

**ECONOMIC GROWTH AND INCOME DISTRIBUTION
IN NORTH CAROLINA AND INTRODUCTION OF THE
NC-GROWTH AND NC-SHARE INDICES**

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EXECUTIVE SUMMARY

Economic growth and the distribution of that growth are two key elements of the economy as well as points of debate. Most public policy issues have as their background one or both of these important factors.

Given the importance of economic growth and income distribution in public discourse and policy, it is important to have understandable measures of both concepts. This report outlines such measures for North Carolina. The measure for economic growth is termed NC-GROWTH, and the measure for income distribution is called NC-SHARE. Both NC-GROWTH and NC-SHARE are indices based on several individual measures outlined in the report.

Looking at the indices over the period 1997-2020, NC-GROWTH is very volatile, with the index positive in most years of the period but negative when the economy was in or near a recession. In contrast, NC-SHARE shows a definite downward trend during the period, indicating a narrowing of the income distribution in North Carolina. Interestingly, in 2020 NC-GROWTH fell due to the Covid-19 recession, but NC-SHARE rose as a result of the large federal financial assistance to households.

There is a significant positive association between one of the growth measures – the growth rate in real (inflation-adjusted) North Carolina Gross

Domestic Product – and the income distribution index, NC-SHARE. This finding *could* suggest that faster economic growth in the state is associated with a broadening of the income distribution.

Updates to both NC-GROWTH and NC-SHARE are planned when new data become available. This will allow continuous monitoring of changes in these two vital indicators of the North Carolina economy.

About the author: Michael L. Walden is a William Neal Reynolds Professor Emeritus at North Carolina State University. During a 43-year career, Walden became recognized as an expert on the North Carolina economy and public policy. He is the author of 14 books and over 300 articles and reports. Walden has won numerous state and university awards, including the *Order of the Long Leaf Pine*, the UNC Board of Governors' Award for Excellence in Public Service, and the Holladay Award for Excellence from North Carolina State University.

INTRODUCTION

Behind the majority of economic issues are two core factors, economic growth and income distribution. Economic growth calibrates how the size of the “economic pie” is changing, while income distribution shows how the “slices” of the pie are distributed. Questions about fairness, income inequality, job creation, taxes and public debt, and others are all tied to economic growth and income distribution. But before these questions can be adequately addressed, reliable and consistent measures of economic growth and income distribution are needed.

The purposes of this report are to develop such measures for North Carolina, track their changes in recent decades, explore relationships between the measures, and construct two indices that will reflect changes in economic growth and income distribution over time. The indices are labeled the NC-Growth Index for economic growth and the NC-SHARE Index for income distribution.

MEASURES OF ECONOMIC GROWTH

Three commonly used measures of economic growth are used for North Carolina: the real (inflation-adjusted) annual growth rate in state Gross Domestic Product (“real GDP”), the real (inflation-adjusted) annual growth rate in per capita

personal income (“real PCY”), and the annual growth rate in employment from the survey of businesses (“Jobs”).¹

In the real GDP measure, GDP is an aggregate measure of all commercial economic activities during a period of time – here, a year. It is monetized in dollar terms, where the value for a particular sector – like farming, manufacturing, or professional services – is the market value of the sector’s products or services in excess of the cost of their inputs.² GDP therefore allows the activities of sectors engaged in widely varying business pursuits to be summed and presented as a total. The adjustment for inflation makes the dollar values in differing years equivalent in purchasing power. In 2020, the real GDP of the nation was \$18.3 trillion, and in North Carolina real GDP was \$500 billion – with both values measured in 2012 purchasing power dollars.

Real PCY is the sum of income to persons from all sources, including from working, investing, owning a commercial enterprise, as well as from government financial benefits. The sum is divided by the number of people in the geographic area, such as North Carolina, and then converted to a consistent dollar-valued purchasing power.

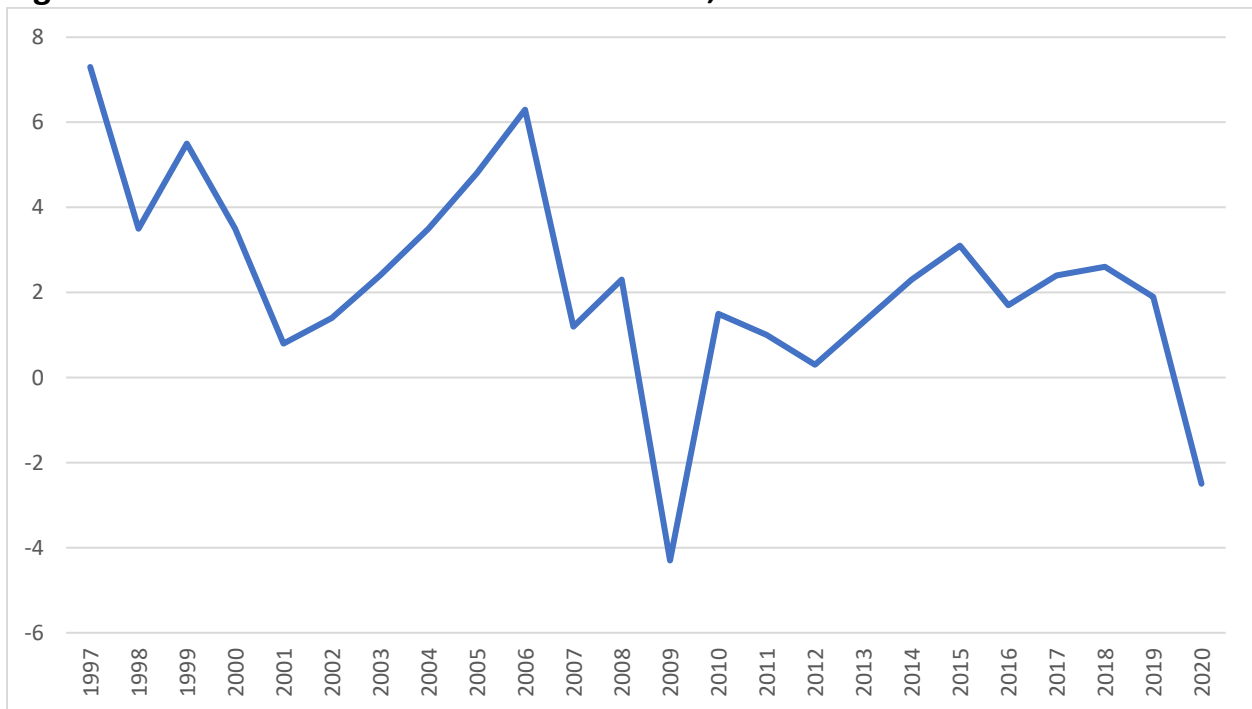
¹ Available from the U.S. Bureau of Economic Analysis and the U.S. Bureau of Labor Statistics.

² For economic activities that do not have an observed market value, such as many government services, the cost of production replaces the market value.

Jobs are those reported from the monthly survey of business establishments, and are available for both the nation and each state.

Since one focus in this report is economic growth, the annual growth rates in the three measures are reported. Figures 1, 2, and 3 show the annual growth rates in real GDP, real PCY and Jobs. The growth rate in real GDP (Figure 1) is positive for most years, but is negative during recessions. Recessions in 2009 (the “Great Recession”) and in 2020 (the “Covid-19 Recession”) are clearly apparent. Over the entire time period (1997-2020) the average annual growth rate is 2.2%.

Figure 1. Annual Growth Rate in NC Real GDP, %.



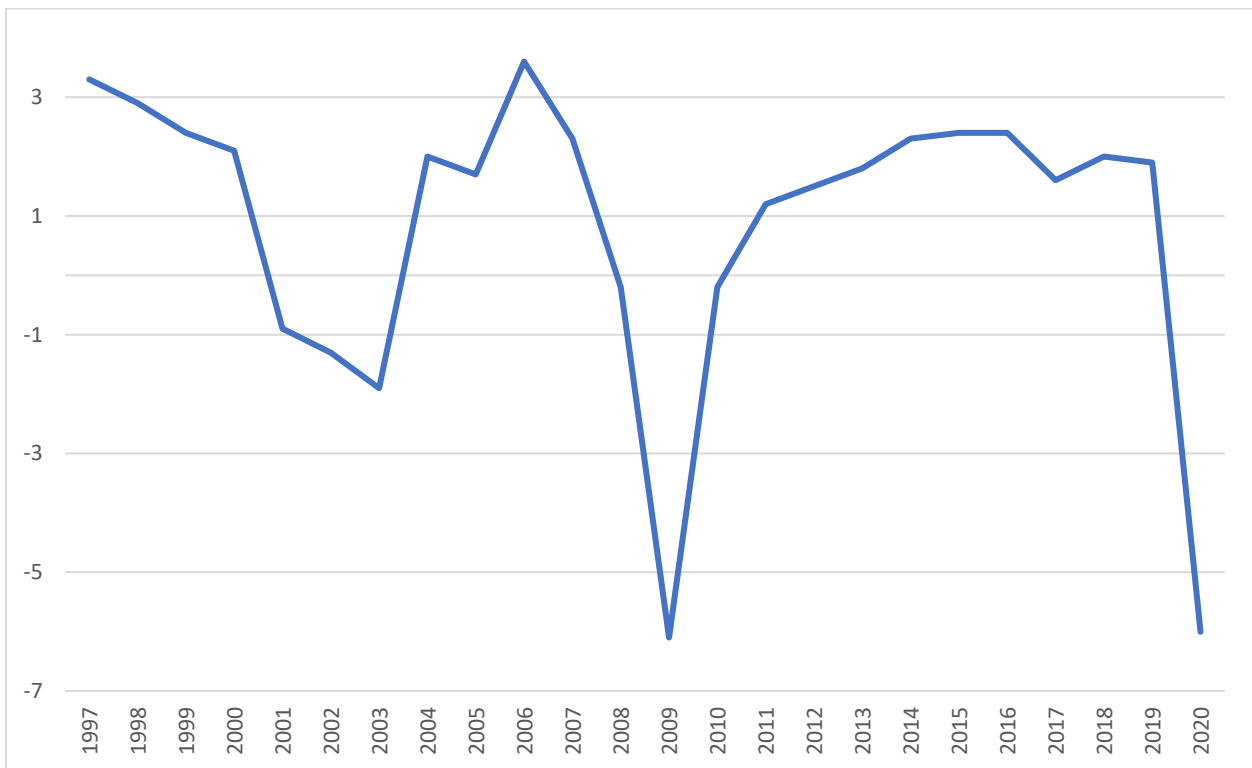
Source: U.S. Bureau of Economic Analysis.

Figure 2. Annual Growth Rate in NC Real Per Capita Personal Income, %.



Source: U.S. Bureau of Economic Analysis.

Figure 3. Annual Growth Rate in NC Jobs, %.



Source: U.S. Bureau of Labor Statistics.

The trend in real PCY (Figure 2) is also volatile, with negative growth in 2001-02, 2008-10, and 2013. The years 2001-02 and 2008-10 were in or near recession years, and in 2013 there was a major downturn in the state's large financial sector. Ironically, real PCY rose during the Covid-19 recession in 2020 as a result of the massive federal financial assistance to households. The average annual growth rate in North Carolina's real PCY over the time period is 1.2%.

There were job losses in North Carolina in 2001-03, 2008-10, and 2020 (Figure 3). This was during or near recession years. The average growth rate in Jobs was 0.9% during the time period.

TRENDS IN EARNINGS FOR INCOME GROUPS

Before presenting the specific income distribution measures used in the report, it is helpful to examine trends among income groups in North Carolina. Using data from the U.S. Bureau of Labor Statistics, North Carolina's labor force is divided into three categories of high-paying, middle-paying, and low-paying economic sectors.³ The high-paying category includes employment in management, finance, utilities, information, and professional services. The middle-paying category aggregates jobs in wholesale trade, mining,

³ U.S. Bureau of Labor Statistics, Quarterly Census of Employment and Wages.

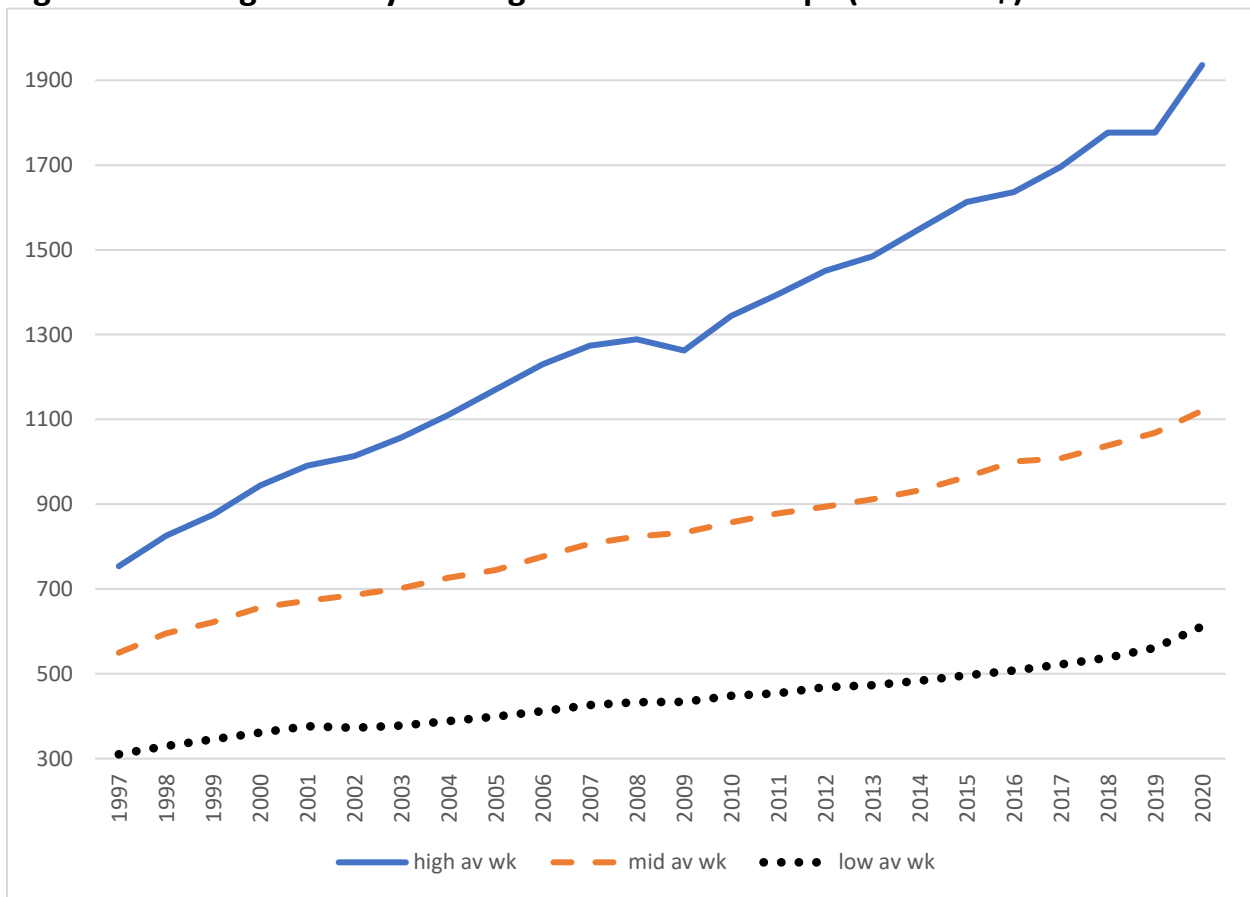
manufacturing, construction, real estate, health care, public administration, transportation/warehousing, and education. Low-paying jobs are in administrative support, agriculture, personal services, arts/entertainment, retail trade, and accommodation/food service. Examination of the data show natural breaks in weekly earnings among the three categories which are consistent over the 1997-2020 time period. A further advantage of the data is its availability on a quarterly basis.

Figure 4 shows that nominal (not adjusted for inflation) average weekly earnings for all three groups rose over the period, although at different rates. From 1997 to 2020, nominal average weekly earnings increased 157% for high-paying jobs, 104% for middle-paying jobs, and 97% for low-paying jobs.

Recognizing that 2020 was an unusual year due to the large financial assistance to households from the federal government, the gains for 1997-2019 were 136% for high-paying jobs, 94% for middle-paying jobs, and 81% for low-paying jobs. It is clear that in both time periods, weekly earnings of all groups rose, but the size of the increase was largest for high-earners, second-largest for middle-earners, and lowest for low-earnings.

The same trends are found when the changes in earnings are adjusted for inflation, meaning the change is now based on constant purchasing-power

Figure 4. Average Weekly Earnings for Income Groups (nominal \$).



Source: U.S. Bureau of Labor Statistics.

dollars.⁴ Over the 1997-2020, the inflation-adjusted change in average weekly earnings was 96% for high-paying jobs, 43% for middle-paying jobs, and 37% for low-paying jobs. Between the shorter period of 1997-2019, the inflation-adjusted changes in average weekly earnings was 76% for high-earners, 34% for middle-earners, and 21% for low-earners.

⁴ The inflation adjustments are based on the all-item Consumer Price Index.

The key finding that all income groups in North Carolina have experienced increases in earnings over time – but with the gains higher for higher income groups – mirrors similar trends at the national level.⁵

MEASURES OF INCOME DISTRIBUTION

The earnings data described in the previous section are used to create three measures of income distribution in North Carolina.

Two are based on comparing average earnings of the three groups. One is the ratio of average weekly earnings of low-paying jobs to the average weekly earnings of high-paying jobs. The second is the ratio of average weekly earnings of middle-paying jobs to the average weekly earnings of high-paying jobs. Increases in the two ratios indicate a reduction of income differences with high-earners and hence a broader income distribution. Decreases in the two ratios imply a widening of income differences with high-earners and therefore a narrower income distribution.

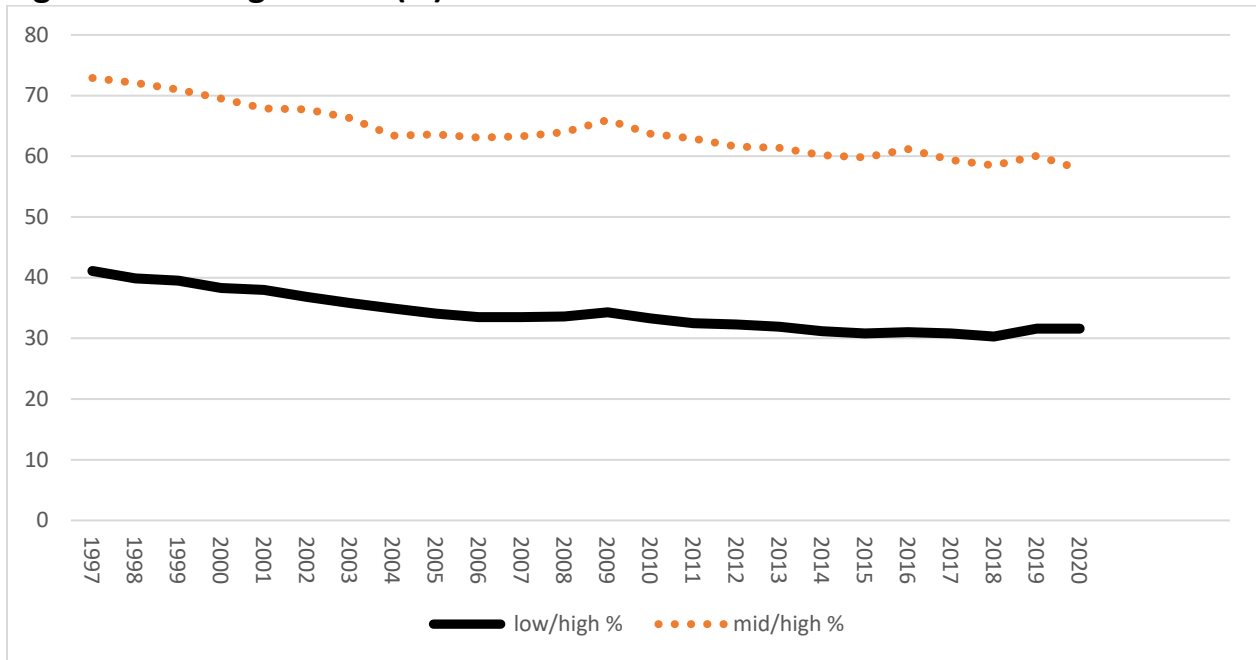
The third measure uses the distribution of employment among high, middle, and low-paying jobs. The measures are the percentages of total employment among the three groups. Increases in the high-earner percentage

⁵ *Income and Poverty in the United States, 2020*, U.S. Census Bureau.

and the middle-earner percentage show a greater access to better paying jobs and hence a wider income distribution. Decreases in these percentages suggest the opposite – less access to better paying jobs and a narrower income distribution. In contrast, an increase in the percentage of low-paying jobs is interpreted as a narrowing of income distribution, while a decrease implies more access to better paying employment and a spreading of the income distribution. These conclusions are summarized in the third measure, calculated as the percentage of high-paying jobs plus the percentage of middle-paying jobs minus the percentage of low-paying jobs. Increases in this third measure should be related to a broadening of the income distribution, while a decrease suggests a narrowing of the income distribution.

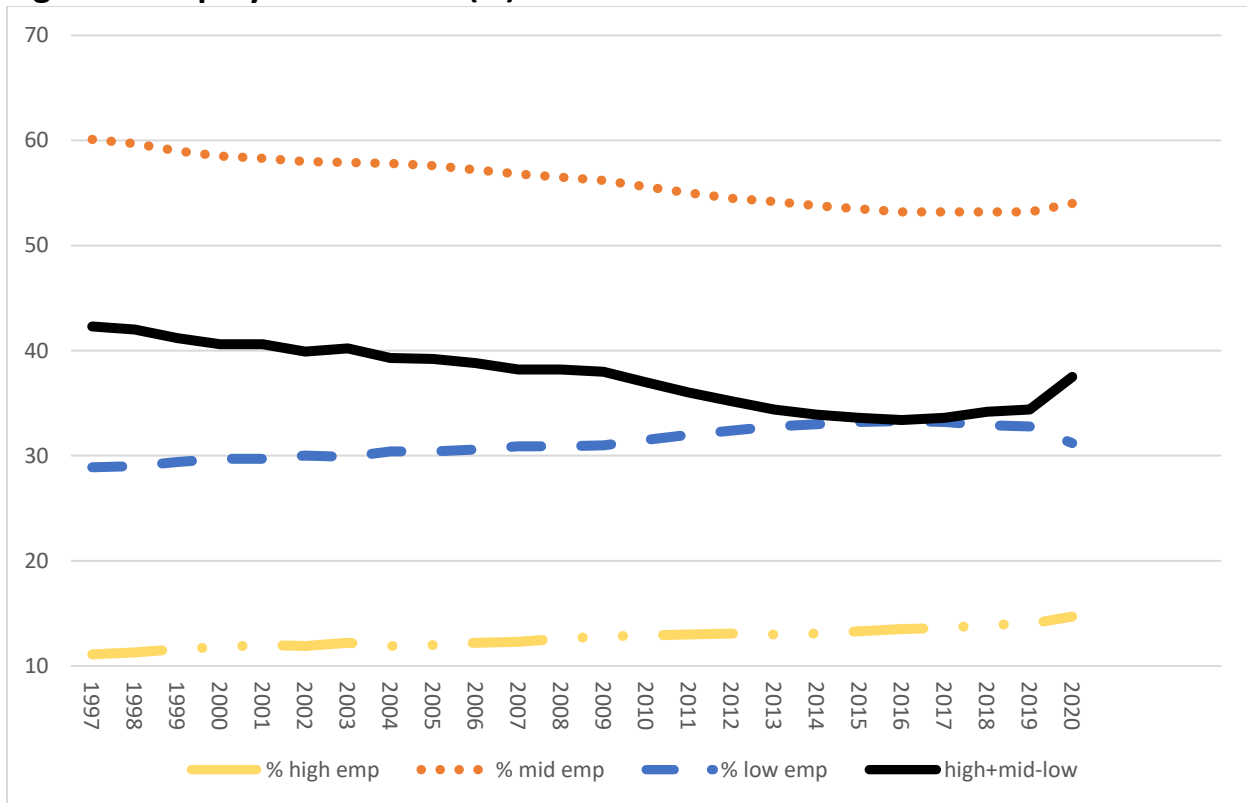
Figure 5 shows ratios of earnings of low-paying jobs to high-paying jobs and middle-paying jobs to high-paying jobs, both in percentage terms. Both ratios trend downward over time, indicating a narrowing of the income distribution. Average weekly earnings of low-paying jobs were 41% of the average weekly earnings of high-paying jobs in 1997, but the ratio was only 31% of the average weekly earnings of high-paying jobs in 2020. Likewise, comparing middle-paying jobs to high-paying jobs, the earnings ratio was 73% in 1997, but only 58% in 2020.

Figure 5. Earnings Ratios (%).



Source: U.S. Bureau of Labor Statistics.

Figure 6. Employment Shares (%).



Source: U.S. Bureau of Labor Statistics.

The employment shares in Figure 6 generate the same conclusion of a narrowing of the income distribution. The shares of high-paying jobs and low-paying jobs increased on trend, while the share of middle-paying jobs decreased on trend over the 1997-2000 time period. These trends are summarized by summing the shares of high-earners and middle-earners and subtracting the share of low-earners. This measure declines on trend to 2019 before it rises substantially during the pandemic in 2020 due to a sharp drop in the low-earners share.

THE NORTH CAROLINA INDICES

The individual measures outlined above can be tracked and interpreted as new data become available. But like many parts of our society, busy people like information presented concisely and quickly. This is the motivation for creating the two North Carolina Indices, NC-GROWTH and NC-SHARE. NC-GROWTH is based on the three growth rate measures: the real GDP growth rate, the real per capita income growth rate, and the job growth rate. Year-to-year changes in each growth rate are observed. Positive changes indicate an improvement in growth, while negative changes result in a decrease in growth.

The second index – NC-SHARE - is derived from three income distribution measures: the ratio of low-paying jobs’ average weekly pay to high-paying jobs’ average weekly pay, the ratio of middle-paying jobs’ average weekly pay to high-paying jobs’ average weekly pay, and the result of adding the percentages of total employment in high-paying jobs and middle-paying jobs and then subtracting the percentage of total employment in low-paying jobs. This calculation is based on the idea that expansions in high-earners’ employment and middle-earners’ employment are positive for income distribution, while expansion in low-earners’ employment is negative for income distribution.

RESULTS FOR NC-GROWTH AND NC-SHARE

The results for the NC-GROWTH AND NC-SHARE indices are shown in Figures 7 and 8. Figure 7 shows the path of NC-GROWTH, the economic growth index. It is a combination of the three economic growth measures, with each receiving an equal weight in the formation of NC-GROWTH.⁶

There are more years of improvement than of decline. Indeed, over the 24 years from 1997 to 2020, there were only eight years where NC-GROWTH was

⁶ Because the values of the individual measures vary in relative size, prior to creating NC-GROWTH, each individual measure’s value is divided by the average of the measure’s values over the entire time period in order to normalize the sizes.

Figure 7. NC-GROWTH Index.

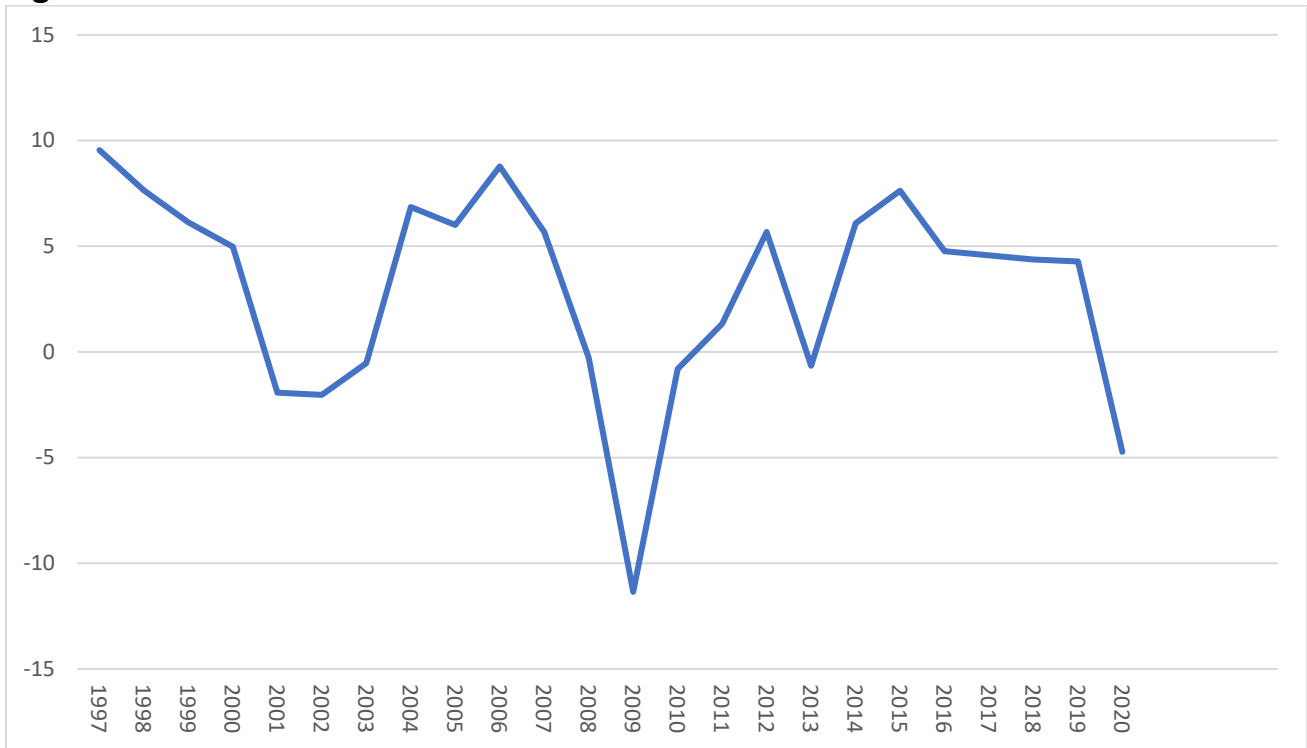
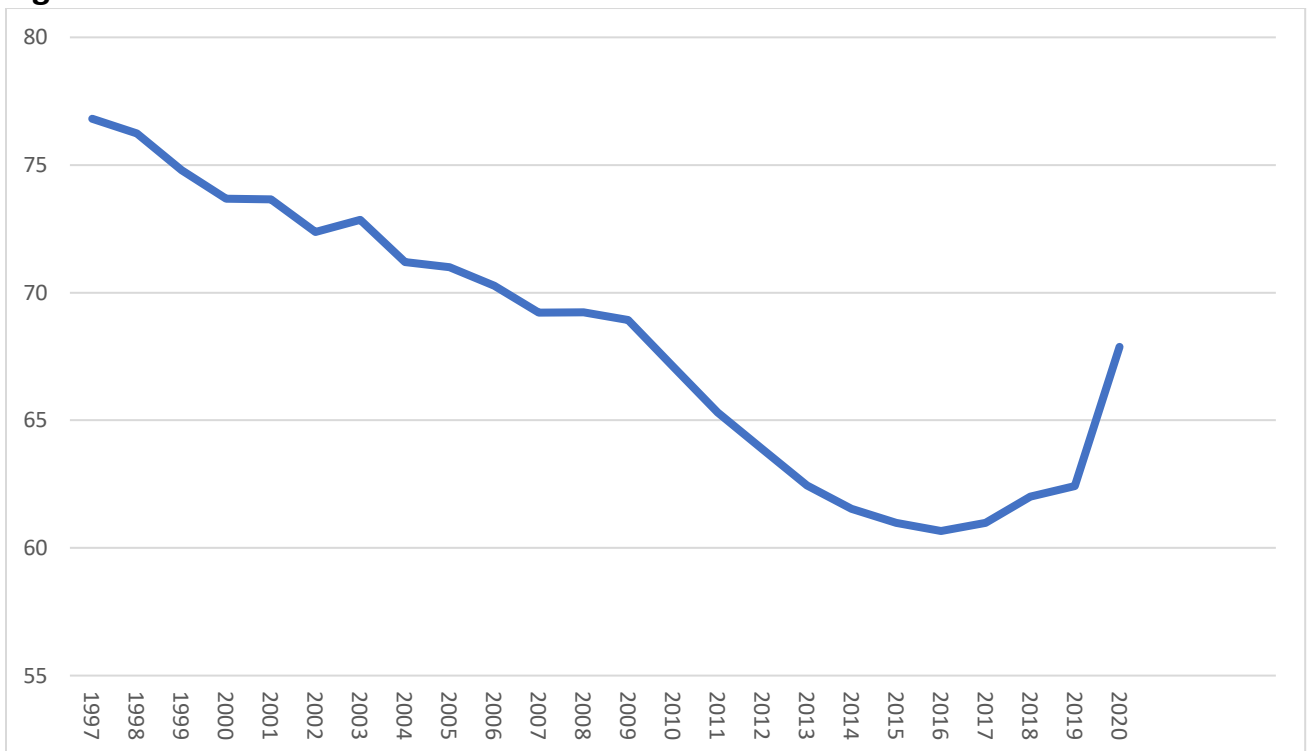


Figure 8. NC-SHARE Index.



negative (2001,2002, 2003, 2008, 2009, 2010, 2013, 2020). Importantly, with one exception, these were official recession years or years following a recession.⁷

Figure 8 is NC-SHARE, the income distribution index. The decline on trend from 1997 to 2016 reflects reductions in each of the three components (see Figures 5 and 6). However, NC-SHARE moved higher from 2016-2000, suggesting greater income distribution. The modest gains from 2016 to 2019 were based on a slight improvement in the ratio of low-paying jobs' average weekly earnings to high-paying jobs' average weekly earnings as well as an improvement in the relative size of high and middle-earners' employment shares relative to the low-earners' employment share. The improvement in the NC-SHARE Index in 2020 was likely due to the large federal financial assistance during the pandemic.

RELATIONSHIP BETWEEN ECONOMIC GROWTH AND INCOME DISTRIBUTION

An often-offered argument is that stronger economic growth can improve income distribution.⁸ To test this assertion, each of the three components of the NC-GROWTH Index were correlated with the NC-SHARE Index. Only one of

⁷ The exception was 2013, when North Carolina experienced a significant contraction in the state's technology sector which caused the state's aggregate real GDP to decline.

⁸ OECD, "Growth and Inequality: A Close Relationship?", 2014. There is a contrary theory that less income inequality -that is, wider income distribution – motivates greater labor productivity and thus higher economic growth (Hamid Lahouig, "The Effects of Income Inequality on Economic Growth: Evidence from MENA Countries").

the components, the real GDP growth rate, has a significant correlation with the NC-SHARE Index. Over the period 1997 to 2019 (2020 was omitted due to the unusual circumstances related to the pandemic) the correlation between NC-SHARE and the real GDP growth rate is 0.36.⁹ The interpretation is that a little over one-third of the variation in NC-SHARE is related to the variation in the real GDP growth rate in the state. While important, this finding suggests factors other than economic growth are related to changes in the state's income distribution. Some of these likely factors are changes in the state's industries, changes in educational needs favoring college graduates over non-college graduates, globalization, automation and technology and the geographic location of growing economic sectors in the state.

TRACKING ECONOMIC GROWTH AND INCOME DISTRIBUTION IN NORTH CAROLINA

The data used to construct both indices (NC-GROWTH AND NC-SHARE) become available with a time lag for each quarter. These data will be accessed to update the indices and provide analysis of how the indices are changing. In this

⁹ The correlation between the real GDP growth rate and the individual components of NC-SHARE-1 are 0.37 with the low-earner to high-earner earnings percentage, 0.29 with the middle-earner to high-earner earnings percentage, and 0.36 with the high-earner employment share + the middle-earner employment share – the low-earner employment share.

way, residents and, importantly, public and private leaders can track how these two key economic indicators are changing in North Carolina.