



# Employment Trends and Competitive Advantage in the Rockies

*A Mix/Share Analysis*

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## Key Findings

- Total employment growth in the Rockies from 1990-2000 was 36 percent, compared to 12 percent nationally.
- Nearly 65 percent of all jobs created in the Rockies from 1990-2000 were due to a regional competitive advantage.
- The Rockies region holds a competitive advantage for all occupational categories analyzed except health-care support.
- Construction and extraction occupations held the strongest competitive advantage in the region, with computer and mathematical occupations second.
- Las Vegas, Nevada held the greatest overall competitive advantage of any metropolitan area in the region.

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## Introduction

*“No region in the world is better positioned than we are to understand and profit from the increasingly important role of livability as a key contributor to sustained prosperity. For a decade and a half, this region has been the fastest growing in the nation, not only in terms of population, but also in economic terms such as income growth.”<sup>1</sup>*

The Rocky Mountains are experiencing an economic boom that is likely to continue. As a result of this economic expansion, the Rocky Mountain region has enjoyed more jobs and greater material wealth for its residents.

In examining the employment trends concurrent with this economic boom, some key questions arise: Which specific occupations are driving employment growth in the Rockies? Which locales have been successful at adding the creative and high tech jobs influential in attaining competitive advantage? Is the Rocky Mountain region adding high wage jobs to keep pace with the increase in low wage jobs? What percentage of employment growth is due to an influx of immigrants working in low skill occupations? To what degree is competitive advantage affecting employment change in the Rockies? Finally, how can competitive advantage influence economic policy in the Rocky Mountain region?

### Our Approach: Mix-Share Analysis

To examine these questions, we conduct a mix-share analysis. Mix-share analysis illustrates how well a region’s occupational sectors are performing in relation to a larger benchmark area—such as the 8-state Rocky Mountain region, or the United States as a whole—by systematically examining three mutually exclusive components of employment change. Through this breakdown, mix-share analysis provides a dynamic account of total regional employment change that is attributable to the growth of a benchmark economy (*growth effect*<sup>2</sup>), a mix of occupations that are growing faster or slower than national averages (*occupational mix effect*<sup>3</sup>), and the competitive nature of local occupational sectors employing workers (*regional effect*<sup>4</sup>).<sup>5</sup>

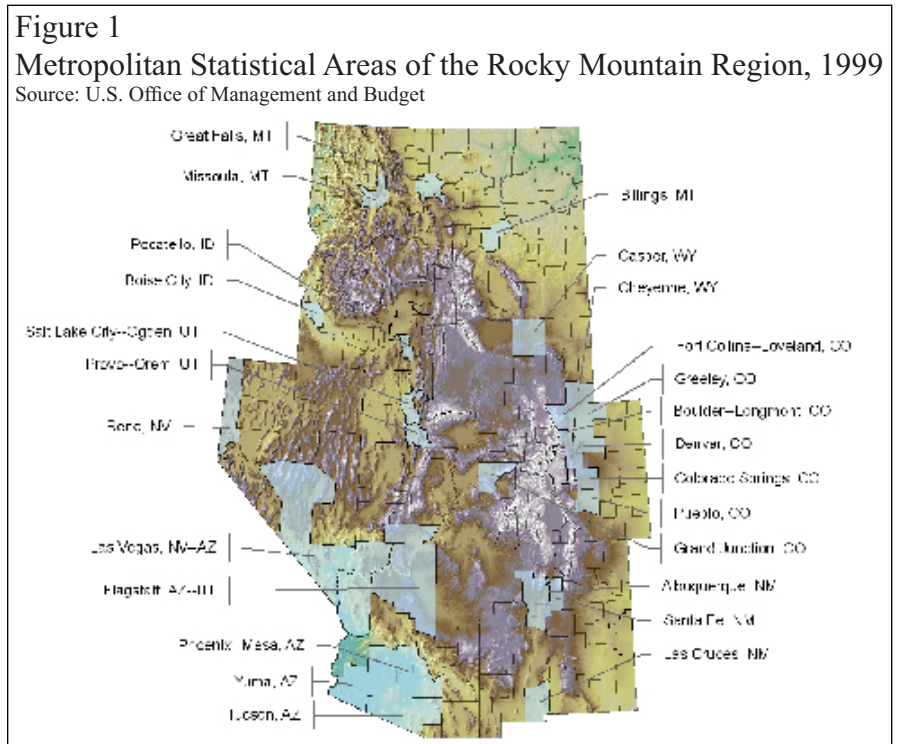
Growth effect addresses the idea that some of a region’s employment growth is due to the overall employment growth of its benchmark area. For example, if total employment in the United States grew by 5 percent from 1950-1960, then employment

in the Rocky Mountains should have also grown by 5 percent over this period.

Occupational mix effect is similar to growth effect, but instead of looking at total employment growth it observes growth rates for specific occupations. For instance, if management occupations in the United States grew by 4 percent in excess of total employment growth from 1950-60, management occupations in the Rocky Mountains should have also grown by 4 percent in excess of total employment growth for this period.

Regional effect refers to employment growth that is the product of the neither growth effect, nor the occupational mix effect. Rather, these jobs are the result of region-specific qualities that promote economic competitiveness. Jobs added by the regional effect demonstrate that a region’s economy out-performed that of its benchmark. In these instances, we say that a region possesses “competitive advantage.”

In this mix-share analysis, we investigate how these three factors influence total employment, specific occupations, and what we define as “cross-occupational super categories.” We first observe the performance of the Rocky Mountain region in relation to the United States as a whole, then assess the performance of Metropolitan Statistical Areas (MSAs) in relation to the Rocky Mountain region (see Figure 1).<sup>6</sup> Following our mix-share analysis, we measure competitive advantage based on our regional effect calculations.<sup>7</sup>



**Table 1**  
**Cross-Occupational Super Categories and Components**

Source: Current Population Survey June 2007, Bureau of Labor Statistics

| Occupation                                     | % of Immigrants employed June 2007 | Median Income, 2006 | High-Income Super Category | Low-Income Super Category | Creative Super Category | Immigrant Super Category | High-Tech Super Category |
|--|------------------------------------|---------------------|----------------------------|---------------------------|-------------------------|--------------------------|--------------------------|
| Management                                     | 8.2%                               | 70,880              | X                          |                           | X                       |                          |                          |
| Business and Financial Operations              | 11.5%                              | 50,165              | X                          |                           |                         |                          |                          |
| Computer and Mathematical                      | 14.5%                              | 61,713              | X                          |                           | X                       |                          | X                        |
| Architecture and Engineering                   | 7.2%                               | 60,701              | X                          |                           | X                       |                          | X                        |
| Life, Physical, and Social Science             | 10.7%                              | 47,640              |                            |                           | X                       |                          | X                        |
| Community and Social Services                  | 6.4%                               | 34,658              |                            |                           |                         |                          |                          |
| Legal  | 4.6%                               | 61,755              | X                          |                           |                         |                          |                          |
| Education, Training, and Library               | 6.0%                               | 36,294              |                            |                           | X                       |                          |                          |
| Arts, Design, Entertainment, Sports, and Media | 7.4%                               | 35,231              |                            |                           | X                       |                          |                          |
| Healthcare Practitioners and Technical         | 7.0%                               | 51,288              | X                          |                           |                         |                          | X                        |
| Healthcare Support                             | 10.7%                              | 23,122              |                            | X                         |                         |                          |                          |
| Protective Service                             | 1.8%                               | 32,029              |                            |                           |                         |                          |                          |
| Food Preparation and Serving Related           | 25.6%                              | 16,308              |                            | X                         |                         | X                        |                          |
| Building and Grounds Cleaning and Maintenance  | 42.6%                              | 20,264              |                            | X                         |                         | X                        |                          |
| Personal Care and Service                      | 13.4%                              | 18,783              |                            | X                         |                         |                          |                          |
| Sales and Related                              | 10.4%                              | 23,392              |                            | X                         |                         |                          |                          |
| Office and Administrative Support              | 7.8%                               | 27,094              |                            |                           |                         |                          |                          |
| Farming, Fishing, and Forestry                 | 40.8%                              | 18,495              |                            | X                         |                         | X                        |                          |
| Construction and Extraction                    | 33.8%                              | 33,677              |                            |                           |                         | X                        |                          |
| Installation, Maintenance, and Repair          | 13.4%                              | 36,577              |                            |                           |                         |                          |                          |
| Production                                     | 20.5%                              | 26,399              |                            |                           |                         |                          |                          |
| Transportation and Material Moving             | 15.8%                              | 25,643              |                            |                           |                         |                          |                          |
| All Occupations                                | 14.6%                              | 32,603              |                            |                           |                         |                          |                          |

### Competitive Advantage

Competitive advantage—a term that applies to both industries and geographic areas—refers to the ability of a market participant to attain superior economic performance, despite the profit-reducing forces of market competition. At the root of competitive advantage sits the “value chain,” or the activities a company or region undertakes to create a valuable product.<sup>8</sup> For example, a company undergoes activities that add value to raw materials, and a region can take steps to make itself more attractive to businesses. When such an entity either produces value more efficiently than its competitors, or differentiates its products so it is able to demand high prices, the entity gains competitive advantage.<sup>9</sup> It may be thought of as the result of “superior productivity, either in terms of lower costs than rivals or the ability to

offer products with superior value that justify premium price.”<sup>10</sup> That is, the competitive advantage of a region or city stems from its capacity to offer a productive (low-cost) environment for economic activity, or its attributes—such as recreational and entertainment opportunities—that make it otherwise attractive to businesses and workers.

Perhaps the most widely recognized factor in establishing competitive advantage is the “cluster effect.” The cluster effect occurs when “clusters” of related companies and institutions facilitate productivity and thus promote competitive advantage. The competition and cooperation brought by clusters increases productivity, spurs innovation, and prompts the development of new business. Clusters increase productivity by allowing companies to “operate more productively in sourcing inputs; accessing information, technology, and needed institutions; coordinating with related companies; and measuring and motivating improvement.”<sup>11</sup> In addition, concentrated innovation within a cluster may further spur productivity by reducing the inputs required for production. Finally, cluster activity leads to the development of new industry niches, which in turn strengthens and expands a cluster.<sup>12</sup>

Some of the Rocky Mountain region’s competitive advantage is attributable to its abundance of natural amenities. Prior research indicates that the Rockies’ wealth of natural amenities may be a commanding force in drawing qualified human capital to the area. Indeed, natural amenities including recreational opportunities, natural scenery, and environmental quality are fundamental to the desirable outdoor lifestyle that, in turn,

builds an attractive atmosphere for businesses and qualified workers alike.<sup>13</sup>

### Creating Cross-Occupational Super Categories

To answer our questions regarding trends in creativity, technology, income, and work force composition, we constructed five cross-occupational “super categories”: Creative, High-Tech, High-Income, Low-Income, and Immigrant. Each super category combines data from the specific occupations that drive these respective trends (See Table 1). Occupational data is classified under the U.S. Bureau of Labor Statistics Standard Occupational Classification system (SOC).<sup>14</sup>



### Mix-Share Analysis Results: The Rockies and the U.S. 1990-2000

(See Appendix 1)

The Rocky Mountain region has experienced more rapid GDP growth than the U.S. as a whole for most of the past two decades.<sup>15</sup> Not surprisingly, our analysis indicates that from 1990-2000 the Rocky Mountain region greatly surpassed the U.S. in employment growth as well. Total employment growth for this period in the Rockies was 36 percent, as compared to 12 percent for the U.S. as a whole.

Illustrating the forces of competitive advantage at work, nearly 65 percent of all jobs created in the Rockies during this period were due to the regional effect, and the Rocky Mountain region maintained a competitive advantage measure of 23 percent. Though the Rocky Mountain region endured a -17 percent competitive advantage in healthcare support occupations, its competitive success prevailed across all remaining occupational sectors. With positive competitive advantages in 21 of 22 occupational categories, employment growth in the Rocky Mountain region out-performed the U.S. for practically all occupations. The Rockies held strong competitive advantages in occupational categories such as construction and extraction occupations (62 percent), computer and mathematical occupations (48 percent) and personal care and service occupations (39 percent). Though all cross-occupational super categories held significant competitive advantages over this period, the immigrant occupations super category (34 percent) and the creative occupations super category (25 percent) displayed the highest competitive advantages. Competitive advantage for all occupations in all Rockies MSAs is shown in Figure 2.

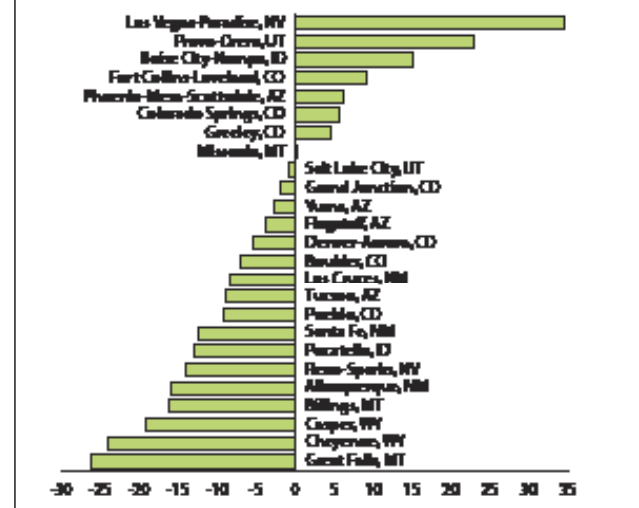
### Change in the Rockies: 1990 - 2000

(See Appendix 2)

From 1990-2000, employment trends varied among Rocky Mountain MSAs. MSAs often exhibited high degrees of specialization in some occupational categories, and lower proficiencies in others. For example, in Boulder, Colorado, specific occupations where a competitive advantage existed include computer and mathematical occupations (173 percent) and—likely due to the presence of the University of Colorado-Boulder campus—life, physical, and social science occupations (95 percent). Conversely, occupations at a competitive disadvantage in Boulder include community and social service occupations (-65 percent) and installation, maintenance, and repair occupations (-58 percent). Among cross-occupational super categories, Boulder experienced positive competitive advantage in the high-income super category (8 percent), the creative super category (24 percent) and the high-tech super category (18 per-

Figure 2  
Competitive Advantage, All Occupations,  
All Rockies MSAs, 1990-2000

Source: Calculations Made From Census Bureau Data



cent). Boulder's performance in the low-income super category and the immigrant occupations super category yielded competitive (dis)advantages of -5.6 percent, and -5.0 percent, respectively.

### A Closer Look at Cross-Occupational Super Categories: Creative Super Category<sup>16</sup>

The Creative super category allows us to observe employment trends among creative occupations. A creative work force implies innovative potential among human capital. As innovative potential leads to competitive advantage,<sup>17</sup> promoting creative occupation growth may be an effective economic development strategy.

Our analysis of the Creative super category, summarized in Table 2, indicates that Provo-Orem, Utah (51 percent) held the greatest competitive advantage in creative occupations from 1990-2000, while Casper, Wyoming (-46 percent) maintained the greatest competitive disadvantage.

Although Provo-Orem did not display competitive advantage in all occupational categories that comprise the Creative super category, its strong competitive advantage in select occupational categories more than offset its competitive disadvantage in others. From 1990-2000, Provo-Orem experienced high competitive advantages in computer and mathematical occupations; education, training, and library occupations; and arts, design, entertainment, sports, and media occupations. Not surprisingly, creative occupations in Provo-Orem grew by 52 percent between 1990-2000.

By contrast, Casper, Wyoming, endured negative competitive advantage in all creative occupations during this time period. Its lowest competitive advantage within

the Creative super category was in computer and mathematical occupations at nearly 200 percent. Overall, Casper lost approximately one half of its creative employment in 1990.

**Table 2**  
**Top 5 and Bottom 5 MSAs:**  
**Creative Super Category**

Source: Calculations Made From Census Bureau Data

| Top 5 MSA's for Creative Occupations |                               | Bottom 5 MSA's for Creative Occupations |                               |
|--------------------------------------|-------------------------------|---|-------------------------------|
| Rocky Mountain MSA                   | Competitive Advantage Measure | Rocky Mountain MSA                      | Competitive Advantage Measure |
| Provo-Orem, UT                       | 51.0%                         | Billings, MT                            | -31.0%                        |
| Fort Collins-Loveland, CO            | 29.1%                         | Pueblo, CO                              | -38.9%                        |
| Las Vegas-Paradise, NV               | 27.2%                         | Cheyenne, WY                            | -39.8%                        |
| Boulder, CO                          | 24.4%                         | Great Falls, MT                         | -44.9%                        |
| Flagstaff, AZ                        | 23.0%                         | Casper, WY                              | -45.6%                        |

### High-Tech Super Category

The High-Tech super category assesses the aptitude of an MSA's workforce to adapt and use new technologies. Incorporating new technologies is essential in both staying current with changing economies, and in boosting innovative capacity. Our mix-share analysis of the High-Tech super category from 1990-2000 found that Boise City-Nampa, Idaho, led with a competitive advantage, and Casper, Wyoming, had the greatest competitive disadvantage. The results of our mix-share analysis for the High Tech super category are displayed in Table 3.

**Table 3**  
**Top 5 and Bottom 5 MSAs:**  
**High Tech Super Category**

Source: Calculations Made From Census Bureau Data

| Top 5 MSA's for High-tech Occupations |                               | Bottom 5 MSA's for High-tech Occupations |                               |
|---------------------------------------|-------------------------------|--|-------------------------------|
| Rocky Mountain MSA                    | Competitive Advantage Measure | Rocky Mountain MSA                       | Competitive Advantage Measure |
| Boise City-Nampa, ID                  | 41.1%                         | Yuma, AZ                                 | -21.1%                        |
| Colorado Springs, CO                  | 32.5%                         | Great Falls, MT                          | -30.3%                        |
| Fort Collins-Loveland, CO             | 26.9%                         | Cheyenne, WY                             | -31.1%                        |
| Provo-Orem, UT                        | 17.6%                         | Las Cruces, NM                           | -38.6%                        |
| Boulder, CO                           | 17.5%                         | Casper, WY                               | -39.6%                        |

### High-Income Super Category

High-income occupations often require high degrees of education, specialization, and an experienced workforce. The presence of jobs requiring such qualities is indicative of a highly developed economy, and is therefore an important tool in assessing the economic profile

of a region or MSA. Table 4 highlights our High Income super category analysis, with Provo-Orem, Utah, holding the highest competitive advantage, and Casper, Wyoming, again with the greatest competitive disadvantage. These high-income competitive advantage estimates are, again, largely affected by competitive advantages within the computer and mathematical occupations category.

**Table 4**  
**Top 5 and Bottom 5 MSAs:**  
**High Income Super Category**

Source: Calculations Made From Census Bureau Data

| Top 5 MSA's for High-Income Occupations |                               | Bottom 5 MSA's for High-Income Occupations |                               |
|---|-------------------------------|--|-------------------------------|
| Rocky Mountain MSA                      | Competitive Advantage Measure | Rocky Mountain MSA                         | Competitive Advantage Measure |
| Provo-Orem, UT                          | 26.4%                         | Pocatello, ID                              | -28.8%                        |
| Las Vegas-Paradise, NV                  | 26.2%                         | Great Falls, MT                            | -30.3%                        |
| Boise City-Nampa, ID                    | 24.9%                         | Yuma, AZ                                   | -35.4%                        |
| Colorado Springs, CO                    | 18.1%                         | Las Cruces, NM                             | -41.6%                        |
| Fort Collins-Loveland, CO               | 13.6%                         | Casper, WY                                 | -42.1%                        |

### Low-Income Super Category

In the Low-Income super category, Las Vegas-Paradise, Nevada/Arizona, held the highest competitive advantage, while Cheyenne, Wyoming, held the lowest competitive disadvantage. The results of our analysis for the low-income super category are listed in Table 5.

**Table 5**  
**Top 5 and Bottom 5 MSAs:**  
**Low Income Super Category**

Source: Calculations Made From Census Bureau Data

| Top 5 MSA's for Low-Income Occupations |                               | Bottom 5 MSA's for Low-income Occupations |                               |
|--|-------------------------------|---|-------------------------------|
| Rocky Mountain MSA                     | Competitive Advantage Measure | Rocky Mountain MSA                        | Competitive Advantage Measure |
| Las Vegas-Paradise, NV                 | 38.0%                         | Tucson, AZ                                | -13.5%                        |
| Provo-Orem, UT                         | 18.8%                         | Billings, MT                              | -16.0%                        |
| Boise City-Nampa, ID                   | 13.3%                         | Reno-Sparks, NV                           | -17.1%                        |
| Missoula, MT                           | 8.6%                          | Great Falls, MT                           | -29.8%                        |
| Fort Collins-Loveland, CO              | 7.9%                          | Cheyenne, WY                              | -33.4%                        |

### Immigrant Occupations Super Category

Finally, we turn to competitive advantages in the Immigrant Occupations super category (Table 5). In occupational categories that employ high levels of immigrants, Las Vegas-Paradise, Nevada/Arizona, held the highest competitive advantage, while Great Falls, Montana, held the lowest competitive advantage. Though it is difficult

to assess the reasons for competitive advantage in this super category, one possibility is that immigrants may gravitate toward economies that are experiencing rapid growth. Because the occupations included in this super category are often indicators of high economic growth, a competitive advantage in immigrant occupations may be due to rapidly growing local economies.<sup>18</sup> It should be noted that the two most competitive MSAs in the Immigrant Occupations super category—Las Vegas-Paradise, NV and Provo-Orem, UT—were also the two most competitive MSAs for total employment growth.<sup>19</sup>

**Table 5**  
**Top 5 and Bottom 5 MSAs:**  
**Immigrant Occupations Super Category**

Source: Calculations Made From Census Bureau Data

| Top 5 MSA's for Immigrant Occupations |                               | Bottom 5 MSA's for Immigrant Occupations |                               |
|---------------------------------------|-------------------------------|--|-------------------------------|
| Rocky Mountain MSA                    | Competitive Advantage Measure | Rocky Mountain MSA                       | Competitive Advantage Measure |
| Las Vegas-Paradise, NV                | 41.7%                         | Pocatello, ID                            | -25.1%                        |
| Provo-Orem, UT                        | 17.1%                         | Reno-Sparks, NV                          | -27.3%                        |
| Santa Fe, NM                          | 14.3%                         | Cheyenne, WY                             | -29.8%                        |
| Fort Collins-Loveland, CO             | 13.7%                         | Billings, MT                             | -34.3%                        |
| Boise City-Nampa, ID                  | 9.3%                          | Great Falls, MT                          | -40.4%                        |

### Revisiting Competitive Advantage

Though we are able to establish the existence of competitive advantage for total employment, specific occupations, and cross-occupational super categories, the precise underlying causes of competitive advantage remain less clear. Many factors, including proximity to markets, urban and social amenities that attract or keep workers, and support from transport and communications infrastructure all play a part. As we mentioned earlier, a city or region can utilize innovation and industry clusters as ways to attain the superior productivity that brings about competitive advantage. Innovation can increase productivity by allowing industries to break away from old production restraints and reduce needed inputs. In addition, horizontally and vertically-linked industry clusters can promote competitive advantage by reducing costs, facilitating both competition and cooperation among cluster members, increasing innovation, and creating new business niches.<sup>20</sup>

Some also point to the Rocky Mountain region's natural amenities as an attracting force for new people and companies seeking a unique quality of life.<sup>21</sup> "Footloose" individuals with high levels of education and skills/training are capable of first choosing where they will live, then seeking employment later. Likewise, companies that are in the service and light-manufacturing sectors

may choose a location first, and seek out a compatible workforce second.

Furthermore, the Rockies' natural amenities are a source of "sustainable" competitive advantage, meaning competitors have difficulty reproducing its value-adding processes.<sup>22</sup> In other words, there is no way for the Midwest or other regions to reproduce all the amenities, and therefore the competitive advantage, provided by the Rocky Mountains. However, a Rocky Mountain location can also be a disadvantage for some industries. With large distances between major cities raising shipping costs, businesses that depend on shipping such as restaurants, retailers, and manufacturers may have difficulty attaining high levels of productivity in the Rockies. Supporting this, our analysis indicates that most Rocky Mountain MSAs had low or negative competitive advantages in production occupations.<sup>23</sup>

Nonetheless, the overall competitive advantages the Rockies displayed throughout the past two decades offer evidence of the region's superior economic potential. In recognition of this potential and how it relates to our economic future, our final question arises: how can competitive advantage influence economic policy in the Rocky Mountain region?

### Creating Competitive Advantage Through Policy: Cluster Development

(See Appendix 3)

Because competitive advantage leads to superior economic growth, cities and regions may benefit by adopting policies to promote and sustain it. To foster advanced, innovative, and competitive economies, some areas have embraced the cluster effect as an integral part of their economic policy.

In the early 1990s, the state of Arizona examined the role of clusters in its economy and adopted a cluster development strategy under the Arizona Strategic Plan for Economic Development (ASPED). In its analysis, Arizona identified 11 industry clusters—some of which were not previously recognized as autonomous indus-







tries—and took steps to assist these clusters through economic policy. While the results of Arizona’s cluster policy are mixed, some industries have experienced significant growth. For instance, Arizona’s diverse and previously unidentified cluster among optics producers has expanded dramatically since its inception. According to one optics industry leader, three years spent on cluster activities and networking cost his company \$50,000, but resulted in more than \$700,000 in new business for a small company.<sup>24</sup>

A key element of Arizona’s cluster development policy has been encouraging communication between clusters and government. Because formal approaches to cluster development are relatively new, difficulties arise in implementing these policies. To address the challenge of identifying and meeting cluster needs and to gain a better understanding of cluster dynamics, Arizona has worked to facilitate collaboration between policy makers and industry advisory groups: a dialogue that has proven fundamental in Arizona’s cluster development strategy. This communication between clusters and government has led to strong support of economic development legislation in the state and has aided policy makers in effectively designing cluster-promoting legislation.<sup>25</sup>

The industry benefits of cluster promotion under ASPED are most apparent within previously unidentified clusters. Similar to the optics cluster, Arizona’s environmental technology and software industries were not recognized before the 1990s. Since their emergence as clusters, these industries have received backing from both policy makers and influential economic development organizations including the state’s two largest public universities and the Arizona World Trade Center.<sup>26</sup>

### Natural Amenities and Competitive Advantage

Competitive advantage can serve as a metric for assessing the economic performance of a region or city. In observing competitive advantage, a locale can evaluate its strengths and weaknesses, and make informed decisions on how to progress economically. When choosing

a course of economic action, however, an area must be cognizant that promoting competitive advantage in one industry may reduce competitive advantage in another.

As noted above, competitive advantage may be derived from an area’s attributes that workers and businesses find attractive. The Rocky Mountain region’s natural amenities are analogous to what economist Michael Porter calls a “[product] with superior value that justifies premium price.”<sup>27</sup> By allowing ready access to the aesthetic and recreational benefits that these amenities provide, features such as the Rocky Mountains effectively compensate workers and businesses for the price of relocating to them. Furthermore, the desirable lifestyles supported by the Rockies’ natural amenities aid in retaining qualified workers who already call the Rockies home.

Given the importance of natural amenities in attracting and maintaining qualified workers, it is economically beneficial to examine the extent to which any economic activity may compromise them. For example, some raise the idea that the establishment of extraction industries in the Rockies may detract from the value of its natural amenities.<sup>28</sup> With a competitive advantage of 62 percent in construction and extraction occupations between 1990 and 2000,<sup>29</sup> the Rocky Mountain region is in a strong position to capitalize on its natural resources. However, before pursuing this competitive advantage, the region must make important decisions regarding how it will develop these resources. While extraction provides economic benefits of increased tax revenue and job growth, the effects of developing an extraction-based economy may decrease the value of natural amenities, and thereby impede the Rocky Mountain region’s ability to draw and sustain a skilled, highly educated workforce.

Therefore, although the Rocky Mountain region may be poised to realize significant economic gains, pursuing competitive advantage in one industry may offset competitive advantage in another. This principle is particularly applicable with regard to the region’s natural amenities. Because natural amenities are a key element in driving competitive advantage in the Rockies, the region must carefully consider how any economic activity affects them.

### Conclusions

Our analysis shows a mixed picture for the Rocky Mountain economy. While some MSAs are moving toward economic compositions that rely on the more advanced occupations of the High-Tech, Creative, and High-Income super categories, others are seeing expansion in their less advanced, lower-income sectors. The economic segmentation that has resulted from this dis-

proportionate occupational growth may or may not continue as competitive advantages either shift or remain in place.

Additionally, our analysis indicates, to some extent, how the high immigration of recent decades has impacted employment in the Rocky Mountains. A competitive advantage in the Immigrant Occupations Super Category may be the product of rapid economic growth within an area, geographic location, or other factors. Reasons that explain growth in immigrant occupations may be solidified by further research.

Much of the economic strength that arises from competitive advantage can be achieved and maintained through policy. In order to improve economic competitiveness, some governments have geared their economic development policy toward the promotion of cluster-based economies. Prior research shows that clusters are an effective way to achieve the productivity increases that lead to competitive advantage.<sup>30</sup> However, cities and regions should take care in deciding where to pursue competitive advantage. While the economic prosperity that competitive advantage represents is generally considered beneficial, the pursuit of competitive advantage in one industry may cause a locale to forfeit its competitive advantage in others. Policy makers must therefore account for these costs and benefits in designing economic policy, specifically with respect to the effect of economic activity on natural amenities. Because of the importance of these natural amenities in creating and sustaining competitive advantage in the Rockies, policy makers must carefully consider them in their decisions.

## Endnotes and Citations

<sup>1</sup>Daniel Kemmis, "Cities in the New West: Urban planning will best determine how the region will grow," *Heawaters News*, 27 October 2007.

<sup>2</sup>We calculate *Growth Effect* with the equation:  $Growth\ Effect\ i = e^i * R_a$  —where  $e$  equals sub-regional employment, and  $R$  equals the overall benchmark growth rate.  $i$  is a subscript denoting specific occupational category, and  $a$  is a subscript denoting aggregate benchmark employment.  $t$  is a superscript denoting the first year of the observation period.

<sup>3</sup>We express *Occupational Mix Effect* with the equation:  $Occupational\ Mix\ Effect\ i = (r_i - R_a) * e^i$  — where  $r$  equals the specific occupational growth rate. All other variables, subscripts, and superscripts used in this equation are the same as those delineated in the equation used to express *Growth Effect*.

<sup>4</sup>We express *Regional Effect* with the equation:  $Regional\ Effect = Aggregate\ Employment\ Change - Growth\ Effect - Occupational\ Mix\ Effect$ .

<sup>5</sup>Avrom Bendavid-Val, *Regional and Local Economic Analysis for Practitioners*, 4th ed. (New York: Praeger Publishers, 1991), 67-73.

<sup>6</sup>Our study uses 1990 and 2000 Census occupation data in addition to 1999 and 2004 Occupational Employment Statistics (OES) data. The data is provided at the MSA level. An MSA is composed of one or more counties, and is usually referred to by the name of the city, or cities, it encompasses. For example, the MSA containing El Paso County is referred to as the Colorado Springs metro area. MSAs considered in this study are those defined according to the 1999 Office of Management and Budget (OMB) guidelines. For 1990-2000, we collapsed county data to create the MSAs based on 1999 OMB definitions. For more information

on the criteria the Census Bureau uses to define MSAs, visit <http://www.census.gov/population/www/estimates/metrodef.html>.

<sup>7</sup>We measure competitive advantage by dividing the number of jobs added due to the regional effect by the number of jobs that existed at the beginning of the period. It is important to note that even with positive employment growth a region or MSA may still exhibit a negative competitive advantage—a competitive disadvantage. This phenomenon occurs when a region or MSA's *actual* job growth falls short of the job growth that it should have experienced as a result of the growth effect and the occupational mix effect. This illustrates the fact that jobs gained by regions and MSAs with positive competitive advantage are essentially jobs lost by comparable regions and MSAs with competitive disadvantage. Note that competitive advantage estimates produced through mix-share analysis have several limitations. First, the presence of competitive advantage in one period does not necessarily assure competitive in succeeding periods. Additionally, mix-share analysis does not address the underlying causes of employment trends: mix share analysis only considers one variable (for our purposes, this is employment) and therefore does not establish causal relationships. One implication of this shortcoming is that, while it may seem, in a superficial sense, that *all* competitive advantage is beneficial, the driving forces behind competitive advantage may indicate the contrary. For example, a low or negative competitive advantage estimate produced by our methodology could represent an increase in labor productivity, or a shift away from unproductive industry— occurrences that should actually increase competitive advantage.

<sup>8</sup>Michael E. Porter and Victor E. Millar, "How Information Gives You Competitive Advantage," *Harvard Business Review* 63 (1983): 149-160.

<sup>9</sup>Ibid.

<sup>10</sup>Michael E. Porter and Claas van der Linde, "Toward a New Conception of the Environment-Competitiveness Relationship," *Journal of Economic Perspectives* 9 (1995): 97-118.

<sup>11</sup>Michael E. Porter, "Clusters and the New Economics of Competition," *Harvard Business Review* 76 (1998): 77-90.

<sup>12</sup>Ibid.

<sup>13</sup>Walter E. Hecox and F. Patrick Holmes, *The Colorado Plateau Economy: Shifting Patterns and Regional Disparities*, The Colorado Plateau II (Tucson: University of Arizona Press, 2005), 13-23.

<sup>14</sup>Bureau of Labor Statistics, "Standard Occupational Classification (SOC) System," 16 February 2007, <<http://www.bls.gov/soc/>> (6 March 2008).

<sup>15</sup>Kemmis, "Cities in the New West," 1.

<sup>16</sup>Todd Gabe, "Growth of Creative Occupations in US Metropolitan Areas: A Shift-Share Analysis," *Growth and Change* 37, no. 3 (2006): 396-415.

<sup>17</sup>Richard Florida, *The Rise of the Creative Class*, (New York: Basic Books, 2002).

<sup>18</sup>There may or may not be an actual causal relationship between a competitive advantage in immigrant occupations and high economic growth.

<sup>19</sup>See Appendix

<sup>20</sup>Porter, "Clusters and the New Economics of Competition," 4.

<sup>21</sup>Hecox and Holmes, *The Colorado Plateau Economy*, 4.

<sup>22</sup>Porter, "How Information Gives you Competitive Advantage," 3.

<sup>23</sup>Authors' Calculations, see appendix

<sup>24</sup>Mary Jo Waits, "The Added Value of the Industry Cluster Approach to Economic Analysis, Strategy, Development, and Service Delivery," *Economic Development Quarterly* 14, no. 1 (2000): 35-50.

<sup>25</sup>Ibid.

<sup>26</sup>Ibid.

<sup>27</sup>Porter, "Clusters and the New Economics of Competition," 4.

<sup>28</sup>Todd Hartman, "Drilling operations reshape landscape" *Rocky Mountain News* 10 December, 2005.

<sup>29</sup>Authors' calculations

<sup>30</sup>Porter, "Clusters and the New Economics of Competition," 4.





Appendix 1  
Occupational Shift Share Analysis, 1990-2000  
Rockies Region  
Benchmark Region: United States  
Source: Calculations Made From Census Bureau Data

| Occupation   | Change in Employment 1990-2000 | % Change in Employment 1990-2000 | Occupational Growth Rates- US Benchmark 1990-2000 | Rockies Growth Effect 1990-2000 | Rockies Growth Effect as a % of Total Job Change 1990-2000 | Rockies Occupational Mix Effect 1990-2000 | Rockies Occupational Mix Effect as a % of Total Job Change 1990-2000 | Rockies Regional Effect 1990-2000 | Rockies Regional Effect as a % of Total Job Change 1990-2000 | Competitive Advantage Measure in % |
|--|--------------------------------|----------------------------------|---|---------------------------------|--|---|--|-----------------------------------|--|------------------------------------|
| 11-0000 Management Occupations                                     | 263,746                        | 49.8%                            | 24.2%   | 64,304                          | 24.4%  | 64,076                                    | 24.3%  | 135,366                           | 51.3%  | 25.6%                              |
| 13-0000 Business and Financial Operations Occupations              | 111,502                        | 46.7%                            | 25.2%   | 28,968                          | 26.0%  | 31,195                                    | 28.0%  | 51,339                            | 46.0%  | 21.5%                              |
| 15-0000 Computer and Mathematical Occupations                      | 133,287                        | 161.0%                           | 113.4%  | 10,046                          | 7.5%   | 83,781                                    | 62.9%  | 39,460                            | 29.6%  | 47.7%                              |
| 17-0000 Architecture and Engineering Occupations                   | 29,056                         | 17.5%                            | -10.6%  | 20,108                          | 69.2%  | -37,656                                   | -129.6%  | 46,605                            | 160.4%   | 28.1%                              |
| 19-0000 Life, Physical, and Social Science Occupations             | 15,919                         | 23.7%                            | -0.4%   | 8,156                           | 51.2%  | -8,405                                    | -52.8%   | 16,168                            | 101.6%   | 24.1%                              |
| 21-0000 Community and Social Services Occupations                  | 37,829                         | 50.5%                            | 43.4%   | 9,085                           | 24.0%  | 23,400                                    | 61.9%  | 5,344                             | 14.1%  | 7.1%                               |
| 23-0000 Legal Occupations  | 25,275                         | 43.3%                            | 33.6%   | 7,085                           | 28.0%  | 12,531                                    | 49.6%  | 5,659                             | 22.4%  | 9.7%                               |
| 25-0000 Education, Training, and Library Occupations               | 148,392                        | 47.7%                            | 29.1%   | 37,735                          | 25.4%  | 52,582                                    | 35.4%  | 58,074                            | 39.1%  | 18.7%                              |
| 27-0000 Arts, Design, Entertainment, Sports, and Media Occupations | 45,058                         | 37.5%                            | 13.3%   | 14,596                          | 32.4%  | 1,449                                     | 3.2%   | 29,013                            | 64.4%  | 24.1%                              |
| 29-0000 Healthcare Practitioners and Technical Occupations         | 80,629                         | 31.7%                            | 30.1%   | 30,872                          | 38.3%  | 45,781                                    | 56.8%  | 3,977                             | 4.9%   | 1.6%                               |
| 31-0000 Healthcare Support Occupations                             | 4,496                          | 3.4%                             | 20.8%   | 16,269                          | 361.9%   | 11,544                                    | 256.8%   | -23,318                           | -518.7%  | -17.4%                             |
| 33-0000 Protective Service Occupations                             | 60,433                         | 52.8%                            | 23.9%   | 13,891                          | 23.0%  | 13,505                                    | 22.3%  | 33,037                            | 54.7%  | 28.9%                              |
| 35-0000 Food Preparation and Serving Related Occupations           | 133,746                        | 38.7%                            | 13.6%   | 41,947                          | 31.4%  | 4,893                                     | 3.7%   | 86,906                            | 65.0%  | 25.1%                              |
| 37-0000 Building and Grounds Cleaning and Maintenance Occupations  | 36,866                         | 13.9%                            | 0.4%  | 32,210                          | 87.4%  | -31,225                                   | -84.7%   | 35,881                            | 97.3%  | 13.5%                              |
| 39-0000 Personal Care and Service Occupations                      | 124,548                        | 77.2%                            | 38.4%   | 19,578                          | 15.7%  | 42,359                                    | 34.0%  | 62,610                            | 50.3%  | 38.8%                              |
| 41-0000 Sales and Related Occupations                              | 220,971                        | 28.4%                            | 4.1%  | 94,453                          | 42.7%  | -62,822                                   | -28.4%   | 189,341                           | 85.7%  | 24.3%                              |
| 43-0000 Office and Administrative Support Occupations              | 298,106                        | 29.4%                            | 2.5%  | 123,192                         | 41.3%  | -97,769                                   | -32.8%   | 272,683                           | 91.5%  | 26.9%                              |
| 45-0000 Farming, Fishing, and Forestry Occupations                 | 399                            | 0.6%                             | -8.9%   | 8,650                           | 2168.6%  | -15,009                                   | -3762.8%   | 6,758                             | 1694.2%  | 9.5%                               |
| 47-0000 Construction and Extraction Occupations                    | 241,031                        | 69.6%                            | 7.2%  | 42,059                          | 17.4%  | -17,071                                   | -7.1%  | 216,043                           | 89.6%  | 62.3%                              |
| 49-0000 Installation, Maintenance, and Repair Occupations          | 119,907                        | 54.3%                            | 21.0%   | 26,806                          | 22.4%  | 19,615                                    | 16.4%  | 73,487                            | 61.3%  | 33.3%                              |
| 51-0000 Production Occupations                                     | 5,289                          | 1.1%                             | -7.1%   | 58,454                          | 1105.2%  | -92,427                                   | -1747.5%   | 39,262                            | 742.3%   | 8.2%                               |
| 53-0000 Transportation and Material Moving Occupations             | 96,718                         | 25.8%                            | 10.5%   | 45,521                          | 47.1%  | -6,044                                    | -6.2%  | 57,241                            | 59.2%  | 15.3%                              |
| All Occupations  | 2,233,202                      | 35.9%                            | 12.1%   | 753,984                         | 33.8%  | 38,285                                    | 1.7%   | 1,440,933                         | 64.5%  | 23.2%                              |
| High Income Super Category   | 643,496                        | 48.4%                            | 27.1%   | 161,383                         | 25.1%  | 199,482                                   | 31.0%  | 282,631                           | 43.9%  | 21.3%                              |
| Low Income Super Category  | 521,025                        | 29.7%                            | 9.1%  | 213,107                         | 40.9%  | -53,391                                   | -10.2%   | 361,310                           | 69.3%  | 20.6%                              |
| Creative Super Category  | 635,457                        | 49.8%                            | 24.3%   | 154,946                         | 24.4%  | 155,825                                   | 24.5%  | 324,686                           | 51.1%  | 25.4%                              |
| Immigrant Super Category   | 412,042                        | 40.1%                            | 6.6%  | 124,866                         | 30.3%  | -57,124                                   | -13.9%   | 344,300                           | 83.6%  | 33.5%                              |
| High Tech Super Category   | 258,891                        | 45.4%                            | 26.8%   | 69,182                          | 26.7%  | 83,484                                    | 32.2%  | 106,225                           | 41.0%  | 18.6%                              |

Appendix 2  
Occupational Shift Share Analysis, 1990-2000  
Boulder, Colorado  
Benchmark Region: Rockies  
Source: Calculations Made From Census Bureau Data

| Occupation   | Change in Employment 1990-2000 | % Change in Employment 1990-2000 | Occupational Growth Rates- Rockies Benchmark 1990-2000 | Boulder Growth Effect 1990-2000 | Boulder Growth Effect as a % of Total Job Change 1990-2000 | Boulder Occupational Mix Effect 1990-2000 | Boulder Occupational Mix Effect as a % of Total Job Change 1990-2000 | Boulder Regional Effect 1990-2000 | Boulder Regional Effect as a % of Total Job Change 1990-2000 | Competitive Advantage Measure in % |
|--|--------------------------------|----------------------------------|--|---------------------------------|--|---|--|-----------------------------------|--|------------------------------------|
| 11-0000 Management Occupations                                     | 8,540                          | 70.0%                            | 49.8%  | 4,387                           | 51.4%  | 1,688                                     | 19.8%  | 2,466                             | 28.9%  | 20.2%                              |
| 13-0000 Business and Financial Operations Occupations              | 2,365                          | 39.8%                            | 46.7%  | 2,135                           | 90.3%  | 640                                       | 27.0%  | -409                              | -17.3%   | -6.9%                              |
| 15-0000 Computer and Mathematical Occupations                      | 9,110                          | 333.9%                           | 161.0%   | 981                             | 10.8%  | 3,413                                     | 37.5%  | 4,716                             | 51.8%  | 172.8%                             |
| 17-0000 Architecture and Engineering Occupations                   | 1,984                          | 36.3%                            | 17.5%  | 1,964                           | 99.0%  | -1,006                                    | -50.7%   | 1,026                             | 51.7%  | 18.8%                              |
| 19-0000 Life, Physical, and Social Science Occupations             | 2,627                          | 118.9%                           | 23.7%  | 794                             | 30.2%  | -271                                      | -10.3%   | 2,104                             | 80.1%  | 95.2%                              |
| 21-0000 Community and Social Services Occupations                  | -331                           | -14.2%                           | 50.5%  | 834                             | -252.3%  | 339                                       | -102.4%  | -1,504                            | 454.7%   | -64.8%                             |
| 23-0000 Legal Occupations  | 563                            | 30.2%                            | 43.3%  | 670                             | 118.9%   | 137                                       | 24.3%  | -244                              | -43.3%   | -13.1%                             |
| 25-0000 Education, Training, and Library Occupations               | 2,464                          | 25.8%                            | 47.7%  | 3,431                           | 139.2%   | 1,124                                     | 45.6%  | -2,091                            | -84.9%   | -21.9%                             |
| 27-0000 Arts, Design, Entertainment, Sports, and Media Occupations | 1,941                          | 51.1%                            | 37.5%  | 1,365                           | 70.3%  | 58  | 3.0%   | 518                               | 26.7%  | 13.6%                              |
| 29-0000 Healthcare Practitioners and Technical Occupations         | -2,016                         | -24.6%                           | 31.7%  | 2,946                           | -146.1%  | -348                                      | 17.3%  | -4,615                            | 228.9%   | -56.3%                             |
| 31-0000 Healthcare Support Occupations                             | -121                           | -5.6%                            | 3.4%   | 771                             | -636.8%  | -699                                      | 577.4%   | -193                              | 159.4%   | -9.0%                              |
| 33-0000 Protective Service Occupations                             | 344                            | 26.2%                            | 52.8%  | 472                             | 137.3%   | 221                                       | 64.4%  | -350                              | -101.6%  | -26.6%                             |
| 35-0000 Food Preparation and Serving Related Occupations           | 2,659                          | 52.5%                            | 38.7%  | 1,822                           | 68.5%  | 139                                       | 5.2%   | 698                               | 26.2%  | 13.8%                              |
| 37-0000 Building and Grounds Cleaning and Maintenance Occupations  | 479                            | 13.6%                            | 13.9%  | 1,271                           | 265.3%   | -780                                      | -162.8%  | -12                               | -2.5%  | -0.3%                              |
| 39-0000 Personal Care and Service Occupations                      | 1,786                          | 73.2%                            | 77.2%  | 877                             | 49.1%  | 1,007                                     | 56.4%  | -98                               | -5.5%  | -4.0%                              |
| 41-0000 Sales and Related Occupations                              | 2,371                          | 15.8%                            | 28.4%  | 5,396                           | 227.5%   | -1,134                                    | -47.8%   | -1,891                            | -79.7%   | -12.6%                             |
| 43-0000 Office and Administrative Support Occupations              | 1,841                          | 9.6%                             | 29.4%  | 6,904                           | 375.0%   | -1,263                                    | -68.6%   | -3,800                            | -206.4%  | -19.8%                             |
| 45-0000 Farming, Fishing, and Forestry Occupations                 | -259                           | -49.8%                           | 0.6%   | 187                             | -72.1%   | -184                                      | 71.0%  | -262                              | 101.1%   | -50.4%                             |
| 47-0000 Construction and Extraction Occupations                    | 2,046                          | 41.5%                            | 69.6%  | 1,774                           | 86.7%  | 1,658                                     | 81.0%  | -1,386                            | -67.7%   | -28.1%                             |
| 49-0000 Installation, Maintenance, and Repair Occupations          | -113                           | -3.4%                            | 54.3%  | 1,184                           | -1044.3%   | 604                                       | -532.9%  | -1,901                            | 1677.2%  | -57.7%                             |
| 51-0000 Production Occupations                                     | -717                           | -8.5%                            | 1.1%   | 3,031                           | -422.6%  | -2,938                                    | 409.7%   | -810                              | 112.9%   | -9.6%                              |
| 53-0000 Transportation and Material Moving Occupations             | 324                            | 7.4%                             | 25.8%  | 1,575                           | 486.9%   | -445                                      | -137.6%  | -807                              | -249.3%  | -18.4%                             |
| All Occupations  | 37,886                         | 30.4%                            | 35.9%  | 44,771                          | 118.2%   | 1,959                                     | 5.2%   | -8,844                            | -23.3%   | -7.1%                              |
| High Income Super Category   | 20,546                         | 56.5%                            | 48.4%  | 13,083                          | 63.7%  | 4,530                                     | 22.0%  | 2,933                             | 14.3%  | 8.1%                               |
| Low Income Super Category  | 6,915                          | 24.1%                            | 29.7%  | 10,324                          | 149.3%   | -1,802                                    | -26.1%   | -1,607                            | -23.2%   | -5.6%                              |
| Creative Super Category  | 26,666                         | 74.2%                            | 49.8%  | 12,921                          | 48.5%  | 4,970                                     | 18.6%  | 8,775                             | 32.9%  | 24.4%                              |
| Immigrant Super Category   | 4,925                          | 35.0%                            | 40.1%  | 5,054                           | 102.6%   | 577                                       | 11.7%  | -706                              | -14.3%   | -5.0%                              |
| High Tech Super Category   | 11,704                         | 62.9%                            | 45.4%  | 6,685                           | 57.1%  | 1,761                                     | 15.0%  | 3,258                             | 27.8%  | 17.5%                              |

### Appendix 3

## Competitive Measure in Percent by SOC and Cross-Occupational Super Category, 1990-2000

Source: Calculations Made From Census Bureau Data

| SOC or Cross-Occupational Category | Management occupations | Business and financial operations occupations | Computer and mathematical occupations | Architecture and engineering occupations | Life, physical, and social science occupations | Community and social services occupations | Legal occupations | Education, training, and library occupations | Arts, design, entertainment, sports, and media occupations | Healthcare practitioners and technical occupations | Healthcare support occupations | Protective service occupations |
|------------------------------------|------------------------|---|---------------------------------------|--|--|---|-------------------|--|--|--|--------------------------------|--------------------------------|
| Rocky Mountain MSA                 |                        |   |                                       |  |  |   |                   |  |  |  |                                |                                |
| Flagstaff, AZ                      | 34.3%                  | -20.8%  | -160.2%                               | -49.2%                                   | 120.5%   | 62.4%                                     | -23.0%            | 78.7%  | -1.5%  | 10.5%  | -27.1%                         | -30.1%                         |
| Phoenix-Mesa-Scottsdale, AZ        | 5.2%                   | 18.1%   | 49.1%                                 | 23.9%                                    | -46.2%   | -4.3%                                     | 13.2%             | -12.3%                                       | 4.2%   | 5.1%   | 5.7%                           | 6.4%                           |
| Tucson, AZ                         | -15.8%                 | -21.0%  | -54.5%                                | 12.5%                                    | 18.7%  | 5.0%                                      | -21.5%            | -10.6%                                       | -10.0%   | 4.7%   | 9.5%                           | 0.7%                           |
| Yuma, AZ                           | -50.5%                 | -32.2%  | -180.3%                               | -21.4%                                   | -58.2%   | 78.2%                                     | -23.7%            | 84.0%  | -24.9%   | 40.5%  | -10.1%                         | 10.4%                          |
| Boulder, CO                        | 20.2%                  | -6.9%   | 172.8%                                | 18.8%                                    | 95.2%  | -64.8%                                    | -13.1%            | -21.9%                                       | 13.6%  | -56.3%   | -9.0%                          | -26.6%                         |
| Colorado Springs, CO               | 6.1%                   | -3.5%   | 261.4%                                | 22.3%                                    | -59.9%   | 17.4%                                     | -31.2%            | -14.7%                                       | 8.4%   | -10.6%   | 9.1%                           | 2.2%                           |
| Denver-Aurora, CO                  | -1.4%                  | 16.3%   | 134.7%                                | 5.5%                                     | -6.7%  | -27.8%                                    | 33.1%             | -39.0%                                       | -6.9%  | -20.9%   | -12.1%                         | -11.0%                         |
| Fort Collins-Loveland, CO          | 29.1%                  | -3.4%   | 59.8%                                 | 45.5%                                    | 88.5%  | -17.5%                                    | -80.8%            | 3.5%   | 14.6%  | -12.6%   | 9.1%                           | -1.7%                          |
| Grand Junction, CO                 | -6.1%                  | -13.7%  | -156.9%                               | -12.6%                                   | -3.8%  | 46.4%                                     | -22.7%            | -5.3%  | -49.7%   | 44.8%  | 73.6%                          | -23.7%                         |
| Greeley, CO                        | -2.7%                  | 17.6%   | 24.3%                                 | -3.1%                                    | -10.4%   | 53.9%                                     | -46.8%            | 39.1%  | 4.4%   | 9.3%   | 41.2%                          | 0.1%                           |
| Pueblo, CO                         | -18.8%                 | -8.0%   | -171.3%                               | -43.1%                                   | -75.7%   | 64.3%                                     | -35.4%            | -13.6%                                       | -59.0%   | 78.7%  | 36.6%                          | 4.2%                           |
| Boise City-Nampa, ID               | 2.1%                   | 33.8%   | 51.7%                                 | 78.5%                                    | -8.1%  | 35.6%                                     | 22.2%             | 17.2%  | 14.7%  | 25.0%  | 47.8%                          | 7.0%                           |
| Pocatello, ID                      | -33.4%                 | -32.6%  | -145.6%                               | -15.8%                                   | 12.9%  | 5.9%                                      | -50.3%            | 44.4%  | -55.4%   | 16.9%  | 18.3%                          | 14.0%                          |
| Billings, MT                       | -30.3%                 | -34.6%  | -135.4%                               | -23.0%                                   | -2.9%  | 62.4%                                     | 18.6%             | -12.7%                                       | -37.4%   | 44.9%  | 14.6%                          | -20.8%                         |
| Great Falls, MT                    | -35.7%                 | -28.0%  | -209.2%                               | -51.4%                                   | -48.6%   | 4.8%                                      | -10.0%            | -13.0%                                       | -47.9%   | 45.5%  | 0.1%                           | -3.2%                          |
| Missoula, MT                       | -10.2%                 | -9.5%   | -125.8%                               | -58.4%                                   | 74.2%  | 49.6%                                     | 10.3%             | 9.8%   | 22.4%  | 11.6%  | -14.4%                         | -39.6%                         |
| Albuquerque, NM                    | -19.5%                 | -10.5%  | -66.9%                                | 12.1%                                    | 2.3%   | -29.8%                                    | 3.0%              | -29.9%                                       | -22.4%   | -7.3%  | 2.0%                           | -7.4%                          |
| Las Cruces, NM                     | -34.6%                 | -40.4%  | -138.2%                               | -18.4%                                   | 5.2%   | 19.4%                                     | -71.7%            | 54.8%  | -50.3%   | -30.9%   | 14.9%                          | -1.0%                          |
| Santa Fe, NM                       | -6.5%                  | 0.5%  | -75.4%                                | 0.7%                                     | 191.9%   | -50.8%                                    | 41.1%             | -43.2%                                       | 35.1%  | -42.3%   | -10.8%                         | -13.2%                         |
| Las Vegas-Paradise, NV             | 29.9%                  | 12.0%   | -61.4%                                | -7.3%                                    | -29.5%   | 4.7%                                      | 102.5%            | 36.5%  | 133.8%   | 67.5%  | -48.5%                         | 16.1%                          |
| Reno-Sparks, NV                    | -15.2%                 | -20.2%  | -114.8%                               | -26.7%                                   | -1.4%  | -30.3%                                    | 18.4%             | -15.8%                                       | 14.9%  | 21.0%  | -49.4%                         | -34.5%                         |
| Provo-Orem, UT                     | 45.5%                  | 29.3%   | 227.7%                                | -35.9%                                   | -6.2%  | -2.7%                                     | -51.3%            | 75.6%  | 35.5%  | -8.2%  | 33.7%                          | 16.7%                          |
| Salt Lake City, UT                 | -10.6%                 | 13.5%   | 23.0%                                 | -7.7%                                    | -9.8%  | -19.0%                                    | -0.2%             | -12.4%                                       | -7.2%  | -7.5%  | 18.1%                          | -3.1%                          |
| Casper, WY                         | -36.5%                 | -58.6%  | -195.4%                               | -28.5%                                   | -40.0%   | 14.5%                                     | -43.1%            | -28.6%                                       | -55.8%   | 2.8%   | 37.3%                          | -46.2%                         |
| Cheyenne, WY                       | -29.2%                 | -24.9%  | -129.1%                               | -28.3%                                   | -13.2%   | -8.8%                                     | 42.0%             | -41.3%                                       | -52.0%   | -6.0%  | -4.4%                          | -26.0%                         |



| Food preparation and serving related occupations | Building and grounds cleaning and maintenance occupations | Personal care and service occupations | Sales and related occupations | Office and administrative support occupations | Farming, fishing, and forestry occupations | Construction and extraction occupations | Installation, maintenance, and repair occupations | Production occupations | Transportation and material moving occupations | All Occupations | High Income | Low Income | Creative | Immigrant | High Tech |
|--|---|---------------------------------------|-------------------------------|---|--|---|---|------------------------|--|-----------------|-------------|------------|----------|-----------|-----------|
| 25.6%  | 10.9%   | -29.4%                                | -16.7%                        | -7.3%   | 23.2%                                      | -25.1%                                  | -27.4%  | -10.5%                 | -27.0%   | -3.9%           | -8.3%       | -4.1%      | 23.0%    | 6.1%      | -18.3%    |
| 3.4%   | 29.6%   | 1.4%                                  | 4.6%                          | 6.4%  | -12.7%                                     | -2.8%                                   | 9.0%  | 6.4%                   | 11.1%  | 6.2%            | 13.0%       | 7.3%       | 3.6%     | 8.9%      | 11.1%     |
| -8.8%  | 2.8%  | -25.7%                                | -21.0%                        | 1.7%  | -61.0%                                     | -15.6%                                  | 3.5%  | -8.3%                  | -14.4%   | -8.9%           | -11.4%      | -13.5%     | -10.6%   | -9.2%     | 0.0%      |
| -8.1%  | -22.0%  | -45.0%                                | 6.0%                          | -4.5%   | 150.6%                                     | -26.9%                                  | 33.7%   | -11.0%                 | 2.2%   | -2.6%           | -35.4%      | 5.6%       | -24.7%   | 2.6%      | -21.1%    |
| 13.8%  | -0.3%   | -4.0%                                 | -12.6%                        | -19.8%  | -50.4%                                     | -28.1%                                  | -57.7%  | -9.6%                  | -18.4%   | -7.1%           | 8.1%        | -5.6%      | 24.4%    | -5.0%     | 17.5%     |
| -5.4%  | -6.9%   | -5.8%                                 | -2.4%                         | 7.3%  | -55.3%                                     | 7.1%                                    | 7.2%  | 13.8%                  | 13.8%  | 5.5%            | 18.1%       | -2.9%      | 16.9%    | -1.5%     | 32.5%     |
| -16.4%   | -8.7%   | -7.6%                                 | -6.9%                         | -14.0%  | -50.9%                                     | 8.5%                                    | 8.3%  | -7.7%                  | 7.2%   | -5.4%           | 9.1%        | -9.2%      | -1.4%    | -3.8%     | 11.4%     |
| 5.8%   | 11.2%   | -14.0%                                | 11.1%                         | -1.8%   | 7.8%                                       | 21.7%                                   | -24.2%  | 17.7%                  | 16.5%  | 9.1%            | 13.6%       | 7.9%       | 29.1%    | 13.7%     | 26.9%     |
| 2.5%   | -4.0%   | -35.0%                                | -12.3%                        | 12.3%   | 6.7%                                       | 8.2%                                    | -17.1%  | -10.0%                 | 10.8%  | -2.0%           | -8.5%       | -3.1%      | -20.6%   | 3.3%      | -6.5%     |
| 0.4%   | -24.5%  | -29.9%                                | 3.7%                          | 3.2%  | 1.9%                                       | 10.0%                                   | -1.4%   | 11.5%                  | 7.5%   | 4.6%            | 2.6%        | -4.7%      | 8.2%     | -5.6%     | 5.6%      |
| -12.7%   | -25.5%  | -63.4%                                | -0.7%                         | -3.3%   | -27.7%                                     | 2.8%                                    | -8.6%   | -12.4%                 | -9.0%  | -9.2%           | -10.9%      | -10.2%     | -38.9%   | -11.0%    | -10.9%    |
| 24.1%  | -1.5%   | 19.2%                                 | 8.4%                          | 7.8%  | 18.7%                                      | 3.0%                                    | 12.7%   | 26.1%                  | 3.7%   | 15.2%           | 24.9%       | 13.3%      | 19.0%    | 9.3%      | 41.1%     |
| -7.7%  | -2.0%   | -28.7%                                | -12.9%                        | -2.0%   | -6.5%                                      | -64.9%                                  | 14.3%   | -0.8%                  | -30.6%   | -13.0%          | -28.8%      | -8.8%      | -18.0%   | -25.1%    | -16.7%    |
| -15.0%   | -38.8%  | -31.2%                                | -11.9%                        | -18.3%  | -18.7%                                     | -53.8%                                  | -0.7%   | 1.6%                   | -1.1%  | -16.3%          | -21.0%      | -16.0%     | -31.0%   | -34.3%    | -6.5%     |
| -33.7%   | -42.8%  | -53.8%                                | -25.0%                        | -12.9%  | -16.9%                                     | -44.7%                                  | -24.6%  | -23.5%                 | -22.4%   | -26.1%          | -30.3%      | -29.8%     | -44.9%   | -40.4%    | -30.3%    |
| 24.7%  | -5.7%   | 7.2%                                  | 7.9%                          | 6.1%  | 28.0%                                      | -16.5%                                  | 34.1%   | -11.6%                 | -7.4%  | 0.3%            | -18.9%      | 8.6%       | -11.0%   | 3.2%      | -21.0%    |
| 1.9%   | -2.8%   | -25.0%                                | -16.5%                        | -14.9%  | -51.8%                                     | -39.8%                                  | -18.9%  | -12.8%                 | -17.0%   | -15.8%          | -13.1%      | -10.5%     | -20.0%   | -13.6%    | -9.1%     |
| 10.3%  | 11.7%   | -11.9%                                | -4.0%                         | -8.4%   | 19.8%                                      | -13.7%                                  | 7.3%  | -10.0%                 | 2.1%   | -8.4%           | -41.6%      | 2.6%       | -16.2%   | 1.6%      | -38.6%    |
| 12.3%  | 22.5%   | -7.5%                                 | -18.4%                        | -21.0%  | -40.8%                                     | 11.4%                                   | -45.2%  | -22.6%                 | -36.9%   | -12.5%          | -14.9%      | -5.6%      | -3.9%    | 14.3%     | -6.7%     |
| 36.7%  | 42.3%   | 124.6%                                | 32.0%                         | 44.4%   | -47.7%                                     | 59.7%                                   | 18.5%   | 1.6%                   | 42.4%  | 34.6%           | 26.2%       | 38.0%      | 27.2%    | 41.7%     | 15.5%     |
| -31.4%   | -15.2%  | 23.8%                                 | -15.5%                        | -13.4%  | -38.9%                                     | -30.5%                                  | -4.7%   | 5.7%                   | 4.5%   | -14.0%          | -15.6%      | -17.1%     | -19.6%   | -27.3%    | -15.3%    |
| 1.4%   | 17.7%   | -11.1%                                | 34.5%                         | 20.6%   | -36.8%                                     | 40.1%                                   | 2.1%  | 6.4%                   | 13.5%  | 22.9%           | 26.4%       | 18.8%      | 51.0%    | 17.1%     | 17.6%     |
| -12.0%   | 16.0%   | -1.5%                                 | 2.2%                          | 2.8%  | -41.6%                                     | -19.8%                                  | -6.4%   | 11.7%                  | 6.1%   | -0.7%           | -2.4%       | 2.1%       | -8.0%    | -5.1%     | -3.2%     |
| -10.5%   | 25.2%   | -45.1%                                | -8.2%                         | -18.7%  | -41.8%                                     | -21.3%                                  | 29.5%   | -8.3%                  | -22.8%   | -19.1%          | -42.1%      | -4.8%      | -45.6%   | -4.9%     | -39.6%    |
| -38.2%   | -31.0%  | -55.1%                                | -35.3%                        | -21.2%  | -3.9%                                      | -25.0%                                  | 12.9%   | 0.0%                   | -4.3%  | -24.1%          | -26.9%      | -33.4%     | -39.8%   | -29.8%    | -31.1%    |