2020 TAMPA BAY E-INSIGHTS REPORT

STATE OF THE REGION

THE 2020 E-INSIGHTS REPORT IS PRODUCED BY THE MUMA COLLEGE OF BUSINESS AT THE UNIVERSITY OF SOUTH FLORIDA, A PREEMINENT UNIVERSITY, AND IS AFFILIATED WITH THE STATE OF THE REGION INITIATIVE.

stateoftheregion.com

An Introduction from the Dean

We are excited to join the Tampa Bay Partnership for the 2020 State of the Region Community Report as we unveil new research tracking our regional competitiveness and prosperity. We examine where we stand compared to top markets nationwide and explore the steps policymakers and influencers can take to create a vibrant, inclusive economy.

A companion piece to the research conducted by the Tampa Bay Partnership, the *Tampa Bay E-Insights Report* is a multi-dimensional quantitative assessment of the performance of the Tampa Bay region along different dimensions of "inclusive economic growth." By inclusive economic growth, we mean the economic growth that is distributed fairly across society and creates opportunities for all.

This work is transformational. Our scholars use real-time big data to analyze the economic health of the Tampa Bay region using rigorous quantitative methods. The result: data-driven insights that not only inform business and civic leaders about the state of the Tampa Bay region, but also provide policy recommendations to drive the needle in a positive direction.

What Gets Measured is What Gets Done.

One could ask why the USF Muma College of Business has taken up this initiative because, after all, we are a business school and we focus on creating the future talent by providing an outstanding business education. But we do so much more than simply disseminate information. We equip students with the skills and knowledge needed to take leading positions in business and society. And one of the ways we do that is by focusing on analytics and creativity, using our faculty expertise to contribute to the well-being of the greater community while providing opportunities for our students to conduct relevant business research.

To improve the region's health, we have to know where we stand relative to similar and aspirant communities. After all, if you cannot measure it, you cannot improve it. However, we do not want to stop there. We want to take a scientific approach and work closely with the business community and policymakers to improve the economic health of the region and to make Tampa Bay a very attractive destination for businesses as well as for the public. Understanding that what gets measured is what gets done, we can then measure our progress and make timely and effective recommendations that can lead to maximum impact. Data is the key.

Real-time Signals, Real-time Findings

One unique feature of this project is that we take a multi-dimensional approach to derive insights about the region. We used real-time big data signals – such as Google Trends and Twitter sentiment – and data about traditional economic indicators to derive a holistic picture of the inclusive economic health of the region.

Real-time signals on job openings suggest the need to nurture young talent in the domains of finance and information technology because these two industries command a major chunk of open, high-paying jobs in the region. Furthermore, we have employed econometric and simulation methods to identify policy initiatives that can boost the inclusive economic growth of the region.

Improving Tampa Bay's Competitive Position

From our analysis, we have identified two key areas that need attention of the policymakers: higher education and public transit infrastructure. Higher education empowers underprivileged youth with the necessary skill set and opens doors of opportunity that help them improve their economic situation and, hopefully, to come out of poverty. Adequate public transit infrastructure gives the lower income strata section of society easy and affordable access to education, work and health.

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The analysis concludes that increased investments in high-skill education (STEM: Science, Technology, Engineering and Mathematics) and public transit infrastructure have the potential to help alleviate income inequality and boost economic mobility in the region leading to inclusive economic growth.

We strongly believe that the best way to predict the future is to shape it. Using the latest tools and research techniques, we can understand where we are and see how policy changes might shape our future.

Enjoy our report,

Moez Limayem, Dean
USF Muma College of Business

About the USF Muma College of Business

Our mission guides what we do now and our vision guides where we want to go, but it is our strategic priorities that help us focus our actions.

Our first priority is student success. We want students to leave USF with the best possible business education so that they can begin careers in their fields with competitive salaries, using the knowledge gleaned through our programs.

But we are committed to doing more than simply providing the technical training students seek. We are committed to guiding students through their academic journey by providing opportunities for them to develop as professionals from their first moments on campus.

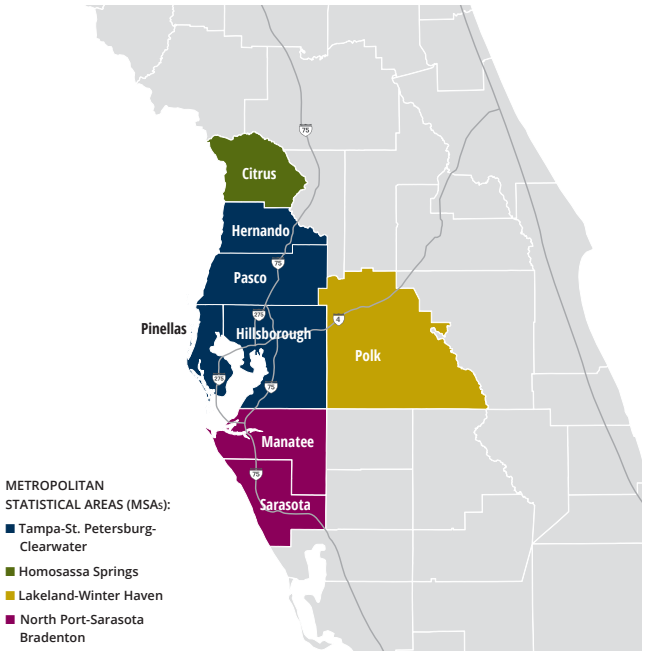
- **Mission:** We emphasize creativity and analytics to promote student success, produce scholarship with impact and engage with all stakeholders in a diverse global environment.
- **Strategic Vision:** We aspire to be internationally recognized for developing business professionals who provide analytical and creative solutions in a global environment.

2020 Tampa Bay E-Insights Report

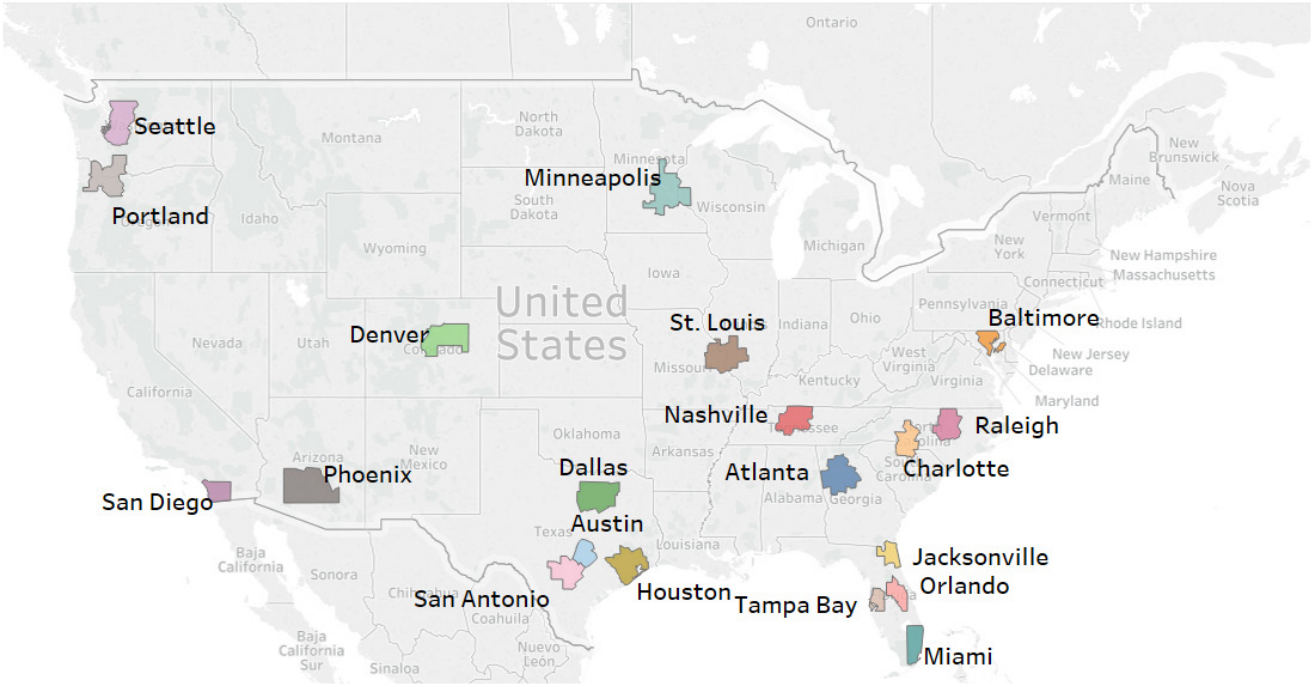
Tampa Bay E-Insights report examines the economic performance of the Tampa Bay region relative to 19 other comparable Metropolitan Statistical Areas (MSAs). These MSAs were selected based on factors such as demography, size of the economy and presence of regional assets such as ports and research universities. The selected MSAs reflect both peer and aspirational relationships with Tampa Bay.

This report analyzes the performance of the Tampa Bay region along the dimensions of personal prosperity, income inequality and economic mobility. The analysis consists of four distinct components: examination of real-time signals, study of competitive trends based on traditional economic indicators, identification of drivers of economic outcomes through econometric modeling and policy experiments.

In this report, Tampa Bay is defined as the region consisting of eight counties: Citrus, Hernando, Hillsborough, Manatee, Pasco, Pinellas, Polk and Sarasota. The eight-county area includes four MSAs: Tampa-St. Petersburg-Clearwater, Homosassa Springs, Lakeland-Winter Haven and North Port-Sarasota-Bradenton. The data presented in the report for Tampa Bay is aggregated for the four MSAs.



The MSAs studied in the report are shown in the map below.



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Part 1: Signals from Real-Time Sources

One defining feature of this report is that it presents multidimensional view of the economic performance of the Tampa Bay MSA. Traditionally, most of the analyses were focused on traditional economic indicators such as poverty rate, income inequality (the Gini index) and economic mobility. However, such data becomes available with significant time lag and oftentimes provides a macro picture. On the other hand, real-time online data sources such as search engines, social media platforms and job portals provide patterns and signals, which can be used to gain real-time and novel insights about the economic wellbeing of a region.

This section presents insights from four real-time data sources. These data sources are grouped into three categories based on the type of information each presents. Below are the brief descriptions of the three categories of real-time data sources that have been considered for this study.

Google Trends

Google Trends provides insights about online search behavior. This information can be used to assess the state of the inclusive economic growth by analyzing how the search behavior differs across MSAs.

Job Portals and Professional Networks

LinkedIn and Indeed provide data regarding number and types of job openings in different regions. This data can be used to analyze the characteristics of the job market in a region.

Social Media

Twitter data can be used to generate insights about public perception towards different regions. Novel techniques such as sentiment analysis help derive insights about the public opinion on various aspects of the region.

Google Trends

Google Trends is an online tool that analyzes the popularity of search queries on Google across multiple regions. In this report, we aim to capture the level of economic inequality and economic mobility for the Tampa Bay region and 19 other MSAs using the data from this tool.

The Google Trends tool creates a search index for each search unit based on its popularity relative to all other search terms queried in a region. The index value ranges between 0 and 100. The index data has been collected for 20 MSAs of study including the Tampa Bay region between the dates of January 2006 and October 2019.

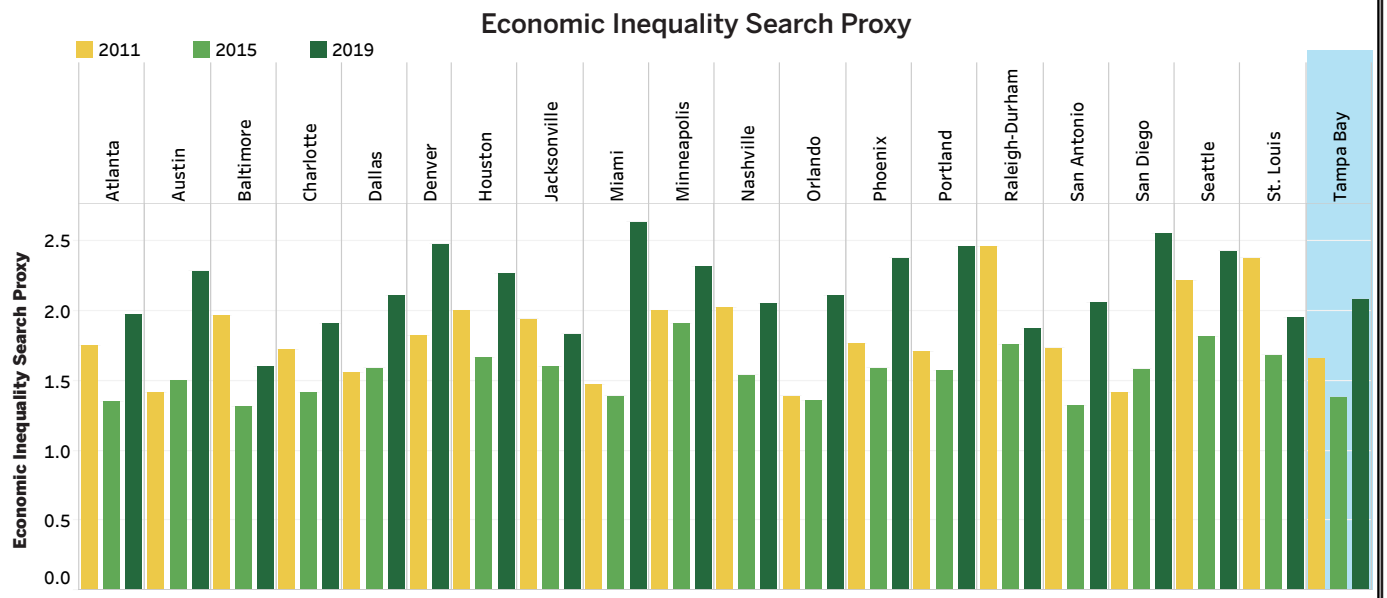
The analysis for trends of economic inequality and economic mobility includes comparison of search volumes of pairs of related queries. For example, search volume of “cars” versus “used cars” can be used as a proxy for economic inequality. Similarly, by looking at how the search volumes of “manager jobs” and “temporary jobs” change over time, a proxy for economic mobility can be constructed.

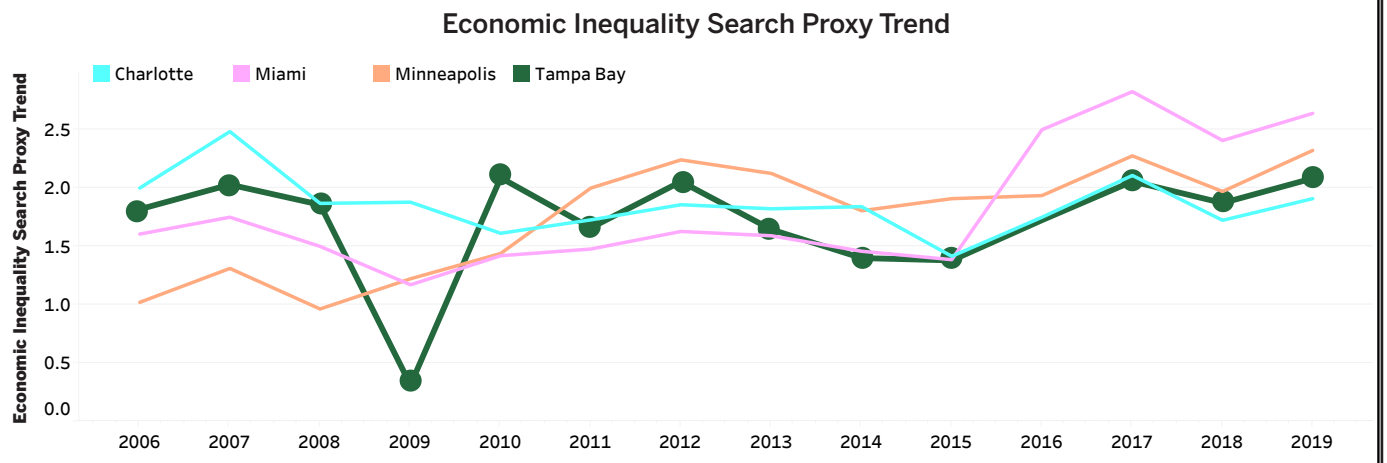
Google Trends

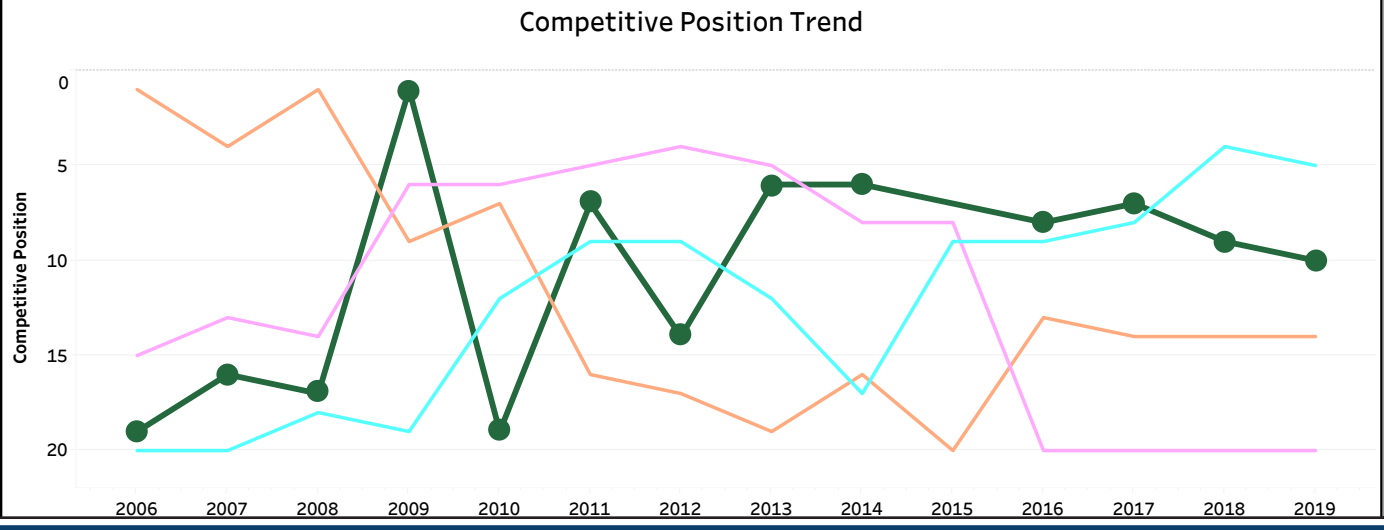
SUMMARY OF INSIGHTS AND FINDINGS

The Tampa Bay region's competitive position has been declining for the past few years (almost all MSAs appear to have increasing inequality).

About: Google trends-based proxy for economic inequality.
Source: Google Trends.





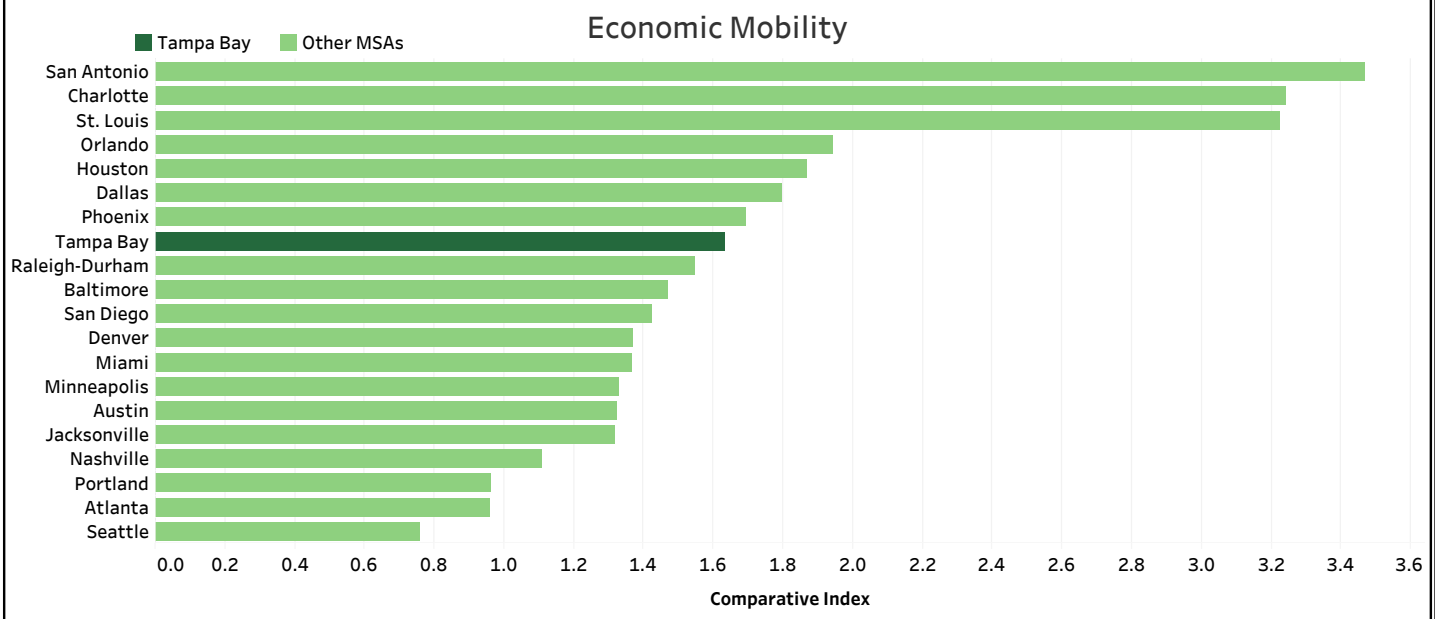


Google Trends

SUMMARY OF INSIGHTS AND FINDINGS

As per the Google Trends analysis, Charlotte, San Antonio and St. Louis registered highest economic mobility. The Tampa Bay region is in the top half of the group.

About: Google Trends-based proxy for economic mobility.
Source: Google Trends.



Real-Time Signals on Job Opportunities

The availability of jobs is one of the most important signals of economic strength for any region. Traditionally, such data has been collected with a time lag and reported by federal and state agencies. However, the opportunity to derive real-time insights about labor markets using signals from online platforms such as LinkedIn and Indeed exists. These platforms are increasingly used by both job seekers and employers.

Data on number of full-time, part-time, commission, contract, internship and temporary job openings was collected from Indeed between July 2019 and October 2019, and was then grouped into temporary and permanent jobs. Also, the data on the number of jobs available in different salary ranges was collected from Indeed. The data was grouped into high-paying and low-paying job buckets.

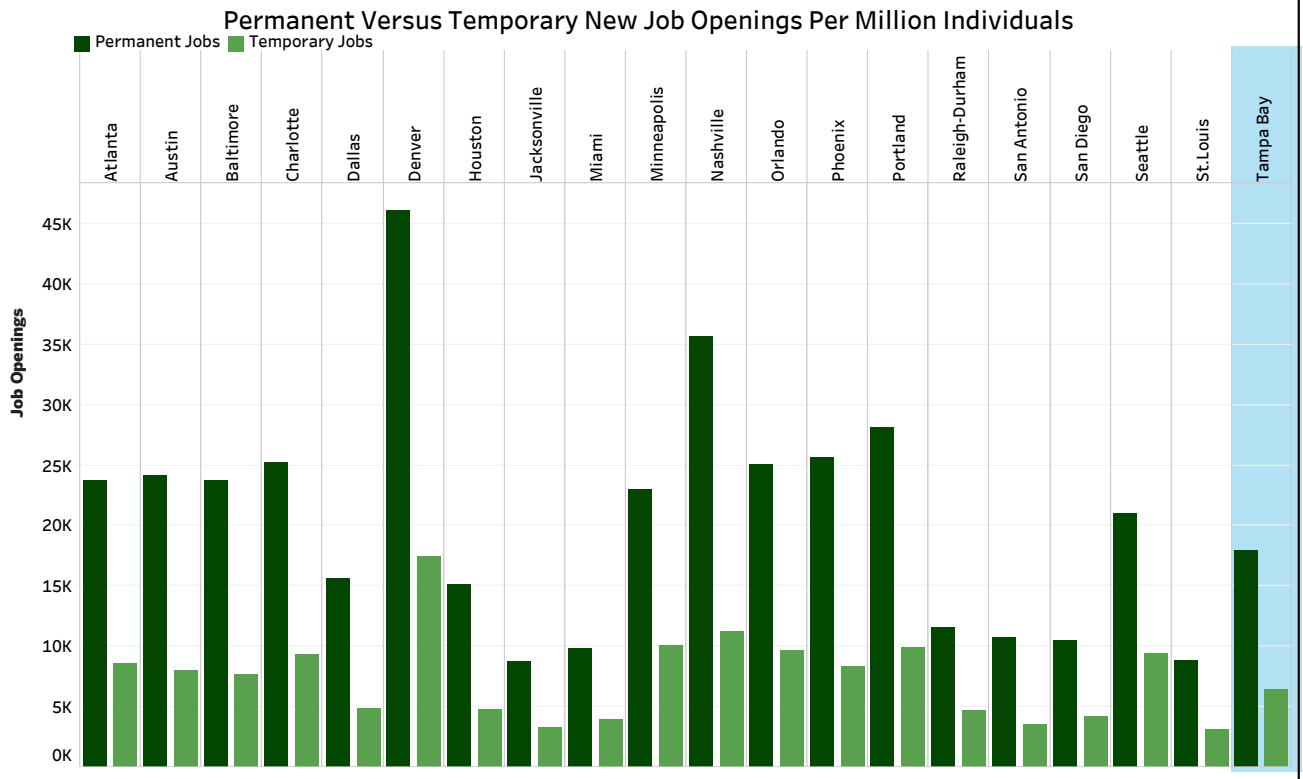
From LinkedIn, data was collected on the number of job openings related to the different job levels such as internship, entry-level, associate, mid-senior, director and executive. Given the importance of the technology industry, data on IT job postings was collected across MSAs from LinkedIn. Using the industry-wise job openings data from LinkedIn, top three job providing industries in the Tampa Bay region were identified.

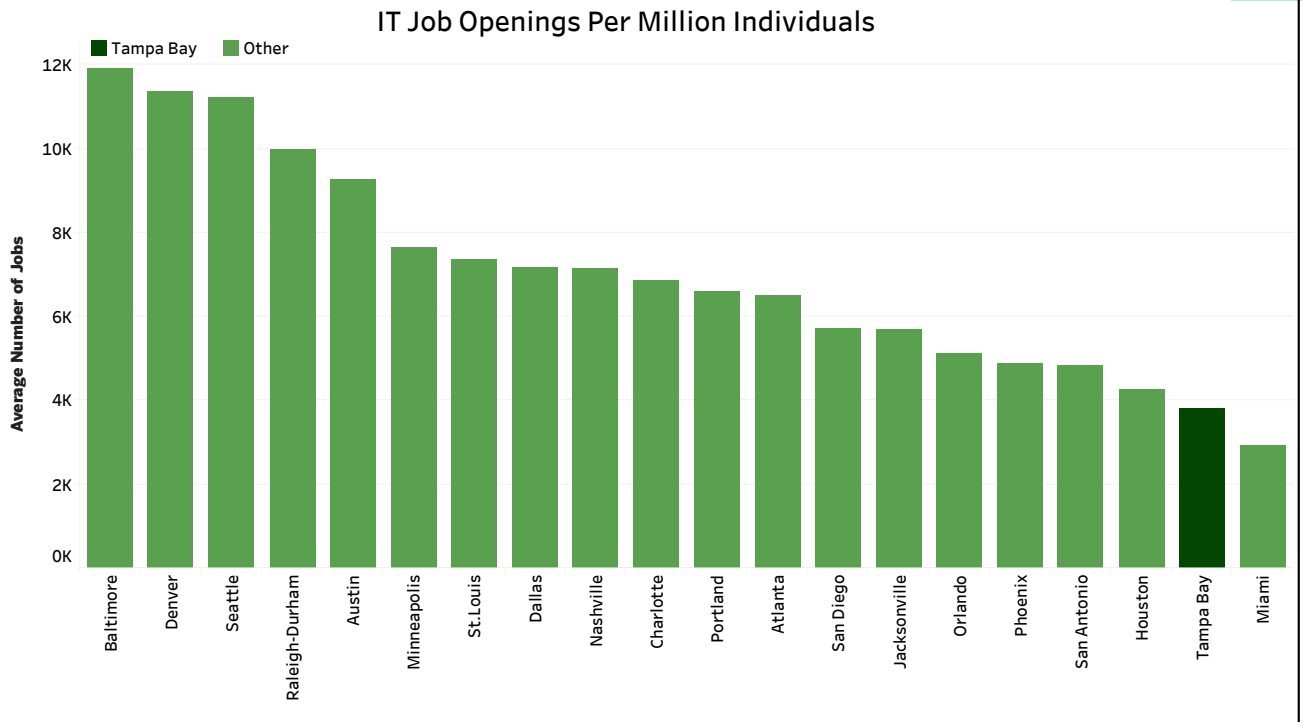
Job Opening Signals

SUMMARY OF INSIGHTS AND FINDINGS

The Tampa Bay region is near the bottom of the group in terms of IT job openings per capita.

About: Online platforms such as LinkedIn and Indeed provide real-time signals, which can be useful to derive insights about the state of the labor market of a region.
Source: Indeed and LinkedIn.



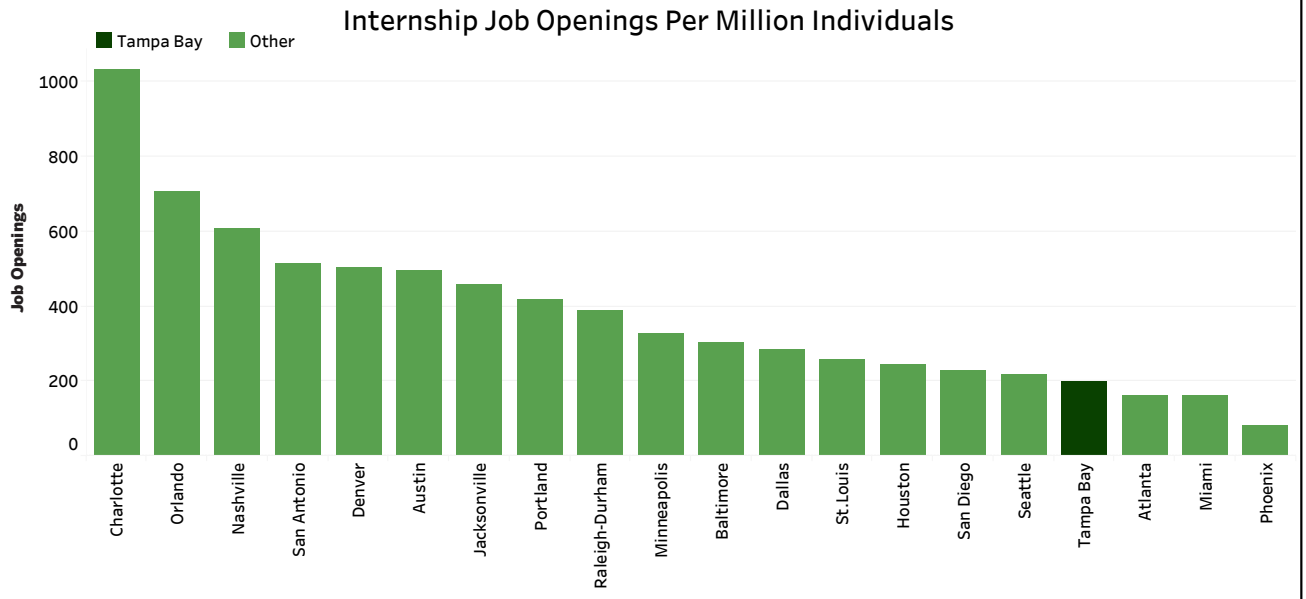


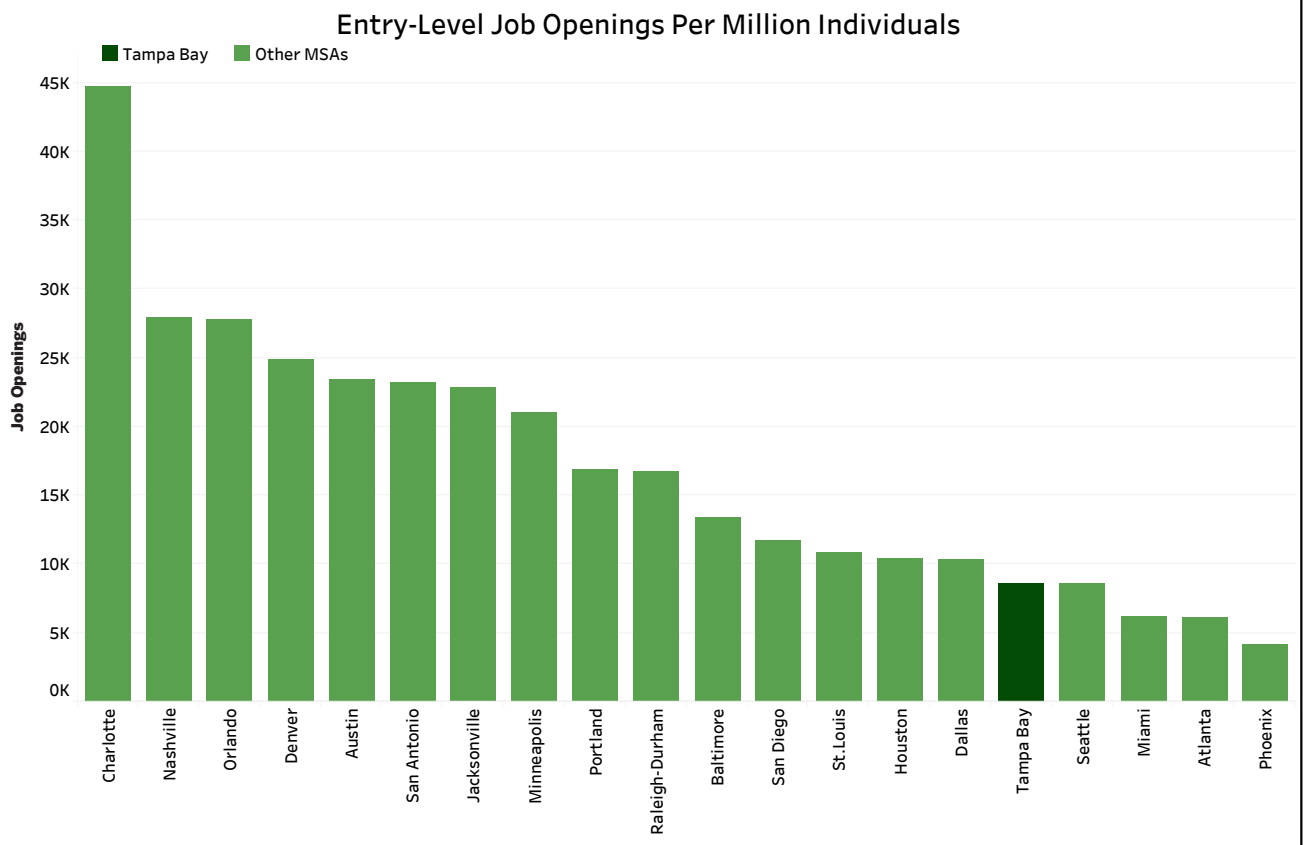
Job Opening Signals

SUMMARY OF INSIGHTS AND FINDINGS

Charlotte tops the list in terms of both internship job openings and entry-level job openings. The Tampa Bay region is in the lowest quintile (bottom 20%) of the group.

About: Online platforms such as LinkedIn and Indeed provide real-time signals, which can be useful to derive insights about the state of the labor market of a region.
Source: LinkedIn



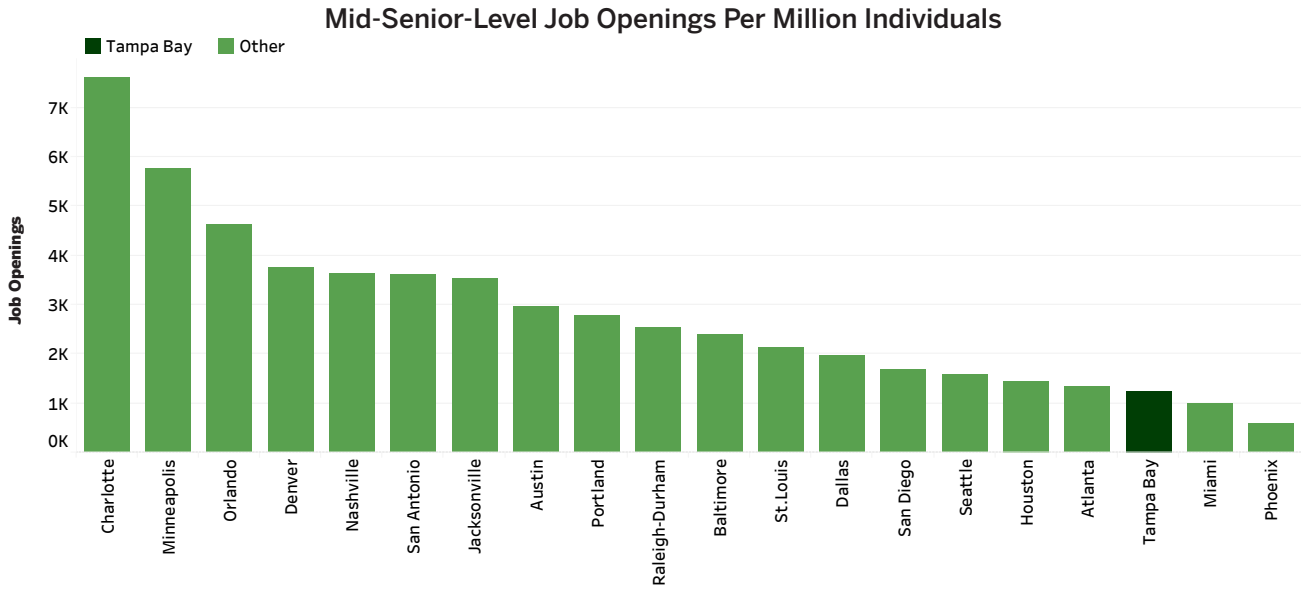


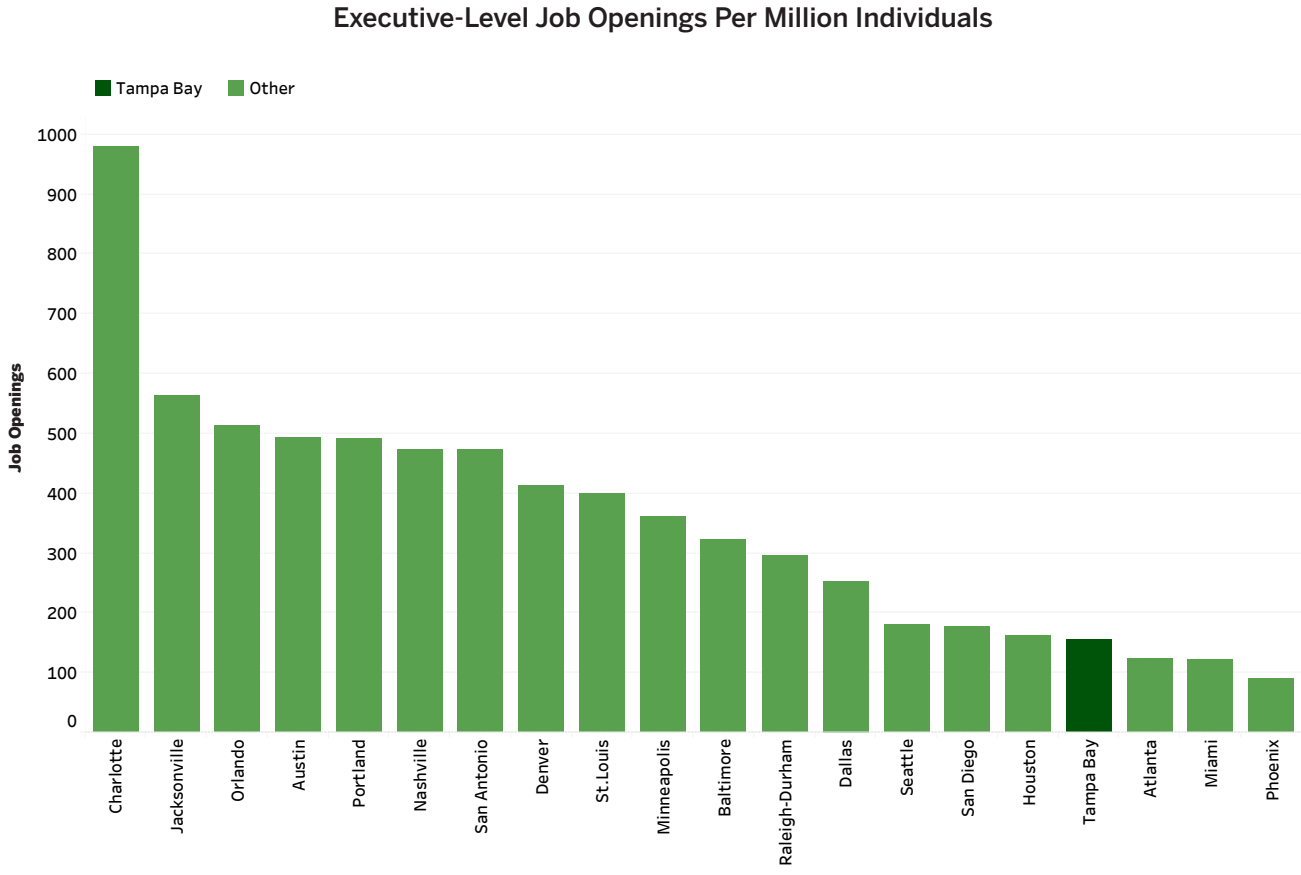
Job Opening Signals

SUMMARY OF INSIGHTS AND FINDINGS

Charlotte tops the table in terms of mid-senior-level and executive-level job openings by significant amount.

About: Online platforms such as LinkedIn and Indeed provide real-time signals which can be useful to derive insights about the state of the labor market of a region.
Source: LinkedIn.





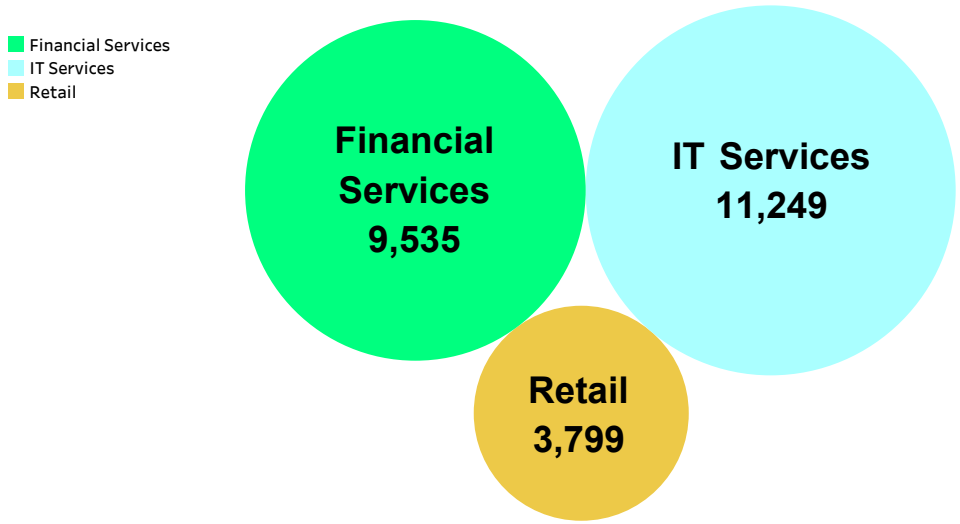
Job Opening Signals

SUMMARY OF INSIGHTS AND FINDINGS

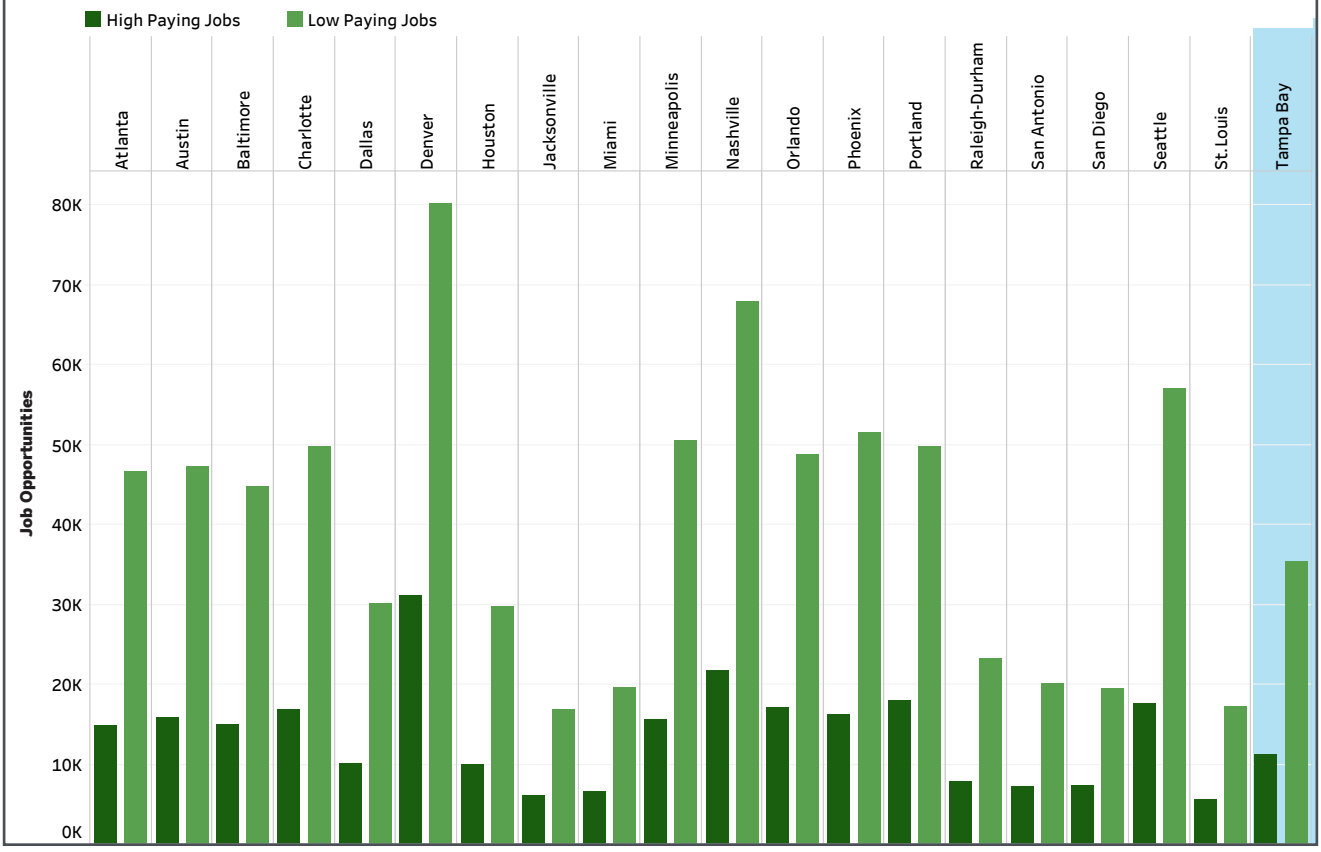
IT and financial services are driving the most number of job openings in the Tampa Bay region. This could provide guidance for how to nurture professional talent in the region. Tampa Bay falls near the middle in high paying and low paying job openings.

About: Online platforms such as LinkedIn and Indeed provide real-time signals which can be useful to derive insights about the state of the labor market of a region.
Source: LinkedIn and Indeed.

Services With Most Number Of Job Openings in Tampa Bay



High Paying Versus Low Paying Job Openings Per Million Individuals

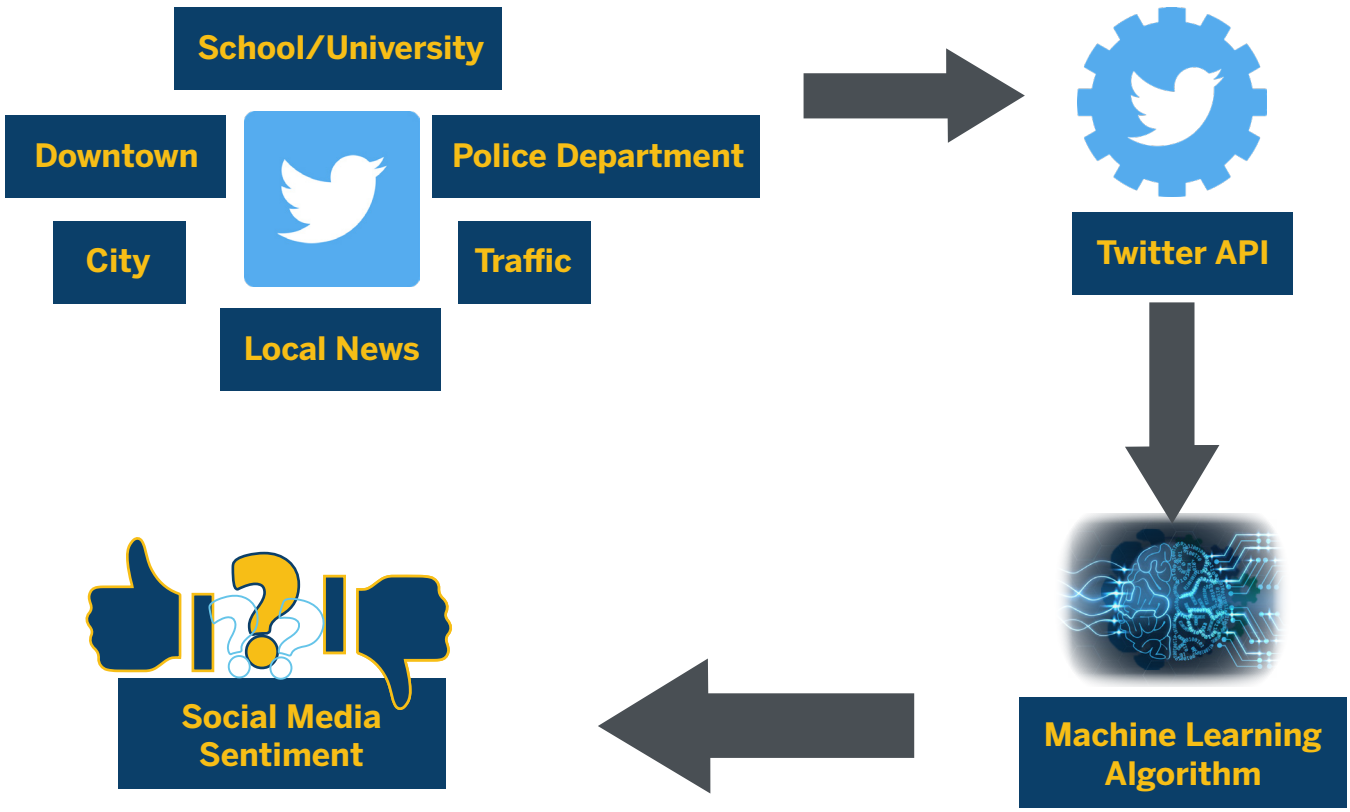


Social Media Sentiment

Social media sentiment reflects the positive or negative emotions conveyed through social media posts. In this social media sentiment analysis, Twitter data was used to discover people's emotions and feelings about each MSA based an analysis of tweets related to each MSA.

Tweets were gathered from official Twitter handles belonging to universities, traffic departments, police, news, and local agencies promoting downtown activities for specific cities in each MSA. Tweets for a two-month period (October and November 2019) for all the MSAs were scraped using Twitter's Python search API. Raw tweets were pre-processed, and an ensemble machine-learning algorithm was used to determine the sentiment of each tweet. The sentiment for all the tweets was then aggregated to derive the overall sentiment of each MSA.

After obtaining the overall sentiment, a deep-dive analysis between the most positive MSA and the Tampa Bay region was performed. Also, sentiment analysis was performed for all the cities of the Tampa Bay MSA, including Tampa, Clearwater, St. Petersburg, North Port, Bradenton, Sarasota, Lakeland, Winter Haven and Homosassa Springs.

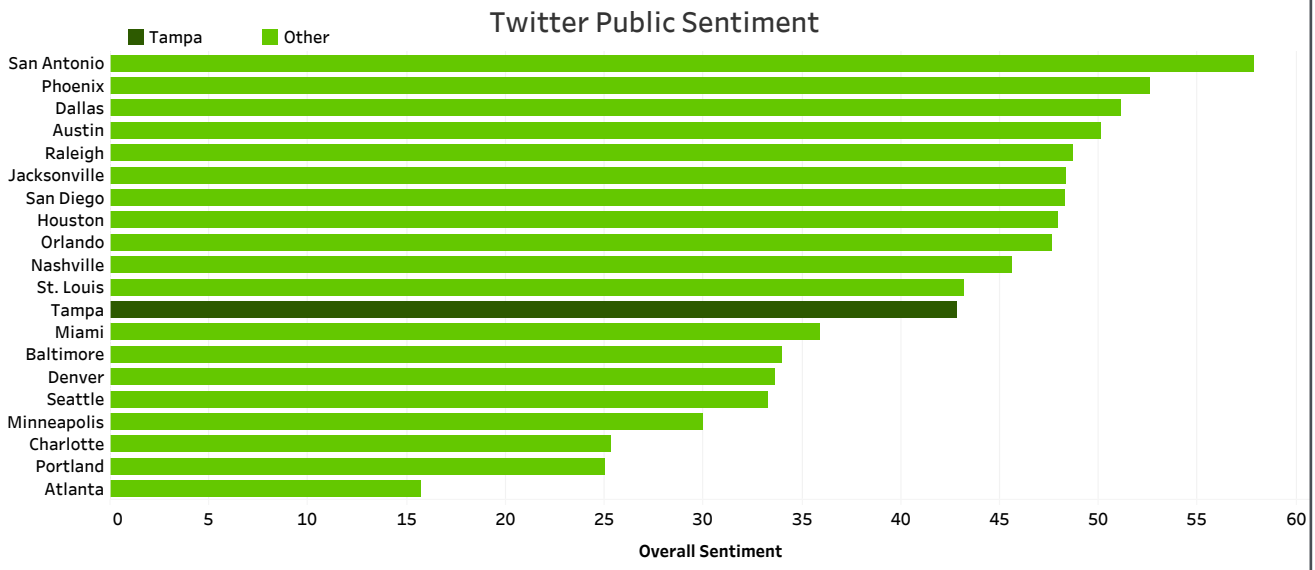


Twitter Sentiment Analysis

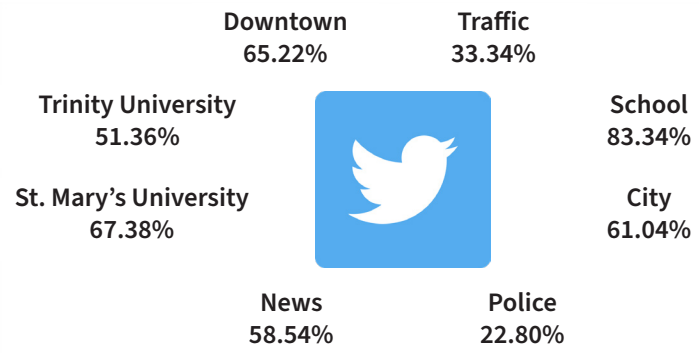
SUMMARY OF INSIGHTS AND FINDINGS

The Tampa Bay region is the middle of the pack in terms of overall sentiment. Within Tampa Bay, the positive sentiment is mostly driven by the conversations about downtown, schools and universities. Specifically for schools, positive sentiment stems from conversations about school events and competitions that students appear to be participating in.

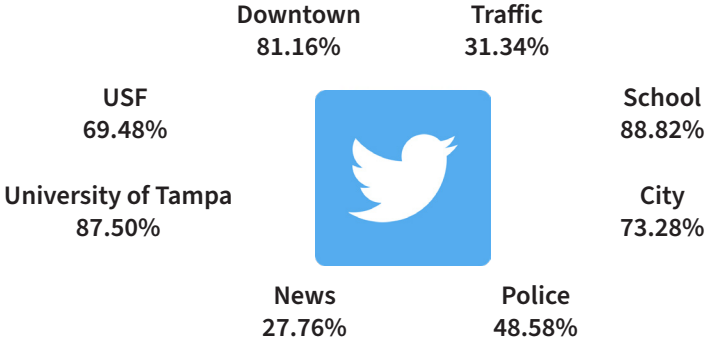
About: Twitter sentiment analysis gives overall sentiment about a region based on the conversations on Twitter about that region.
Source: Twitter API



Deeper Look Into San Antonio's Sentiment (Net Percentage Positive Tweets)



Deeper Look Into Tampa Bay's Sentiment (Net Percentage Positive Tweets)

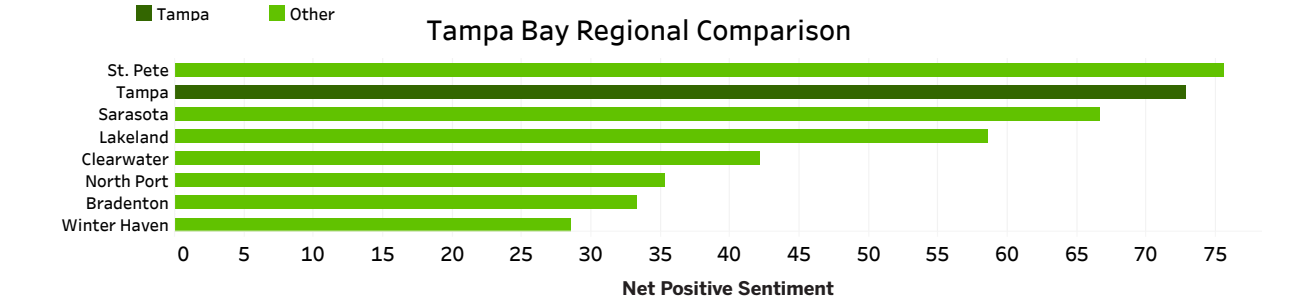


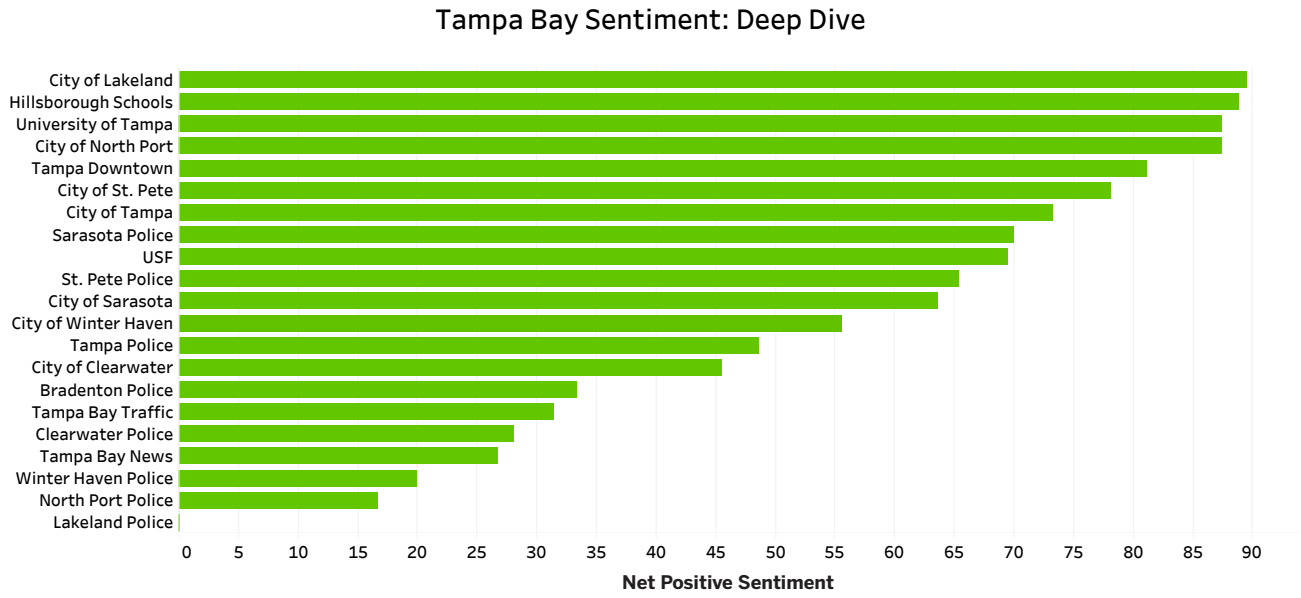
Twitter Sentiment Analysis

SUMMARY OF INSIGHTS AND FINDINGS

St. Petersburg has the overall highest positive sentiment among the cities in the Tampa Bay region.

About: Twtter sentiment analysis gives overall sentiment about a region based on the conversations in twitter about that region.
Source: Twitter API.





Key Insights from Real-Time Signals

- Google Trends indicate that economic inequality is **increasing** for most of the MSAs compared in this study.
- The Tampa Bay region stands **in the middle of the group** in terms of economic inequality and economic mobility.
- Real-time job market signals indicate that Tampa Bay is **falling behind** most of the MSAs in terms of job openings.
- There is a significant gap between talent supply and talent demand in finance and information technology industries in Tampa Bay. This insight signifies **the need to train youth** in the domains of finance and IT to bridge the gap.
- The positive Twitter sentiment for the Tampa Bay region is driven by conversations about **downtown, universities and schools.**

Part 2:
Competitive Trends Based on Traditional Economic Indicators

Outcomes of Interest

This report focuses on the following variables that can be viewed as indicators related to the economic prosperity of a region. While some of these are standard measures used in most such reports, a few are specific to the theme of inclusive growth and prosperity for all.

Income inequality refers to the extent to which income is distributed in an uneven manner among the population. Income distribution is measured using the "Gini index." Economic mobility is measured by the ability of an individual, family or some other groups to move between income strata or quantiles. This report focuses on the following outcome variables:

- Gross regional product per capita
- Poverty rate
- Unemployment rate
- Net migration rate
- Income inequality (Gini index)
- Economic mobility

This report also focuses on the following supplemental variables. Though not directly linked to the outcome variables, the supplemental variables help make sense of personal economic prosperity of the region. The supplemental variables that this report focuses on are:

- Supplemental poverty measure
- Debt-to-income ratio
- Mean house rent

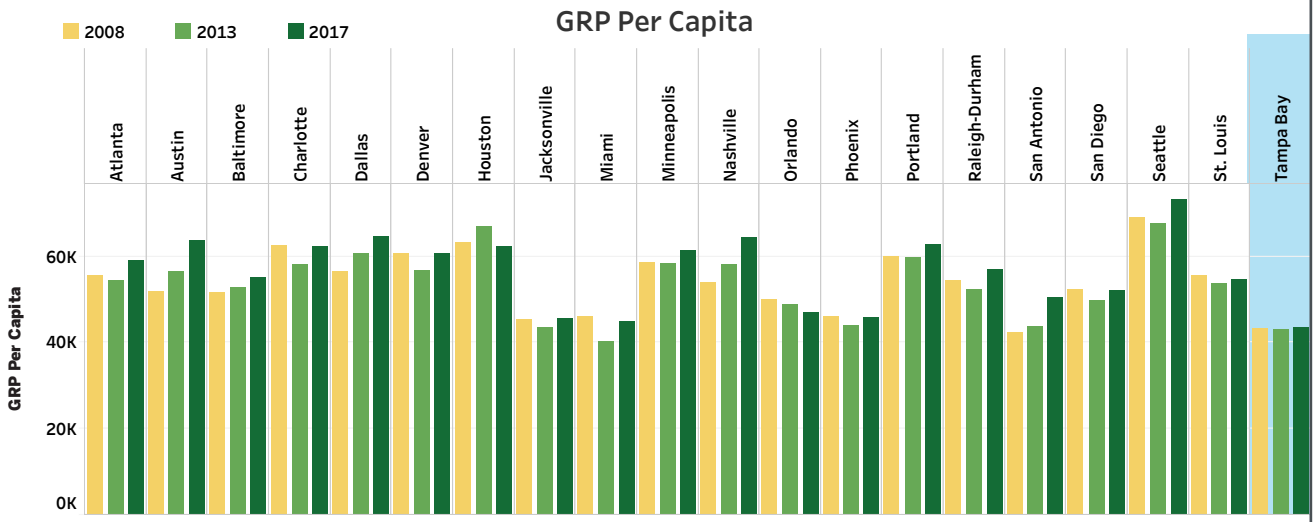
For all outcome variables except economic mobility, the analysis presented in this report is based on data for a 10-year period (2008-2018). For economic mobility, this report uses data from The Opportunity Atlas (opportunityatlas.org).

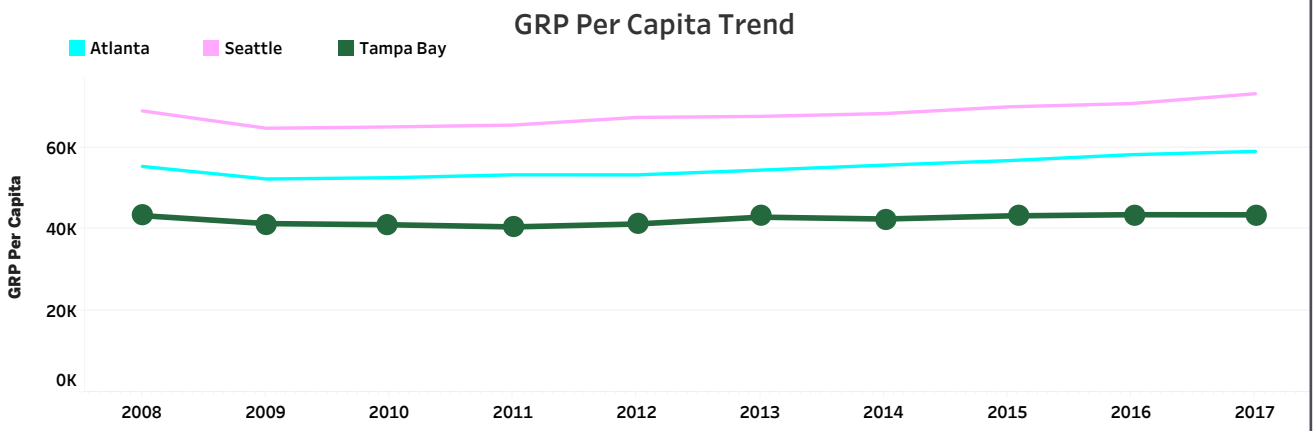
GRP Per Capita

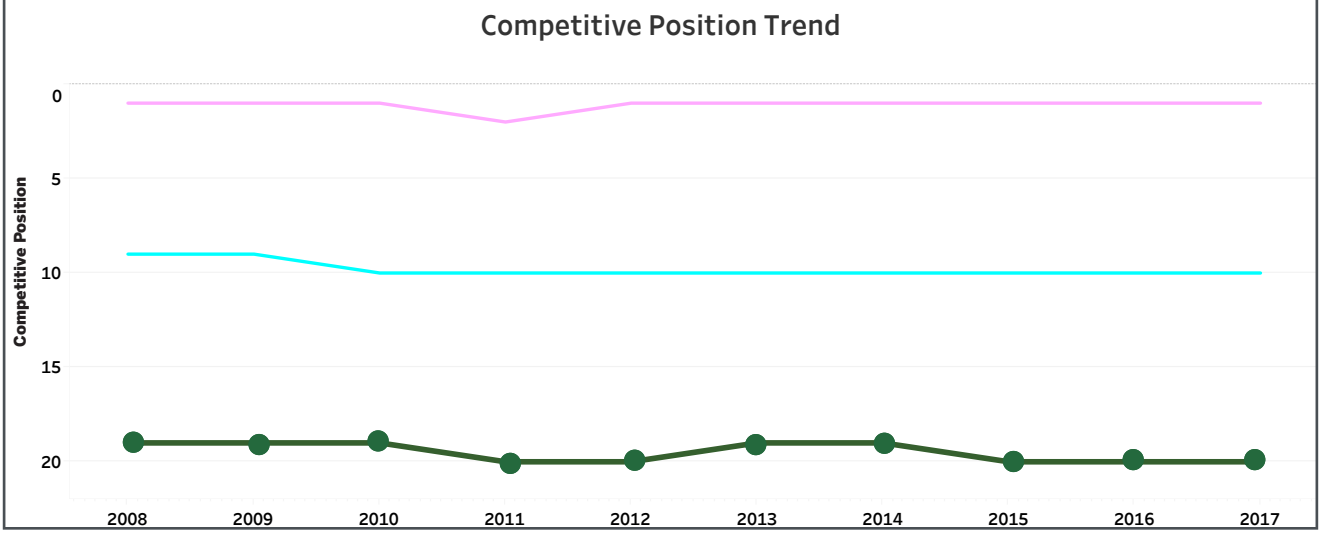
SUMMARY OF INSIGHTS AND FINDINGS

Most MSAs from Florida consistently ranked low in this metric. Most MSAs' GRP per capita dropped in 2009 and Tampa Bay MSA is among few that did not. However, the Tampa Bay MSA has consistently been at the bottom across the years shown.

About: This measurement divides the Gross Regional Product, the value of all goods and services produced in the region, by the population of the region.
Source: Bureau of Economic Analysis, Regional Data, Per Capita Real Gross Domestic Product.





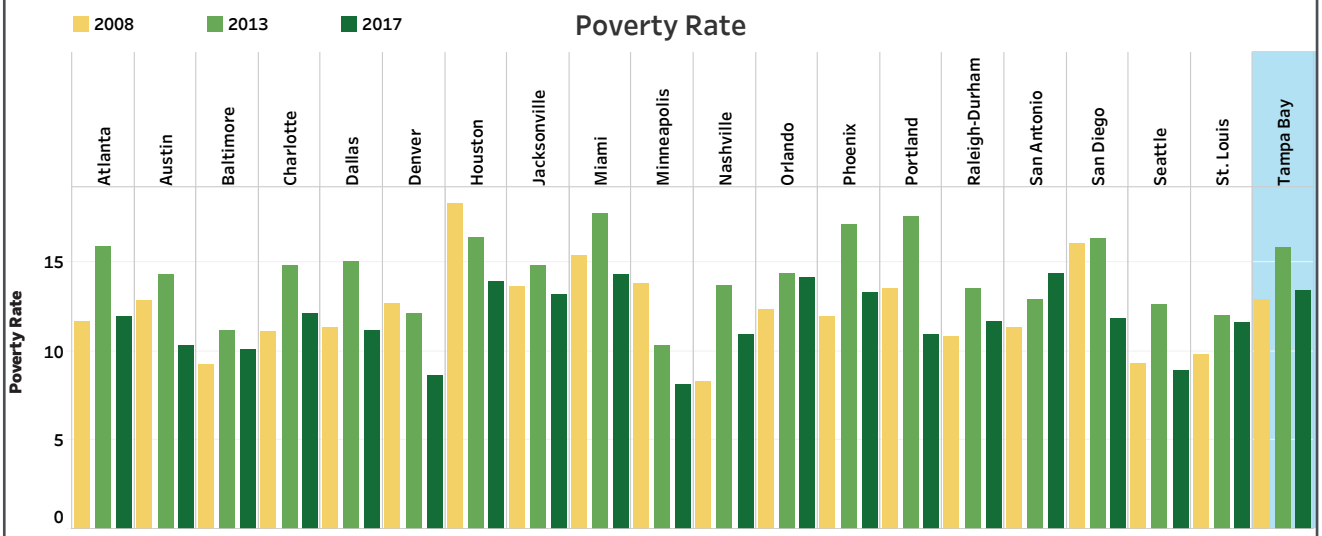


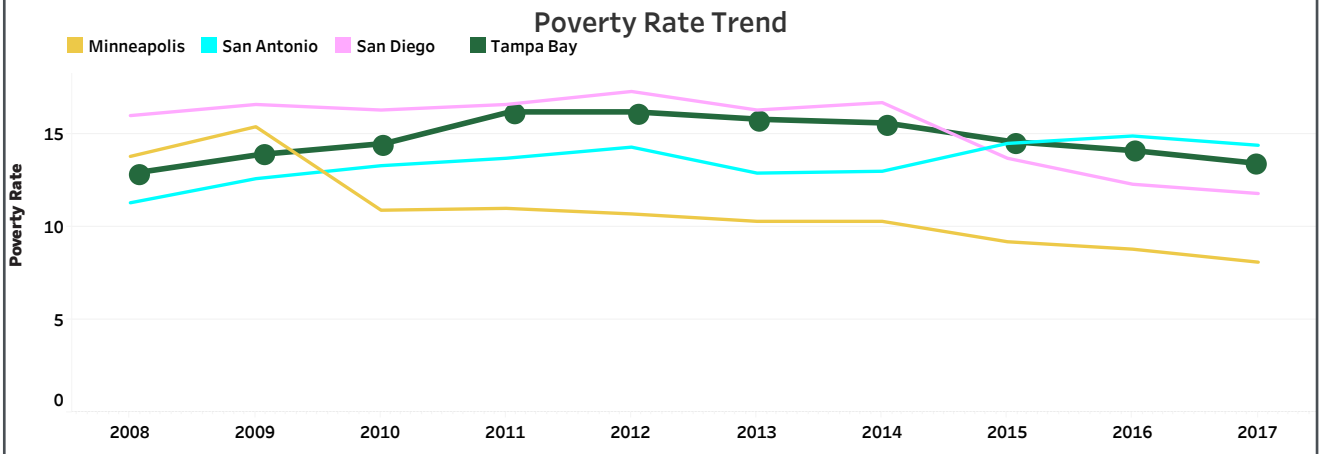
Poverty Rate

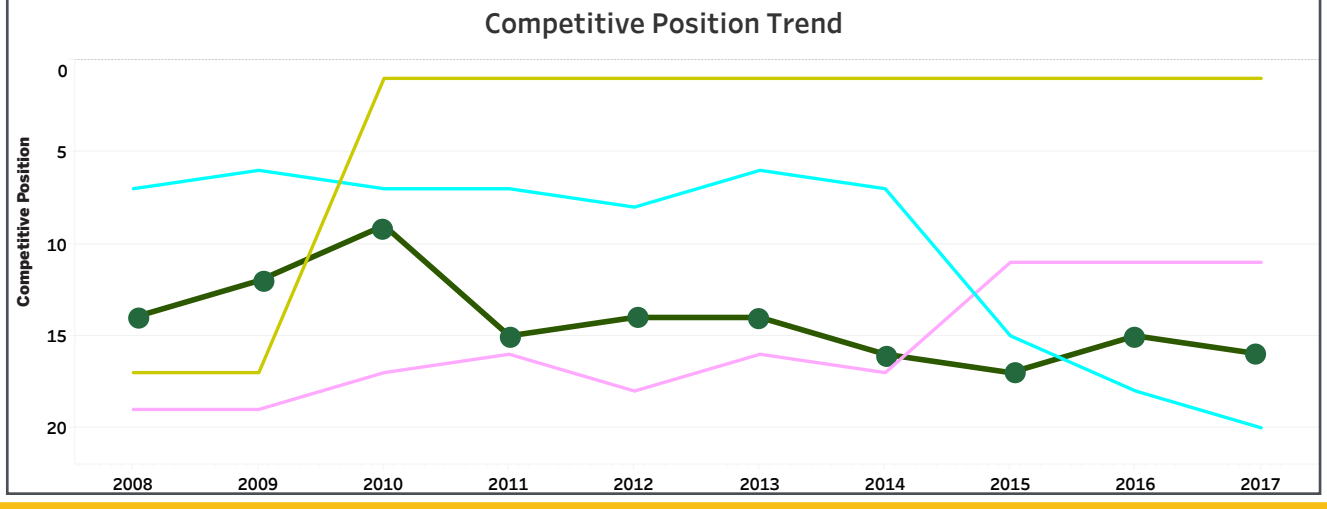
SUMMARY OF INSIGHTS AND FINDINGS

The Tampa Bay region's poverty rate has increased from 2008 to 2011 and has been declining since then. Tampa Bay's competitive position declined from 10 in 2010 to 16 in 2017. Minneapolis has consistently recorded the lowest poverty rate among the MSAs in the comparison group.

About: Measures the percentage of population that is living below the federal poverty level as defined by the U.S. Census Bureau (Income thresholds vary by family size).
Source: U.S. Census Bureau, American Community Survey.





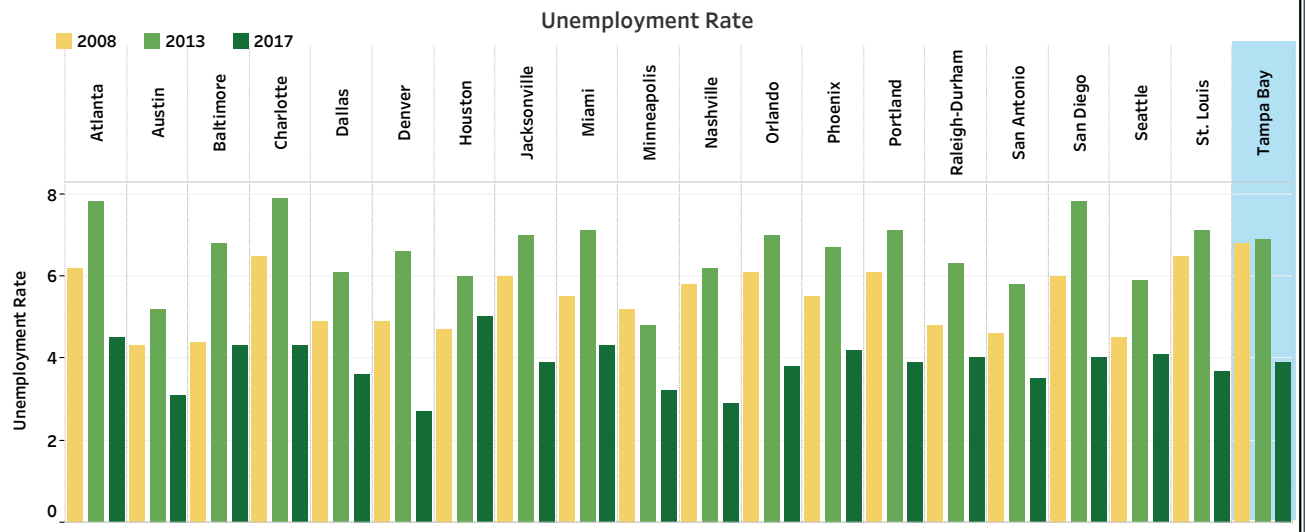


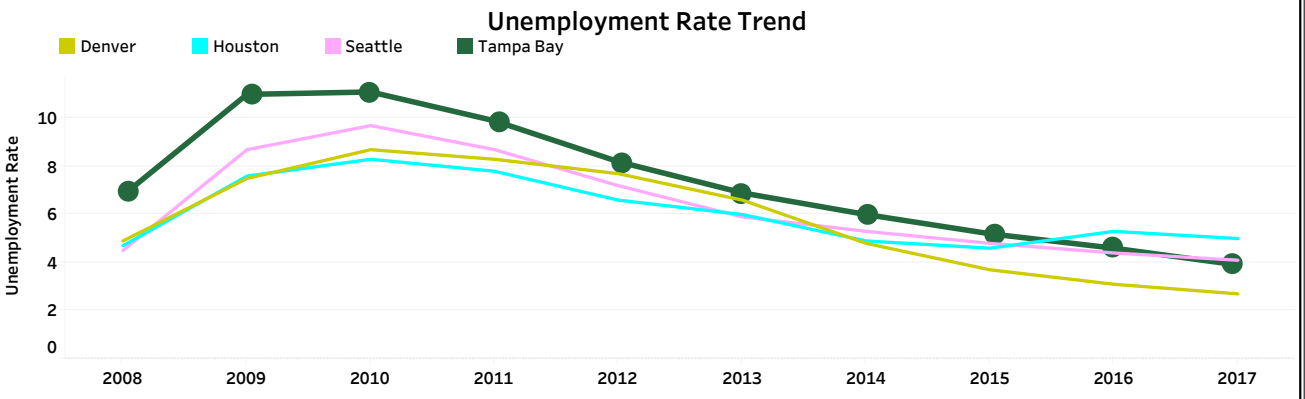
Unemployment Rate

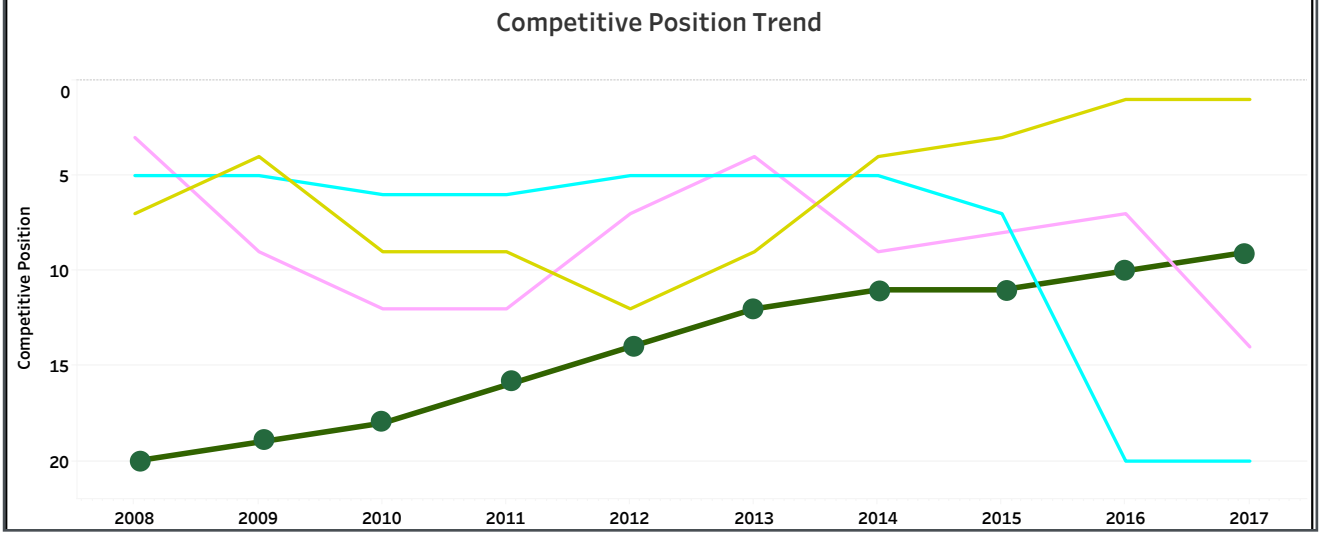
SUMMARY OF INSIGHTS AND FINDINGS

The Tampa Bay region made a significant progress during 2013-2017 than during 2008-2013. Unemployment rate for Tampa Bay, as with most MSAs compared, has seen consistent decline. The unemployment rate for all the 20 MSAs was higher in 2013 than in 2008 and 2017.

About: Measures the share of the labor force that is jobless. Generally, an individual is considered unemployed if he or she is willing and able to work but unable to find a job.
Source: U.S. Bureau of Labor Statistics, local area unemployment statistics.





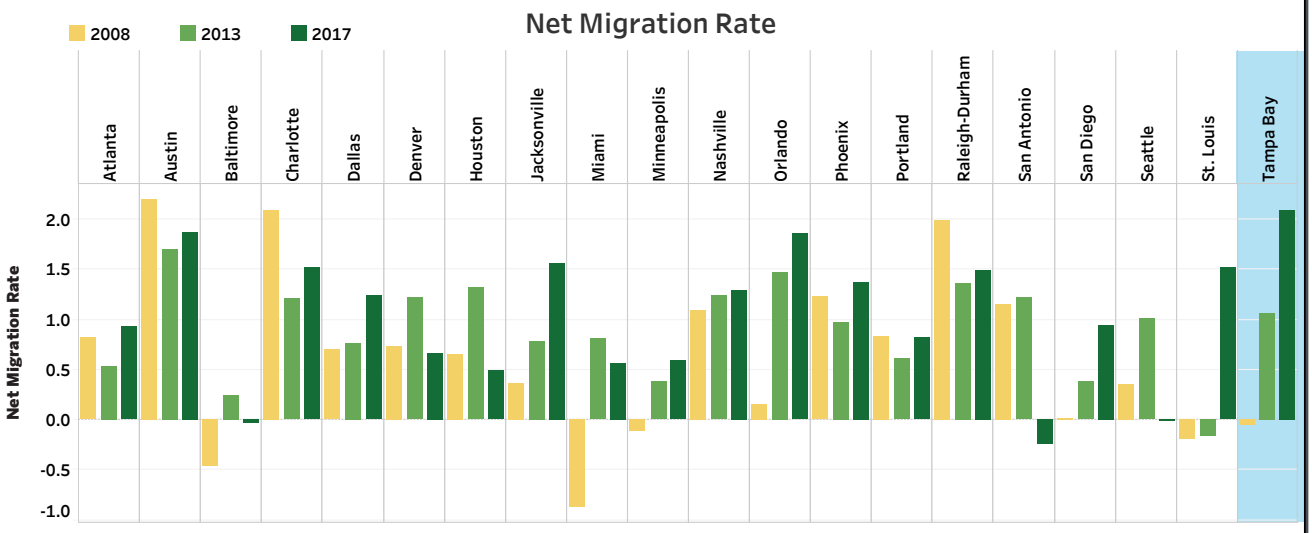


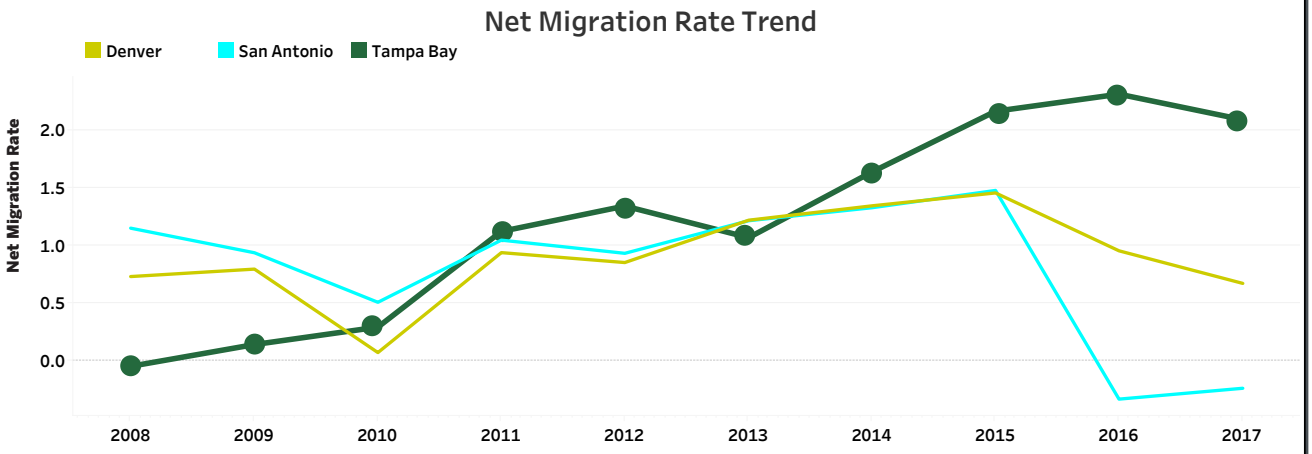
Net Migration Rate

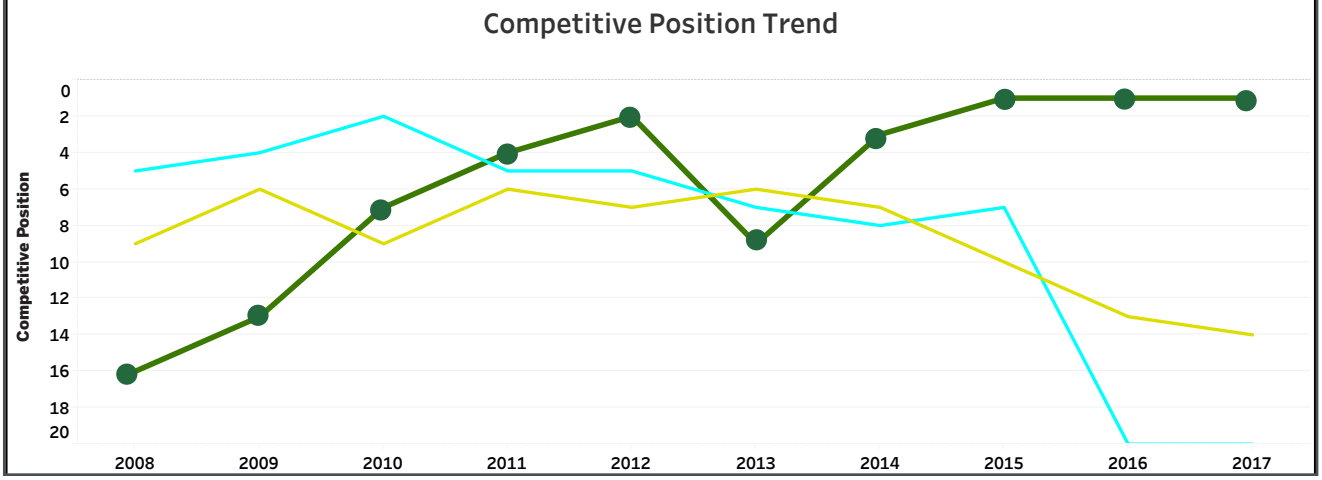
SUMMARY OF INSIGHTS AND FINDINGS

The Tampa Bay MSA has registered a strong growth in net migration rate over the last decade. Tampa Bay has maintained No. 1 position in the recent years. Some MSAs, including Tampa Bay, experienced negative net migration due to the 2008 economic recession.

About: Net migration rate is calculated as population change, less the net effect of natural increase (births minus deaths) relative to the population as a whole.
Source: U.S. Census Bureau, Estimates of the Components of Resident Population Change.







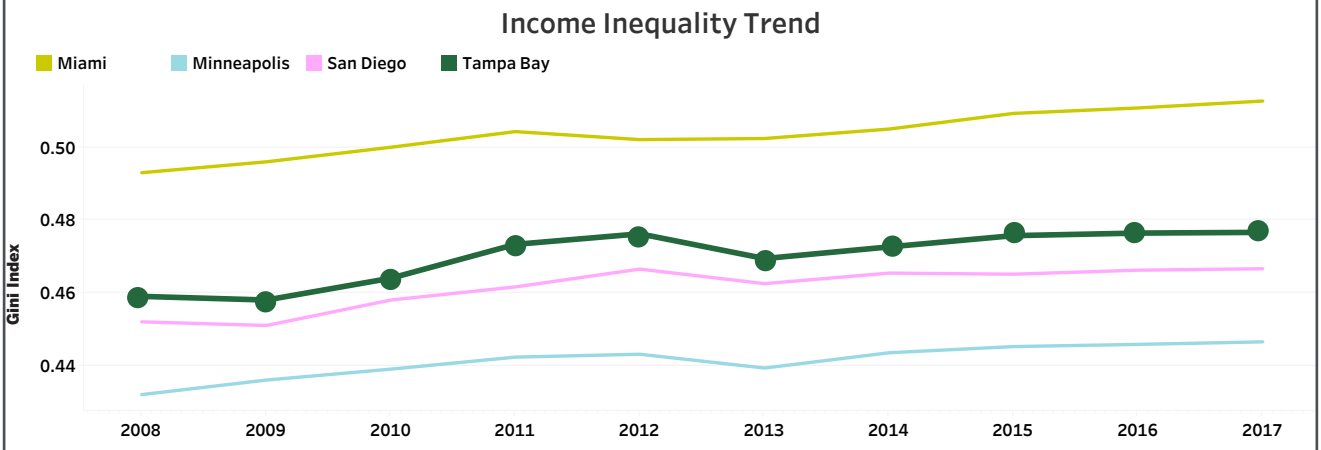
Income Inequality (Gini Index)

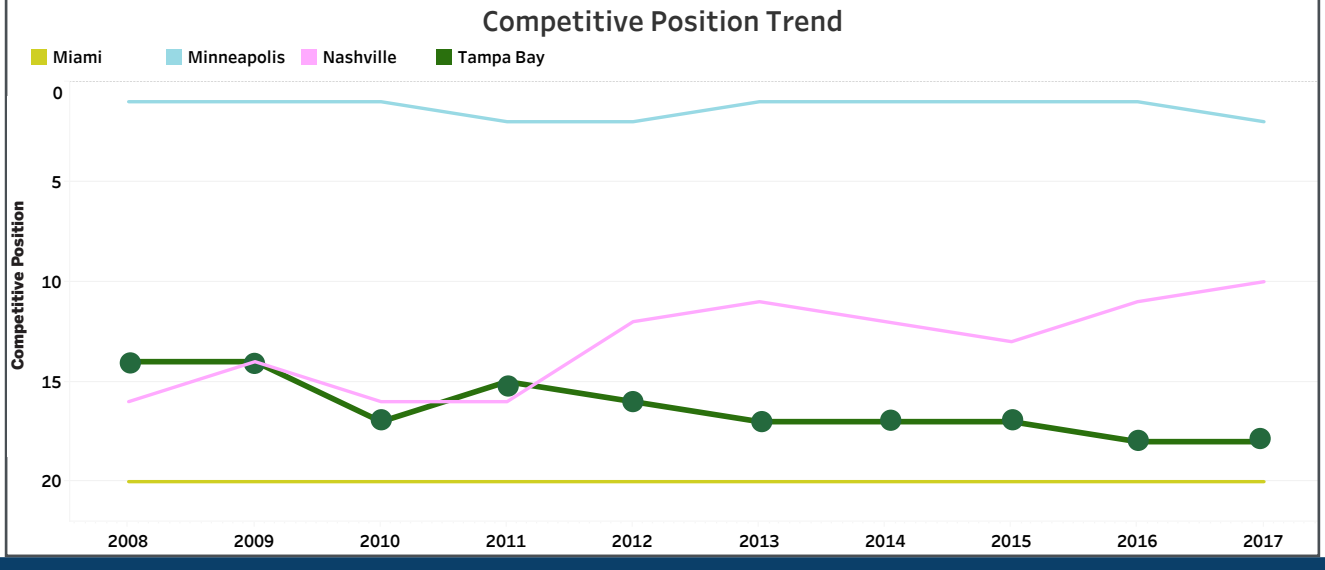
SUMMARY OF INSIGHTS AND FINDINGS

Minneapolis consistently outperformed most of the MSAs. Miami remained at the bottom of the chart in terms of competitive position for all the years. Income inequality has been increasing for most of the MSAs over the years. The competitive position of the Tampa Bay MSA in terms of income inequality in 2016-17 is at all time low in the last decade.

About: Income inequality refers to the extent to which income is disributed in an uneven manner among the population. Income inequality is measured by gini index, which ranges from 0 to 1. Gini index of 0 implies perfect income equality, i.e., every individual receives equal share. Gini index of value 1 indicates perfect income inequality, which implies that only one individual receives all the income.

Source: U.S. Census Bureau, American Community Survey.





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Economic Mobility

Economic mobility broadly captures the ability of people to move from a lower income stratum to higher income strata. This is measured using two variables: Absolute mobility and relative mobility.

Absolute Economic Mobility

One way of determining absolute economic mobility is to examine the average income percentile of children whose parents were at the 25th percentile of the national income distribution. If the children are at a higher income percentile than 25, then it indicates that there has been positive economic mobility. The higher the income percentile of the children, the higher the absolute economic mobility. For example, if, in region A, the children of parents who were at 25th percentile are at the 40th percentile, and in region B, the children of parents who were at 25th percentile are at the 32nd percentile, then one can conclude that region A has experienced higher economic mobility than region B.

"The Opportunity Atlas" is an interactive database with a user-friendly tool to assess the economic mobility across various regions in the United States. This tool provides an in-depth understanding of how the average outcomes (for example, household income) of children varied by demographic subgroups.

"Which neighborhoods in America offer children the best chance to rise out of poverty?" is the kind of question can be answered by using data from the Opportunity Atlas.

The research paper *"The Opportunity Atlas: Mapping the Childhood Roots of Social Mobility"* by Raj Chetty, John N. Friedman, Nathaniel Hendren, Maggie R. Jones and Sonya R. Porter provides detail on how this publicly available dataset was constructed to examine children's outcomes in adulthood using anonymized longitudinal data covering nearly the entire U.S. population. The sources of data used in this process were (1) the U.S. Census 2000 and 2010 short forms; (2) federal income tax returns from 1989, 1994, 1995 and 1998-2015; and (3) the U.S. Census 2000 long form and the 2005-2015 American Community Surveys.

Relative Economic Mobility

Relative mobility refers to the expected difference in the income percentile rank of children belonging to two parents whose income percentile rank differs by 1 unit.

For example, consider region A, with relative economic mobility of 0.2. This implies that the gap in income percentile of children of parents at the 10th percentile of income distribution and those of the parents at the 20th percentile is going to be, on average, 2.

Hence, the children of these parents are closer to each other in their (percentile) ranks within their cohort, compared to how close the parents were to each other in their (percentile) ranks within their cohort. Relative economic mobility is often used to check how much individuals "move" across income percentile ranks as compared to their parents.

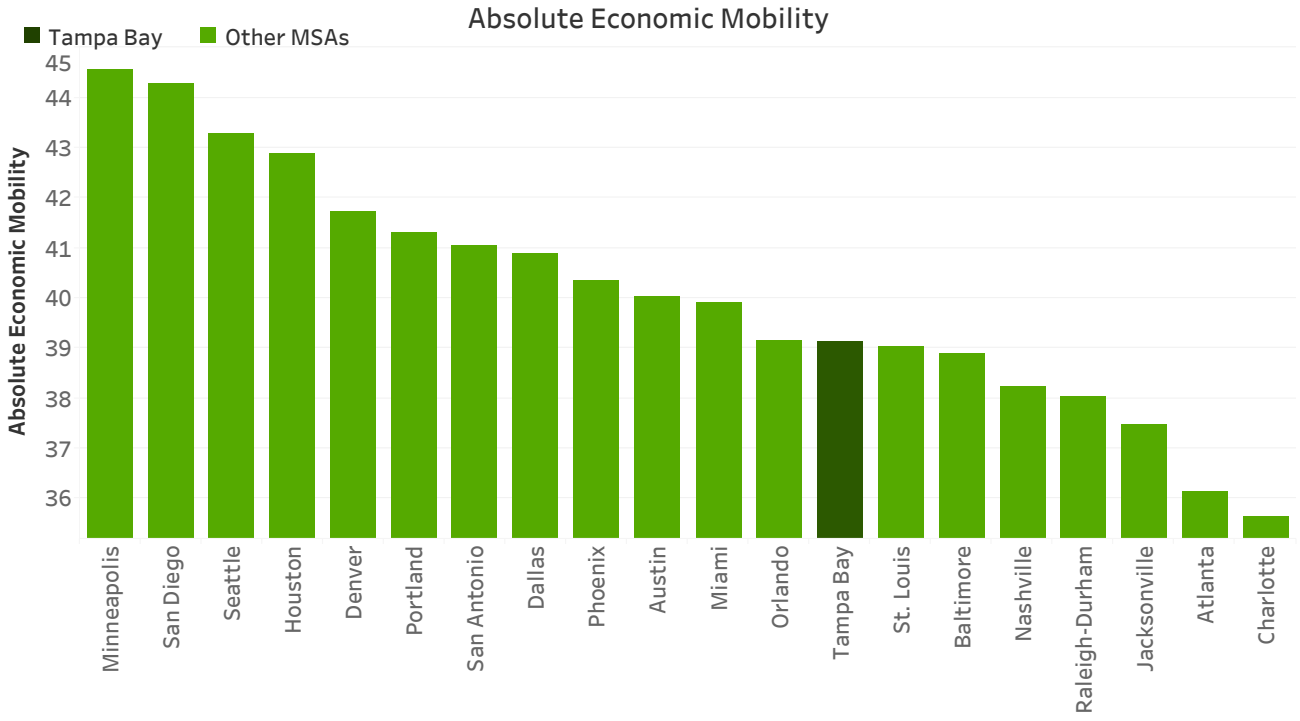
(Source: Table 4 in the 'Geography of Mobility: Metropolitan Statistical Area Intergenerational Mobility Statistics' dataset from https://opportunityinsights.org/data/)

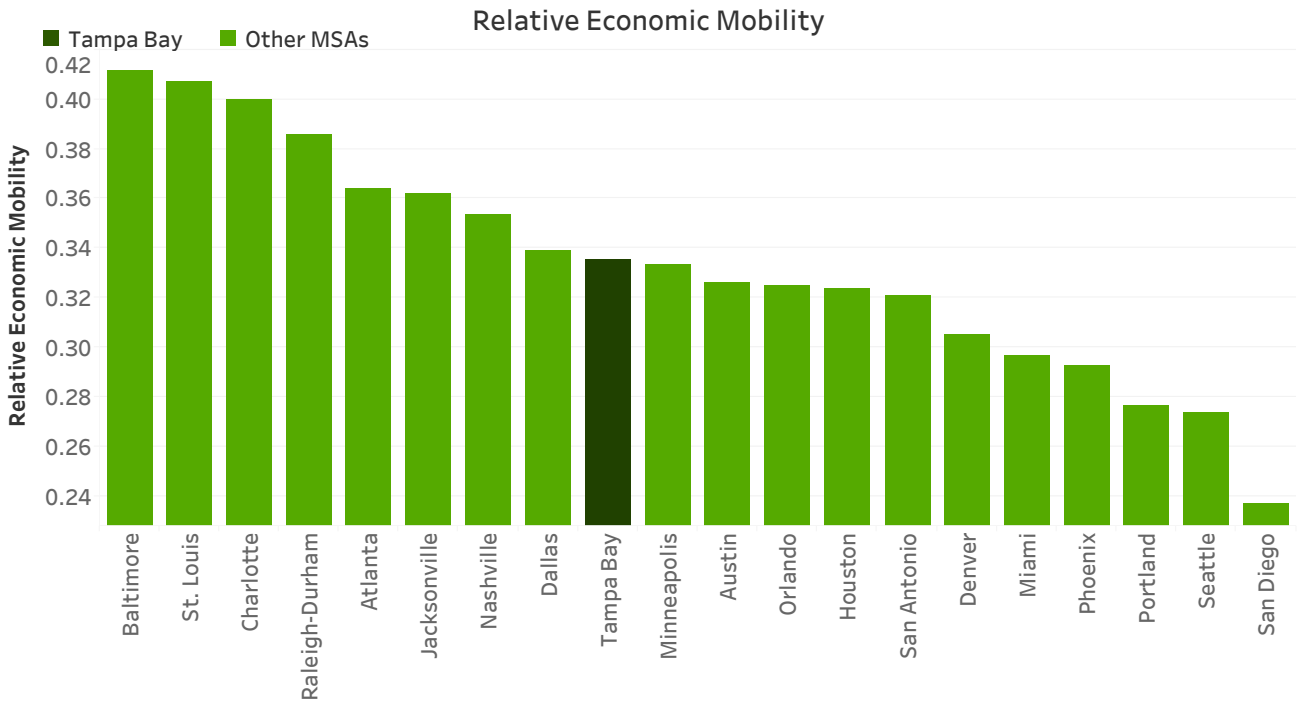
OPPORTUNITY INSIGHTS

SUMMARY OF INSIGHTS AND FINDINGS

The Tampa Bay MSA is at No. 13 in terms of absolute economic mobility. Minneapolis achieved the highest absolute economic mobility in the MSAs considered for this study.

About: The absolute mobility is the average rank of the children whose parents are at 25 percentile in the income ranking (measured on a scale of 0-100). Relative mobility is the increment in the rank of the child with an increment in the rank of the parent in terms of income.
Source: Opportunity Insights.





Supplemental Poverty Measure (SPM)

The official poverty measure (poverty rate) was developed in the early 1960s and only a few minor changes have been made since then. According to this measure, a family's poverty status is determined by comparing its before-tax income to that of the poverty threshold value. This threshold value represents the cost of a minimal diet multiplied by three (in the 1960s the average family spent about a third of their income on food).

After many years of research, analysis and debate, the Interagency Technical Working Group suggested a new measure to supplement the current measure of poverty, which is the "Supplemental Poverty Measure."

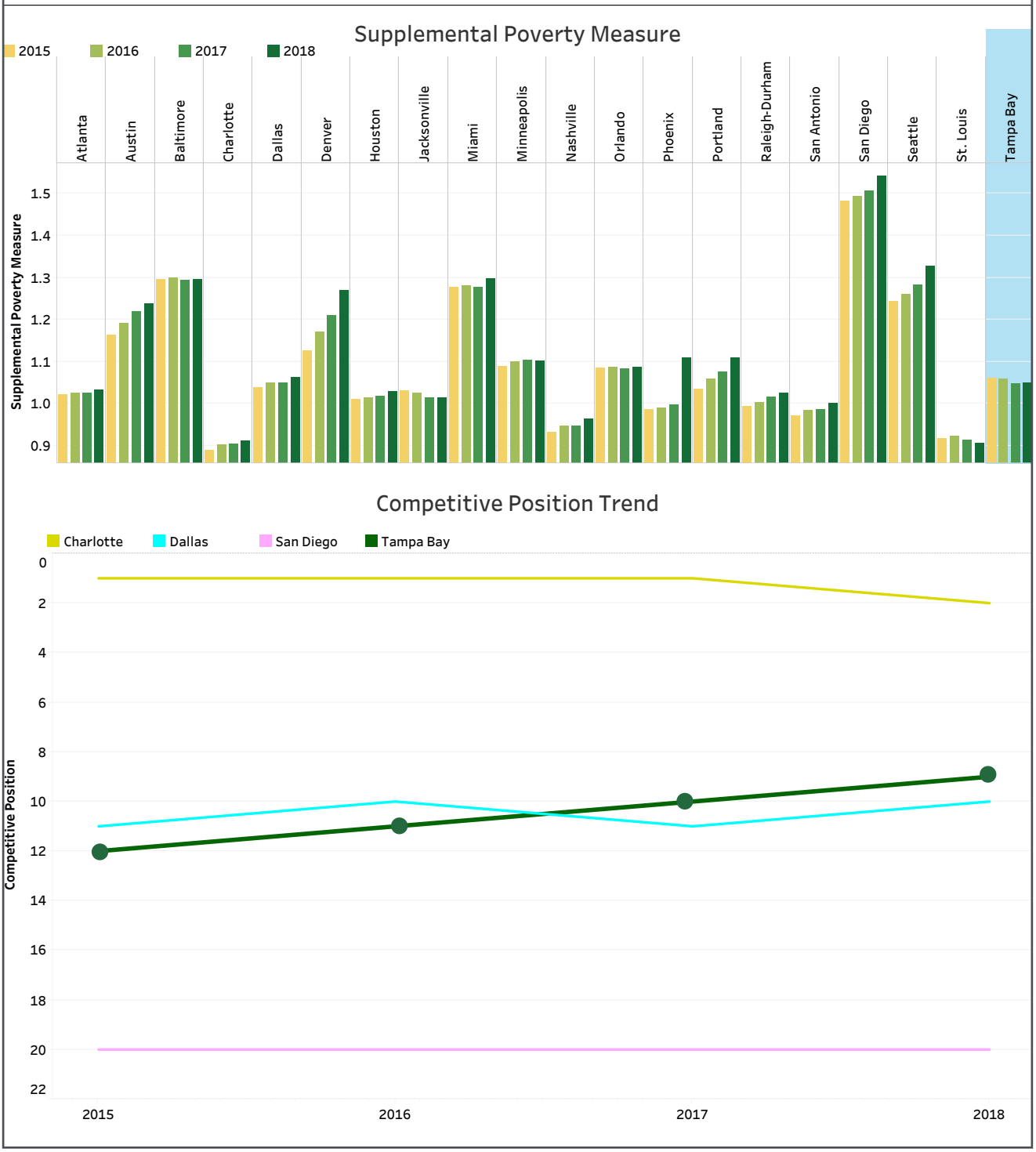
While the official poverty measure is based on cash resources, the SPM, in addition to cash resources, considers non-cash benefits and subtracts necessary expenses (such as taxes and medical expenses). Though the SPM is a more nuanced indicator that captures aspects that traditional poverty indicators do not, it should not be viewed as a substitute for the currently used poverty rate measure.

Supplemental Poverty Measure

SUMMARY OF INSIGHTS AND FINDINGS

Charlotte holds the first rank for having lowest value of SPM for all the years (2015 to 2018). There is significant gap in the values of SPM for Seattle and San Diego, both holding the No. 19 and No. 20 positions, respectively. The Tampa Bay MSA has been improving slightly over the years.

About: A measure of poverty that considers non-cash benefits in addition to cash resources and subtracts necessary expenses such as taxes and medical expenses.
Source: U.S. Census Bureau, American Community Survey.

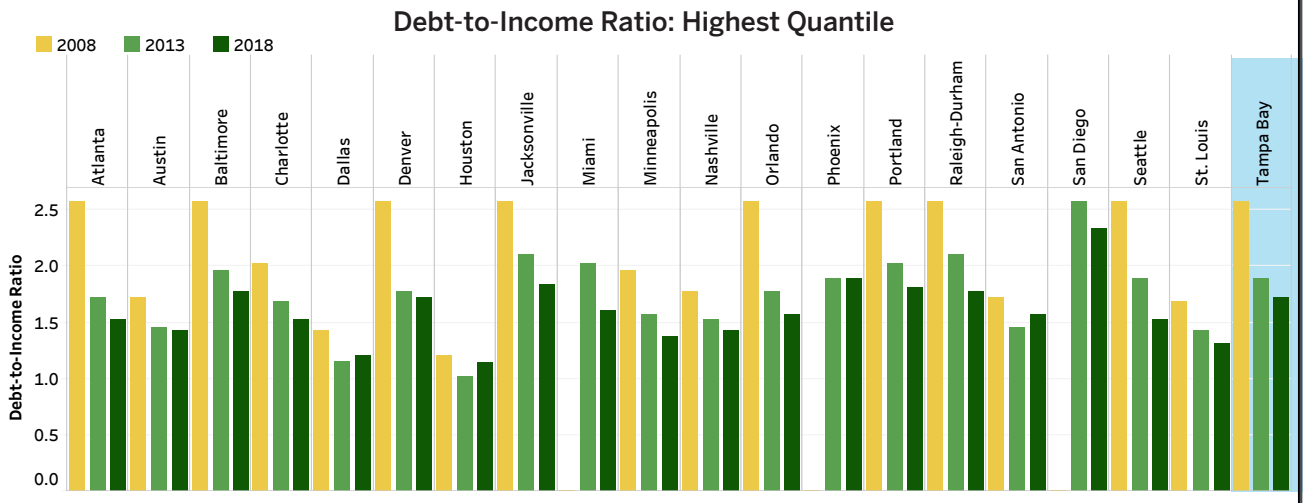


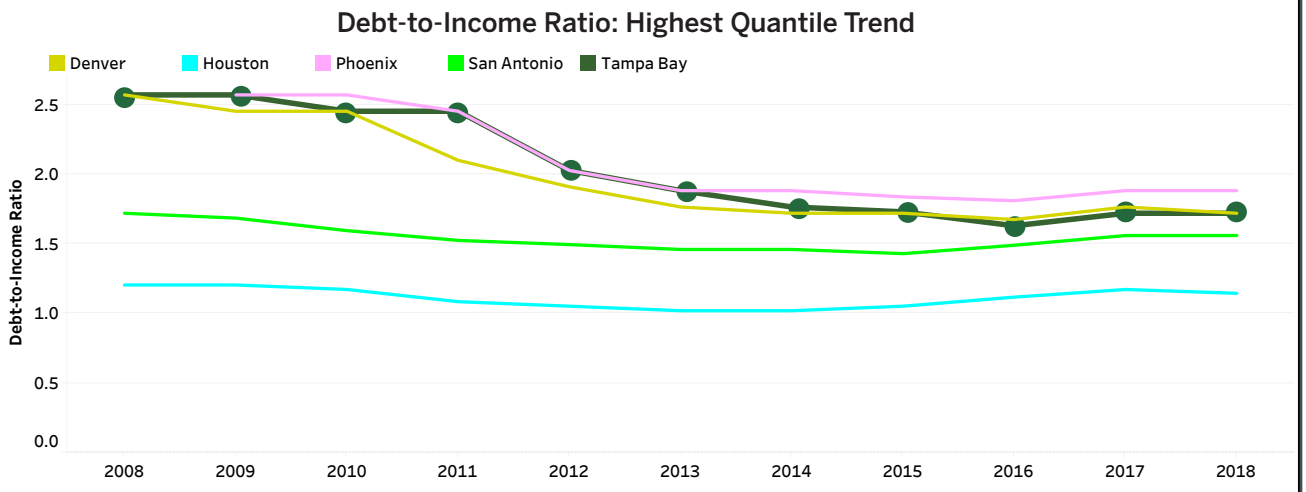
Debt-to-Income Ratio

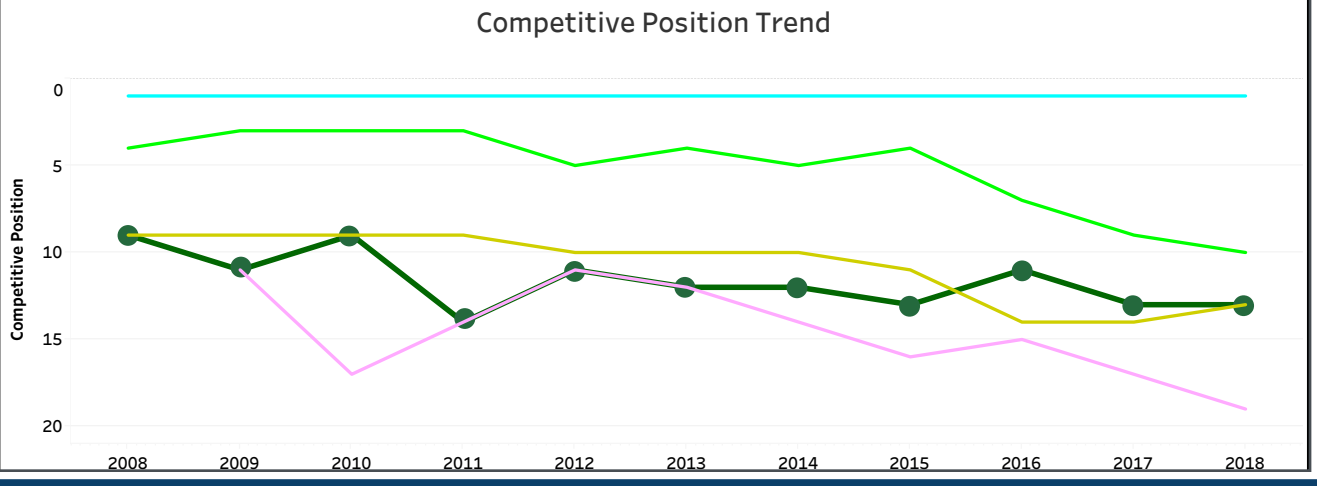
SUMMARY OF INSIGHTS AND FINDINGS

Houston maintained No. 1 position for all years consistently. In 2018, San Diego was the only MSA with household debt-to-income ratio greater than 2.

About: Measures the MSAs household debt relative to the household income for each MSA.
Source: Board of Governers of the Federal Reserve System.







SUMMARY OF INSIGHTS AND FINDINGS

Mean house rents in Seattle, San Diego and Denver increased at higher rates compared to other MSAs. Unlike zero bedroom, four bedroom mean rents never decreased over the years for all the MSAs.

About: Rent estimates at the 50th percentile (or median).
Source: Office Of Policy Development And Research.

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Key Insights from Traditional Economic Indicators

- The Tampa Bay region has consistently ranked **lowest** in the group in terms gross regional per capita.
- The Tampa Bay region's poverty rate has been **declining** for the past few years.
- Income inequality for the Tampa Bay region is **increasing**, as it is with most other MSAs.
- The Tampa Bay region is in the **lower half** of the comparison group in terms of absolute economic mobility.
- Debt-to-income ratio has been **declining** over the years for most of the MSAs, including Tampa Bay.

Part 3:
Identifying Drivers of Economic Outcomes

In the previous section, we looked at the performance of Tampa Bay region in comparison to other MSAs on various indicators of inclusive economic growth. The trend graphs enable us to see the direction in which the region is moving in terms of competitive position as well as actual values across the outcomes. At this juncture, a couple of questions arise.

1. Can we do something to perform better?
2. Are there any policy initiatives that might be taken to improve the competitive position of the Tampa Bay region in coming years?

To answer these questions, econometric models were built to identify the drivers of inclusive economic growth.

The independent variables used for the analysis are possible drivers of the economic growth. These variables fall into five different categories: economic vitality, talent, infrastructure, civic quality and innovation. These possible driver variables have been identified after many interviews with the business leaders from the greater Tampa Bay region. A total of 19 variables were considered for the analysis. The annual data for these variables for the MSAs from 2008 through 2017 was collected from federal sources such as the U.S. Census Bureau, U.S. Bureau of Labor Statistics and the U.S. Bureau of Economic Analysis.

The data for the four Tampa Bay MSAs (Tampa-St. Petersburg-Clearwater, Homosassa Springs, Lakeland-Winter Haven and North Port-Sarasota-Bradenton) was aggregated to derive the values for the Tampa Bay region and the data for Raleigh and Durham was aggregated to derive the values for Raleigh-Durham region. In summary, this report uses data for six outcome variables (for economic mobility outcome variable different strategy was used as described below) and 22 possible economic drivers for 20 regions for 10 years. The data was adjusted for the cost of living and inflation.

Panel data methods were used to create models for each outcome. For each of the outcomes, multiple drivers were identified. One prime driver for each outcome was identified based on the strength of potential causal explanation.

The outcome variable of economic mobility has data that compares the outcome over two time intervals. Thus, this data cannot be included in the panel data model as there is only one number for each MSA which reflects opportunities for economic mobility over a long time period (around 40 years). In order to identify drivers for economic mobility, this report adopts an innovative approach. The driver for economic mobility is identified by using a regression analysis where the outcome variable (or y variable) value for each MSA is derived from the Opportunity Atlas, and the values of each of potential drivers (or x variables) are derived by taking the average values of each variable over the time period.

Drivers of Inclusive Economic Growth

The significant drivers for each of the indicators of inclusive economic growth are given in the tables below. The sign indicates the direction of impact. The plus (+) sign indicates the impact in the positive direction which implies that as the value of the driver variable increases, the value of the outcome variable of interest increases. Similarly, the minus (-) sign indicates the impact in negative direction. The report identifies one primary driver for each of the outcome economic indicator as an actionable driver. The choice was made based on the strength of causal explanation. The primary drivers, which are highlighted in yellow, can be used for policy initiatives.

Unemployment Rate	
Mean Household Income Lowest Quintile	-
Educational Attainment (Graduates/Professional)	-
Mean Commute Time	-
Net Business Establishment Entry Rate	-
Labor Force Participation Rate (25-64)	+
Mean House Value Per Square Feet	-

GRP Per Capita	
Mean Household Income Lowest Quintile	+
Average Wage Rate	+
Mean Commute Time	-
Transit Availability	+
Share of Commuters with 1+ Hour of Commute Time	+
University R&D Expenditures	+
Business Establishment Start Rate	+

Net Migration Rate	
Mean Household Income Lowest Quintile	+
Air Traffic Growth Rate	+
Mean Commute Time	+
Merchandise Exports Growth Rate	-
Labor Force Participation Rate (ages 25-64)	-

Poverty Rate	
Mean Household Income Lowest Quintile	-
Transit Availability	-
Share of Commuters with 1+ Hour of Commute Time	+
Mean House Value Per Square Feet	-
Labor Force Participation Rate (ages 25-64)	-

Income Inequality	
Transit Availability	-
Stem Degree Production Per Capita	-

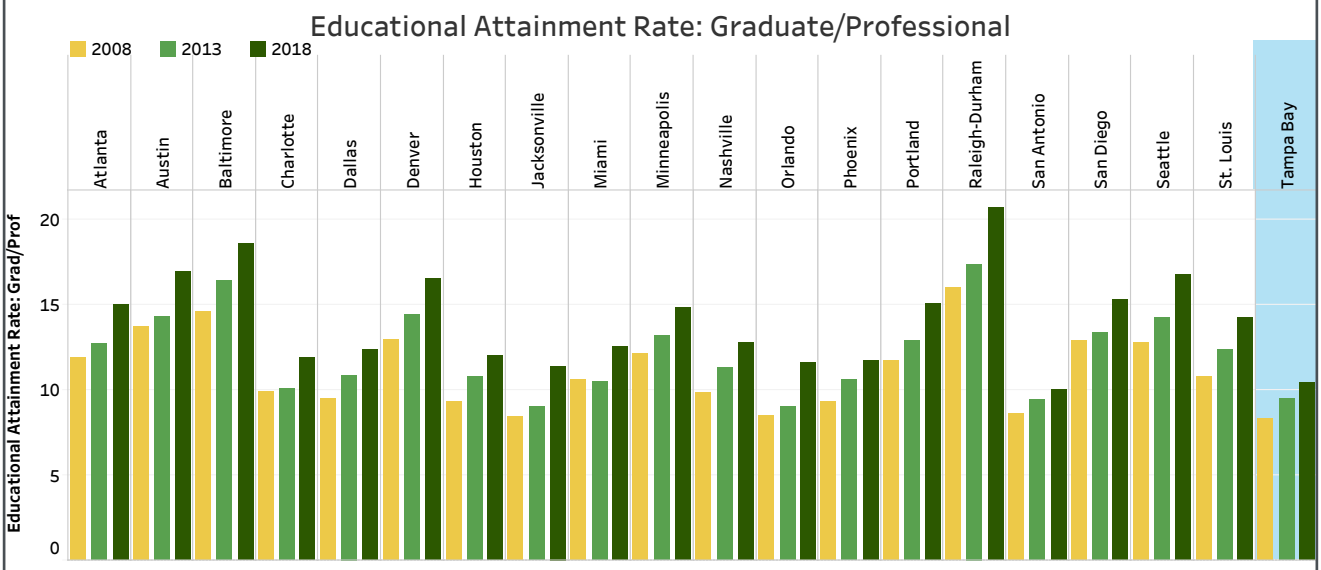
Economic Mobility	
Transit Availability	+

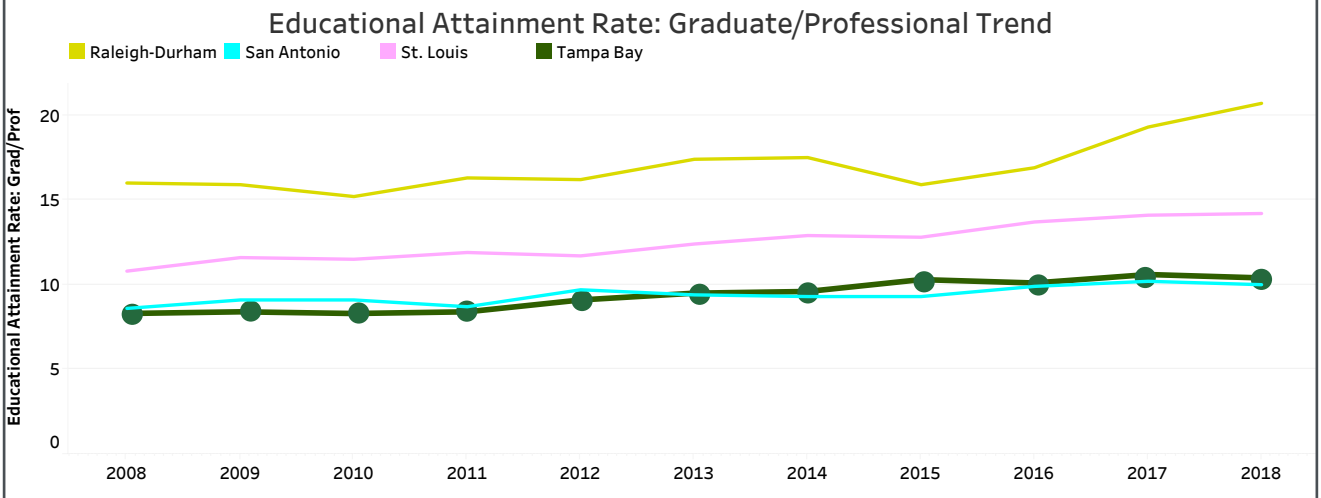
Educational Attainment Rate: Graduate/Professional

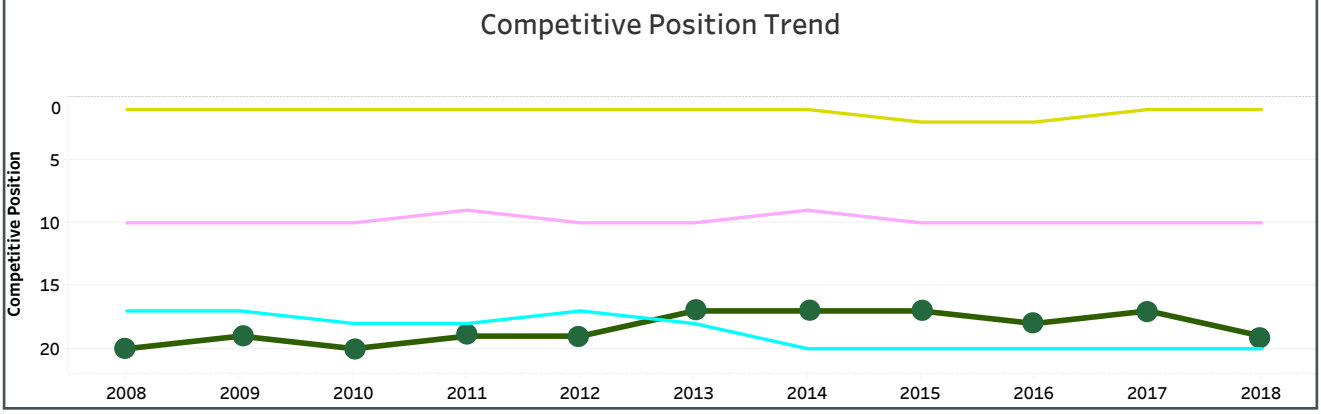
SUMMARY OF INSIGHTS AND FINDINGS

Tampa Bay's educational attainment (graduate/professional) has consistently increased over the years. Raleigh-Durham has the highest graduate attainment rate for 8 of the 10 years and has been maintaining No. 1 position for all the years.

About: Measures the percentage of the population, 25 years or older, who have attained a graduate or professional degree.
Source: U.S. Census Bureau, American Community Survey.





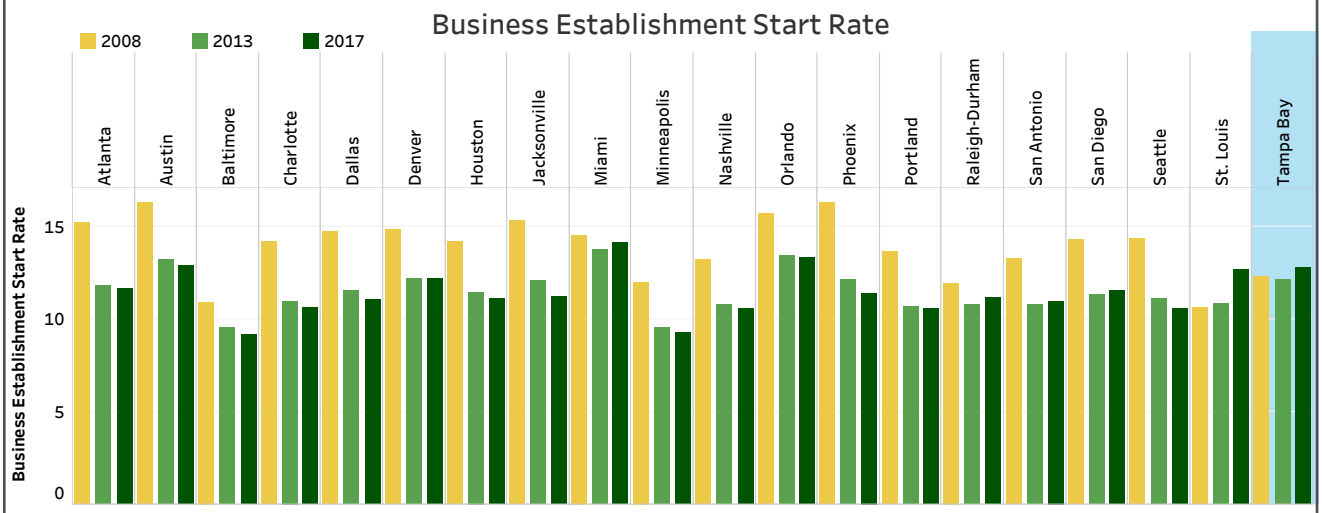


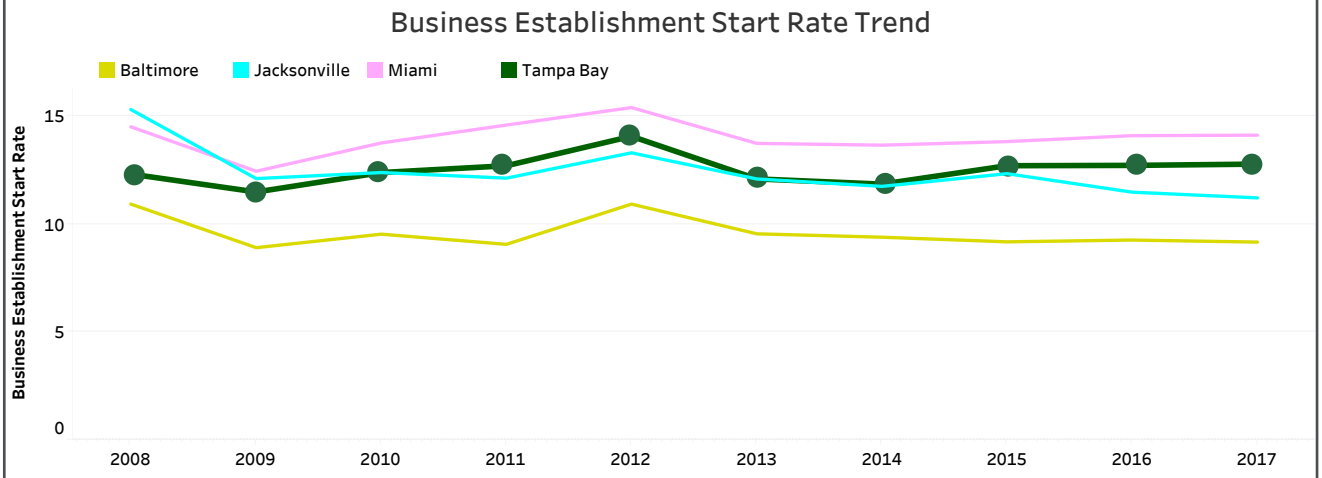
Business Establishment Start Rate

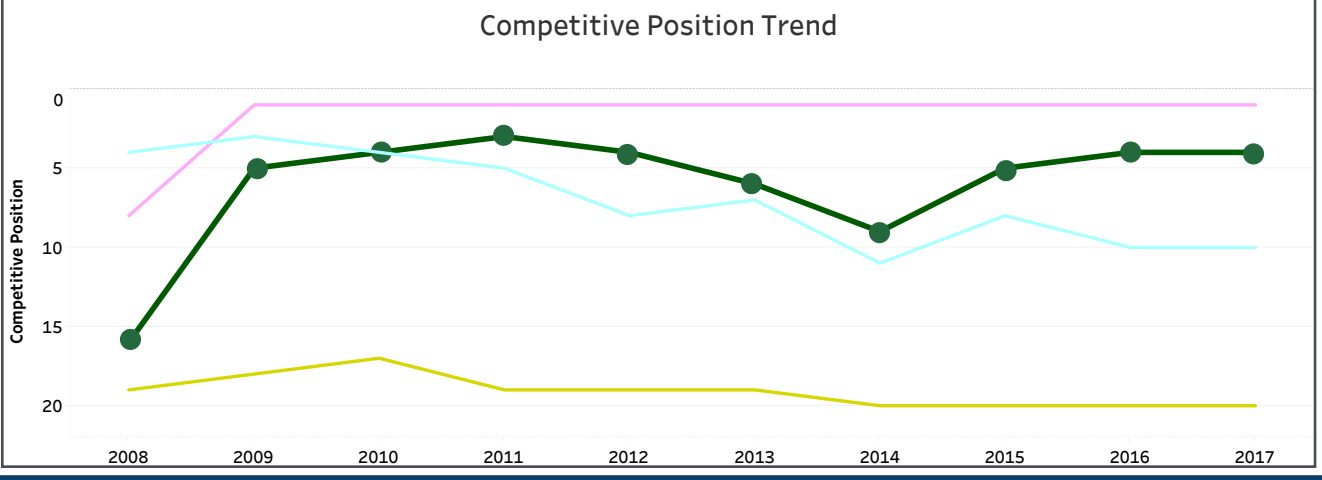
SUMMARY OF INSIGHTS AND FINDINGS

The Tampa Bay region started at No. 16 in 2008 and has made significant progress to stand currently at the 4th position. Tampa Bay and St.Louis are the only MSAs where the most recent net business establishment rate is higher than it was in 2008 just prior to the recession.

About: Measures the number of new businesses (with employees) started in a year, divided by the number of businesses (with employees) in the previous year.
Source: U.S. Census Bureau, Business Dynamic Statistics, Establishment Characteristics Data Tables.





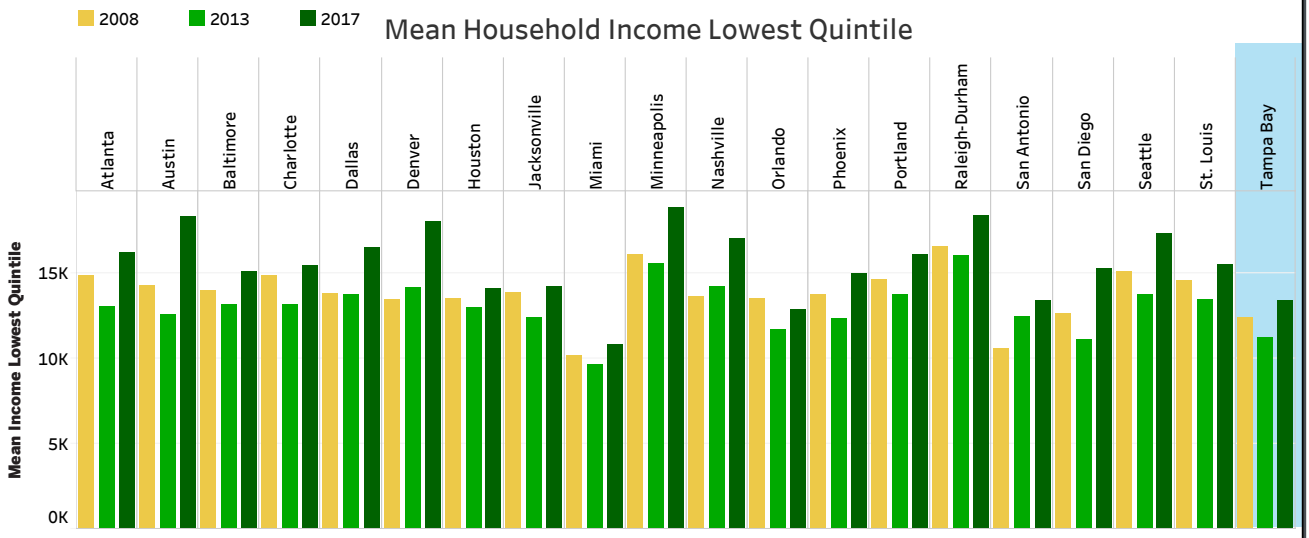


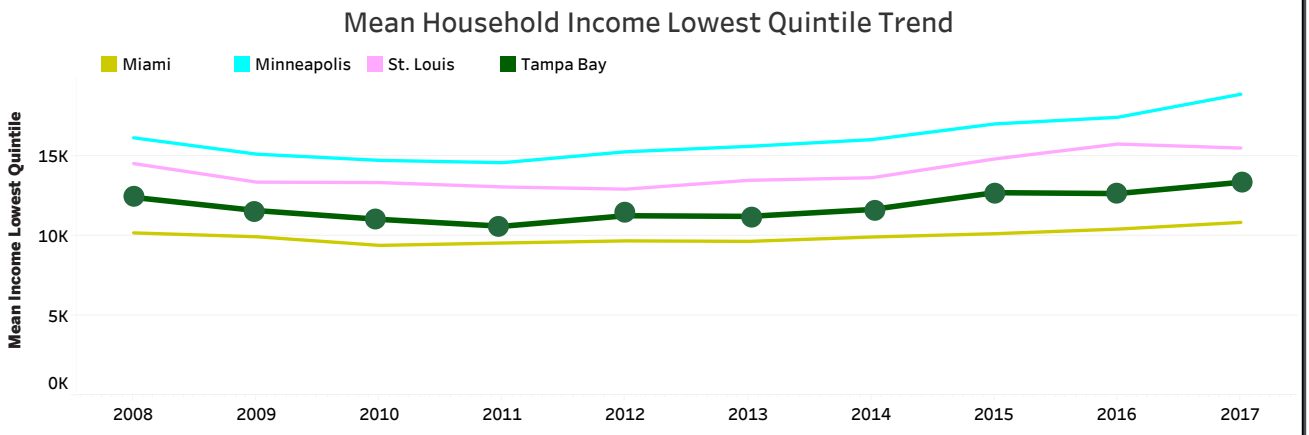
Mean Household Income Lowest Quintile

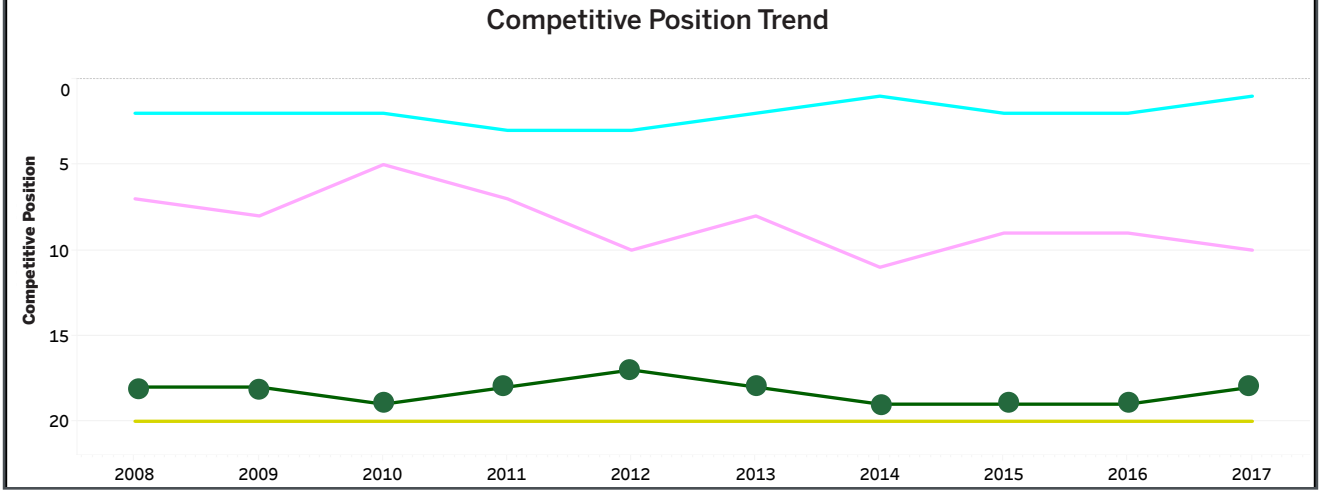
SUMMARY OF INSIGHTS AND FINDINGS

The Tampa Bay region saw a slight decline in median household income from 2008 to 2011 but has gradually improved since then. The Tampa Bay region has been fluctuating between position 17 and 19 in the competitive positions since 2008. Miami has been consistently held bottom spot in the competitive positions.

About: Measures the average household income for the households that have income in the lowest 25% of all households.
Source: U.S. Census Bureau, American Community Survey.





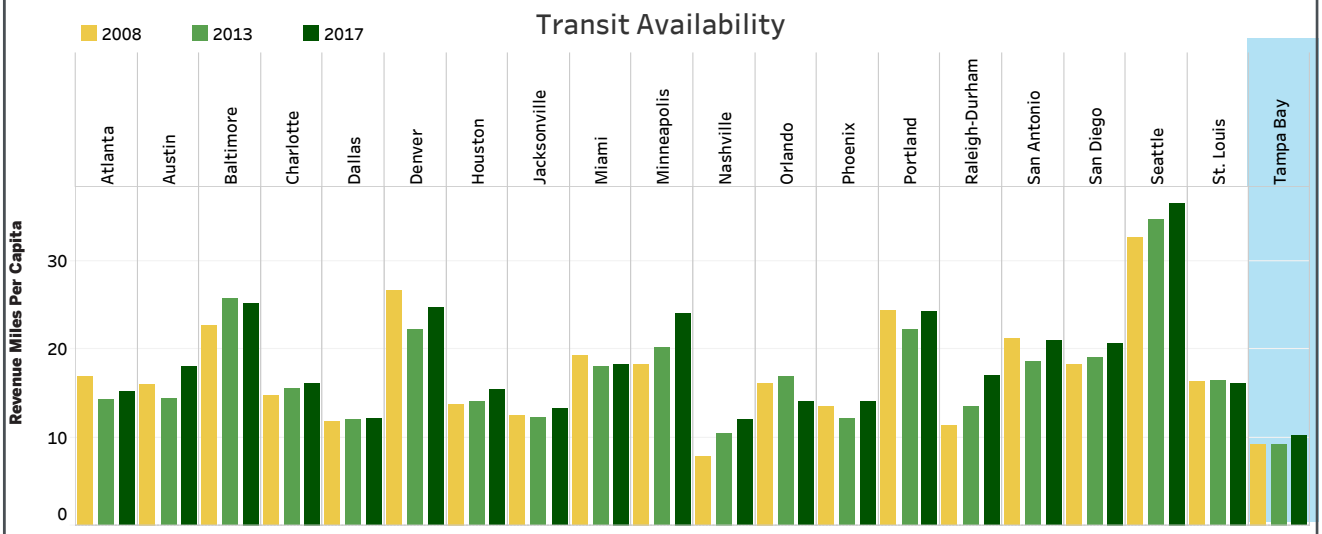


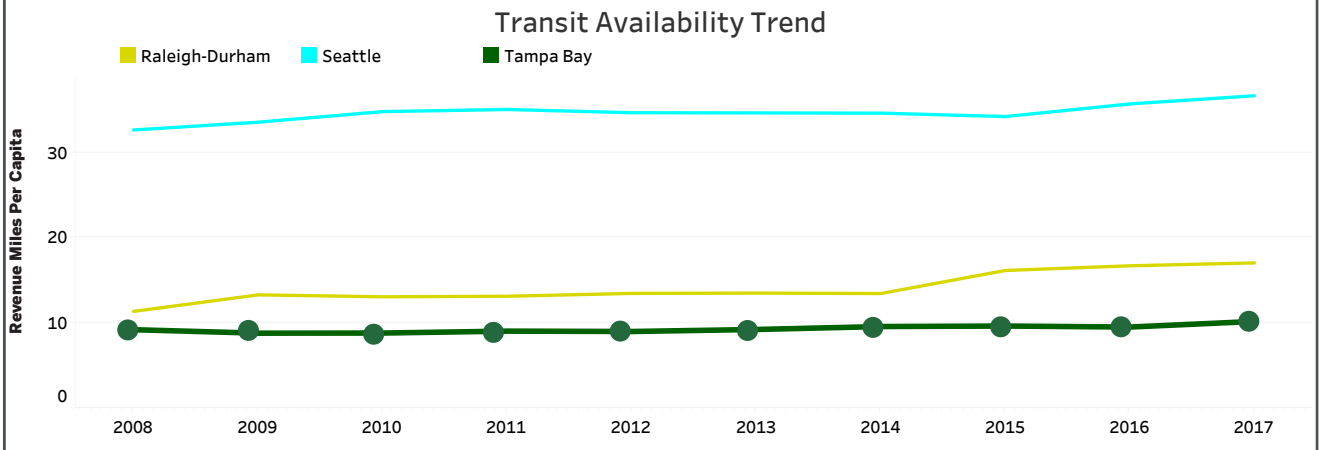
Transit Availability

SUMMARY OF INSIGHTS AND FINDINGS

The Tampa Bay region ranked dead last for almost a decade. Seattle has the highest revenue miles per capita and is consistently ranked No. 1. Raleigh-Durham's rank has risen from No. 18 to No. 10 over the last decade.

About: Measures, on a per capita basis, the number of miles traveled by public transit vehicles during revenue service, meaning that the vehicle is transporting passengers while on the road.
Source: Federal Transit Administration, National Transit Database, Annual UZA Sums.



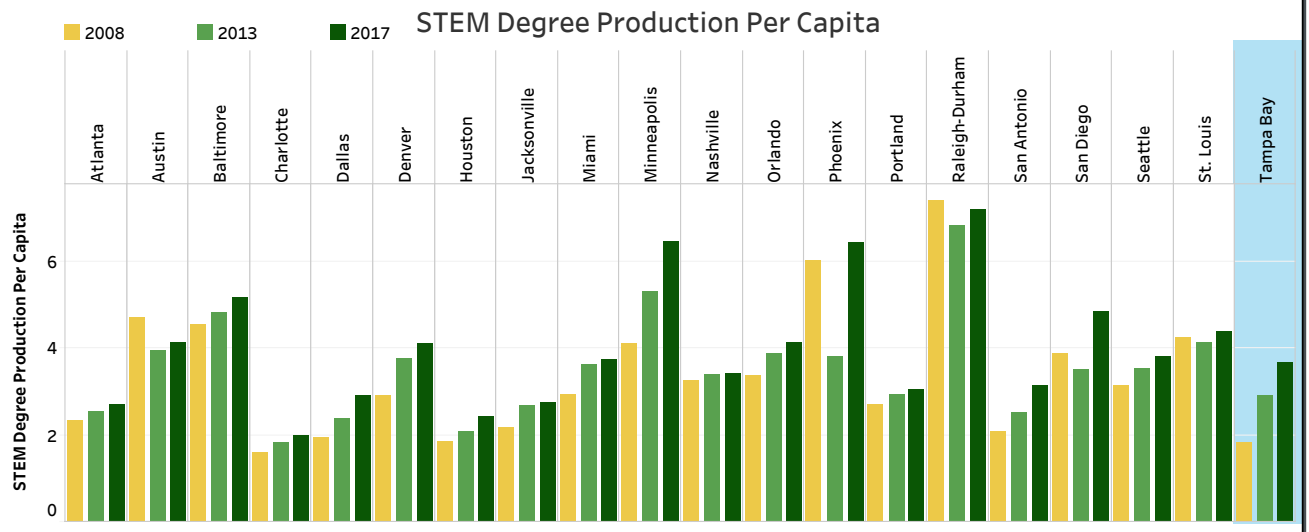


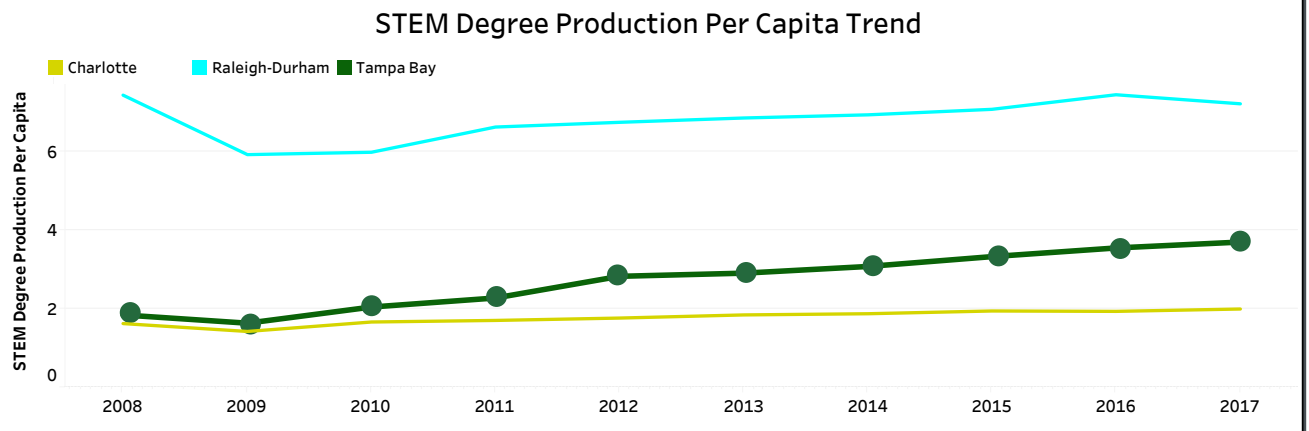
STEM Degree Per Production Capita

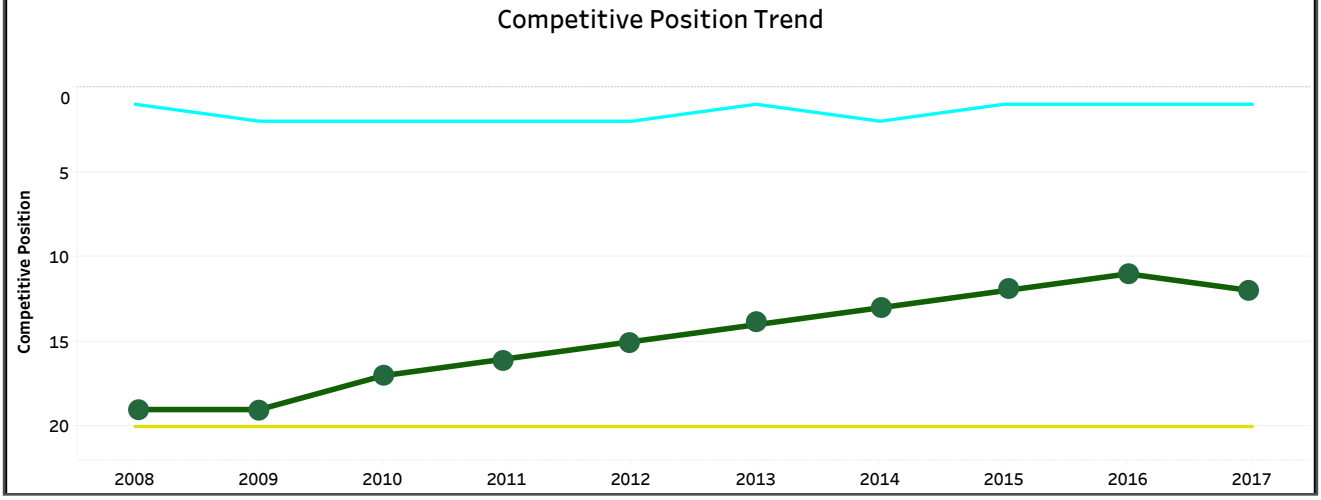
SUMMARY OF INSIGHTS AND FINDINGS

Tampa Bay and Minneapolis MSAs have improved in STEM degree production per capita at higher rate than other MSAs. The Tampa Bay MSA has steadily improved its ranking since 2009 but dropped in 2017.

About: Measure of number of individuals graduating with degrees in science, technology, engineering and mathematics (STEM degrees) per thousand individuals.
Source: Higher Education Information System.







Key Insights from Analysis to Identify Drivers of Inclusive Economic Growth

Econometric models were built for each of the outcome variables to identify the driver variables. Below were the key insights derived from the econometric analysis and trend analysis of the driver variables.

- **Transit availability is the primary driver** for three variable indicating inclusive economic growth: poverty rate, income inequality and economic mobility. Higher public transit availability leads to lower poverty rate and income inequality and higher economic mobility.
- STEM education (science, technology, engineering and mathematics) is **negatively related** to income inequality.
- The Tampa Bay region has consistently **maintained last position** in terms of public transit availability.
- STEM degree production per capita for the Tampa Bay region has seen a **consistent rise** both in terms of absolute value and competitive position last decade.
- The results signify the **key role played by public transit infrastructure** and STEM education in achieving higher inclusive economic growth.

Part 4: Policy Experiments and Looking Ahead

In the previous section, drivers for the outcome variables were identified. This section presents policy experiments, which can inform business and civic leaders about the impact of certain policy initiatives on the inclusive economic growth of the Tampa Bay region0.

The policy experiments were performed using technique called “sensitivity analysis,” which is described below.

The competitive positions of the MSAs for three years (2018, 2019 and 2020) on the outcomes related to inclusive economic growth were forecast. If all remains the same and all the MSAs follow the trends that they have been following for the recent years on the outcomes, the MSAs will achieve the forecasted competitive positions. The econometric models were used to forecast the values of outcomes for Tampa Bay when some of the values of the driver variables for Tampa Bay are changed (keeping all else constant for other MSAs). This method allows researchers to forecast the Tampa Bay region’s competitive positions for the next three years should certain policy initiatives be implemented.

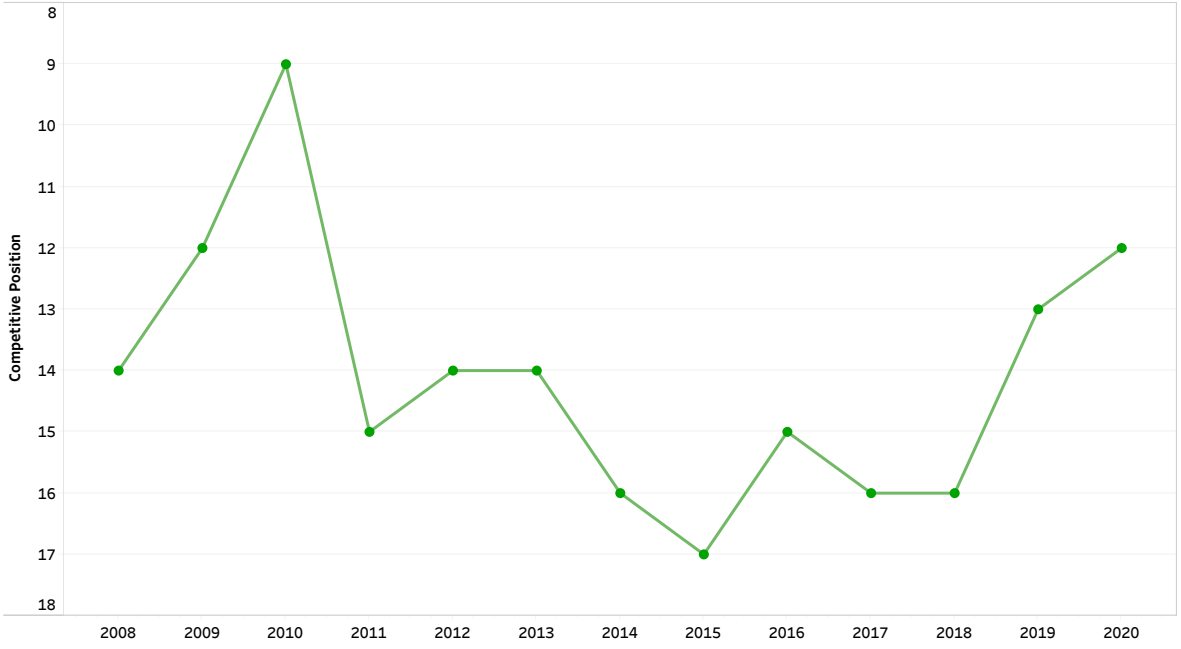
For this study, the policy experiment of increasing public transit availability by 20 revenue miles per capita every year was selected. This policy initiative was chosen because public transit availability was found to be a common driver for all the three variables that indicate inclusive economic growth.

This section presents the results of policy experiments on the outcomes of poverty rate, income inequality and economic mobility to assess the impact of policy initiatives on the inclusive economic prosperity of the Tampa Bay region.

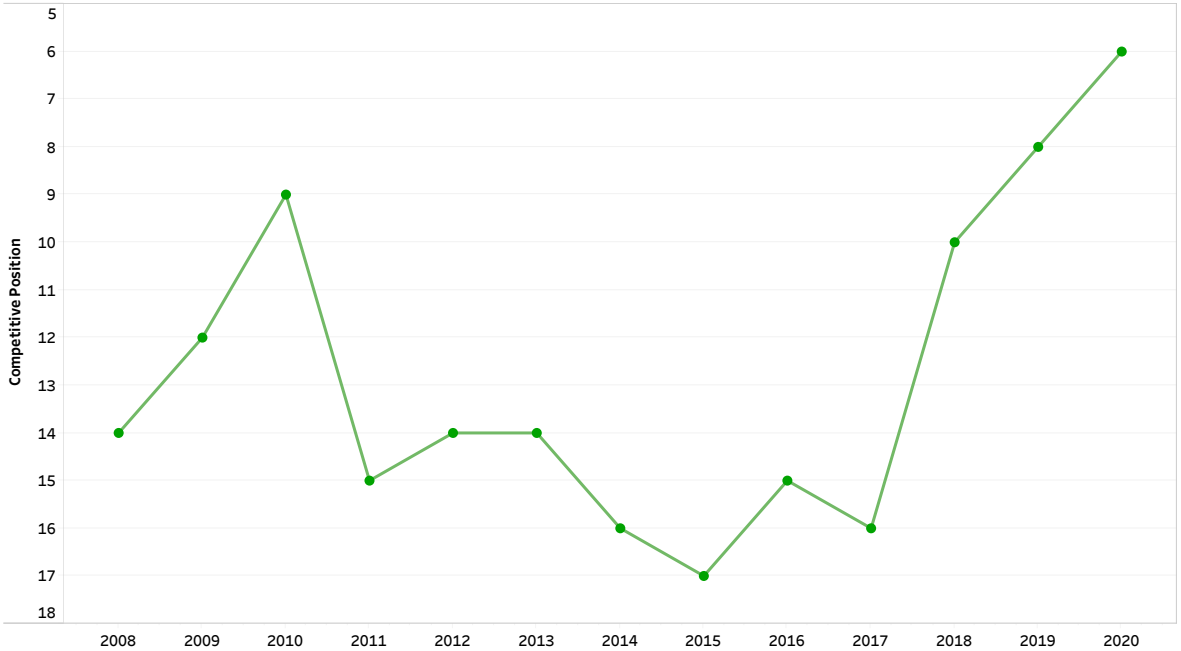
Poverty Rate

Policy initiative: Increase in transit availability by 20 revenue miles per capita for 2018, 2019 and 2020.

Poverty Rate - Competitive Position Trend **Without** Policy Initiative



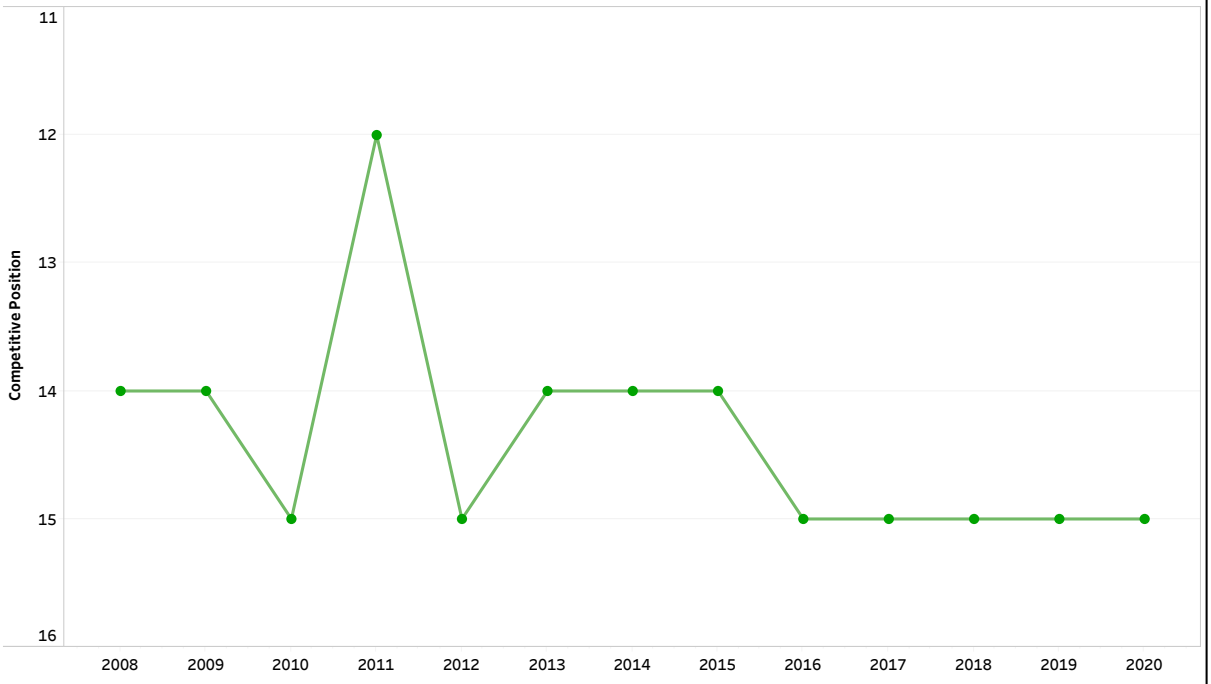
Poverty Rate - Competitive Position Trend **With** Policy Initiative



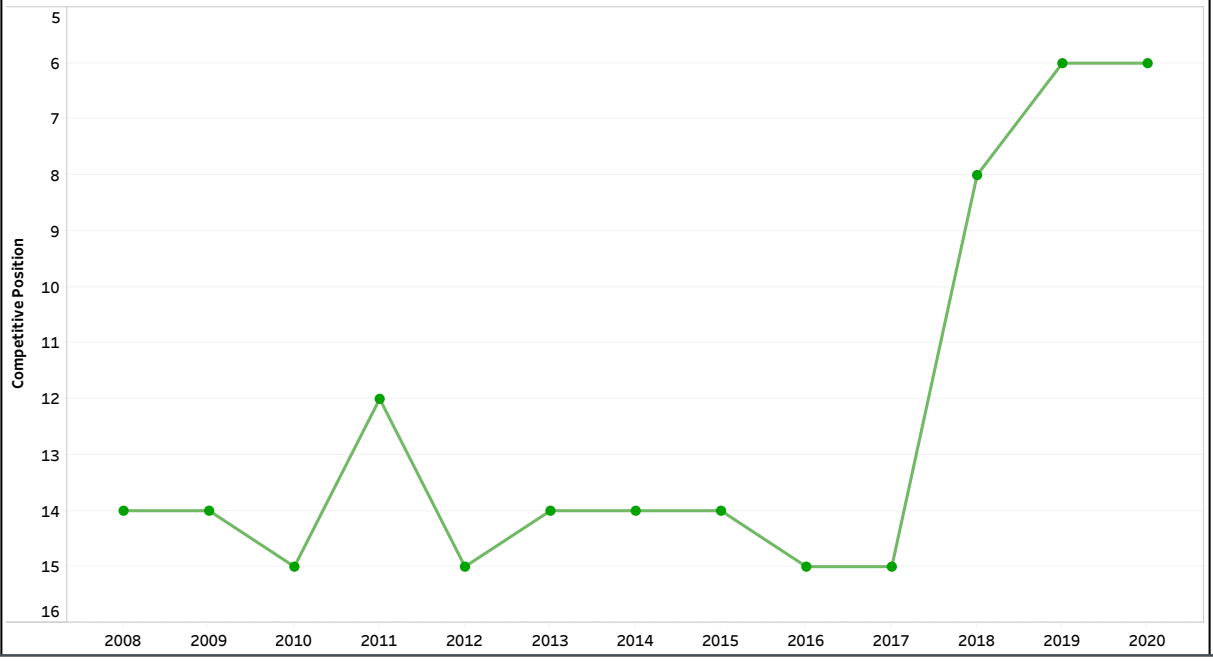
Income Inequality (Gini Index)

Policy initiative: Increase in transit availability by 20 revenue miles per capita for 2018, 2019 and 2020.

Income Inequality - Competitive Position Trend **Without** Policy Initiative

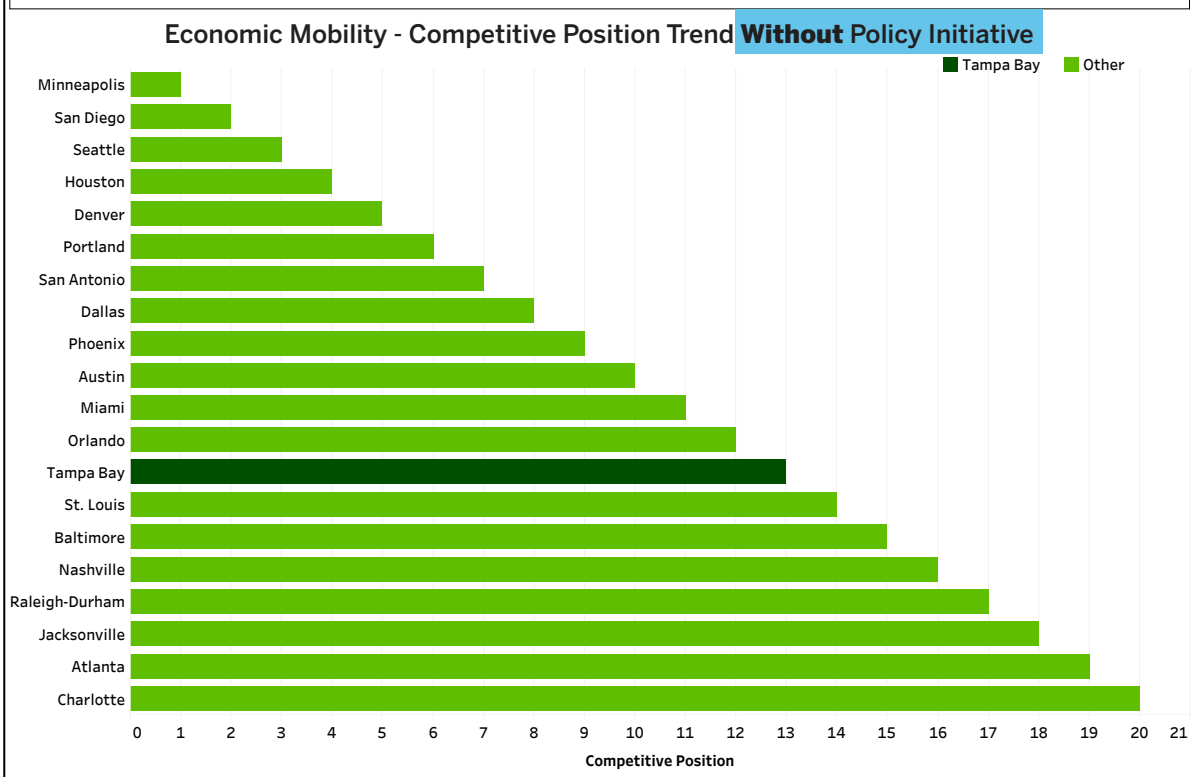


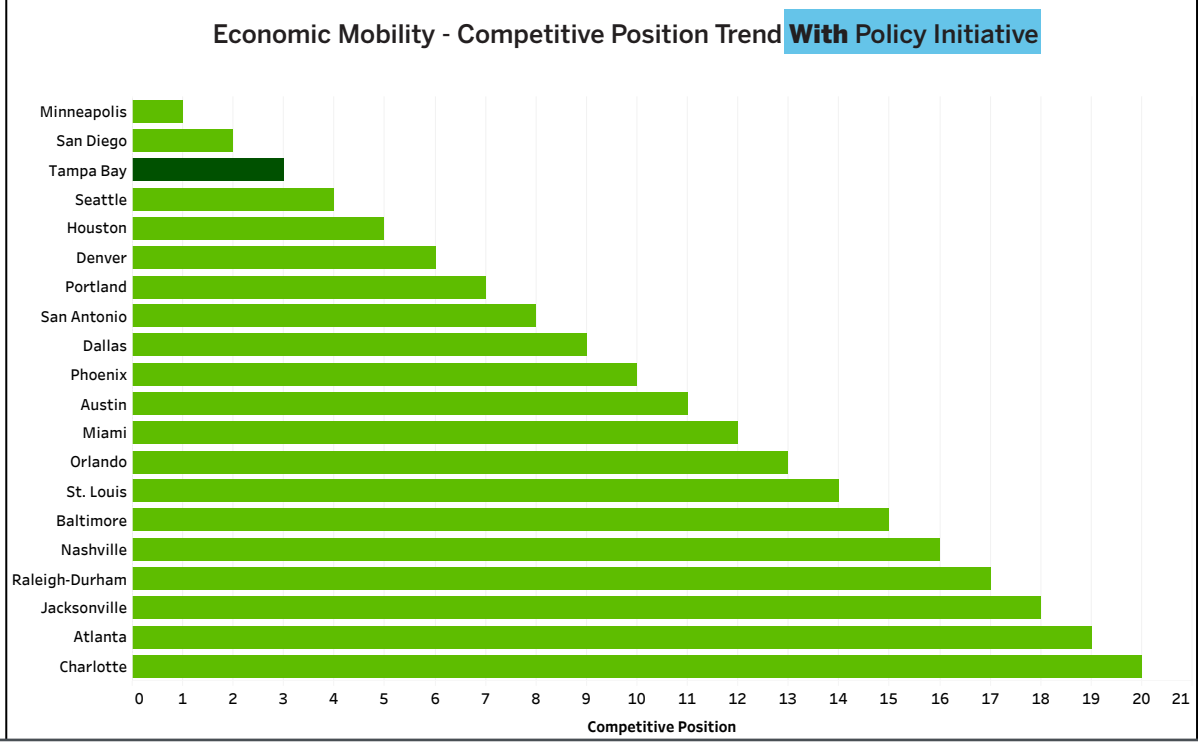
Income Inequality - Competitive Position Trend **With** Policy Initiative



Economic Mobility

Policy initiative: Increase in average transit availability by 20 revenue miles per capita.





Key Insights from Policy Experiments

Policy experiments were performed for Tampa Bay on three economic outcome variables related to inclusive economic growth: poverty rate, income inequality and economic mobility. The policy initiative of increasing public transit infrastructure availability by 20 revenue miles per capita every year was considered, as transit availability was found to be common primary driver for all the three variables. The following insights were gleaned from the experiments.

- The **policy initiative had significant effect** on the competitive positioning of the Tampa Bay region in terms of income inequality and economic mobility.
- With the policy initiative, the Tampa Bay region's competitive positioning **improved moderately** in terms of poverty rate.
- The policy experiments confirm that **public transit infrastructure plays a crucial role** in the inclusive economic growth of a region by providing the impoverished strata of the society easy and affordable access to education, work and health.

Key Takeaways

This report presents multidimensional analysis of the Tampa Bay region's performance in terms of inclusive economic growth relative to 19 other MSAs. The three primary variables considered for the study are poverty rate, income inequality and economic mobility.

- Data from real-time sources such as Google Trends, LinkedIn and Twitter was considered along with the traditional U.S Census data to obtain a **holistic view of inclusive economic growth** of the Tampa Bay region.

- Analysis of data from real-time sources revealed **a significant gap in the talent supply** relative to demand for finance and information technology industries in Tampa Bay.

- Trend analysis of traditional indicators related to inclusive growth suggests that the Tampa Bay region is **performing poorly among the comparison group in terms of poverty rate and income inequality**. However, in terms of economic mobility, the Tampa Bay region is performing a little better, landing in the middle of the pack.

- **Econometric models were built** to identify the primary drivers of inclusive economic growth of the Tampa Bay region.

- Econometric analysis concluded that **public transit infrastructure availability and STEM education are the key drivers** for inclusive economic growth of a region.

Next Steps

- USF researchers plan to continue expanding the kinds of real-time big data signals for this type of study. For example, scholars are exploring real-time sources on traffic patterns and retail purchase behavior across MSAs.

- Most of the real-time big data signals obtained were through APIs and scraping. USF faculty and student researchers will explore the possibility of building direct and deeper partnership with the source companies. They encourage the community to reach out should there be opportunities to connect with local or regional providers of such real-time big data signals.

- USF researchers will consider deeper study of whether any of the big-data signal can serve as reliable proxy of traditional economic indicators. This can be valuable because the proxy can be used to assess the economic health of the region on a real-time basis and can help in faster policy decision making.

- USF Muma College of Business faculty are building an index of real-time big data signals which can gauge economic prosperity in real time. Such an index would be a single number that can provide a composite measure of economic health of a region.

- Faculty and student researchers look forward to directly partnering with the business community to help potentially leverage real-time big data signals for long-term growth.

Community ideas and feedback are welcome!

USF Muma College of Business

UNIVERSITY of SOUTH FLORIDA

2020 TAMPA BAY E-INSIGHTS REPORT

STATE OF THE REGION

THE 2020 E-INSIGHTS REPORT IS PRODUCED BY THE MUMA COLLEGE OF BUSINESS AT THE UNIVERSITY OF SOUTH FLORIDA, A PREEMINENT UNIVERSITY, AND IS AFFILIATED WITH THE STATE OF THE REGION INITIATIVE.

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