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Linking Employment Location Quotients with Economic Performance for Counties in Florida

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ABSTRACT

Location Quotients (LQs) are widely used to assess industry concentration in specific regions relative to broader areas. However, their utility in predicting societal outcomes such as wealth, health, and education remains less explored. This study examines the links between selected industry location quotients and economic determinants of household income and poverty rate in Florida. Other factors, such as healthcare and education, were also considered to quantify the macroeconomic impact of these industries in Florida. Additionally, healthcare and education factors are considered to gauge the overall macroeconomic impact of these industries. Employing a Structural Equation Model with a three-stage least squares regression approach, our analysis unveils nuanced effects: while certain sectors bolster economic outcomes, others contribute to economic disparities. For instance, the construction and accommodation/food services sectors are found to influence local economies positively. Understanding these industry dynamics at the county level enables more informed local planning and long-term support strategies for communities.

Keywords: Location Quotients, Income, Poverty Rate, Structural Equation Model

Humans have three very clear stages in their lives. The time you prepare for work, the time people work, and when people retire. Excluding special cases, most people spend the first 18-25 years preparing for their future employment. They learn in school, gather experience, and start their long-term occupation. People then progress in their field, and their life is dependent on their income. Once they reach a certain age, people retire. Based on an individual's savings and additional benefits from employment, people tend to retire within their means. Work is the most consistent thing in humanity because we all must do it. However, have we ever stopped to think about how jobs affect people and economic performance? Employment can be broken down into various sectors or general groupings based on the similarity of work. Different sectors logically have different outcomes, such as compensation, hours worked, work difficulty, and location, depending on the job itself. Some sectors lead to proportionally higher outcomes, while some lead to worse. The United States has classified data collected on businesses using the North American Industry Classification System, or NAICS (Census, 2023). Adopted in 1997, these identify unique industry codes to categorize businesses and make this information accessible for modern data analysis.

The state of Florida is a rapidly growing state and prosperous economy. Since 2000, the real GDP of the state has grown from 624 billion USD to over 1.07 trillion USD in 2022 (Statista, 2023). This level of growth has been accompanied by massive developments, investment in infrastructure, and a massive influx of population, which has risen from 15.98 million residents to over 22.24 million in 2022 (Statista). This growth has benefited the state in several ways. Unprecedented wealth has entered the state, business is thriving, and the overall quality of living has improved (Britannica, 2023). However, the growth may have negatively affected vulnerable stakeholders who are being left behind in this era of growth. People who lived here before the boom are now being priced out as the costs of living soar (Rohwedder, 2023). Their incomes are no longer sufficient for the area they are in. Property and housing have become exponentially more expensive, and most jobs simply do not pay enough to sustain basic needs. In 2022, the median individual income in the state was $40,770 while the individual cost of living was $55,516 (Carey and Morgan, 2024). Another example is the housing price index. Using a base of 2000 has increased from 100 to 380.5 at the end of 2022 throughout the entire state which is shown in Figure 1 (Federal Reserve of St. Louis, 2024). The communities who have called Florida home since the state's inception are now faced with difficult decisions about their future. Why are people being priced out? Has the growth caused the employment structure to change? To better understand the potential issues and provide policy implications for stakeholders in the state, it is vital to analyze employment trends before more people are left behind.

The research gap that needs to be addressed is how location quotients can be used to predict societal outcomes, such as wealth, health, and education. Once the link between location quotients and these corresponding outcomes is established, we can analyze the effects and the magnitude of the effects of the location quotients with the state of Florida as a case study. For example, we assess whether certain sectors are associated with negative externalities in the counties of Florida. The main research question is whether there exists a link between certain

employment sectors (LQs) and expected socioeconomic outcomes in Florida. What sectors are relevant, and to what extent? Should the growth of the sector be promoted in other areas? Our research aims to understand the underlying effects of LQ in the state economy and identify sectors associated with positive outcomes.

Location Quotients

Location quotient (LQ) is a statistic utilized in regional economics and urban planning to measure an industry's concentration within a specific area against its concentration nationwide (US BLS, 2024). LQs are computed by dividing local industry employment by the total local employment across all industries and ownerships, then dividing national industry employment by the total national employment across all industries and ownerships, and subsequently dividing the local ratio by the national ratio.

These ratios enable comparisons of an area's employment distribution by industry, ownership, and size class with that of a reference area. The United States is utilized as the reference area for all LQs within the files. This will allow Florida and its counties to be compared to the greater nation. The reference industry is consistently the total across all industries and ownerships for both the local area and the nation. For example, an LQ value of 1 signifies that the industry holds the same proportion of area employment as it does nationally. LQs greater than 1 indicate industries with a higher local employment share than the national average (US BLS, 2024).

According to McCann (2001), one way to determine which sectors comprise the base of the local economy is through location quotients. An industry location is a way to define how concentrated an industry is in a region compared to a larger geographic area (country as a whole), it yields more useful information than job numbers or job growth. Industries with high LQ and high total job numbers typically form a region’s economic base and bring money into the region (Gomez & Stair, 2017). Many studies apply LQ as a simple metric to detect industrial specialization (Guimaraes et al., 2009; Billings & Johnson, 2012; Herath Bandara, 2004). However, to our knowledge, scholars had not linked LQs to more broad macroeconomic indicators, such as poverty rate and household income.

In this paper, we link the LQs to unemployment, household incomes, and poverty rates in Florida. For Florida counties, taking Bradford County as an example, the Location Quotient (LQ) for average 2019 employment in agriculture, forestry, fishing, and hunting (NAICS 11) stands at 1.47 under private ownership. This indicates that the concentration of employment in private agriculture within Bradford County is 1.47 times greater than the national concentration. Consequently, the agriculture sector constitutes a larger share of Bradford County's employment landscape than it does on a national scale.

For the experiment, eight industries were initially chosen as crucial sectors for the Florida economy. Each industry can be identified by its unique North American Industry Classification

System (NAICS) code. These included food and beverage retailers (NAICS 445), accommodation and food service (NAICS 72), arts, entertainment and recreation (NAICS 71), finance and insurance (NAICS 52), wholesale trade (NAICS 42), construction (NAICS 23), utilities (NAICS 22), and agriculture, fisheries, and hunting (NAICS 11). Each industry is found in different concentrations throughout Florida.

METHODS

In the framework mentioned, the Local Quotient (LQ) of employment represents the employment ratio of a specific industry within a given locality compared to the national average. This metric shows the industry's presence in a geographic area. Together with various factors such as healthcare and education, these factors collectively impact the macroeconomic landscape of the region, as observed in Florida's counties (Figure 2).

To investigate the effect of selected industries on Florida's macroeconomic outcomes, we identified eight industries using NAICS codes: agriculture, utilities, construction, wholesale trade, finance, recreation, accommodation and food services, and food and beverage retailing (Table 1). We controlled for variables such as life expectancy and educational attainment to mitigate the influence of other pertinent factors on macroeconomic outcomes. A subsequent discussion will delve into how these factors interplay with unemployment, income, and poverty rates.

Our study focuses on three dependent variables: unemployment, median household income, and county poverty.

The county-level Employment Location Quotient (LQ) data were sourced from the US Bureau of Labor Statistics (BLS) Quarterly Census of Employment and Wage (QCEW) database. This program compiles administrative and survey data to offer a quarterly report on employment and wages reported by employers, as well as annual data. It covers over 95 percent of U.S. jobs across counties, Metropolitan Statistical Areas (MSA), states, and the nation, categorized by industry (US BLS, 2023). More information can be found at https://www.bls.gov/cew/downloadable-data-files.htm.

Data Source Industrial Employment LQ

Open access CSV Single Files from the US Bureau of Labor Statistics (BLS) Quarterly Census of Employment and Wage (QCEW) database were downloaded on 12/14/23, focusing on the annual averages from 2017 to 2019. Details of the QCEW data can be accessed at https://www.bls.gov/cew/downloadable-data-files.htm. Within the county employment and wage release, the QCEW program furnishes establishment, employment, and wage data categorized down to the 6-digit NAICS industry level.

In this study, we specifically examine data spanning the years 2017 through 2019 to show the impact of industrial employment LQ on county-level macroeconomic performance. Recognizing the profound disruptions caused by the pandemic on local industries and employment dynamics, we opted not to include data from 2020 to 2022. Given the ongoing recovery process and uncertainty regarding a return to pre-pandemic conditions, we focus solely on the pre-pandemic period to maintain consistency in our study.

The dataset includes approximately 67 counties in Florida, albeit with some null data points, for the years 2017 to 2019. We accessed county-level employment LQ information for eight selected industries from the publicly available QCEW Data Files, accessible at https://www.bls.gov/cew/downloadable-data-files.htm. A summary of the employment LQ for the eight industries over the three years is presented in Table 1.

Structural Equation Model (SEM) and 3SLS Regression

In this study, we employed a Structural Equation Model (SEM) to show the impact of employment Location Quotients (LQ) across various industries in Florida counties on economic performance. SEM is a commonly used analytical tool renowned for its capability to analyze the structural relationships among interconnected variables, offering insights into multiple correlations through path diagrams (Lin et al., 2017; Lopez-Mosquera & Sanchez, 2012).

Drawing from the theoretical framework outlined earlier, we specified the equations as follows:

$$Unemployment = \alpha_0 + \alpha_1 Year + \alpha_2 LQ + \alpha_3 Life\_Exp + \alpha_4 Bachelor + \alpha_5 Less\_High \quad (1)$$

$$HouseholdIncome = \beta_0 + \beta_1 Year + \beta_2 LQ + \beta_3 Life\_Exp + \beta_4 Bachelor + \beta_5 Less\_High \quad (2)$$

$$PovertyRate = \gamma_0 + \gamma_1 Year + \gamma_2 LQ + \gamma_3 Life\_Exp + \gamma_4 Bachelor + \gamma_5 Less\_High \quad (3)$$

where α, β, γ are coefficients.

We employed a three-stage least squares (3SLS) method to estimate the system of structural equations, accommodating equations containing endogenous variables among the explanatory variables. The 3SLS regression model considers the correlations between the three equations, thereby enhancing the efficiency of estimation by incorporating these cross-equation correlations. This approach involves three distinct steps: first-stage regressions to derive predicted values for the endogenous regressors, a two-stage least-squares step to obtain residuals for estimating the cross-equation correlation matrix, and finally, the ultimate 3SLS estimation step (Stata, 2023).

Concerning the explanatory variables, our focus primarily centered on the Location Quotient (LQ) variables for the selected eight industries. The "*Year*" variable was also included to control for time. The "*Life_Exp*" variable denotes the county's average life expectancy, serving as an indicator of the overall health status of the county population. This measure reflects the average years a person is expected to live from birth based on current death rates by age group. Furthermore, we included two education attainment variables: "*Bachelor*," representing the

percentage of adults with a bachelor's degree or higher, and "*Less_High*," indicating the percentage of adults with less than a high school diploma.

Given that we selected eight industries, we estimated eight sets of regressions, one for each employment LQ. The subsequent section elaborates on the empirical findings derived from these regressions. To interpret the results, we reported marginal effects from the estimated coefficients derived from the 3SLS multivariate regression model. These marginal effects illustrate the dependent variables (economic indicators) changes resulting from a one-unit change in the corresponding explanatory variable. All analyses were conducted using Stata software.

Dependent and Other Explanatory Variables

To investigate the impact of employment Location Quotients (LQ) on county-level economic performance, we designated three dependent variables: unemployment (percentage), median income per household (USD), and county poverty (percentage). Unemployment data were sourced from the US Bureau of Labor Statistics' Local Area Unemployment Statistics, Annual Average of Monthly Labor Reports. Specifically, the unemployment rate for each county represents the percentage of unemployed individuals actively seeking work, aged 16 and above, relative to the total county labor force (US BLS, 2004). Median income and poverty rate information was obtained and defined from the US Census Bureau's Small Area Income and Poverty Estimates (SAIPE) Program (US Census Bureau, 2024).

In addition to the employment LQ variables, we included crucial variables about each county's overall health status and educational attainment as explanatory variables. These variables served a dual purpose. Firstly, they were used to control for the effects of health and education on macroeconomic indicators, thereby enhancing the efficiency of our estimations. Secondly, they also provided insights into the effects of health and education on overall economic outcomes. As hypothesized, indicators such as life expectancy and educational attainment levels, including the percentage of the population with bachelor's degrees and those with less than a high school education, were expected to impact not only local employment but also household incomes and poverty rates.

Health-related data, including life expectancy, were retrieved from the Florida Department of Health's Division of Public Health Statistics and Performance Management. Life expectancy is a theoretical estimate of the average number of years a person is expected to live from birth. While we also collected information on chronic diseases and obesity rates for each county, these health indicators only covered specific years within the study period (specifically, 2016 or 2019) and were therefore excluded from the analysis. However, the inclusion in future studies could provide valuable insights into predicting county economic performance.

Educational attainment data were sourced from the USDA Economic Research Service Data, encompassing adults aged 25 and older at the national, state, and county levels. A summary of these explanatory variables over the three years is presented in Table 1.

RESULTS

The multivariate regression model produced mixed results linking selected industries' location quotient (LQ) to the county-level unemployment rate from 2017 to 2019. The employment LQ of selected industries exhibited correlations with the unemployment rate, indicating the potential effect of industrial infrastructure. NAICS11 (agriculture, forestry, fishing, and hunting) was estimated to have a coefficient of 0.03, with a p-value of 0.00. This implies that a one unit increase in employment (LQ ratio) in industries related to NAICS11 would result in unemployment rising by 0.03%. NAICS22 (utilities) was estimated to have a coefficient of 0.14, with a p-value of 0.00; a one unit increase of employment in industries related to NAICS22 would result in unemployment rising by 0.14%. NAICS23 (construction) was estimated to have a coefficient of 0.24, with a p-value of 0.01. A one unit increase in employment related to NAICS23 would increase unemployment by 0.24%. NAICS52 (finance and insurance) was estimated to have a coefficient of 0.22, with a p-value of 0.06. This implies that a one unit increase in employment in industries related to NAICS52 would result in unemployment rising by 0.22%. NAICS445 (food and beverage retailers) was estimated to have a coefficient of 0.20 with a p-value of 0.02. This implies that a one unit increase in employment in industries related to NAICS445 would result in unemployment rising by 0.20%. These industries may employ more people. However, our results revealed that they negatively contribute to the employment situation in Florida counties.

In contrast, NAICS72 (accommodation and food services) was estimated to have a negative coefficient of -0.14, with a p-value of 0.08, on unemployment. This implies that a one unit increase in employment in industries related to NAICS72 would result in unemployment decreasing by 0.14%. These industries contribute positively to the county's employment situation. The location quotients of NAICS42 (wholesale trade) and NAICS71 (arts, entertainment, and recreation) show statistically insignificant results compared to the unemployment rate.

In sum, NAICS 11, 22, 23, 52, and 445 seem to have the effects of increasing the unemployment rate. NAICS 72 results in a decrease in the unemployment rate. NAICS 42 and 71 have an unclear effect on the unemployment rate.

The estimation yielded mixed results linking the location quotient of selected industries to median household income. One industry exhibited positive effects on household income in Florida counties. NAICS72 (accommodation and food services) was estimated to have a coefficient of 2,730.11, with a p-value of 0.00. This implies that a one unit increase in employment in industries related to NAICS72 would result in a median income increase of $2,730.11.

However, several other industries show negative effects on household income. For example, NAICS42 (wholesale trade) had a coefficient of -3,845.05, with a p-value of 0.00 (a

one unit increase in employment would result in median income decreasing by $3,845.05). NAICS52 (finance and insurance) resulted in a coefficient of -2,161.86 as well. A p-value of 0.065 implies that a one unit increase in employment in industries related to NAICS52 would also decrease household income by $2,161.86. It is interesting that wholesale trading, finance, and insurance, these two industries, decrease the household incomes for Florida counties instead of increasing incomes. The location quotients of NAICS11 (agriculture, forestry, fishing, and hunting), NAICS22 (utilities), NAICS23 (construction), NAICS445 (food and beverage retailers), and NAICS71 (arts, entertainment, and recreation), all showed statistically insignificant impacts on median household income.

In sum, NAICS 72 exhibits a positive correlation to median household income. NAICS 42 and 52 exhibit a negative correlation to median household income. The effect of NAICS 11, 22, 23, 445, and 71 regarding median household income is unclear.

The regression produced mixed results linking the location quotient of selected industries to the poverty rate. Several industries exhibited negative correlations. NAICS23 (construction) was estimated to have a coefficient of -2.05, with a p-value of 0.00. This implies that a one unit increase in employment in industries related to NAICS23 would decrease the poverty rate by 2.05%. NAICS72 (accommodation and food services) was estimated to have a coefficient of -1.28, with a p-value of 0.00. This implies that a one unit increase in employment in industries related to NAICS72 would decrease the poverty rate by 1.28%. The location quotients NAICS11 (agriculture, forestry, fishing, and hunting), NAICS22 (Utilities), NAICS44(food and beverage retailers), NAICS 42 (wholesale trade), NAICS 52 (finance and insurance), NAICS71 (arts, entertainment, and recreation), and NAICS445 (food and beverage retailers) all produced statistically insignificant results when compared to the poverty rate.

In sum, both NAICS 23 and 72 seem to have significant effects on decreasing the poverty rate at the country level, which is worth discussing in the next section.

DISCUSSION

In this section, we first discussed the effects of location quotient by industry code. Then, we discussed the policy implications and recommendations for the county level.

Agriculture, Forestry, Fishing, and Hunting (NAICS 11)

For the agriculture industry, as the concentration of employment increased, the unemployment rate rose. This could be caused by several different factors. The increased unemployment could be explained by certain jobs being eliminated due to automation. Another possible explanation for the increasing unemployment rate could be the high number of seasonal workers employed in the agriculture industry in Florida. The seasonal nature of the agriculture industry leads to low-skilled workers being cyclically unemployed. Another aspect unique to the agriculture industry is the concentration of migrants and H2A workers engaged in the industry. While agriculture

employment did not show significant effects regarding poverty rate and median household income, certain workers (Undocumented Migrants) earning low wages may not be included in government statistics, so our model is limited by the data we possess.

These findings provide insights into the solutions a local government at the county level could employ to combat the increased unemployment rates and household incomes. Transitory work programs could be implemented to assist workers who may be out of season. More importantly, diversification of the agriculture industry would allow for year-round employment due to crop variation. Education and a transition away from concentrated agriculture operations would also benefit a county seeking to improve its unemployment rate and household income.

Utilities (NAICS 22)

The utilities industry (NAICS 22) negatively affects the unemployment rate of a county. As the concentration of employment (LQ) in the utility industry rose within a county, unemployment increased. It was not initially expected in our hypothesis. Possible explanations include urban sprawl and the increased stress that it puts on utilities. Urban sprawl drastically increases the space and resources needed to provide basic utilities. The diversion of these resources to utilities rather than other important aspects of the community could lead to a lack of funding for crucial programs. Although the impact might be indirect, the findings showed that the concentration of employment in the utility industry might hurt the overall employment situation for the county. Another possibility might be due to the location of the utility jobs themselves. Powerplants and other utility services tend to be in isolated locations. Although it could be on a small scale, the concentration of employment in the utility industry could have accumulative effects for the local and the county. More importantly, other industries would not be encouraged to move to the area as they would have a hard time finding workers as well. The lack of surrounding industries in an area (within the utility industry) with a high utility concentration could decrease the unemployment rate.

The policy implications for this issue at the county level may vary depending on the cause of the problem. A more efficient development path should be pursued if the increased unemployment rate is due to utility resource consumption. Environments that promote walkability, density, shared transportation, and energy efficiency could all lower operating costs. Since these funds would no longer be needed for utilities and employment in the sector, they could be reallocated towards projects that benefit the community and county. If the underlying issue is the nature of the utility, there are also options to be selected. For example, an old power plant could be refurbished or transitioned into a cleaner form of industry. Additionally, investment in green energy would provide an incentive for prospective employers and employees in other industries due to the societal benefits they provide. However, certain areas, such as landfills, will always be unattractive places to live. Thus, how to restore the surrounding area and attract certain industries could be a priority on the local agenda.

Construction (NAICS 23)

The construction industry (NAICS 23) affects two economic indicators. An increased concentration of construction employment leads to an increased unemployment rate. Similar to the agriculture industry, construction employs seasonal or transitory workers. This is because as projects begin or end, demand for employees shifts. Some workers may be employed for a certain number of months while completing a development project and may choose to take some time off after. Other employees may not be able to find alternative employment if they are actively looking for a job if the market cools. Additionally, methods are streamlined as tools and construction equipment become more efficient. Labor cost increases cause employers to find alternatives. These are some possible explanations for the concentration of employment within the construction industry increasing the unemployment rate.

The construction industry also affects the poverty rate in the county. An increased concentration of employment in construction decreases the poverty rate. Increased construction is synonymous with increased growth within an area. Either scenario implies that construction jobs have a positive impact at the county level.

Local governments may utilize this finding to encourage the construction industry within their county. This is because the industry will lower the poverty rate and lead to a higher standard of living. To address the increasing unemployment rate, counties could employ transitory work programs to assist workers when they are not engaged in the construction job. This would allow workers to have support and not slip into economic turmoil when cyclically unemployed.

Wholesale Trade (NAICS 42)

The wholesale industry (NAICS 42) displayed a negative effect on household income. An increase in employment concentration in wholesale results in a drastic decrease in median household income. Jobs in the wholesale trade industry tend to be low-paying warehouse jobs and in isolated areas. While the location of these opportunities may be in less expensive areas, as the jobs will be low paying, employment, and income levels are still undesirable at the county level.

Local governments may consider encouraging the wholesale industry within their county to increase worker pay or employment benefits. Due to the nature of these jobs, governments should also encourage automation to streamline tasks and optimize employment within the sector. A decrease in necessary employment could result in wages for those remaining workers increasing. For workers displaced, other alternative employment could be found in industries that result in positive outcomes, such as Construction (NAICS 23) or Food Service (NAICS 72). A combination of these strategies is recommended at the county level.

Finance and Insurance (NAICS 52)

Finance and insurance (NAICS 52) showed unexpected effects on multiple indicators. An increased concentration of employment in the finance and insurance sector correlates to increased unemployment and decreased median household incomes. These results characterize the industry as a net negative for the local and society. However, there are underlying causes. Upon further inspection of the BLS data, we found that most jobs within the sector are not directly related to finance but insurance jobs. Insurance jobs tend to be commission-based and have a high turnover rate. Jobs in the financial industry tend to have a salary and a lower turnover rate. The finance industry was not separated, but further research should be conducted to determine the difference between the sectors.

At the county level, it is not easy to address the problems that the insurance sector and companies pose. On the one hand, they provide employment and tax revenue for the county. Finance and insurance are necessary for development and business expansion, so a county would naturally want to be a home for the business. However, the jobs themselves have been linked to societal negatives. A Laissez-faire approach from the government may provide the best outcomes at the county level. Additional oversight from the federal or state level would be necessary to shift the nature of the industry.

Accommodation and Food Service (NAICS 72)

The accommodation and food service sector (NAICS72) had positive effects, linking the industry's location quotient to all economic indicators. A higher concentration of accommodation and food services led to a decrease in the countywide unemployment rate. This could be explained due to the high number of workers the industry tends to employ, and a large workforce leads to a lower unemployment rate. Additionally, the sector has a positive effect on household income. This implies that accommodation and food service jobs increase the average economic output within a county. More importantly, the industry was linked to decreasing the poverty rate. Both are positive economic outcomes. An explanation is the varying scale of accommodation and food services. Some are large corporations that employ massive amounts of people. Others are small family businesses that could have been in the family for generations. There are a variety of management levels and support positions that pay well and provide upward mobility for workers. Also, the surrounding services a strong accommodation and food service sector provides. If there are a lot of places for people to eat, then there are naturally more people in an area with disposable income to spend on food services accompanied by other service businesses.

Given the information, the policy recommendation for the local governments is to aggressively pursue policy that promotes growth in the accommodation and food service sector. The jobs the industry provides improve the local economy. As the businesses vary in size, the industry can create a fluent middle class and provide entertainment for those uninvolved in the industry. The model shows that a higher concentration of food and accommodation services can

define the culture of a city, strengthen its economy, and create better economic outcomes for its citizens.

CONCLUSIONS

The objective of this study was to examine the link between location quotients of employment in related industries in the state of Florida and economic indicators, e.g., overall unemployment rate, household income, and poverty. The results were mixed; certain industries indicated significant effects, while others showed no correlation. The location quotients of construction (NAICS 23) and accommodation and food services (NAICS 72) suggested the two sectors are a net positive at the county level. Policies should be considered and implemented to encourage the development of these industries in the county and state. The location quotients of agriculture (NAICS 11), utilities (NAICS 22), wholesale trade (NAICS 42), and finance and insurance (NAICS 52) all showed negative effects on economic outcomes. The location quotient of NAICS 71 (arts, entertainment, and recreation) did not show significant effects. At the county level, state and local governments may utilize the findings of this study to encourage sectors to enter and concentrate on growing jobs in the sectors, which link to better economic outcomes. These opportunities from introducing industries with positive links to economic performance could provide individuals with a better chance of not only escaping and avoiding poverty but also increasing income in the long run. For better economic growth and over-welfare, we should begin to structure our education and employment into sectors linked with better economic outcomes and begin to automate or reduce fewer desirable sectors.

While this study attempted to answer a unique research question regarding the LQs (the employment concentration of certain sectors), further research is invited to determine more industries with more quantified economic outcomes. In addition, we selected only eight industrial codes, which might limit the ability to visualize the big picture. Further subdivisions of these industrial groups would allow us to understand the effects of industrial sectors on economic results. In Florida, there are hundreds of unique industries whose societal effects could be understood by studies following our route. Determining which industries are a net positive or negative would allow local governments to encourage growth in the most efficient and productive areas.

This study suggests that exploring an increased set of industries would allow us to better understand the state of employment throughout all industries in the state of Florida and their relation to economic outcomes. The sample utilized in this study was only from the state of Florida. Other states may retrieve similar or completely different results. For example, perhaps construction is a positive in Florida but a negative in Massachusetts. Do regional economies strengthen sectors in particular areas of the country? Certain states may specialize in industries, which could lead to better results in that region than in others. Further research questions could be followed using similar methodologies. In addition, all counties should know where they stand as well. The study could be extended to determine what sectors should be federally promoted or phased out through the education system and policy direction.

As humanity progresses through the 21st century, it is clear there is a need for change. There are many issues to solve. Although people's basic needs and education are prioritized, understanding the employment structure at the county level would allow local governments to better plan and support their population in the long run. Income disparity and poverty are systemic issues that must be addressed. Providing more employment opportunities in ideal industries will lead to better economic outcomes at the county and state levels.

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FIGURES

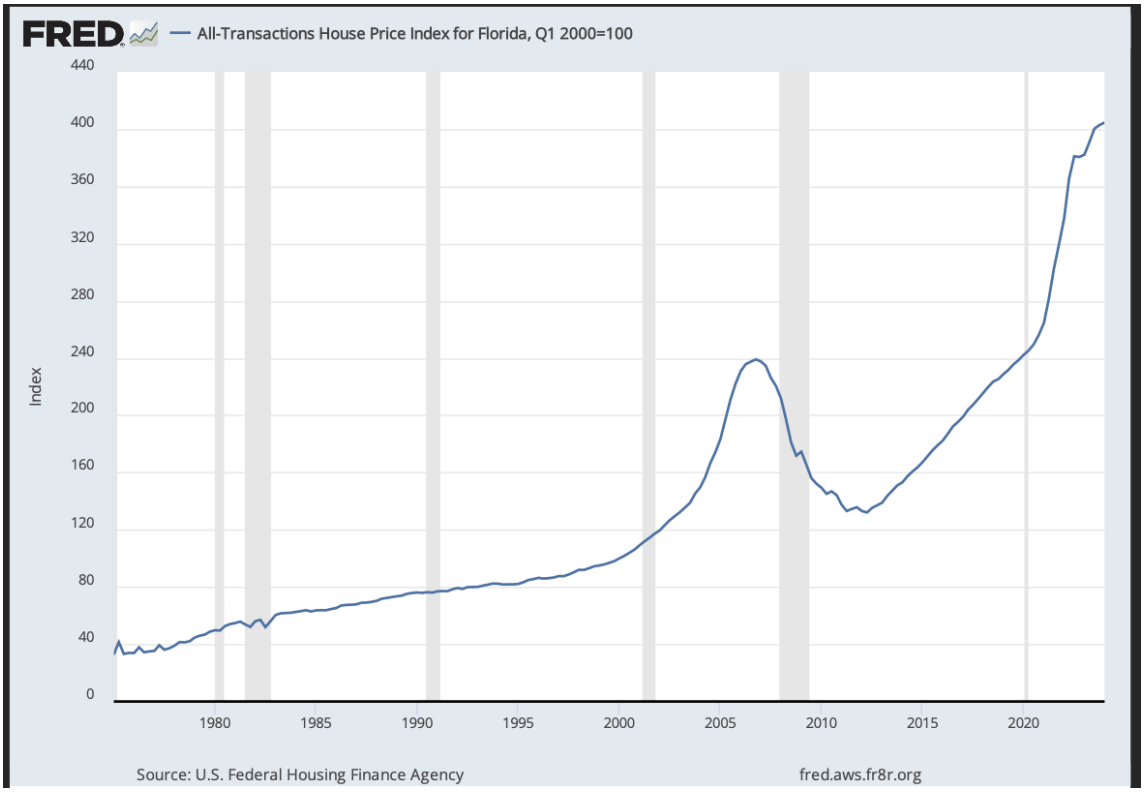

Figure 1. All Transactions House Price Indec for Florida, Q1 2000 =100

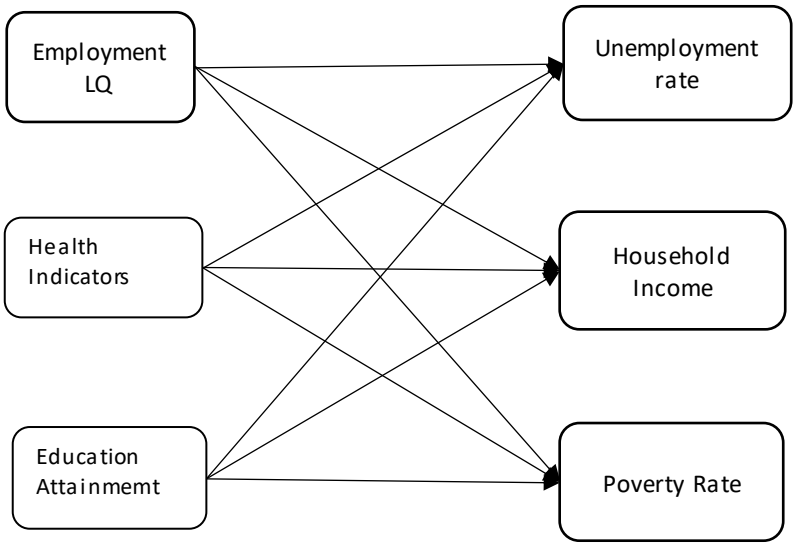

Figure 2. Industrial LQ of employment influencing employment, income, and poverty.

TABLES

Table 1. Descriptions of the dependent and explanatory variables used in the SEM model.

Variable	Description	Mean	Std. Dev.
Dependent variables			
Unemployment rate	Number of unemployed people who were looking for work 16 years and older as a percent of the total county labor force	4.01	0.77
Household Income	Median Household Income: the income level at which half the households earn more and half the households earn less.	51374.06	10276.81
Poverty Rate	The number or percentage of those living below the poverty line, all ages	15.92	5.14
LQ variables			
NAICS	Industry Code (6-character, North American Industry Classification System (NAICS), SuperSector).		
LQ of Employment	Location quotients are ratios that allow an area's distribution of employment to be compared to a reference area's distribution.		
LQ_NAICS11[a]	Agriculture, forestry, fishing and hunting	2.26	5.06
LQ_NAICS22	Utilities	1.13	1.57
LQ_NAICS23	Construction	1.31	0.48
LQ_NAICS42	Wholesale trade	0.62	0.49
LQ_NAICS52	Finance and insurance	0.63	0.46
LQ_NAICS71	Arts, entertainment, and recreation	1.02	0.91
LQ_NAICS72	Accommodation and food services	1.12	0.61
LQ_NAICS445	Food and beverage retailers	1.37	0.55
Other explanatory variables			
life_expectancy	Life expectancy is a theoretical estimate of the average number of years from birth a person is expected to live.	77.85	2.61
overweight_percent	Adults Who Are Overweight, from a state-based telephone surveillance system called the Behavioral Risk Factor Surveillance System (BRFSS)	35.71	3.62
percent_bachelor	Percent of adults with a bachelor's degree or higher, 2017-21	23.92	10.36
percent_less_than_high	Percent of adults with less than a high school diploma, 2017-21	13.60	6.16

total_population	Estimated Total Population of Florida counties. Population estimates in the county, 2017-2019	317221	497545
percent_population	Percent of total Florida population, 2017-2019	1.49	0.17

Table 2. Regression estimation results of Unemployment Rate.

	NAICS 11 agriculture, forestry, fishing, and hunting		NAICS22 utilities		NAICS23 construction		NAICS42 wholesale trade		NAICS52 finance and insurance		NAICS71 arts, entertainment, and recreation		NAICS72 accommodation and food services		NAICS44 food and beverage retailers	
Explanatory variables	Coef.	P-value	Coef.	P-value	Coef.	P-value	Coef.	P-value	Coef.	P-value	Coef.	P-value	Coef.	P-value	Coef.	P-value
CONSTANT	896.79	0.000	921.64	0.000	928.54	0.000	845.25	0.000	913.24	0.000	918.45	0.000	908.37	0.000	902.88	0.000
Year	-0.44	0.000	-0.46	0.000	-0.46	0.000	-0.42	0.000	-0.45	0.000	-0.46	0.000	-0.45	0.000	-0.45	0.000
LQ of Employment	0.03	0.000	0.14	0.000	0.24	0.014	0.09	0.483	0.22	0.061	0.02	0.684	-0.14	0.079	0.20	0.017
Life Expectancy	0.08	0.000	0.07	0.004	0.07	0.002	0.08	0.000	0.09	0.000	0.06	0.025	0.09	0.000	0.08	0.000
Bachelor above (%)	-0.04	0.000	-0.04	0.000	-0.04	0.000	-0.05	0.000	-0.05	0.000	-0.04	0.000	-0.04	0.000	-0.04	0.000
Less than high school (%)	-0.01	0.218	0.00	0.851	0.01	0.657	-0.00	0.901	-0.01	0.622	0.01	0.369	-0.01	0.376	0.01	0.646
N	203		194		203		191		203		194		203		203	
adj. R-sq	0.491		0.519		0.463		0.456		0.456		0.482		0.455		0.461	
P-value	0.000		0.000		0.000		0.000		0.000		0.000		0.000		0.000	
Chi-squared	195.70		209.7		174.79		160.21		170.21		180.72		169.48		174.23	

Note: The unemployment rate is based on the Bureau of Labor Statistics, Local Area Unemployment Statistics.
∗ ∗∗, and ∗∗∗ indicate 10%, 5%, and 1% significance levels, respectively.

Table 3. Regression estimation results of Median Household Income.

	NAICS 11 agriculture, forestry, fishing, and hunting		NAICS22 utilities		NAICS23 construction		NAICS42 wholesale trade		NAICS52 finance and insurance		NAICS71 arts, entertainment, and recreation		NAICS72 accommodation and food services		NAICS44 food and beverage retailers	
Explanatory variables	Coef.	P-value	Coef.	P-value	Coef.	P-value	Coef.	P-value	Coef.	P-value	Coef.	P-value	Coef.	P-value	Coef.	P-value
CONSTANT	-5351300	0.000	-5504284	0.000	-5257052	0.000	-5730343	0.000	-5394975	0.000	-5551887	0.000	-5314218	0.000	-5323820	0.000
Year	2654.24	0.000	2707.62	0.000	2610.31	0.000	2836.38	0.000	2678.05	0.000	2373.20	0.000	2635.69	0.000	2640.53	0.000
LQ of Employment	-66.49	0.440	-276.30	0.271	1769.73	0.077	-3845.05	0.002	-2161.86	0.065	620.25	0.285	2730.11	0.001	-1239.97	0.139
Life Expectancy	535.69	0.015	1194.34	0.000	406.91	0.075	706.63	0.002	479.20	0.029	1037.69	0.000	493.70	0.021	583.54	0.008
Bachelor above (%)	463.49	0.000	316.09	0.001	505.65	0.000	479.70	0.000	521.17	0.000	300.88	0.001	432.53	0.000	433.77	0.000
Less than high school (%)	-456.91	0.000	-661.83	0.000	-389.22	0.003	-470.15	0.000	-472.54	0.000	-690.34	0.000	-374.03	0.002	-548.60	0.000
N	203		194		203		191		203		194		203		203	
adj. R-sq	0.683		0.722		0.686		0.695		0.687		0.715		0.699		0.685	
P-value	0.000		0.000		0.000		0.000		0.000		0.000		0.000		0.000	
Chi-squared	436.44		504.56		444.40		435.48		445.26		485.72		470.75		441.45	

Note: Median Household Income is from the U.S. Census Bureau, Small Area Income and Poverty Estimates (SAIPE) Program, release date: December 2020.
∗ ∗∗, and ∗∗∗ indicate 10%, 5%, and 1% significance levels, respectively.

Table 4. Regression estimation results of Poverty Rate.

	NAICS 11 agriculture, forestry, fishing, and hunting		NAICS22 utilities		NAICS23 construction		NAICS42 wholesale trade		NAICS52 finance and insurance		NAICS71 arts, entertainment, and recreation		NAICS72 accommodation and food services		NAICS44 food and beverage retailers	
	NAICS 11		*NAICS22*		*NAICS23*		*NAICS42*		*NAICS52*		*NAICS71*		*NAICS72*		*NAICS445*	
Explanatory variables	Coef.	P-value	Coef.	P-value	Coef.	P-value	Coef.	P-value	Coef.	P-value	Coef.	P-value	Coef.	P-value	Coef.	P-value
CONSTANT	1601.71	0.001	1707.89	0.000	1478.61	0.001	1733.32	0.000	1626.72	0.001	1614.68	0.000	1590.79	0.001	1595.71	0.001
Year	-0.77	0.001	-0.81	0.000	-0.71	0.002	-0.83	0.000	-0.78	0.001	-0.76	0.001	-0.76	0.001	-0.76	0.001
LQ of Employment	0.05	0.257	0.14	0.244	-2.05	0.000	0.10	0.866	0.65	0.240	-0.17	0.538	-1.28	0.001	0.57	0.147
Life Expectancy	-0.65	0.000	0.99	0.000	-0.50	0.000	-0.69	0.000	-0.63	0.000	-0.94	0.000	-0.63	0.000	-0.67	0.000
Bachelor above (%)	0.10	0.019	0.18	0.000	0.05	0.217	0.12	0.004	0.08	0.071	0.18	0.000	0.11	0.006	0.11	0.010
Less than high school (%)	0.70	0.00	0.83	0.000	0.62	0.000	0.74	0.000	0.71	0.000	0.83	0.000	0.67	0.000	0.75	0.000
N	203		194		203		191		203		194		203		203	
adj. R-sq	0.719		0.752		0.744		0.732		0.720		0.747		0.733		0.721	
P-value	0.000		0.000		0.000		0.000		0.000		0.000		0.000		0.000	
Chi-squared	520.43		589.35		588.86		517.00		520.78		572.77		556.37		523.34	

Note: Poverty percent, All Ages, information is from U.S. Census Bureau, Small Area Income and Poverty Estimates (SAIPE) Program, release date: December 2020.

∗ ∗∗, and ∗∗∗ indicate 10%, 5%, and 1% significance levels