The Recovery of U.S. Cities and States from the COVID-19 Employment Declines of Early 2020

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Abstract:

This paper examines the economic performance of U.S. cities (i.e., metropolitan areas) and states over the period immediately before and throughout the COVID-19 pandemic. The U.S. economy experienced a 14 percent reduction in year-over-year employment from April 2019 to 2020, and the nation's employment level in December 2021 was about two percent below its employment two years earlier.

The economic performance of U.S. regions varied widely at the beginning of the pandemic (e.g., year-over-year employment growth of U.S. metropolitan areas ranged from a 3 percent to 35 percent decline between April 2019 and 2020) and the months that followed. In general, the regions that experienced the least severe employment impacts associated with COVID-19 had considerably more robust employment in December 2021 compared with pre-pandemic levels two years earlier.

Perhaps the most striking feature of the analysis presented in this study is how the past performance of U.S. regions had very little bearing on the relative impacts of COVID-19 on state and metropolitan area employment declines. In other words, the economic impacts of COVID-19 were almost totally unrelated to the economic performance of regions between 2011 and 2018. By the end of 2021, however, the pre-pandemic patterns of a high correlation between past and future employment growth rates began to reemerge.

The Recovery of U.S. Cities and States from the COVID-19 Employment Declines of Early 2020

1.   Introduction

Along with its serious impacts on health and overall wellbeing, the COVID-19 pandemic had very large and negative impacts on the U.S. and global economies. For example, the U.S. unemployment rate rose sharply from 4.4 percent to 14.7 percent between March and April of 2020, at the beginning of the pandemic in America.[3] In addition, total U.S. private nonfarm employment fell by 13.7 percent—from 150.8 million to 130.2 million jobs—between March and April of 2020.[4] Although the U.S. unemployment rate has subsequently fallen to 3.9 percent as of December 2021 and total U.S. employment numbers are within about two million jobs relative to pre-pandemic levels, there is wide heterogeneity in the employment recovery of U.S. cities and states. For instance, the Austin metropolitan area had an employment level in December 2021 that was 4.0 percent above its pre-pandemic mark in December 2019.[5] At the other end of the spectrum, employment in the New York metropolitan area was 6.9 percent lower in December 2021 compared with the region's employment two years earlier.

This paper examines the economic performance of U.S. cities (i.e., metropolitan areas) and states over the period immediately before and throughout the COVID-19 pandemic. Although a variety of indicators can be used to track regional economies (e.g., unemployment rate, per-capita income, output and productivity), we focus on monthly employment and

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[3] U.S. unemployment rates (seasonally adjusted) are from the U.S. Bureau of Labor Statistics.
[4] U.S. employment figures (seasonally adjusted) are from the U.S. Bureau of Labor Statistics.
[5] Metropolitan area employment figures (seasonally adjusted) are from the U.S. Bureau of Labor Statistics.

employment growth rates. The use of monthly data allows for a reasonably precise measurement of the immediate employment impacts of COVID-19 that happened at the beginning of the pandemic. In addition, an analysis of metropolitan area and state-level employment numbers from April 2020 to the (near) present can be used to track the recovery of regions from the COVID-19 employment shock.

2.   Analysis of U.S. Employment

To provide some context to the employment change that took place in U.S. cities and states—and to set benchmarks for the employment impacts of COVID-19 and the recovery that followed—Figure 1 shows U.S. monthly employment numbers (nonfarm and seasonally adjusted) over the 11-year period from January 2011 to December 2021. The figure shows very steady and consistent U.S. employment growth over the period leading up to March 2020. The U.S. economy added over 20 million jobs between January 2011 and 2020, and year-over-year employment change (measured from January to January) ranged from 1.4 percent between 2019 and 2020 to 2.2 percent between 2014 and 2015. Simply put, U.S. employment was a model of consistency leading up to the COVID-19 pandemic. Figure 1, however, shows a very sharp drop in overall U.S. nonfarm employment due to the pandemic between March and April of 2020. The U.S. economy lost over 20 million jobs—from an employment level of 150.8 million to 130.2 million—over this two-month period at the beginning of the pandemic. From April 2020 to the (near) present, employment increased from the low of 130.2 million in April 2020 to 149.0 million in December 2021.

In the analysis of the employment growth of U.S. cities and states that follows, we primarily look at changes in employment numbers measured over time in the same month of the year. For example, we are particularly interested in year-over-year employment change in April 2020—this covers April 2019 to 2020—and employment change over the two-year period of December 2019 to 2021. The former is a measure of the employment impacts of COVID-19, which influenced regional economic indicators in April 2020 relative to 12 months earlier. The latter is an indicator of the extent to which a region's overall employment has recovered—as of December 2021—to a level prior to the COVID-19 pandemic.

For the U.S. economy, year-over-year employment fell by 13.5 percent between April 2019 and 2020, and the nation's employment level in December 2021 was about two percent below its employment two years earlier. These two rates of employment change are used as benchmarks for evaluating the impacts of the pandemic on the employment change of U.S. cities and states, as well as their recoveries from the COVID-19 economic downturn.

3.   COVID-19 Employment Impacts and Recovery of U.S. Cities and States

Figure 2 shows state-level employment (nonfarm and seasonally adjusted) rates of change between April 2019 and 2020 along the horizontal axis and from December 2019 to 2021 on the vertical axis. The bold vertical line in the figure represents a U.S. benchmark of a 13.5 percent decline from April 2019 to 2020 due to COVID-19 and the bold horizontal line is a benchmark of the two percent decline in U.S. employment between December 2019 and 2021. The states listed in the top-right corner of Figure 2 experienced smaller employment declines as compared with the overall U.S. economy between April 2019 and 2020—suggesting less severe

economic impacts associated with COVID-19—and stronger overall employment recoveries as of December 2021 (compared with December 2019). Places positioned in the bottom-left quadrant had larger (negative) impacts due to COVID-19, and they have December 2021 employment levels that are relatively lower compared with employment in December 2019. The states in the bottom-right quadrant had April 2019 to 2020 employment declines that were less severe than the drop experienced by the U.S. economy, but their recoveries relative to December 2019 employment levels are below the national benchmark.

The sections with the largest numbers of states are the bottom-left (20 states) and top-right (17 states) quadrants. This is no surprise because it suggests that the regions with the smallest COVID-related employment impacts have the highest December 2021 employment levels relative to conditions two years earlier (upper right) and that the states with the largest COVID-related employment declines are farthest away from a recovery to December 2019 employment levels (bottom left). Utah, Idaho, Texas, Arizona and Montana are among the states that experienced the smallest negative employment impacts associated with COVID-19 along with the most robust recoveries relative to pre-pandemic employment levels. Hawaii, New York, Michigan, Nevada, Pennsylvania and Massachusetts are among the states with the largest COVID-related employment declines and their employment levels in December of 2021 severely lag employment from two years earlier.

The third most populated quadrant of Figure 2 is the bottom-right corner, which has 11 states and the District of Columbia (for a total of 12 regions). These places experienced relatively small employment declines due to COVID-19 compared with the U.S. benchmark, but they are farther away from recovering to pre-pandemic employment. Finally, the upper-left quadrant has

only two states (Indiana and Kentucky) and their placements in the figure are very close to the U.S. benchmarks. This is no surprise because inclusion in the upper-left quadrant means that a state experienced relatively large negative employment impacts due to COVID-19, yet its recovery to December 2019 employment levels is more robust than the U.S. benchmark.

Figure 3 shows similar data for large U.S. metropolitan areas, which are defined as metros with over one million people.[6] Of the 53 metros that are above this size threshold, 20 are positioned in the upper-right quadrant (i.e., smaller employment impacts from COVID-19, stronger recoveries relative to employment in December 2019) and 23 are in the lower-left section of Figure 3. Salt Lake City, Austin and Dallas are among the large metropolitan areas that experienced the least severe employment impacts due to COVID-19 and have the strongest recoveries, as are the southern metros of Tampa, Raleigh, Nashville and Memphis.

Turning to the large U.S. metropolitan areas that experienced relatively large employment declines associated with COVID-19 and that are farther away from recovering to pre-pandemic levels, the regions of Las Vegas, New Orleans, Miami and San Francisco are positioned in the lower-left quadrant of Figure 3, along with the northern metros of Buffalo, Rochester, New York, Detroit and Boston. Next, 10 of the 53 large U.S. metros are in the bottom-right quadrant of Figure 3, as they experienced COVID-19 employment declines that were less severe than the U.S. benchmark, yet they are farther away from pre-pandemic employment levels. San Jose, Sacramento, Richmond and Virginia Beach are among the large U.S. metros that are included in this category. Finally—and this is not a surprise—there are no large U.S. metropolitan areas that experienced relatively larger employment declines due to COVID-19,

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[6] Metropolitan area population figures are from the American Community Survey of the U.S. Census Bureau.

compared with the U.S. benchmark, and are closer to returning to (or surpassing) pre-pandemic employment levels.

The same general trends that we found in the analysis of large U.S. metros are also revealed in Figure 4, which covers all 387 U.S. metropolitan areas. That is, 33 percent and 35 percent of all metros are positioned in the upper-right and lower-left quadrants, respectively, and the smallest share of metropolitan areas—at nine percent—is housed in the upper-left section of Figure 4.

The metropolitan areas of St George and Provo-Orem, Utah; Pocatello, Idaho; and Lakeland-Winter Haven, Florida, are among the places that experienced the smallest employment declines due to COVID-19 along with being closer to (or surpassing) pre-pandemic employment levels from December of 2019. At the other end of the spectrum, regions such as Kahului-Wailuku-Lahaina, Hawaii; Lake Charles, Louisiana; and Norwich-New London, Connecticut, are among the places with the largest employment declines between April 2019 and 2020 as well as December 2021 employment numbers that are well below pre-pandemic levels. Perhaps somewhat surprisingly, the Texas metropolitan areas of Midland and Odessa are also positioned in the bottom-left quadrant of Figure 4. Although the April 2019 to 2020 employment declines in these two metropolitan areas are only slightly larger than the U.S. benchmark (i.e., the markers for Midland and Odessa are just to the left of the bold vertical line), the large percentage declines in employment between December 2019 and 2021 are unexpected, given past performance. These two metropolitan areas were among the fastest growing U.S. regions over the past several decades and they are among the leaders for overall economic development (Gabe 2017).

4.   Economic Performance of U.S. States at the Start of the COVID-19 Pandemic

A striking feature of the economic performance of U.S. regions is that the places with the highest growth in the recent past tend to be the same ones that have the most robust growth in the present and moving into the near future. That is, the relative fates of U.S. regions—at least in terms of employment growth—do not change very much in the short term. The economic impacts of COVID-19, however, altered these trends during the very early months of the pandemic.

To provide an idea of the consistency of employment growth rates over time, Figure 5 shows the relationship between the year-over-year employment growth rates of states between March 2019 and 2020, and the seven-year growth rates of states from March 2011 to 2018. The figure reveals a positive relationship between the 12-month employment growth rate of states (March 2019 to 2020) and their performance in the recent past (i.e., 2011 to 2018), with a high correlation of r = 0.72. In other words, unlike a lot of my recent stock picks, past performance was a good indicator of future employment growth before the pandemic impacted U.S. states.

The picture that emerges just one month later, which focuses on the employment growth rates of states between April 2019 and 2020 (the first month when COVID-19 impacted employment numbers), is quite different. In Figure 6, we see that the employment growth rates of states from April 2011 to April 2018 are a very poor predictor (i.e., a low correlation of r = 0.12) of their performance between April 2019 and 2020. This result suggests that the past performance of states had very little bearing on the size of their COVID-19 employment shocks. For example, the three slowest growing states between April 2011 and 2018 are either close to the top (e.g., Wyoming) or in the middle of the pack (e.g., Alaska and West Virginia) in terms of

the employment impacts of COVID-19. At the opposite end of the spectrum relative to Wyoming, Nevada had one of the largest employment impacts of COVID-19 after experiencing robust employment growth in the recent past (i.e., 2011 to 2018). No doubt, the large impact of COVID-19 on employment in Nevada is largely due to the state's heavy reliance on tourism (e.g., Las Vegas) and the almost immediate and total shutdown of the tourism and hospitality sectors at the beginning of the pandemic (Gabe and Crawley 2020a, 2020b, 2021).

A comparison of the correlations of past growth (i.e., 2011 to 2018) to later performance (i.e., 2019 to 2020) for the months of March and April of 2020 shows a steep decline from r = 0.72 (Figure 5) to r = 0.12 (Figure 6). In other words, whereas past performance was a strong predictor of future outcomes in March 2020—immediately prior to the large employment impacts due to COVID-19—this connection became very weak at the beginning of the pandemic. To illustrate these trends over a longer period, Figure 7 shows the correlations between the employment growth of a state between 2011 and 2018 and its year-over-year growth starting in January 2019 (i.e., growth from January 2018 to 2019). When calculating the correlations, the growth rates from 2011 to 2018 use the same month for which year-over-year growth is measured (in later years). This means, for example, that the far-left bar of Figure 7 measures the correlation of state-level employment growth rates calculated between January 2018 and 2019, and growth rates from January 2011 to 2018.

The bars in the left side of Figure 7 show that the correlations between past performance and future growth varied between about 0.70 and 0.80 in the period leading up to the COVID-19 pandemic. In the 12 months of April 2020 to March 2021, however, these correlations were substantially lower in the range of about 0.10 to 0.25. In the right side of Figure 7, we see the

start of a trend where correlations are moving higher (e.g., about 0.50 in October and November of 2021) and, perhaps in the future, back to levels found prior to the start of the COVID-19 pandemic.

5.   Economic Performance of Large U.S. Metros at the Start of the COVID-19 Pandemic

The general trends shown for states in Figure 7 are also found in the analysis of U.S. metropolitan areas with more than one million residents. That is, the correlation between past growth and future performance fell substantially at the start of the COVID-19 pandemic.

In Figure 8, we see a very high correlation (r = 0.80) between the growth of metropolitan area employment from March 2011 to 2018 and the region's employment growth from March 2019 to 2020. Austin, Riverside, Nashville, Denver and Raleigh are among the large metropolitan areas with the highest rates of employment growth in both periods, whereas Buffalo, Rochester, Cleveland and Pittsburgh are among the slowest growing regions in both periods. At the start of the pandemic, as shown next in Figure 9, the correlation between past performance and future growth fell substantially to r = 0.31. Of note, a comparison of the two figures shows that the marker for Las Vegas moves from on the line in Figure 8 (i.e., Las Vegas' employment growth from March 2011 to 2018 practically perfectly predicts its pre-pandemic performance from March 2019 to 2020) to the very bottom right corner of Figure 9 (i.e., Las Vegas experienced a very large COVID-19 employment decline, despite strong growth from April 2011 to 2018).[7]

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[7] After removing the "outlier" of Las Vegas from Figure 9, the correlation between past growth (i.e., April 2011 to 2018 employment growth rate) and future performance (i.e., April 2019 to 2020 rate of employment change) increased from r = 0.31 (with the outlier of Las Vegas) to r = 0.40 (without Las Vegas).

Moving to Figure 10, we see that the correlation (r = 0.80) between past growth and the performance of large U.S. metros between March of 2019 and 2020 (Figure 8) is almost perfectly representative of the correlations across the entire period of January 2019 to March 2020. That is, as shown in the left side of Figure 10, these correlations are all very close to r = 0.80. In the center of the figure, we see that the correlations between the 2011 to 2018 employment growth rates of large U.S. metropolitan areas and year-over-year growth rates in the first 12 months of the pandemic (i.e., April 2020 to March 2021) ranged from about r = 0.05 to r = 0.30. As was the case in the analysis of the employment growth of states, the trend shown in the right side of Figure 10 suggests that the correlations between past performance and future growth are increasing in later months in the direction of those observed prior to COVID-19.

6.   Economic Performance of All U.S. Metros at the Start of the COVID-19 Pandemic

As was the case for states and large metropolitan areas, the correlation between past performance and future growth fell considerably at the start of the COVID-19 pandemic in the analysis of all U.S. metros. However, because of vast differences across all metropolitan areas in their economic characteristics and performance, the pre-pandemic correlations for metros of all sizes started at lower values (e.g., correlations of about r = 0.50) as compared with states (i.e., pre-pandemic correlations of about r = 0.70) and large metropolitan areas (i.e., pre-pandemic correlations of about r = 0.80). For example, although Figure 11 shows a positive relationship (r = 0.47) between March 2019 to 2020 employment growth rates of all U.S. metros and growth rates from March 2011 to 2018, there are numerous regions (e.g., Lake Charles, Louisiana; Yuba City, California; Walla Walla, Washington) that are reasonably large outliers from the pattern. In

Figure 12, however, the almost flat trendline indicates that there's practically no correlation (r= 0.11) between the employment growth rates of all U.S. metropolitan areas between April 2011 and 2018 and the employment impacts of COVID-19, as measured by the April 2019 to 2020 rate of employment change.

Like the overall trends uncovered for states and large U.S. metros, the analysis of all U.S. metropolitan areas reveals a steep drop off in the correlations between past performance and future growth at the start of the COVID-19 pandemic. As shown in Figure 13, these correlations ranged from about r = 0.45 to r = 0.50 in the 15 months of January 2019 to March 2020, and then from about r = 0.05 to r = 0.15 at the beginning of the pandemic. After this period, however, the correlations between year-over-year employment change and the employment growth experienced from 2011 to 2018 returned to (almost) pre-pandemic levels. For example, there's a correlation of r = 0.51 between the employment growth rates of all U.S. metropolitan areas between November 2020 and 2021, and their growth rates from November 2011 to 2018.

7.   Summary and Conclusions

This study examined the employment growth and change of U.S. regions—states, metropolitan areas, and a focus on large metros with over one million people—between 2011 and 2021, with a particular interest in the employment impacts of the COVID-19 pandemic. The results show that overall U.S. employment fell by about 14 percent between March and April of 2020 and that year-over-year employment decreased by a similar percentage between April 2019 and 2020. As of December 2021, total U.S. nonfarm employment remained at about two percent below its pre-pandemic level in December 2019.

The economic performance of U.S. regions varied widely at the beginning of the pandemic (e.g., year-over-year employment growth of U.S. metropolitan areas ranged from a 3 percent to 35 percent decline between April 2019 and 2020) and the months that followed. For example, states such as Utah, Idaho and Texas, and metropolitan areas including Austin, Tampa and Raleigh experienced employment growth between December 2019 (i.e., pre-pandemic) and December 2021. On the other hand, states such as Hawaii, Michigan and California, and metropolitan areas including New Orleans, Las Vegas and Pittsburgh had employment levels in December 2021 that lingered well below pre-pandemic levels two years earlier.

In general—and this should come as no surprise—the regions that experienced the least severe employment impacts associated with COVID-19 (i.e., employment change between April 2019 and 2020) had considerably more robust employment in December 2021 compared with pre-pandemic levels two years earlier. That is, the areas with the smallest impacts of COVID-19 are relatively closer to matching (or even surpassing) their pre-pandemic employment levels. On the flip side, most of the places with the largest April 2019 to 2020 employment declines are farthest away—as of December 2021—from recovering to pre-pandemic employment levels measured back in December 2019.

Perhaps the most striking feature of the analysis presented in this study is how the past performance of U.S. regions had very little bearing on the relative impacts of COVID-19 on state and metropolitan area employment declines. In other words, the economic impacts of COVID-19 were almost totally unrelated to the economic performance of regions between 2011 and 2018. This large "reshuffling of the deck" in terms of regional employment growth rates stands in stark contrast to the months prior to COVID-19, when the past performance of U.S. regions was a

pretty solid predictor of future outcomes. By the end of 2021, however, the pre-pandemic patterns of a high correlation between past and future employment growth rates began to reemerge. For example, the year-over-year employment growth rates of large U.S. metropolitan areas in October and November of 2021 had reasonably high correlations—r = 0.65 and r = 0.62, respectively—with pre-pandemic growth rates from 2011 to 2018. Moving forward into 2022 and beyond, it remains an open question whether the relative economic performance of U.S. cities and states will realign with the economic fates of regions prior to COVID-19, or whether some of the changes that happened at the beginning of the pandemic will last.

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Figure 1. U.S. employment dropped sharply in April 2020 due to COVID-19

Notes: Employment figures are seasonally adjusted. Data are from U.S. Bureau of Labor Statistics.
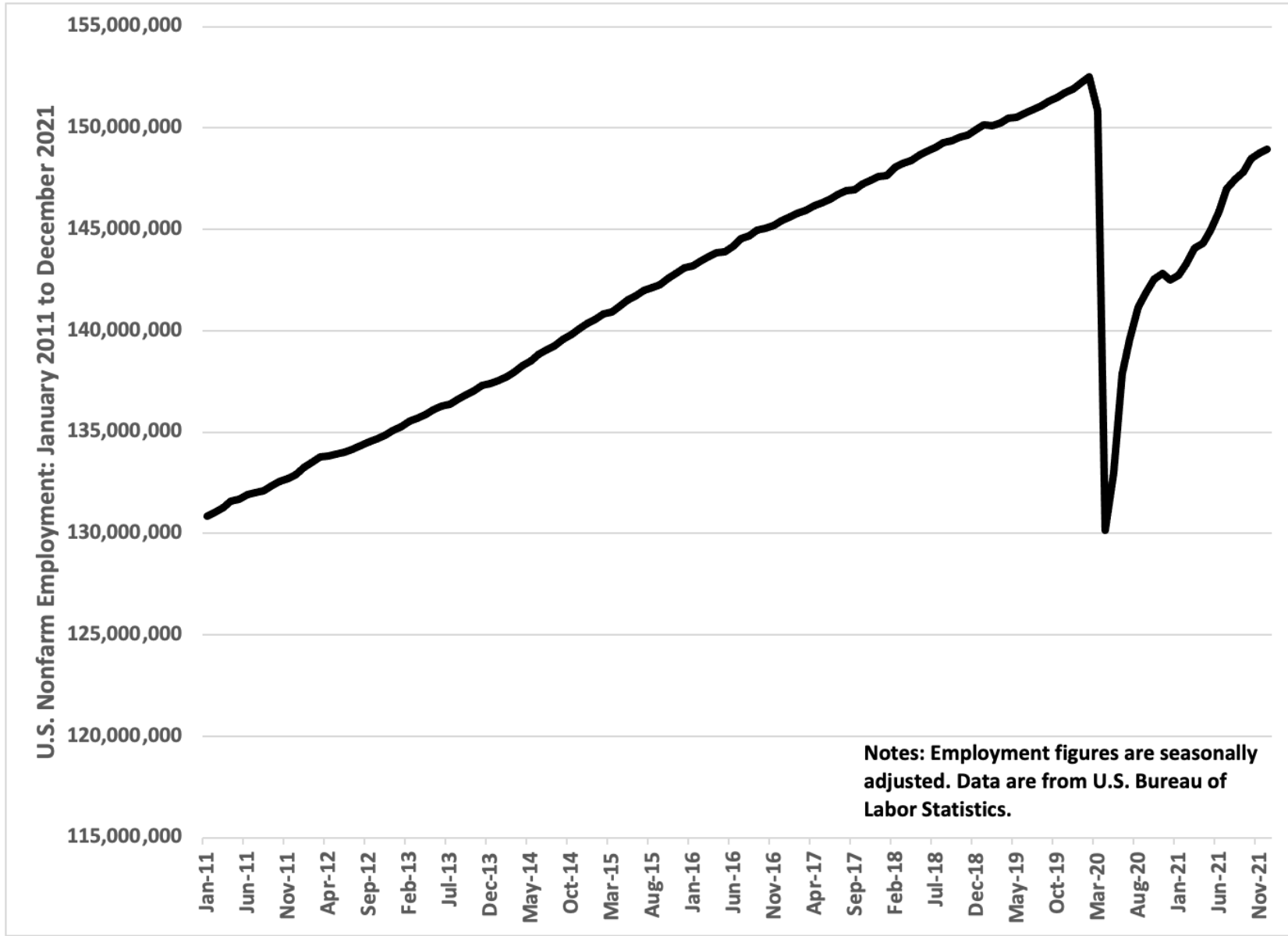
Figure 2. State-level employment change from April 2019 to 2020 and December 2019 to 2021
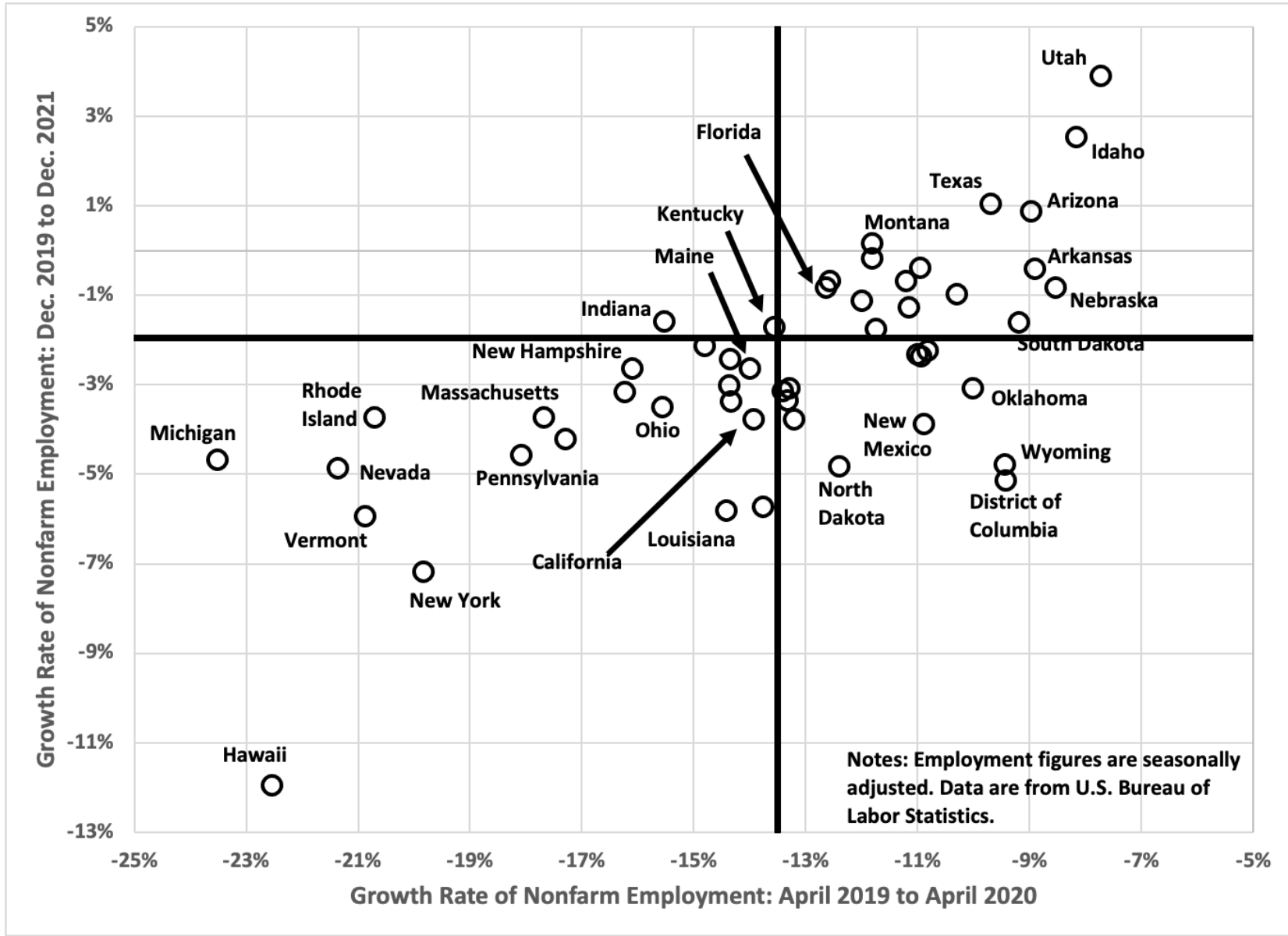
Figure 3. April 2019 to 2020 and December 2019 to 2021 employment growth rates of large U.S. metropolitan areas
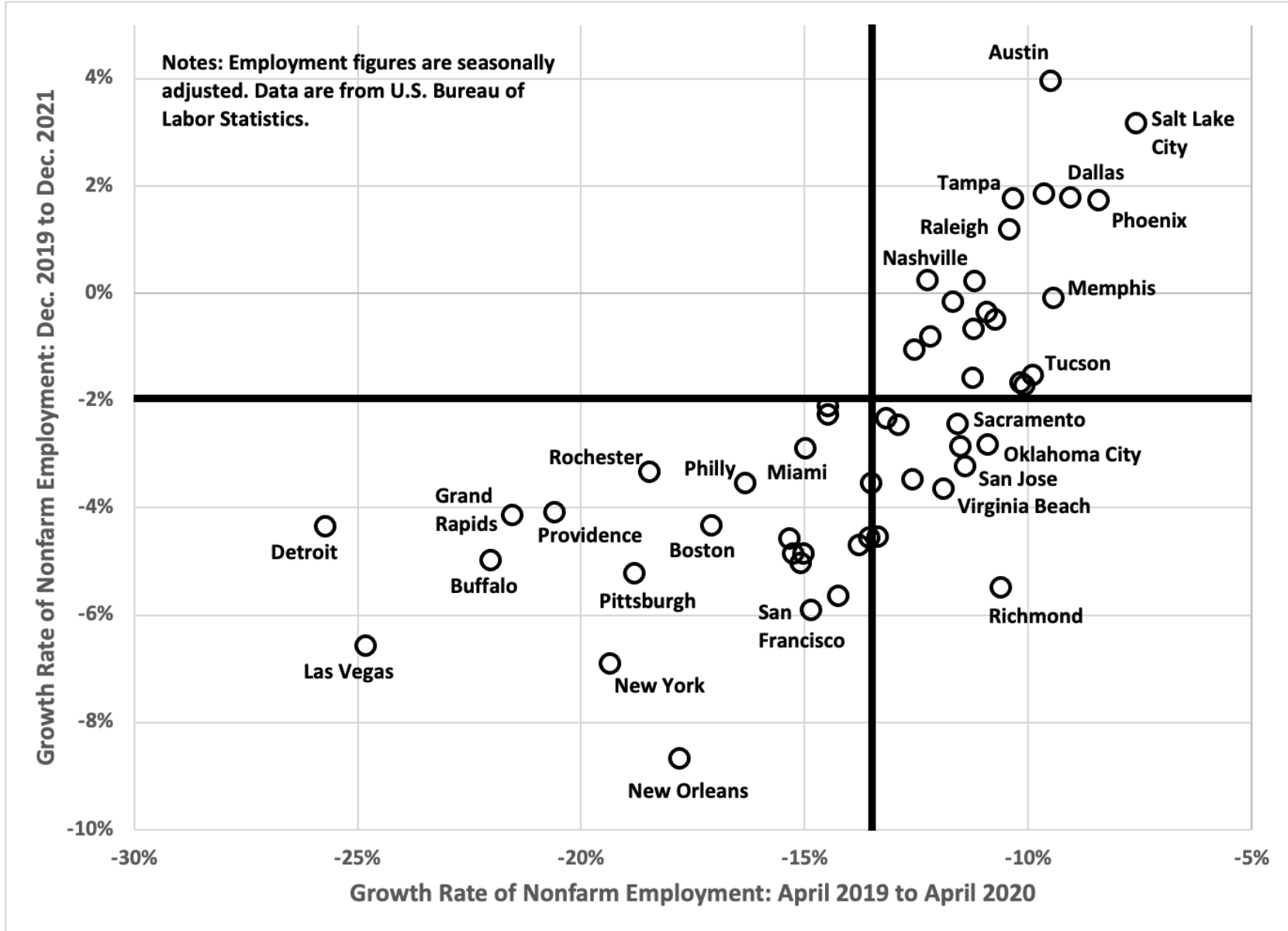
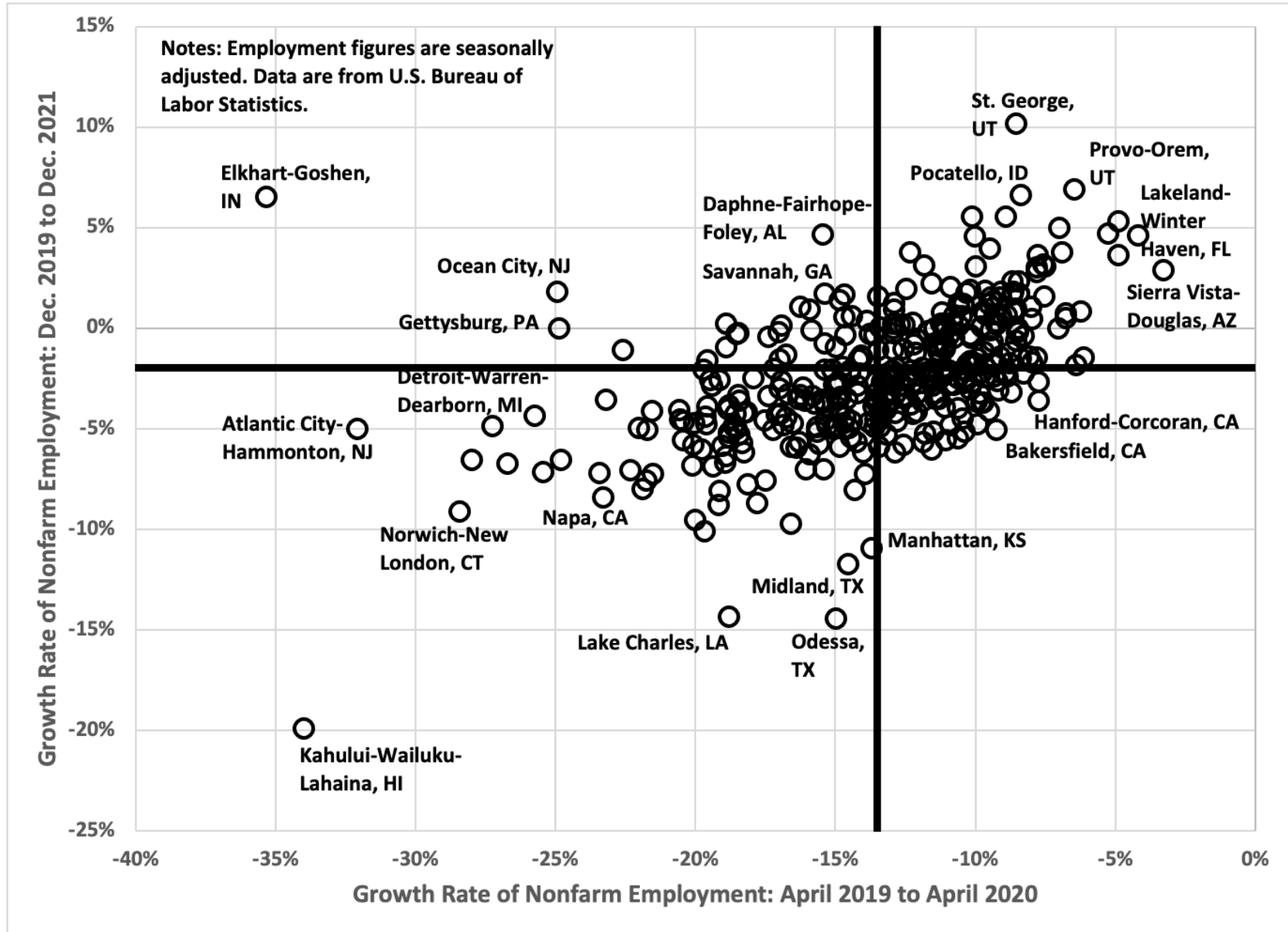Figure 4. COVID-19 employment impacts and subsequent recoveries of all U.S. metros

Figure 5. States with the highest 2011 to 2018 growth rates had the most robust growth between March 2019 and 2020
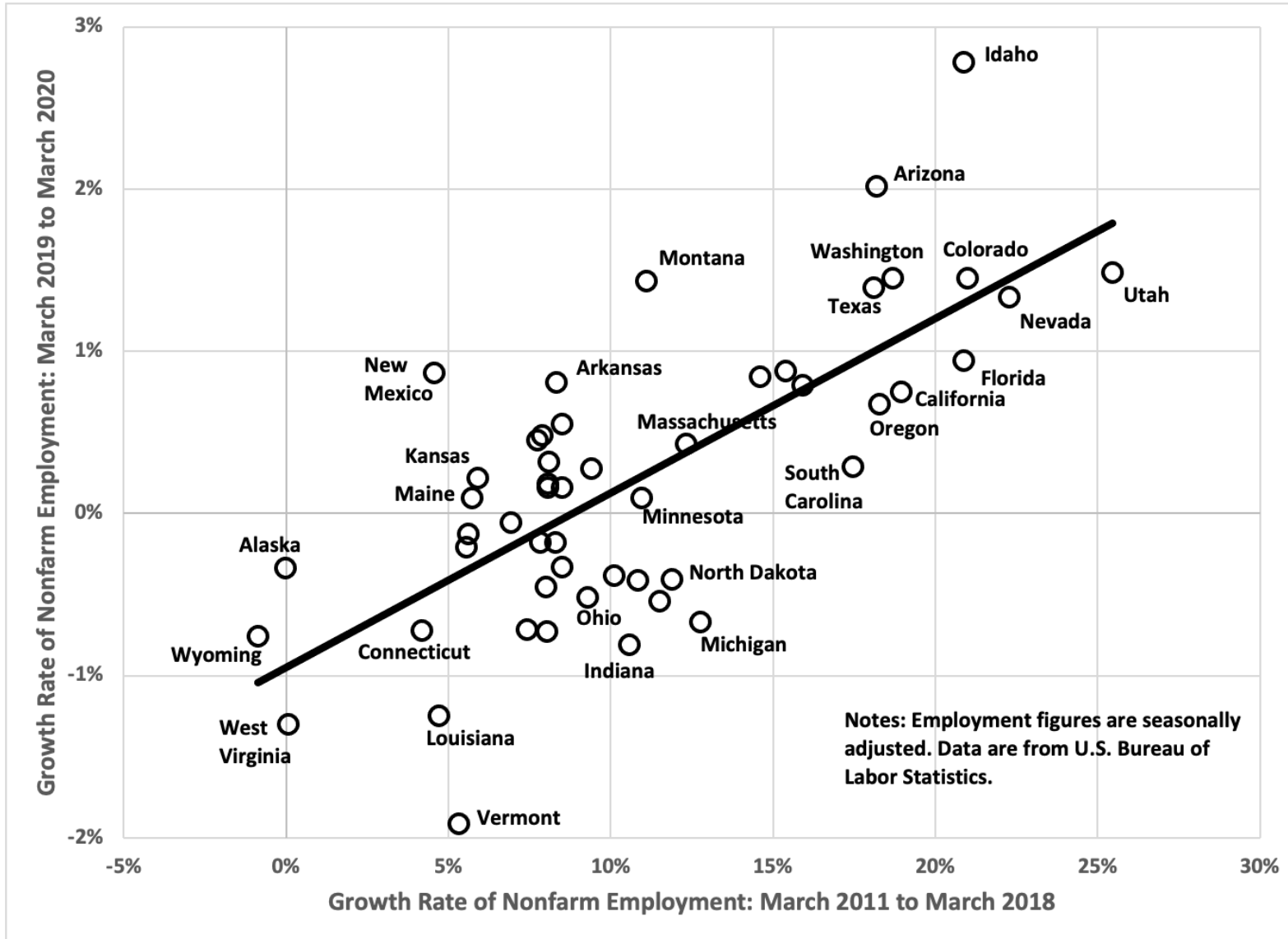
Figure 6. April 2011 to 2018 growth rates are a poor predictor of the employment impacts of COVID-19
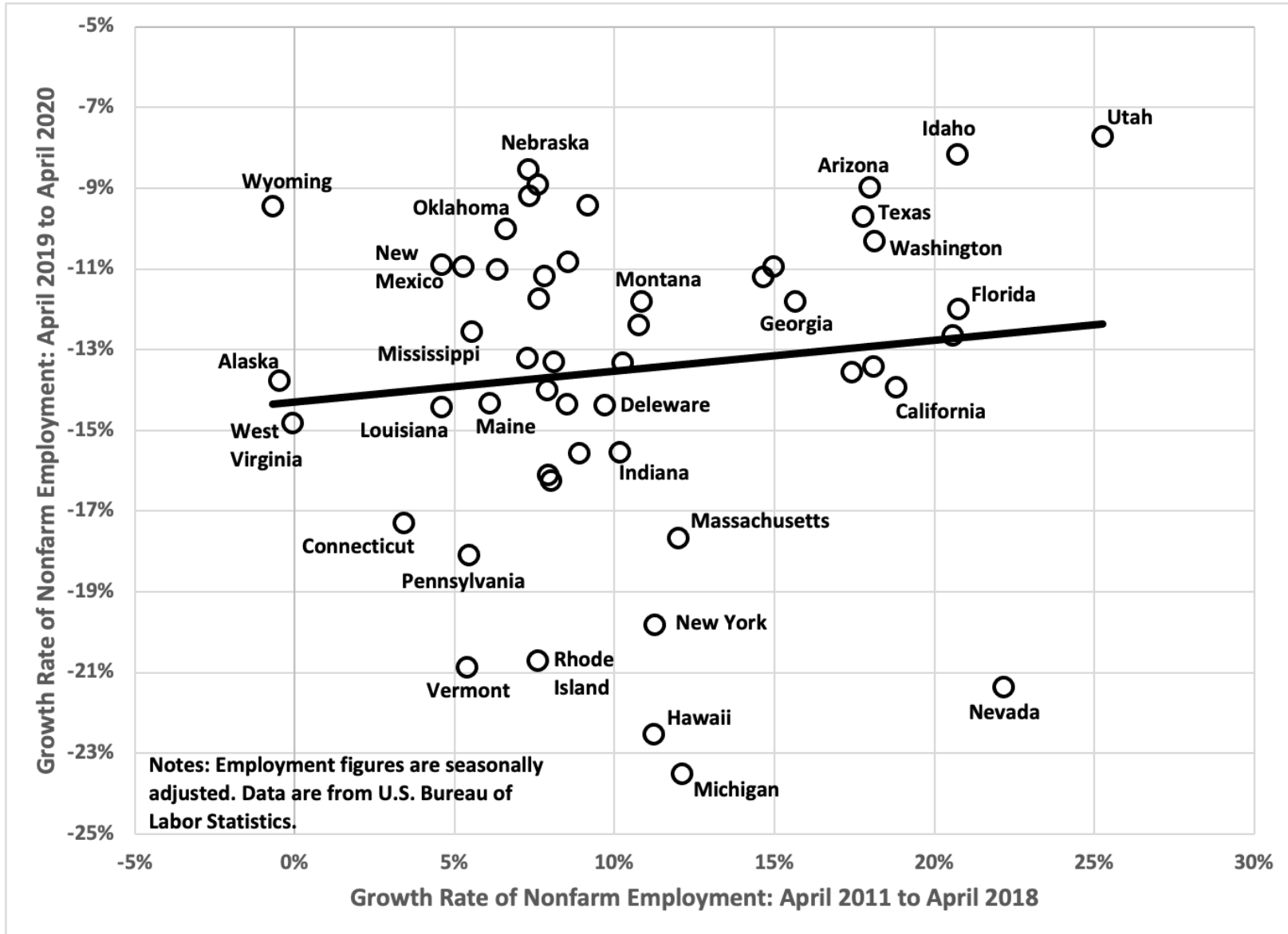
Figure 7. Past performance was a good predictor of pre-pandemic state employment growth rates
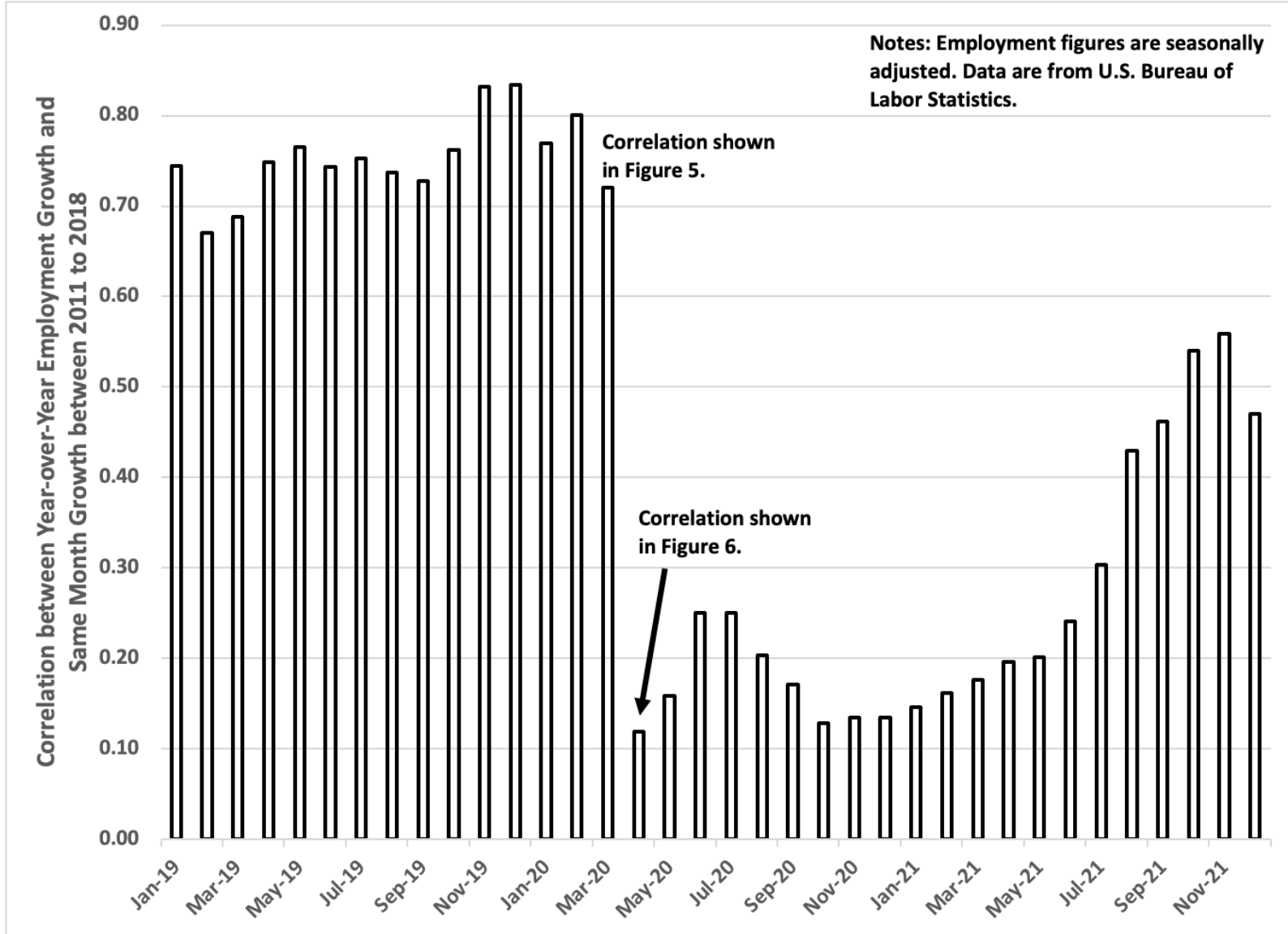
Figure 8. Large U.S. metros with the fastest 2011 to 2018 growth had the highest growth rates from March 2019 to 2020
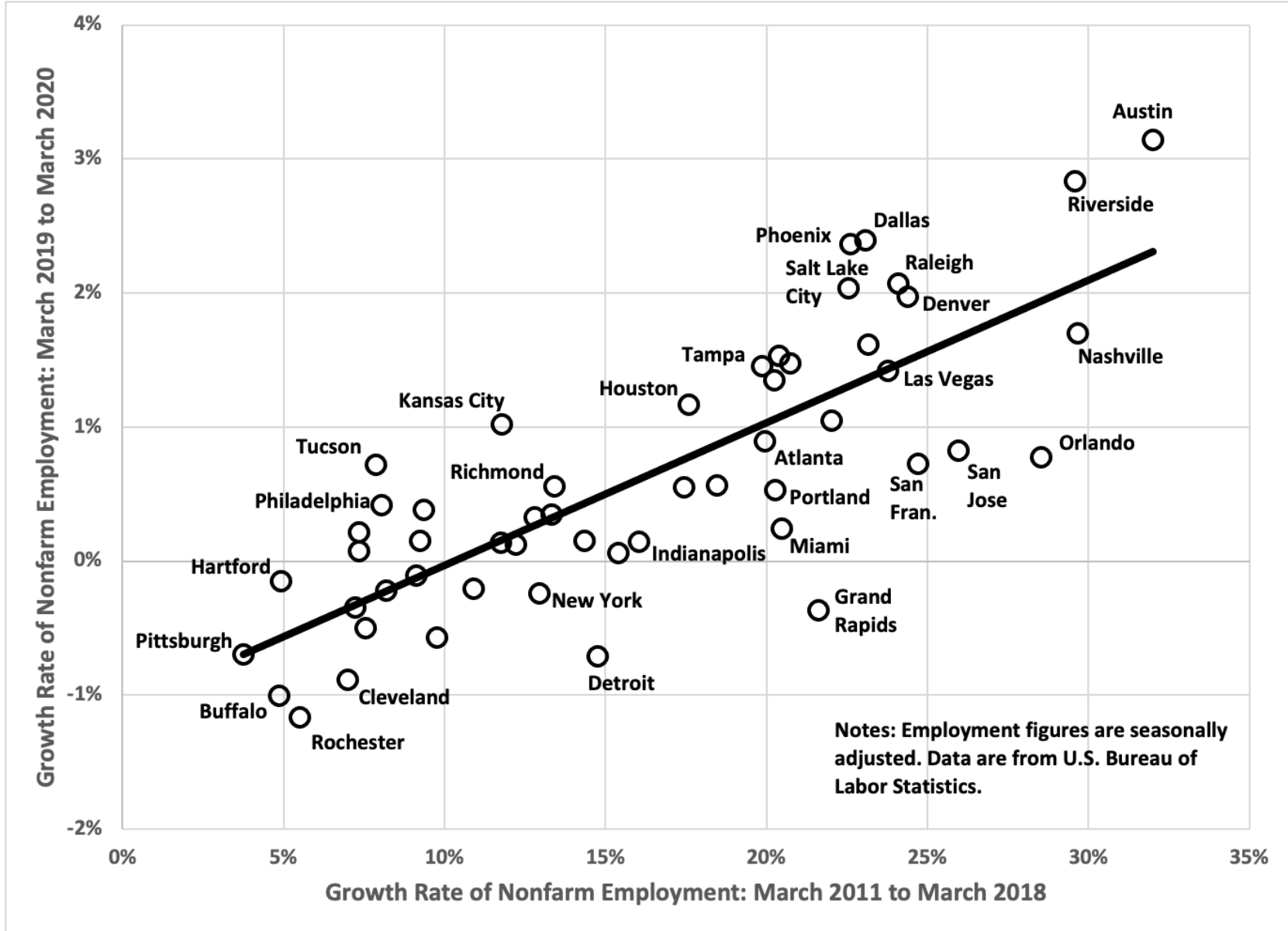
Figure 9. April 2011 to 2018 employment growth rates were unreliable predictors of the April 2019 to 2020 growth rates of large U.S. metropolitan areas
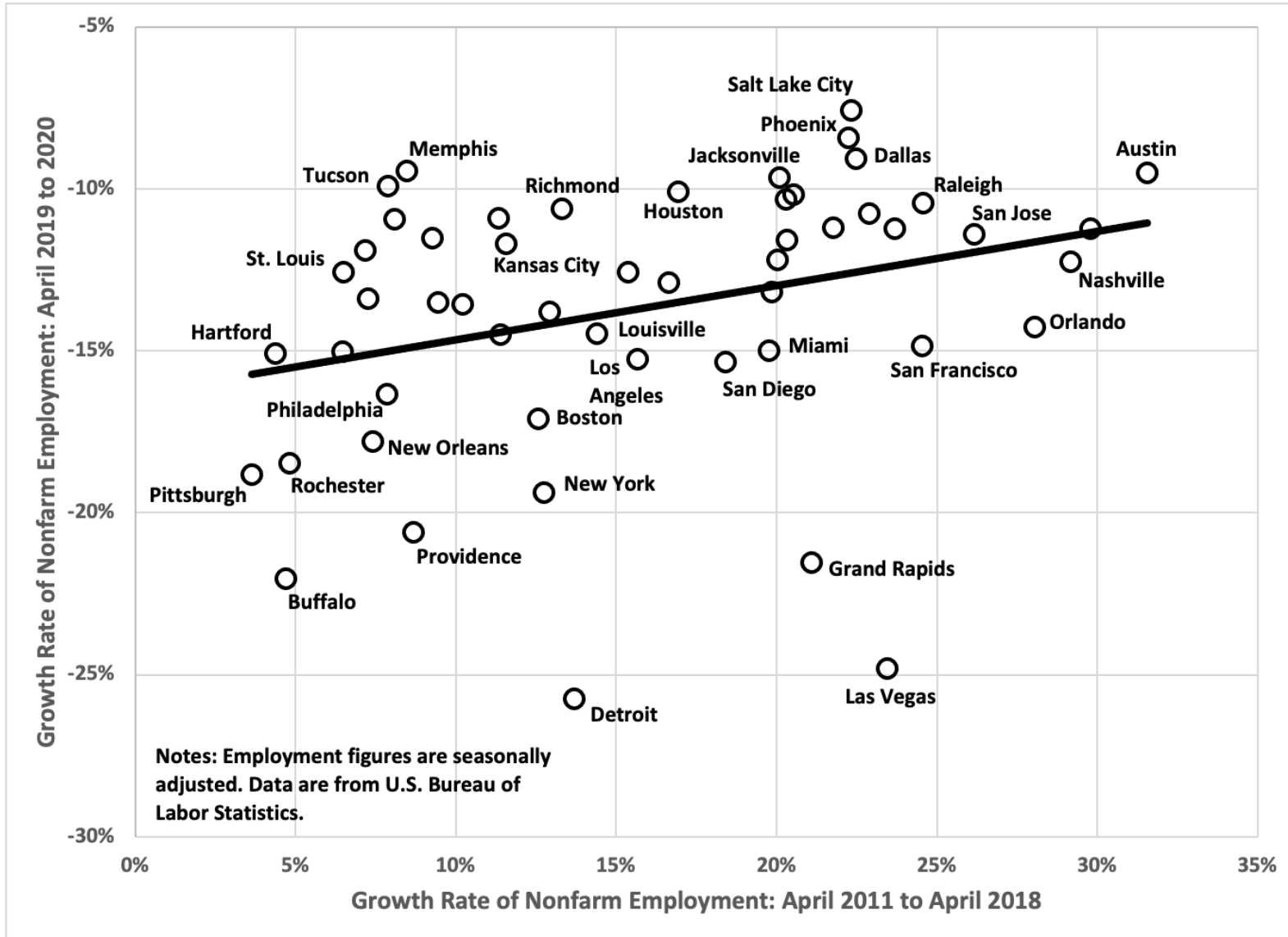
Figure 10. Past performance was a good predictor of large U.S. metro employment growth prior to COVID-19
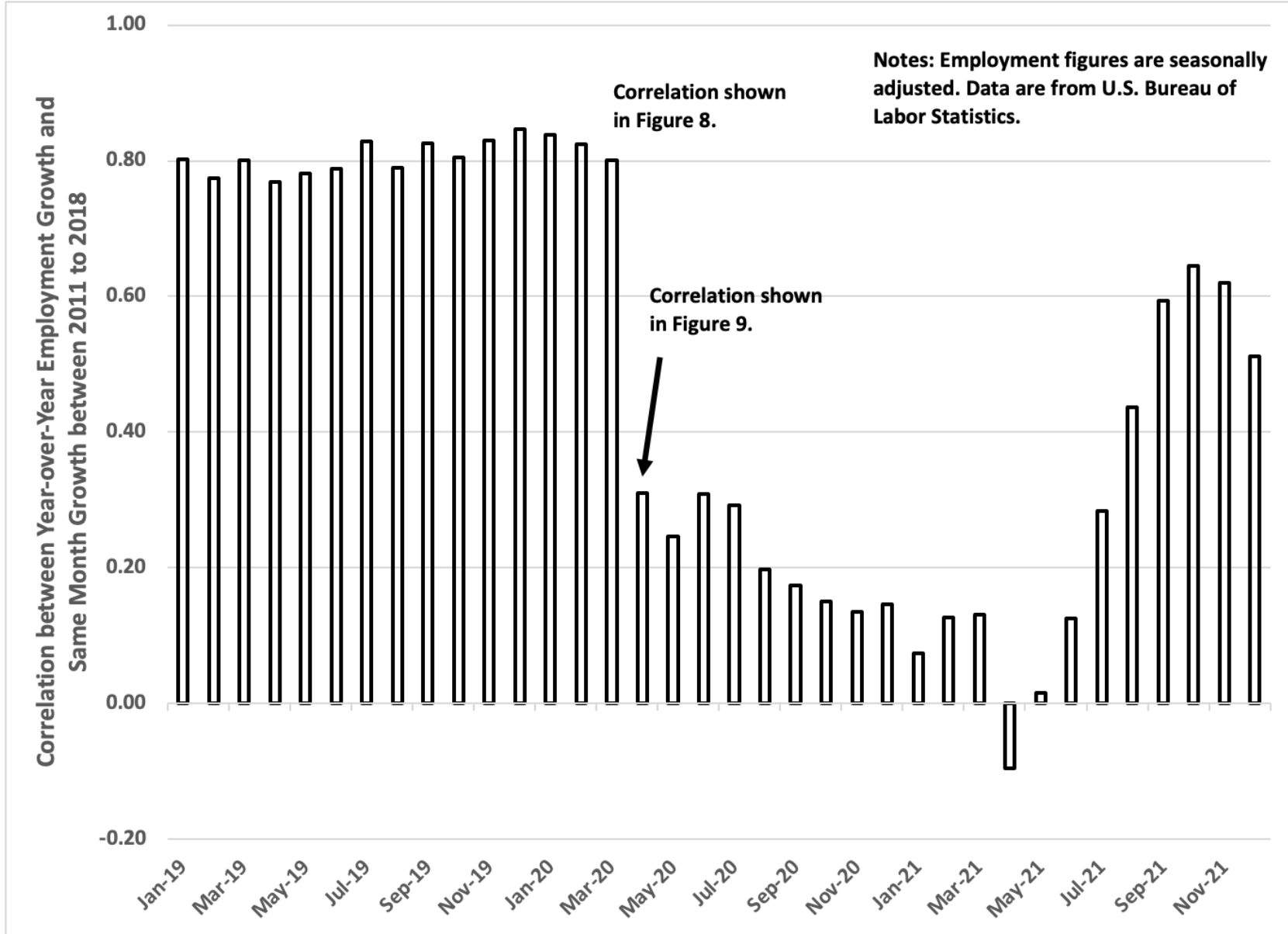
Figure 11. Employment growth from March 2011 to 2018 is a decent predictor of the performance of all U.S. metros from March 2019 to 2020
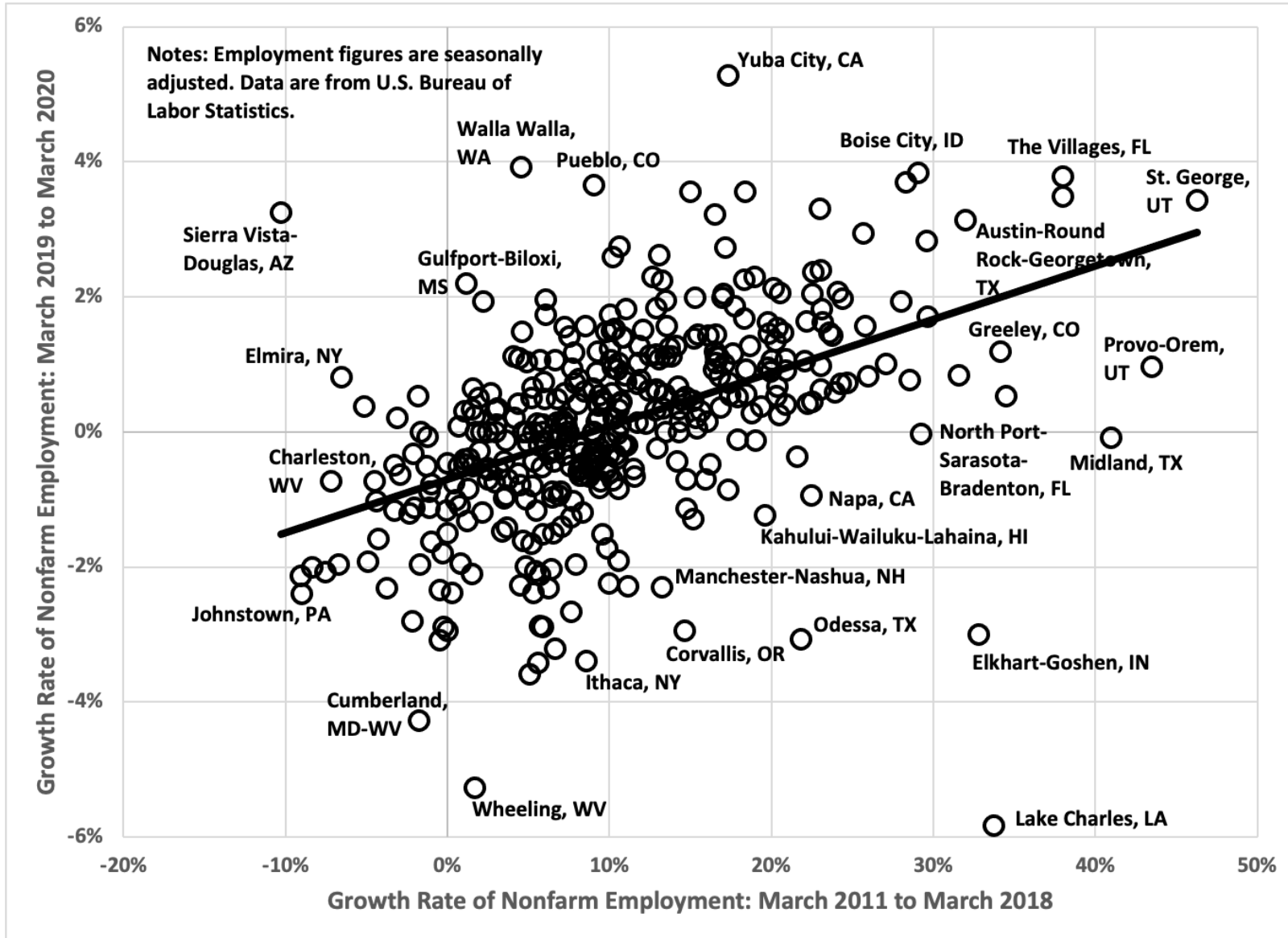
Figure 12. The economic performance of all U.S. metros from April 2011 to 2018 had almost no bearing on the employment growth rate from April 2019 to 2020
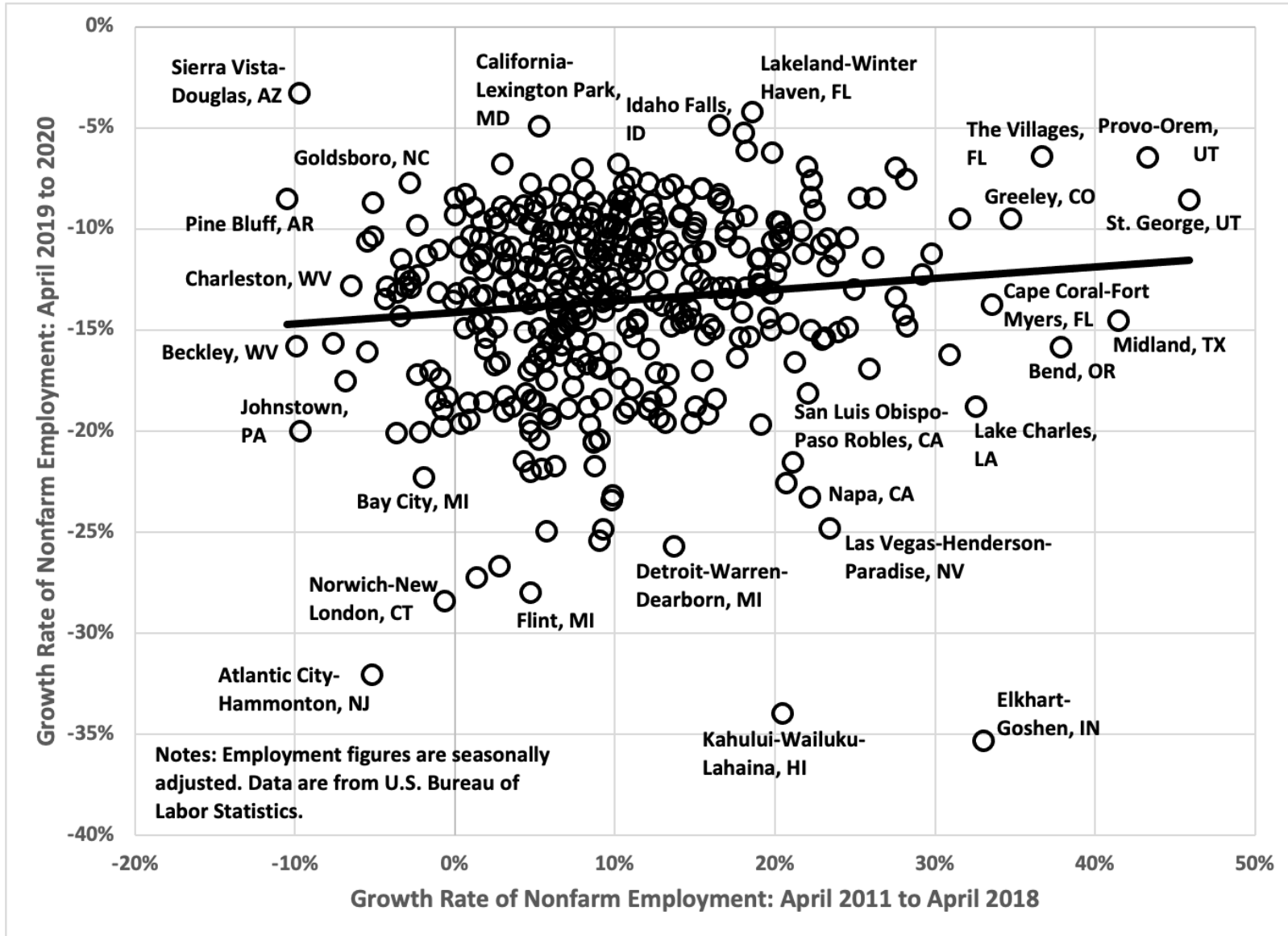
Figure 13. Past performance was a reasonably good predictor of U.S. metro employment growth prior to COVID-19