Evaluating Technology Hub Markets by the Types of Companies Present
 - ii. Evaluating Technology Hub Markets by the Types of Jobs Present
 - b. Growing Pains
 - c. Legacy Markets Playing Defense
- V. Potential Implications from COVID-19
 - a. Corporate Footprint Rationalization
 - b. Adoption of Alternative Work Methods, Including Remote Work
 - c. Potential Impact on Gateway Office Markets
- VI. Conclusion
- VII. References
- VIII. Schedule of Industry Experts Consulted

I. INTRODUCTION

In December 2020, Oracle Corporation, one of Silicon Valley’s most valuable and long-tenured technology companies, announced they were moving their headquarters from Redwood City, California to Austin, Texas.¹ Oracle was founded in 1977 in Santa Clara, California, by Larry Ellison, Bob Miner, and Ed Oates, three of the founding fathers of Silicon Valley and the technology industry that was born there.² By 2020, Oracle had come to be one of the largest software companies in the world, with revenues close to \$40 billion, a market cap of \$190 billion, and over 135,000 employees.³ In the quarterly earnings report announcing its headquarters’ migration to Austin, Oracle commented that they were adopting “a more flexible employee work location policy” that would “best position Oracle for growth and provide [its] personnel with more flexibility about where and how they work” while continuing to operate “major hubs for Oracle around the world, including those in the United States such as Redwood City, Austin, Santa Monica, Seattle, Denver, Orlando and Burlington, among others.”⁴ The company stated that “by implementing a more modern approach to work, we expect to further improve our employees’ quality of life and quality of output.”⁵ Despite the shockwaves that the announcement sent throughout the technology and real estate industries, Oracle is among a growing number of firms embracing this innovative real estate strategy, and corporations, employees, governments, and investors alike should take note.

¹ Calvey, M. (2020, December 11). Oracle joins Bay Area exodus as it moves headquarters to Texas. *San Francisco Business Times*. Retrieved from https://www.bizjournals.com/sanfrancisco/news/2020/12/11/oracle-joins-bay-area-exodus-as-it-moves-headquart.html?ana=e_sfbt_bn_breakingnews_breakingnews

² Oracle Corporation. (2021). About Oracle | Company Information. Retrieved from <https://www.oracle.com/corporate/>

³ Oracle Corporation. (2020, December 23). Retrieved from https://en.wikipedia.org/wiki/Oracle_Corporation

⁴ Oracle Corporation (2021). Form 10-q. Retrieved from <https://investor.oracle.com>

⁵ Oracle Corporation, Form 10-q.

Oracle's announcement came at a time when other Silicon Valley stalwarts, such as Hewlett Packard and Palantir, had announced similar headquarter migrations and even more tech giants, such as Google, Apple, Facebook, and Tesla, were significantly growing their footprints outside of Silicon Valley as well. These behaviors marked a significant change in the 40-plus year relationship between Silicon Valley and the very companies that made the Valley the global technology mecca that it was. But Silicon Valley, long the global headquarters of the technology industry, was not alone in experiencing outmigration from corporations. Other tenured industry centers, such as New York, the center of gravity for the financial services industry, had too been experiencing outmigration from the corporations that once defined the city's relevance. What had soured in the relationship between these markets and the corporations that had been founded there?

Until recently, corporate headquarters have historically been concentrated in gateway markets in the United States, such as Chicago, Los Angeles, New York, and San Francisco. Companies are typically headquartered in markets that have historically supported their industries. This phenomenon, called agglomeration or clustering, generally results in industry concentrations in select markets. Houston is home to many energy companies, the San Francisco Bay Area is home to many tech companies, New York is home to many financial services companies, and Detroit is home to many automotive companies. These industry specializations were not planned, but rather the result of economic activity tied to the regional geography, making these markets logical locations in which to grow these industries and its market participants.

In recent years, however, a combination of decreasing affordability in many of these markets and technological advancement in the workplace has spurred many companies, particularly those in the technology and financial services industries, to rethink their geographical locations with regards to footprint expansion or relocation. San Francisco and New York

specifically, the respective hubs for these two industries, have become increasingly cost prohibitive for employers and employees alike, spurring migration to smaller, more affordable metro areas. These markets provide corporations the opportunity to achieve cost savings and better align employee incomes and costs-of-living, often while providing employees a better quality of life.

The result has been the emergence and growth of new hub markets throughout the nation, across which the companies and industries formerly-concentrated in gateway markets have chosen to distribute their workforces. These new hub markets have seen positive net migration driven by their collectively high qualities of life, low costs of living, and financial incentives that lure companies away from more expensive markets. The growth of corporations outside of gateway markets provides opportunity for non-gateway markets to participate in corporate growth, positioning them for future expansion, and real estate developers and investors should take note.

However, not all hubs are created equal. The diaspora from expensive markets has been uneven, and the new hubs themselves have developed concentrations of across technology and financial services sub-industries and job types. When considering these hubs for investment, investors must take into consideration the staying power of the industry concentrations and job functions that are driving growth.

This thesis studies recent population and corporate migration trends, evaluates how corporations approach real estate strategy and the various factors that corporations consider when deciding how and where to physically grow their operations, and examines the characteristics of select new hub markets in an effort to establish a framework through which real estate professionals can view development and investment in these markets. These trends, established before the COVID-19 pandemic, very well may be accelerated by changes in behavior spurred by

the pandemic, as workforce distribution becomes more commonplace, in large part due to the forced adoption of remote work and telecommuting, growing employee demands to live in more affordable and livable markets, and mounting corporate desire to reduce costs.

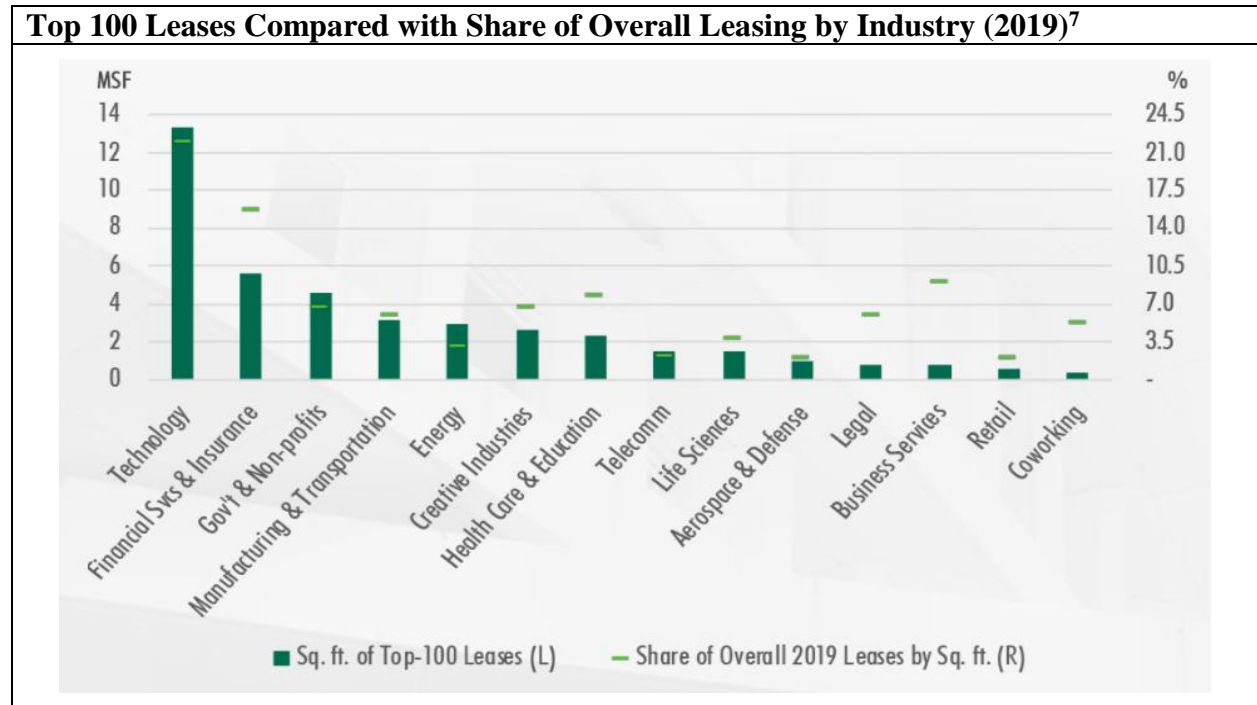
Importantly, COVID-19 has brought real estate planning to the forefront of corporate strategy, forcing many corporations to think more critically about their real estate footprints than ever before. Technology companies, the subject of many of the trends discussed in this thesis, have long been leaders in human resources innovations that engender heightened focus on real estate as a critical component of corporate operating and growth strategy. These companies have spent decades executing real estate strategies with a level of sophistication not matched in any other industry, and their decision to more broadly adapt hub-and-spoke business models in recent years should not be ignored. When more corporations put critical eyes to their real estate strategies, they too could take actions similar to Oracle's, embracing flexible location planning away from gateway markets and industry hubs, which would have monumental impacts on the commercial real estate industry.

a. Comment on Industry Focus

This thesis will focus primarily on the real estate behavior of corporations in the technology and financial services industries. Corporations within these industries are the most significant to the commercial office real estate market, and are also the corporations most poised for change in strategy and behavior in the coming years, as discussed in depth in this thesis. In 2019, technology companies accounted for 22% of total office space leased in the United States, and across the nation's largest 100 leases, technology accounted for 32%, or 13 million square feet.⁶ The next

⁶ CBRE Research. (2020, February 12). *U.S. Office MarketFlash: Tech Reigns as King of Large Leases*. Retrieved from <https://www.cbre.us/research-and-reports/US-MarketFlash-Tech-Reigns-as-King-of-Large-Leases>

largest industry, financial services and insurance, comprised approximately 10% of the overall 2019 leases:



Together, the two industries represented nearly 32% of overall office leasing activity in 2019, cementing their relevance when discussing trends that will directly impact commercial leasing going forward as these two industries were, at the time of publication, also the ones expected to gain additional share in the future:

⁷ CBRE Research, *U.S. Office MarketFlash: Tech Reigns as King of Large Leases*.

Near-term Outlook for Top 100 Leases⁸



Given the size and relative importance of the technology and financial services industries, the majority of the trends discussed in this thesis will apply most directly to them, although many of the trends studied could also be applied to corporations with similar characteristics operating in other industries.

b. Comment on Research and Data

Much of the research for this thesis was conducted via informal discussions with industry experts and participants, whose views and opinions greatly aided the narrative of this body of work. Many of the themes discussed herein reflect a combination of views and opinions of these experts and participants, but do not alone reflect any one individual's views or opinions, and their

⁸ CBRE Research, *U.S. Office MarketFlash: Tech Reigns as King of Large Leases*.

collective contributions to this body of work should be acknowledged throughout. A list of those consulted can be found at the thesis' conclusion.

The data for this paper was collected throughout the course of 2020, and it must be noted that many of the highlighted trends emerged long before the outbreak of the COVID-19 pandemic. While the impacts of COVID-19 on the real estate industry will be profound, they also will not be known for many years to come, so much of the data employed to support the long-standing trends discussed in this thesis was observed only through 2019. Nevertheless, COVID-19 will spark fundamental changes in demographic and corporate behavior, and data collected throughout the duration of the pandemic has proven to reinforce many of the very trends whose roots were sown long before the pandemic; in many cases, the pandemic appears to be accelerating many of them. While this thesis was published in the first inning of a new chapter in real estate, the indications of trends to come are many, and this thesis seeks to identify them.

II. DEMOGRAPHIC AND CORPORATE DISTRIBUTION ACROSS THE UNITED STATES

Throughout much of modern American history, corporations and their employees have been concentrated in gateway markets, such as Chicago, Los Angeles, New York, and San Francisco. Over the past two decades, however, these markets have begun to lose both people and companies to smaller markets throughout the country. These migrations are a clear indication that the distribution of people and corporations throughout the country is evolving. This section will explore why people and corporations historically located where they did, and, more importantly, study the patterns that show that they are currently on the move.

a. Comment on Market Classifications

First, a note on market classifications. This thesis often differentiates between gateway markets and their smaller peers, but real estate professionals seldom perfectly align on market classifications. Markets can be measured by different metrics, such as population, gross economic production, number of corporate headquarters, and so on, and each approach typically arrives at a slightly, albeit significantly, different outcome. The largest markets are often referred to as tier one, gateway, or primary markets, and below them are smaller markets referred to as tier two, tier three, secondary, tertiary, emerging, and so on. For clarity, a market classification system must be established to discuss the trends relevant to this thesis.

For the purposes of this study, the largest markets will be referred to as *gateway markets*, broadly encompassing large metropolitan areas such as Chicago, Los Angeles, New York City, and San Francisco, though the term will principally be applied to the latter two markets, which serve as industry hubs for the financial services and technology industries, respectively, studied in

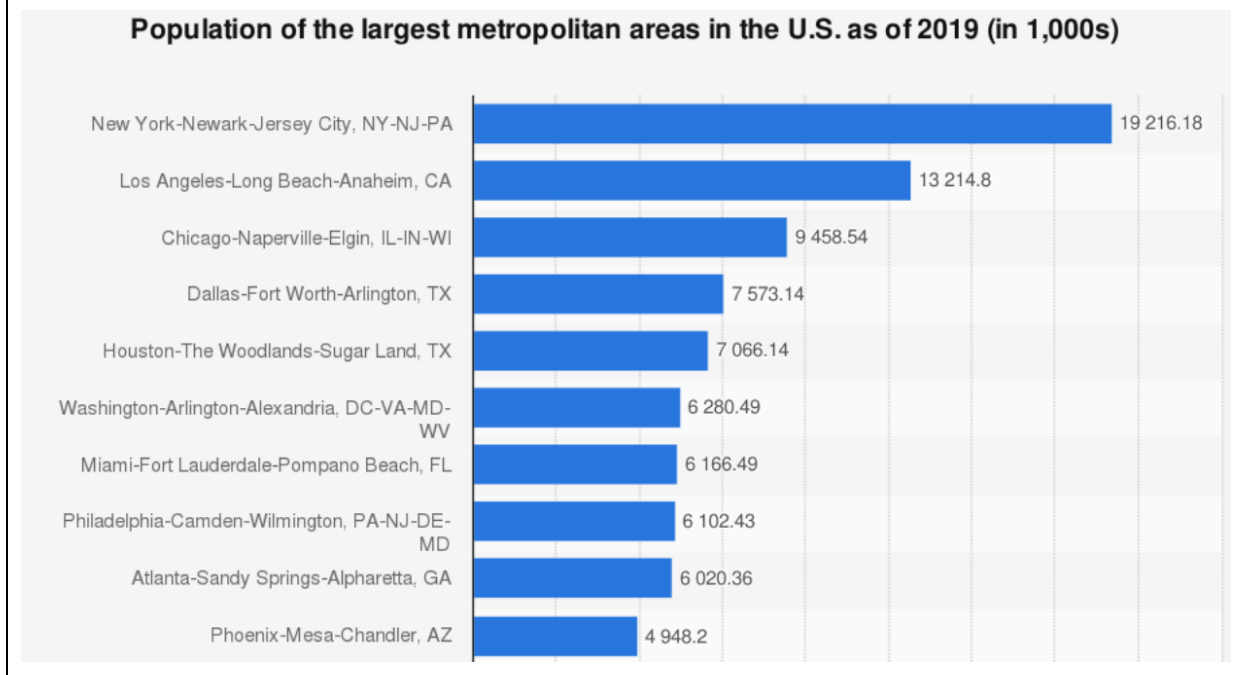
detail in this thesis. The term gateway is often given to the nation's largest markets because they are typically the most traveled points of entry and, concurrently, the most nation's largest and most concentrated population centers. Because gateway markets are the largest, they are often believed to be the most significant in the real estate development and investment world, however, as will be discussed throughout this thesis, smaller markets have grown increasingly competitive with the larger ones, attracting individuals and corporations alike with both tangible and intangible benefits.

Any other market that is not defined as gateway above will be referred to as a *hub market*. These markets are generally smaller in population but, more importantly, definitively less economically significant than the gateway markets (at least, historically). Significant emerging hub markets include but are not limited to: Atlanta, Austin, Charlotte, Dallas, Denver, Nashville, Raleigh, Salt Lake City, and Seattle, among many others. These markets, broadly speaking, are located throughout the Sun Belt and West, are welcoming individual and corporate migrants with open arms, and are poised for continued growth.

b. Demographic Distribution

The nation's population, once concentrated on the Eastern Seaboard, has gradually spread from coast to coast since the nation's founding, driven by various push and pull factors. Opportunities, ranging from economic to educational to exploratory, have long drawn individuals to new lands in the spirit of "life, liberty, and the pursuit of happiness," as denoted in the United States Declaration of Independence. As of 2019, the largest 10 metro markets by population in the United States were New York, Los Angeles, Chicago, Dallas, Houston, Washington, Miami, Philadelphia, Atlanta, and Phoenix, as shown below:

Population of the Largest MSAs in the US (2019)⁹



The primary reason that these markets are the most populous is because they have historically offered the most economic promise for the general population. But while people have historically been drawn to geographies by job opportunities in the past, today the opposite has begun to ring true.¹⁰ For example, following World War II the abundance of manufacturing jobs in the states now referred to as the Rust Belt brought millions from throughout the country to the Midwest for employment opportunities. While certain large markets still draw individuals seeking the steepest-possible career trajectory (e.g. Los Angeles, New York City, San Francisco, etc.), recently there has been greater population distribution away from large markets and instead across markets that offer a lower cost of living and a better quality of life relative to the larger, higher-opportunity yet higher-cost markets.

⁹ US Census Bureau. (March 26, 2020). Population of the largest metropolitan areas in the U.S. as of 2019 (in 1,000s) [Graph]. In Statista. Retrieved from <https://www.statista.com/statistics/183600/population-of-metropolitan-areas-in-the-us/>

¹⁰ Johnson, K.M., Voss, P.R., Hammer, R.B. et al. Temporal and spatial variation in age-specific net migration in the United States. *Demography* 42, 791–812 (2005). <https://doi.org/10.1353/dem.2005.0033>

This trend has been studied by many scholars over the past several decades. In their 2005 paper on population redistribution in the US, *Temporal and Spatial Variation in Age-Specific Net Migration in The United States*, Kenneth Johnson, Paul Voss, Roger Hammer, Glenn Fuguitt, and Scott Mcniven summarize that:

This trend is the result of a combination of economic and noneconomic factors, including the preference of a significant proportion of the U.S. population to live and work in lower-density settings, a more diverse employment structure with less emphasis on extractive and manufacturing activities, and the spatial diffusion of employment facilitated by innovations in transportation and communications that have diminished the “friction of distance” that traditionally supported agglomerative settlement patterns (Brown et al. 1997; Champion 1992; Frey 1987; Wardwell 1981; Wardwell and Gilchrist 1987; Zelinsky 1971).¹¹

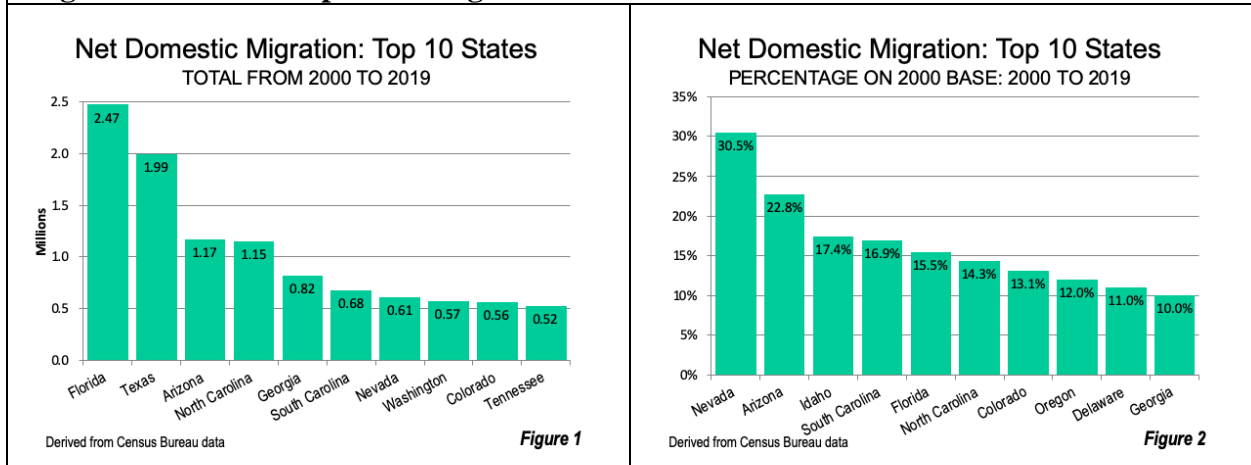
In short, employment opportunities are no longer the driving force behind migratory and settlement patterns within the US.

Migratory data over the last two decades reveals that certain markets have seen net in-migration while others have seen net out-migration. From 2000-2019, the nation saw net domestic migration of 24.6 million residents, or roughly 8% of the total population.¹² *Net migration* accounts for moves into and out of markets (in this case, states), allowing the two to cancel out, resulting in an absolute change in population. (Note that these figures do not include population fluctuations from other factors such as international immigration, household formation, offspring, etc.) From 2000-2019, the Sun Belt and Western states experienced the largest net in-migration, both on an absolute basis and on a percentage basis:

¹¹ Johnson, et al., 42, 791–812.

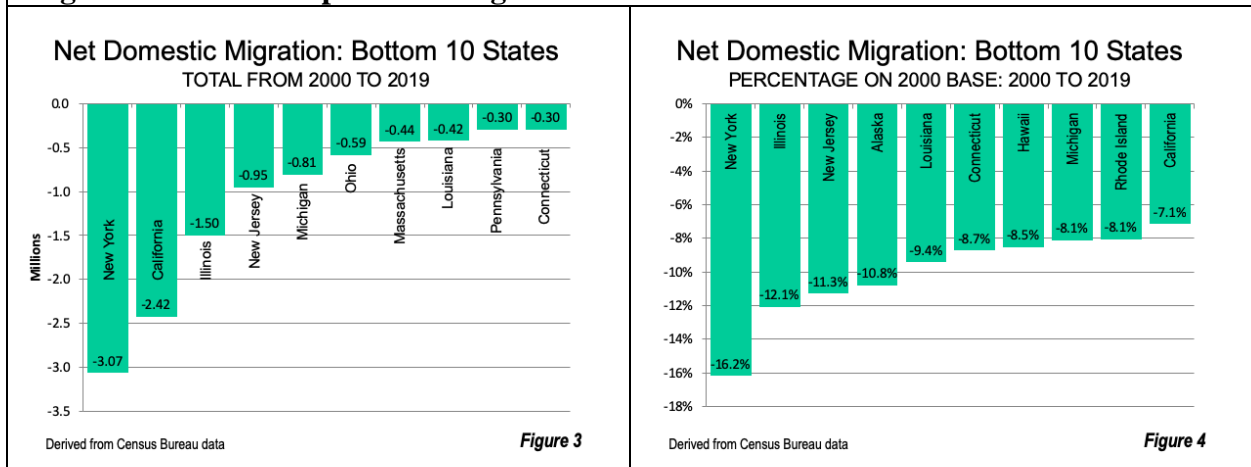
¹² Cox, W. (2020, September 13). Two Decades of Interstate Migration. *New Geography*. Retrieved from <https://www.newgeography.com/content/006773-two-decades-interstate-migration>

Migration Trends: Top 10 In-Migration States¹³



Florida was the largest recipient of state-to-state migrants on an absolute basis, growing by 2.47 million residents, or 16%, while Nevada was the largest recipient on a percentage basis, growing by 31%, or 601,000 residents. Conversely, the Northeastern and Rust Belt states experienced the largest net out-migration:

Migration Trends: Top 10 Out-Migration States¹⁴

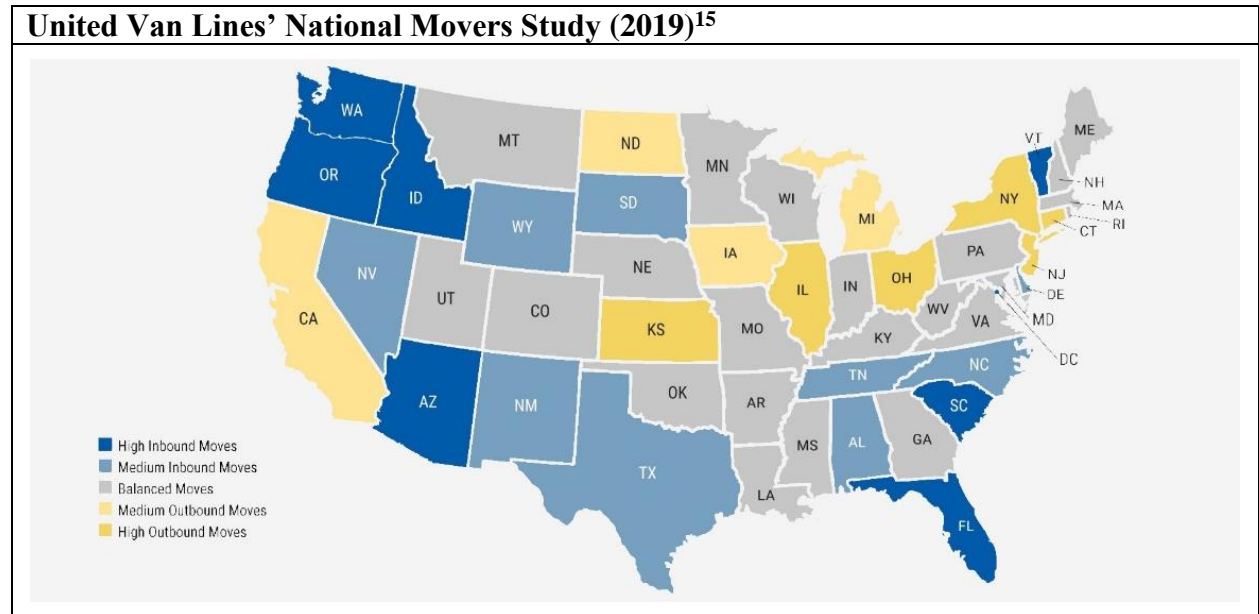


New York saw the largest out-migration, both on an absolute and a percentage basis, losing 3.1 million individuals, or 16% of its population to state-to-state migration. California came in second, losing 2.4 million (though only representing 7% of its population), followed by Rust Belt states

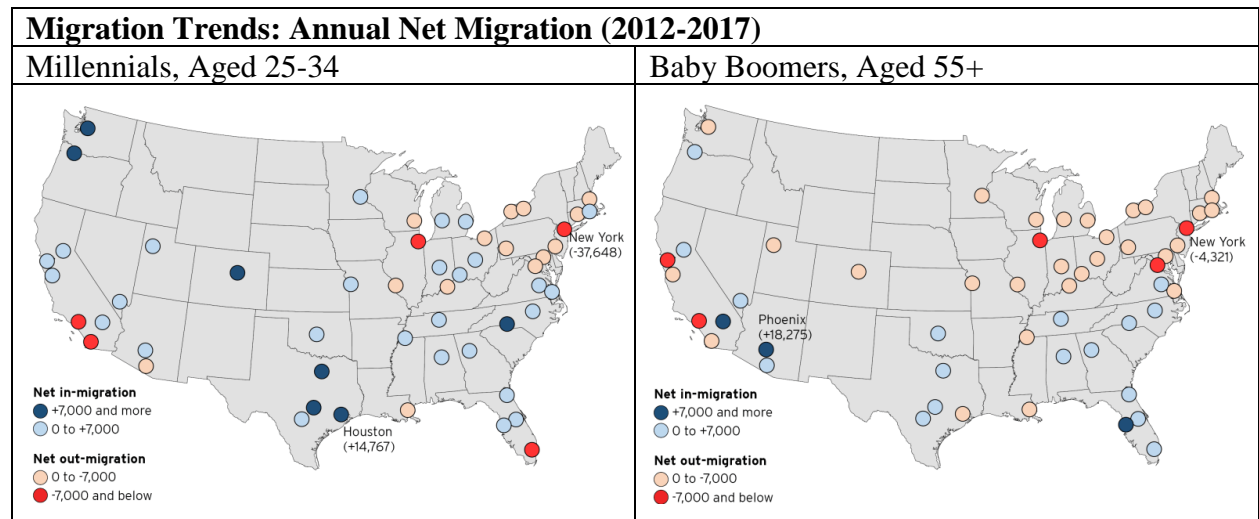
¹³ Cox, W., Two Decades of Interstate Migration.

¹⁴ Cox, W., Two Decades of Interstate Migration.

such as Illinois, Michigan, and Ohio, as well as New Jersey. The map below, based on information from moving company Atlas Van Lines, corroborates and visualizes this trend:



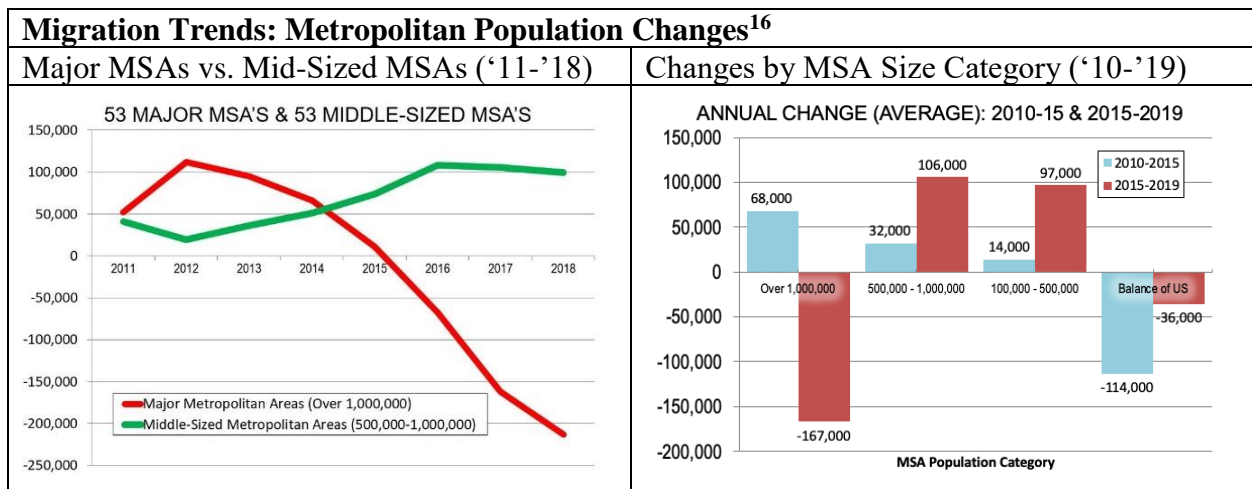
Looking deeper to the underlying demographics, it becomes clear that the migration patterns are somewhat consistent across both the Millennial and Baby Boomer demographic cohorts:



¹⁵ Farr, M. (2020, April 24). 2019 Migration Patterns. Retrieved from <https://www.atlasvanlines.com/amplifier/household-moving/2019-migration-patterns>

While there may be some minor differences in preference amongst the two demographic cohorts, the trend of flight from the Northeast and Rust Belt to the Sun Belt and West remains constant across both.

Importantly, it is notable that these state-to-state migration trends are not at odds with broader urbanization trends. People are still gravitating to cities, but instead of gravitating to the largest metro areas, as in the past, people are starting to gravitate toward smaller cities, principally those across the Sun Belt and the West. The below charts contemplate population changes across the nation’s major MSAs, revealing that the largest MSAs are losing population while the mid-size and smaller MSAs are gaining population:



The data shows that major MSAs experienced growth through 2014, but since 2015 have experienced negative growth while mid-sized MSAs (up to 1 million in population) experienced positive growth during the same period. Importantly, the MSAs with populations ranging from 500,000 to 1 million have experienced the most growth, followed closely by MSAs with

¹⁶ Cox, W. (2020, May 18). Domestic Migration to Dispersion Accelerates (Even before COVID). *New Geography*. Retrieved from http://www.newgeography.com/content/006648-domestic-migration-dispersion-accelerates-even-covid?utm_source=feedburner&utm_medium=email&utm_campaign=Feed%3A%2BNewgeography%2B%28Newgeography.com%2B-%2BEconomic%2C%2Bdemographic%2C%2BAnd%2Bpolitical%2Bcommentary%2Babout%2Bplaces%29

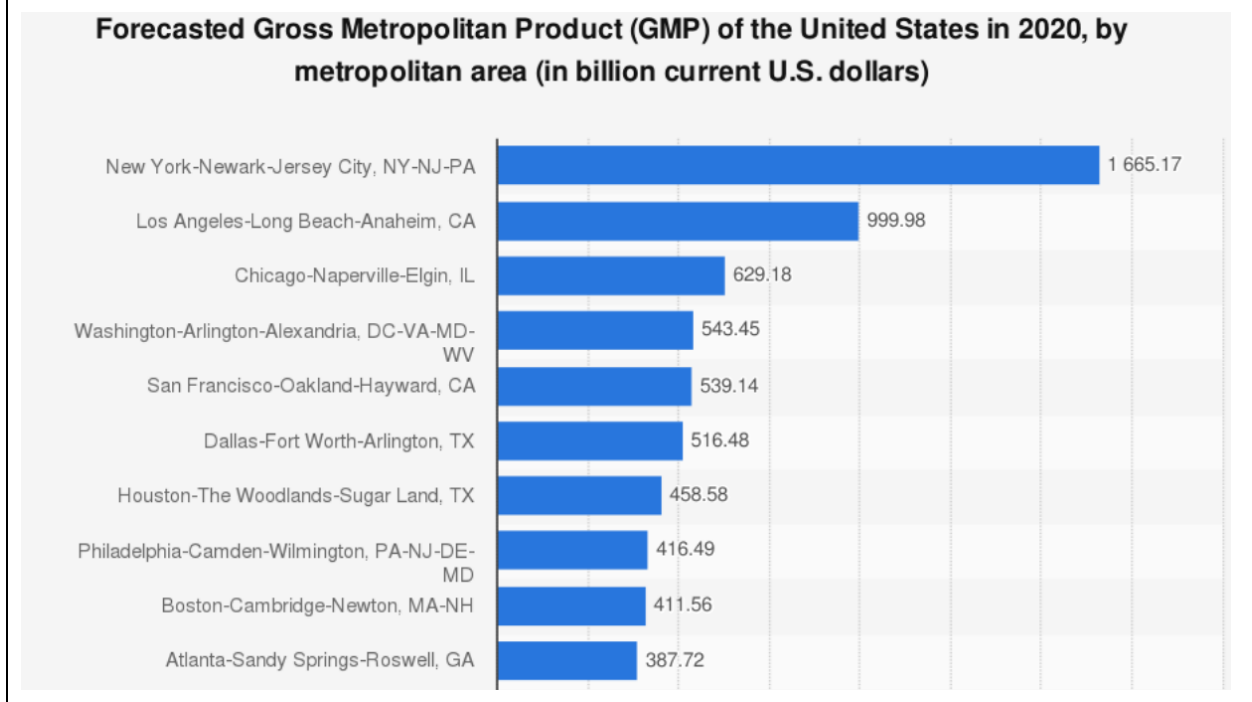
populations ranging from 100,000 to 500,000, while MSAs with populations over 1 million and rural areas have experienced negative growth. Urbanization is still alive and well, albeit to smaller metropolitan areas.

The demographic trends only paint part of the full migration picture. It is also necessary to analyze the trends among the companies that employ the people moving to these markets, for without the presence of these corporations these migratory trends would likely not be financially feasible.

c. Corporate Distribution

While the population measurements discussed in the prior section indicate the general size of each metropolitan market, each market's economic and corporate activity must also be measured. The chart below looks similar to the population measurement chart but instead measures markets' gross metropolitan product, an indication of economic output:

Forecasted Gross Metropolitan Product of the US in 2020 by MSA (2020)¹⁷



By this measure, the largest 10 markets would be New York, Los Angeles, Chicago, Washington, San Francisco, Dallas, Houston, Philadelphia, Boston, and Atlanta. Markets such as Washington and Dallas rise and fall by a few rankings, respectively, but, importantly, Miami and Phoenix fall off the map altogether. Newcomers San Francisco (not including the proximate San Jose MSA, which ranks #13) and Boston move into the #5 and #9 rankings, respectively, despite not having cracked the top 10 on a population basis. To understand the disconnect between the population rankings and the economic ones, it is helpful to consider the underlying corporate activity that contributes to both.

¹⁷ US Conference of Mayors. (July 22, 2020). Forecasted Gross Metropolitan Product (GMP) of the United States in 2020, by metropolitan area (in billion current U.S. dollars) [Graph]. In Statista. Retrieved from <https://www.statista.com/statistics/183808/gmp-of-the-20-biggest-metro-areas/>

i. Historical Corporate Agglomeration

Corporations typically exist where they do as a result of their environments. Each individual corporation has a unique history, but often a corporation resides in a city that supports (or is supported by) that corporation's industry. Houston is home to many energy companies. The San Francisco Bay Area is home to many tech companies. New York is home to many financial services companies, and Detroit has historically been home to many automotive companies. Industry specializations in these markets were not necessarily planned, but rather the result of economic activity tied to regional geography, making these markets logical locations in which to grow these industries and their market participants. These geographical drivers have historically meant proximity to things critical to the industry itself, such as a natural resource, a marketplace, or a concentrated cohort of skilled laborers that possess industry knowledge.

Sociologist Saskia Sassen, a leading global expert on global markets, has commented that "the deep economic history of a place matters for the type of knowledge economy a city or a city-region winds up developing."¹⁸ The development of a knowledge economy as a result of industry specialization is often referred to as *agglomeration*, the result of which is a *cluster*, defined as a "regional concentration of related industries in a particular location."¹⁹ In these clusters you will often find "companies, suppliers, and service providers, as well as government agencies and other institutions that provide specialized training and education, information, research, and technical support" for corporations in locations "where the economic activities in a set of related industries...reach critical mass."²⁰ Real estate economists have found that corporations that

¹⁸ Sassen, Saskia. "The Specialised Differences of Cities Matter in Today's Global Economy," in *Reforming the City: Responses to the Global Financial Crisis*, Sam Whimster (ed.), Erf at London Metropolitan University: 2009. Retrieved from <http://saskiasassen.com/PDFs/publications/The-Specialised-Differences.pdf>

¹⁹ Porter, M. E. (2020). *The U.S. Cluster Mapping Project at the Institute for Strategy and Competitiveness*, Harvard Business School. (n.d.). Retrieved from <http://www.clustermapping.us/content/clusters-101>

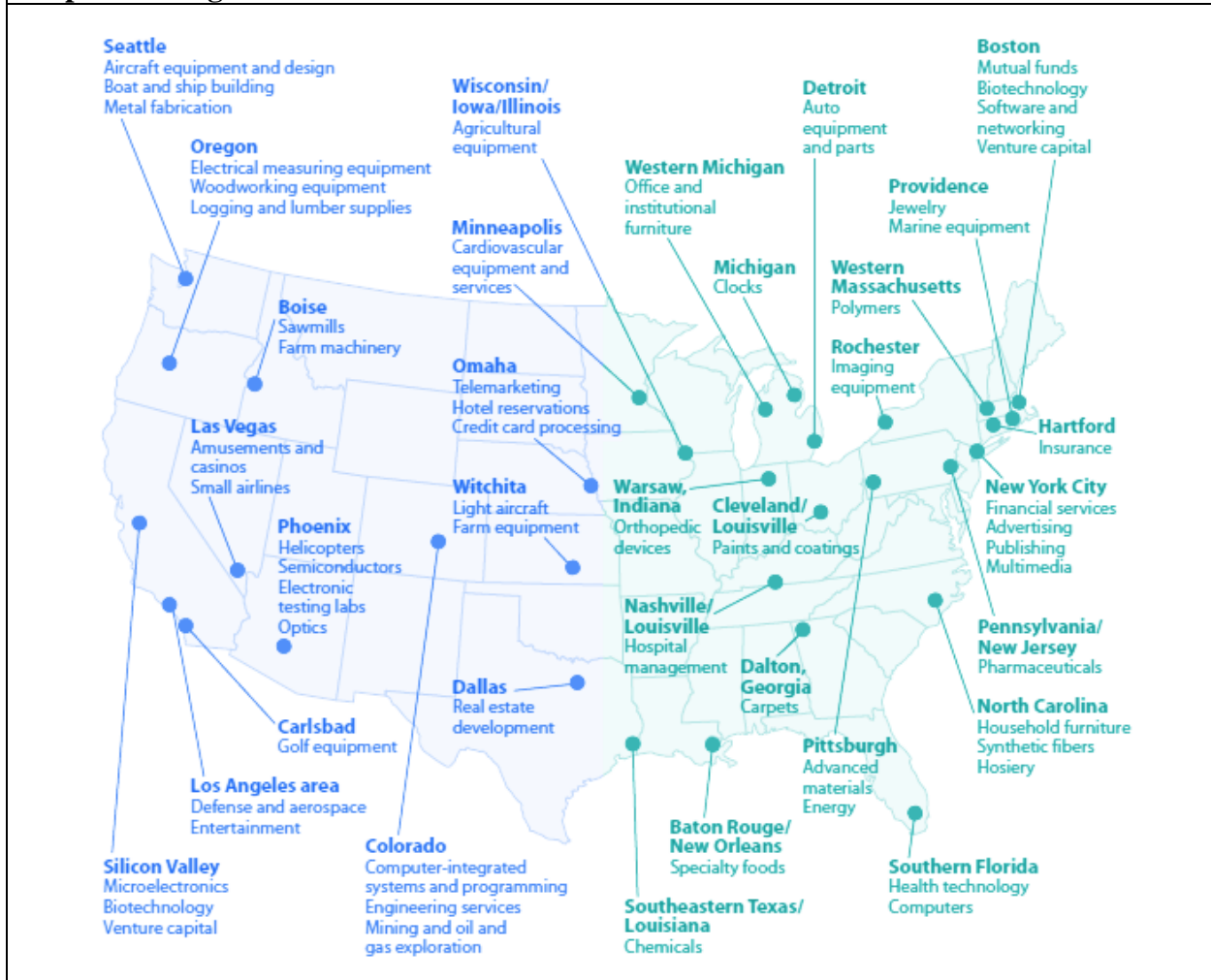
²⁰ Porter.

operate in clusters “might receive some form of agglomeration benefit that could improve productivity, increase innovation, or reduce production costs.”²¹ As such, clustering is an important consideration for corporations seeking to establish themselves in specific industries. Industries themselves have historically required some sort of agglomeration to achieve critical mass.

To put a visual behind clustering, consider the below map provided by Institute for Strategy and Competitiveness at Harvard Business School in conjunction with the U.S. Department of Commerce, Economic Development Administration. The map illustrates the geographically-oriented industry specializations that have evolved across the United States over time:

²¹ DiPasquale, D., & Wheaton, W. C. (1996). Firm Site Selection, Employment, Decentralization, and Multicentered Cities. In *Urban Economics and Real Estate Markets* (7th ed., Vol. 23, pp. 91-123). Englewood Cliffs, NJ: Prentice Hall.

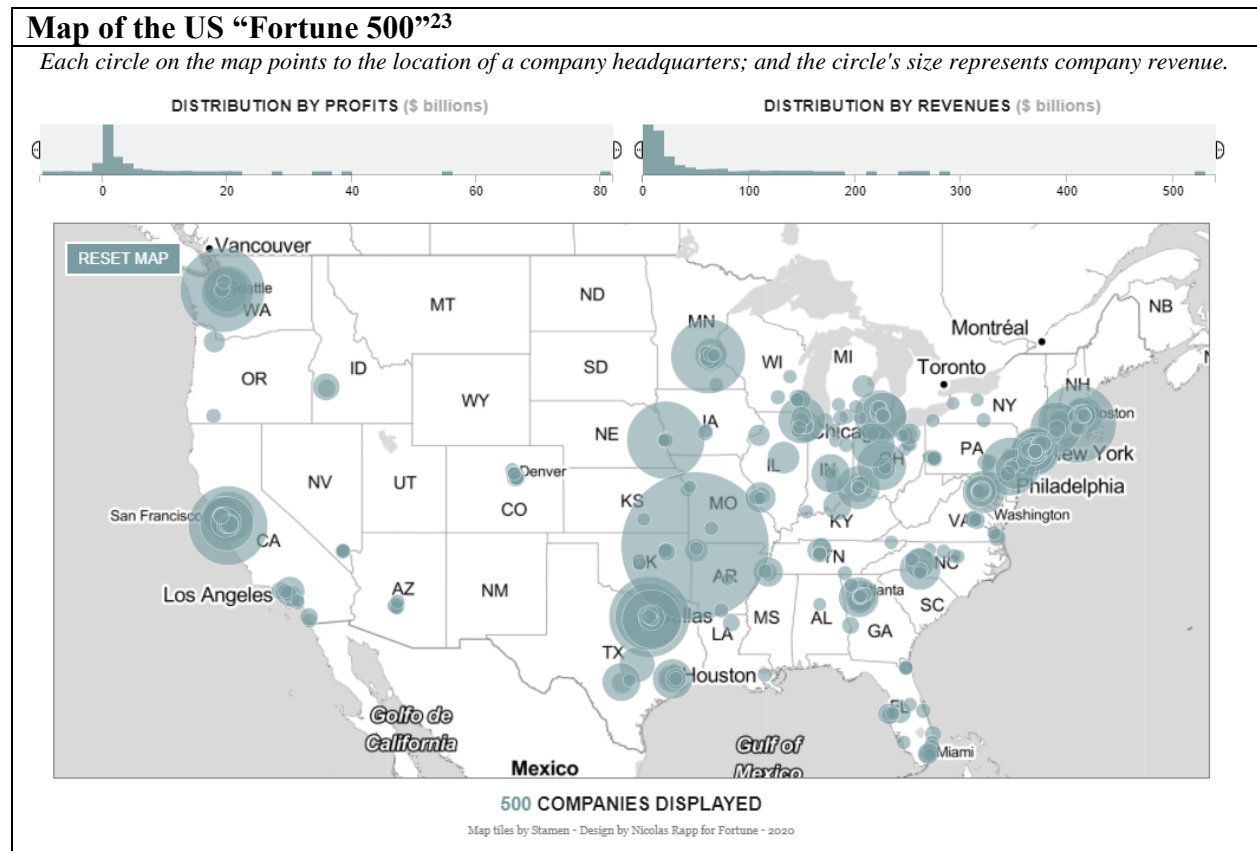
Map of US Regional Cluster Economies²²



As previously stated, the clusters are often derived from proximity to surrounding natural resources (for example, chemicals in Southeastern Texas/Louisiana as a result of proximity to petrochemical activity from nearby oil wells) or a marketplace that has come to support a given industry (for example, the financial services industry in New York City or the insurance industry in Hartford, Connecticut). Over time, skilled industry laborers concentrate in these clusters both as a product of and to take advantage of the industry specialization. Underpinning each of the clusters are

²² Porter.

hundreds if not thousands of individual corporations that support the industries. Consider now a map of the US “Fortune 500” companies:



When compared to the cluster map, it becomes clear that these companies are located along similar axes as the industry specializations that likely supported their development. The industry clustering explains why these headquarters are located where they are. Clustering provides these companies proximity to customers and suppliers, access to large pools of skilled, industry-specialized labor, possibly proximity to natural resources and favorable regulatory environments, and so on. Over time, with more industry concentration, a self-reinforcing cycle emerges wherein companies are born out of the clustering effect, while simultaneously growing the industry ecosystem that supported its own creation. These development trends are important to understand when

²³ Jorhten. (2020, May 18). Visualize the Fortune 500. *Fortune*. Retrieved from <https://fortune.com/franchise-list-page/visualize-the-fortune-500-2020>

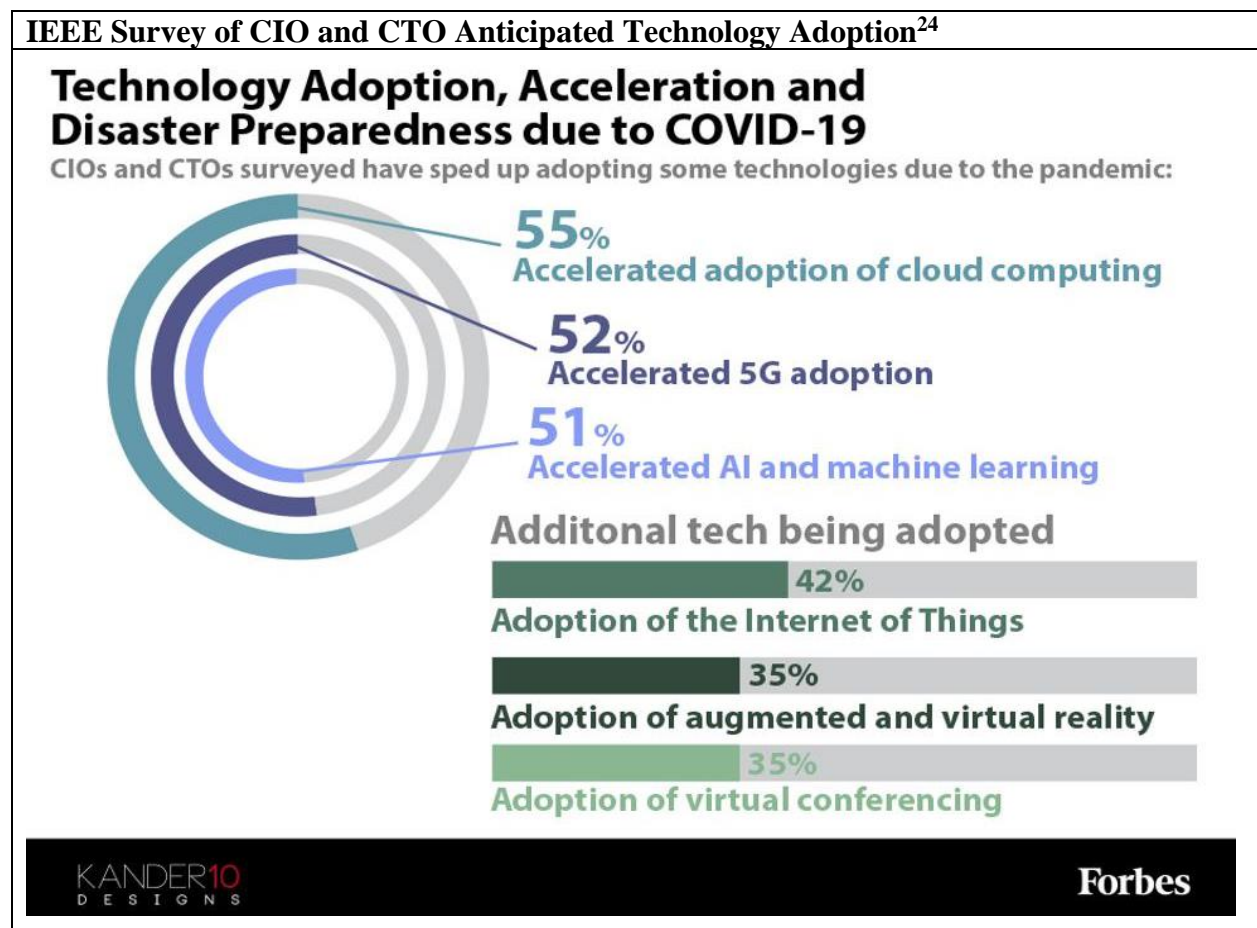
considering the history of corporations and their corporate locations. The trends support a logical growth pattern, where the free market supports the growth of industry and market participants.

ii. The Impact of Technology on Corporate Agglomeration

In recent decades, however, these logical, historical agglomeration trends have increasingly been disrupted by *technology*. Technology is changing clustering patterns by providing tools for virtual communication and collaboration, allowing companies to participate in industries without being physically located in their traditional hubs. This is particularly true in industries whose deliverables center not around manufacturing and products but rather talent and services, such as the technology and financial services industries. Advances in telecommunications and the growing adoption of telecommuting has allowed for these types of businesses to maintain continuity across disparate geographic locations. While clustering and agglomeration are still very much occurring, technology is allowing corporations to spread out geographically and benefit from clustering and agglomeration that falls along more specialized sub-industry lines.

For example, Part VI, which discusses hub markets in greater detail, discusses how Seattle has become a cluster for the software sub-industry (due in large part to the marketplace established by Microsoft's founding there) while Boston has become a cluster for the EdTech sub-industry (due in large part to the proximity of many top-tier academic institutions). Recent technological advancements in telecommunication and web collaboration have allowed for large technology firms to grow specialized teams in each of these markets, rather than having to choose one over the other. This allows institutions to separate specialized business units, therefore distributing their workforces across geographies to allow for the highest degree of specialization and, therefore, efficiency and effectiveness.

While a later section will separately discuss the impacts of COVID-19, the pandemic's impact on technology adoption must be considered upfront because its impact on behavior, despite having only lasted ten months, has been profound by many measures. Several technology specialists have conducted studies and surveys to explore the extent to which technology adoption has accelerated, and how this may impact individual and corporate behavior going forward. The IEEE, a technical professional organization for the advancement of technology, is one such consultant group that has released a study reviewing the changes in technology adoption as a result of the pandemic. The results show that nearly half of CIOs and CTOs expect the pandemic to accelerate their adoption of technology:



²⁴ Anderton, K. (2020, November 30). The Impact of Covid-19 Is Forcing Companies To Adopt New Technology [Infographic]. *Forbes*. Retrieved from <https://www.forbes.com/sites/kevinanderton/2020/11/30/the-impact-of-covid-19-is-forcing-companies-to-adopt-new-technology-infographic/?sh=4b79d6d26089>

The results show an increased level of comfort across many forms of technology, proof that technological adoption has been advanced by the pandemic. Of note, 42% of respondents anticipate “additional tech being adopted” and 35% anticipate greater “adoption of virtual conferencing,” both of which could impact corporate real estate footprints. Specifically, the latter would give corporations more flexibility with regards to real estate planning and the geographic location of teams.

iii. Recent Corporate Activity in Emerging Hub Markets

Technology has been an enabling factor in the evolution of corporate real estate strategy, particularly as corporations respond to the migration of the general population, as discussed earlier in this section. As noted above, technology has allowed for firms to migrate away from traditional industry hubs to new markets while still maintaining relevance and connectivity to their industries, allowing corporations to choose their locations based on criteria other than industry agglomeration and clustering.

Over the past several years, many corporations have made headlines for departing their traditional industry hubs for new markets that satisfy other high-priority criteria. The most visible moves have been headquarter relocations, particularly those in the technology and financial services industries moving out of the San Francisco Bay area and New York City metro area, respectively. In 2020, **Hewlett Packard**, a Silicon Valley stalwart, moved their headquarters from Palo Alto, California to Houston, Texas, citing “the opportunity over time to draw more diverse talent into [it’s] ranks.”²⁵ The tech CEO further commented, “as we look to the future, our business

²⁵ Somerville, H. & Armental, M. (2020, December 02). Hewlett Packard Enterprise to Leave Silicon Valley for Texas. *Wall Street Journal*. Retrieved from https://www.wsj.com/articles/hewlett-packard-enterprise-to-leave-silicon-valley-for-texas-11606862026?mod=article_inline

needs, opportunities for cost savings, and team members' preferences about the future of work, we are excited to relocate HPE's headquarters to the Houston region...Houston is an attractive market to recruit and retain future diverse talent and where we are currently constructing a state-of-the-art new campus."²⁶ **Tanium**, a \$9 billion cybersecurity company, also moved their headquarters from the San Francisco Bay Area in 2020, instead to Seattle, after considering other locations such as Denver, Austin, and Nashville.²⁷ **CBRE**, an international brokerage company long-headquartered in Los Angeles, also moved their headquarters in 2020, this time to Dallas.²⁸ The list continues, and includes large corporate names across industries such as **Parsons Corp**, **Charles Schwab**, **McKesson**, **Core-Mark Holding Co.**, and **Broadcom**, who have all moved their headquarters from gateway markets to hub markets.²⁹

While headquarter relocations make splashy headlines, they are more exception than rule. However, just because corporations are not moving their headquarters does not mean they are not contributing to the migration trends away from gateway markets. Many corporations have chosen to keep their headquarters in-place while significantly growing their footprints in hub markets.

Take, for example, financial services corporation **Goldman Sachs**, who has been growing its footprint away from its New York City headquarters for years. Today, it has major offices in markets across the nation including Dallas and Salt Lake City, and made headlines in December 2020 when it was revealed that the bank was considering moving its large asset management division from New York City to Southern Florida, citing a "strategy of locating more jobs in high-

²⁶ Somerville & Armental.

²⁷ Cook, J. (2020, December 03). Tech CEO moves \$9B cybersecurity company's HQ to Seattle area, says S.F. is 'not the city it was'. *Geekwire*. Retrieved from <https://www.geekwire.com/2020/tech-ceo-moves-9b-cybersecurity-companys-hq-seattle-area-says-san-francisco-not-city-20-years-ago/>

²⁸ Vincent, R. (2020, October 29). Real estate brokerage CBRE moves headquarters from Los Angeles to Dallas. *Los Angeles Times*. Retrieved from <https://www.latimes.com/business/story/2020-10-29/real-estate-brokerage-cbre-moves-headquarters-from-los-angeles-to-dallas>

²⁹ Vincent.

value locations throughout the U.S.”³⁰ Around the same time, other large, New York-based financial services corporations, including alternative asset managers *Elliott Management*, *Icahn Enterprises*, and *Blackstone*, were also revealed to have signed leases in Florida.³¹ Blackstone, the world’s largest alternative asset manager, headquartered in New York City since its founding in the 1980s, signed a 41,000 square foot lease in a Miami office tower in 2020 to “create a hub for its in-house technology division and plans to hire more than 200 tech-focused employees in Miami in the coming years.”³² Seeing this behavior from even the most conservative of firms when it comes to human resource management and real estate planning, such as alternative asset managers, signals a changing of the tide.

Another large bank, **Deutsche Bank**, similarly made headlines in late 2020 when it was leaked that the corporation was considering moving 50% of its staff, or 2,300 employees, to locations outside New York City. When prompted, CEO of Deutsche Bank Americas Christiana Riley told the Financial Times: “I am optimistic that New York remains, to a degree, a hub. But it isn’t maybe going to be relevant” to as many employees as it used to be.³³ *Apple* too has committed to significantly expand its footprint away from its headquarters in Cupertino, California. In 2018, the tech giant announced that it would build a \$1 billion campus in Austin, while committing to developing new sites in Seattle, San Diego, and Los Angeles.³⁴ Lastly, in May 2020, *Tesla*

³⁰ Natarajan, S. (2020, December 6). Goldman Plots Florida Base for Asset Management in a Blow to New York. *Bloomberg*. Retrieved from https://www.bloomberg.com/news/articles/2020-12-06/goldman-plots-florida-base-for-asset-management-in-a-blow-to-nyc?campaign_id=4

³¹ Natarajan.

³² Real Estate Weekly. (2021, January 04). Shorenstein leases Miami office space to Blackstone. *Real Estate Weekly Online*. Retrieved from <https://rew-online.com/shorenstein-leases-miami-office-space-to-blackstone/>

³³ Schaefer, D. (2020, December 12). Deutsche Bank May Move Half of New York Staff Elsewhere. *Bloomberg*. Retrieved from <https://www.bloomberg.com/news/articles/2020-12-13/deutsche-bank-may-move-half-of-new-york-staff-elsewhere-ft-says?sref=Ie7GDrhe>

³⁴ Heschmeyer, M. (2018, December 13). Apple To Build \$1 Billion Campus in Austin; Add Thousands of Jobs in Other U.S. Cities. *CoStar*. Retrieved from <https://www.costar.com/article/448587496/apple-to-build-1-billion-campus-in-austin;-add-thousands-of-jobs-in-other-us-cities>

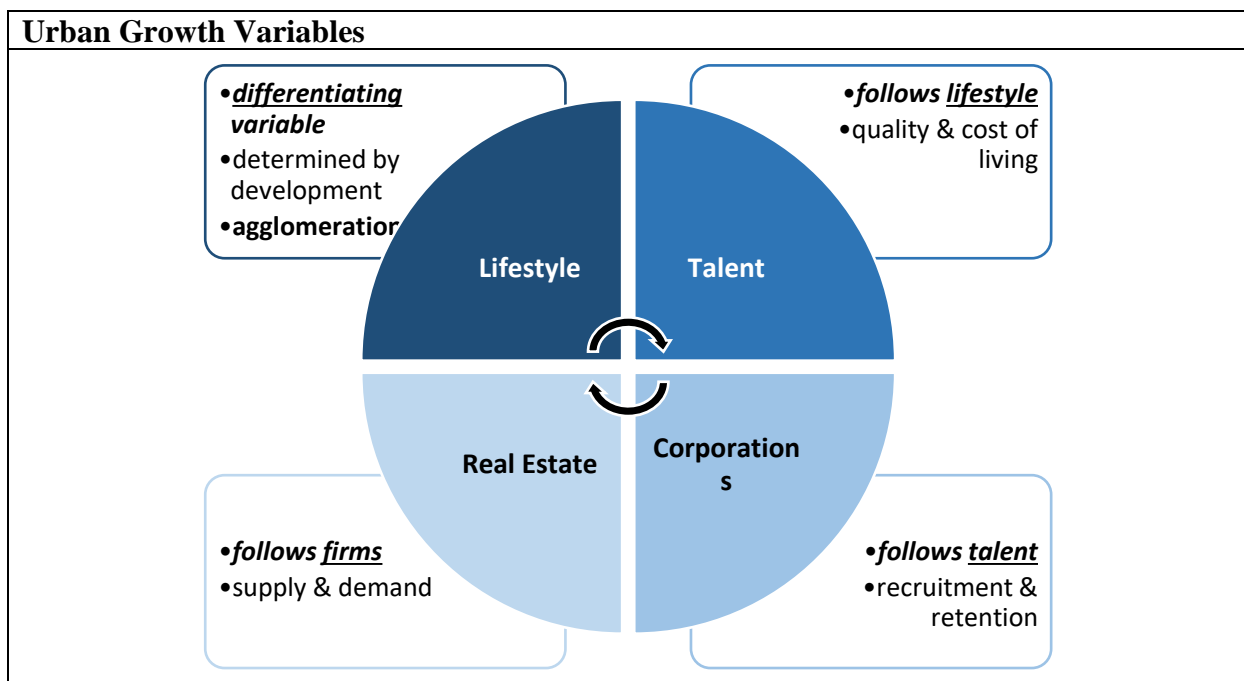
announced that it was building a “gigafactory in the Austin area that would employ around 5,000 people and cost \$1.1 billion to open,” a notable change for the California-born and -headquartered company.³⁵

While many of these corporations have kept their headquarters in their hub markets, they are investing significant amounts of capital to develop new offices and grow their footprints in other markets. The question is not whether these corporations are pursuing growth in other markets, but rather which markets are they choosing and why?

d. The Creation of Hub Markets

Having studied the trends that brought an influx of both people and corporations into these new emerging hub markets, it is necessary to acknowledge that there are several factors that influence the growth and, importantly, the competitive success of markets beyond just the physical presence of people and corporations. These factors can be grouped into four key variables: lifestyle, talent, corporations, and real estate, or the built environment. Each of these factors affects the others:

³⁵ Moss, J. J. (2020, December 8). It's official: Elon Musk has moved to Texas. *San Francisco Business Journal*. Retrieved from https://www.bizjournals.com/sanfrancisco/news/2020/12/08/elon-musk-reportedly-set-to-move.html?ana=e_sfbt_bn_editorschoice_editorschoice



The above chart illustrates the interconnectedness of these separate variables. As discussed in the *Demographic Distribution* section above, talent is increasingly chasing lifestyle, which broadly encompasses cost and quality of living. As discussed in the *Corporate Distribution* section above, corporations are increasingly following talent to facilitate growth. These corporations (demand) encourage real estate development (supply), which directly influences the lifestyle of the market, which, if done well, draws in more talent. This ongoing cycle can be observed within all of the markets discussed in this paper, however the emerging hub markets are earlier-on in their evolution versus the gateway markets.

As a real estate developer or investor, it is important to understand these trends in order to identify emerging hub markets as opportunities for investment. Talent has been recognized as the driving variable in urban growth, but tracking talent, given the fluidity and fragmentation of the US population, is a difficult task. Instead of attempting to track talent directly, real estate

developers and investors are better served to track the corporations who employ thousands of human resources employees specifically to do this task. As such, the next section will explore the “Firms” section of the urban growth formula from a bottoms-up approach. Better understanding how these firms approach real estate and, more importantly, how they choose locations, will prove helpful to real estate developers and investors evaluating new markets.

III. UNPACKING CORPORATE REAL ESTATE STRATEGY

Having established the trend of corporate growth outside of gateway markets, this next section attempts to answer how these companies chose which real estate strategies to employ, and which markets were best for expansion. For context, consider first the uniquely-public site selection process that *Amazon* has pursued over the last several years, which provides preliminary insight into how corporations have come to approach real estate planning.

In 2017, Amazon released a Request for Proposal (“RFP”) for a second headquarters location dubbed “Amazon HQ2.” The corporation was seeking a location at which it could “hire as many as fifty thousand (50,000) new full-time employees with an average annual total compensation exceeding one hundred thousand dollars (\$100,000) over the next ten to fifteen years, following commencement of operations” and promised “over \$5 billion in capital expenditures.”³⁶ The RFP spurred a fierce competition amongst markets nationwide, and ultimately 238 cities submitted RFPs in hopes of uniquely satisfying Amazon’s laundry list of demands.³⁷ After a highly-publicized process, the New York City market was selected, only to later lose the title to the Washington, DC market after inciting unfavorable local political furor.

Interestingly, just two years later, in August of 2020, Amazon announced “plans to create 3,500 new tech and corporate jobs across six cities in the United States,” noting that the corporation would “expand its Tech Hubs in Dallas, Detroit, Denver, New York (Manhattan), Phoenix, and San Diego.” Further, the corporation promised to “invest more than \$1.4 billion in these new offices, which will host teams supporting businesses across the company.”³⁸ Within a span of 2

³⁶ Amazon. Amazon HQ2 RFP. September 2017. Typescript.

³⁷ Jensen, N. (2019, March 06). Five economic development takeaways from the Amazon HQ2 bids. *The Brookings Institution*. Retrieved from <https://www.brookings.edu/research/five-economic-development-takeaways-from-the-amazon-hq2-bids/>

³⁸ Amazon. Amazon Announces Plans to Create 3,500 New Jobs in U.S. Tech Hubs in Dallas, Detroit, Denver, New York, Phoenix, and San Diego. (2020, August 18). Retrieved from

years, the company pivoted from a dual-headquarters approach to a more distributed approach, often referred to as the hub-and-spoke model (discussed later in this section). Some, however, believe that this was Amazon’s intention all along. Richard Florida, a Professor at the University of Toronto’s School of Cities and Rotman School of Management, commented in a piece for the Bloomberg city lab that “a chorus of urbanists including myself have said that the Amazon HQ2 was never about a single HQ2, but rather about crowdsourcing data on sites, talent pools, and local incentives, for future sites.”³⁹ This last bit, if true, provides key insight into current approaches to real estate planning. Amazon used the process to gain knowledge of multiple markets and then selected several different markets to support “businesses across the company,” presumably choosing markets that provided the best cluster for each of their distinct, growing businesses.

The Amazon case study illustrates the degree of sophistication that real estate planning within large corporations has achieved. This section explains how corporations approach real estate in general by examining how real estate requirements change as a function of a corporations’ operational requirements, the considerations that corporations must weigh when approaching real estate planning, and how these come together to inform location strategy.

a. Real Estate Strategy as a Function of Corporate Size and Organization

Corporations’ real estate needs evolve as they mature. As such, corporate real estate strategy cannot be viewed as “one size fits all” across all corporations. The ways in which corporations approach real estate decision making depend on characteristics of each individual corporation:

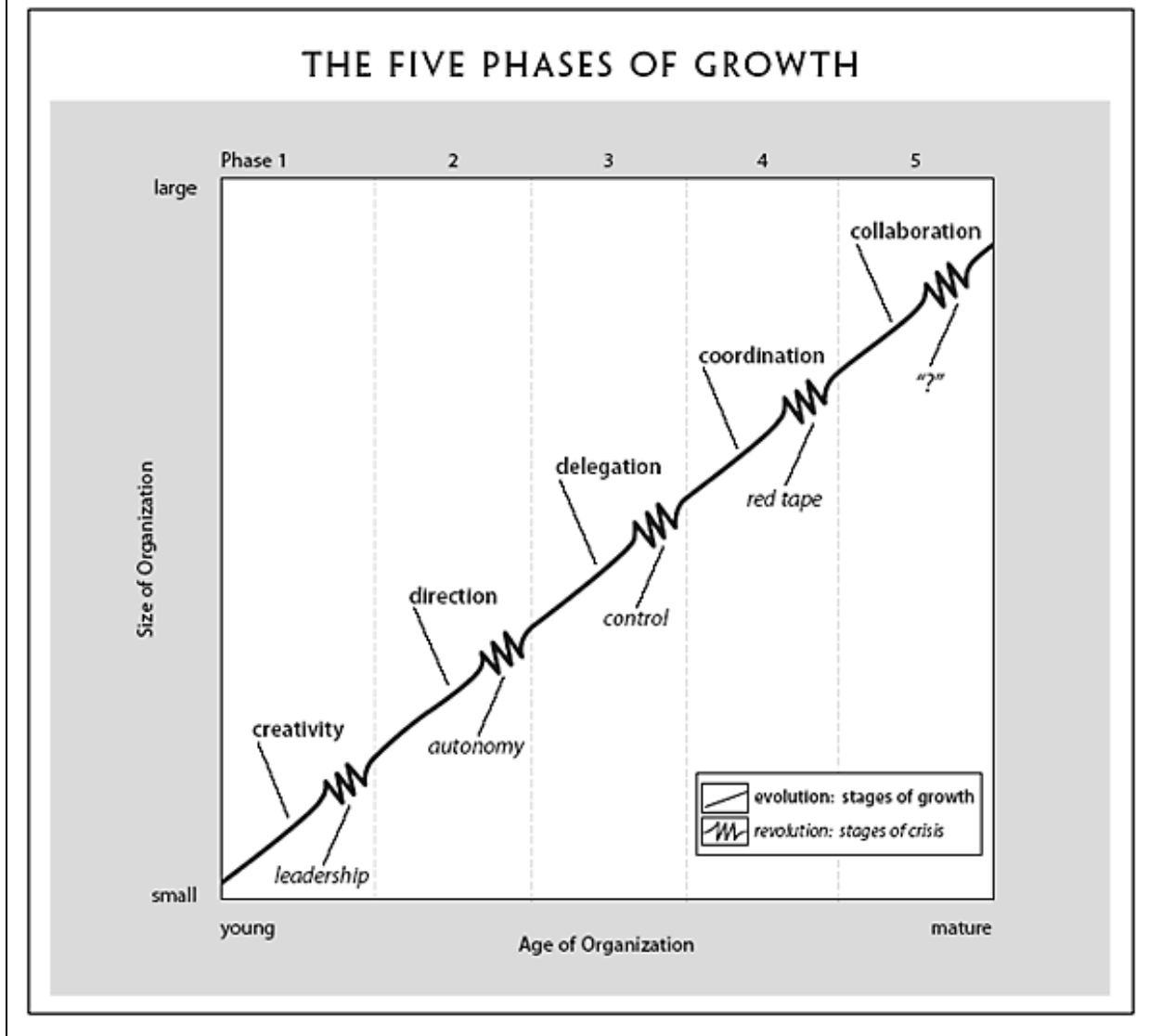
<https://www.businesswire.com/news/home/20200818005306/en/Amazon-Announces-Plans-to-Create-3500-New-Jobs-in-U.S.-Tech-Hubs-in-Dallas-Detroit-Denver-New-York-Phoenix-and-San-Diego>

³⁹ Florida, R. (2018, November 15). The Geography of Corporate Headquarters. *Bloomberg*. Retrieved from <https://www.bloomberg.com/news/articles/2018-11-15/where-corporate-headquarters-are-located?sref=Ie7GDrhe>

- First and foremost is the corporation's *size*, which can be measured in across many variables, but is herein determined by headcount and extent of financial resources. A public corporation with 10,000 employees will have markedly different real estate needs than a 20-employee corporation that just completed a seed fundraising round;
- Closely related to size is the *growth profile* of the corporation. Real estate is needed to house growth, particularly when it comes to headcount, and a rapidly expanding corporation will have unique needs. The type of growth corporations experience (e.g. organic or via acquisition) will also dictate real estate strategy;
- Along the growth profile, corporations will hit certain organizational *milestones* that will greatly influence their hiring plans and their real estate needs. For example, colocation is a critical real estate priority for startups, helping to build corporate identity and drive growth via collaboration, but is less important, affordable, and feasible for larger, more mature corporations.

Taken together, these factors indicate that corporations utilize real estate planning in different ways during different phases of their growth and maturation.

To put a visual behind this concept, consider the Harvard Business Review's below framework which identifies 5 distinct Phases of Growth through which all corporations must navigate on the path from startups to, ultimately, enterprises:



The Phases, numbered 1-5, prescribe characteristics to organizations as they grow from young companies to mature ones. In each of the Phases, the organization looks and acts differently across basic functions, as described in detail below:

⁴⁰ Greiner, L. E. (1998). Evolution and revolution as organizations grow. Harvard business review, 76(3), 55-64.

Harvard Business Review: Organizational Practices in the Five Phases of Growth⁴¹

ORGANIZATIONAL PRACTICES IN THE FIVE PHASES OF GROWTH					
CATEGORY	PHASE 1	PHASE 2	PHASE 3	PHASE 4	PHASE 5
Management Focus	Make and sell	Efficiency of operations	Expansion of market	Consolidation of organization	Problem solving and innovation
Organizational Structure	Informal	Centralized and functional	Decentralized and geographical	Line staff and product groups	Matrix of teams
Top-Management Style	Individualistic and entrepreneurial	Directive	Delegative	Watchdog	Participative
Control System	Market results	Standards and cost centers	Reports and profit centers	Plans and investment centers	Mutual goal setting
Management Reward Emphasis	Ownership	Salary and merit increases	Individual bonus	Profit sharing and stock options	Team bonus

Of particular interest are the management focus and organizational structure components, highlighted above in red, and the implications that these factors have on the organization’s physical presence, or their real estate.

In Phase 1, a corporation is focused foremost on “[making] and [selling]” its products. As such, the organizational structure is “informal,” and often undefined, meaning that corporate functions, such as human resources and real estate planning, are often afterthoughts, serving a need (e.g. space) but providing nothing more. As the corporation matures into Phase 2, management focus shifts to “efficiency of operations” and the organizational structure shifts to “centralized and functional.” In this stage, the corporation establishes a presence (e.g. formalizes its headquarters) to centralize operations and colocate employees, typically within a single, centralized office.

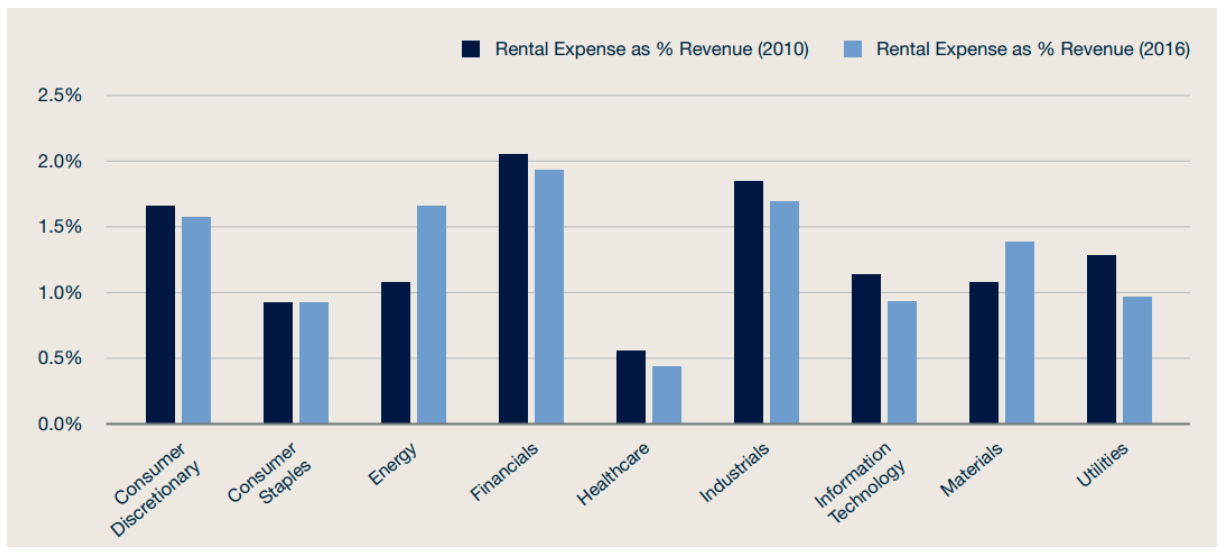
⁴¹ Greiner, 55-64.

Colocation is an important factor, as it facilitates communication, aids execution efforts, and, importantly, builds the corporate culture. Phase 3, however, has broader implications on the corporation's real estate planning. This "expansion of market" phase (e.g. scale phase) shifts the organizational structure from "centralized and functional" to "decentralized and geographical." Location typically becomes a subject of greater focus during this phase, as scaling a business is a costly and operationally challenging endeavor. Corporations must plan for growth in operations and, concurrently, personnel, growing the footprint. Successful execution of these initiatives becomes mission critical, and suddenly real estate planning and location selection become part of the company's core operating and growth strategy. It is at this phase, when corporations reach a certain size, that real estate becomes a considerable component, not only of costs, but also of operations management.

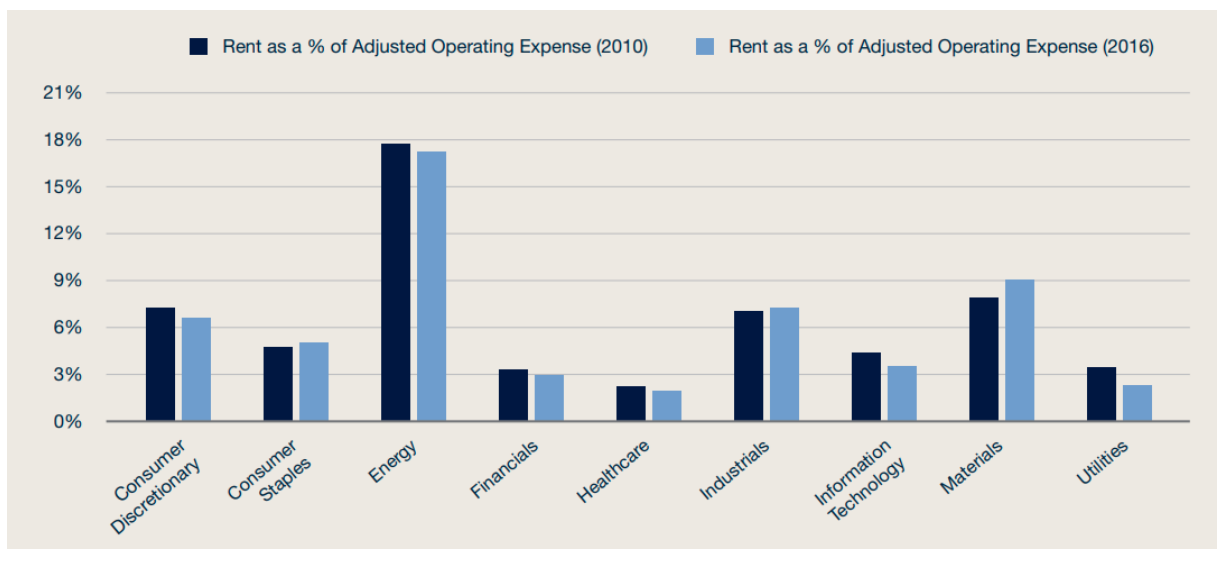
b. The Role of Real Estate in Corporate Operations

For most companies, real estate is viewed as a cost center. Physical space is a requirement for operations. Real estate costs are commonly expressed as (i) a percentage of revenues; or (ii) a percentage of costs, which allow for simple comparison across companies of the same industry. Generally, real estate costs fall between 0.5-2.0% of revenue and 2.0-18% of operating costs, depending on the industry, per the below data from Savills:

Rent as a Percentage of Revenue, 2010 & 2016, by Aggregate Sector⁴²



Rent as a Percentage of Adjusted Operating Expense, 2010 & 2016, by Aggregate Sector⁴³



The common use of these metrics engenders broad compartmentalization of real estate as a cost variable rather than a variable that can impact top line performance or growth.

In recent years, however, real estate has increasingly assumed a more prominent role within organizations beyond simply being a cost variable. Real estate is now commonly playing a role in

⁴² Learner, H. (2017). *Rent Expense Analysis for Companies in the S&P 500* (Rep.). Retrieved <https://pdf.euro.savills.co.uk/usa/in-depth-reports/rent-cost.pdf>

⁴³ Learner.

functions from culture reinforcement to marketing and branding to human resource management. This shift has caused corporations to reevaluate (and, in many cases, build out) their real estate strategies to stay competitive with their peers.

Many corporations in the technology and financial services industries have increasingly come to design their office spaces in ways that tie into *corporate culture*. Office space design sets the tone for the workplace, and corporations have become increasingly aware of their ability to use office atmospheres to make an impression upon all who enter them. Design firms have learned how to effectively customize built environments to be physical representations of corporations' cultures and values. Companies such as Bloomberg, Google, and Facebook have increasingly harnessed real estate to make statements about corporate culture, identity, and ethos.

These statement offices can also be a source of pride amongst employees, which can help toward *employee recruitment and retention*. Impressive workplaces can play a part in the recruitment process by generating candidate interest, and well-designed, pleasant workspaces and amenities can serve to keep workers happy. Retention can also be achieved by opening new office locations or by offering increased workspace flexibility, which is discussed in the later subsection on *Quality of Life and Cost of Living*.

Over the past several years, corporations have invested in *innovating office space design* to make office atmospheres more enjoyable for their employees, and office design has evolved significantly to accommodate the 21st century employee, especially in the technology industry. In recent years, firms have innovated office space design to enhance employee experience particularly as it relates to (i) the densification of workspaces, the proliferation of open plan layouts, and coworking environments; (ii) a growing list of on-site amenities for employees; and (iii) and increased focus on health and wellness, engendering a healthier work environment.

While important, these focus areas pertain mostly to the character of the buildings in which corporations operate. More important are the markets in which the firms choose to locate.

c. Corporate Location Selection Process and Considerations

Having identified ways in which corporations design and embrace their built environments to further corporate initiatives, this subsection will dive into the important topic of location strategy to explain why corporations choose to locate where they do, and why are so many corporations (and their employees) are moving around today.

As discussed in the prior subsection, as corporations mature they must decide whether to (i) grow in place, via footprint expansion; (ii) open new offices for certain teams (e.g. high-growth or altogether new teams or functions); or (iii) completely relocate the corporation to a new space that can seat growth. The option to grow in place is almost always preferred. It offers continuity across the board, fosters continued cross-collaboration between business units, and allows the corporation to remain in the same location which, presumably, comes with the benefits of the colocation and agglomeration that inspired the corporation to locate there in the first place.

However, this option can be expensive depending on the corporation's location, or physically impossible if the corporation's building does not have any additional space available or if the corporation already occupies 100% of its building. In some cases, markets have grown prohibitively expensive and have nearly run out of room for further expansion. Reporters have commented that "Silicon Valley Has Nowhere to Grow," citing Joint Ventures' *Silicon Valley Index*, which has found that:⁴⁴

⁴⁴ Swartz, J. (2019, February 13). Silicon Valley Has Nowhere to Grow. *Barrons*. Retrieved from <https://www.barrons.com/articles/with-silicon-valley-just-about-maxed-out-tech-companies-look-elsewhere-to-expand-51550079000>

The Bay Area has added 821,000 jobs—the equivalent of dropping another city the size of San Francisco onto our landscape—and the growth is fueled by innovation and ingenuity...[but] we haven't added appreciably to our housing stock. Over that same nine-year period we permitted 173,000 new housing units, a jobs-housing mismatch of nearly five to one. The result is the nation's highest housing prices, an unsettled workforce, and a transportation system sagging under the weight of 100,000 megacommuters. Add to this the nation's most sharply pronounced income gaps and you have a formula for despair.⁴⁵

Even if corporations desire to remain in their home locations, there may be push factors, such as those emphasized above, that force corporations to look to alternative markets to seat growth.

i. The Selection Process

It's helpful to understand the various conditions and environments under which these selection processes take place, although the process for selection will look different for each corporation. While there are clear differences between relocation and opening new offices in a new market (some less obvious than others), both processes rely upon a common selection process that considers similar criteria and priorities for the corporation.

First and foremost: who is being relocated? Is it the entire corporation, or just a part of the corporation? If just a part of the corporation, what type of business unit and/or job functions are being moved? Where does the business unit fall on the spectrum related to the rest of the corporation from fully autonomous to fully connected? Given this, how important is colocation (relative to both the company and nearby industry participants) for the individuals, the job functions, the business units, the corporation, and the industry?

Additionally, who at the company is making the decision? Is the initiative being led by the CEO, the CFO, human resources, or the lead of whichever department is growing or relocating?

⁴⁵ Jennings, J. (n.d.). A Message About the 2020 Index. *Joint Venture Silicon Valley*. Retrieved from <https://jointventure.org/a-message-about-the-2020-index>

Each of these constituents will approach the process from a different perspective, and likely have different priorities. The process will also contemplate topics regarding corporate culture and collocation. How big should any one office be? Does it make sense to have fewer, larger remote offices or more, smaller remote offices? Will some of the new employees work remotely? How does the corporation maintain culture as the office grows? How many employees should be colocated in the same office, and which groups must be colocated, and which can be separated?

The answers to all of these questions will be different for every company. Location strategy specialists have worked to provide data and tools to expanding companies in an effort to help them work through these tough and complicated decisions. StateBook is one such company that has built a user-friendly platform to access comprehensive economic market data across the US. Users can explore markets at varying degrees of granularity to closely evaluate them, reviewing aggregated data that can provide insights ranging from market economic development (macro) to site selection (micro). Another is BeyondHQ, which focuses specifically on companies opening offices in new locations. BeyondHQ has an interactive tool that helps companies “find a new market that is the best fit...based on...business strategy, criteria for talent, cost parameters” by providing a “digitized workflow [that] brings certainty and speed to an otherwise inefficient and manual evaluation process.”

Even with ample amounts of data, location strategy has a high degree of subjectivity and is more art than science. Each company will have a unique set of facts and circumstances that drive its ultimate decision. That said, there are many common considerations that are centered less on a corporation’s specific needs and more on the characteristics of the markets they evaluate.

ii. Market Considerations: Room to Grow

The site selection process begins with a review of the demographic, economic, and business climate conditions across potential target markets. Expansion via new sites represents a large investment on a corporation's behalf, and corporations will typically only want to expand in markets that are stable and/or improving to ensure their investment has staying power. Further, corporations will only target markets that (i) are relevant to their industry; and (ii) provide ample labor availability. Generally speaking, if a corporation is growing, its industry is likely growing as well. As such, markets that are of interest due to industry relevance are likely stable and/or growing due to the effects of clustering and agglomeration, as discussed in the prior section. Still, corporations must confirm positive economic trends in target markets as part of the process.

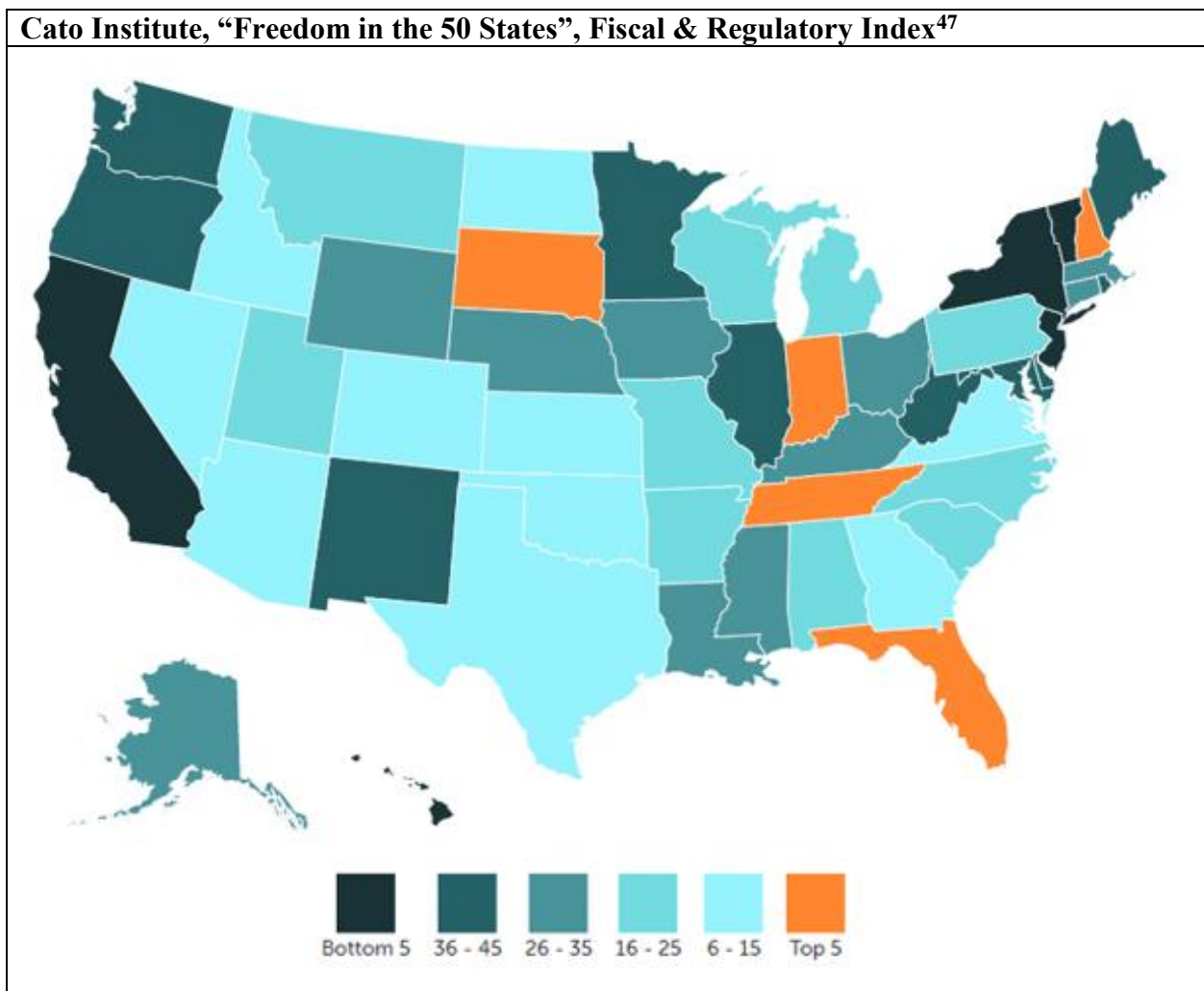
1. Economic and Business Climates

First and foremost, corporations must consider the macroeconomic health of the regions, the MSAs, and the cities they are considering for expansion. At the highest level, this means measuring state and local product (e.g. gross metropolitan product), employment and unemployment trends, and general economic activity, commonly measured by the number of companies located in the region.⁴⁶ Also important are the regions' growth prospects for these same categories.

The business climate is generally determined by government policy and regulation, and environments can vary greatly across markets. The Cato Institute, a public policy thinktank specialized in the study of individual freedoms, government intervention, and free markets, has created an interactive tool that can be manipulated to evaluate the degree of "freedom" of a

⁴⁶ Sharf, S. (2019, December 19). How We Ranked the Best States for Business 2019. *Forbes*. Retrieved from <https://www.forbes.com/sites/samanthasharf/2019/12/19/how-we-rank-the-best-states-for-business-2019/>

particular state across many variables broadly categorized into fiscal, regulatory, and personal buckets. The below map represents a customized map generated by in the interactive tool that weighs (i) fiscal policy, which contemplates state and local taxation, government consumption and investment, government employment, and government balance sheet; and (ii) regulatory policy, which contemplates freedoms related to land use, health insurance, labor markets, lawsuits, occupations, and other smaller categories to illustrate varying degrees of “freedom” across the 50 states:



⁴⁷ Ruger, W., & Sorens, J. (2020). How free is your state? *The Cato Institute*. Retrieved from <https://www.freedominthe50states.org/>

While not a perfect (or entirely objective) ranking, the map (which somewhat resembles the tax map discussed later in this section) illustrates the discrepancies between states and the implications associated with moving to a different business environment in a new state. The U.S. Chamber Institute for Legal Reform does a similar analysis on the fairness and reasonableness of states' legal climates.⁴⁸ According to the Institute's survey, "seventy percent of general counsels...say a state's lawsuit environment impacts decisions such as where to locate or expand."⁴⁹

2. Demographic Trends and Access to Talent

Second, as mentioned several times at this point, corporations need to locate in markets and regions that have available labor, especially if the contemplated site is an expansion that will require hiring new employees (versus a relocation, which might relocate existing employees). To best locate talent, corporations need to understand where the talent is located, and where it is going. The state-to-state migration trends discussed in the prior section are a good place for corporations to begin, but migration trends alone do not tell corporations about the labor supply. Corporations must evaluate the age distribution of the population, their educational attainment levels, and take a view on future population growth. A later section will discuss the more granular analyses that corporations must perform to test the depth of the talent pool, and the particular skills available to determine whether the location is a viable place for expansion.

Still, one of the most notable ways real estate can be embraced to enhance corporate operations and fuel growth is by enlarging the company's potential talent pool by expanding into new markets. Competition for talent is a key driver in corporation's decision-making, especially

⁴⁸ U.S. Chamber Institute for Legal Reform. (2020, December 17). State Legal Climate Ranking. Retrieved from <https://instituteforlegalreform.com/map-page/>

⁴⁹ Sharf.

as it pertains to expansion and growth. A corporation's growth and successful business plan execution requires the right talent. Corporations need to be able to identify, attract, and retain talent. On one hand, being in a competitive labor market can be challenging for companies. Competition, spurred by industry growth that has outpaced the growth of talent pools, results in higher average salaries, increasing the cost of talent acquisition and retention. Markets such as San Francisco and New York have become saturated with corporations that compete over a finite talent pool. At the same time, however, corporations look to competitive labor markets for opportunity as well. Colocation amongst competitors increases a corporation's access to talent via poaching, making it easier to attract talent, but likewise making it more difficult to retain that same talent.

Regardless, it is clear that competition for talent (and, therefore, the demographic trends that underlie talent behavior) has become increasingly critical for corporations' location strategies. One particularly loud voice on this topic has been *Palantir Technologies* co-founder Joe Lonsdale. Palantir, a large data analytics software company, itself announced a headquarters relocation from Palo Alto, California to Denver, Colorado in mid-2020.⁵⁰ In a December 2020 *Wall Street Journal* op-ed, Lonsdale articulated that:

In 2000 or 2010, it made sense to build in San Francisco. That's where all the talent was, but not anymore. Except for a few concentrated parts of advanced biotech and software infrastructure technology, talented people are building top technology firms all over the country. This disaggregation of talent will spread prosperity across the U.S. Some of my most prolific entrepreneurial friends from California have moved with us here to Texas. Others have left for Miami, Nashville, Las Vegas and other great American cities. Six of our portfolio companies are already based in Austin and employ hundreds of people...Our investments follow the talent. We're betting that the future of America is going to be built in the middle of the

⁵⁰ Bursztynsky, J. (2020, August 19). Palantir to relocate headquarters from Silicon Valley to Colorado. *CNBC*. Retrieved from <https://www.cnbc.com/2020/08/19/palantir-headquarters-moves-from-silicon-valley-to-colorado.html>

country, in places with good government and a reasonable cost of living. In other words, places like Texas.”⁵¹

One effective way for companies to pursue talent without having to fully relocate is by employing an approach called the *hub and spoke model*, in which “a primary hub office is used to house key functions, teams, meetings and events with spokes leading to convenient local offices where employees can check in and work.”⁵² The hub and spoke model has been used increasingly by technology companies seeking to access talent outside of their primary markets. Opening an office in a new market opens the company up to new pools of talent that can greatly aid expansion. At the same time, entry into a new market may enhance employees lives outside the office, namely by expanding their footprints via spokes in locations with better and more affordable lifestyles, as discussed in the *Quality of Life and Cost of Living* subsection to follow.

iii. Financial Considerations: Cost of Doing Business

Corporations must also study the relative costs of doing business in each target market. The cost of doing business, otherwise commonly referred to as the business environment, can vary a great deal between markets. Moody’s, which publishes a Cost of Doing Business index to objectively measure the business environments across markets, contemplates the costs of doing business to include the costs of labor, energy, and taxes by state or market for corporations.^{53 54}

⁵¹ Lonsdale, J. (2020, November 15). Opinion | California, Love It and Leave It. *Wall Street Journal*. Retrieved from <https://www.wsj.com/articles/california-love-it-and-leave-it-11605472619>

⁵² Brown, L. (2020, August 12). Hub and Spoke Model Looks to Confront Changing Workplace Dynamics. *Globe Street*. Retrieved from <https://www.globest.com/2020/08/12/hub-and-spoke-model-looks-to-confront-changing-workplace-dynamics/>

⁵³ Sharf.

⁵⁴ Moody’s Analytics | Economic & Consumer Credit Analytics. (2019). Regional Cost of Doing Business. Retrieved from <https://www.economy.com/store/shop.aspx?pubid=11>

1. Hard Costs: Real Estate and Personnel

The hard costs associated with expansion or relocation are fairly obvious financial considerations. On the real estate side, the corporation must determine the cost for securing new space (leasing commissions, etc.) and occupying it (build-outs, the cost of furniture, fixtures and equipment, etc.). Then there is the ongoing rental cost, assuming the corporation does not buy its space, as well as energy and other utilities. Depending on where the company is currently located, expansion into new markets can either increase or decrease a corporation's real estate costs. On the personnel side, the corporation must determine the costs of building out a new team and hiring new employees. Taken together, these are the two most visible financial considerations when contemplating new locations. They are not, however, financially equivalent.

Take for example Company A, located in Market #1, who is contemplating adding 20 employees to their headcount. Company A uses their existing space to guide the expansion budget – 20 employees earning an average of \$200,000 per year (including benefits, etc.), each requiring 300 square feet of space in the office, with market rents of \$50/sf. Expanding in Market #1 would cost the Company \$4.3 million in combined real estate and personnel cost.

In an effort to manage costs, Company A also considers locating the new employees in Market #2. In Market #2, the rents are 20% lower, but wages are the same. As shown in the exhibit below, real estate costs equate to just ~7% of the total cost of expansion (the balance being labor), so the impact of a 20% rent reduction equates to just 1.4% total savings, bringing the cost of expansion down to \$4.24 million.

Company A also looks to locate the new employees in Market #3. In this market, the real estate costs are the same as Market #1 but wages are 20% less than they are in Market #1. Instead of making \$200,000 annually, employees in Market #3 make \$160,000 annually. Keeping real

estate costs constant, the total cost of expansion would be 18.6% less than it would be in Market #1, and 17.5% less than it would be in Market #2, because the labor is so much cheaper and talent is the biggest driver of cost. See table below for the supporting calculations:

Market Growth Cost Analysis					
Market #1		Market #2		Market #3	
Real Estate Cost		Real Estate Cost		Real Estate Cost	
# Employees	20	# Employees	20	# Employees	20
# SF/Employee	300	# SF/Employee	300	# SF/Employee	300
Total SF	6,000	Total SF	6,000	Total SF	6,000
Market Rent / Year	\$50.00	Market Rent / Year	(20.0%) \$40.00	Market Rent / Year	\$50.00
Total RE Cost	\$300,000	Total RE Cost	\$240,000	Total RE Cost	\$300,000
Personnel Cost		Personnel Cost		Personnel Cost	
# Employees	20	# Employees	20	# Employees	20
Annual Salary	\$200,000	Annual Salary	\$200,000	Annual Salary	(20.0%) \$160,000
Total Personnel Cost	\$4,000,000	Total Personnel Cost	\$4,000,000	Total Personnel Cost	\$3,200,000
Total Cost	\$4,300,000	Total Cost	\$4,240,000	Total Cost	\$3,500,000
RE % Total	7.0%	RE % Total	5.7%	RE % Total	8.6%
Personnel % Total	93.0%	Personnel % Total	94.3%	Personnel % Total	91.4%
		Cost Reduction vs. Market # 1 (\$)	(\$60,000)	Cost Reduction vs. Market # 1 (\$)	(\$800,000)
		Cost Reduction vs. Market # 1 (%)	(1.4%)	Cost Reduction vs. Market # 1 (%)	(18.6%)
				Cost Reduction vs. Market # 2 (\$)	(\$740,000)
				Cost Reduction vs. Market # 2 (%)	(17.5%)

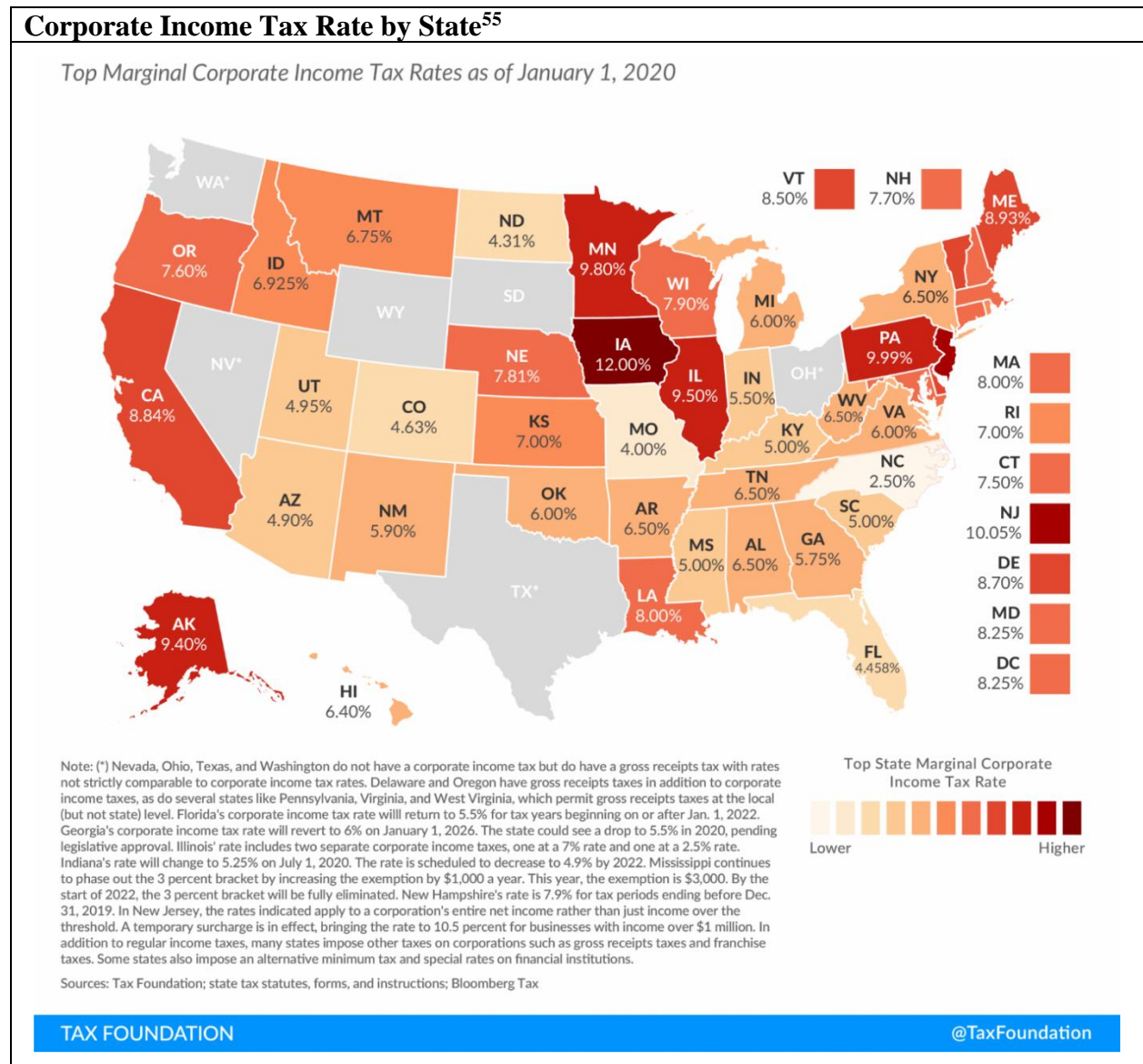
Using this illustrative example, it is clear that cost savings are more significant with regards to talent, rather than physical space. Thus, when corporations are looking to expand into new markets, the cost of labor should be a larger consideration than the cost of the expected footprint.

2. Taxes and Incentives

Property, state, and local taxes are also a large component of general business costs. So are government-sponsored incentives that may offset these tax burdens. In recent years, state-by-state competition has grown, as many pro-business states have actively marketed their business environments to corporations in less-business-friendly states (see Cato Institute map for reference). This competition has manifested itself in the colloquially termed "Red state versus Blue state" battle, which pits Republican states against Democratic ones, with the assumption that Republican states are, generally, more business friendly than Democratic ones. Political affiliations aside, it is

clear that there is a large difference between states, not only in subjective terms, such as business climate as previously discussed, but also in objective terms, such as taxes.

As noted in the chart below, provided by the Tax Foundation, the top marginal corporate income tax rates vary dramatically across states, from 0% in the six states with no corporate income tax (Nevada, Ohio, South Dakota, Texas, Washington, and Wyoming) to as high as 10% in New Jersey and Pennsylvania and 12% in Iowa:

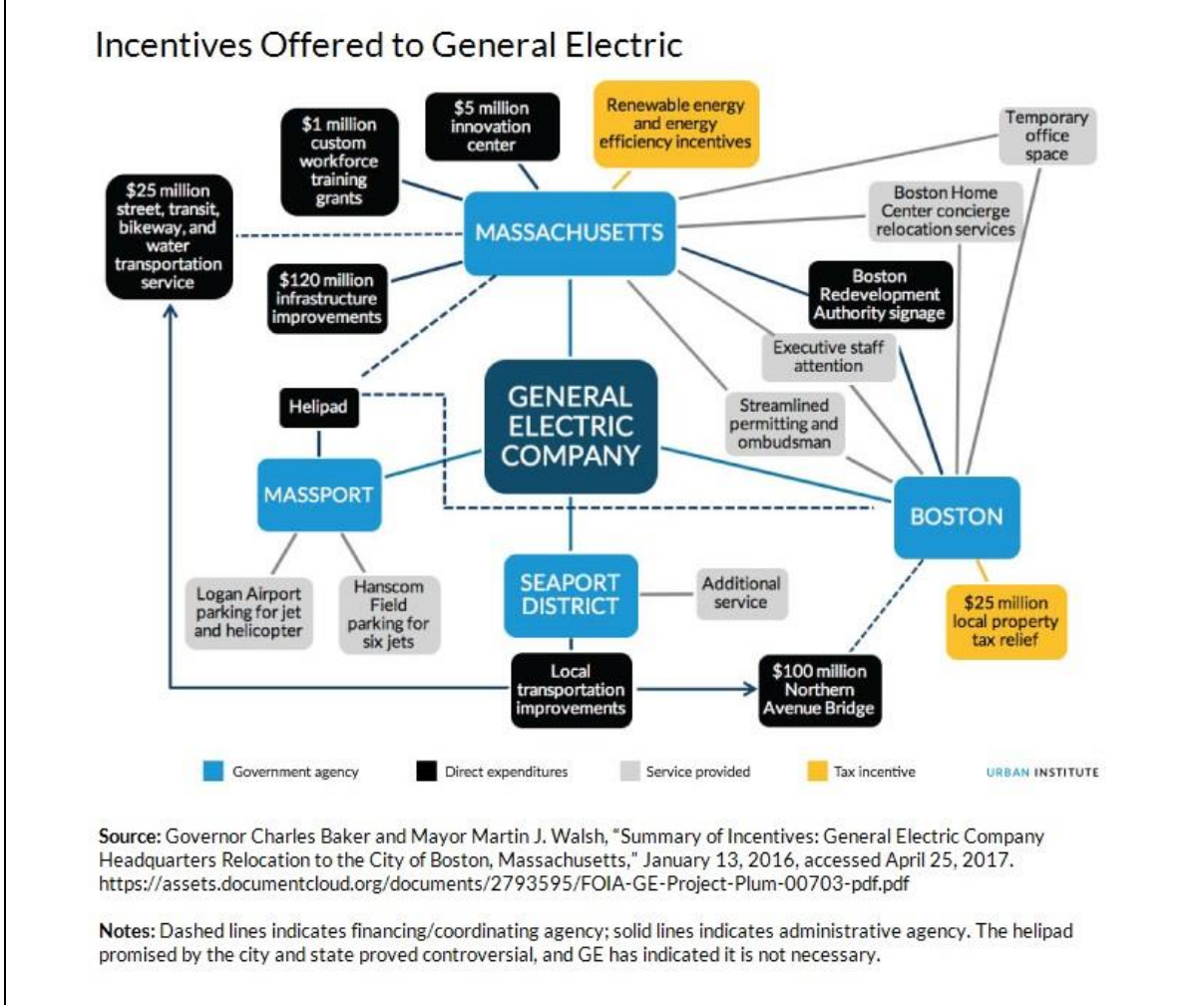


⁵⁵ Cammenga, J. (2020, November 30). State Corporate Income Tax Rates and Brackets for 2020. *The Tax Foundation*. Retrieved from <https://taxfoundation.org/state-corporate-income-tax-rates-brackets-2020/>

States often compete against each other for corporations using taxes. Texas is perhaps the state most well-known for not having a corporate income tax, and is therefore often considered to be one of the most business-friendly states in the nation. This helps explain many of the recent corporate migrations to Texas.

Beyond tax *rates*, tax *incentives* have also proven to be a useful tool for states and cities in luring companies. Take, for example, General Electric's controversial move from Fairfield, Connecticut to Boston, Massachusetts, in 2016. To make Boston more attractive, the Commonwealth of Massachusetts and the City of Boston offered GE a myriad of benefits, including over \$25 million in local property tax relief:

Incentives Offered to GE by the State of Massachusetts and the City of Boston⁵⁶

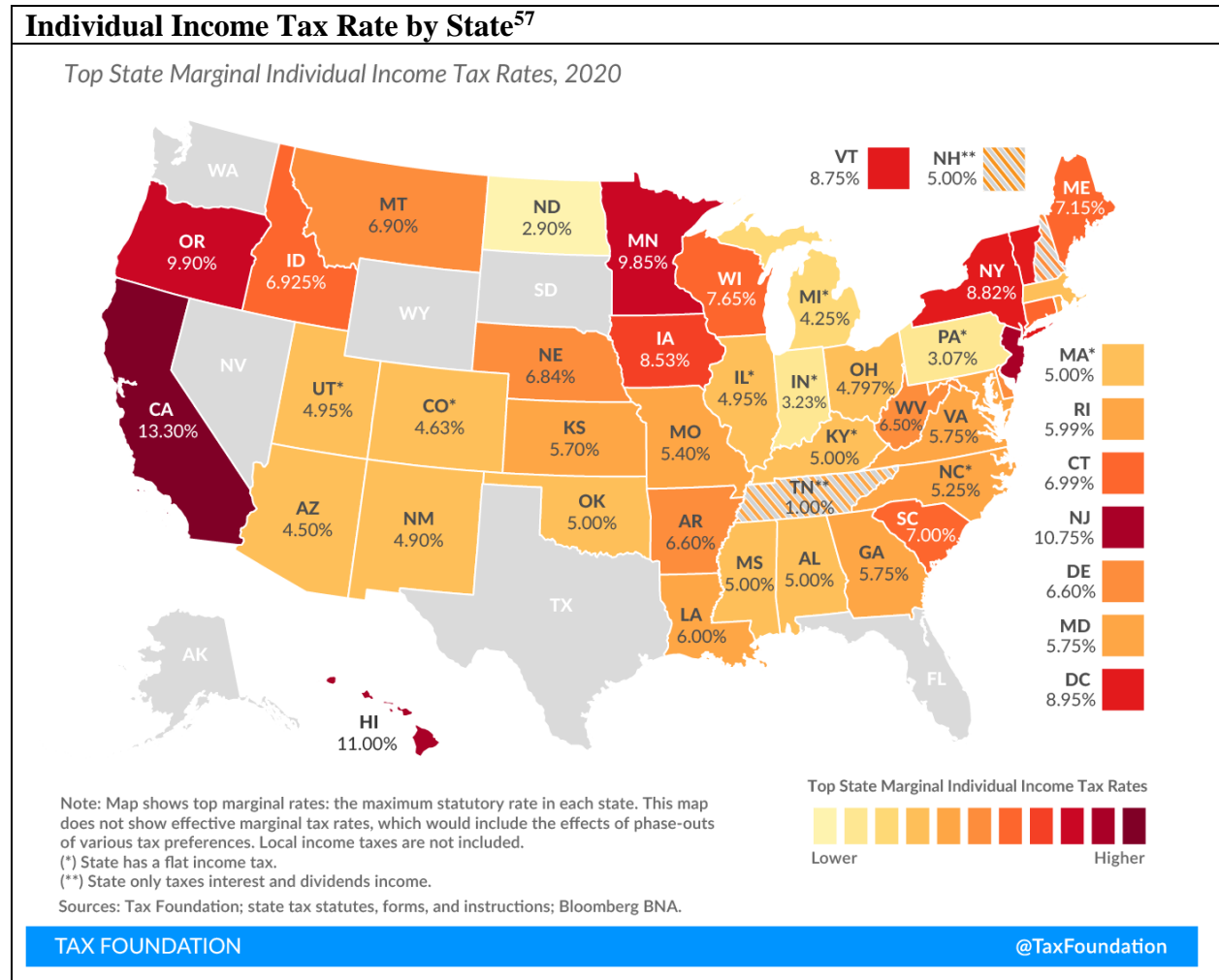


The incentives outlined above successfully secured General Electric’s headquarters relocation to Boston, dealing a significant blow to the state of Connecticut. In this case, it is also important to note that Massachusetts is very much a “Blue state,” underscoring that political leaning does not always beget the business environment.

Separate but related are individual income taxes. While not directly reflected in corporations’ earnings, they must be considered by corporations as they factor into the cost of labor. Individual income taxes are also relevant to founders and executives, the magnitude of

⁵⁶ Randall, M. (2017, May 08). Massachusetts gave GE a "mega-deal" to move, but did it matter? *Urban Institute*. Retrieved from <https://www.urban.org/urban-wire/massachusetts-gave-ge-mega-deal-move-did-it-matter>

whose earnings make tax payments more substantial and whose authority make taxes a consideration in real estate location decision-making. The map below illustrates individual income tax rates by state:



While not identical to the map illustrating corporate income tax rates, there are similarities between the two, driven by respective states’ attitudes toward taxation and, therefore, public spending.

In recent years, there has been a well-publicized exodus of wealthy residents from high-personal income tax states, such as California, New Jersey, and New York, to lower-personal

⁵⁷ Loughead, K. (2020, February 04). State Individual Income Tax Rates and Brackets. *The Tax Foundation*. Retrieved from <https://taxfoundation.org/publications/state-individual-income-tax-rates-and-brackets/>

income tax states, such as Texas, Florida, and Washington. **Elon Musk**, founder of Tesla Motors, changed his residency to Texas from California in 2020, while simultaneously putting all of his California real estate holdings on the market, remarking that “California has been winning for a long time and I think they're taking it for granted a little bit”⁵⁸ **Larry Ellison**, founder of Oracle, announced in December 2020 that he was moving from Silicon Valley to Hawaii after Oracle announced its headquarters move to Texas.⁵⁹ Any there have been countless others.⁶⁰

Certainly, part of this migratory phenomenon is due to individuals desire to pay fewer taxes (e.g. push factor). But states, and even cities, are becoming increasingly creative about marketing themselves as lower-cost alternatives to high-tax states (e.g. pull factor). Local economic development offices have become more important as states and cities compete for talent. In the same way that corporations are looking for talent and tax incentives, so too are states and cities looking for demographic and corporate in-migration to grow their economies and their tax bases.

Tulsa, Oklahoma, for example, launched a program in 2018 called Tulsa Remote, which offered \$10,000 grants to individuals who moved to Tulsa for at least a year.⁶¹ ⁶² The program, aimed at supporting migratory growth to the city, advertises itself by telling applicants: “Hi, remote workers! We'll pay you to work from Tulsa. You're going to love it here.”⁶³ In the context of COVID-19, this approach has become more widespread. Evan Hock, co-founder of TMap, a tech

⁵⁸ Moss.

⁵⁹ Hartmans, A. (2020, December 14). Billionaire Oracle founder Larry Ellison has reportedly moved to the Hawaiian island he mostly owns, the latest high-profile departure from Silicon Valley. *Business Insider*. Retrieved from https://www.businessinsider.com/larry-ellison-oracle-lanai-island-hawaii-move-2020-12?nr_email_referer=1

⁶⁰ Morris, M. (2020, November 28). Is Silicon Valley finally dead? *Business Insider*. Retrieved from https://www.businessinsider.com/tech-elites-leaving-san-francisco-threaten-silicon-valley-supremacy-2020-11?nr_email_referer=1

⁶¹ Dean, G. (2020, November 25). Tulsa, Oklahoma, is paying remote workers \$10,000 to move there for a year. *Business Insider*. Retrieved from <https://www.businessinsider.com/tulsa-oklahoma-remote-workers-pay-move-there-for-year-2020-11>

⁶² Chang, R. (2020, November 23). Earn \$10,000 by Moving to This U.S. City for a Year. *Travel & Leisure*. Retrieved from <https://www.travelandleisure.com/jobs/tulsa-oklahoma-recruiting-remote-workers-stipend>

⁶³ Tulsa Remote. (2020). Tulsa Remote. Retrieved from <https://tulsaremote.com/>

recruiter based in Indianapolis, recently remarked that “for the first time in at least a century, the fundamental deal that most workers had signed up for — hitching their work life to where they live — has been decoupled for millions of people. Suddenly people have the freedom to live and play where they want, independent of their work.”⁶⁴ TMap has even created a marketplace intended to match remote workers with states and cities that are, like Tulsa, trying to participate in the great migration occurring nationwide. The emergence of individual-focused incentive programs is further evidence of an increasing battle between state and local governments to entice migrants.

iv. Operational Considerations: Continuity and Scaling

Corporations must also carefully consider operations as part of the decision-making process. The benefit of having one location is that business groups are inherently connected and, presumably, communication between groups is fluid. Single locations also help corporate leaders shape culture amongst employees. Corporations utilizing multiple locations will rely upon technology, as discussed in a prior section, to ensure continuity and to allow for the continued collaboration between groups, as needed.

1. *Autonomy and “Un-Pluggability”*

In separating business groups, especially geographically, management has to study the communication habits of each group. How much are they meeting with other groups within the company? How much are they meeting clients? Corporations must separate groups by function and by ultimate customer – who is the group serving? Is it the client? Suppliers? Other internal

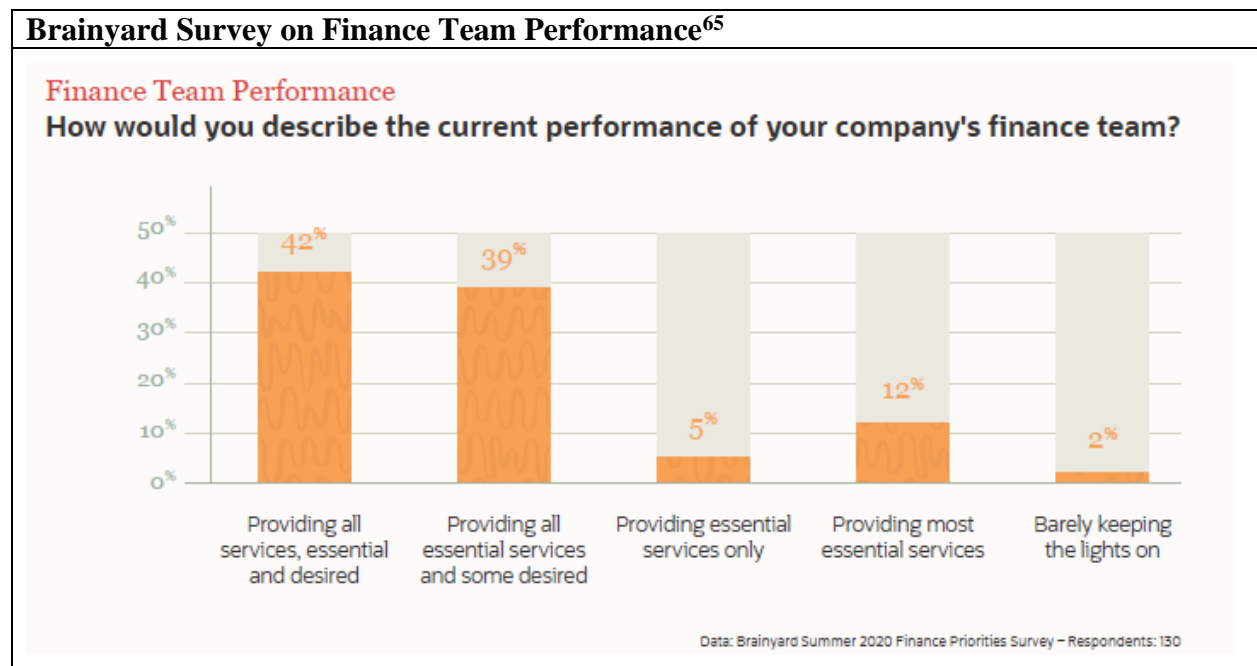
⁶⁴ Calvey, M. (2020, December 22). Amid Bay Area exodus, more cities offer cash, land, other incentives to attract remote workers. *San Francisco Business Journal*. Retrieved from https://www.bizjournals.com/sanfrancisco/news/2020/12/22/amid-bay-area-exodus-more-cities-offer-cash-land.html?ana=e_sfbt_bn_editorschoice_editorschoice

business units? Essentially, management must evaluate the *autonomy* of each business group to determine the benefits and costs of removing that group from a given location. The more interconnected a group, the harder it is to “unplug” from the office without disrupting business. On a deeper level, management must also consider the character of the interactions happening between groups. Is the constant communication a part of the creative process (e.g. may impact revenue and/or product development), or is it a form of reporting? The character of the interaction may determine whether frequent communication must be conducted in-person or whether it can be done electronically or remotely.

Often, as corporations grow and new offices are opened, an operational delineation is drawn amongst offices, creating somewhat of a hierarchy. As discussed in prior sections, the company is likely headquartered in a location that is advantageous to operations. Thus, the headquarters and other strategically important offices become primary sites, generally housing groups centered around product and revenue generation, such as executives and development, though these delineations will be different for every corporation. At a certain size, corporations will start to operate secondary sites that take operating pressures off the primary ones. In other words, corporations will free up space for the highest valued employees by moving lesser-valued employees to other locations. Generally, those units focused on the top-line will receive priority over those focused on the bottom line (e.g. groups colloquially referred to as middle- and back-office roles that are often processors rather than creators, or customer facing (e.g. sales, account management, customer support)). In the case of these latter groups, is the workforce being relocated, or is the corporation looking to make new hires? Often, corporations will move these latter business units to areas with lower labor costs to achieve *labor arbitrage*, securing the same

labor in a different market for lesser pay. Lastly, how easy to move is the job function? A customer support call center is far easier to move than an assembly line or a laboratory.

Studies have been conducted to test the “un-pluggability” of certain business groups and functions within larger corporations to determine which groups can be geographically isolated from the others while allowing for maximum business continuity. In summer 2020, Oracle and NetSuite published a report called “The Future of Business: How Finance Is Becoming a Catalyst for Change” stemming from Brainyard’s Summer 2020 Finance Priorities Survey. The survey canvassed groups of professionals working on corporate finance teams, in an attempt to determine how well finance teams had been working remotely during the pandemic. The survey found that 42% of respondents reported they were “providing all services, essential and desired” despite operating fully remote from the rest of the organization. In total, 81% of respondents reported that they were providing all essential services:



⁶⁵ Wittmann, A. (2020). *The Future of Business: How Finance is Becoming a Catalyst For Change* (Rep.). Retrieved <https://www.netsuite.com/portal/assets/pdf/wp-brainyard-summer-2020-the-future-of-business.pdf>

These results suggest that 81% of finance teams would be able to provide all essential services operating remotely. Putting aside technological advancement and adoption momentarily, the study importantly shows that finance teams are fully capable of doing their jobs while separated from the rest of the business. If these teams do not have to be colocated with the rest of the business, corporations can reasonably justify allowing permanent remote work, or even moving these teams in their entirety to lower-cost, better-cost-of-living locations where real estate costs and personnel costs are considerably lower, and recruiting and retaining talent is easier. Separating out “tester” groups, such as finance teams, could set a notable precedent for operations in years to come, as corporations discover that business continuity can indeed be achieved when certain groups are unplugged from the rest of the firm.

Some corporations have been studying this “un-pluggability” since before COVID-19. Facebook’s decision to move its finance team to Austin was the result of years studying internal communications and logistics data (such as cell phone location tracking, email traffic, meeting invites/locations, etc.) to determine which groups are interacting most frequently – and therefore must be colocated – and those that are interacting least frequently (or electronically) – and can therefore be geographically separated.

Related to this is **time-zone alignment**. Coordinating operations during aligned business hours can have enormous impacts on efficiency and effectiveness of work. This extends principally to operations (internal) and client coverage (external). Businesses have identified Central Time and Mountain Time as preferred time zones for business groups principally concerned with operations and client coverage.

2. Logistics and Infrastructure

There are also functional reasons for location preference. Corporations must have smart access to **transportation**, both for daily commutes and for business travel to and from the corporation's various offices. Daily employees must have multiple modes of transportation to access the office, while keeping commuting costs reasonable. Depending on the predominant modes of transportation for their employees, corporations choose to be located near freeways, public transportation routes and nodes, and/or walking- and biking-friendly commercial centers. For periodic travel to and from the office, corporations choose to be located in reasonable proximity to long-distance travel ports such as airports and rail stations.

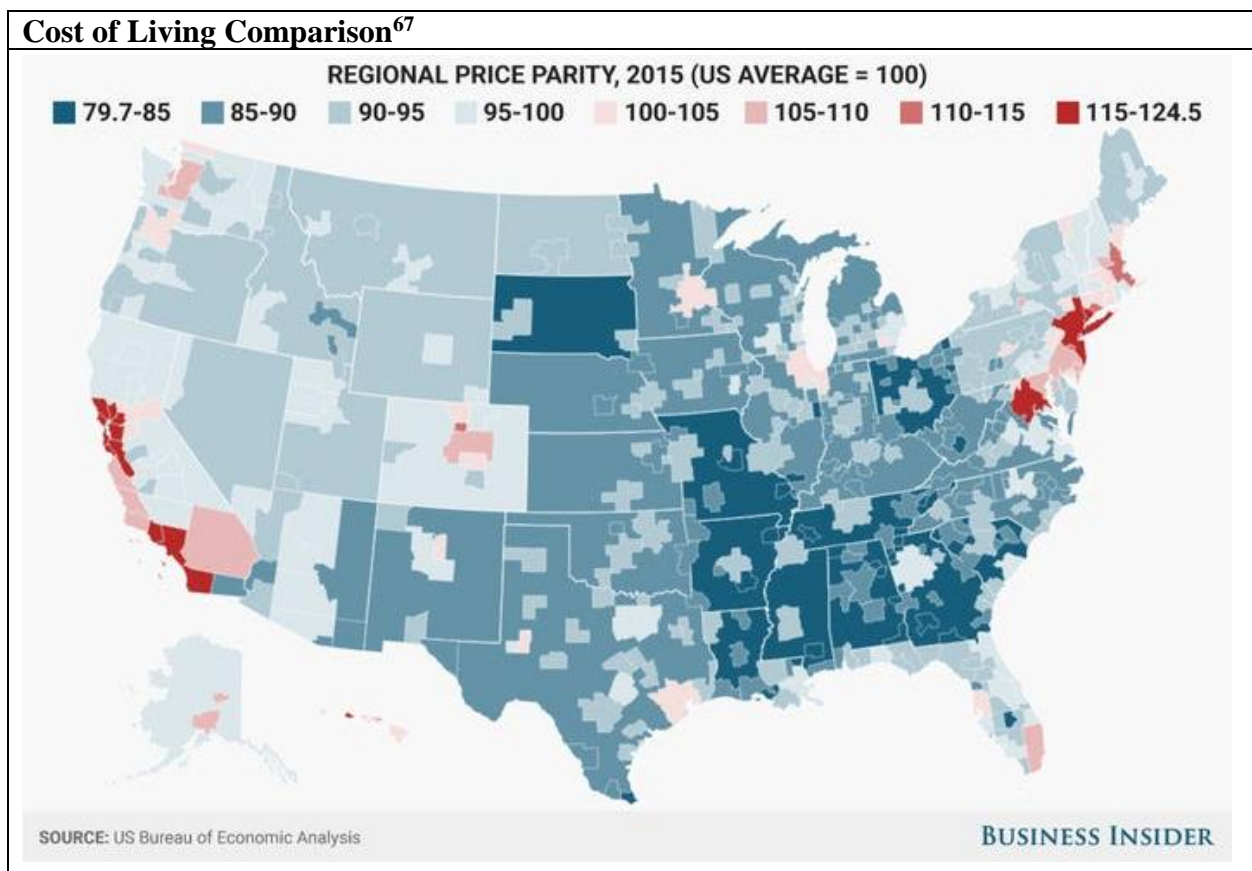
v. Quality of Life and Cost of Living: Talent Management

Last but certainly not least is the consideration of quality of life and cost of living for employees. In fact, this is perhaps one of the most poignant and most discussed considerations for real estate planning amongst corporations today, namely because it ties in so closely to the prior subsections of human resource management and access to talent. As previously discussed, real estate has increasingly become a tool for human resource management in terms of both talent recruitment and talent retention. Both quality of life and cost of living play heavily into this part of the equation.

Quality of life and cost of living are separate but intertwined concepts. Quality of life is a broad term that refers to residents' general satisfaction with the places in which they live. In their annual Best Places to Live rankings, U.S. News and World Report considers crime rates, quality and availability of healthcare, quality of education, well-being, and commute times in their

analysis of quality of life.⁶⁶ Most people also associate quality of life with access to amenities and culture (such as restaurants and the arts), access to recreation spaces (such as parks and trails), and a comfortable climate. Many of these factors can be subjective, which makes quality of life somewhat difficult to objectively compare across markets.

Easier to compare is cost of living, which is actually a factor in quality of life (often described as “value” in each of these locales). There have been many widely-publicized studies about costs of living across the nation, especially as the cost of living has climbed so high in certain markets as a result of high housing costs. The figure below shows the variations across the nation in the cost of living:



⁶⁶ U.S. News & World Report. (2020). How We Rank the Best Places to Live & Retire. *U.S. News & World Report*. Retrieved from <https://realestate.usnews.com/places/methodology>

⁶⁷ Kiersz, A. (2017, July 06). The most and least expensive places to live in America. *Business Insider*. Retrieved from <https://www.businessinsider.com/most-and-least-expensive-places-in-america-regional-price-parity-map-2017-7>

The discrepancies in cost of living across the nation are quite large, with the biggest markets typically commanding the highest premiums. Much of this is attributed to housing costs, which are elevated in these markets due to limits on supply, but other factors, such as the cost of food, transportation, and utilities also factor into this equation. The below chart provides specific estimates for the cost of living in the top 75 cities in the US, to convey the magnitude of the discrepancy:

Cost of Living Across Top 75 US Cities⁶⁸

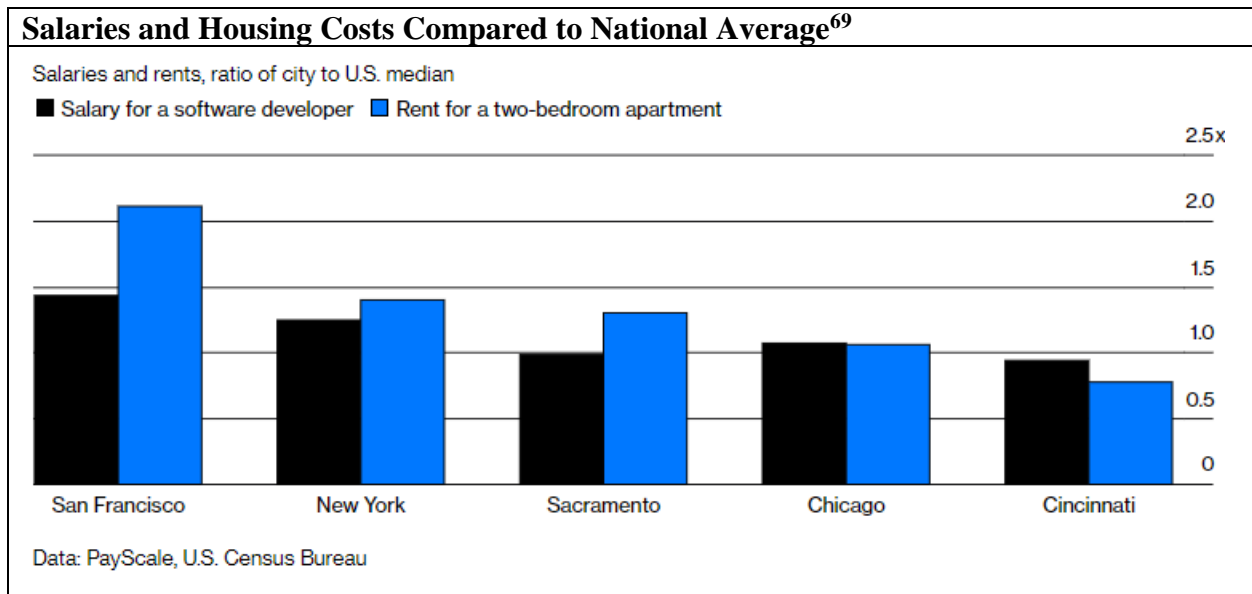


The figures above illustrate that the discrepancies are incredibly large. Importantly, the data is collected across cities, meaning that it accounts for all of the expenses that come with an urban lifestyle. Still, living in the most expensive city, San Francisco, is 3.6 times more expensive than living in the least expensive city, El Paso. More importantly, the data shows that the cost of living

⁶⁸ Roberts, J. (2020, August 25). Top 10 US Cities With the Lowest Cost of Living. *Move.org*. Retrieved from <https://www.move.org/lowest-cost-of-living-by-us-city/>

sees the biggest increase in the ~20 most expensive cities. Below that, the bottom 55 cities indeed have variation but are within a smaller range.

But cost of living cannot be studied in isolation. Presumably, those living in the most expensive cities are earning more from their jobs. One comparative way to measure cost of living and relative affordability is by comparing salaries and housing costs to national averages. The chart below illustrates the relationship between salaries and housing costs in a sample of markets:



Chicago’s salaries and housing costs align both with each other and the national average, both marked around 1.0x. San Francisco, however, is well above the national average in both categories. Importantly, though, there is a large difference between salaries and living costs versus the national average. Salaries are just under 1.5x the national average, but housing costs are over 2.0x the national average. The gap between these two statistics indicates that the average employee in San Francisco must spend a greater percentage of their annual income on housing than employees in other cities such as Chicago, where incomes and housing costs are more closely aligned. This data

⁶⁹ Frier, S. (2020, May 14). Tech Workers Consider Escaping Silicon Valley’s Sky-High Rents. *Bloomberg*. Retrieved from https://www.bloomberg.com/news/articles/2020-05-14/tech-workers-consider-escaping-silicon-valley-s-sky-high-rents?cmpid=BBD051420_CITYLAB

suggests that the cost of living adjustments factored into the average San Francisco salary do not sufficiently compensate for higher housing costs in this city. In Cincinnati, on the other hand, both wages and cost of living are below the national average, and housing is a lower percentage of the national average than are salaries, indicating that the average employee in Cincinnati can spend a lower percentage of their annual income on housing than employees in other cities. In sum, this data shows that there can be (and are) disconnects between employee income and cost of living.

A more granular look into this discrepancy provides even more insight. The below table was produced by BuiltIn, a startup designed to provide career and industry information to employees across the tech industry. BuiltIn has an interactive tool that allows users to look at the cost of living of various markets versus traditional tech hubs, such as San Francisco. See below an example comparing the cost of living in Austin against the cost of living in San Francisco:

Cost of Living: Austin, Texas versus San Francisco, California⁷⁰



⁷⁰ Built In. (2021). Tech Hubs In US: 7 Growing Cities Beyond Silicon Valley. *BuiltIn*. Retrieved from <https://builtin.com/tech-hubs>

This analysis provides an excellent view into the discrepancies that many employees in the tech industry are waking up to. The cost of a one-bedroom apartment in San Francisco is 241% more expensive than it is in Austin. Similarly, the median home price is 264% more expensive in San Francisco than it is in Austin. Notably, however, the salaries offered in San Francisco are only 39% above those in Austin, on average, based on the figures above. So, while employees in Austin are paying 70% less in housing costs, their compensation is only 28% less, meaning that they are taking home a far greater percentage of their earnings versus their peers in San Francisco because the cost of living is so much lower.

Combining this analysis with the tax discussion from the prior section, it becomes clear that employees in less expensive locations (in terms of housing expense and tax) will “take home” more income than their peers in more expensive locations. This is an important observation for both corporations and their employees. The discrepancy in cost of living means that corporations can pay their employees less if located in less expensive locales. The question becomes: can they get the same quality of employee, and quality of work, out of offices in these locations. For employees, this means that they can move to a city with a lower cost of living and, so long as their salaries are not reduced a greater amount than the cost of living decrease, they will make more money due to the wage arbitrage. This observation has been acknowledged by both parties as, for the most part, mutually beneficial. And this observation is perhaps the most powerful when trying to explain the migration trends this thesis is evaluating.

vi. Pulling it All Together: Two Case Studies

Corporations have started to take notice. Increasingly, corporations have started to prioritize better matching employees’ incomes with their cost of living. This notion is one of the

driving concepts behind real estate becoming a human resources tool. Adjustments that improve quality of life and/or cost of living can be meaningful for employee recruitment and retention.

One noteworthy case study centered on this approach is that of *Toyota Motor Corp*, which is, interestingly, neither a technology nor a financial services company at its core. In 2014, Toyota announced that they were moving their U.S. corporate headquarters from Torrance, California, to Plano, Texas. The announcement dealt a notable blow not only to California but also to New York and Kentucky, which were also slated to lose jobs to Texas. The move almost immediately affected “2,000 employees at Toyota Motor Sales USA in Torrance, California; 1,000 employees at Toyota Motor Engineering & Manufacturing North America Inc. in Erlanger, Kentucky; and certain employees at Toyota Motor North America in New York City” with Toyota Financial Services and its 1,000 employees based in Torrance slated to move in 2017.⁷¹ The move would consolidate Toyota’s three then-separate North American headquarters (manufacturing, sales and marketing, and corporate operations, respectively) at a brand-new, \$1 billion, 100-acre campus in Plano, Texas.⁷²

On the surface, the move appears to be one out of a conventional corporate playbook: consolidate more employees at a centralized campus. While this was likely a driving factor in the decision, over time more light has been shed on the other factors that were weighed during the decision-making process, revealing that access to affordable housing for the corporation’s workers played a significant part in positioning the Dallas market as the most attractive option. The Dean of the Cox School of Business at Southern Methodist University, Albert Niemi Jr., speaking on behalf of the city of Dallas, commented that: “It wasn’t so much that we don’t tax income...It was

⁷¹ France-Presse, A. (2014, April 28). Toyota to Move US Operations to Texas. *Industry Week*. Retrieved from <https://www.industryweek.com/talent/article/21962753/toyota-to-move-us-operations-to-texas>

⁷² France-Presse.

really about affordable housing. That's what started the conversation. They had focus groups with their employees. Their people said, 'We're willing to move. We just want to live the American Dream.'"⁷³

Central to the analysis was the cost of housing relative to the salaries its employees were earning. Sources noted that "the median home in Dallas-Fort Worth costs about \$210,000, and the median income is roughly \$58,000" while "in Torrance the median home price is \$508,000 and the median income is \$76,000."⁷⁴ If keeping salaries constant, "in real terms, they're going to triple the affordability of housing they can buy if they move to Texas," noted Niemi. Also central to the analysis was the assumption that the company would retain roughly 70% of its employees through the move.⁷⁵ Toyota North America CEO Jim Lentz told reporters that "We didn't want to force them into a quick decision. We gave every employee the chance to come and see the area, the houses and the churches before deciding to make the move," said Lentz.⁷⁶

Toyota U.S.'s proactive approach to addressing the desires of its employees reflects the increasing propensity of corporations to consider employee cost of living (and, therefore, quality of life) in their corporate real estate decision-making. Corporations are increasingly acknowledging that employee satisfaction is critical to achieving better companywide results, similar to the stance that Oracle has taken regarding its own move to Texas.

Toyota U.S.'s actions also hint at the increasing complexity and sophistication of America's industrial corporations and the corresponding implications this could have on corporate

⁷³ Hethcock, B. (2015, December 11). Here's the main reason Toyota is moving from California to Texas. *Dallas Business Journal*. Retrieved from <https://www.bizjournals.com/dallas/blog/2015/12/heres-the-main-reason-toyota-is-moving-from.html>

⁷⁴ Hethcock.

⁷⁵ Hellwig, E. (2017, July 06). Toyota Completes Move to Texas with Opening of \$1B Headquarters. *Edmunds*. Retrieved from <https://www.edmunds.com/car-news/auto-industry/toyota-completes-move-to-texas-with-opening-of-1b-headquarters.html>

⁷⁶ Hellwig.

location strategy. As previously acknowledged, Toyota is neither a technology nor a financial services company at its core, yet over time the company has developed large technology and financial services groups internally, as required to remain competitive with the technological advancement of the auto industry. The growing size and influence of these groups within the organization may have influenced Toyota's decision to pursue a corporate location strategy that more closely resembles that of firms in the technology and financial services industries, signaling a shift in the way Toyota thinks about its corporate identity and the talent it seeks to employ. Toyota's real estate actions mark a potentially significant departure from the company's industrial identity toward a more technology and financial services-oriented one. More corporations of a similar profile may follow suit if the move proves successful for Toyota.

Another relevant case study pertains to an anonymous, large tech corporation, whose real estate group contemplates employee retention by imagining the "lifecycle of the ideal employee" at the corporation.⁷⁷ For this corporation, the ideal employee will (i) upon university graduation, work in a nearby regional hub office as an entry-level employee, before (ii) moving to the Bay Area headquarters, where the employee takes on more responsibility, is paid more, and is given the chance to maximize his or her potential within the large corporation. After a few years, however, this employee will likely get married and start a family. Given the high cost of living in the Bay Area, this employee can expect to either (iii.a) increase earnings enough to afford to raise a family in the expensive market, or (iii.b) decide to relocate to a city with a quality of life better suited for families and a cost of living lower than the headquarters' market. This last step is becoming increasingly critical for technology corporations as their employee bases mature. Once concentrated amongst 20-something year-olds, tech corporations have managed to successfully

⁷⁷ Industry expert consultation, 2020.

retain their talent over the last decade, resulting in a high concentration of 30-something year-olds whose life preferences are changing, principally driven by family planning. While there are many 20-something year-olds entering the workforce to backfill these seats, retention and advancement within a corporation is paramount, and corporations are responding to retain these employees. This takes the form of hub offices in locations that better serve the priorities of their aging workforces.

Clearly, firms have a lot of factors to consider with regards to corporate real estate strategy. While there is no universal playbook, understanding each of these factors and how they play into the decision-making process can provide a framework through which to evaluate markets that could be ripe for further corporate and demographic growth. The next section will explore some of these emerging hub markets, providing further examples of corporate behavior and exploring the characteristics of these markets that developers and investors should consider when evaluating these markets for investment.

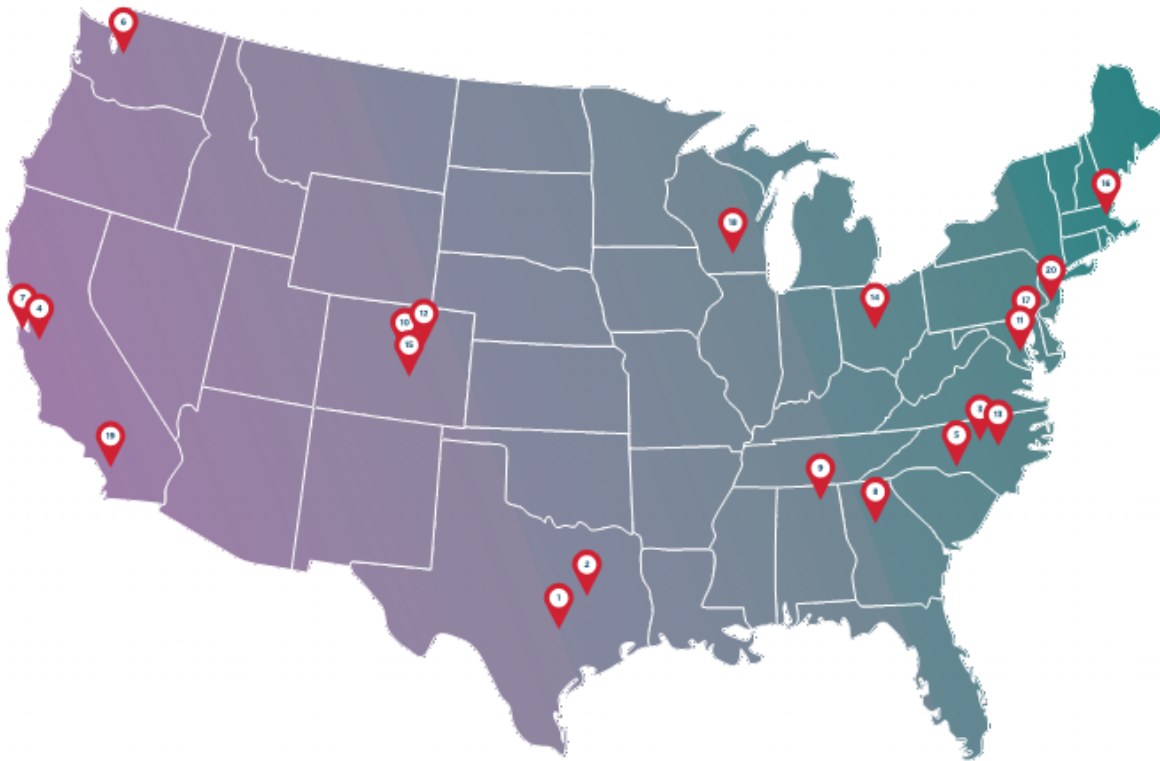
IV. THE RESULT: EMERGING HUB MARKETS

All of the trends discussed thus far have converged in the numerous new hub markets gaining national prominence including Atlanta, Austin, Charlotte, Dallas, Denver, Nashville, Raleigh, Salt Lake City, and Seattle, among many others. Demographic and corporate migration have fueled growth in these markets that is outpacing the gateway markets, leading to a greater distribution of corporations and jobs across a broader set of markets, particularly for the technology and financial services industries.

a. New Hub Markets for the Technology Industry

The technology sector, in particular, has spread from its traditional industry hub (the San Francisco Bay Area) to many other markets across the nation. Many experts have evaluated this trend, including CompTIA, who conducts an annual study to determine the hottest US markets for technology companies and employees. The map below indicates their top 20 tech markets in 2020:

CompTIA Tech Town Index 2020⁷⁸



- | | |
|----------------------|--------------------------|
| 1. Austin, TX | 11. Washington, DC |
| 2. Dallas, TX | 12. Boulder, CO |
| 3. Raleigh, NC | 13. Durham, NC |
| 4. San Jose, CA | 14. Columbus, OH |
| 5. Charlotte, NC | 15. Colorado Springs, CO |
| 6. Seattle, WA | 16. Boston, MA |
| 7. San Francisco, CA | 17. Baltimore, MD |
| 8. Atlanta, GA | 18. Madison, WI |
| 9. Huntsville, AL | 19. San Diego, CA |
| 10. Denver, CO | 20. Trenton, NJ |

While large markets such as San Francisco and New York (#7 and unranked, respectively) used to dominate the tech landscape, there is clearly increasing parity amongst these stalwarts and new emerging hubs. The pattern for the tech industry is clear: there is clustering and agglomeration happening in markets outside of these traditional hubs.

⁷⁸ CompTIA. *Tech Town Index 2020* (Rep.). (2020, October). Retrieved <https://comptia.informz.net/COMPTIA/data/images/2020/Membership-Landing%20Pages/2020USTechTownReportFINAL.pdf>

Austin, Texas is one of the most widely-used examples for the emerging tech hub. CompTIA assesses Austin versus other markets across many of the metrics examined in the prior section, namely cost of living, job postings, job growth, and salaries. Their synopsis succinctly shows how the aforementioned factors can converge in one location to create an attractive market for corporations and employees alike:

CompTIA Tech Town Index 2020: Austin, Texas #1⁷⁹

Austin, Texas

(Austin-Round Rock, TX)

Austin has done it again. The Austin-Round Rock metro area is holding steady at No. 1 on the Tech Town Index—its second year in a row in the top spot, rising from No. 3 in 2018. In 2018, we reported 46 tech company relocations to Austin. In 2019, that number increased to 58, according to the Austin Chamber of Commerce, which translated to 4,648 new jobs. Those numbers align with CompTIA's findings, which show 68,323 IT jobs posted between August 2019 and July 2020—an increase of more than 19,000 over last year.

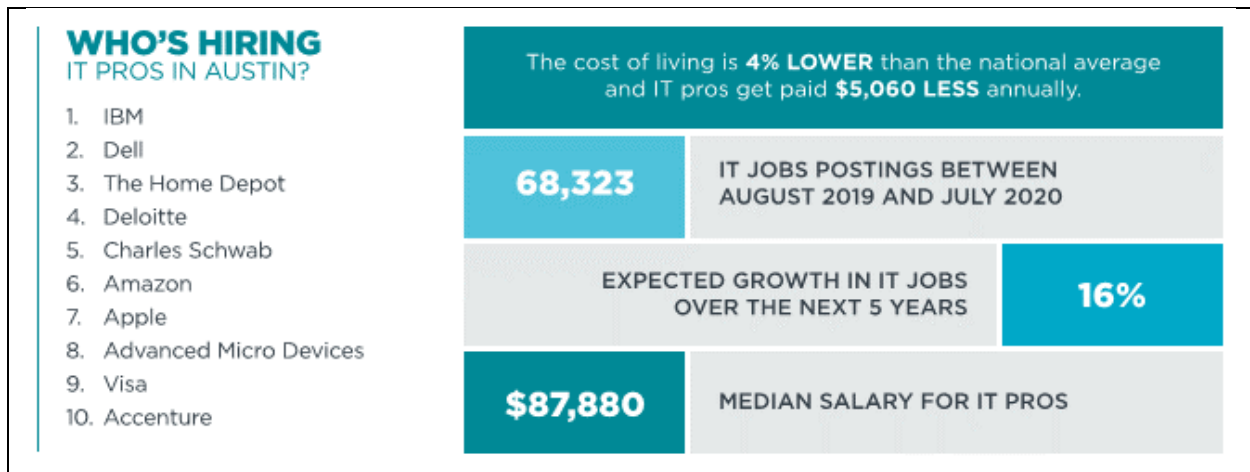
Of course, with exponential growth comes exponential capital. Crunchbase data claims Austin experienced record venture funding in 2019, with local startups raising \$1.84 billion for the year, up 19.5% compared to the \$1.54 billion raised in 2018, and an impressive 87% increase compared to \$983 million in 2017.

Where are these companies coming from? Experts say that Austin has become a favorable alternative to the Bay Area and New York City for companies of all sizes that are looking to grow. In fact, the Austin-Round Rock area is home to 5,500 startups and tech companies—leading to many dubbing it the “Silicon Hills.” Google, Facebook, Atlassian and Oracle have thousands of workers in Austin and Apple is making the move to North Austin as well—with potential to add 15,000 more workers to its existing 7,000.

Even amid the latest technology boom, the Austin metro area remains one of best places to live in terms of cost of living. Keeping below the national average by about 4%, Austin continues to flex its muscle when it comes to affordability. In fact, there are only three other cities on this list that fare better (Columbus, Atlanta and Huntsville). That's a bonus for IT pros who earn a median salary of \$87,880 here.

With major tech players and startups alike calling Austin home, along with great schools, a thriving nightlife and an active, outdoor lifestyle, it's no surprise that the city has been named the fastest-growing major metro area in the U.S.—and is the reigning No. 1 Tech Town.

⁷⁹ CompTIA, *Tech Town Index 2020*.



Austin is but one example in their report, but the commentary across each ranked city shows a clear commitment to both employment opportunity and quality of life to deliver their results.


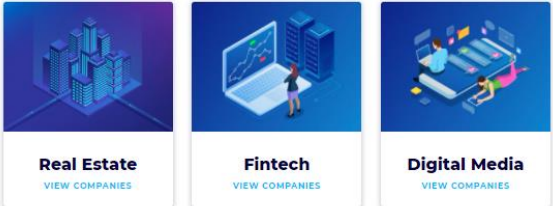




It is important to note, however, that the diaspora is not evenly spread across each city. Each of these tech concentrations, or “emerging hubs”, are different. Tech has grown enormously in the past few decades, and today the “tech industry” is catch-all category with hundreds of different job types included. The best markets for corporations and their employees may not be the best markets for real estate investors, who should look past job growth and migration and pay further attention to the *types of companies* and *types of tech jobs* migrating to each city.

i. Evaluating Technology Hub Markets by the Types of **Companies** Present

One way to evaluate the investment quality of emerging hub markets is to bifurcate them by the tech subindustries that have begun to cluster there. This classification reflects the *type of companies* operating in these markets, and is a nod to the clustering and agglomeration supporting technology sub-industries in these markets. Research organizations such as BuiltIn have taken stock of the companies that are most active in these markets. For example, Boston is well-known for EdTech (given its proximity to so many academic institutions), Hardware and Security,

whereas Seattle is better known for Software (especially cloud computing and data centers given the market's roots stem from the likes of Microsoft), Marketing Tech, and HealthTech:

Emerging Hubs' Popular Tech Industries⁸⁰

<p>Austin's Tech Overview Popular Tech Industries</p>  <p>eCommerce VIEW COMPANIES</p> <p>Software VIEW COMPANIES</p> <p>Cloud VIEW COMPANIES</p>	<p>Los Angeles's Tech Overview Popular Tech Industries</p>  <p>Consumer Web VIEW COMPANIES</p> <p>Digital Media VIEW COMPANIES</p> <p>eCommerce VIEW COMPANIES</p>
<p>Boston's Tech Overview Popular Tech Industries</p>  <p>Edtech VIEW COMPANIES</p> <p>Hardware VIEW COMPANIES</p> <p>Security VIEW COMPANIES</p>	<p>NYC's Tech Overview Popular Tech Industries</p>  <p>Real Estate VIEW COMPANIES</p> <p>Fintech VIEW COMPANIES</p> <p>Digital Media VIEW COMPANIES</p>
<p>Chicago's Tech Overview Popular Tech Industries</p>  <p>Fintech VIEW COMPANIES</p> <p>Healthtech VIEW COMPANIES</p> <p>Big Data VIEW COMPANIES</p>	<p>San Francisco's Tech Overview Popular Tech Industries</p>  <p>Fintech VIEW COMPANIES</p> <p>Artificial Intelligence VIEW COMPANIES</p>
<p>Colorado's Tech Overview Popular Tech Industries</p>  <p>Software VIEW COMPANIES</p> <p>Adtech VIEW COMPANIES</p> <p>Mobile VIEW COMPANIES</p>	<p>Seattle's Tech Overview Popular Tech Industries</p>  <p>Software VIEW COMPANIES</p> <p>Marketing Tech VIEW COMPANIES</p> <p>Healthtech VIEW COMPANIES</p>

These sub-industries are the result of colocation and clustering within these emerging hub markets, where the tech talent has self-sorted according to specialization due to their desire to participate in

⁸⁰ Built In.

different hub markets' specializations. Investors and developers must look to these underlying sub-industries when performing diligence to evaluate the staying power of the market or the longevity of the growth trend it has recently experienced. For instance, when evaluating Colorado markets, investors and developers should take a view on the AdTech industry specifically, as it is a primary cluster for those markets.

ii. Evaluating Technology Hub Markets by the Types of **Jobs** Present

Beyond bifurcation by tech sub-industry, there is also a bifurcation by job function or type. While the jobs will, in some ways, reflect the sub-industries in each market, there can be discrepancies between the types of industry and the types of jobs in each market. For instance, Facebook is present in Austin, but a portion of that presence is their finance department. While Facebook is considered tech company, the jobs in this department it has located in Austin are more traditional corporate roles, and thus deserve to be categorized differently. Just because a high-powered tech company is moving into a new market doesn't mean it's moving its highest earning, most powerful people there.

CBRE has made commendable headway in furthering this type of analysis. Using data from the US Bureau of Labor Statistics, CBRE has taken a close look at all tech markets to better understand the composition and quality of the job growth that has been occurring. First, they take stock of all employees belonging to tech companies, referring to this pool as "total tech employment." This pool is then split into two groups, "tech talent" and "non-tech talent." The former group includes the higher-earning, traditional jobs that come to mind when one thinks of tech employment, namely roles pertaining to (i) Software Developers & Programmers; (ii) Computer Support, Database & Systems; (iii) Computer & Information Systems Managers; and

(iv) Technology Engineering-Related. The latter group includes jobs related to support functions within technology companies, namely roles pertaining to (i) Sales; (ii) Administrative & Office Support; (iii) Business Operations & Finance; and (iv) Marketing.⁸¹

The distinction between these two cohorts is very important when considering the quality of the labor pools forming in these hub markets. Every job is important, and all talent is valuable. But while “non-tech talent” jobs are certainly important for corporate operations, their importance undoubtedly comes second to the “tech talent” jobs that are centered around principal business activities and growth. Generally speaking, “tech talent” jobs have higher wages, signaling that corporations value these employees, at least on a monetary basis, more than their “non-tech talent” counterparts. Further, the “tech talent” jobs equate to greater stability of the labor pool and general employment because these jobs are mission critical and less likely to be outsourced or automated in the future. “Non-tech talent” jobs, on the other hand, risk outsourcing and/or automation. Lastly, the sub-industry specializations of these markets (via agglomeration), as discussed in the prior section, likely matter less to the “non-tech talent” jobs located there, meaning they have a higher risk of being relocated in the future. “Tech talent” jobs, on the other hand, are likely highly correlated to each market’s sub-industry specialization, meaning that these jobs have greater staying power. As real estate investors and developers study these markets, it is important to review the composition of these markets’ labor pools to better determine the quality and stability of the jobs and business functions located there.

Consider, for example, a side-by-side analysis of the labor pools in San Francisco and Austin. In the last sub-section, Austin was ranked by CompTIA as the #1 market for tech employment while San Francisco was ranked #7. Using CBRE’s talent pool analysis, however,

⁸¹ CBRE Research. (2021). *2020 Tech Talent Analyzer*. Retrieved from <https://mapping.cbre.com/maps/Scoring-Tech-Talent-2020/>

San Francisco becomes #1 and Austin ranks at #21. The reasoning behind CBRE’s ranking relates to the quality and depth of the labor pool in these respective markets. The side-by-side analysis below shows that San Francisco’s tech talent pool is far deeper than Austin’s and, importantly, that a greater percentage of the San Francisco’s total tech employment is considered “tech talent”:

Side-by-Side Talent Pool Analysis ⁸²				
San Francisco, CA				
WHAT IS THE EMPLOYMENT BREAKDOWN?				
	Employment (2019)	Growth (5Yr Growth)	Average Wage	Wage Growth (5Yr Growth)
TOTAL TECH TALENT	379,670	30.5%	\$136,060	13.8%
Software Developers & Programmers	168,200	29.8%	\$141,785	12.9%
Computer Support, Database & Systems	133,480	42.7%	\$113,330	15.1%
Computer & Infor. Systems Managers	37,200	58.4%	\$207,332	17.0%
Technology Engineering-Related	40,790	-7.8%	\$121,838	5.1%
TOTAL NON-TECH TALENT	432,490	14.5%	\$70,154	7.7%
Sales	62,470	16.7%	\$90,969	-1.9%
Administrative & Office Support	224,560	7.5%	\$48,991	12.5%
Business Operations & Finance	93,100	23.1%	\$96,234	4.1%
Marketing	52,360	32.6%	\$89,709	0.1%
Source: U.S. Bureau of Labor Statistics (Metro), April 2020.				
Austin, TX				
WHAT IS THE EMPLOYMENT BREAKDOWN?				
	Employment (2019)	Growth (5Yr Growth)	Average Wage	Wage Growth (5Yr Growth)
TOTAL TECH TALENT	76,270	16.7%	\$95,416	11.0%
Software Developers & Programmers	29,230	39.3%	\$102,586	10.4%
Computer Support, Database & Systems	35,650	25.0%	\$81,714	12.2%
Computer & Infor. Systems Managers	3,330	26.6%	\$159,900	13.0%
Technology Engineering-Related	8,060	-38.9%	\$103,376	12.2%
TOTAL NON-TECH TALENT	156,340	25.7%	\$50,462	12.5%
Sales	20,940	186.5%	\$70,533	-16.4%
Administrative & Office Support	98,070	12.9%	\$37,935	13.5%
Business Operations & Finance	25,350	20.2%	\$74,121	8.7%
Marketing	11,980	31.4%	\$67,871	-0.8%
Source: U.S. Bureau of Labor Statistics (Metro), April 2020.				

On absolute terms, San Francisco has a much deeper talent pool than does Austin. And importantly, “tech talent” represents 47% of the total tech employment in San Francisco, while it comprises only 33% in Austin. Using San Francisco as a control, consider another side-by-side analysis, this time with emerging tech hub Dallas, Texas:

⁸² CBRE Research, 2020 Tech Talent Analyzer.

Side-by-Side Talent Pool Analysis⁸³

San Francisco, CA					Dallas, TX				
WHAT IS THE EMPLOYMENT BREAKDOWN?					WHAT IS THE EMPLOYMENT BREAKDOWN?				
	Employment (2019)	Growth (5Yr Growth)	Average Wage	Wage Growth (5Yr Growth)		Employment (2019)	Growth (5Yr Growth)	Average Wage	Wage Growth (5Yr Growth)
TOTAL TECH TALENT	379,670	30.5%	\$136,060	13.8%	TOTAL TECH TALENT	179,570	14.3%	\$99,297	14.7%
Software Developers & Programmers	168,200	29.8%	\$141,785	12.9%	Software Developers & Programmers	65,250	29.3%	\$106,445	13.0%
Computer Support, Database & Systems	133,480	42.7%	\$113,330	15.1%	Computer Support, Database & Systems	87,920	11.3%	\$85,766	12.4%
Computer & Infor. Systems Managers	37,200	58.4%	\$207,332	17.0%	Computer & Infor. Systems Managers	11,050	42.0%	\$161,880	15.5%
Technology Engineering-Related	40,790	-7.8%	\$121,838	5.1%	Technology Engineering-Related	15,350	-22.6%	\$101,362	16.8%
TOTAL NON-TECH TALENT	432,490	14.5%	\$70,154	7.7%	TOTAL NON-TECH TALENT	500,600	14.8%	\$50,333	10.5%
Sales	62,470	16.7%	\$90,969	-1.9%	Sales	47,790	3.7%	\$73,240	8.2%
Administrative & Office Support	224,560	7.5%	\$48,991	12.5%	Administrative & Office Support	336,080	11.4%	\$38,040	11.3%
Business Operations & Finance	93,100	23.1%	\$96,234	4.1%	Business Operations & Finance	88,120	29.3%	\$79,163	6.1%
Marketing	52,360	32.6%	\$89,709	0.1%	Marketing	28,610	41.9%	\$67,670	1.3%
Source: U.S. Bureau of Labor Statistics (Metro), April 2020.					Source: U.S. Bureau of Labor Statistics (Metro), April 2020.				

The data shows that Dallas (ranked #5) has a very deep pool of tech talent, with 179,000 employees, and is a huge employment hub with 680,000 total jobs. Importantly, though, “non-tech talent” makes up 74% of the total employment, with much of those individuals working in Administrative and Office Support, jobs that are less related to Dallas and more related to Dallas’ ability to offer labor arbitrage opportunities to corporations. As noted above, these jobs are at higher risk of both relocation and automation than the “tech jobs” located there. Consider too Salt Lake City, Utah:

⁸³ CBRE Research, 2020 Tech Talent Analyzer.

Side-by-Side Talent Pool Analysis⁸⁴

San Francisco, CA					Salt Lake City, UT				
WHAT IS THE EMPLOYMENT BREAKDOWN?					WHAT IS THE EMPLOYMENT BREAKDOWN?				
	Employment (2019)	Growth (5Yr Growth)	Average Wage	Wage Growth (5Yr Growth)		Employment (2019)	Growth (5Yr Growth)	Average Wage	Wage Growth (5Yr Growth)
TOTAL TECH TALENT	379,670	30.5%	\$136,060	13.8%	TOTAL TECH TALENT	51,220	42.7%	\$88,972	16.9%
Software Developers & Programmers	168,200	29.8%	\$141,785	12.9%	Software Developers & Programmers	19,450	35.1%	\$98,768	15.4%
Computer Support, Database & Systems	133,480	42.7%	\$113,330	15.1%	Computer Support, Database & Systems	24,610	54.7%	\$73,124	20.2%
Computer & Infor. Systems Managers	37,200	58.4%	\$207,332	17.0%	Computer & Infor. Systems Managers	4,360	79.4%	\$138,402	16.9%
Technology Engineering-Related	40,790	-7.8%	\$121,838	5.1%	Technology Engineering-Related	2,800	-11.4%	\$83,251	7.6%
TOTAL NON-TECH TALENT	432,490	14.5%	\$70,154	7.7%	TOTAL NON-TECH TALENT	141,970	12.5%	\$45,195	11.1%
Sales	62,470	16.7%	\$90,969	-1.9%	Sales	13,170	0.4%	\$72,201	8.2%
Administrative & Office Support	224,560	7.5%	\$48,991	12.5%	Administrative & Office Support	96,410	6.4%	\$36,026	14.9%
Business Operations & Finance	93,100	23.1%	\$96,234	4.1%	Business Operations & Finance	21,520	43.9%	\$63,000	-4.1%
Marketing	52,360	32.6%	\$89,709	0.1%	Marketing	10,870	45.7%	\$58,551	1.1%
Source: U.S. Bureau of Labor Statistics (Metro), April 2020.					Source: U.S. Bureau of Labor Statistics (Metro), April 2020.				

Similarly, Salt Lake City’s 27% “tech talent” represents a far lower concentration than in San Francisco, also with the majority of jobs in Administrative & Office Support. The data suggests that a large percentage of Salt Lake City’s tech employment could be at risk of relocation or automation, therefore making the market risky from an underwriting perspective.

Again using San Francisco as a control, consider one more side-by-side analysis, this time with Seattle, Washington:

⁸⁴ CBRE Research, 2020 Tech Talent Analyzer.

Side-by-Side Talent Pool Analysis⁸⁵

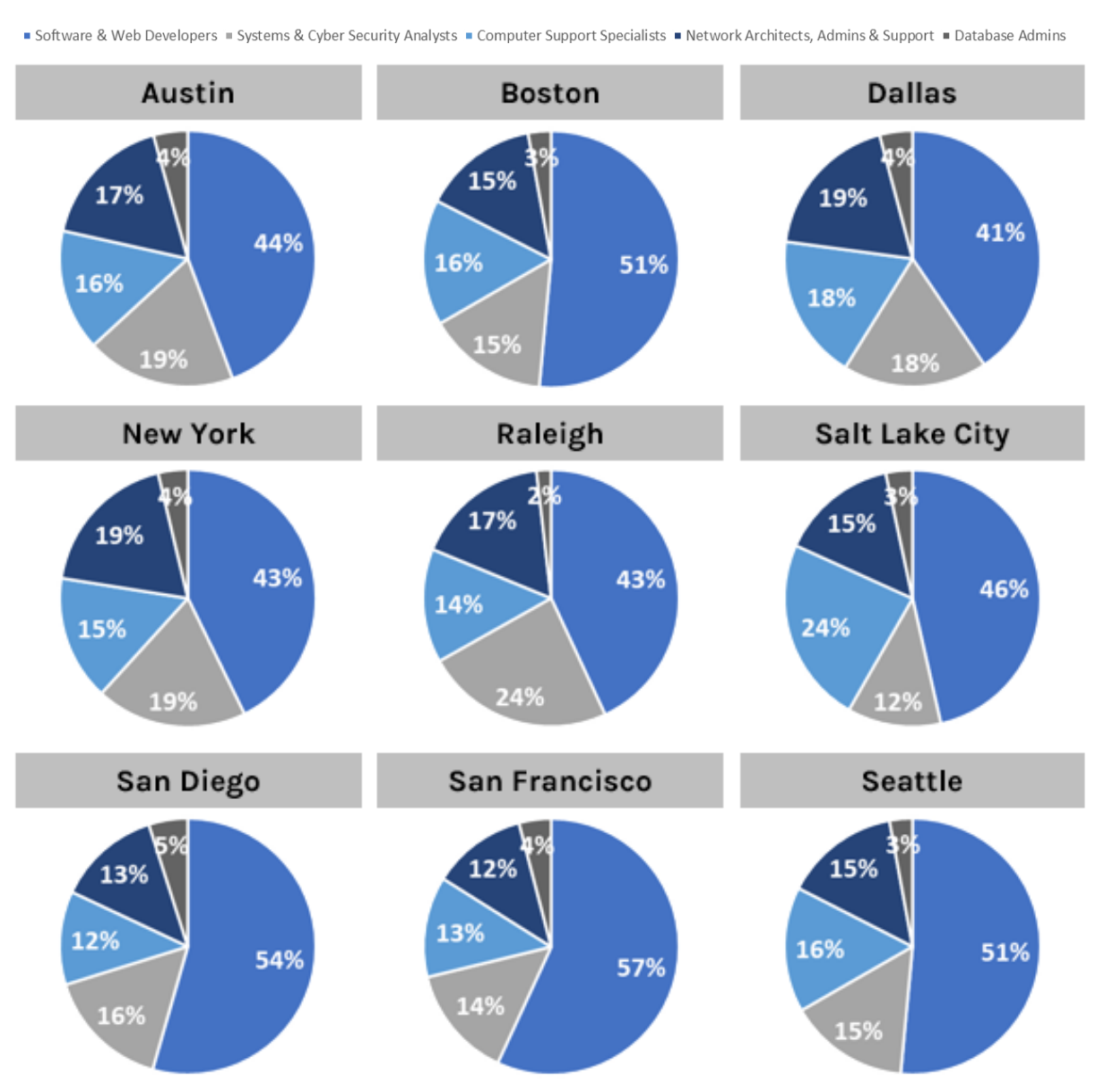
San Francisco, CA					Seattle, WA				
WHAT IS THE EMPLOYMENT BREAKDOWN?					WHAT IS THE EMPLOYMENT BREAKDOWN?				
	Employment (2019)	Growth (5Yr Growth)	Average Wage	Wage Growth (5Yr Growth)		Employment (2019)	Growth (5Yr Growth)	Average Wage	Wage Growth (5Yr Growth)
TOTAL TECH TALENT	379,670	30.5%	\$136,060	13.8%	TOTAL TECH TALENT	155,330	22.7%	\$119,170	11.7%
Software Developers & Programmers	168,200	29.8%	\$141,785	12.9%	Software Developers & Programmers	90,540	26.5%	\$127,067	10.0%
Computer Support, Database & Systems	133,480	42.7%	\$113,330	15.1%	Computer Support, Database & Systems	43,760	7.7%	\$96,189	13.3%
Computer & Infor. Systems Managers	37,200	58.4%	\$207,332	17.0%	Computer & Infor. Systems Managers	10,560	35.0%	\$171,230	13.4%
Technology Engineering-Related	40,790	-7.8%	\$121,838	5.1%	Technology Engineering-Related	10,470	59.6%	\$94,420	2.0%
TOTAL NON-TECH TALENT	432,490	14.5%	\$70,154	7.7%	TOTAL NON-TECH TALENT	238,260	45.0%	\$62,144	17.0%
Sales	62,470	16.7%	\$90,969	-1.9%	Sales	22,930	25.9%	\$82,525	27.2%
Administrative & Office Support	224,560	7.5%	\$48,991	12.5%	Administrative & Office Support	139,260	48.5%	\$44,847	17.5%
Business Operations & Finance	93,100	23.1%	\$96,234	4.1%	Business Operations & Finance	48,890	42.8%	\$86,372	14.2%
Marketing	52,360	32.6%	\$89,709	0.1%	Marketing	27,180	50.5%	\$89,994	18.3%
Source: U.S. Bureau of Labor Statistics (Metro), April 2020.					Source: U.S. Bureau of Labor Statistics (Metro), April 2020.				

Seattle’s “tech talent” jobs comprise 39% of total employment, which does not match San Francisco’s 47%, but is 12-13% higher concentration than in Dallas or Salt Lake City. Too, importantly, the majority of Seattle’s tech talent jobs are in Software Developers & Programmers, which are the most prized jobs within the tech talent cohort, because these jobs are revenue- and product-focused, high-earning, and highly-dependent on Seattle’s software sub-industry specialization, discussed in the prior section.

To provide a higher-level view of this analysis, see below a collection of charts that categorizes the jobs in several emerging hub markets by job type and/or function:

⁸⁵ CBRE Research, *2020 Tech Talent Analyzer*.

Tech Employment by Job Function / Type⁸⁶



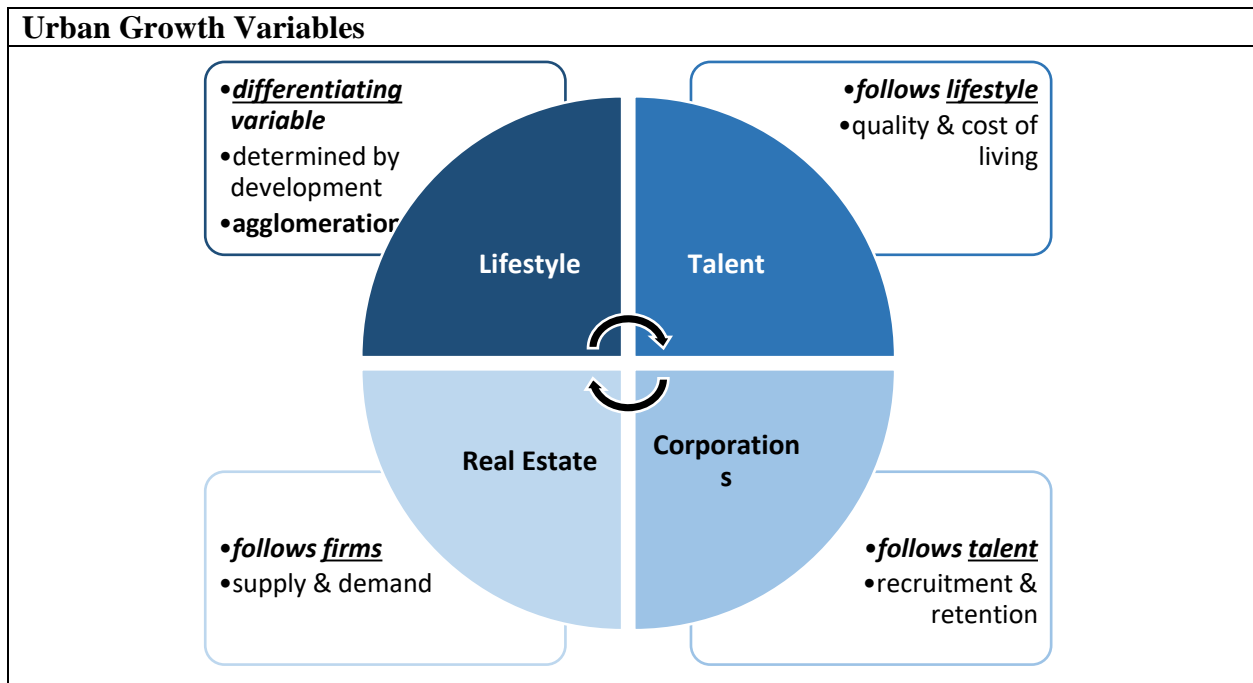
These charts begin to show just how different the labor pools within these markets are, even though they have all been pegged as emerging hub markets experiencing notable job growth over the past decade. Investors should take note of these concentrations and what these discrepancies mean for the stickiness of these jobs, and therefore the longevity of growth in these markets when

⁸⁶ CompTIA. (2020). *2020 Tech Industry Job Market & Salary Trends Analysis: Cyberstates* by CompTIA. Retrieved from <https://www.cyberstates.org/index.html>

considering investment. While all these markets will likely continue to see outsized demographic and corporate growth for all the aforementioned reasons, certain markets represent better real estate development and/or investment opportunities than others.

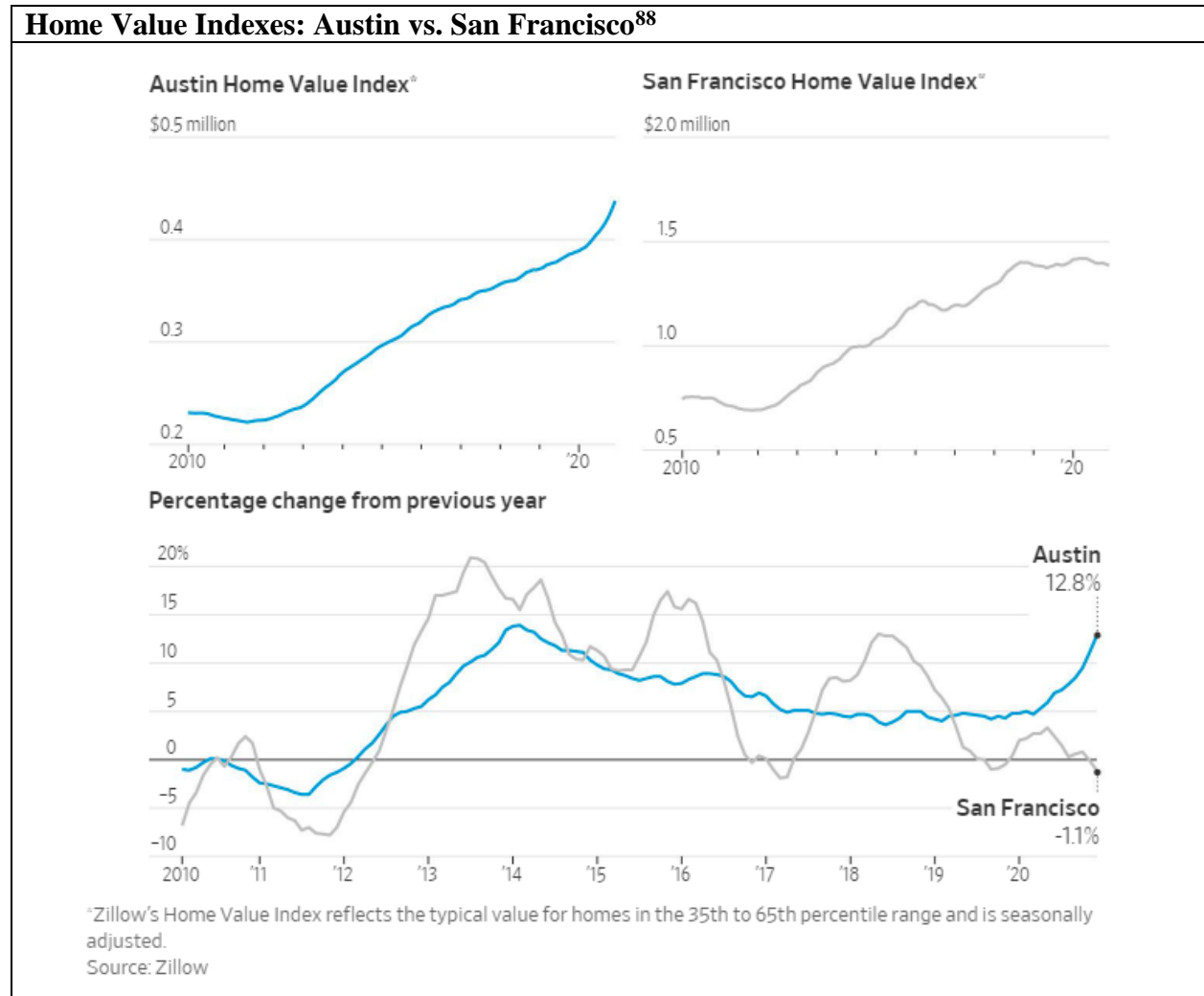
b. Growing Pains

One result from emerging hub growth that all constituents alike must consider is the speed at which many of these emerging hubs are growing, and the potential for growing pains as the growth occurs. This shifts the focus to the “lifestyle” quadrant in the urban growth variables chart discussed in an earlier section:



This variable is often the key differentiating factor, and many markets are learning first-hand the impact of the influx of tech corporations and their employees to new markets. Austin, for example, informally adopted a slogan to “Keep Austin Weird,” a nod to the city’s eclectic roots. The influx of affluent tech workers has brought with it some of the same affordability issues that those same

tech workers were fleeing in their prior markets, but this time disproportionately affecting the city’s legacy, non-tech workers who are struggling to afford the gently rising cost of living.⁸⁷ Austin’s home prices, for example, have seen consistent year-over-year growth since 2012, with prices experiencing a significant increase throughout 2020 as more corporations announced growth initiatives in the city:



⁸⁷ Chapman, L. (2019, March 08). Austin Is Building a Mini Silicon Valley, With Some of the Same Problems. *Bloomberg*. Retrieved from <https://www.bloomberg.com/news/articles/2019-03-08/austin-is-building-a-mini-silicon-valley-with-some-of-the-same-problems?sref=Ie7GDrhe>

⁸⁸ Findell, E., & Putzier, K. (2020, December 27). 'Startup City': Accelerated Growth Strains Austin. *Wall Street Journal*. Retrieved from https://www.wsj.com/articles/start-up-city-accelerated-growth-strains-austin-11609093013?mod=hp_lead_pos7

Housing is just one measure of affordability, but it provides data to suggest that the city is becoming increasingly less affordable (in relative terms) than it was at the start of the last decade. This quickly becomes an issue for the incumbent population as tech employees with larger salaries enter the market with more spending power, allowing home prices to ratchet upwards. Governments are often protectors of incumbent populations, and rapid changes in the cost of living could lead to increased regulation, which, as we have discussed, corporations and individuals have historically been fleeing.

c. Legacy Markets Playing Defense

Gateway markets and their more loyal tenants have started to respond to the outmigration that has been occurring. *Jeff Lawson*, Co-Founder, CEO, & Chairman of cloud communications company *Twilio, Inc.*, has been vocal in his spurning of the tech companies who have recently left the Bay Area.^{89 90} In a recent Twitter post, Lawson coined the hashtag #committothebay to organize support. In his public statement, he pleaded:

With many of the Valley's richest companies fleeing the Bay mid-pandemic, I feel compelled to speak out. There's no question that California is imperfect. The cost of living, taxes and policies, among other things, make it difficult for lots of people to succeed here. (1/9)

I fully understand, respect & support the desire to seek out more affordable locations when the opportunity presents itself. People need to do what's best for them, their family and well-being & I respect those decisions. (2/9)

What I take issue with is our leaders—people of means— abandoning our community when it needs us most. Reaping the benefits of Silicon Valley's talent, tech incubators, mentors, professional network, and culture until they no longer need it. (3/9)

⁸⁹ Twilio. (2021). About the Cloud Communications Company. Retrieved from <https://www.twilio.com/company>

⁹⁰ Kawamoto, D. (2020, December 29). Billionaire tech exec calls on wealthy CEOs to commit to Bay Area. *San Francisco Business Journal*. Retrieved from https://www.bizjournals.com/sanfrancisco/news/2020/12/29/billionaire-tech-ceo-calls-on-ceos-to-commit-to-sf.html?ana=e_sfbt_bn_editorschoice_editorschoice

This community has bred and cultivated some of the most successful and innovative companies in the world. And to be frank, it made a lot of business leaders extraordinarily wealthy. If you reaped the benefit, pay your taxes! (4/9)

(By the way, Austin is awesome. I just hope you don't abandon them too when its convenient.)

What San Francisco needs now as small businesses are desperate for a lifeline, average Americans are food insecure, workers are losing their jobs, homes and loved ones to this nasty virus and shelters and hospitals are overrun is for tech leaders to step up and give back. (5/9) To commit to helping our community not only get through this pandemic but to emerge stronger, more equitable, and more sustainable for all. Give more than you take from this community. (6/9)

I'm asking my colleagues, friends and fellow CEOs to #committothebay. Pledge to stay and rebuild what has given so much to us. This is what it means to be a part of a community. @twilio isn't going anywhere. (7/9)

I'm investing in San Francisco. My wife & I were among the first to support Give2SF, the city's COVID relief fund. We have committed \$8M this year for Help Kitchen (<http://helpkitchen.org>) to connect the food insecure with meals from local restaurants. (8/9)

We have the opportunity to build a better, more equitable place to live and work. To become stronger as a result. #committothebay #webuild (9/9)"

Lawson's voice is not alone in articulating this view. Of particular focus is the area's lack of affordable housing, which directly contributes to the cost of living for all residents, as noted in the prior section.

Big tech, despite growing its footprints outside the Bay Area, has made verbal commitments to help combat the issues plaguing the region, namely the lack of affordable housing.

In June 2019, *Google* CEO *Sundar Pichai* published a blog post where he noted:

Across the region, one issue stands out as particularly urgent and complex: housing. As Google grows throughout the Bay Area — whether it's in our home town of Mountain View, in San Francisco, or in our future

developments in San Jose and Sunnyvale — we’ve invested in developing housing that meets the needs of these communities. But there’s more to do.⁹¹

The commitment from Google represented \$1 billion to San Francisco Bay Area housing, which comprised of a 10-year commitment including the rezoning of \$750 million worth of Google-owned land currently zoned for commercial and office, while directing \$50 million to nonprofits focused on homelessness and displacement and \$250 million to “an investment fund for developers specifically to build affordable housing.”⁹² Together, this commitment would translate into “15,000 new homes in the San Francisco Bay Area.”⁹³ The move prompted others, such as *Facebook* and *Microsoft*, to make similar commitments. *Amazon*, too, has committed \$2 billion to affordable housing initiatives; interestingly, their commitment is to preserve and deliver affordable housing in Arlington and Nashville, two of its larger hub markets, in addition to its headquarter market, Seattle.⁹⁴

The result of these efforts has yet to be seen. Verbal commitments are one thing, and action is another. Many also question whether the action will be enough to affect any type of change in the nation’s largest and most expensive housing markets. Further, will government officials, who have grown increasingly antagonistic toward these big players, allow them to have a role in the reshaping of the community that many feel they disrupted in the first place? Time will answer these questions, but the focus amongst all constituents remains clear, that more affordable housing is a necessity for many of these markets to remain competitive versus new hubs.

⁹¹ Elias, J. (2019, June 18). Google to invest \$1 billion in San Francisco Bay Area housing amid regional expansion. *CNBC*. Retrieved from <https://www.cnbc.com/2019/06/18/google-to-invest-1-billion-in-san-francisco-bay-area-housing.html>

⁹² Elias.

⁹³ Elias, J. (2020, September 02). Google proposes new town-like tech hub in Mountain View. *CNBC*. Retrieved from <https://www.cnbc.com/2020/09/02/google-mountain-view-tech-hub-proposal-pictures.html>

⁹⁴ Friedman, N. (2021, January 06). Amazon Pledging More Than \$2 Billion for Affordable Housing in Three Hub Cities. *Wall Street Journal*. Retrieved from https://www.wsj.com/articles/amazon-pledging-more-than-2-billion-for-affordable-housing-in-three-hub-cities-11609930800?mod=hp_featst_pos4

Most of these hub markets have grown considerably over the last two decades as the product of long-standing trends converging to support the demographic and corporate migration that fuel them. Recent data suggests that these trends are likely to be accelerated COVID-19, which the next section will discuss.

V. POTENTIAL IMPLICATIONS FROM COVID-19

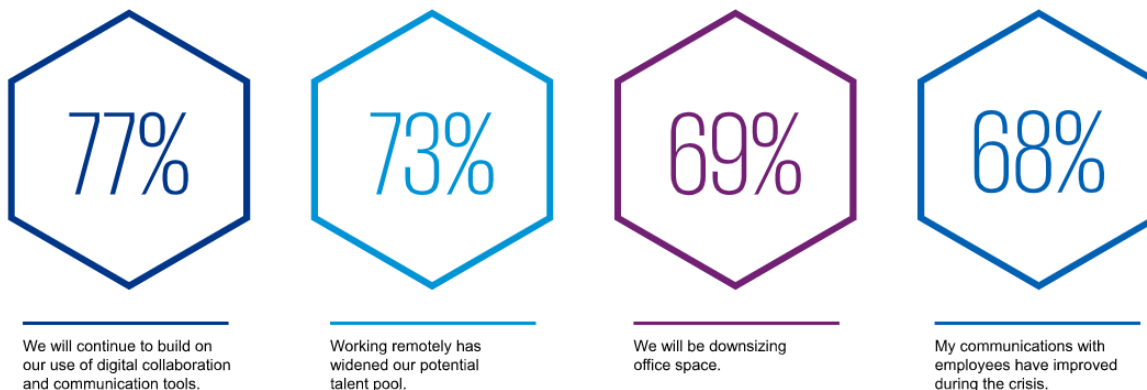
The COVID-19 pandemic was a sledgehammer upon all real estate products, sending splinters and shockwaves through every product type, and its impacts will significantly change the way our society interacts with the built environment, both in the short- and long-term. This section seeks to make sense of the data currently being collected in the context of trends discussed throughout this thesis.

a. Corporate Footprint Rationalization

COVID-19 will undoubtedly impact how corporations operate going forward. A prior section already discussed the impact that accelerated adoption of technology may have on operations and real estate planning, but another anticipated impact of the pandemic will be corporations' reassessment of their stance on remote work and their existing physical footprints. A summer 2020 KPMG CEO survey revealed that the pandemic had indeed prompted CEOs to "rethink the way [their corporations] work and communicate," as illustrated in the table below. The results indicated that the CEOs' had grown to accept previously-untested and, in some cases, undesired working and communicating methods, such as digital collaboration and communication and remote work:

KPMG 2020 CEO Outlook: COVID-19 Special Edition⁹⁵

CEOs see the pandemic as an opportunity to rethink the way we work and communicate



Source: KPMG 2020 CEO Outlook COVID-19 Special Edition, KPMG International.

As noted above, 77% of respondents noted that they will continue to use digital collaboration and communication tools, while 68% of respondents noted that communications with employees had actually improved during the crisis. Also significant: 69% of respondents acknowledged that they would be downsizing office space.

Related to this last finding, Bloomberg recently trained an AI model to search corporate earnings call transcripts for indications of potential footprint rationalization action. The machine determined that, across 4,767 global earnings calls between July 21 and December 8, “about one in eight machine-generated transcripts revealed that corporations were rethinking their real estate needs, with many on track to save millions of dollars in the process.”⁹⁶ The report noted that these cost cuts would be achieved by “cutting office space, accelerating branch closures, renegotiating rents on warehouses and even shutting data centers” amongst companies across all industries.⁹⁷

⁹⁵ KPMG International. (2020, July 29). *KPMG 2020 CEO Outlook: COVID-19 Special Edition*. Retrieved from <https://home.kpmg/xx/en/home/insights/2020/08/global-ceo-outlook-2020.html#:~:text=The%20agenda%20for%20the%20new,impact%2C%20both%20societal%20and%20economic>

⁹⁶ Sidders, J. (2020, December 18). The World’s CFOs Have a Dire Message for Real-Estate Investors. *Bloomberg*. Retrieved from <https://www.bloomberg.com/news/articles/2020-12-18/the-world-s-cfos-have-a-dire-message-for-real-estate-investors?sref=Ie7GDrhe>

⁹⁷ Sidders.

As of the publication of this thesis (January 2021), several corporations had already started to rationalize their footprints in the wake of COVID-19. Brokers in high-rent cities from London to San Francisco had already begun to see corporations with large amounts of leased office space looking to sublease portions of their footprints on the secondary market.⁹⁸ Subleasing is a quick and efficient way for corporations to achieve footprint rationalization, as it allows them to effectively offload portions of their lease commitments well-before the leases actually expire.

In October 2020, a Savills survey of 250 technology companies revealed that 82% of respondents anticipated they would require less office over the subsequent 12-18 month period, and 55% of respondents anticipated they would actually dispose of existing space during that period.⁹⁹ The same report noted that, at the time of publication, Zillow had placed more than 150,000 square feet on the sublet market in New York City and that Yelp, too, had placed a 58,000 square foot Fifth Avenue office on the sublease market. “Among all sublease space put on the market since the coronavirus pandemic began in Manhattan, more than 44% [had come] from tech companies.”¹⁰⁰ In San Francisco, notable tech stalwarts such as Dropbox and Glassdoor had also listed sublease space throughout the duration of 2020, with Dropbox listing 472,000 square feet, or 63%, of its 750,000 square foot leased space at The Exchange, the company's new Mission Bay headquarters complex, in November 2020.¹⁰¹ Heidrick & Struggles International Inc., a Chicago-based global executive search firm, had also gone on the record stating they planned to “match the

⁹⁸ Ryan, C. (2021, January 02). Office Landlords Will Be Squeezed by Secondhand Market. *Wall Street Journal*. Retrieved from <https://www.wsj.com/articles/office-landlords-will-be-squeezed-by-secondhand-market-11609599780>

⁹⁹ Banister, J. (2020, October 09). More Than Half of Tech Companies Plan to Dispose of Real Estate In Coming Months. *Bisnow*. Retrieved from https://www.bisnow.com/national/news/office/more-than-half-of-tech-companies-plan-to-dispose-of-real-estate-in-coming-months-106271?utm_source=outbound_pub_19

¹⁰⁰ Banister.

¹⁰¹ Waxmann, L. (2020, November 9). Dropbox, Glassdoor list more S.F. office space for sublease. *San Francisco Business Journal*. Retrieved from <https://www.bizjournals.com/sanfrancisco/news/2020/11/09/sublease-space-dropbox-glassdoor-san-francisco.html>

[corporation's] footprint to the new expected normal, which, in many cases, reduces [its] footprint by 50%.” At the time, Bloomberg reported that the corporation’s real estate footprint included more than 50 city-center locations worldwide, and that the actions would achieve cost savings of “\$6 million a year, with an additional \$5-8 million as the strategy progresses.”¹⁰²

Importantly, Bloomberg’s report noted that corporations across all industries were anticipating footprint rationalization actions, with companies such as papermill operator Domtar Corp., recycling center operator Waste Connections Inc., and retirement home operator Brookdale Senior Living Inc. all noting expected footprint rationalizations or rent reductions as a result of the pandemic on their earnings calls. The CEO of Brookdale, Lucinda Baier, noted that the “rent reductions that we received are significant and permanent and they total more than \$500 million.”¹⁰³ With these cost savings becoming public record, it is very possible that many firms try to opportunistically achieve concessions from their landlords given the current market environment, which would put additional downward pressure on the market.

b. Adoption of Alternative Work Methods, Including Remote Work

Among other impacts, COVID-19 has tremendous potential to accelerate the adoption of alternative work methods, particularly remote work. The timing of this thesis’ publication will not allow for a full examination of the adoption of remote work, as COVID-19 continues to permeate throughout the country, prohibiting millions of workers from returning to their offices; the “new normal” will not be known for years to come. However, some of the data collected to date offers a glimpse into what may unfold in the coming months and years. The COVID-19 “Zoom Experiment” will undoubtedly increase the adoption of remote work, not only because of the

¹⁰² Sidders.

¹⁰³ Sidders.

technological dynamics discussed earlier in this thesis, but also because of the operational benefits that it offers.

One major incentive for corporations to accelerate the adoption of remote work is that remote work, much like the hub-and-spoke model, allows corporations access to a greater labor pool. Instead of having to locate where the talent is, corporations can locate where they choose and instead have employees telecommute. Facebook CEO Mark Zuckerberg was quoted in May 2020 saying “the biggest advantages [to Facebook’s new hub-and-spoke and remote strategy] are access to large pools of talent who don’t live around the big cities and aren’t willing to move there. And there are a lot of people in the U.S. and in Canada and ultimately around the world that I think we, and other companies that go in this direction, will be able to access.”¹⁰⁴ To a similar end, CompTIA’s *Tech Town Index* study noted that:

“...despite the strength of these tech towns, the story about where tech pros choose to live and work—and why—is changing. While remote work has been on the tech sector’s radar for at least a decade and the workforce’s willingness to move for not just the right job, but the right place has been documented, IT pros options are expanding. During COVID-19, the demand for remote IT workers has increased with the number of job postings nearly doubling. From August 2018 to July 2019 approximately 10% of IT jobs were labeled as “remote” or “work from home.” But from August 2019 to July 2020, that number jumped to 21%. That translates to nearly 800,000 IT jobs posted nationwide that can be conducted remotely at least partially (as some employers don’t specify full or partial work from home).”¹⁰⁵

COVID-19 forced business operations to go fully-remote, and this jobs data from July 2020 indicates that corporations are not only tolerating remote work but embracing it. The data indicates that statements like Zuckerberg’s are not just fodder, but rather plans of action that are already

¹⁰⁴ Matsuda, A. (2020, September 03). Nearly 70% of CEOs expect to downsize offices: KPMG. *The Real Deal*. Retrieved from <https://therealdeal.com/2020/09/03/nearly-70-of-ceos-expect-to-downsize-offices-survey/>

¹⁰⁵ CompTIA, *Tech Town Index 2020*.

being implemented across the industry. Taken together these actions could have a sweeping impact on the real estate landscape.

Remote work is just one of many alternative work methods that are being explored in the context of COVID-19. Most remarkable, though, is that more corporations than ever before are currently experimenting with alternative work methods, such as remote work, and engaging with real estate planning and human resource management at elevated levels. In the past, these human resource initiatives were luxuries for some corporations at their best, and afterthoughts for others at their worst. True, this heightened engagement is a necessity, forced by COVID-19, for business continuity and contingency planning. But the longer firms are forced to incorporate these specialties into their core strategy, the harder they will be to remove from strategy when the pandemic ultimately ends.

Re-entering the workplace will be a stepwise function for most companies, with most companies likely returning workers to the office in shifts that would allow a stepwise return to the normalcy that engenders collaboration and effective work. Corporations will have to do ample real estate and human resource planning to determine the composition and coordination of these shifts, forcing them to determine which groups of employees need to interact in-person to generate effective work, and how often. Corporations will have to plan for collaboration, determining which groups and which individuals are expected to (and actually do) collaborate in the workplace. If this type of this type of planning sounds familiar, it's because it is – it's the same type of planning discussed in the *Operational Considerations: Continuity and Scaling, Autonomy and “Un-Pluggability”* section of this thesis. The technology and financial services companies discussed during that section, longtime leaders across all industries with regards to human resource management, have, until now, been leaders in the field. Because of COVID-19, many corporations

have been brought to these corporations' levels of sophistication. COVID-19 and the re-entry process may force corporations to adopt this type of thinking, which could translate to more thoughtful and sophisticated location planning in general. If more companies begin employing more sophisticated corporate real estate planning, it is possible they begin to follow the trends set by the technology and financial services companies discussed herein, in particular their growing propensity to embrace the hub-and-spoke models. Those companies could soon be joined in emerging hub markets by corporations in other industries should they too sophisticate their human resource management approach, possibly supporting further talent and corporate distribution across the nation, sending soundwaves through the real estate industry. As reference, consider again the Toyota case study in the prior section.

To that end, the pandemic has brought human resource management to the forefront of corporations' operational focuses, forcing corporations to be more deliberate regarding their resource and space planning, because the sustainability of their businesses and their talent bases demand it. In these uncertain times, corporations have had to reevaluate their short- and long-term real estate plans as part of these initiatives, and the process may allow corporations opportunities to improve their operations. COVID-19, a catalyst for change, may allow corporations the opportunity to take bold action, such as (i) rationalizing real estate footprints; (ii) distributing workforces to better align incomes with costs of living; and (iii) accessing previously-unattainable talent that is less proximate to their headquarters but is now-accessible due to remote work, among a myriad of other possibilities. Not every corporation will act on each of these initiatives, but even action on the margin of such an enormous industry will have significant, lasting effects on the built environment.

c. Potential Impact on Gateway Office Markets

To estimate what the impact of these wide-ranging impacts may be, see below an illustrative example of the potential impact of remote work on San Francisco. The analysis contemplates a shift of 5-25% of the workforce to remote work (although this could also be the impact of 5-25% footprint rationalization). The analysis suggests that, keeping all other variables equal (square footage per employee, employment, office market size) and conservatively halving the 2019 record-breaking absorption rate of 9.5 million square feet, it would take 12-60 months for the market to absorb all of the office space that would come to market, excluding any completions delivered to the market or any lease expirations, of which there will be many:

Potential Impact of Increased Remote Work¹⁰⁶			
<u>San Francisco</u>			
White Collar Jobs	467,653		
SF Office Market (SF)	94,788,993		
Implied Avg SF per Employee	203		
PF White Collar Jobs	467,653	467,653	467,653
% Workforce Working Remote	5.00%	15.00%	25.00%
Number of Jobs	23,383	70,148	116,913
Estimated Post-COVID SF/Employee	203	203	203
Implied Vacated Office Space (sf)	4,739,450	14,218,349	23,697,248
2019 Absorption Rate * 50%	4,750,000	4,750,000	4,750,000
Months Vacancy	12	36	60

This level of months’ supply would significantly disrupt to the market, where development and expansion throughout the broader market has been predicated on sky-high rents, driven by record demand and limited supply. Markets are often determined at the margin, and as noted above, even marginal shifts in the workforce could have significant and long-lasting impacts in the space use for many corporations and the markets in which they operate.

¹⁰⁶ Colliers International. (2020, January 28). 2019 Q4 San Francisco Market Research Report: Colliers International. Retrieved from <https://www2.colliers.com/en/Research/San-Francisco-Bay-Area/2019-Q4-San-Francisco-Office-Market-Research-Report>

COVID-19 will have a myriad of short- and long-term effects on the real estate industry. The early data from COVID-19 suggests that the pre-COVID trends discussed in this thesis will be accelerated by the pandemic and the behavior it engenders. Developers and investors should take note, and use this thesis as a tool to make prudent investments throughout the real estate cycle that COVID-19 has presented.

VI. CONCLUSION

Over the past two decades, corporations and their talent have begun to migrate away from large, expensive gateway markets to smaller, lower-cost, and higher-quality of life emerging hub markets. The migration from gateway to emerging hub markets, largely enabled by advances in and increased adoption of technology, has upended the historical geographic distribution of people and companies traditionally driven by industry agglomeration. The result is a broader nationwide distribution of corporations and talent across a larger number of markets, driving the growth of emerging hub markets. These markets, principally spread across the Sun Belt and Western regions, are gaining corporations and their talent because they allow for the better alignment of employees' incomes and their costs-of-living, often while providing cost savings for corporations. These trends are likely to continue, particularly amongst corporations from the increasingly-expensive San Francisco and New York metro areas, as corporations continue to position headcount and footprint growth in emerging hub markets, both driving and being driven by increased demographic migration to these markets.

These trends have been aided by a combination of technology and increasing real estate savvy amongst corporations, particularly in the technology and financial services industry. Corporations have started to embrace real estate planning as a core consideration in corporate strategy and, as a result, corporations have shown to be more aggressive and strategic in their real estate planning. Corporations are increasingly seating growth in markets away from their expensive headquarter markets, instead growing their footprints and employee bases in more affordable emerging hub markets nationwide, leading to further corporate and talent distribution. Corporations are increasingly employing the hub-and-spoke model to allow individual business units to tap into specialized, sub-industry agglomeration hubs and broader talent pools.

The COVID-19 pandemic is likely to accelerate this trend. The pandemic forced corporations to move operations online wherever possible, requiring corporations and employees alike to test the limits of remote work and other alternative work methods that go hand-in-hand with workforce distribution in normal times. Indeed, many firms, particularly across the technology and financial services industries, are showing increased propensity to embrace these alternative work methods that have proven to be effective throughout the duration of the pandemic. Early data has shown that businesses in these industries have achieved continuity despite the distribution of their workforces, some at equal or greater levels of productivity.

More importantly, the pandemic has brought a level of attention and sophistication to real estate planning and human resource management across a broader swath of corporations to ensure business continuity. The forced maturation of real estate planning across this broader set of corporations could have long-term behavioral impacts, engendering more thoughtful and sophisticated real estate strategy at more corporations. If this occurs, it is possible more companies will follow the trends set by the technology and financial services companies discussed in this thesis, in particular their growing propensity to embrace the hub-and-spoke models that distribute the workforce across the nation. Such activity would support the continuation of trends discussed in this thesis, likely driving their acceleration.

Emerging hub markets remain dynamic. On one hand, increased sophistication in corporate real estate strategy and the continued advancement and adoption of technology (at least in some part due to COVID-19) will likely continue to support the broader distribution of workforces to these markets, enhancing their collective significance. However, the growth of these markets will be uneven as each market is forced to grapple with several challenges. One marked challenge will be managing the different, and likely unequal, composition of job and labor pools concentrating

in each of these markets. Certain markets will attract high-paying, sticky jobs, while others will attract lower-quality jobs as part of labor arbitrage that risk relocation or automation in the future. Markets will also face unique growing pains stemming from rapid, often uncontrolled expansion. Lastly, competition amongst markets is set to increase, as the battle for corporations and people alike becomes more fierce. Rising tides may lift all boats, but winners and losers will ultimately emerge.

In acknowledging the trends discussed throughout this thesis, and the implications they may have on the future trajectories of markets across the nation, it is important that real estate investors and developers carefully diligence each market they seek to enter. Each market is unique, and the trends discussed herein will affect each market differently. Understanding the trends discussed throughout this thesis, and the corporate behaviors that belie them, will serve to be a useful tool for analysis.

VII. REFERENCES

- Amazon. Amazon Announces Plans to Create 3,500 New Jobs in U.S. Tech Hubs in Dallas, Detroit, Denver, New York, Phoenix, and San Diego. (2020, August 18). Retrieved from <https://www.businesswire.com/news/home/20200818005306/en/Amazon-Announces-Plans-to-Create-3500-New-Jobs-in-U.S.-Tech-Hubs-in-Dallas-Detroit-Denver-New-York-Phoenix-and-San-Diego>
- Amazon. Amazon HQ2 RFP. September 2017. Typescript.
- Anderton, K. (2020, November 30). The Impact of Covid-19 Is Forcing Companies To Adopt New Technology [Infographic]. Forbes. Retrieved from <https://www.forbes.com/sites/kevinanderton/2020/11/30/the-impact-of-covid-19-is-forcing-companies-to-adopt-new-technology-infographic/?sh=4b79d6d26089>
- Banister, J. (2020, October 09). More Than Half of Tech Companies Plan to Dispose of Real Estate In Coming Months. Bisnow. Retrieved from https://www.bisnow.com/national/news/office/more-than-half-of-tech-companies-plan-to-dispose-of-real-estate-in-coming-months-106271?utm_source=outbound_pub_19
- Brown, L. (2020, August 12). Hub and Spoke Model Looks to Confront Changing Workplace Dynamics. Globe Street. Retrieved from <https://www.globest.com/2020/08/12/hub-and-spoke-model-looks-to-confront-changing-workplace-dynamics/>
- Built In. (2021). Tech Hubs In US: 7 Growing Cities Beyond Silicon Valley. BuiltIn. Retrieved from <https://builtin.com/tech-hubs>
- Bursztynsky, J. (2020, August 19). Palantir to relocate headquarters from Silicon Valley to Colorado. CNBC. Retrieved from <https://www.cnbc.com/2020/08/19/palantir-headquarters-moves-from-silicon-valley-to-colorado.html>
- Calvey, M. (2020, December 11). Oracle joins Bay Area exodus as it moves headquarters to Texas. San Francisco Business Times. Retrieved from https://www.bizjournals.com/sanfrancisco/news/2020/12/11/oracle-joins-bay-area-exodus-as-it-moves-headquart.html?ana=e_sfbt_bn_breakingnews_breakingnews
- Calvey, M. (2020, December 22). Amid Bay Area exodus, more cities offer cash, land, other incentives to attract remote workers. San Francisco Business Journal. Retrieved from https://www.bizjournals.com/sanfrancisco/news/2020/12/22/amid-bay-area-exodus-more-cities-offer-cash-land.html?ana=e_sfbt_bn_editorschoice_editorschoice
- Cammenga, J. (2020, November 30). State Corporate Income Tax Rates and Brackets for 2020. The Tax Foundation. Retrieved from <https://taxfoundation.org/state-corporate-income-tax-rates-brackets-2020/>

- CBRE Research. (2020, February 12). U.S. Office MarketFlash: Tech Reigns as King of Large Leases. Retrieved from <https://www.cbre.us/research-and-reports/US-MarketFlash-Tech-Reigns-as-King-of-Large-Leases>
- CBRE Research. (2021). 2020 Tech Talent Analyzer. Retrieved from <https://mapping.cbre.com/maps/Scoring-Tech-Talent-2020/>
- Chang, R. (2020, November 23). Earn \$10,000 by Moving to This U.S. City for a Year. Travel & Leisure. Retrieved from <https://www.travelandleisure.com/jobs/tulsa-oklahoma-recruiting-remote-workers-stipend>
- Chapman, L. (2019, March 08). Austin Is Building a Mini Silicon Valley, With Some of the Same Problems. Bloomberg. Retrieved from <https://www.bloomberg.com/news/articles/2019-03-08/austin-is-building-a-mini-silicon-valley-with-some-of-the-same-problems?sref=Ie7GDrhe>
- Colliers International. (2020, January 28). 2019 Q4 San Francisco Market Research Report: Colliers International. Retrieved from <https://www2.colliers.com/en/Research/San-Francisco-Bay-Area/2019-Q4-San-Francisco-Office-Market-Research-Report>
- CompTIA. (2020). 2020 Tech Industry Job Market & Salary Trends Analysis: Cyberstates by CompTIA. Retrieved from <https://www.cyberstates.org/index.html>
- CompTIA. Tech Town Index 2020 (Rep.). (2020, October). Retrieved <https://comptia.informz.net/COMPTIA/data/images/2020/Membership-Landing%20Pages/2020USTechTownReportFINAL.pdf>
- Cook, J. (2020, December 03). Tech CEO moves \$9B cybersecurity company's HQ to Seattle area, says S.F. is 'not the city it was'. Geekwire. Retrieved from <https://www.geekwire.com/2020/tech-ceo-moves-9b-cybersecurity-companys-hq-seattle-area-says-san-francisco-not-city-20-years-ago/>
- Cox, W. (2020, May 18). Domestic Migration to Dispersion Accelerates (Even before COVID). New Geogrpahy. Retrieved from http://www.newgeography.com/content/006648-domestic-migration-dispersion-accelerates-even-covid?utm_source=feedburner&utm_medium=email&utm_campaign=Feed%3A%2BNewgeography%2B%28Newgeography.com%2B-%2BEconomic%2C%2Bdemographic%2C%2Band%2Bpolitical%2Bcommentary%2Babout%2Bplaces%29
- Cox, W. (2020, September 13). Two Decades of Interstate Migration. New Geography. Retrieved from <https://www.newgeography.com/content/006773-two-decades-interstate-migration>

- Dean, G. (2020, November 25). Tulsa, Oklahoma, is paying remote workers \$10,000 to move there for a year. Business Insider. Retrieved from <https://www.businessinsider.com/tulsa-oklahoma-remote-workers-pay-move-there-for-year-2020-11>
- DiPasquale, D., & Wheaton, W. C. (1996). Firm Site Selection, Employment, Decentralization, and Multicentered Cities. In *Urban Economics and Real Estate Markets* (7th ed., Vol. 23, pp. 91-123). Englewood Cliffs, NJ: Prentice Hall.
- Elias, J. (2019, June 18). Google to invest \$1 billion in San Francisco Bay Area housing amid regional expansion. CNBC. Retrieved from <https://www.cnbc.com/2019/06/18/google-to-invest-1-billion-in-san-francisco-bay-area-housing.html>
- Elias, J. (2020, September 02). Google proposes new town-like tech hub in Mountain View. CNBC. Retrieved from <https://www.cnbc.com/2020/09/02/google-mountain-view-tech-hub-proposal-pictures.html>
- Farr, M. (2020, April 24). 2019 Migration Patterns. Retrieved from <https://www.atlasvanlines.com/amplifier/household-moving/2019-migration-patterns>
- Findell, E., & Putzier, K. (2020, December 27). 'Startup City': Accelerated Growth Strains Austin. Wall Street Journal. Retrieved from https://www.wsj.com/articles/start-up-city-accelerated-growth-strains-austin-11609093013?mod=hp_lead_pos7
- Florida, R. (2018, November 15). The Geography of Corporate Headquarters. Bloomberg. Retrieved from <https://www.bloomberg.com/news/articles/2018-11-15/where-corporate-headquarters-are-located?sref=Ie7GDrhe>
- France-Presse, A. (2014, April 28). Toyota to Move US Operations to Texas. Industry Week. Retrieved from <https://www.industryweek.com/talent/article/21962753/toyota-to-move-us-operations-to-texas>
- Friedman, N. (2021, January 06). Amazon Pledging More Than \$2 Billion for Affordable Housing in Three Hub Cities. Wall Street Journal. Retrieved from https://www.wsj.com/articles/amazon-pledging-more-than-2-billion-for-affordable-housing-in-three-hub-cities-11609930800?mod=hp_featst_pos4
- Frier, S. (2020, May 14). Tech Workers Consider Escaping Silicon Valley's Sky-High Rents. Bloomberg. Retrieved from https://www.bloomberg.com/news/articles/2020-05-14/tech-workers-consider-escaping-silicon-valley-s-sky-high-rents?cmpid=BBD051420_CITYLAB
- Greiner, L. E. (1998). Evolution and revolution as organizations grow. *Harvard business review*, 76(3), 55-64.
- Hartmans, A. (2020, December 14). Billionaire Oracle founder Larry Ellison has reportedly moved to the Hawaiian island he mostly owns, the latest high-profile departure from

- Silicon Valley. Business Insider. Retrieved from https://www.businessinsider.com/larry-ellison-oracle-lanai-island-hawaii-move-2020-12?nr_email_referer=1
- Hellwig, E. (2017, July 06). Toyota Completes Move to Texas with Opening of \$1B Headquarters. Edmunds. Retrieved from <https://www.edmunds.com/car-news/auto-industry/toyota-completes-move-to-texas-with-opening-of-1b-headquarters.html>
- Heschmeyer, M. (2018, December 13). Apple To Build \$1 Billion Campus in Austin; Add Thousands of Jobs in Other U.S. Cities. CoStar. Retrieved from <https://www.costar.com/article/448587496/apple-to-build-1-billion-campus-in-austin;-add-thousands-of-jobs-in-other-us-cities>
- Hethcock, B. (2015, December 11). Here's the main reason Toyota is moving from California to Texas. Dallas Business Journal. Retrieved from <https://www.bizjournals.com/dallas/blog/2015/12/heres-the-main-reason-toyota-is-moving-from.html>
- Industry expert consultations, 2020. *See attached schedule.*
- Jennings, J. (n.d.). A Message About the 2020 Index. Joint Venture Silicon Valley. Retrieved from <https://jointventure.org/a-message-about-the-2020-index>
- Jensen, N. (2019, March 06). Five economic development takeaways from the Amazon HQ2 bids. The Brookings Institution. Retrieved from <https://www.brookings.edu/research/five-economic-development-takeaways-from-the-amazon-hq2-bids/>
- Johnson, K.M., Voss, P.R., Hammer, R.B. et al. Temporal and spatial variation in age-specific net migration in the United States. *Demography* 42, 791–812 (2005). <https://doi.org/10.1353/dem.2005.0033>
- Johrten. (2020, May 18). Visualize the Fortune 500. Fortune. Retrieved from <https://fortune.com/franchise-list-page/visualize-the-fortune-500-2020>
- Kawamoto, D. (2020, December 29). Billionaire tech exec calls on wealthy CEOs to commit to Bay Area. San Francisco Business Journal. Retrieved from https://www.bizjournals.com/sanfrancisco/news/2020/12/29/billionaire-tech-ceo-calls-on-ceos-to-commit-to-sf.html?ana=e_sfbt_bn_editorschoice_editorschoice
- Kiersz, A. (2017, July 06). The most and least expensive places to live in America. Business Insider. Retrieved from <https://www.businessinsider.com/most-and-least-expensive-places-in-america-regional-price-parity-map-2017-7>
- KPMG International. (2020, July 29). KPMG 2020 CEO Outlook: COVID-19 Special Edition. Retrieved from <https://home.kpmg/xx/en/home/insights/2020/08/global-ceo-outlook-2020.html#:~:text=The%20agenda%20for%20the%20new,impact%2C%20both%20social%20and%20economic>

- Learner, H. (2017). Rent Expense Analysis for Companies in the S&P 500 (Rep.). Retrieved <https://pdf.euro.savills.co.uk/usa/in-depth-reports/rent-cost.pdf>
- Lonsdale, J. (2020, November 15). Opinion | California, Love It and Leave It. Wall Street Journal. Retrieved from <https://www.wsj.com/articles/california-love-it-and-leave-it-11605472619>
- Loughead, K. (2020, February 04). State Individual Income Tax Rates and Brackets. The Tax Foundation. Retrieved from <https://taxfoundation.org/publications/state-individual-income-tax-rates-and-brackets/>
- Matsuda, A. (2020, September 03). Nearly 70% of CEOs expect to downsize offices: KPMG. The Real Deal. Retrieved from <https://therealdeal.com/2020/09/03/nearly-70-of-ceos-expect-to-downsize-offices-survey/>
- Moody's Analytics | Economic & Consumer Credit Analytics. (2019). Regional Cost of Doing Business. Retrieved from <https://www.economy.com/store/shop.aspx?pubid=11>
- Morris, M. (2020, November 28). Is Silicon Valley finally dead? Business Insider. Retrieved from https://www.businessinsider.com/tech-elites-leaving-san-francisco-threaten-silicon-valley-supremacy-2020-11?nr_email_referer=1
- Moss, J. J. (2020, December 8). It's official: Elon Musk has moved to Texas. San Francisco Business Journal. Retrieved from https://www.bizjournals.com/sanfrancisco/news/2020/12/08/elon-musk-reportedly-set-to-move.html?ana=e_sfbt_bn_editorschoice_editorschoice
- Natarajan, S. (2020, December 6). Goldman Plots Florida Base for Asset Management in a Blow to New York. Bloomberg. Retrieved from https://www.bloomberg.com/news/articles/2020-12-06/goldman-plots-florida-base-for-asset-management-in-a-blow-to-nyc?campaign_id=4
- Oracle Corporation (2021). Form 10-q. Retrieved from <https://investor.oracle.com>
- Oracle Corporation. (2020, December 23). Retrieved from https://en.wikipedia.org/wiki/Oracle_Corporation
- Oracle Corporation. (2021). About Oracle | Company Information. Retrieved from <https://www.oracle.com/corporate/>
- Porter, M. E. (2020). The U.S. Cluster Mapping Project at the Institute for Strategy and Competitiveness, Harvard Business School. (n.d.). Retrieved from <http://www.clustermapping.us/content/clusters-101>

- Randall, M. (2017, May 08). Massachusetts gave GE a "mega-deal" to move, but did it matter? Urban Institute. Retrieved from <https://www.urban.org/urban-wire/massachusetts-gave-ge-mega-deal-move-did-it-matter>
- Real Estate Weekly. (2021, January 04). Shorenstein leases Miami office space to Blackstone. Real Estate Weekly Online. Retrieved from <https://rew-online.com/shorenstein-leases-miami-office-space-to-blackstone/>
- Roberts, J. (2020, August 25). Top 10 US Cities With the Lowest Cost of Living. Move.org. Retrieved from <https://www.move.org/lowest-cost-of-living-by-us-city/>
- Ruger, W., & Sorens, J. (2020). How free is your state? The Cato Institute. Retrieved from <https://www.freedominthe50states.org/>
- Ryan, C. (2021, January 02). Office Landlords Will Be Squeezed by Secondhand Market. Wall Street Journal. Retrieved from <https://www.wsj.com/articles/office-landlords-will-be-squeezed-by-secondhand-market-11609599780>
- Sassen, Saskia. "The Specialised Differences of Cities Matter in Today's Global Economy," in *Reforming the City: Responses to the Global Financial Crisis*, Sam Whimster (ed.), Erf at London Metropolitan University: 2009. Retrieved from <http://saskiasassen.com/PDFs/publications/The-Specialised-Differences.pdf>
- Schaefer, D. (2020, December 12). Deutsche Bank May Move Half of New York Staff Elsewhere. Bloomberg. Retrieved from <https://www.bloomberg.com/news/articles/2020-12-13/deutsche-bank-may-move-half-of-new-york-staff-elsewhere-ft-says?sref=Ie7GDrhe>
- Sharf, S. (2019, December 19). How We Ranked The Best States For Business 2019. Forbes. Retrieved from <https://www.forbes.com/sites/samanthasharf/2019/12/19/how-we-rank-the-best-states-for-business-2019/>
- Sidders, J. (2020, December 18). The World's CFOs Have a Dire Message for Real-Estate Investors. Bloomberg. Retrieved from <https://www.bloomberg.com/news/articles/2020-12-18/the-world-s-cfos-have-a-dire-message-for-real-estate-investors?sref=Ie7GDrhe>
- Somerville, H. & Armental, M. (2020, December 02). Hewlett Packard Enterprise to Leave Silicon Valley for Texas. Wall Street Journal. Retrieved from https://www.wsj.com/articles/hewlett-packard-enterprise-to-leave-silicon-valley-for-texas-11606862026?mod=article_inline
- Swartz, J. (2019, February 13). Silicon Valley Has Nowhere to Grow. Barrons. Retrieved from <https://www.barrons.com/articles/with-silicon-valley-just-about-maxed-out-tech-companies-look-elsewhere-to-expand-51550079000>
- Tulsa Remote. (2020). Tulsa Remote. Retrieved from <https://tulsaremote.com/>

- Twilio. (2021). About the Cloud Communications Company. Retrieved from <https://www.twilio.com/company>
- U.S. Chamber Institute for Legal Reform. (2020, December 17). State Legal Climate Ranking. Retrieved from <https://instituteforlegalreform.com/map-page/>
- U.S. News & World Report. (2020). How We Rank the Best Places to Live & Retire. U.S. News & World Report. Retrieved from <https://realestate.usnews.com/places/methodology>
- US Census Bureau. (March 26, 2020). Population of the largest metropolitan areas in the U.S. as of 2019 (in 1,000s) [Graph]. In Statista. Retrieved from <https://www.statista.com/statistics/183600/population-of-metropolitan-areas-in-the-us/>
- US Conference of Mayors. (July 22, 2020). Forecasted Gross Metropolitan Product (GMP) of the United States in 2020, by metropolitan area (in billion current U.S. dollars) [Graph]. In Statista. Retrieved from <https://www.statista.com/statistics/183808/gmp-of-the-20-biggest-metro-areas/>
- Vincent, R. (2020, October 29). Real estate brokerage CBRE moves headquarters from Los Angeles to Dallas. Los Angeles Times. Retrieved from <https://www.latimes.com/business/story/2020-10-29/real-estate-brokerage-cbre-moves-headquarters-from-los-angeles-to-dallas>
- Waxmann, L. (2020, November 9). Dropbox, Glassdoor list more S.F. office space for sublease. San Francisco Business Journal. Retrieved from <https://www.bizjournals.com/sanfrancisco/news/2020/11/09/sublease-space-dropbox-glassdoor-san-francisco.html>
- Wittmann, A. (2020). The Future of Business: How Finance is Becoming a Catalyst For Change (Rep.). Retrieved <https://www.netsuite.com/portal/assets/pdf/wp-brainyard-summer-2020-the-future-of-business.pdf>

VIII. SCHEDULE OF INDUSTRY EXPERTS CONSULTED

Schedule of Firms Consulted for Primary Research*	
Company	Category
7Park Data	Industry Expert / Consultant
BeyondHQ	Industry Expert / Consultant
Database USA	Industry Expert / Consultant
Fannie Mae	Industry Expert / Consultant
Harvard Business School	Industry Expert / Consultant
LocalLogic	Industry Expert / Consultant
MIT Center for Real Estate	Industry Expert / Consultant
StateBook	Industry Expert / Consultant
T3 Advisors	Industry Expert / Consultant
Team Blind	Industry Expert / Consultant
Will Reed Advisors	Industry Expert / Consultant
Google	Corporate Representative
Facebook	Corporate Representative
Blackstone	Developers, Owners & Operators
EQ Office	Developers, Owners & Operators
Jamestown LP	Developers, Owners & Operators
JBG Smith	Developers, Owners & Operators
United Properties	Developers, Owners & Operators

**Individual names withheld; available upon request.*