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American Growth Project

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December Report

THE POWER OF PRODUCTIVITY

2022's Winning Cities and Top Gainers, Ranked

A wide-angle photograph of a large industrial steel mill. In the foreground, two workers in blue protective suits and hard hats are working with large steel beams. One worker is using a tool that produces a bright orange spark. The background is filled with various industrial equipment, including large blue machines, yellow overhead cranes, and stacks of steel materials. The scene is brightly lit, typical of an industrial environment.

AMERICAN GROWTH PROJECT

Productivity is the single most important determinant of a society's standard of living.

But how can you gauge it, and why does it matter? For economists, productivity simply refers to the level of economic output generated for a given amount of input – or, put simply, how much you get out of what you put in. Tracking productivity is important not only to better understand economics, but also to make sense of any number of global dynamics. This is because highly productive societies are able to generate more with what they have, receiving more in return for this increased output. Such highly productive societies tend to generate more wealth, and growing wealth typically confers increased political power.

In the United States, broadly speaking, we have seen productivity rise nearly every year since 1889 (though 2022 is projected to show the largest pro-

ductivity decline in nearly 50 years). These national numbers, however, obscure the differences in productivity among large U.S. cities along with the factors that produce such variations. In this second report from the American Growth Project, we examine the productivity levels of the 50 largest microeconomies in the United States along with how those productivity levels have shifted during the last 15 years.

Some of what we find is unsurprising. For example, San Francisco was one of the most productive cities in 2007, though, perhaps surprisingly, Hartford was the nation's most productive microeconomy at that time. As the technology sector exploded during the next 15 years, the Bay Area's productivity pulled ahead of the pack and now leads the rest of the country by a substantial margin.

Other findings offer important context and even run contrary to dominant

media narratives. Cities commonly portrayed as being in a state of decline, such as New Orleans and several microeconomies within the Rust Belt, have transitioned away from less productive sectors toward areas such as technology and advanced manufacturing. This sectoral shift has led to tremendous productivity gains for these cities, which may indicate that they are gathering momentum for a comeback. By contrast, cities such as Las Vegas and Tampa have struggled to recover from the damage wrought by the collapse of the housing sector and the COVID-19 pandemic, both of which have greatly hampered their productivity. Finally, we observe greater disparities between the most and least productive areas, which indicates growing inequality between cities – and also points to the importance of analyzing economies at the regional level.

[Learn more at AmericanGrowthProject.com](https://AmericanGrowthProject.com)



MOST PRODUCTIVE U.S. CITIES TOP GAINERS 2007-2022 (by rank)

1	New Orleans Louisiana
2	Pittsburgh Pennsylvania
3	Salt Lake City Utah
4	Portland Oregon
5	Columbus Ohio

6	Fresno California
7	San Antonio Texas
8	Cincinnati Ohio
9	Oklahoma City Oklahoma
10	Cleveland Ohio

Productivity: Making Work Count

What makes economies grow? As complicated as the question might seem, the answer should be quite simple: The more people you have working, the larger your economy is likely to be. This explains why, for example, India has one of the largest economies in the world. But the raw size of a labor force alone fails to tell the full story. Although India's labor force is nearly three times the size of the U.S. labor force, its total economic output remains less than half that of the U.S.¹

The missing component here is productivity, or the level of economic output generated by each worker. Productivity can be increased through a variety of channels, such as mechanization, more efficient energy use or more streamlined organization of workers and their processes. Ultimately, all these mechanisms result

in workers being able to do more with the time they spend working. More productive areas and workforces can provide more goods and services for the same amount of work, which in turn promotes higher standards of living. This is why economists, business leaders and policymakers strive to increase productivity.

In this report, we illustrate the importance of productivity in explaining the rise and fall of U.S. cities' economies. For example, our 2022 data shows that the Extended Metropolitan Areas² (EMAs) of Atlanta and Miami have roughly the same population, yet we estimate Atlanta's economy to be \$83 billion larger. Productivity is also a useful tool when comparing groups of cities; as we discussed in our initial release of the American Growth Project, the largest 50 EMAs in the U.S. are home to 65% of the U.S. population but generate more than 72% of GDP. This means that those 50 cities are more productive than the rest of the

U.S.; as a result, they generally enjoy greater returns for their efforts, which in turn enables them to sustain higher standards of living.

To be sure, labor productivity is not a singular determinant of societal health. Richer cities also tend to have higher costs of living, so residents of those microeconomies may not be as well off as the numbers suggest. And while higher productivity yields greater GDP, neither metric captures important issues like inequality – which has been on the rise both between and within the microeconomies we examine (as illustrated by the increased rates of homelessness documented in cities across the country). These are questions we plan to examine in greater depth in future reports. First, however, it behooves us to unpack U.S. productivity trends through the last 130 years, with a particular focus on the past 15 years. Doing so allows us to have a solid grasp on how different regions have navigated the turbu-

lence of a financial crisis, a global pandemic and rapid technological change.

Before we dive into our findings, we would like to offer two caveats for the reader. First, we wish to clarify that our discussions of productivity are all based on the standard productivity metric, which is calculated by dividing the GDP of a given EMA or industry by employment levels in that EMA or industry. This productivity metric is essentially GDP per worker and thus does not reflect the effort that goes into a given position – it merely captures the level of economic output. This leads us to our second caveat: Because productivity is the gap between output and employment, quarterly or annual variability in those measures resulting from stimulus funds or employee strikes can create short-run volatility in measured productivity, which in turn can make it difficult to discern long-term trends.

So what makes a worker or industry productive? In general, high-productivity workers are able to leverage their skills (and often technology) to create high levels of output – for example, developers of a popular app have to write code only once, but that app can be downloaded millions or billions of times with no additional effort by the developer. Meanwhile, restaurant servers have limited numbers of customers they can serve per shift, which makes productivity gains

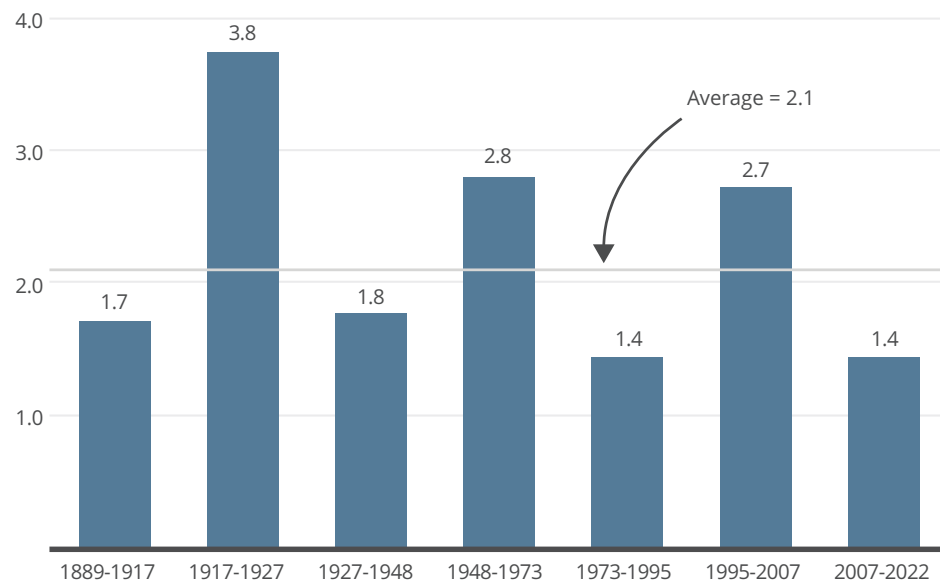
harder to come by. That is certainly not to say restaurant workers cannot be highly productive, but they are often doing so by creating a special experience for which patrons are willing to pay a lot of money. This combination of what you are producing and how you are producing it helps explain the continuum of productivity across industries. In general, for instance, manufacturing tends to be highly productive because the process uses machines to leverage workers. But manufacturing productivity can vary substantially depending on how mechanized the process is, the level of international competition within the industry and the value of the output (i.e., semiconductors vs. T-shirts).

Productivity in 2022 and Beyond

For the most part, the U.S. has seen its productivity grow steadily through the past 130 years with only intermittent periods of decline.³ During that period, we estimate productivity grew 2.1% per year on average. However, that rate of growth has varied dramatically across different eras. For example, from the post-World War II period until the early 1970s, productivity grew at an average rate of 2.8% a year. It then slowed to 1.4% until the mid-1990s, accelerated to 2.7% until the mid-2000s, and then – despite innovations such as smartphones – decelerated sharply once more, averaging just 1.4% from the mid-

Long Waves of Productivity

Percent Change, Annual Rate





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2000s until the onset of the COVID-19 pandemic.

Since Q1 of 2020, productivity has fluctuated even more than usual. With the arrival of the pandemic and the restrictions that followed, U.S. productivity jumped 4.4% in 2020, the fastest pace in more than 30 years, and grew an additional 2.4% in 2021. Productivity slumped in the first half of 2022, however, and is on track to have its biggest decline since at least 1974.⁴ Consistent with the national pattern, we estimate that productivity in *all* 50 of the largest U.S. cities shrank in 2022.

What explains these rapid shifts in productivity? As the pandemic progressed, many businesses had to institute layoffs or close shop altogether. And while the economy shrank, employment – the denominator in our productivity metric – fell even more. Though all sectors of the economy were affected, the impact was felt unevenly, hitting leisure, hospitality and other low-productivity industries the hardest.⁵ Aided by technologies such as videoconferencing platforms like Zoom, many high-productivity workers were able to shift to working at home while many low-productivity workers were unable to do so. These low-productivity sectors subsequently observed job losses that decreased their share of the overall workforce. Thus, the productivity surge observed

in 2020 was due more to distortions in the labor force created by the pandemic than to the ability of Zoom to maintain productivity. (As we discuss later, though, the creators of such technologies were significant beneficiaries of many businesses' rapid shift to remote work.)

All this led to productivity surging during the early part of the pandemic. As households and businesses adapted to life during COVID, governments relaxed lockdown and social distancing requirements, and as vaccinations came online, the economy rebounded. Employment continued to lag, however, which meant that productivity remained high. In the first half of 2022, the economy contracted while national employment continued its strong upward trajectory. In addition, this year has seen low-productivity jobs return at high rates and overall worker attitudes shift toward decreased engagement (as exemplified by the rise of "quiet quitting"). As a result, some of the productivity gains of the early pandemic period have reversed.

Does this augur a return to the bad old days of pre-pandemic productivity malaise? Interestingly, productivity experienced a similar pattern during the 1918-19 Spanish flu pandemic – jumping in the early flu period and then declining as the flu waned (though it is admittedly hard to disentangle the

economic effects of the World War I engagement and drawdown from those of the flu). Productivity then grew strongly until the late 1920s and the onset of the Great Depression. As we will discuss, it is difficult to understand and replicate the drivers of productivity – which also makes it a difficult metric to forecast – but the post-Spanish flu period may provide some clues as to where we are headed. Will better integration of existing technologies such as videoconferencing that aided us during the pandemic and innovations such as mRNA vaccines usher in a new era of high productivity, or should we be concerned about heading toward another Great Depression?

Trends of Productivity Growth in the Past 15 Years

Our economic growth report illustrated that national statistics obscure substantial differences between regions and microeconomies.⁶ The same is true for productivity. Thus, this report focuses on the change in productivity and productivity growth of the 50 largest EMAs between 2007 and 2022, giving us a snapshot of how regional economies have fared during the last 15 years. This timespan contains numerous events that could be seen as anomalies, including the deadliest pandemic in U.S. history⁷, the longest recession since the Great Depression⁸ and the highest

levels of political polarization since the Civil War.⁹ With so much upheaval occurring around our data, one might wonder why we chose 2007 as a starting point.

For one thing, starting in 2007 allows us to capture the change the U.S. has experienced amid all this tumult. While the Great Recession technically lasted for only a year and a half, its impact left permanent effects. Homeownership rates fell dramatically, credit standards tightened and financial security was thoroughly upended, resulting in drastic changes to the common outlook on the economy.^{10,11} A decade later, COVID-19 brought about migratory shifts alongside a reimagining of how and where many sectors work.¹²

To expand on this last point, the rise of remote work has meant broad swaths of employees may now live in areas separate from where their employers are located. This begs the question: Does the recent work-from-home trend mean our measures of productivity in places like San Francisco and Seattle are overstated? For instance, could economic activity attributed to the Bay Area actually be occurring in Boise? While some of this may be happening, we think the impact on our rankings is relatively minor. These cities were already leading in productivity before the pandemic, with a somewhat similar level of out-



performance relative to other microeconomies. In addition, the breadth of our EMAs should capture most of this, as many people working from home remain within their EMAs. However, while the fast-moving nature of work from home is hard to measure, our subsequent models will attempt to incorporate work-from-home trends in future analyses.

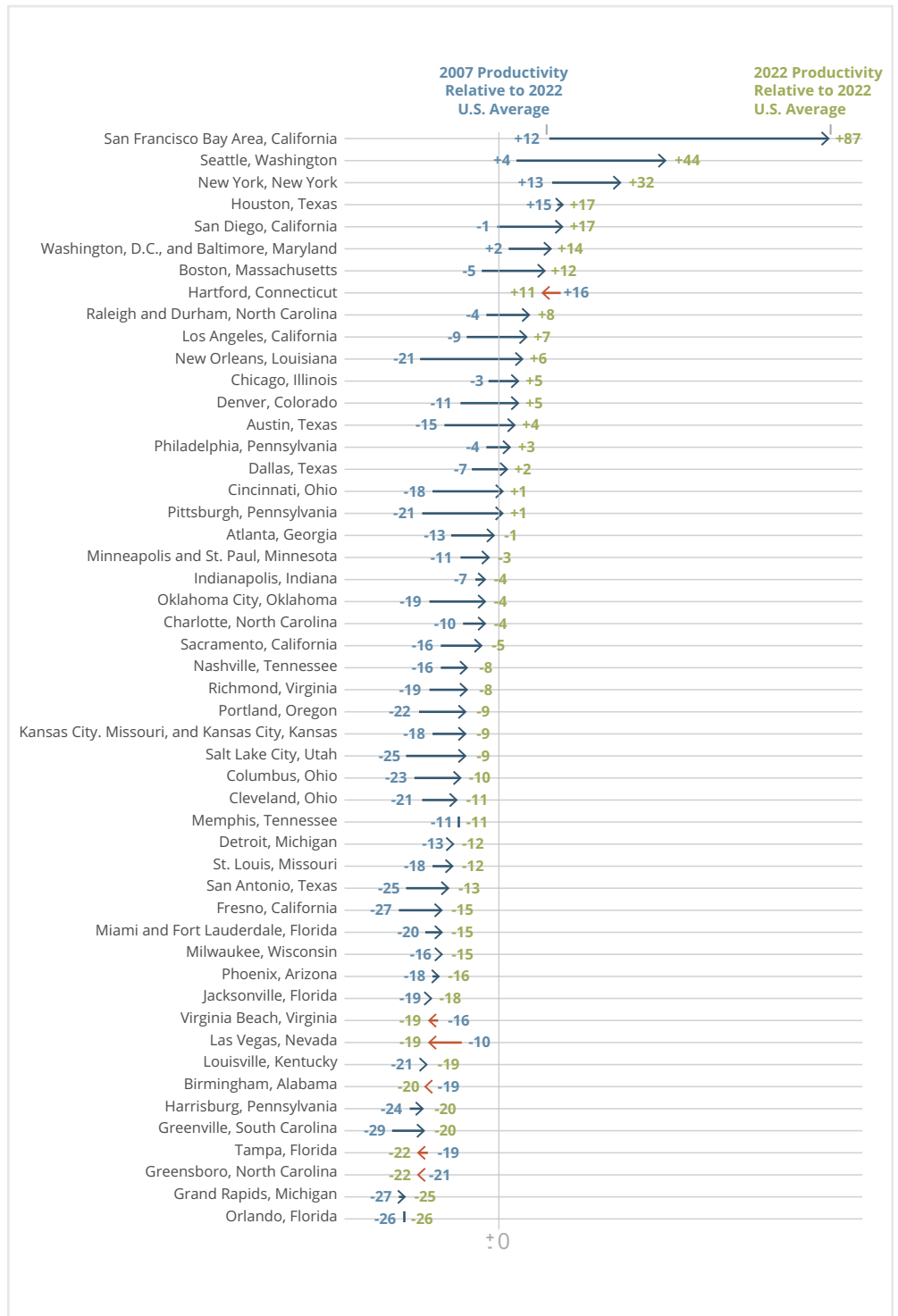
Another reason we begin our analysis in 2007 is that the start date allows us to disentangle how different regional fortunes have fared – as well as how different areas have navigated such rocky waters. Even though the U.S. has generally recovered on a national level, its recovery has been uneven, with many cities still grappling with the aftershock of the financial crisis and following economic realignments. With the prospect of potential future turmoil on the horizon, our 2007-2022 timespan allows us to dissect productivity in the context of the new, rapidly shifting world in which we find ourselves.

Finally, the 15-year window of our analysis is sufficiently long for us to properly identify the trends that have emerged and weathered the numerous shocks that have taken place. First, the superstar cities that lead the pack in productivity are beginning to grow apart from one another, even as the group as a whole pulls further away from other EMAs. Second, New Orleans and a cluster of EMAs in the Rust Belt have made considerable gains relative to their 2007 standing and have started to climb the productivity ranks. Finally, some EMAs have fallen behind the rest of the pack, still reeling from the real estate bubble, the pandemic and the Great Recession.

The Rise of Superstar Cities and Increasing Inequality

In 2007, the San Francisco Bay Area EMA, which includes Oakland, San Jose and other cities within San Francisco's economic orbit, was the fourth-most-productive city in the United States. Even in 2007, an average worker in San Francisco was 12% more productive than was the average U.S. worker in 2022 (see figure at right).¹³ Meanwhile, the Hartford EMA had the highest level of productivity in 2007, 16% greater the U.S. 2022 average. Houston was the second most productive at +15%, followed by New York at +13% and San Francisco at +12%. Notice how those cities

The Rise of Superstar Cities and Increasing Inequality: Productivity Growth Relative to 2022 U.S. Average



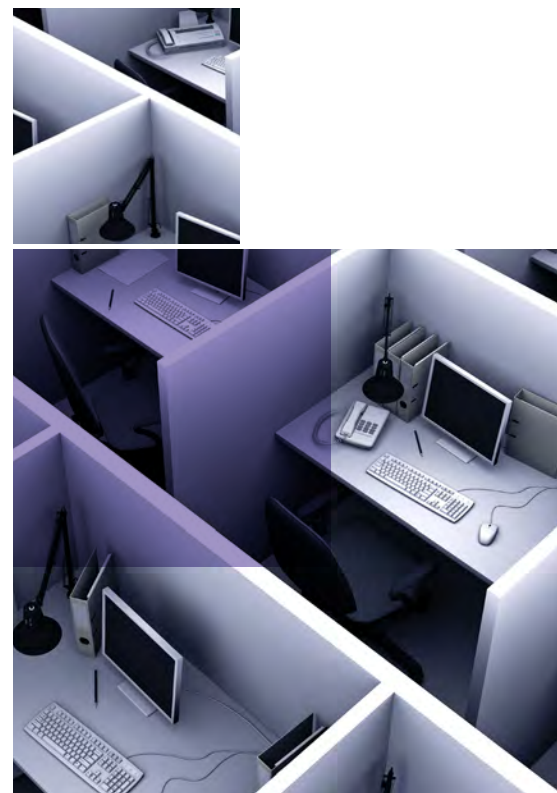
were tightly grouped, reporting similar productivity numbers relative to our benchmark of national productivity in 2022. There was a second cluster led by Seattle at +4% that included Washington, D.C.; San Diego; Chicago; Raleigh and Durham, N.C.; Philadelphia; and Boston (at -5%). At the bottom of the list was Greenville, South Carolina, which in 2007 was 29% less productive than the U.S. 2022 level.¹⁴

By 2022, those rankings had shifted substantially, even though many familiar names still appear at the top of the list. San Francisco now ranks as the most productive city by a considerable margin, followed by Seattle and New York City. Productivity has exploded in the Bay Area, growing 66% since 2007. Much of this growth can be traced to the proliferation of smartphones and software applications during the past 15 years, as many of the innovators spearheading this digital revolution are based in the Bay Area. This group of tech giants includes both established corporations like Apple and new household names like Uber, all of whom worked to develop new products with mass appeal during the timeframe examined. We estimate that San Francisco's productivity in 2022 is now a whopping 87% higher the U.S. average, 43 percentage points higher than Seattle and 76 points above Hartford – which has fallen seven spots to clock in today as the nation's eighth-most-pro-

ductive city. In fact, between 2007 and 2022, productivity in Hartford actually fell 4.5%. Hartford's insurance and finance industries – both highly productive sectors – shrank their operations, resulting in a 23% decline in employment since 2007. Meanwhile, New York City rebounded from the financial crisis and continued to outperform its peers with above-average productivity growth, and thus retained its third-place spot.

San Francisco and Seattle's productivity growth helps explain why they perform so well in our 2022 economic growth rankings, and also illustrates one of the drivers of rising inequality between microeconomies. Large increases in productivity mean that even modest gains in employment can lead to strong economic growth, since each hour worked yields relatively more GDP. At the same time, employment to date in San Francisco this year has been very healthy, both in absolute terms and relative to its peers. This combination explains San Francisco's 4.8% estimated GDP growth in 2022 despite dizzyingly high real estate prices and high-profile corporate departures to places like Austin. Still, even though San Francisco topped our growth rankings, we estimate that productivity shrank in all 50 of the largest EMAs, including San Francisco, in 2022. (Austin came closest to breaking even.)

The ascendancy of these “superstar cities” during the last 15 years has created even wider gaps between the best- and worst-performing EMAs. In 2007, there was a gap of roughly 45 percentage points between the most productive (Hartford) and least productive (Greenville) cities. Today, that gap is 113 percentage points as measured between San Francisco and Orlando – our new frontrunner (at 87% more productive than the U.S. average) and bottom of the pack (at 27% below national levels), respectively.¹⁵ Additionally, our top three superstar cities – San Francisco, Seattle and New York – created 17.5% of the U.S. GDP in 2022 despite containing only 11.5% of the population, meaning they account for much of the gap between the population and GDP



of the 50 largest EMAs that we have discussed.

As we noted earlier, this suggests a significant divergence in standards of living across cities, not to mention the growing disparities within those cities. Our 2007 productivity levels are far closer together than in our 2022 ranking, in which the EMAs – particularly our superstar cities that top the rankings – have separated from one another.¹⁶ In 2007, the top four EMAs were all within 3 percentage points of one another in their relative productivity measures, and the top 10 EMAs were within 20 points of one another. By 2022, the top four EMAs (excluding San Francisco) had a 27-point range and the top 10 had a 38-point gap.

Even after removing San Francisco, which has pulled away from the rest of the pack and thus represents a significant outlier, our 2022 rankings exhibit larger productivity gaps between cities. These notable differences in productivity serve as a strong indication that inequality across EMAs is also growing.

Top Gainers: Surprising Cities on the Rise

Could New Orleans become the next San Francisco? Might tech's move out of the Bay Area make San Francisco the next Hartford? Could the Rust Belt once again serve as an econom-

ic engine spurring the rest of the country forward? Each of these seems doubtful – yet these scenarios might be less unlikely than they sound given the productivity jumps we have seen during the past 15 years.

The graphic on Page 10 lists EMAs by the change in their rankings from 2007 to 2022. Perhaps surprisingly, New Orleans tops the list with a 28-point jump in rank, driven by 35% productivity growth in the technology sector (bested only by Seattle's 38% and San Francisco's 66%). It's worth noting that New Orleans' population remains below pre-Hurricane Katrina levels,¹⁷ and deep-seated inequality is still a problem. Moreover, our 2007 starting point means that some of this growth reflects the recovery from Hurricane Katrina, which occurred two years earlier. Employment within New Orleans' construction industry grew by 10% in the years following Katrina, peaking in December 2008 before falling back to pre-Katrina levels following the Great Recession. Other positive forces are at work in the city as well – of note is the 23% growth in high-productivity jobs found in software development and R&D between 2007 and 2022.

Our analysis suggests that – despite the common narrative of Rust Belt decline – Pittsburgh, Columbus, Cincinnati and Cleveland have been making huge strides in productivity growth.

At the same time, this cohort has exhibited relatively weak job growth, which explains some of their underperformance in our 2022 economic growth rankings: Their economies may be more efficient, but the boom in total jobs has yet to take place. And yet there seems a similar restructuring pattern going on, as all four micro-economies experienced similar shifts in their industry mixes from 2007 to 2022. Less competitive manufacturing, government and retail industries' shares of employment declined significantly, while the higher education and health services and professional and business services sector both expanded. Much of this growth has been driven by these cities' investments in high-tech sectors, such as Pittsburgh's development of its robotics industry.¹⁸ In Cincinnati, Columbus and Cleveland, the transportation sector grew as well, especially in Columbus, where its employment in transportation increased by 92 percent between 2007 and 2022. Ohio's location at the intersection of several key transportation corridors has continued to bolster its trucking and freight industry and has spurred public investment in the sector, such as the Smart Mobility Corridor.¹⁹ The corridor, which is the world's most connected highway, connects the technology and transportation sectors by serving as a development and testing ground for intelligent transportation systems (such as self-driving cars).²⁰

Surprising EMAs on the Move: Change in Rank and Productivity Growth, 2007-2022

	EMA Name	Change in Rank	Productivity Growth
1	New Orleans, Louisiana	28	34.6%
2	Pittsburgh, Pennsylvania	23	28.3%
3	Salt Lake City, Utah	16	20.7%
4	Portland, Oregon	15	17.5%
5	Columbus, Ohio	13	16.9%
6	Fresno, California	12	17.3%
7	San Antonio, Texas	11	16.6%
8	Cincinnati, Ohio	10	22.7%
9	Oklahoma City, Oklahoma	10	17.9%
10	Cleveland, Ohio	9	12.5%
11	Austin, Texas	8	22.3%
12	Richmond, Virginia	7	13.0%
13	Denver, Colorado	6	18.5%
14	Boston, Massachusetts	4	17.6%
15	Los Angeles, California	4	16.9%
16	Greenville, South Carolina	4	12.9%
17	San Francisco Bay Area, California	3	66.2%
18	Seattle, Washington	3	37.9%
19	San Diego, California	2	18.3%
20	Kansas City, Missouri and Kansas City, Kansas	2	11.1%
21	Atlanta, Georgia	1	13.4%
22	Nashville, Tennessee	1	9.9%
23	New York, New York	0	16.2%
24	Washington, D.C., and Baltimore, Maryland	0	12.3%
25	Raleigh and Durham, North Carolina	0	12.4%
26	Sacramento, California	0	12.6%
27	Grand Rapids, Michigan	0	2.8%
28	Miami and Fort Lauderdale, Florida	-1	5.3%
29	Harrisburg, Pennsylvania	-1	5.2%
30	Houston, Texas	-2	1.6%
31	Dallas, Texas	-3	9.9%
32	Minneapolis and St. Paul, Minnesota	-3	8.9%
33	Orlando, Florida	-3	0.8%
34	Chicago, Illinois	-4	8.6%
35	Philadelphia, Pennsylvania	-5	7.3%
36	St. Louis, Missouri	-5	6.8%
37	Jacksonville, Florida	-5	1.2%
38	Louisville, Kentucky	-6	1.5%
39	Hartford, Connecticut	-7	-4.5%
40	Charlotte, North Carolina	-7	6.6%
41	Indianapolis, Indiana	-9	2.7%
42	Birmingham, Alabama	-10	-1.2%
43	Greensboro, North Carolina	-10	-2.2%
44	Phoenix, Arizona	-11	1.5%
45	Detroit, Michigan	-12	1.0%
46	Memphis, Tennessee	-14	-0.4%
47	Milwaukee, Wisconsin	-15	0.3%
48	Virginia Beach, Virginia	-16	-3.4%
49	Tampa, Florida	-16	-3.6%
50	Las Vegas, Nevada	-27	-9.8%

Though these Rust Belt EMAs were all in the top 10 of the most improved EMAs, the extent of their growth differed significantly. Pittsburgh had the greatest leap in productivity (28%), while Cleveland had the smallest (13%); Cincinnati and Columbus landed in the middle with 23% and 17% productivity growth, respectively. The professional, scientific, technical and financial activities industries saw employment growth of 20% in Pittsburgh and 18% in Cincinnati and Columbus, as well as the higher productivity growth that these sectors bring. Cleveland, however, experienced virtually no growth in these industries.

EMAs Falling Behind

While the past 15 years have been kind to some of our cities, others have been less fortunate. In Las Vegas, the long tail of the housing bubble's collapse has had lasting effects that have led to sharp productivity losses. To exacerbate the situation, Las Vegas' GDP and productivity were unrealistically high in 2007 as a result of the housing bubble, thus making its declines even more pronounced. When the bubble did burst, the Las Vegas economy was in a vulnerable position as it held the highest share of construction-based employment of any EMA at the time. The housing bubble's collapse led to construction employment falling by 63% from 2007 to 2012. As of 2022, Las Vegas' construction employment has partially recovered but is still 32% below its 2007 levels. The tourism and hospitality industry also plays a large role in Las Vegas' economy – employing more than 25% of its workforce – but its overall share has fallen by 4% since 2007. In total, Las Vegas has seen its productivity shrink by nearly 10% during the last 15 years, driving its ranking down by 27 points – by far the largest decline out of all our EMAs. Given the centrality of hospitality to the Las Vegas economy – with more than 1 in 4 workers in the region connected to the tourism sector – the decreased revenue from this industry has likely affected other high-productivity

sectors in that EMA by reducing financial resources in the area as a whole.

Detroit, Phoenix and Tampa sit alongside Las Vegas as cities that have fallen behind dramatically in productivity, seeing their rankings drop by 12, 11 and 16 places respectively. Following the housing collapse, the construction and manufacturing sectors in Tampa Bay and Phoenix shrank as well. However, unlike Las Vegas, Tampa Bay and Phoenix saw growth in high-productivity industries (such as financial activities, software and R&D), which offset some of their productivity decline. While Detroit did not experience a large contraction in its construction sector, the city has been reeling from the early 2000s collapse of its highly productive auto industry, and even filed for Chapter 9 bankruptcy in 2013. Ultimately, productivity shrank in Tampa Bay by 4% between 2007 and 2022 and grew in Detroit and Phoenix by 1% and 2%, respectively, during the 15-year period. Each of these productivity growth rates remains well below the median of 10% calculated from the 50 EMAs we examine.

How to Move the Needle Going Forward

Economists, businesspeople and policymakers know the general building blocks of productivity: a skilled labor



force, machines to leverage that labor force (such as computers and robots), and innovations that allow for continued efficiency gains. The problem is that the mix of machines and skills vary among industries and locations, and the ecosystem for innovation is hard to understand and re-create. If it were easy, of course, every city would be able to re-create San Francisco's success.

The story of productivity from 2007 to 2022 is not uniformly positive or negative. The bad news is that, to date, the divergence in productivity between the have and the have-not cities continues to grow. San Francisco generates massive levels of GDP and thus exhibits sky-high productivity numbers that dwarf those of nearly all our other EMAs. At the time of this writing in November 2022, the tech sector has begun to exhibit strong signs of a slowdown – and yet its dominance in the U.S. economy has reached such heights that this slowdown may not topple the Bay Area from (near) the top of productivity rankings for some time. That said, how the tech sector's slowdown af-

fects San Francisco's economic growth ranking in 2023 could be a different matter.

The good news is that some EMAs may be poised to catch up to the leaders. First, the list of top gainers suggests that some areas have been making investments that are yielding marked productivity gains. Second, cities that have experienced hardship, such as New Orleans or those in the Rust Belt, offer evidence that increased productivity can be realized through the development of new industries.

Innovation comes in many forms. Some comes from labs and research – such as the development of an artificial intelligence management system that cools data center warehouses while using 40% less energy,²¹ or the creation of zinc-manganese-oxide batteries that are simultaneously more stable and more efficient than are their predecessors.²² However, many innovations also come from collaboration between colleagues and better management of resources – such as redesigning production lines



or delivery routes, and rethinking inventory management and even worker scheduling.²³ And these innovations can feed upon themselves – for instance, more computing power allows for better worker scheduling software. Moreover, the location and diversity of financiers can play an important role in the success of entrepreneurs.²⁴ As we move forward, a key goal of the American Growth Project will be to develop a better understanding of how these forms of innovation may be harnessed – as well as using this understanding to help decision-makers increase productivity in an equitable and sustainable manner.

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New Orleans, Louisiana

To be sure, New Orleans' productivity growth between 2007 and 2022 is at least somewhat skewed by the impact of Hurricane Katrina, which hit in 2005 – meaning that some of what we are capturing is the city's return to pre-disaster levels. That being said, the city also performed relatively well during the crisis of 2008; employment declined just 1%

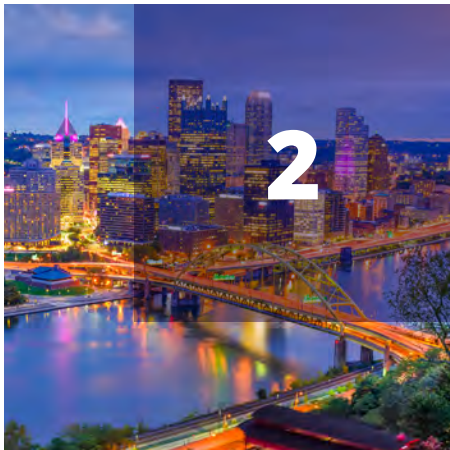
from 2008 to 2010, compared with a national average of 5%.²⁵ The Big Easy also saw the scientific and technical sectors grow, and venture capital funding double, between 2010 and 2014. Both factors fed into strong GDP growth, even as the city continues to struggle with crime, inequality and overall employment.

What's Going On in NOLA?

New Orleans tops our list of the microeconomies that have jumped the most in our rankings – and even lands near the top of the overall list, clocking in as the city with the 11th-most-productive workforce. How has this been happening, given that the city is still struggling to recover from Hurricane Katrina? Like many of our other cities moving up the list between 2007 and 2022, the answer has come in the transition from low-productivity sectors to high-productivity ones. Since 2007, New Orleans' economy has shifted away from the less competitive manufacturing, retail and wholesale industries toward the higher education, health and professional and business services

industries. Of the 50 largest EMAs, New Orleans experienced the largest shift toward the education and health services industry. The share of employment in the education and health services industry grew by 6 percentage points, driven by a surge in the healthcare side of the industry that saw employment grow by more than 53%. A recent study indicates this is predominantly driven by hospital employees, who flocked to New Orleans above all other cities between 2007 and 2017.²⁶ This is evident in our data, which shows New Orleans' education and healthcare industry employment grew by 60% from 2007 to 2022.





Pittsburgh, Pennsylvania

Even with its population in decline since 2000, Pittsburgh has seen its per capita income increase by more than 20% since the turn of the century²⁷, a clear indication of productivity growth. The city has been working to transform its economy, moving away from its long-held status as

the premier location for steel production. By the end of the 2010s, its largest sectors included advanced manufacturing, healthcare, energy, financial services and technology – all sectors that tend to yield high returns.

Salt Lake City, Utah

Utah has been in the midst of an expansion for some time – upon the release of the 2020 census, it had the fastest population growth rate of any state in the past decade, with many of those newcomers flocking to Salt Lake City and the surrounding area.²⁸ The EMA has seen 30% growth in high-tech industries between

2015 and 2020, much of which came in the scientific research and development services industry, which grew almost 75% during those years. These high-productivity sectors have propelled Salt Lake City to its third-place spot on our list; it also made our ranking of the top [10 U.S. cities with the fastest-growing economies](#).



Portland, Oregon

Portland's population growth in recent decades has led to broad expansion across many industries, ranging from the food and beverage sector to technology and manufacturing. Its turnaround in productivity has been largely driven by rapid growth in high-productivity sectors

such as semiconductor manufacturing and software publishing, the latter of which has nearly doubled in size since 2007. And of course, being home to the world headquarters of Nike and the U.S. HQ of Adidas, both major manufacturers, doesn't hurt.

Columbus, Ohio

Much like Pittsburgh, Columbus has been transitioning from industrial production to smart tech, healthcare, higher education and other high-productivity sectors. Columbus won the U.S. Department of

Transportation's Smart City challenge in 2015, receiving a \$50 million grant to turn its plan for tech-based transportation innovation into a reality.³⁰



Fresno, California

In 2007, Fresno was third from last in our productivity rankings. However, a painful reshuffling during and following the Great Recession to advanced manufacturing and its traditional reliance on agriculture, which – thanks to heavy mechanization – can be very productive, pushed

its ranking up to spot number 36. It is important to note that these gains have been unevenly distributed – as of November 2022, Fresno reports a poverty rate of 20.6%, more than 1.5 times that of the state of California or the U.S. as a whole.³¹

San Antonio, Texas

San Antonio has been growing across a diverse array of sectors, ranging from manufacturing to technology finance and insurance. Its status as a cybersecurity hub attracts many of the best and brightest in a high-productivity field that

is growing in importance. The city's noted collaborations among civic, academic and business entities allow for rapid innovation, which is then borne out in its economic output.





Cincinnati, Ohio

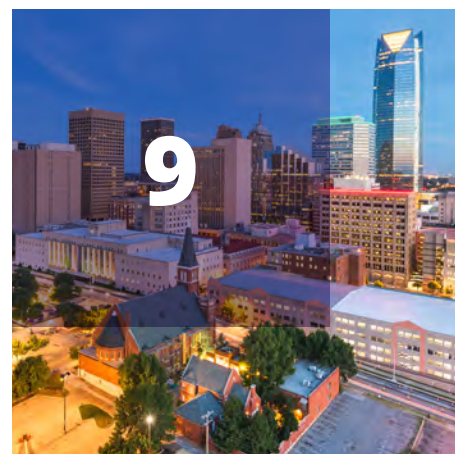
The second of three Ohio cities to make our list, Cincinnati has seen its manufacturing sector begin to rebound slightly since the Great Recession. At the same

time, the city has observed drastic expansion in other high-productivity areas such as healthcare, which increased by about 16% between 2007 and 2022.

Oklahoma City, Oklahoma

Oklahoma City has been making its way up through the middle of the pack, moving up to No. 22 in our 2022 list from No. 32 in 2007. The city has seen steady, sustained population growth through the past decade alongside continued public investment in its downtown, contributing

to a quiet urban revival. Wages in the technology sector have increased by an average of 17% between 2016 and 2021, indicating the productivity growth that the EMA's tech and energy sectors have undergone.



Cleveland, Ohio

The final Ohio city to make the top 10 jumped from spot number 40 to number 31 in our rankings between 2007 and 2022. This move was driven in part by sharp declines in less competitive manufacturing sectors; the city's population declined roughly 6% between 2010 and

2020. The city has, however, also been working to replace those less productive jobs with opportunities in more productive industries – healthcare in particular stands out as a sector in which both job and wage growth have outpaced the national averages.

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- ¹ The size of the economy is based on purchasing power parity, which tries to equalize the value of goods and services produced in India and the U.S. Using dollars as the common denominator, the U.S. economy is more than seven times larger than India's.
- ² A geographic designation determined by the Kenan Institute that groups U.S. urban areas in economically meaningful ways. Learn more here: https://kenaninstitute.unc.edu/wp-content/uploads/2022/10/Whats_in_my_EMA.pdf
- ³ The official measure of productivity from the Bureau of Labor Statistics starts in 1947, but the Kenan Institute has created a measure of productivity going back to 1889. For this discussion we use the standard definition of U.S. productivity as output per hour worked in the nonfarm business sectors. For our EMAs, we use output (GDP) per employee.
- ⁴ U.S. Bureau of Labor Statistics. (2022, November 3). *Economic News Release: Productivity and Costs*. <https://www.bls.gov/news.release/prod2.toc.htm>
- ⁵ Stewart, J. (2022). *Why was Labor Productivity Growth So High during the COVID-19 Pandemic? The Role of Labor Composition* (Working Paper 545). U.S. Bureau of Labor Statistics. <https://www.bls.gov/osmr/research-papers/2022/pdf/ec220010.pdf>
- ⁶ For more on the need to examine regional economies, see: Ozoguz, A. (2022, October 28). All Economics is Local. *Kenan Institute of Private Enterprise*. <https://kenaninstitute.unc.edu/commentary/all-economics-is-local/>
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- ⁸ National Bureau of Economic Research. (2021). *US Business Cycle Expansions and Contractions*. <https://www.nber.org/research/data/us-business-cycle-expansions-and-contractions>
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- ¹¹ Additionally, research from Kenan Institute expert Camelia Kuhnén shows that negative economic shocks can sharply increase uncertainty and pessimism, which subsequently decreases the likelihood of investment and depresses the economy. For more, see: Femand, E. & Kuhnén, C. (2020, May 27). *How Will the COVID-19 Pandemic Affect Personal Economic Decisions?* Kenan Institute of Private Enterprise. <https://kenaninstitute.unc.edu/kenan-insight/how-will-the-covid-19-pandemic-affect-personal-economic-decisions/>
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- ¹³ For EMAs, productivity is measured as economic output (GDP) per employee. For comparison purposes we have benchmarked all cities relative to our estimate of U.S. GDP per employee in 2022, which is \$126,000.
- ¹⁴ In 2007 terms, Greenville was 83% of the U.S. average, while Boston was 111%.
- ¹⁵ Relative to 2007 U.S. GDP, the gap between the most and least productive EMAs was 53 percentage points in 2007 and 132 points in 2022.
- ¹⁶ These are measured relative to 2022 productivity. Relative to 2007 U.S. productivity, the range between the top three was 4 percentage points and 24 points between the top 10.
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