



AUGUST 2016

## Regional Performance Over Time

Thriving and Reviving  
Amid Economic Challenges

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## ACKNOWLEDGMENTS

The authors would like to thank their colleagues and several former colleagues for their help. In particular, we are grateful to Gabriela Ortiz for her support during her internship and Ross DeVol and Armen Bedroussian for their continuing work on the Best-Performing Cities index, upon which this paper draws heavily. We also thank the public, business, and civic leaders in communities across the United States who have shared their experiences and questions with us, and whose efforts to build prosperous regional economies motivate this research.

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### Introduction

What factors distinguish cities that can withstand an economic downturn, or rebound afterward, from those that cannot? Are these factors unique to successful cities, or are there best practices that can be adopted in peer cities? Building on the Milken Institute's Best-Performing Cities index, this paper examines what sets resilient cities apart.

The economic performance of a city is driven by a confluence of factors, including national and international trends, local government policy, industry mix, technological change, and the choices made by individual firms and entrepreneurs. The Milken Institute has tracked and evaluated the success of metropolitan areas in its annual Best-Performing Cities index since 1999, highlighting the urban regions that are outperforming peers on key measures of economic health, including total employment and wage growth. Our scale includes a mix of one- and five-year indicators to capture recent momentum as well as achievement in the medium term. While cities that capitalize on a boom in their core industry can rise to the top of the index for a year or two and potentially present attractive investment opportunities, a sustained strong showing or swift rebound indicates a broader set of assets than a sharp rise and fall.

To separate the effects of the national business cycle within particular industries from locally relevant factors, cities should be compared with peers that share their mix of industries. Cities that outperform peers on the Best-Performing Cities index over time have been more competitive in some way that enabled them to weather the same external shocks more effectively. This may be due to a homegrown company that captured the market for a new technology, or it may be based on a local tax policy or regulatory environment that attracts investment, to offer two possible examples among myriad options. Examining shared characteristics of resilient cities may offer insight into the practices that support sustained prosperity.

To try to isolate the local factors without ignoring industry makeup, cities with similar economies were grouped using a cluster analysis, and performance over time on the Best-Performing Cities index was evaluated within groups. This approach unveiled trends common to the group as a whole and identified cities that had outperformed their peers during the period studied.

The use of cluster analysis was also motivated by a desire to build the peer groups on a solid foundation of industrial makeup and other key characteristics, rather than on existing, purely geographic or historical groupings. Different strategies and fortunes have meant that the experience of traditionally

grouped Rust Belt cities, for example, have diverged since that name was first applied. Decision-makers in cities across the country are dealing with their local economies as they are now and as they aspire to be, not as they once were or as people may still perceive them. Our new groups aim to reflect more current experience and identify peer economies that may be unexpected, in some cases, but are chosen systematically based on recent economic data.

This paper represents a first step in examining the resilience of cities. It will be followed by a series of case studies that explore the choices of successful cities and identify factors that helped them resist or recover from downturns. The broader aim of this series is to use the specific metropolitan experiences behind the numbers to offer decision-makers in peer regions a suite of best practices to consider as they pursue robust and sustained prosperity for their communities.

## Methodology

To evaluate which cities outperformed their peers, we created a 25-variable economic profile of each and conducted a cluster analysis. This grouped cities with similar economic characteristics together and allowed us to identify the more successful cities in each group by looking at trends in the Best-Performing Cities index rankings over time. Further methodological detail is provided in the Appendix.<sup>1</sup>

### Definition of ‘cities’

We built our analysis on the Milken Institute Best-Performing Cities (BPC) index, which ranks metropolitan statistical areas (MSAs) and metropolitan divisions (MDs) based on their economic performance. MSAs and MDs are defined by the federal Office of Management and Budget (OMB) based on data from the United States Census. Each typically represents a large population nucleus and adjacent territory with a high degree of economic and social interdependence. While these metropolitan regions are often larger than individual cities as defined by municipal boundaries, they represent interconnected economies that share a labor force. The 200 most populous MSAs and MDs are ranked on the primary BPC index, with best-performing small cities ranked separately. Both sets of cities are included in this analysis.

### Variables to create an economic profile

As the basis for our cluster analysis, we created an economic profile of each city using 25 economic variables. These differed from the indicators used in the BPC analysis and focused primarily on “stock” measures that capture characteristics of the economy that are likely to persist. The variables used in the cluster analysis include the region’s relative concentration in 19 industries as measured by the location quotient of the gross metropolitan area product (in chained 2009 U.S. dollars), the labor force participation rate, median family income, housing affordability, changes in residential housing permits issued, population growth, and population density.

To classify metros based on their recent economic profile and maximize the number of metros for which complete data was available, we used 2013 data as the basis for the cluster analysis. Metros that had been newly added or had significantly changed their geographic boundaries after the 2010 Census were removed. Ultimately, 370 metros were classified using cluster analysis.

### Cluster analysis characteristics

The aim of cluster analysis is to group elements—in this case, the 370 U.S. cities—based on their similarity. There are many different algorithms that can be used, and which is the most appropriate and

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<sup>1</sup> This report draws on data and text from the Milken Institute’s “Best-Performing Cities” series.

informative depends on the data. Two key characteristics of a cluster analysis are the approach used—primarily hierarchical or non-hierarchical—and the number of clusters into which elements are grouped.

The hierarchical approach, where sub-clusters are nested under a single, large cluster, is more appropriate for data sets with small sample sizes. So the non-hierarchical approach, which can be applied to data sets with bigger sample sizes, was more suitable to analyze the 370 metros in the United States.

The art of clustering includes choosing the appropriate number of groups in which to aggregate elements. In our analysis of city data, we found that too few clusters generated groups with large numbers of heterogeneous metros, making it difficult to identify the overarching characteristics shared by its members. On the other hand, too many clusters tend to yield some groups with only one or two metros, possibly artificially separating these from peer cities to populate the required number of clusters rather than identifying true outliers. After repeated testing, we determined that 14 clusters was the most appropriate number for our analysis.

### Validating the stability of city groupings

To ensure that the grouping of cities created by our cluster analysis of their 2013 economic profiles was not affected by the recent business cycle, we conducted a sensitivity check by running analogous cluster analyses for the years 2005, 2008, and 2012. These years represent different points in the national business cycle—2005 represents the peak before the 2007 economic downturn and 2008 marks the trough of that crisis, while 2012 gives us a picture of U.S. metros' economic performance during the recovery. For the majority of cities, the cluster assignments in 2013 were consistent with the assignments in previous years. These cities are grouped based on their 2013 classification in this paper. We created a new group for metros that lacked a stable assignment across the years to explore what can be learned from these locales that are “in transition.” The resulting 15 groups varied in size, ranging from six to 64, and represent cities with similar economic profiles but may have divergent rankings in the Best-Performing Cities index. Identifying likely causes of these different experiences is the goal of this research.

### Alignment with the Best-Performing Cities index

Published annually, the BPC index is based on a weighted average of nine outcome measures of a regional economy's vitality (see Table 1). It measures growth in jobs, wages, salaries, and technology output over five years to adjust for extreme variations in business cycles. It also incorporates the latest available year's performance in these areas, along with a measure of 12-month job growth to capture recent momentum among metropolitan economies. As can be seen in Table 1, the index also evaluates the concentration and diversity of the high-tech sector in each region. Taken together, these outcomes determine where employment is stable and expanding, wages and salaries are increasing, and economies and businesses are thriving.

Table 1 Components of the Milken Institute Best-Performing Cities Index

Component	Weight
Five-year job growth	0.143
One-year job growth	0.143
Five-year wage and salary growth	0.143
One-year wage and salary growth	0.143
Short-term job growth (most recent 12 months)	0.143
Five-year high-tech GDP growth	0.071
One-year high-tech GDP growth	0.071
High-tech GDP location quotient (LQ)	0.071
Number of high-tech industries with GDP LQ>1	0.071

Because we use the BPC U.S. rankings to examine the economic performance of U.S. metros over time, we made one final adjustment to the city groups, eliminating metros that had fewer than five years of consecutive rankings. This led us to focus on 365 U.S. metros in our analyses for each of the 15 clusters.

### Choosing case studies

Within each cluster, we identified metros that had outperformed their peers on the Best-Performing Cities index. Since they shared an economic profile, we attempted to identify factors that may have contributed to the stronger showing. Although we tried to identify top performers in each cluster, the nature of the groupings is that some clusters are in an economic situation few would want to share. However, we can still learn from the strategies being implemented to address the challenges these metros face.

# Cluster Analysis: Knowledge-Based Economies

## Innovation Hubs



In general, metros in the Innovation Hubs group are large, diverse, innovative, and entrepreneurial, rich in human capital. They are strong in high value-added industries such as information; real estate, rental, and leasing; and professional, scientific, and technical services. It should come as no surprise that Los Angeles-Long Beach-Glendale, San Francisco-San Mateo-Redwood City, and San Jose-Sunnyvale-Santa Clara in California and Seattle-Bellevue-Everett, Wash., fall into this cluster. Compared with these established dynamos, Boulder and Denver-Aurora-Broomfield in Colorado are rising stars (particularly in high-tech). They all have diverse economies with rich talent pools.

Most metros in this cluster have been ranked among the top 50 in our Best-Performing Cities U.S. rankings, and most have trended upward in recent years. The only exceptions are Los Angeles-Long Beach-Glendale and Little Rock-North Little Rock-Conway, Ark. Although the Los Angeles metro has a diverse economic base with lots of talented professionals, it has sometimes fallen out of the top 100 in our BPC rankings. It has improved in recent years, climbing to 95th place in 2012 and reaching 42nd in 2014. Yet it dropped to 77th place in our 2015 ranking. Little Rock-North Little Rock-Conway had been moving up and reached 23rd place in 2009, but the following year it plummeted to 93rd and has fluctuated ever since. San Francisco-San Mateo-Redwood City, San Jose-Sunnyvale-Santa Clara, and Seattle-Bellevue-Everett are the top three performers in this cluster. They have mostly ranked among the top 10 during the 2013-2015 period. San Francisco-San Mateo-Redwood City and San Jose-Sunnyvale-Santa Clara won the crown in 2014 and 2015, respectively.

### **Case Study: Denver-Aurora-Broomfield, Colo.**

Over recent decades, the Denver-Aurora-Broomfield, Colo., metro has experienced relatively steady population growth. Even after the 2007 economic crisis, that growth remained at 1.8 to 1.9 percent per annum. The metro had approximately 2.7 million residents in 2014. This metro has also enjoyed strong job and wage growth, largely attributed to the regeneration of downtown Denver as well as the concentration of high-tech companies in the state. The growth of this metro has also driven up the housing supply and property prices.

Denver-Aurora-Broomfield has developed a diverse economic base. It has high GDP in a range of sectors: mining, quarrying, and oil and gas extraction; information; professional, scientific, and technical services; and management of companies and enterprises. In 2012, approximately 40 percent of the population in this metro had at least a bachelor's degree (ranked 32nd of 395 U.S. metros). This rich talent pool and



the presence of several major universities, including the University of Colorado Denver and the University of Denver, have provided knowledge-based firms such as Lockheed Martin with highly skilled workforces. In addition, the redevelopment of downtown Denver has also fueled the metro's economic growth, particularly in construction and restaurants. A rail line linking downtown and the Denver International Airport opened in April 2016. The concentration of urban amenities such as art museums, theaters, restaurants, and retailers is attractive to residents and visitors alike.

Despite the dynamic economy around Denver, the high-tech manufacturing sector there is vulnerable to business cycles. Also, rising business and housing costs have posed a challenge for this metro's future growth. Yet the diversified economic base and its well-educated population are likely to keep propelling the area's long-term performance.

### Established Knowledge Economies



Home to many top-tier universities, including the majority of the Ivy League, Established Knowledge Economies have a long history of building, and building on, knowledge to generate growth. With the exception of the Anaheim-Santa Ana-Irvine, Calif., metropolitan area, the regions in this group are clustered in the northeast United States. The East Coast regions have strong education sectors, most notably in Ithaca, N.Y., home to Cornell University, where the education sector is 20 times as important to the local economy as the national average. Ithaca is the sole small Established Knowledge Economy and the only one on the East Coast that lies outside the Northeast Corridor conurbation between Boston and Washington, D.C.

The larger Established Knowledge Economies have relatively diverse industries that benefit from the educated workforce created by their universities, who are attracted to the urban lifestyle and employment opportunities for high-skill workers. The share of the population with at least a bachelor's degree in these cities is significantly higher than the national average; in some Established Knowledge Economies, more than half the population boasts this qualification. Industries that depend on expert talent, including finance and technology, are important contributors to these regional economies. Without the open space or natural resources to enable them to benefit from the real estate and energy booms enjoyed by other regions, however, growth has been hard to come by for many Established Knowledge Economies. Only the Cambridge-Newton-Framingham, Mass., region ranked in the top 50 of our 2015 Best-Performing Cities index, and several regions in this group have languished in the bottom half of our rankings over the past decade. Yet their size and their economic diversification also contribute stability, boosting their rankings on our BPC index during the economic downturn, when more dynamic regions floundered.

**Case Study: Cambridge-Newton-Framingham, Mass.**

The Cambridge-Newton-Framingham, Mass., region placed in the bottom half of our large-city rankings between 2005 and 2008. However, after dropping to 171st on the 2007 index, the region began to recover from job losses in the construction, business, and professional service sectors, and by 2012 it had climbed to No. 8. The area's performance has dropped since then, but it remains stable in the mid-30s. Cambridge-Newton-Framingham has maintained a solid economic base thanks in part to a tech cluster that benefits from software and engineering talent developed at its top-tier universities and the presence of both startups and established companies. Massachusetts consistently ranks at the top of our State Technology and Science index, indicating the breadth of the state's assets in talent and innovation infrastructure.

# Cluster Analysis: Manufacturing and Resource-Based Economies

## Renewed and Prospering Manufacturers



This group of six metropolitan areas lacks a sizable manufacturing center, at least in the traditional sense. Reflecting these regions' essential economic orientation, they can be depicted as technology-production-service centers propelled by high-value, innovation-driven enterprises. Five of the six regional economies in the group are home to renowned universities and research centers and have built strong technology research and development infrastructure. Research Triangle in Durham-Chapel Hill, N.C., and Indiana University and Purdue in Indiana are examples.

Indeed, several metropolitan areas in this group have long histories in traditional manufacturing but have evolved to become today's modern manufacturing centers, specializing in electronics and electrical machinery as well as pharmaceuticals and other health products and services. The Harrisonburg, Va., metro is the only exception. This regional economy, though changing, remains a small, traditional manufacturing area with little high-tech industry and few global production links.

Over the last decade and a half, this group of mostly innovation-driven manufacturing economies has made a good showing compared to their national counterparts. They have tended to reside in the upper third of the BPC rankings since the mild recession in 2001. Due to global trade trends and domestic economic cyclicity, these economies can suffer slowdowns as other manufacturing economies do. However, the diversity and high-value character of their manufacturing bases, along with the presence of research universities, are stabilizing forces. These regions, not surprisingly, expand their populations through good and bad times.

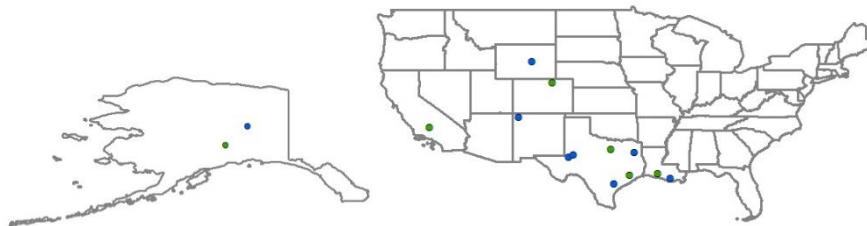
### **Case Study: Bloomington, Ind.**

As one of the smaller metropolitan economies in the Rust Belt, the Bloomington metro has taken a slightly different path to growth and prosperity. Unlike many in its cohort that have fought to withstand deindustrialization in the last several decades, including the Gary and South Bend metros, Bloomington has expanded its manufacturing base. Today, Bloomington's manufacturing output accounts for more than 25 percent of the regional economy's total, making it more than twice as concentrated in this sector as the nation.

The composition of the manufacturing sector in this metro has determined the region's growth pattern and set it apart from many other midsize Rust Belt economies. The region's manufacturing sector is anchored by advanced processes and technology, and its production environment has deeper ties to Indiana University's research capacity and pharmaceutical and medical device manufacturing than to

automobile parts, machinery, and metals. The Bloomington economy is on a path to participate in the expanding life sciences sector and has attracted workforce talent in life science research and production as well as the larger health services industry. Population growth reinforces the future economy's expansion prospects.

## Resource-Dependent Economies



The regions in our Resource-Dependent Economies group are marked by very strong concentrations in the mining, quarrying, and oil and natural gas extraction industries. Nine of the nation's 10 most mining-related economies are represented. While some of the larger Resource-Dependent Economies are five or six times as reliant on this sector as the national economy, some of the smaller cities are 20 or 30 times as dependent and were even more concentrated in the past. Other key sectors include the utilities, construction, government, and transportation and warehousing (including pipeline transportation of oil and gas), although these are not consistently present throughout the group. Finance, information, and education play at most minor roles in the local economies.

Most Resource-Dependent Economies are focused on energy production and related support services. Fort Worth-Arlington, Tex.; Lafayette, La.; and Longview, Tex., also supply the energy industry with equipment and provide professional services. Farmington, N.M., extracts a broader set of resources. Companies there mine minerals along with coal, while the metro also produces oil and gas.

The movement of the Resource-Dependent Economies in our Best-Performing Cities index reflects the presence of small metros in the group and commodity price fluctuations over the past decade. Many dropped in the rankings in 2004 and 2005, but most avoided the complete collapses experienced by other clusters we examined. After post-2008 gains, thanks to the rapid investment in oil and gas extraction from shale formations and the resulting increased demand for pipelines and processing, Resource-Dependent Economies are again grappling with difficult times. With commodity prices weak, investment has slowed, rig counts have dropped, and the rich early production years have passed for many of the wells drilled in 2008 and 2009. This created ripple effects throughout the more concentrated economies, as employment drops in high-wage anchor industries and consumer spending declines.

### **Case Study: Fort Worth-Arlington, Tex.**

Other than a three-year dip from 2005 to 2008, Fort Worth-Arlington, Tex., has consistently ranked in the top 50 of our Best-Performing Cities index. Positioned to benefit from growth in the energy business

thanks to a manufacturing sector that supplies it with equipment, the metro is not solely reliant on oil and gas extraction, which differentiates it from most other economies in this group. Vehicle manufacturing, transportation and logistics, and production of military aircraft have helped the region grow more reliably over a longer period of time than its peers. A substantial shift in military policy or demand could still put the brakes on growth in any of these industries, but the impact to the overall economy would be limited. With other economic engines still running, policymakers may be able to counteract the effects of a slowdown in one sector.

One strategy being used in Fort Worth-Arlington is offering tax rebates as economic development incentives. In 2015, Facebook announced plans for a \$1 billion data center in the area, linked to a deal for up to \$150 million in local tax rebates over 20 years, in addition to state tax incentives. State and local tax breaks valued at up to \$25 million over 15 years also helped to ensure that American Airlines' headquarters stays in Fort Worth amid worries of a relocation to Dallas or Irving.

### Best of Times/Worst of Times



This small group of small metropolitan areas has a long manufacturing tradition. These economies, situated along transport routes or near older major industry clusters, grew through the 1960s. Not only do these metropolitan economies rely heavily on manufacturing, but for most, their customer bases are concentrated in only a few industries. Historically, these economies have experienced volatile shifts as the nation's competitive position changed, powerfully influencing their fortunes. Despite these areas' reliance on manufacturing and relative lack of diversity, they have performed better than the larger and older manufacturing economies. One significant difference between these smaller manufacturing towns and their larger counterparts such as Cleveland and Detroit is that they adapted more effectively to sea changes in global trade during the '80s and '90s.

The rankings of the group's six metros in the Best-Performing Cities index over the last 15 years show some similarities, yet reflect noticeable differences. When American manufacturing expanded, particularly during upswings in automobile and machinery production, their relative performances rose dramatically. The majority of these locales achieved appreciably higher rankings from 2002 to 2004 and 2012 to 2015. Those two periods were marked by nationwide economic recovery; the latter one featured in addition a "manufacturing renaissance," with an influx of investment from abroad stimulating both output and employment.

Decatur, Ala., differs from the rest of the group. Though the area economy is manufacturing oriented, the sector is relatively small and weak. Also over time, the roles of river port transportation and regional

tourism have expanded. The Decatur metro’s performance is slightly more stable than the other five, but its performance is lackluster.

### Case Study: Lake Charles, La.

Although these regions share the heritage of building their economies on manufacturing, their performance over time also illustrates the benefit of having a diversified regional economy that can provide stability. Lake Charles stands out in the six-member group for its resilience and steadiness due largely to its mix of industries. The region’s consistent good showing is credited to a diversified portfolio of energy resources and transportation, its unique Acadian cultural heritage fueling a strong tourism/gaming sector, and a manufacturing sector that balances chemical and machinery production. Finally, the region benefits by being a transport hub for international trade. These interdependent pillars of industry, each with strong ties to external markets, provide balance and steady support for economic development and sustainable growth.

### Consumer-Driven Economies



This eclectic group comprises metros of contrasting sizes, levels of economic diversification, and growth rates. However, these regional economies were historic builders of the nation’s industrial infrastructure and have been involved in river and railroad transportation since the 19th century. They were once North America’s frontier economies, providing crucial links to facilitate commerce among the inland regions. Furthermore, one common characteristic, with the exception of Corpus Christi, Tex., is the important role of manufacturing in regional development. Regions such as Gary, Ind., and Redding, Calif., exemplified the rise and fall of key manufacturing industries and the economic fallout of the changes.

Today, manufacturing is a minor factor in these economies. Most have evolved into centers of logistics and trade-related product processing. Decatur, Ill., is the only one that still relies heavily on manufacturing, with 20 percent of its payroll jobs in that field. Even so, Decatur is largely a logistics center where agricultural products are processed and transported to other regions in North America. Over the last 15 years, manufacturing payroll jobs have followed a downward trend, but logistics and utilities have eased the pain in the job market.

Economic performance within this group diverges widely. While Baton Rouge, La., and Corpus Christi have consistently ranked in the top bracket among U.S. metros in the BPC index, others in the group struggled throughout the last decade and a half, tending to stay in the lower third. Some were dragged

down by their deteriorating manufacturing sectors; one example is Gary, where steel has been the only influential industry. Others have more diversified economies but lack strong drivers that can propel expansion. In general, these economies also recover more slowly after recessions. While they can leverage their geographic locations and stable population bases to maintain growth, they are slow to adapt to change or leverage opportunities presented by domestic and global competitive trends.

### **Case Study: Corpus Christi, Tex.**

Corpus Christi has performed relatively well in the last decade. Known for tourism and hospitality, ports, and petrochemical production, the region has consistently placed in the top quarter of our BPC rankings. The area economy has grown significantly thanks to the energy industry and the tourism boom, which generated ample employment for the construction sector and the young workforce.

Corpus Christi's economic success hinges on several elements. While the energy cycle has helped, the region's position as a key destination for tourists from the South and Southwest stimulates a flow of vacationers who support local service industries. Regarding the economic fundamentals, the region maintains low living costs and strong population growth—over 9 percent in the last decade, which provides an abundant supply of labor. Lastly, federal government and military facilities are the largest employers, sustaining the economy when tourism hits a slippery patch.

### **Floating Economies**



The small metros in this group have populations that are growing slowly or declining. In addition, the educational level of metros in this cluster is below the national average. The majority of the Floating Economies—Jackson, Monroe, and Niles-Benton Harbor, Mich.; Steubenville, Ohio; and Weirton, W.Va.—used to rely heavily on the economic ecosystems around Detroit's auto industry and Pittsburgh's steel industry. But global competition has blunted the edge they once possessed in vehicle and steel manufacturing. Although many of them still depend on manufacturing, this sector can no longer propel their economies. Yet most have failed to find industries that can drive future growth.

Their low cost of doing business and affordable housing may confer advantages and help Floating Economies attract some businesses and residents to this cluster. Yet the relative lower incomes in these locales may offset the gains. That largely depends on adjacent larger metros. If their neighbors become economically healthier, these small metros may attract people and firms seeking cheaper places to live and do business. For instance, the metro of Steubenville-Weirton is only about 40 miles away from

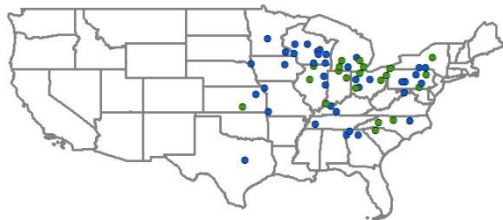
Pittsburgh, whose economic recovery is in progress. In this case, Pittsburgh's strength may help Steubenville-Weirton reinvent its economy.

Most of the metros in this cluster fall into the 100-200 interval of our recent U.S. Best-Performing Cities rankings and have either fluctuated (e.g., Jackson, Niles-Benton Harbor, and Steubenville-Weirton) or declined (Dothan, Ala.; Goldsboro, N.C.; and Pine Bluff, Ark.) in recent years. The metros in this cluster generally lack a primary economic driver and are floating as they seek their paths forward. It remains to be seen what pillar industries will emerge to lead these metros into the future.

### **Case Study: Monroe, Mich.**

Monroe, Mich., is the only metro in this cluster that has trended upward in our recent BPC rankings. In 2010, it was ranked 173rd, moved up to 93rd in 2014, and reached 30th place among 201 small metros in 2015. Close to Detroit, Monroe remains largely reliant on the auto industry. Fiat Chrysler Automobiles has its Dundee Engine Plant in Monroe. Gerdau Special Steel North America, which provides steel products for vehicles and construction, expanded its Monroe plant in 2012. In addition, DTE Energy, an electric company, has a coal-fired power plant in Monroe. These job-creating companies have provided benefits to Monroe that no other metro in the cluster can match. Yet Monroe has its vulnerabilities. More stringent Environmental Protection Agency regulations may limit the DTE plant's growth. Monroe's heavy reliance on the manufacturing and utility sectors also raises concerns about the city's long-term fortunes. If any of its key industries hits a major obstacle, it could inflict damage on the local economy.

### **Traditional Manufacturing**



Many metros in this group were manufacturing towns before their industrial decline. Now, a number of these economies are concentrated in manufacturing, energy, and retail, generally demonstrating less industrial diversity. Quite a few jobs in these metros are low-paying and sensitive to global competition. Although high-tech is a significant presence in some of these areas, this does not guarantee their economic success. For instance, even with Lockheed Martin and BAE Systems involved in electronic component manufacturing, Binghamton, N.Y., has suffered due to defense spending cuts. Other metros that rely on the energy sector (e.g., natural gas extraction in Altoona, Pa., and Canton-Massillon, Ohio) were hit by the recent slide in prices.



The economic struggles of these metros are reflected in their demographic composition and trends. Many in this group have high proportions of residents in or nearing retirement or a large share of less-educated residents. In fact, several have experienced depopulation on a dramatic scale, including “shrinking cities” such as Youngstown, Ohio, and Flint, Mich. In some metros in this group, businesses and residents cluster in the thriving outskirts while the downtowns decline, resulting in a “donut” development pattern.

The low costs of living (e.g., Dalton, Ga.) and business operations (e.g., Altoona) of many metros in this group have enticed some businesses to set up in their territories. However, many of these metros lack high value-added industries and highly educated workforces and thus fail to compete with other low-cost metros that can boast these advantages. The dwindling populations and high vacancy rates (e.g., Altoona) of downtown areas have also eroded tax bases, making service delivery and reinvestment more challenging.

These difficulties are clearly reflected in the BPC rankings, which show a steady low or declining rank for most of the metros in this group. There is a concentration of Traditional Manufacturing metros in Michigan, many of which prospered and grew as part of the state’s automotive ecosystem. Despite the shared history, their trajectories have not been uniform. While east Michigan metros such as Detroit and Flint have languished at the bottom of BPC, those in the west, like Battle Creek and Grand Rapids-Wyoming, have benefited from exporting auto parts to China and other countries and have developed other sectors to fuel their economies.

### **Case Study: Grand Rapids-Wyoming, Mich.**

Grand Rapids-Wyoming has bounced back since the Great Recession. It has developed several major industries, including automotive, aviation, biomedical, and furniture, to drive economic growth.

To some extent, what differentiates Grand Rapids-Wyoming from its counterparts in the state is that its auto sector manufactures a range of vehicles, from sedans and SUVs to pickup trucks, and is also involved in high value-added auto technologies such as transmissions and engines. Its varied automotive products allow Grand Rapids-Wyoming to diversify its target markets. Airbus, Boeing, and GE Aviation Systems have significant presences here. But Grand Rapids-Wyoming has also cultivated its biotech and health-care sector. Spectrum Health, headquartered in this metro, is the top employer. In 2010, the Michigan State University (MSU) College of Human Medicine opened its education headquarters, Secchia Center, in downtown Grand Rapids. Also, MSU recently built an \$88.1 million Grand Rapids Research Center focused on biomedical research, which is expected to open in 2017. That facility will further bolster the health industry in this metro.

In addition to diversification, local initiatives such as Grand Action and public-private partnerships help drive the economy. Efforts to revitalize downtown Grand Rapids in recent years have added housing, job opportunities, multipurpose markets, and entertainment and cultural destinations. These have attracted young professionals to the downtown area. Moreover, this metro has a welcoming attitude toward business, offering a range of tax abatements, for example. Diversified industries, a business-friendly

environment, and public- and private-sector efforts to revitalize Grand Rapids' core have brought economic success to this metro.

## Cluster Analysis: Service-Based Economies

### Diverse Service Economies



Forty-one metros fall into this cluster. Most are service-based economies, particularly in administrative and support and waste management and remediation services. Despite seemingly homogeneous economic profiles within this group, not all of these metros have achieved the same outcomes. One subset of metros (mostly in California and Texas), including Austin-Round Rock-San Marcos, Tex., and Provo-Orem, Utah, have developed high value-added economic bases in such fields as financial services, technology, and biomedicine. In recent years, the economies in this subset have boomed.

Yet overall, this cluster's performance has ranged widely in our BPC rankings. Some metros' positions have fluctuated over the years, with some bouncing back (e.g., Atlanta-Sandy Springs-Marietta, Ga.) and others sliding again (Baltimore-Towson, Md.), while other metros boomed (e.g., Dallas-Plano-Irving, Tex.) or plummeted (Washington-Arlington-Alexandria, D.C.-Va.-Md.-W.Va).

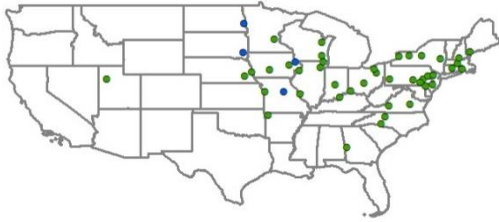
#### **Case Study: Dallas-Plano-Irving, Tex.**

This metro offers a low cost of doing business and a vibrant and diverse economy. In particular, it is strong in financial services; professional, scientific, and technical services; and transportation. Comerica is headquartered in downtown Dallas, and Bank of America, Citibank, and J.P. Morgan Chase all have operations in this metro. Due to its location at the confluence of several major highways, this metro has become a logistics and distribution hub. Amazon.com, for example, has established a fulfillment center in Dallas. There has also been significant growth in the aviation and automotive industries. This metro is the gateway to the U.S. and Canada for the booming Mexican auto manufacturing industry and hosts many companies' headquarters, such as AT&T, TM Advertising, and TXU Energy in Dallas, J.C. Penney in Plano, and ExxonMobil in Irving.

Due to this metro's low costs and business-friendly environment, it has attracted many companies and motivated others to expand here. For instance, Toyota Financial Services announced in 2014 that it would relocate its North American headquarters from Torrance, Calif., to Plano. This decision can be attributed not only to the financial and tax incentives Plano offered but also to the area's low operating costs, welcoming environment, and pivotal location. Liberty Mutual Insurance and FedEx Corp. are building campuses in the same area where J.C. Penney is headquartered.

Although the oil industry is a significant part of this metro's economy, the diversity of its industries mitigates the impact of the price drop—an important lesson for other metros.

## Rejuvenated Regions



Concentrated in the Midwest and the Northeast, Rejuvenated Regions include many that have successfully evolved beyond their manufacturing past into a more diversified present. The trajectory of their manufacturing hubs may still influence how prosperous their futures are, but Rejuvenated Regions also boast other sources of vitality, including state capitals, universities, medical centers, and logistics hubs. Their low cost of doing business makes them competitive locations for firms, but not all Refreshed Regions have the educated workforce that companies seek. While depressed energy costs have been a boon, some locales are seeing demand for their manufacturing industries ebb as globalization reduces their competitive advantage. They will need to learn from their peers in order to adapt. Others have seen manufacturing productivity gains keep the industry stable but employment flat. With a strong dollar and slowing demand from China, those Rejuvenated Regions that export manufactured goods— heavy equipment, airplanes, appliances, etc.—may face challenges.

Those serving local demand also face risks. Automobile demand in the U.S., temporarily buoyed coming out of the recession by postponed purchases and lower gasoline prices, is expected to slow, and vehicle and parts manufacturers may have to scale back their large investments in Rejuvenated Regions.

The Rejuvenated Regions typically have fairly diversified economic bases. Close to three-quarters of the members of this large group have more headquarters-related activities than the national average, and more than half have a significant manufacturing sector (with a location quotient between 1.5 and 2) that contributes to but does not dominate the local economy. Other cities in this group have concentrations in the financial sector, education, or transportation and warehousing.

### **Case Study: Salt Lake City, Utah**

Salt Lake City, Utah, has been a top performer in recent years. The region ranked in the lower half on our BPC index in 2003 and 2004 but has been in the top 50 since 2006 and placed in the top 10 in six of those years. Its growth was sustained through the recession as it developed its financial hub, benefiting from companies relocating operations from more expensive East Coast cities. Salt Lake's highly skilled workforce (42 percent of the city's population and 31 percent of the overall metro's population over 25 have a bachelor's degree) also has fueled growth in the technology field. Manufacturing is an important part of the economic landscape here, as in many other Rejuvenated Regions, and medical device production supports employment growth. The diversity of the Salt Lake economy, its competitive costs, and skilled workforce have made the region attractive to relocating or expanding businesses.

## Retreats



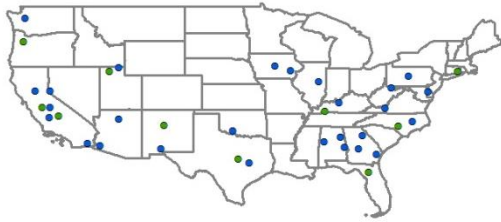
Attractive to older Americans and tourists, Retreats include bedroom communities, travel destinations, and retirement havens. Their economies are characterized by concentrations in the leisure, hospitality, retail, and, to a lesser extent, construction industries. With scenic locations, or offering alternatives to denser living in nearby large conurbations, some Retreats witnessed a burst of house building that oversaturated the market during the boom of the 2000s. The expanding numbers of seniors living in and moving to Retreats are stimulating growth in the health-care industry. This is an important addition to the industry mix in metros that have largely relied on leisure and hospitality for growth, since the higher wages paid in health care can bolster consumer spending and wealth creation. With a few exceptions, the Retreats regions lack substantial manufacturing, mining, and education sectors.

After performing well earlier in the decade, many Retreats weakened as the housing crisis hit, chilling consumer spending. Outlays on tourism, leisure, hospitality, and retail declined, and fewer retirees showed up in these areas to begin new lives. Indeed, many people who could delay retirement did so in an effort to maintain their financial security until the economy's health improved. The recession's effects on Retreats are reflected in lower rankings in our Best-Performing Cities indexes between 2009 and 2014.

### **Case Study: Bend, Ore.**

Bend, Ore., held a spot in our top three best-performing small cities between 2005 and 2008, then began to fall precipitously in our rankings. The region hit a low of 147 in 2011 and has since climbed back to eighth place on the 2015 index. Central Oregon has adopted a collaborative, regional approach to economic development, where coordinated efforts among cities aim to attract and retain businesses. Though still concentrated in tourism, the Bend region has made progress in diversifying its economy, attracting data centers, for example, while the mainstay tourism industry has benefited from strong growth in major metros along the West Coast, notably Seattle, Wash., and Portland, Ore. Robust housing demand has absorbed the excess capacity built before the recession, and housing permits for single-family homes are projected to rise.

## Government-Based Economies



As the cluster's name suggests, economies in this group get their strength from the government sector. More specifically, government agencies, public educational institutions, and military bases are the mainstays of this type of economy. In metros such as Carson City, Nev., federal and municipal government employers have a large presence. Others, like Ames, Iowa; Champaign-Urbana, Ill.; and College Station-Bryan, Tex., are well-known college towns. Dover, Del., and many others have military installations.

One might expect that these Government-Based Economies would be less volatile than those dependent on cyclical industries, given the stability of public sector jobs. However, our U.S. BPC rankings suggest otherwise, indicating the diversity among metros in this cluster. In fact, most have been either fluctuating or declining. Within the declining group, a few (e.g., Elizabethtown, Ky.; Lawton, Okla.; and Warner Robins, Ga.) are mainly military bases.

It is worth noting that Madera-Chowchilla, Calif., is bouncing back in our BPC rankings. It was ranked 163rd out of 179 small metros in 2012, but reached 32nd place among 201 small metros in 2015. Two metros—Ames, Iowa, and Yuba, Calif.—have boomed since 2010. Ames placed between 60th and 80th from 2010 to 2013 and jumped to third place in our 2015 small metros ranking. Yuba was ranked 155th in 2010 but ended at 26th in 2015.

### **Case Study: College Station-Bryan, Tex.**

The economy of College Station-Bryan, Tex., has been performing well in recent years. Despite ups and downs, this metro has mostly stayed in the top 50 of our rankings. Along with its economic success, College Station-Bryan has seen its population grow and housing demand increase in recent years. Three major factors contribute to those gains. First, Texas A&M University has been the primary economic driver in this metro. In addition to its own employees, the university has drawn investors to this metro who seek to leverage the institution's research and development capacity. Second, because of the combination of Texas A&M's presence and relatively light regulation in Texas, this metro has a rich talent pool and a low cost of doing business that has attracted businesses. Third, due to its proximity to the Barnett Shale formation, the area has an active oil and gas sector.

The Research Valley Partnership attempts to better integrate Texas A&M with industry to nurture innovation. Despite these strengths, the metro needs to address certain challenges if it wants its success to be sustained. The recent slide in energy prices has constrained the metro's economic growth. In addition, about one-third of the jobs in College Station-Bryan are concentrated in the government

sector, at Texas A&M University in particular. Retail trade, leisure, and hospital services each account for approximately 10 percent of the metro's workforce. The concentration of government jobs may pose a risk if the state faces budget cutbacks. Despite these concerns, its high value-added and diversified economy gives this metro great assets to build its future on.

## Leisure Locations



With strong employment in the leisure and tourism industries, metropolitan areas in our Leisure Locations benefited when consumer confidence and spending were high. Gaming, golf, and natural and built attractions drew visitors, new residents, and retirees to these cities in good economic times. However, performance dipped during the Great Recession as consumers curtailed leisure spending, visitors stayed away, and local construction shed employment.

Accommodations and food services are a strength of Leisure Locations, which are all at least twice as concentrated in these fields as the nation as a whole. They were not directly affected by the rapid rise and fall of U.S. energy investment, and manufacturing is not a core industry.

Cities that had more diverse offerings outperformed those primarily dependent on tourism tied to gaming, especially coming out of the recession. So while Las Vegas-Paradise, Nev., ranked 198th of 200 in our 2011 Best-Performing Cities index and Atlantic City-Hammonton, N.J., ranked 197th in the same year, they have followed different trajectories during the recovery. Las Vegas-Paradise has seen increased visitor numbers, with people coming to shop, see shows, place wagers, and visit restaurants and bars, while Atlantic City-Hammonton's allure has diminished amid competition for gaming dollars from neighboring states. That metro has remained at, or very near, the bottom of our rankings for the past three years, and its decline predates that suffered by other metros in this group. One factor bolstering growth in some cities: Many retirees who postponed purchasing their retirement residence in a Leisure Location now feel comfortable making the move.

### **Case Study: Orlando-Kissimmee-Sanford, Fla.**

After consistently ranking in the top 50 and spending three years at sixth, fifth, and 11th place on our Best-Performing Cities index between 2005 and 2008, the Orlando-Kissimmee-Sanford, Fla., metro dropped to 99th place in 2009. Hitting a low of 124th in 2012, it was still the best-performing Leisure Location that year, after which it began its rebound. In 2015, it placed 28th, demonstrating an ability to weather the business cycle and recover when opportunity returns. Orlando-Kissimmee-Sanford distinguishes itself from the other Leisure Locations with its higher concentration in arts, entertainment,

and recreation and lower dependence on accommodations and food services (recording the lowest concentration among this group of cities).

With its family-friendly attractions like Walt Disney World Resort, Universal Orlando Resort, and SeaWorld Orlando, the Orlando metro entices a broader cohort of visitors than cities that emphasize gaming. The Orlando metro has close to the national level of concentration in information services, while that sector is less than half as important to the other Leisure Locations. The University of Central Florida, which contributes to the educated workforce, is another asset that distinguishes Orlando. Large multinational corporations with an economic interest in making Orlando a pleasant destination for visitors have supported the region's development through improving its transportation systems, and continue to drive investment as Disney and Universal expand their offerings. The Wizarding World of Harry Potter attraction at the Universal Orlando theme park resort is an example.

### Commercial and Trading Hubs



There are 61 metros in this geographically distributed cluster. Many have strong connections with bigger metros. Although their manufacturing sectors, by and large, are not doing well, cities in this group are generally strong in retail trade, transportation and warehousing, and health care and social assistance. However, those metros involved in natural resources trade face global competition, and those concentrated in a few industry sectors tend to turn in relatively weak performances. On the other hand, metros with more diversified or high value-added industries typically have better economic outcomes. For instance, the economy of Gadsden, Ala., depends largely on health care, and this lack of industrial diversity has hindered its growth. Boise City-Nampa, Idaho, is booming, thanks to efforts to diversify its industry, in particular nurturing its high-tech sector.

Given the large number of metros in this group, their trends are mixed in BPC. Some have moved up and down the rankings, while others dropped most of the time. Still others, such as Boise City-Nampa and Medford, Ore., declined initially but bounced back and became economically vibrant metros.

### Case Study: Boise City-Nampa, Idaho

Boise City has been among the fastest-growing metros in recent years. Downtown Boise provides numerous urban amenities such as restaurants, bars, and theaters. Also, this metro has convenient access to outdoor activities. These amenities, along with job and wage growth, have attracted talent to the city. Thanks to Boise's growing population, housing demand and prices have climbed in recent years.



Boise's economy is multifaceted. Government (15.6 percent), education and health services (15.1 percent), professional and business services (14.4 percent), and retail trade (11.8 percent) are the main industry sectors, according to 2014 data. The rise of high-tech in Boise has helped fuel its development. Most of Idaho's high-tech jobs are concentrated in town. In addition to Hewlett-Packard, which has operations in Boise, tech companies such as Balihoo, Keynetics, WhiteCloud Analytics, and multinational semiconductor producer Micron Technology are headquartered here. A large portion of the metro's GDP comes from exports of computer equipment and electronics.

The metro's economic success can also be attributed to the business-friendly environment created by the local government. For instance, the city charges reasonable permitting fees, keeps turnaround times short, and offers financial incentives to attract new businesses. In addition, the city of Boise and Boise State University have collaborated to establish incubators for startup companies.

Although tech has been a key contributor, the manufacturing and export of memory chips are vulnerable to business cycles. Micron Technology has been a major employer in the region and pays healthy salaries. However, memory chip sales were weak in 2015.

## Cluster Analysis: In Transition

### Shifting Winds: Challenges Ahead, Opportunity Abounds



This group of metropolitan areas in transition is unique among the 15 sets in this study. Unlike the 14 other groups, these regions' economic profiles have shifted significantly over the last decade and a half. Some have lost an anchor industry to national or global changes in demand or competitive trends. Others are capitalizing on a new opportunity or expanding an anchor industry, while others are developing a more diverse industrial base from a concentrated past. They may leverage natural resources and/or economic and social capital to capture growth. Case in point: Some regional economies in the Pacific Northwest, such as Tacoma and Mount Vernon-Anacortes in Washington, changed their profiles from retail and utilities to mining and gas extraction as global energy demand heightened, illustrating the potential rewards of adaptation.

It is unsurprising, given that their shared characteristic is structural change, that these locales vary in many ways, including land mass and population. Some are state capitals, others typical small regional economies. The group includes metropolises like Miami, Fla., and Phoenix, Ariz., as well as smaller economies such as Bismarck, N.D., and Cheyenne, Wyo. To put these contrasts in perspective, the population difference between Phoenix and Cheyenne is huge—more than 4 million versus fewer than 96,000. Notably, Miami-Miami Beach-Kendall and Phoenix are impressively diversified while the range of industry in the Wichita Falls, Tex., and Cheyenne, Wyo. metros is limited. However, Cheyenne, ranked 33rd among small metros on the 2015 Best-Performing Cities index, compared more favorably with similar-sized metros than Phoenix, which ranked 62nd among the 200 largest metros that year.

Why? Upon examination of the BPC rankings over the last decade and a half, it appears that more diversified economies and larger metropolises had greater exposure to the Great Recession than the typical smaller American city. One contributing factor is the larger economies' greater share of property development, which increased their financial risk during the mortgage meltdown. Large metros in this group have been relatively slow to recover, which is reflected in their BPC rankings. Miami-Miami Beach-Kendall, whose performance ranking has returned to its pre-recession level, has been the exception.

Metropolitan areas with economies based on government employment, whether at the federal, state, or local level, tend to enjoy stability over time. They are far less volatile than resource-driven small metros and tend to display elevated performance rankings during economic downturns. Springfield, Ill., and Jefferson City, Mo., exemplify the rising-and-falling pattern resulting largely from changing economic conditions.

**Case Study: Lansing-East Lansing, Mich.**

The Lansing-East Lansing metro is both the political center of Michigan and a fully industrialized and commercialized region. Additionally, the metro is home to a renowned research institution, Michigan State University. A good mix of manufacturing, finance, and commerce in Lansing-East Lansing separates it from most U.S. state capitals. Also, as one of the nation's few refugee housing centers, the metro has gained population through settlement, helping to maintain its consumer demand base.

However, Lansing-East Lansing has not capitalized on these assets to further its economic development. In the last 15 years, the area's performance has put it in the lowest quarter among large metros. In part, that's because manufacturing has not transitioned to high value-added industries and remains closely associated with traditional auto manufacturing. Government, the region's largest employer, has shed jobs due to the financial crunch Michigan suffered during the last recession. With the public sector constrained and the private sector on the sidelines of high-tech, growth is hindered. Hence, the region's economic power and position have waned.

## Observations and Questions for Further Study

Our examination of the cities that outperformed their peers in each cluster suggests several factors that may contribute to regional resilience. Some of these can be influenced by local policies, and for these it will be interesting to learn what combination of strategies, if any, successful regions used to pursue these factors. Since there are opportunity costs involved in investing time and effort in economic development policy, understanding the trade-offs communities chose to make is also of interest. Through further research and case studies of resilient regions, we will explore the questions raised in this paper and outlined below. These case studies will be published in future papers to showcase best practices and share lessons for policymakers who face similar challenges in their communities.

The regions that outperformed their peers in this analysis often had a more diversified industrial base that allowed them to withstand external shocks to an anchor industry. However, other regions that had lost an anchor industry emerged with a weaker, albeit more diverse, economy, with no engine for growth.

### **How can industrial diversification aid regional resilience?**

While we focused primarily on differences within clusters, cross-cluster analysis highlighted cases in which regions had been transformed through technological development, while other groups had stagnated. Manufacturing metros, for example, were divided not by geography or history, but by innovation and industrial diversification. **How does innovation within industries relate to growth?**

Participation in the global economy exposes a region to a new range of economic shocks, yet enables it to hedge against local shocks like flooding or a factory closure. The export and trade of goods and services allow for industrial specialization and concentration that can amplify fluctuations during the business cycle. **How do trade and industrial concentration affect regional resilience?**

Having a flexible, skilled workforce can make it easier for a region to adapt to changes in technology or industrial concentration. It can be developed by offering high-quality, accessible avenues for training and retraining, basic and higher education. **How can building human capital locally aid resilience?**

Regions that are perceived to offer a high quality of life and a labor market in which one can build a career have advantages in attracting and retaining a skilled workforce. Regions with a culture of entrepreneurship and the resources to support new companies can address changing conditions with new ideas and approaches. **How do opportunity and quality of life relate to the health of a regional economy?**

Within clusters of cities that share an economic profile, there may be competition to attract the same businesses. Some regions use their tax, incentive, and regulatory environment to enhance their competitiveness. **What aspects of the business climate support resilience?**

The location, layout, and characteristics of a region's environment and urban spaces can foster the generation of ideas by creating opportunities for interaction among cultures, people, and businesses in different fields. **How do place and diversity relate to resilience?**

The ability to move people and goods effectively is a core component of economic vitality, whether it happens over roads, transit, rail, trails, or high-speed Internet connections. Some regions have invested in creating and maintaining these links, despite the long-term nature of the planning required and benefits anticipated. In some cases, economic change has made these expensive investments redundant by the time of completion. **How does infrastructure relate to resilience?**

Some regions make more of the hand they are dealt by working cooperatively across municipal boundaries and levels of government, or by engaging all sectors of the economy to pursue shared goals with shared strategies. **How can partnerships among the public, private, and civic sectors contribute to resilience?**

Good policy can make good outcomes more likely, but it is no guarantee. Changes in competitor cities or countries can pose new challenges even for a region that is “doing everything right” on paper. Although cities are vulnerable to chance setbacks, there may be policies that mitigate their dependence on fortune. **How important is luck to resilience, and how can communities prepare for change when times are good?**

## Appendix: Data and Methodology

### Unit of Analysis

The units of analysis of this study are metropolitan divisions and metropolitan statistical areas (metros). In our latest (i.e., 2015) “Best-Performing Cities” (BPC) U.S. report, there are 401 metros. Since the U.S. Census Bureau redefines metros every 10 years, three metro definitions were used in our 2002-2015 BPC rankings. Our 2002-2004, 2005-2014, and 2015 rankings were based on 1990, 2000, and 2010 census metro definitions, respectively. Given the addition, subtraction, and merging of metros, the number in our BPC rankings changed over time. Except for the changing census definition, only 370 metros hold the full information for all variables used in the first-stage cluster analysis of this study. These 370 metros were initially classified into 14 sub-clusters, then outlier metros were separated from the original 14 clusters to form the 15th cluster. Because this study also aims to analyze economic performance trends based on our BPC rankings, five metros with data for fewer than five consecutive years were also excluded, yielding 365 metros in this study.

### Data and Variables

The main data for this study comes from Moody’s Analytics, which compiled data from various government sources and made estimations and adjustments when necessary. Seven types of metro-level economic variables for the year 2013 are used in the cluster analysis: location quotient (LQ) of gross product for industries, labor force participation rate, median family income, housing affordability, housing permit change, total population change, and population density.

For the LQ of gross product for industries, 19 industry categories were included (see Table 2 for the full list). LQ is a ratio that compares the concentration of a resource or activity, in this case gross product, in a defined area to that of a larger area. In this study, an LQ greater than 1 indicates that the gross product derived from a particular industry of a metro has a greater share of the local gross product than other U.S. metros as a whole. Conversely, an LQ of less than 1 indicates a smaller share of gross product. This ratio intuitively measures the economic productivities of metros.

The other six variables can be categorized into three groups. The first group, associated with jobs, includes labor force participation rate and median family income. The second group, reflecting the housing dimension, consists of housing affordability and housing permit change. The third group, concerning demography, comprises total population change and population density. Table 2 provides more detailed description and sources for these variables.

Table 2 Data Description and Sources

Variable	Description	Source
<b>Location Quotient of Gross Product for Industries</b>	$Location\ Quotient_i = \frac{\frac{g_i}{G_i}}{\frac{g}{G}}$ <p> <i>LQ<sub>i</sub></i> = location quotient for sector <i>i</i> in metro economy  <i>g<sub>i</sub></i> = gross product in sector <i>i</i> in metro  <i>g</i> = total gross product in metro  <i>G<sub>i</sub></i> = gross product in sector <i>i</i> in the United States  <i>G</i> = total gross product in the United States                 </p> <p>Industries include mining, quarrying, and oil and gas extraction; utilities; construction; manufacturing; wholesale trade; retail trade; transportation and warehousing; information; finance and insurance; real estate and rental and leasing; professional, scientific, and technical services; management of companies and enterprises; administrative and support and waste management and remediation services; educational services; health care and social assistance; arts, entertainment, and recreation; accommodation and food services; other services; government (gross product is in 2009 chained dollars)</p>	Moody's Analytics
<b>Labor Force Participation Rate</b>	2013 Labor Force Participation Rate (%) (seasonally adjusted)	U.S. Bureau of Labor Statistics (BLS): CPS Household Survey; U.S. Census Bureau (BOC); U.S. Bureau of Economic Analysis (BEA); Moody's Analytics (ECCA) estimated
<b>Median Family Income</b>	2013 Median Family Income (US\$) (seasonally adjusted)	U.S. Census Bureau (BOC): Decennial Census, Current Population Survey (CPS), American Community Survey (ACS); Moody's Analytics (ECCA) estimated
<b>Housing Affordability</b>	2013 Housing Affordability Index	National Association of Realtors (NAR): Real Estate Outlook; U.S. Census Bureau (BOC); U.S. Bureau of Economic Analysis (BEA); Moody's Analytics (ECCA) estimated
<b>Housing Permit Change</b>	2013 Total Residential Unit Permits Change (%) (seasonally adjusted annual rate)	U.S. Census Bureau (BOC): Form C-404; Moody's Analytics (ECCA) estimated
<b>Total Population Change</b>	2013 Total Population Change (%)	U.S. Census Bureau (BOC): Population Estimates; Moody's Analytics aggregated
<b>Population Density</b>	2013 Population Density (persons per square mile)	U.S. Census Bureau (BOC); Moody's Analytics calculated using 2000 land area

## Methodology in Detail

The main aims of this study are to classify U.S. metros into groups, identify the economic features of each group, and ultimately draw lessons from these metros' experiences. To do so, we adopt cluster analysis. There are two major branches of cluster analysis. The first is hierarchical clustering, which is more suitable for observations where one cluster can be nested within another, larger cluster and eventually converge into a single cluster, and for data with a smaller sample size. The second type is non-hierarchical clustering, which is good for clusters that are independent of one another and for data with a larger sample size.

This study uses a non-hierarchical clustering approach by applying a K-means algorithm. As mentioned earlier, due to data availability, 370 metros were included in our cluster analysis. After numerous experiments using various numbers of clusters for different years, we assigned 14 clusters based on 370 metros with 2013 data.

To evaluate how stable the clustering result is, we also ran cluster analyses using data from the years 2005, 2008, and 2012. Although many metros remained in the same cluster over time, some did move among clusters. Since some of them change frequently, we put these volatile metros in an additional cluster, yielding 15 in the next step of our analysis. Because we were also interested in each metro's economic performance over time based on our BPC rankings, we eliminated five metros that lack at least five consecutive years in the index.

In our final analysis, 365 metros were classified into 15 clusters. Our overall analytical approach to each cluster consists of three parts. First, we identified the key characteristics. Second, we examined each metro's economic performance over time in reference to BPC rankings. Third, we selected a metro in each cluster as a brief case study, aiming to identify best practices for other metros.

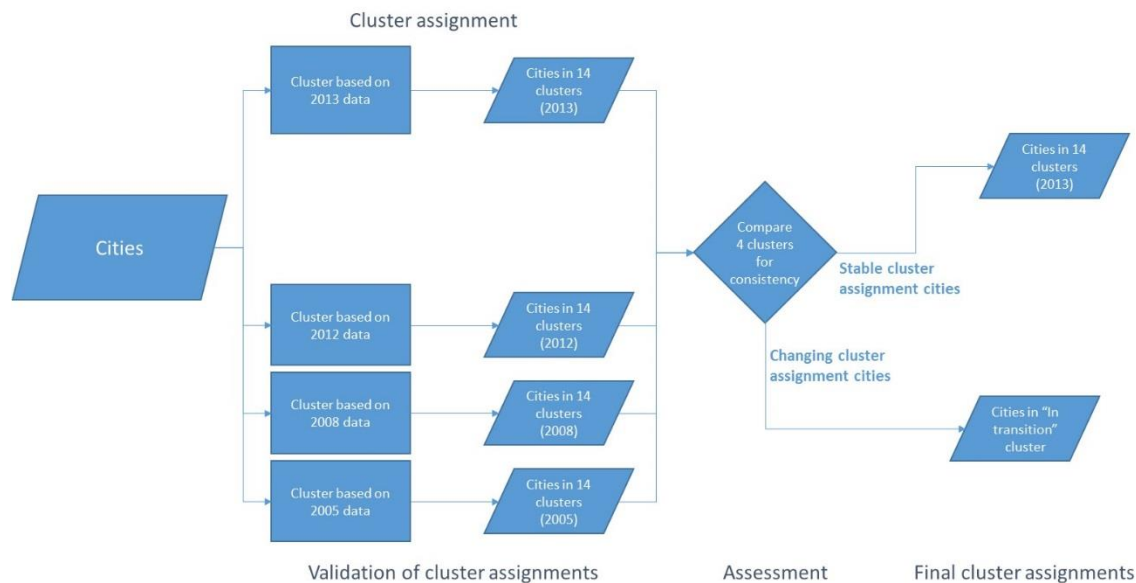


Figure 1 Cluster Assignment Process



## List of Metropolitan Statistical Areas and Metropolitan Divisions by Group

### Knowledge-Based Economies

#### Innovation Hubs

Boulder, CO MSA  
Denver-Aurora-Broomfield, CO MSA  
Little Rock-North Little Rock-Conway, AR MSA  
Los Angeles-Long Beach-Glendale, CA MD  
San Francisco-San Mateo-Redwood City, CA MD  
San Jose-Sunnyvale-Santa Clara, CA MSA  
Seattle-Bellevue-Everett, WA MD

#### Established Knowledge Economies

Boston-Quincy, MA MD  
Bridgeport-Stamford-Norwalk, CT MSA  
Cambridge-Newton-Framingham, MA MD  
Ithaca, NY MSA  
Nassau-Suffolk, NY MD  
New Haven-Milford, CT MSA  
New York-White Plains-Wayne, NY-NJ MD  
Philadelphia, PA MD  
Santa Ana-Anaheim-Irvine, CA MD  
Trenton-Ewing, NJ MSA

### Manufacturing and Resource-Based Economies

#### Renewed and Prospering Manufacturers

Bloomington, IN MSA  
Corvallis, OR MSA  
Durham-Chapel Hill, NC MSA  
Harrisonburg, VA MSA  
Lafayette, IN MSA  
Portland-Vancouver-Hillsboro, OR-WA MSA

#### Best of Times/Worst of Times

Beaumont-Port Arthur, TX MSA  
Columbus, IN MSA  
Decatur, AL MSA  
Elkhart-Goshen, IN MSA  
Kokomo, IN MSA  
Lake Charles, LA MSA

#### Resource-Dependent Economies

Anchorage, AK MSA  
Bakersfield-Delano, CA MSA  
Casper, WY MSA  
Fairbanks, AK MSA  
Farmington, NM MSA  
Fort Worth-Arlington, TX MD  
Greeley, CO MSA  
Houma-Bayou Cane-Thibodaux, LA MSA  
Houston-Sugar Land-Baytown, TX MSA  
Lafayette, LA MSA  
Longview, TX MSA  
Midland, TX MSA  
Odessa, TX MSA

#### Consumer-Driven Economies

Baton Rouge, LA MSA  
Corpus Christi, TX MSA  
Decatur, IL MSA  
Florence, SC MSA  
Gary, IN MD  
Kingsport-Bristol-Bristol, TN-VA MSA  
Michigan City-La Porte, IN MSA  
Redding, CA MSA  
Terre Haute, IN MSA  
Floating Economies  
Dothan, AL MSA  
Goldsboro, NC MSA  
Jackson, MI MSA  
Monroe, MI MSA  
Niles-Benton Harbor, MI MSA  
Pine Bluff, AR MSA  
Steubenville-Weirton, OH-WV MSA  
Victoria, TX MSA

## Manufacturing and Resource-Based Economies (cont.)

### Traditional Manufacturing

Altoona, PA MSA  
Appleton, WI MSA  
Battle Creek, MI MSA  
Binghamton, NY MSA  
Bowling Green, KY MSA  
Canton-Massillon, OH MSA  
Dalton, GA MSA  
Danville, IL MSA  
Dayton, OH MSA  
Detroit-Livonia-Dearborn, MI MD  
Eau Claire, WI MSA  
Elmira, NY MSA  
Erie, PA MSA  
Evansville, IN-KY MSA  
Flint, MI MSA  
Fond du Lac, WI MSA  
Fort Wayne, IN MSA  
Gainesville, GA MSA  
Grand Rapids-Wyoming, MI MSA  
Greensboro-High Point, NC MSA  
Hickory-Lenoir-Morganton, NC MSA  
Jackson, TN MSA  
Janesville, WI MSA  
Johnstown, PA MSA  
Joplin, MO MSA  
Kalamazoo-Portage, MI MSA  
Kankakee-Bradley, IL MSA  
La Crosse, WI-MN MSA  
Lebanon, PA MSA  
Lima, OH MSA  
Mansfield, OH MSA  
Oshkosh-Neenah, WI MSA  
Owensboro, KY MSA  
Peoria, IL MSA  
Racine, WI MSA  
Rochester, MN MSA  
Rockford, IL MSA  
Rocky Mount, NC MSA  
Rome, GA MSA  
Saginaw-Saginaw Township North, MI MSA  
Scranton--Wilkes-Barre, PA MSA  
Sheboygan, WI MSA  
Sioux City, IA-NE-SD MSA  
South Bend-Mishawaka, IN-MI MSA  
Spartanburg, SC MSA  
Springfield, OH MSA  
St. Cloud, MN MSA  
St. Joseph, MO-KS MSA  
Toledo, OH MSA  
Topeka, KS MSA  
Utica-Rome, NY MSA  
Waco, TX MSA  
Waterloo-Cedar Falls, IA MSA  
Wausau, WI MSA  
Wichita, KS MSA  
Williamsport, PA MSA  
Winchester, VA-WV MSA  
York-Hanover, PA MSA  
Youngstown-Warren-Boardman, OH-PA MSA

## Service-Based Economies

### Diverse Service Economies

Atlanta-Sandy Springs-Marietta, GA MSA  
Austin-Round Rock-San Marcos, TX MSA  
Baltimore-Towson, MD MSA  
Bethesda-Rockville-Frederick, MD MD  
Burlington-South Burlington, VT MSA  
Charleston-North Charleston-Summerville, SC MSA  
Charlottesville, VA MSA  
Colorado Springs, CO MSA  
Crestview-Fort Walton Beach-Destin, FL MSA  
Dallas-Plano-Irving, TX MD  
Fort Collins-Loveland, CO MSA  
Fort Lauderdale-Pompano Beach-Deerfield Beach, FL MD  
Honolulu, HI MSA  
Huntsville, AL MSA  
Idaho Falls, ID MSA  
Jacksonville, FL MSA  
Kennewick-Pasco-Richland, WA MSA  
Lawrence, KS MSA  
Lexington-Fayette, KY MSA  
Madison, WI MSA  
Memphis, TN-MS-AR MSA  
Napa, CA MSA  
Nashville-Davidson--Murfreesboro--Franklin, TN MSA  
Oakland-Fremont-Hayward, CA MD  
Oxnard-Thousand Oaks-Ventura, CA MSA  
Provo-Orem, UT MSA  
Raleigh-Cary, NC MSA  
Rockingham County-Strafford County, NH MD  
Sacramento--Arden-Arcade--Roseville, CA MSA  
Salinas, CA MSA  
San Antonio-New Braunfels, TX MSA  
San Diego-Carlsbad-San Marcos, CA MSA  
San Luis Obispo-Paso Robles, CA MSA  
Santa Barbara-Santa Maria-Goleta, CA MSA  
Santa Cruz-Watsonville, CA MSA  
Santa Rosa-Petaluma, CA MSA  
Savannah, GA MSA  
Tallahassee, FL MSA  
Tulsa, OK MSA  
Washington-Arlington-Alexandria, DC-VA-MD-WV MD  
Wilmington, NC MSA

### Rejuvenated Regions

Akron, OH MSA  
Albany-Schenectady-Troy, NY MSA  
Allentown-Bethlehem-Easton, PA-NJ MSA  
Bloomington-Normal, IL MSA  
Buffalo-Niagara Falls, NY MSA  
Camden, NJ MD  
Cedar Rapids, IA MSA  
Charlotte-Gastonia-Rock Hill, NC-SC MSA  
Chicago-Joliet-Naperville, IL-IN-WI MD  
Cincinnati-Middletown, OH-KY-IN MSA  
Cleveland-Elyria-Mentor, OH MSA  
Columbia, MO MSA  
Columbus, GA-AL MSA  
Columbus, OH MSA  
Davenport-Moline-Rock Island, IA-IL MSA  
Des Moines-West Des Moines, IA MSA  
Dubuque, IA MSA  
Fargo, ND-MN MSA  
Fayetteville-Springdale-Rogers, AR-MO MSA  
Green Bay, WI MSA  
Harrisburg-Carlisle, PA MSA  
Hartford-West Hartford-East Hartford, CT MSA  
Indianapolis-Carmel, IN MSA  
Kansas City, MO-KS MSA  
Lake County-Kenosha County, IL-WI MD  
Lancaster, PA MSA  
Lincoln, NE MSA  
Louisville-Jefferson County, KY-IN MSA  
Manchester-Nashua, NH MSA  
Milwaukee-Waukesha-West Allis, WI MSA  
Minneapolis-St. Paul-Bloomington, MN-WI MSA  
Newark-Union, NJ-PA MD  
Omaha-Council Bluffs, NE-IA MSA  
Pittsburgh, PA MSA  
Portland-South Portland-Biddeford, ME MSA  
Providence-New Bedford-Fall River, RI-MA MSA  
Reading, PA MSA  
Richmond, VA MSA  
Roanoke, VA MSA  
Rochester, NY MSA  
Salt Lake City, UT MSA  
Sioux Falls, SD MSA  
St. Louis, MO-IL MSA  
Syracuse, NY MSA  
Warren-Troy-Farmington Hills, MI MD  
Wilmington, DE-MD-NJ MD  
Winston-Salem, NC MSA  
Worcester, MA MSA

## Service-Based Economies (cont.)

### Retreats

Barnstable Town, MA MSA  
Bend, OR MSA  
Brunswick, GA MSA  
Cape Coral-Fort Myers, FL MSA  
Coeur d'Alene, ID MSA  
Deltona-Daytona Beach-Ormond Beach, FL MSA  
Hot Springs, AR MSA  
Missoula, MT MSA  
Naples-Marco Island, FL MSA  
North Port-Bradenton-Sarasota, FL MSA  
Ocala, FL MSA  
Panama City-Lynn Haven-Panama City Beach, FL MSA  
Pensacola-Ferry Pass-Brent, FL MSA  
Pittsfield, MA MSA  
Port St. Lucie, FL MSA  
Prescott, AZ MSA  
Punta Gorda, FL MSA  
Rapid City, SD MSA  
Salisbury, MD MSA  
Santa Fe, NM MSA  
Sebastian-Vero Beach, FL MSA  
St. George, UT MSA  
Vallejo-Fairfield, CA MSA  
West Palm Beach-Boca Raton-Boynton Beach, FL MD

### Leisure Locations

Atlantic City-Hammonton, NJ MSA  
Las Vegas-Paradise, NV MSA  
Myrtle Beach-North Myrtle Beach-Conway, SC MSA  
Ocean City, NJ MSA  
Orlando-Kissimmee-Sanford, FL MSA  
Reno-Sparks, NV MSA

### Government-Based Economies

Albuquerque, NM MSA  
Ames, IA MSA  
Anniston-Oxford, AL MSA  
Athens-Clarke County, GA MSA  
Auburn-Opelika, AL MSA  
Blacksburg-Christiansburg-Radford, VA MSA  
Bremerton-Silverdale, WA MSA  
Carson City, NV MSA  
Champaign-Urbana, IL MSA  
Clarksville, TN-KY MSA  
College Station-Bryan, TX MSA  
Dover, DE MSA  
El Centro, CA MSA  
Elizabethtown, KY MSA  
Fayetteville, NC MSA  
Flagstaff, AZ MSA  
Gainesville, FL MSA  
Greenville, NC MSA  
Hanford-Corcoran, CA MSA  
Hinesville-Fort Stewart, GA MSA  
Iowa City, IA MSA  
Jacksonville, NC MSA  
Killeen-Temple-Fort Hood, TX MSA  
Las Cruces, NM MSA  
Lawton, OK MSA  
Logan, UT-ID MSA  
Madera-Chowchilla, CA MSA  
Merced, CA MSA  
Morgantown, WV MSA  
Norwich-New London, CT MSA  
Ogden-Clearfield, UT MSA  
Salem, OR MSA  
State College, PA MSA  
Tuscaloosa, AL MSA  
Visalia-Porterville, CA MSA  
Warner Robins, GA MSA  
Yuba City, CA MSA  
Yuma, AZ MSA

## Service-Based Economies (cont.)

### Commercial and Trading Hubs

Abilene, TX MSA  
Albany, GA MSA  
Alexandria, LA MSA  
Amarillo, TX MSA  
Asheville, NC MSA  
Augusta-Richmond County, GA-SC MSA  
Bangor, ME MSA  
Bay City, MI MSA  
Birmingham-Hoover, AL MSA  
Boise City-Nampa, ID MSA  
Brownsville-Harlingen, TX MSA  
Burlington, NC MSA  
Charleston, WV MSA  
Chattanooga, TN-GA MSA  
Cleveland, TN MSA  
Columbia, SC MSA  
Cumberland, MD-WV MSA  
Duluth, MN-WI MSA  
El Paso, TX MSA  
Eugene-Springfield, OR MSA  
Florence-Muscle Shoals, AL MSA  
Gadsden, AL MSA  
Glens Falls, NY MSA  
Grand Forks, ND-MN MSA  
Grand Junction, CO MSA  
Great Falls, MT MSA  
Greenville-Mauldin-Easley, SC MSA  
Hagerstown-Martinsburg, MD-WV MSA  
Hattiesburg, MS MSA  
Huntington-Ashland, WV-KY-OH MSA  
Jackson, MS MSA  
Johnson City, TN MSA  
Jonesboro, AR MSA  
Knoxville, TN MSA  
Lakeland-Winter Haven, FL MSA  
Laredo, TX MSA  
Lewiston, ID-WA MSA  
Lewiston-Auburn, ME MSA  
Longview, WA MSA  
Lubbock, TX MSA  
Lynchburg, VA MSA  
McAllen-Edinburg-Mission, TX MSA  
Medford, OR MSA  
Mobile, AL MSA  
Modesto, CA MSA  
Monroe, LA MSA  
Muncie, IN MSA  
Muskegon-Norton Shores, MI MSA  
Oklahoma City, OK MSA  
Palm Bay-Melbourne-Titusville, FL MSA  
Parkersburg-Marietta-Vienna, WV-OH MSA  
Pocatello, ID MSA  
Pueblo, CO MSA  
Riverside-San Bernardino-Ontario, CA MSA  
San Angelo, TX MSA  
Shreveport-Bossier City, LA MSA  
Spokane, WA MSA  
Springfield, MO MSA  
Stockton, CA MSA  
Texarkana, TX-Texarkana, AR MSA  
Tucson, AZ MSA  
Tyler, TX MSA  
Vineland-Millville-Bridgeton, NJ MSA  
Wheeling, WV-OH MSA

## In Transition

### **Shifting Winds: Challenges Ahead, Opportunity Abounds**

Ann Arbor, MI MSA  
Bellingham, WA MSA  
Billings, MT MSA  
Bismarck, ND MSA  
Cheyenne, WY MSA  
Chico, CA MSA  
Fort Smith, AR-OK MSA  
Fresno, CA MSA  
Gulfport-Biloxi, MS MSA  
Jefferson City, MO MSA  
Kingston, NY MSA  
Lansing-East Lansing, MI MSA  
Macon, GA MSA  
Miami-Miami Beach-Kendall, FL MD  
Montgomery, AL MSA  
Morristown, TN MSA  
Mount Vernon-Anacortes, WA MSA  
New Orleans-Metairie-Kenner, LA MSA  
Olympia, WA MSA  
Phoenix-Mesa-Glendale, AZ MSA  
Sherman-Denison, TX MSA  
Springfield, IL MSA  
Springfield, MA MSA  
Sumter, SC MSA  
Tacoma, WA MD  
Tampa-St. Petersburg-Clearwater, FL MSA  
Valdosta, GA MSA  
Virginia Beach-Norfolk-Newport News, VA-NC MSA  
Wenatchee-East Wenatchee, WA MSA  
Wichita Falls, TX MSA  
Yakima, WA MSA

## ABOUT THE AUTHORS

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**PERRY WONG** is managing director of research at the Milken Institute. He is an expert in regional economics, development, and econometric forecasting and specializes in analyzing the structure, industry mix, development, and public policies of a regional economy. He designs, manages, and performs research on labor and workforce issues; the relationship between technology and economic development; and trade and industry, with a focus on policy development and implementation of economic policy in both leading and disadvantaged regions. Wong is actively involved in projects aimed at increasing access to technology and regional economic development in California and the rest of the United States. His work extends to the international arena, where he is involved in regional economic development in greater China and other parts of Asia. Prior to joining the Institute, Wong was a senior economist and director of regional forecasting at Global Insight Inc. (formerly Wharton Econometric Forecasting), where he managed regional quarterly state and metropolitan area forecasts and provided consultation. There he designed regional modeling systems and contributed to regional economic impact studies on such topics as budget reduction and health-care reform. Wong has conducted many research studies regarding regional development and policy impacts on the public and private spheres. These include the impact of U.S. budget and trade policy on key U.S. industries and regions, health-care reform and its implications for the federal budget, the Kyoto Agreement and its impact on U.S. regional economies, and the pharmaceutical industry's contribution to Pennsylvania's economy.



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