**The Impact of socioeconomic factors in the United States**

**INTRODUCTION**

In a contemporary landscape characterized by digital interconnectedness and socio-economic disparities, discerning the ramifications of various factors on societal structure is imperative. This data visualization endeavour scrutinizes the intricate interplay between socio-economic variables and their repercussions across diverse regions in the United States. With an extensive analysis encompassing Texas, Florida, and New York, this project endeavours to illuminate the nuanced dynamics shaping the economic landscapes and societal frameworks of these states.

This project addresses the complex landscape of socio-economic factors by consolidating data from six distinct datasets. Through the examination of variables including internet expenses, ethnic and racial demographics, yearly earnings, educational achievements, poverty levels, and Gross Domestic Product (GDP) across different Metropolitan Statistical Areas (MSAs) and counties, the project endeavours to offer a holistic comprehension of the interconnections among these factors.

With my Tableau visualizations, I am addressing the following research questions: Additionally, two questions from these can be answered by visualizations involving more than one table in the Tableau data source:

1. What correlations exist between education attainment rates and poverty rates within different Counties, and what implications do these correlations have for socio-economic mobility?
2. How have poverty rates evolved over time within different counties, and what contributing factors have shaped these trends?
3. How do poverty rates, education attainment rates, and the poverty education ratio vary across counties, and how do these metrics inform discussions on socio-economic disparities and educational equity?
4. How do variations in the cost of internet services across different cities impact the accessibility and affordability of internet connectivity within Cities?
5. How does the GDP Chain Index fluctuate across different MSAs, and what does this reveal about the economic growth trajectory and competitiveness of these regions?
6. How have poverty rates by county evolved over the period from 2012 to 2022 in terms of competitive rankings, and what insights do these rankings offer into the changing socioeconomic landscape and relative well-being among counties?
7. How does the representation of Asian, Black, and White individuals vary across different institutions within Texas, Florida, and New York, and what insights does this provide into diversity and inclusion efforts within these states?
8. What correlations exist between annual wages per employee and the total number of bachelor's degrees earned at the state, MSA, and county levels, and how do these connections illuminate the link between education attainment and earning potential?
9. How do variations in average GDP and average annual wages per employee across different Counties offer insights into regional economic dynamics?

**METHODOLOGY**

**Data Sources:**

[Poverty rate](https://data.census.gov/table?q=Poverty%20rate&g=310XX00US11580,15980,17500,18880,19660,22380,22420,22500,22520,23540,26140,27260,28580,29380,29460,33100,34940,35840,36100,36380,36740,37260,37340,37380,37460,37860,38940,39460,42680,42700,45220,45300,45540,48100)

[Education Attainment Rate](https://data.census.gov/table?q=dp02&g=310XX00US11580,15980,17500,18880,19660,22380,22420,22500,22520,23540,26140,27260,28580,29380,29460,33100,34940,35840,36100,36380,36740,37260,37340,37380,37460,37860,38940,39460,42680,42700,45220,45300,45540,48100)

[GDP](https://apps.bea.gov/itable/?ReqID=70&step=1&acrdn=5#eyJhcHBpZCI6NzAsInN0ZXBzIjpbMSwyOSwyNSwzMSwyNiwyNywzMF0sImRhdGEiOltbIlRhYmxlSWQiLCI1MzMiXSxbIk1ham9yX0FyZWEiLCI1Il0sWyJTdGF0ZSIsWyI1Il1dLFsiQXJlYSIsWyJYWCJdXSxbIlN0YXRpc3RpYyIsWyItMSJdXSxbIlVuaXRfb2ZfbWVhc3VyZSIsIkxldmVscyJdLFsiWWVhciIsWyIyMDIyIl1dLFsiWWVhckJlZ2luIiwiLTEiXSxbIlllYXJfRW5kIiwiLTEiXV19)

[Annual Wages](https://data.bls.gov/cew/apps/table_maker/v4/table_maker.htm#type=3&year=2022&qtr=A&own=5&ind=10&supp=0)

[Ethnicity and Race](https://nces.ed.gov/ipeds/datacenter/Data.aspx?sid=b16b97be-6abb-405d-8981-84492211e16e&rtid=1)

[Cost of Internet](https://www.numbeo.com/cost-of-living/historical-data)

**Cost of Internet:** The cost of internet data was sourced from numbeo.com. It includes information on the cost of internet in various cities in Florida, presented alongside their respective state abbreviations.

**Percentage of Ethnicity and Race in Institutions:** Data on the percentage of ethnicity and race in institutions across Texas, Florida, and New York was obtained from IPEDS (Integrated Postsecondary Education Data System). This dataset contains information on American Indian or Alaska Native, Asian, Black or African American, Hispanic/Latino, Native Hawaiian or Other Pacific Islander, White, two or more races, and race/ethnicity unknown categories.

**Annual Wages per Employee:** The annual wages per employee data for MSAs in Texas, Florida, and New York was sourced from the U.S. Bureau of Labor Statistics. It provides information on the annual wages per employee and total annual wages across various Metropolitan Statistical Areas.

**GDP in MSAs:** Data on Gross Domestic Product (GDP) in MSAs of Texas, Florida, and New York was obtained from the Bureau of Economic Analysis. It includes information on GDP, GDP chain index, and current-dollar GDP for different Metropolitan Statistical Areas.

**Education Attainment:** Information on education attainment in selected counties of MSAs was collected from the Census Bureau. This dataset includes data on the number of bachelor's degrees, graduate or professional degrees, high school graduates or higher, and education attainment rates.

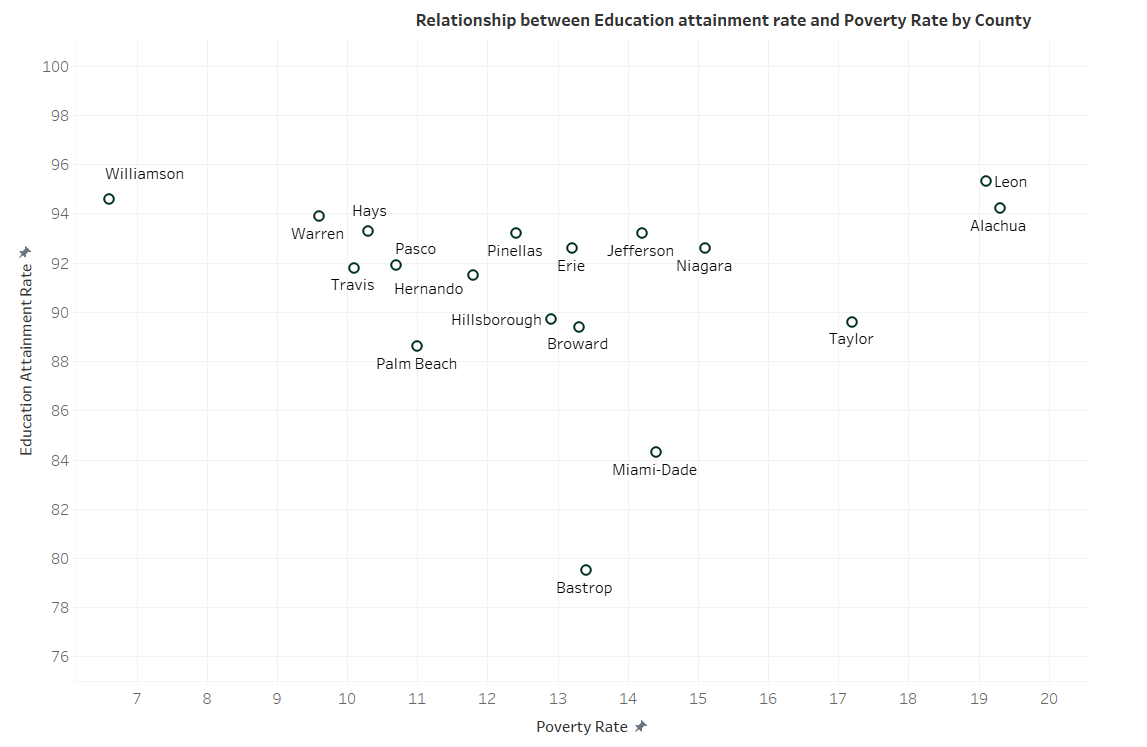
**Poverty Rate:** The poverty rate data for selected counties of MSAs in Texas, Florida, and New York was sourced from the Census Bureau. It contains information on the population below the poverty level, poverty rates, and year, spanning from 2012 to 2022.

**ANALYSIS**

**Visualization 1: Exploring the relation between Education and Poverty**

This scatter plot delves into the relationship between education attainment rates and poverty rates across various counties. Each point represents a county, with its position indicating its education attainment rate and poverty rate.

**Visualization1**

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Despite having a relatively low Education Attainment Rate of 84.3, the Poverty Rate is not as high as expected at 14.4%. This could be due to various factors such as employment opportunities in the area or social welfare programs.

Williamson County has the highest Education Attainment Rate of 94.6%, coupled with a remarkably low Poverty Rate of 6.6%. This suggests that Williamson County has a highly educated population with low levels of poverty, indicating a strong local economy and potentially robust social support systems.

Bastrop, Hays, Travis, Williamson counties in the Austin area generally have high Education Attainment Rates (ranging from 79.5% to 94.6%) and relatively low Poverty Rates (ranging from 6.6% to 13.4%). This indicates a strong educational infrastructure and economic prosperity in this region.

Hernando, Hillsborough, Pasco, Pinellas counties in this area show moderate to high Education Attainment Rates (ranging from 89.7% to 93.2%) and relatively low Poverty Rates (ranging from 10.7% to 12.9%). This suggests a similar trend of educational attainment positively impacting poverty reduction.

**Visualization 2: Unravelling the Evolution of Poverty**

This animated line chart tracks the trajectory of poverty rates across selected counties from 2012 to 2022. Viewers can use the filter to select specific counties and observe how their poverty rates have changed over the years.

**Visualization 2**

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In the span of a decade from 2012 to 2022, significant shifts in poverty rates across counties underscore the dynamic nature of socio-economic landscapes. Notably, Williamson County has experienced a notable decrease in poverty rates, hinting at strides towards enhanced economic stability. Conversely, Alachua County's marginal increase in poverty rate signals persistent challenges in addressing economic disparities.

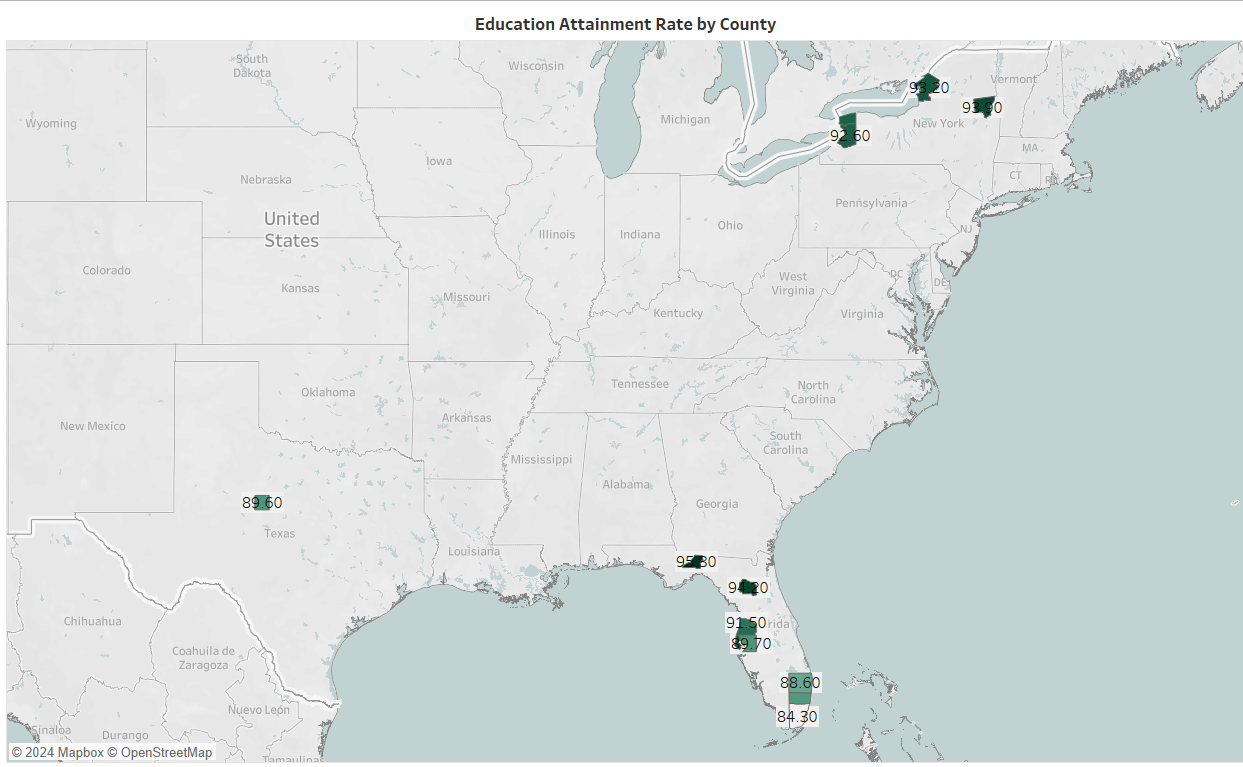
A comparison between years reveals nuanced changes in poverty rates, offering valuable insights into the efficacy of socio-economic policies and interventions over time. This analysis equips policymakers with the understanding needed to customize strategies aimed at alleviating poverty and fostering inclusive economic growth.

It's noteworthy that across all counties, there has been a consistent trend of decreasing poverty rates over time, underscoring the potential impact of ongoing socio-economic initiatives and suggesting positive trajectories towards economic well-being. Additionally, these shifts in poverty rates highlight the need for adaptable and responsive policy frameworks that can effectively address evolving socio-economic challenges. By closely examining the factors driving these changes and understanding their implications for different communities, policymakers can craft targeted interventions to uplift vulnerable populations and promote equitable access to opportunities. Furthermore, continued monitoring and evaluation of poverty alleviation efforts will be crucial in ensuring sustained progress and resilience in the face of future economic uncertainties.

**Visualization 3: Education Attainment rate, poverty education ratio, poverty rate, by County**

This visualization utilizes parameter fields to showcase various aspects, including education attainment rates, the poverty education ratio, and poverty rates categorized by County. It provides insights into the relationship between education levels and poverty rates across different geographic regions, allowing for comparisons and analysis of socioeconomic trends at various levels of granularity.

**Visualization 3**



Observing the Visualization, we can identify notable disparities among counties. Counties like Alachua and Leon exhibit relatively high education attainment rates but also face significant poverty challenges. Conversely, counties like Williamson showcase lower poverty rates and higher education attainment, reflecting a more affluent demographic profile.

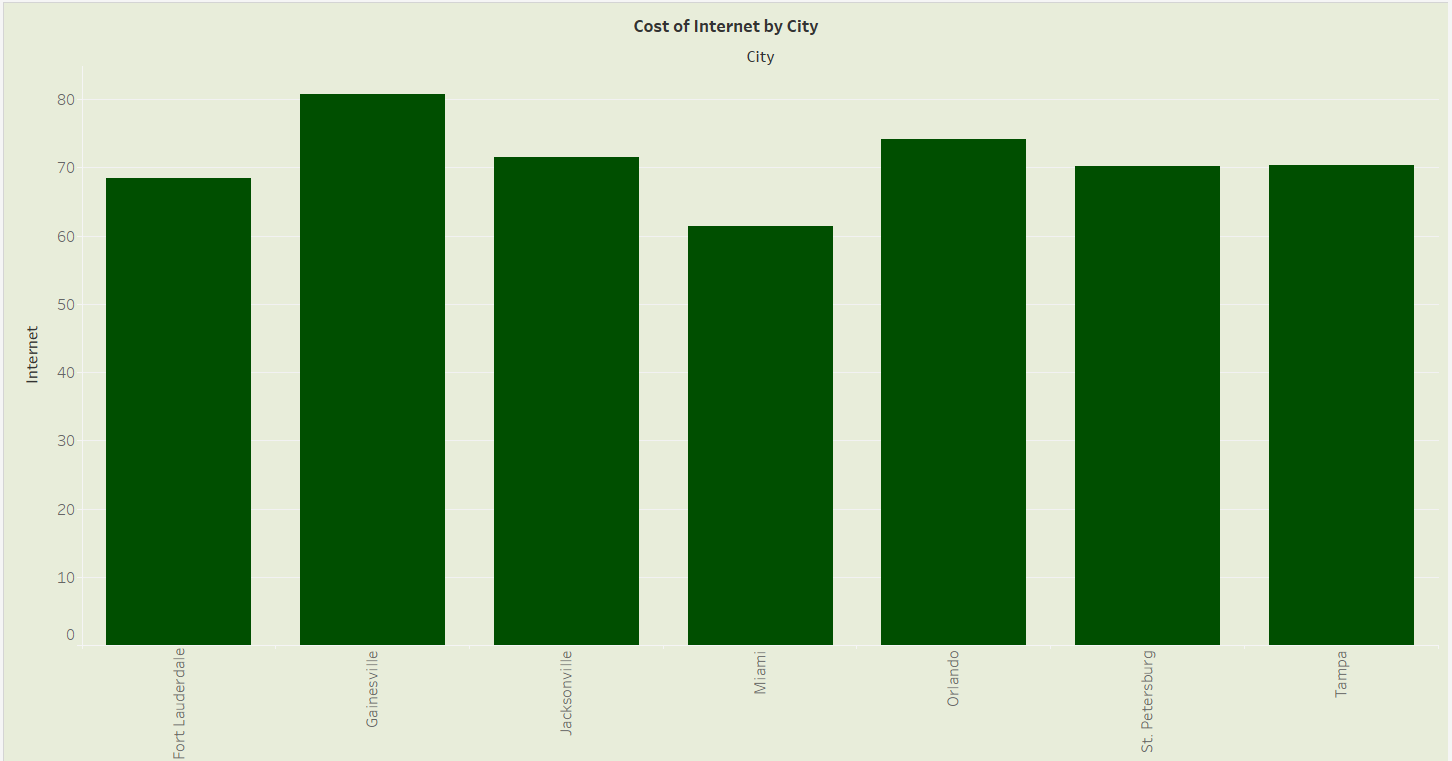
The calculated poverty education ratio serves as a revealing metric, highlighting the relationship between educational achievement and poverty levels. Counties with higher poverty education ratios, such as Alachua, indicate a greater prevalence of poverty relative to educational attainment, signalling potential barriers to socio-economic mobility.

Upon closer examination of the data visualizations, it becomes evident that these disparities extend beyond mere numbers, reflecting underlying social and economic dynamics. The observations underscore the multifaceted nature of poverty and the need for comprehensive approaches that address not just educational disparities but also broader socio-economic inequalities. By delving deeper into the underlying factors driving these disparities, policymakers can develop more targeted and effective strategies to uplift communities and promote equitable access to opportunity.

**Visualization 4: Cost of Internet by City**

The visualization allows for easy comparison of internet costs between different Cities, providing insights into the affordability and accessibility of internet services across urban areas.

**Visualization 4**

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The visualization illustrates the varying costs of internet services across different cities, showcasing notable disparities in affordability. For instance, Gainesville emerges with the highest cost at $80.83, while Miami stands out with the lowest cost at $61.47. These contrasting figures underscore the considerable differences in internet expenses experienced by residents across different urban areas. Such disparities can be attributed to several factors, including market competition, population density, and infrastructure development.

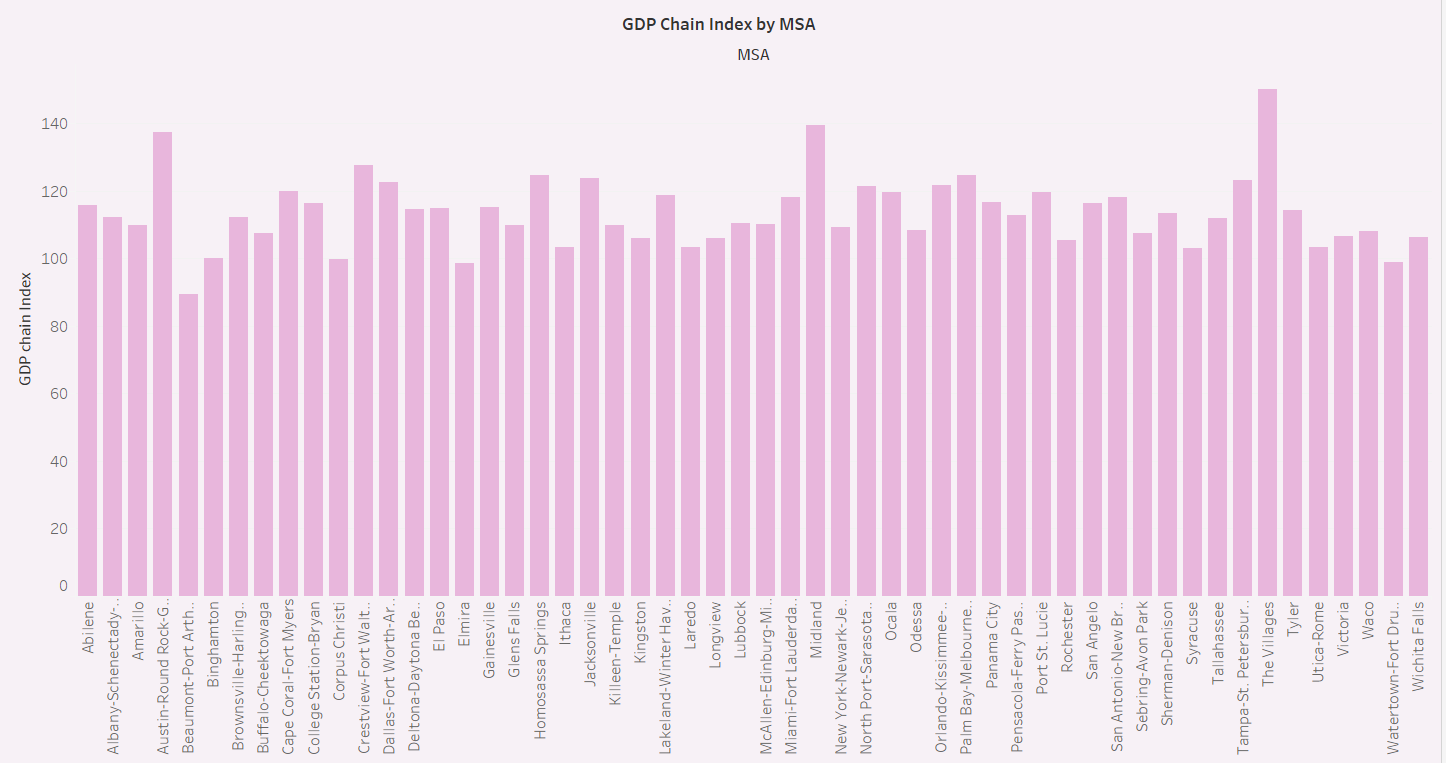
In general, larger urban areas like Miami and Orlando tend to enjoy lower internet costs compared to smaller cities like Gainesville and Fort Lauderdale. This discrepancy may be influenced by heightened competition among service providers in densely populated areas, leading to more competitive pricing. Additionally, the infrastructure development in urban hubs might be more robust, enabling better connectivity and lower operational costs for internet service providers.

Understanding these variations in internet costs is crucial for policymakers and stakeholders aiming to address digital accessibility challenges and promote equitable access to online resources. By identifying cities with disproportionately high internet expenses, policymakers can develop targeted interventions to improve affordability and expand digital access for all residents. Furthermore, fostering collaboration between government, private sector, and community organizations can facilitate the implementation of tailored solutions to bridge the digital divide and ensure that internet services remain affordable and accessible across diverse communities.

**Visualization 5**: **GDP Chain Index by MSA**

The bar graph illustrates the GDP Chain Index for various Metropolitan Statistical Areas (MSAs). The GDP Chain Index serves as a measure of the real economic output of each MSA relative to a base year, usually set at 100. A value above 100 indicates growth in economic output compared to the base year, while a value below 100 suggests a decline.

**Visualization 5**

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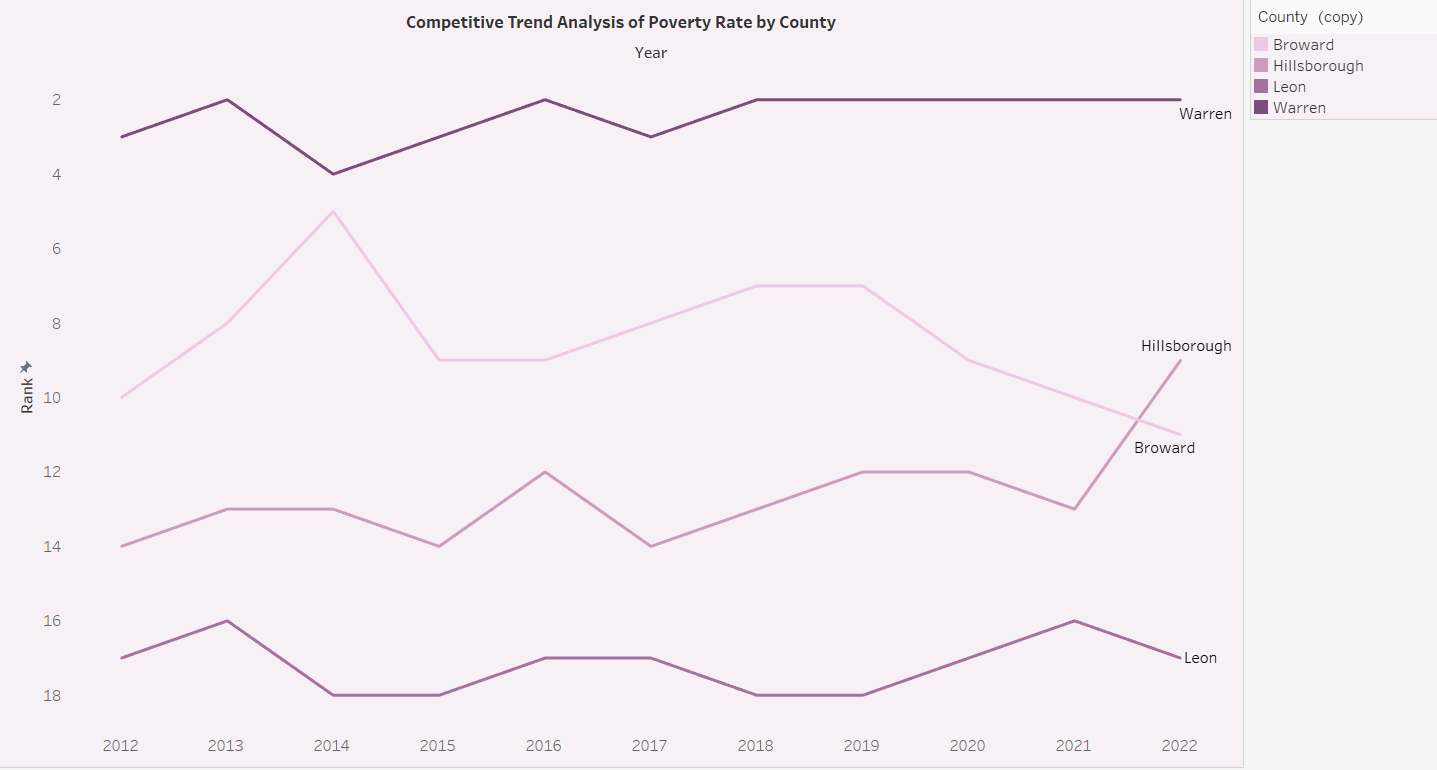
The GDP Chain Index serves as a valuable tool for assessing the economic vitality of various Metropolitan Statistical Areas (MSAs) within the state. Higher index values, exemplified by regions like The Villages and Midland, signify robust economic growth relative to a base year. Conversely, MSAs with lower index values, such as Beaumont-Port Arthur and Corpus Christi, may indicate economic challenges or slower growth trajectories. These disparities in economic performance across MSAs underscore the diverse economic landscapes present within the state, influenced by factors ranging from industry composition to regional development initiatives.

In urban areas like Dallas-Fort Worth-Arlington and Miami-Fort Lauderdale-Pompano Beach, higher GDP Chain Index values are typically observed. This trend reflects the stronger economic performance driven by factors such as the presence of diverse industries, robust infrastructure development, and sustained population growth. Conversely, rural areas like Beaumont-Port Arthur and Odessa may encounter challenges associated with limited economic diversification and a reliance on specific industries such as energy or agriculture. These rural regions often contend with economic vulnerabilities stemming from their industry specialization, necessitating targeted strategies for economic revitalization and diversification.

**Visualization 6: Competitive Trend Analysis of Poverty Rate by County**

The line graph depicts the competitive trend analysis of poverty rates by county from the year 2012 to 2022. Each county's poverty rate is plotted over time to visualize changes and trends in poverty levels. Viewers can use the filter to select specific counties

**Visualization 6**

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This visualization gives comprehensive understanding of varying degrees of poverty and enabling the formulation of targeted strategies for inclusive economic growth. For example, Williamson County ranks at the top with the lowest poverty rate, indicating a prosperous and economically stable community. This suggests that Williamson County residents enjoy better access to resources and opportunities, leading to higher standards of living and overall well-being. The low poverty rate reflects positively on the county's economic policies, employment opportunities, and social welfare programs, which effectively support its residents and contribute to its thriving economy.

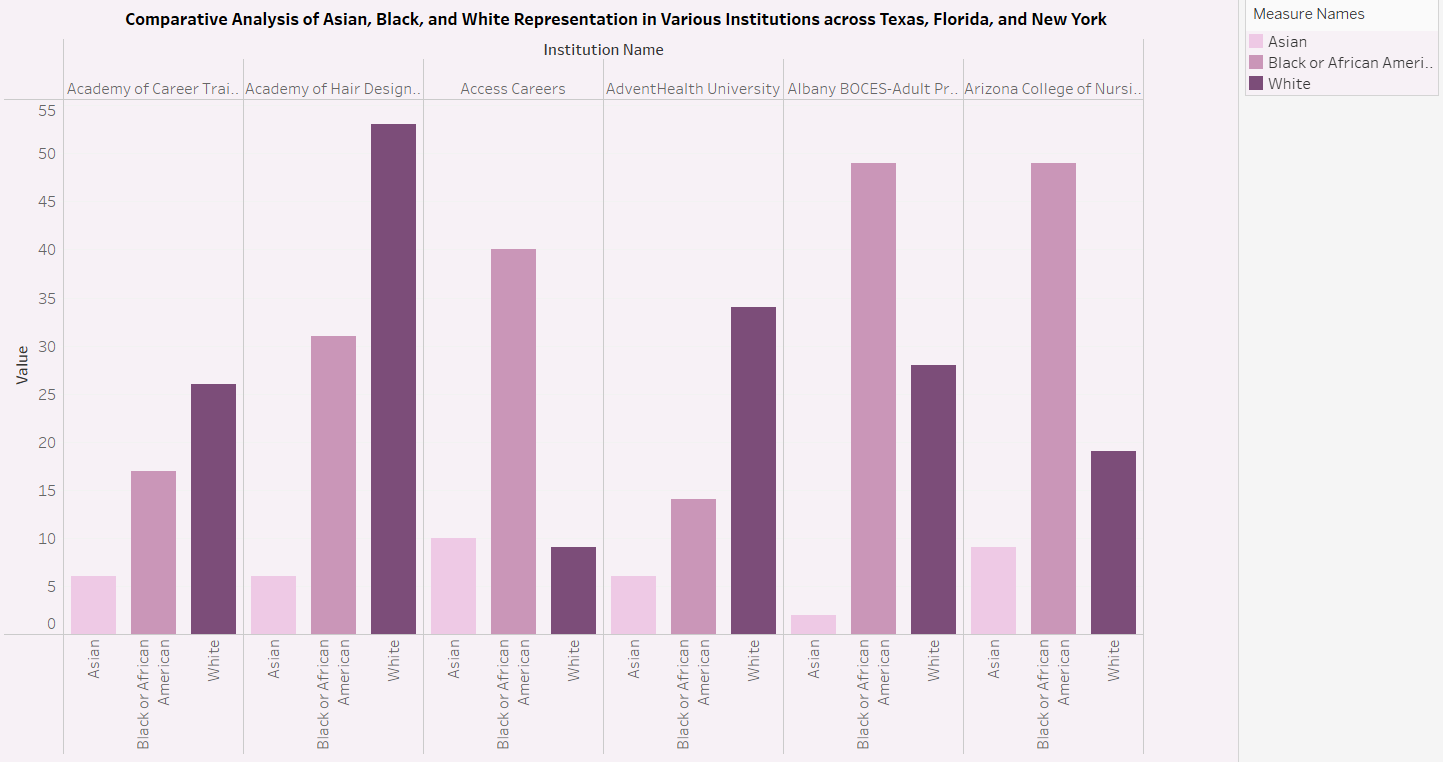
Alachua County, conversely, ranks at the bottom with the highest poverty rate among the listed counties, suggesting significant socio-economic challenges. This indicates that a larger portion of Alachua County's population struggles with financial insecurity and limited access to essential resources and services. The high poverty rate highlights the need for targeted interventions and support systems to address the underlying causes of poverty and improve the quality of life for residents in the county.

Hillsborough County falls in between, with a poverty rate ranking higher than Williamson but lower than Alachua, indicating a moderate level of economic disparity. While not as severe as in Alachua County, the presence of a considerable poverty rate in Hillsborough County underscores the existence of economic inequalities and the need for inclusive growth strategies. Addressing the root causes of poverty and promoting economic mobility can help narrow the gap between different socio-economic groups and foster a more equitable society in Hillsborough County.

**Visualization 7: Comparative Analysis of Asian, Black, and White Representation in Various Institutions across Texas, Florida, and New York**

The bar graph illustrates a comparative analysis of Asian, Black, and White representation in various institutions across Texas, Florida, and New York.

**Visualization 7**

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These are some interpretations from the visualization. The Academy of Hair Design-Lufkin stands out for its notable representation of White individuals, suggesting a demographic trend within the Lufkin area or a targeted demographic for the institution. This observation sheds light on the local population dynamics and preferences, influencing the institution's admission demographics.

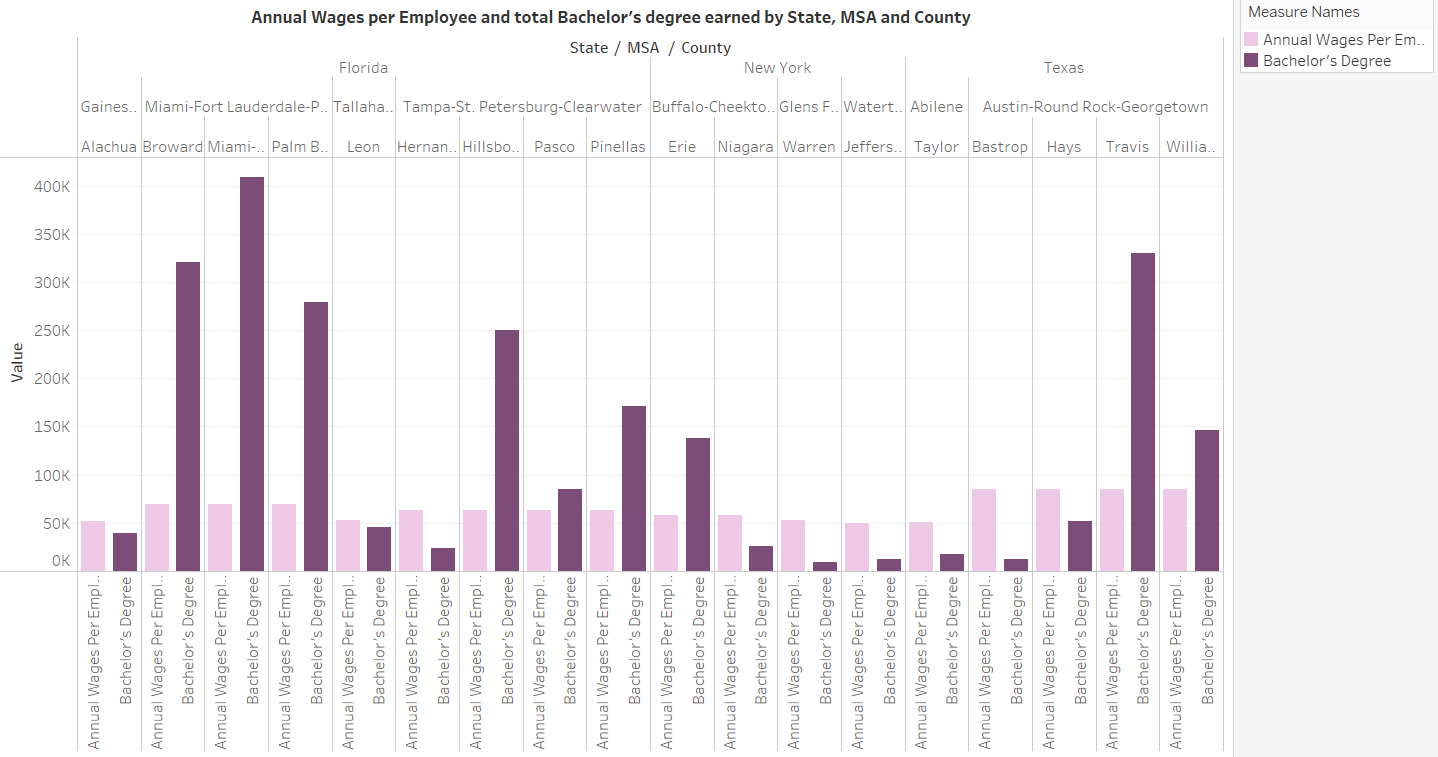
On the other hand, Albany BOCES-Adult Practical Nursing Program and Arizona Nursing College Dallas are distinguished by their high representation of Black or African American individuals. This may be attributed to specific outreach efforts, community demographics, or institutional programs aimed at fostering diversity and providing opportunities for Black or African American students in nursing education. Such interpretations highlight the importance of inclusive educational practices and initiatives tailored to diverse student populations.

Moreover, Access Careers exhibits the highest representation of Asian individuals, indicating a potential focus on diversity and inclusion initiatives within the institution. This could stem from targeted recruitment efforts or the availability of programs that appeal to Asian students. These interpretations underscore the significance of understanding and addressing the needs of diverse student communities within educational institutions.

**Visualization 8:** **Annual Wages per Employee and total Bachelor's degree earned by State, MSA and County**

The bar graph, enhanced with drill-down functionality, provides an analysis of Annual Wages per Employee and the total number of Bachelor's degrees earned, categorized by State, MSA (Metropolitan Statistical Area), and County. This visualization is derived from two data sources: Annual Wages from U.S. Bureau of Labor Statistics and education attainment from United States Census Bureau.

**Visualization 8**

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Miami-Fort Lauderdale-Pompano Beach MSA, Florida reports the highest total number of Bachelor's degrees earned, with Broward County leading with 320,294 degrees and Miami-Dade County following closely with 409,183 degrees. This suggests a strong educational infrastructure and higher education attainment in the Miami metropolitan area.

Warren County has the lowest number of Bachelor's degrees earned among the listed counties, with only 8,919 degrees. This indicates relatively lower educational attainment in this county compared to others.

New York-Newark-Jersey City MSA, New York metropolitan area reports the highest Annual Wages per Employee, with a value of $95,046. This suggests a strong economic environment and higher wages in the New York metropolitan area.

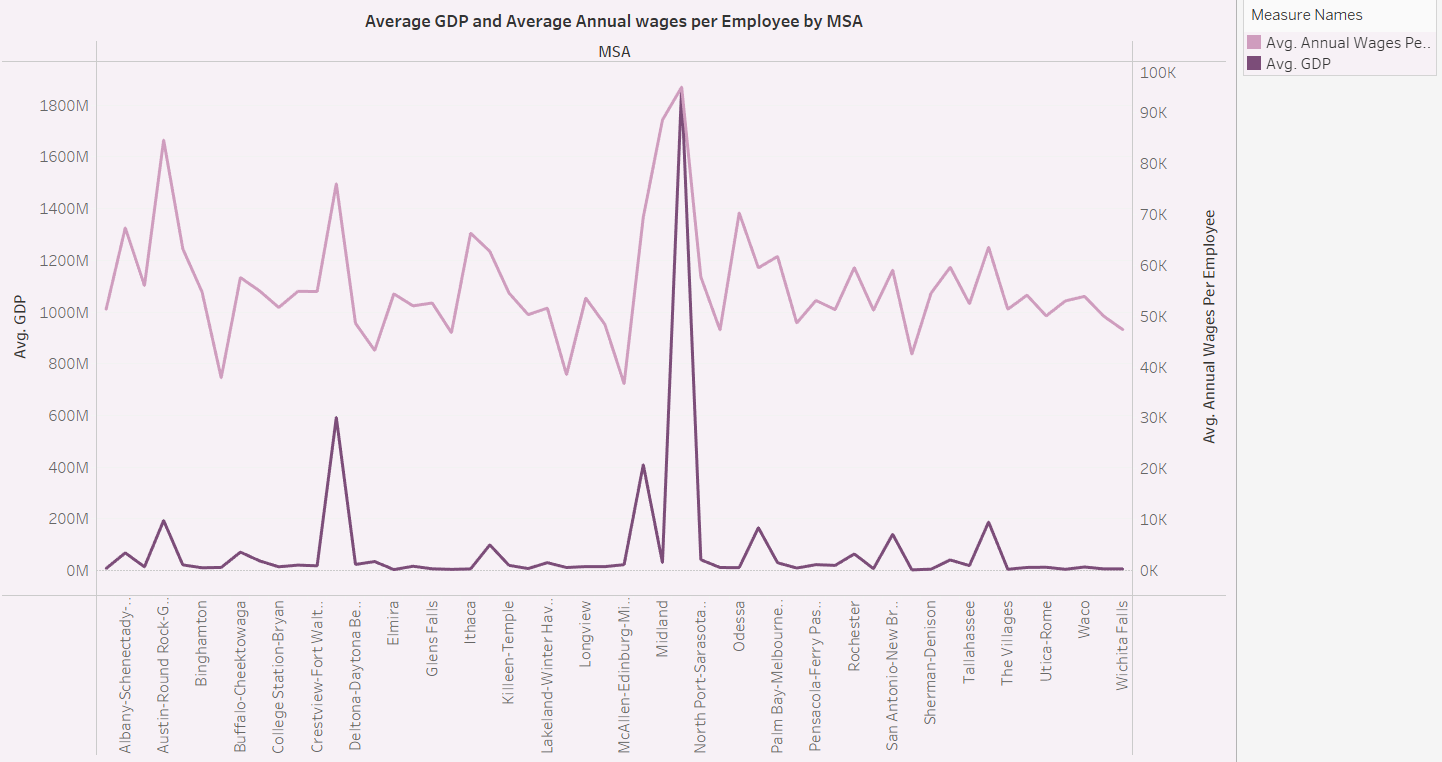
Sebring-Avon Park MSA, Florida metropolitan area has the lowest Annual Wages per Employee, with a value of $42,528. This indicates comparatively lower wages in this area, which may reflect economic challenges or lower-cost living conditions.

The correlations between annual wages per employee and total bachelor's degrees earned reveal nuanced patterns. Despite similar levels of education attainment, Florida exhibits higher wages than Texas, with New York displaying the highest wages alongside a larger number of bachelor's degrees. Variations exist within states: for example, some Florida MSAs with fewer degrees earn higher wages, while in New York, MSAs like Buffalo-Niagara Falls with fewer degrees still boast higher wages.

**Visualization 9: Average GDP and Average Annual wages per Employee by MSA**

This Visualization displays a comparison of the average Gross Domestic Product (GDP) and the average Annual Wages per Employee across different Metropolitan Statistical Areas (MSAs). The visualization utilizes a dual-axis chart, allowing viewers to simultaneously observe the trends in both economic indicators. This visualization is derived from two data sources: GDP from Bureau of Economic Analysis and Annual Wages from U.S. Bureau of Labor Statistics.

**Visualization 9**

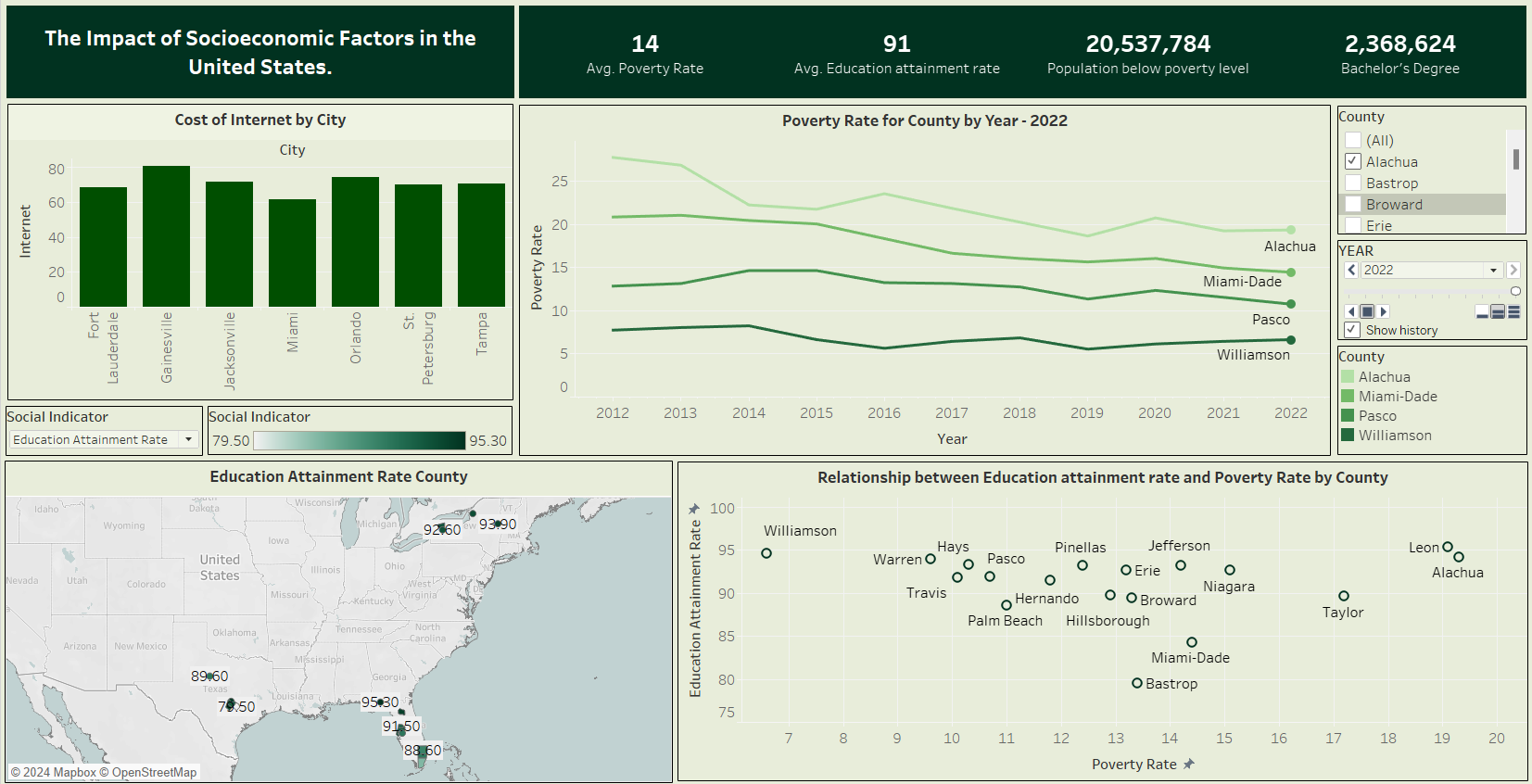
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The New York-Newark-Jersey City-NJ-PA Metropolitan Statistical Area (MSA) is prominently distinguished by its record of boasting the highest average Annual Wages per Employee across the visualized MSAs. This impressive figure is indicative of the area's thriving economy, underscored by robust economic activities, particularly in sectors like finance, technology, and professional services. Such high wages not only reflect a strong job market but also underscore the region's attractiveness to skilled professionals seeking lucrative opportunities.

Conversely, the McAllen-Edinburg-Mission MSA emerges at the other end of the spectrum, showcasing the lowest average Annual Wages per Employee among the depicted regions. This disparity suggests that residents in this area face relatively lower income levels, indicative of economic challenges. Factors such as the presence of lower-cost labor markets and industries with inherently lower average wages may contribute to this economic landscape, highlighting the need for targeted interventions to address income disparities and uplift economic prosperity in the region.

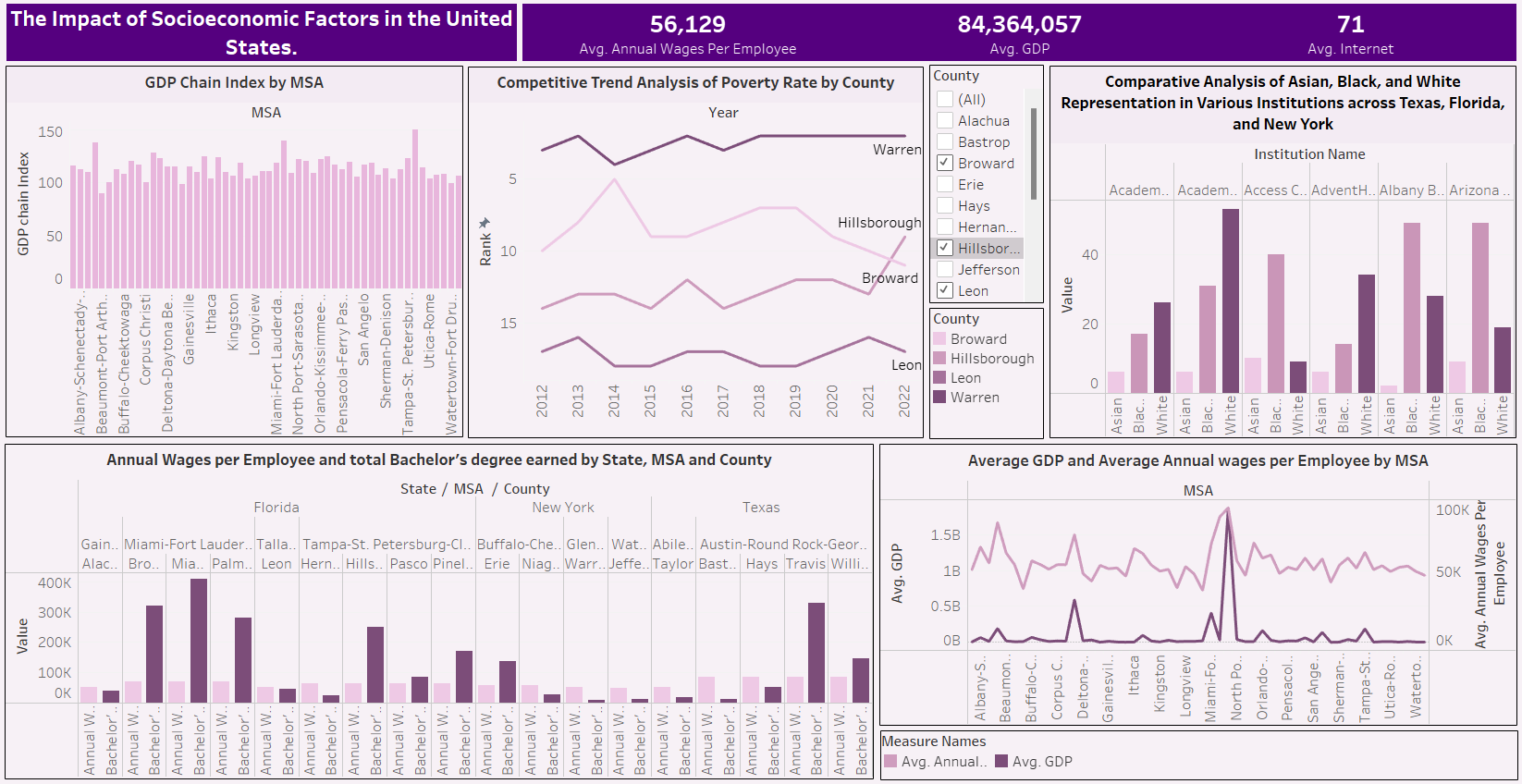
Furthermore, the New York-Newark-Jersey City-NJ-PA MSA once again commands attention for its superior economic performance, this time by leading with the highest average GDP among the visualized MSAs. This remarkable feat underscores the area's significant economic output and overall strength, driven by its diverse economy, vibrant financial services sector, and robust infrastructure. Conversely, Wichita Falls emerges as a stark contrast, showcasing the lowest average GDP among the visualized MSAs. This suggests a relatively subdued economic activity and output in this region, likely influenced by factors such as its industrial composition, dynamics within the workforce, and the efficacy of regional economic development initiatives.

**Dashboard 1**

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*This dashboard provides economic and social insights across three states of the United States: Florida, New York, and Texas.*

**Dashboard 2**

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*This dashboard presents social and educational insights across three states of the United States: Florida, Texas, and New York.*

**CONCLUSION**

Based on the analysis of socio-economic factors across Texas, Florida, and New York, several conclusions can be drawn regarding their impact on societal structures and economic landscapes:

**Education Attainment and Poverty**: There is a discernible relationship between education attainment rates and poverty levels across counties. Counties with higher education attainment tend to have lower poverty rates, indicating the importance of education in socio-economic mobility. For instance, Williamson County in Texas stands out with high education attainment and low poverty, suggesting a strong local economy and support systems.

**Evolution of Poverty**: Over the years, poverty rates have fluctuated across counties, reflecting changes in socio-economic conditions and the effectiveness of policy interventions. While some counties have shown improvements in poverty rates, others continue to face challenges, emphasizing the need for targeted strategies to address economic disparities.

**Regional Disparities**: Disparities in education attainment, poverty rates, and economic indicators exist across states, MSAs, and counties. Urban centres tend to have higher education attainment and economic output, whereas rural areas may face challenges associated with lower wages and limited economic diversification.

**Representation in Institutions**: There are variations in the representation of Asian, Black, and White individuals across institutions within Texas, Florida, and New York. Efforts to promote diversity and inclusion are evident in institutions like Access Careers, which demonstrate a higher representation of Asian individuals.

**Economic Dynamics**: Economic dynamics vary across MSAs, with some areas experiencing robust growth and higher wages, while others face economic challenges and lower income levels. The dual-axis visualization highlights disparities in average GDP and annual wages per employee, underscoring the importance of economic policies and development initiatives.

**Internet Accessibility**: Disparities in internet costs between MSAs indicate variations in affordability and accessibility of internet services, which may impact digital connectivity and socio-economic opportunities within urban and rural areas.

**Identification of Additional Research Questions**

1. How do variations in the cost of internet access affect educational attainment levels and socio-economic mobility across different states?
2. What role does educational attainment play in mediating the relationship between GDP growth and poverty rates within MSAs?
3. How do changes in the poverty rate over time correlate with shifts in GDP and educational attainment levels within MSAs?