THE PURSUIT OF ECONOMIC DEVELOPMENT

Growing Good Jobs in
U.S. Cities and States

Todd M. Gabe

The Pursuit of Economic Development

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For Pam and Quentin

About the Book

This book addresses the challenge of securing high-paying jobs for American workers—a major issue facing the country today. It examines the impacts of a wide range of state and local characteristics (e.g., low taxes, high-skilled workforce, reliance on manufacturing, and nice weather) on the economic development of U.S. regions. For each of the factors considered, the author offers a simple explanation for why it might work and then provides a detailed account of its impact on the growth of good jobs. The research focuses on U.S. metropolitan areas and states, and tracks employment and income change in these regions from 1990 to the near present. While providing numerous best principles for state and regional policy, the author uncovers the keys to supporting high-paying U.S. jobs in an important book that should be read by elected officials, economic development practitioners and students interested in the pursuit of economic development.

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Growth of Good US Jobs

1.1 It's Economic Development, Stupid

A job . . . it is how many Americans and people around the world occupy a great deal of their waking hours. It's a frequent topic of conversation with family and friends, and even among complete strangers. On a cross-country flight from New York to Los Angeles, you're more likely to learn your row-mate's occupation before the plane taxis out to the runway than you'll know his or her religion, place of birth, or favorite food (unless it's small bags of peanuts, or Biscoff cookies) when the aircraft touches down five hours later.

A job sometimes determines a person's location of residence (e.g., financial analysts rarely live very far away from cities), is often a huge factor in how much money a person makes, and—for many professions—even influences how someone is viewed by others. You might refrain from telling dirty jokes in the company of a minister, just as you would talk sports with the high school football coach while waiting in line to pay for groceries.

Above all, a person's job—and even the employment status of others—affects his or her outlook on life. Research by Andrew Clark and Andrew Oswald (1994) shows that being unemployed lowers a person's happiness, and the effect of joblessness on making someone unhappy is larger than the impact associated with divorce. In other words, to keep the same level of happiness, a person would rather separate from a spouse than a job.

Irrespective of a person's own employment status, being around others who are without a job lowers an individual's well-being. A study by Rafael

DiTella, Robert MacCulloch, and Andrew Oswald (2001) found that this "fear of unemployment" effect related to the overall unemployment rate is larger than the reduction in happiness due to inflation. Put another way, a person would accept more rapidly rising prices—which cuts into a household's purchasing power—if it means a lower unemployment rate for all.

It should come as no surprise, then, that people care deeply about the health of the economy and—more specifically—jobs. Prior to the 2012 US Presidential election, when incumbent Barack Obama defeated challenger Mitt Romney, a Pew Research Center poll found that the highest percentage of Americans indicated "the economy" and "jobs" as what mattered most to them when casting their vote for president. More people cited "jobs" than the "budget deficit," "healthcare," "foreign policy," and a host of other issues.[1]

In July of 2013, a Gallup Poll found that 19 percent of Americans believed that "unemployment/jobs" is the most important problem facing the country. This is less than the 23 percent that noted "economy in general" as the biggest problem facing the United States, but higher than the percentages citing other issues such as the "Federal budget deficit," "healthcare," "education," and "crime/violence."[2] Even in February of 2016, when the US unemployment rate was less than 5.0 percent, one in ten Americans told Gallup that "unemployment/jobs" is the nation's most important issue.[3] This is, once again, less than the 17 percent that cited "economy in general" and the 13 percent that picked "dissatisfaction with the government," but similar to the percentage who felt that "immigration/illegal aliens" is the biggest issue facing the United States.[4]

The prime importance that people place on jobs means that policymakers at all levels of government should work to improve the economy. A simple equation of "political cliché math" advises our elected officials to pursue economic development.

"All politics is local" + "The economy, stupid" =
It's economic development, stupid

Tip O'Neill's famous quote, "All politics is local," suggests that voters often decide on candidates based on their perceptions of how the elected officials' plans and policies would affect them personally. Thus, politicians can increase their support and chances of winning elections by tackling issues that are of the utmost importance to their constituents. This turns out to be jobs and the economy. "The economy, stupid," a phrase coined by

political strategist James Carville, was a slogan popularized in Bill Clinton's successful 1992 Presidential campaign against incumbent George H.W. Bush and fellow challenger, H. Ross Perot. This saying advised Clinton to remind voters about the sluggish state of the US economy under Bush's watch, which included a mild recession lasting from July 1990 to March 1991.

The combination of advising politicians to take on issues that directly affect voters and to focus on the health of the economy means that elected officials should implement policies and plans with an objective of growing good jobs in regions across America. Put another way, "it's economic development, stupid."

In this book, we'll embark on a quest in search of the regional characteristics (e.g., low taxes, presence of high-technology businesses, nice weather) that impact the economic development of states and US metropolitan areas. For our purposes, economic development is defined as *the growth of good jobs in a region to improve the economic well-being of people and the places where they reside*. This definition conveys several important ideas about economic development, which we'll illustrate in turn.

Growth of Good Jobs in a Region

First off, I believe there is a strong connection between job growth and economic development. But, as we'll see throughout the book, the factors that contribute to these outcomes are not always, or even usually, one in the same. Growth means simply to have more of something. When discussing the topic of economic development, the "something" that people— especially elected officials—have in mind is usually jobs. An expansion of jobs is important for economic development because most regions have growing populations through natural increases (i.e., birth rates that exceed death rates) and/or relocations of existing households.[5] Basic arithmetic suggests that more jobs are needed even to maintain, let alone improve, the well-being of individuals in areas with growing populations.

But not all jobs are created equal. The growth of some types of jobs will lead to higher incomes and an improved standard of living, while employment growth of other sorts could occur yet leaving people and their communities no better off. It's safe to say that job growth could be a necessary, but not sufficient, condition for achieving economic development. Put another way, most regions need an increase in jobs to raise the well-being of residents, although employment growth alone does not guarantee an improvement in economic development. That's where

"good jobs" come in. The growth of good jobs is an even more important ingredient in the pursuit of economic development.

Now comes the task of describing what is meant by good jobs. Applying a very high standard, a good job is safe, pays a reasonably high wage, offers persistent employment over time, and is involved in pursuits that do not harm the surrounding community and its environment. In other words, good jobs *improve the economic well-being of people*—the second main part of our definition of economic development. I must confess that I don't like the vague quality of the phrase "improve the economic wellbeing," which is a big part of what it means for a job to be "good." But this fuzziness is hard to get around; the very nature of economic development makes it elusive to pin down with a single indicator.

Although we could easily add to our list of the qualities that define a good job, I am actually going to narrow the focus to two characteristics: a job's pay and its persistence. This is done for a couple of reasons.

First, from a practical standpoint, it would be very difficult to examine thoroughly (in a single book) additional qualities of jobs. Broadening our scope in other directions could also change our focus from "economic development" to other aspects of community and regional development. A second reason for focusing on a job's pay and its persistence, along with employment growth, is the recognition that—for some people and places—the definition of what constitutes a good job may fall short of the high standard set above. For people who are unemployed, finding a job—almost any job—could provide a marked improvement in well-being. Since economic development efforts are often (or, at least, should be) directed at regions with the bleakest economic conditions, a pragmatic approach focuses on what is likely to be viewed as most important in these places: jobs, well-paying jobs, and jobs that don't go away.

Last, but not least, our definition of economic development ends with the phrase *and the places where they reside*. This clause is especially important because it goes beyond individuals and extends the concept of economic development to places. Such an orientation underscores the idea that, although someone who makes a lot of money could be "rich" wherever they live, the presence of a few rich folk does not mean that a region has achieved economic development. Instead—and we recognize that this is difficult to measure—economic development is a sort of positive "vibe" that permeates an entire region, providing a sense of security and optimism to its residents and businesses.

The types of regions that we'll study throughout the book are states and US metropolitan areas.

States are admittedly a little too broad; or, maybe, even a lot too broad for the study of some aspects of economic development—with its suggestion that an expansion of good jobs can lift an entire region. For example, New York City and Buffalo, New York, are worlds apart in many ways, and it's probably unlikely that an economic spark occurring in one place will catch fire in the other. Nevertheless, state government agencies have missions of promoting economic development within their borders and officials design policies (e.g., tax incentives; attracting targeted sectors, such as biotechnology) that are often uniformly applied with little regard for a city or town's specific needs. In an effort to examine the success of the myriad programs and policies implemented by these state agencies and the decision makers who lead them (e.g., state governors), we'll examine indicators of economic development measured at the state level.

A focus on US metros also makes sense for examining regional economic development. Metropolitan areas, of which there are 381 in the United States, are defined geographically by patterns of where people live and work.[6] This means that jobs created or innovations hatched in a metropolitan area, which includes a city center and all of the places that are "commutable" to it, can—at least in principle—impact the well-being of people in that region.

1.2   Economic Development Indicators

Throughout the book, we'll examine three separate regional economic indicators—the "employment index," "income index," and "persistence index"—that combine into a fourth indicator, called the "economic development index." The employment, income, and persistence indices are measures of jobs, well-paying jobs, and jobs that don't go away, respectively. You could say that, as a combination of the three, the economic development index is a measure of good jobs.

The employment index is made up of three parts: the growth rate of employment in a region between 1990 and 2014, the employment growth rate over a shorter time period of 2004 to 2014, and the region's unemployment rate in March 2015. Equal weights are applied to these three regional economic indicators to arrive at a single employment index, which we translate to a scale of zero to 100—with 100 being the "best."[7]

The year 1990 provides a good starting point for our study of the factors affecting US regional economic development. The World Wide Web, which has profoundly impacted businesses and individuals—and transformed our entire society—was launched around this time. Some commentators, notably Thomas Friedman (2005), felt that computer technologies such as the Internet would spread out economic activity—that is, make the world "flatter"—as the electronic movement of data and ideas is not hindered by the friction of distance. Other regional development experts, such as Richard Florida (2005), argued that economic activity would remain geographically concentrated even after the advent of computer technologies that can effortlessly move data and ideas across distance. As a complement to (and not a substitute for) information technology, the face-to-face contact needed for many creative- and knowledge-based endeavors would prevent a flattening of economic activity and keep it "spiky."

Going back to a period much earlier than 1990 would provide a starting point where the economy and society were quite different—in some ways, almost too foreign—than how things are today. Thomas Piketty (2014, p. 95), in his book *Capital in the Twenty-First Century*, notes that "in 1980 there was no Internet or cell phone network, most people did not travel by air, most of the advanced medical technology in common use today did not yet exist, and only a minority attended college." Later in this book, we'll find that several of these changes to our society—for example, air transportation, communications, and a college-educated workforce—are positively associated with the economic development of US regions, especially metropolitan areas. Starting our analysis from a point before these services and practices became reasonably widespread—that is, if we had used, say, a period of 1980 to the present—might have made it difficult to uncover these impacts on the growth of good jobs.

The period of analysis covers just about one generation of workers in the labor force, as people who started working in 1990 are currently "mid to late" career. This time span has witnessed some remarkable changes in the structure of the US economy. Although far from its share of about 38 percent of total US employment in 1944, manufacturing accounted for about 16 percent of US employment in 1990. As a point of comparison, professional and business services made up just under 10 percent of US employment at that time. By 2015, these shares almost flipped as professional and business services surged to about 14 percent of US employment and manufacturing had fallen to less than 9 percent of US employment.[8]

Overall, the US economy experienced a 29-percent increase in total employment between January 1990 and 2015.[9] Concealed in this growth rate, figured across the entire nation, is substantial variability in the growth of individual states and metropolitan areas. US metropolitan areas ranged from actual declines in the number of jobs—places such as Flint (Michigan), Mansfield (Ohio), and Elmira (New York)—to growth rates that exceeded 80 percent in areas such as Provo (Utah), Las Vegas, and Austin.[10] Surely, residents of Flint and Austin would have very different impressions about the growth of the US economy, influenced by how employment conditions changed in their own backyards.

The second part of the employment index is a region's employment growth rate between 2004 and 2014. Although it includes one of the most severe economic downturns in our nation's history—the Great Recession of 2008—this period provides a shorter and more recent time frame for examining the expansion of jobs in US regions. Some of the better performing states as measured by their employment growth rates between 2004 and 2014 are North Dakota, Texas, Utah, and Wyoming.[11]

The final component of a region's employment index is the unemployment rate in March 2015.[12] This variable is important because—unlike the first two parts of the employment index that measure the growth of jobs—a comparison of the unemployment rates across regions provides an indication of differences in the availability of jobs at a given point in time. Like the two measures of employment growth, considerable variation exists among US metropolitan areas in their unemployment rates. Places such as Bismarck (North Dakota), State College (Pennsylvania), and Honolulu had unemployment rates of less than 4 percent in March 2015, while other areas including Merced (California) and Yuma (Arizona) had unemployment rates in excess of 12 percent. An unemployment rate of 12 percent means that, roughly, one out of every eight people who is interested in working cannot find a job.

1.3 Measures of Good Jobs: Income and Persistence Indices

The income index, which represents one aspect of the quality of jobs, is made up of three parts: the growth rate of per-capita personal income in a region between 1990 and 2014, a region's per-capita income growth rate between 2004 and 2014, and its annual per-capita income level in 2014.[13]

The income and employment indices, therefore, are similar in the two time periods used to measure growth, as well as the inclusion of a "snapshot" variable captured at a single point in time.

Like we found for employment growth between 1990 and 2014, there's wide variability in income growth over this period. US metropolitan areas ranged from very modest growth in real per-capita income—that is, growth rates of less than 10 percent over the 24-year period—to growth rates that exceeded 50 percent. Of the ten metropolitan areas with the highest growth rates of per-capita personal income between 1990 and 2014, three are located in Texas (Midland, Odessa, and Laredo) and another two are in Louisiana (Houma-Thibodaux and Lafayette). The growth rate of per-capita personal income between 2004 and 2014—a period covering the Great Recession—also shows considerable variation among US regions. Forty-four metropolitan areas—that's well over 10 percent—experienced real (i.e., accounting for inflation) declines in per-capita incomes, while the top-performing places had real income growth that exceeded 20 percent.

The third and final component of the income index is a region's annual per-capita personal income in 2014. By most accounts, per-capita income is a strong indicator of the productivity of workers and the presence of high-paying jobs in a region. Having per-capita incomes of over $50,000 per year, Connecticut, Massachusetts, New Jersey, and North Dakota are the top-performing states by this measure, while the lowest incomes are found in Mississippi, West Virginia, and South Carolina.

The income index is constructed by applying equal weights to the three variables—similar to the makeup of the employment index—and is expressed on a scale of zero to 100, with 100 being the "best."

The persistence index, another way we represent the quality of jobs in a region, is comprised of two variables. First, we constructed a persistence statistic that represents the dynamics of monthly employment change occurring between January 1990 and March 2015.[14] This captures the extent to which monthly job changes "stick" and last into the future.[15] Second, we calculated the percentage change in a region's employment over a two-year period (from December 2007 to 2009) around the Great Recession. This is a measure of US regions' resilience to the recession and its sharp downturn in global economic activity.

Figure 1.1, which shows monthly employment data for Ocean City, New Jersey, provides a good visual representation of (a lack of)
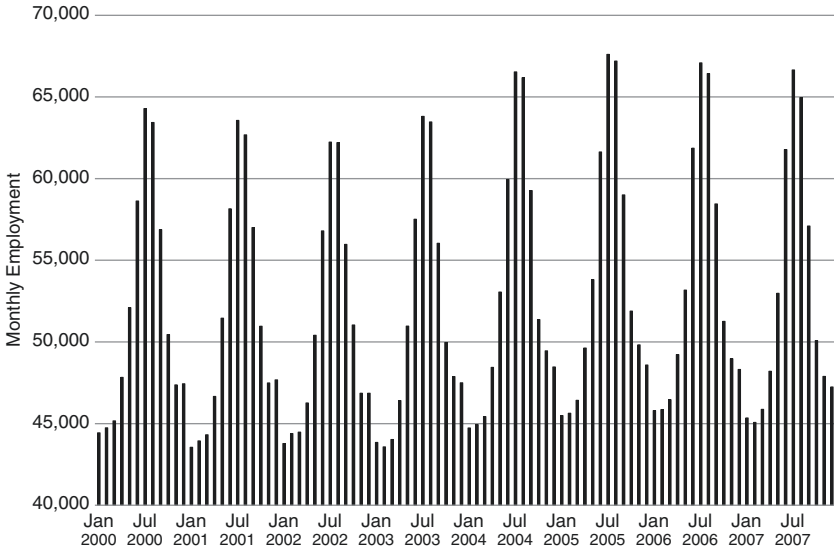
Fig. 1.1 Monthly employment in Ocean City, New Jersey, has a lot of ups and downs

employment persistence. Focusing on a period of January 2000 to December 2007—the Great Recession's official start date—we see that job growth occurring in Ocean City did not "stick" over time. Although employment increased by 37 percent, on average, between January and July each year, it decreased by that same amount (37 percent) over the next six months (from July to the next January). So despite the job creation that takes place—almost like clockwork—on an annual basis, the total change from January 2000 to December 2007 was a measly 6.3 percent.

Of course, an explanation for Ocean City having among the lowest employment persistence of all US metropolitan areas is its status as a summertime "beach town." These places—such as Ocean City, Myrtle Beach (South Carolina), and Hilton Head Island (South Carolina)—provide lots of "fun things to do," which is a regional amenity that we'll touch on later in the book. In some research that Richard Florida discussed in his CityLab blog of August 27, 2014, we found that Ocean City experiences the largest (among all US metropolitan areas) seasonal declines in employment at the end of the summer.[16]

1.4   Top US Regions for Economic Development

Table 1.1 shows the top US metropolitan areas and states according to the economic development index, constructed by applying equal weights to the employment, income, and persistence indices. The top metros for

Table 1.1   Top US regions for economic development

Large metropolitan areas (one million or more people in 1990)	Index value
San Jose-Sunnyvale-Santa Clara, CA	100
San Francisco-Oakland-Hayward, CA	94
Houston-The Woodlands-Sugar Land, TX	90
Dallas-Fort Worth-Arlington, TX	78
San Antonio-New Braunfels, TX	77
Denver-Aurora-Lakewood, CO	73
Seattle-Tacoma-Bellevue, WA	72
Phoenix-Mesa-Scottsdale, AZ	72
Sacramento–Roseville–Arden-Arcade, CA	71
New Orleans-Metairie, LA	68

Small Metropolitan Areas (less than one million people in 1990)	Index value
Midland, TX	100
Odessa, TX	100
The Villages, FL	100
Austin-Round Rock, TX	100
Laredo, TX	91
Fayetteville-Springdale-Rogers, AR-MO	88
Bismarck, ND	85
Casper, WY	84
Victoria, TX	83
Fargo, ND-MN	82

States	Index value
North Dakota	100
Texas	84
Utah	83
Wyoming	80
Colorado	66
Oklahoma	64
Arizona	61
Nebraska	60
Alaska	58
Vermont	56

Source: Author's calculations using data from the U.S. Bureau of Economic Analysis, and U.S. Bureau of Labor Statistics.

economic development are split into two population size categories: places with fewer than one million people in 1990 and those with one million or more residents at that time. The economic development index—as well as the employment, income, and persistence indices—is scaled and interpreted such that a place with a value of 100 has the highest score among all regions (i.e., 381 metropolitan areas or 50 states); and a value of zero corresponds with the lowest-ranked state or metropolitan area.[17]

Nine of the ten highest ranking large metros for economic development are located west of the Mississippi River—New Orleans, which is located "on" the river, is the only exception—and three metropolitan areas located in California and Texas are among the top-ten large regions. Five places in Texas also crack the top ten for overall economic development among the smaller regions, along with two metropolitan areas located in North Dakota.

The top large and small metropolitan areas according to the economic development index are San Jose, San Francisco, and Houston; and Midland (Texas), Odessa (Texas), The Villages (Florida), and Austin, respectively.[18] Outside of Texas and top-ranked San Jose—the hub of Silicon Valley—the other best performing large metros include "new economy" mainstays San Francisco, Denver, and Seattle. Along with our current look at the top large and small metropolitan areas, throughout the book we'll examine the effects of the regional characteristics on economic development by metro area size. A major theme that comes up over and over is the differences in the factors found to impact the growth of good jobs in large and small regions.

The top states for economic development (shown in Table 1.1) are North Dakota, Texas, and Utah. The top-ten states for economic development include only one place located east of the Mississippi River, Vermont, and six of the top performers (North Dakota, Texas, Wyoming, Colorado, Oklahoma, and Nebraska) are counted among states that make up the US Great Plains. When many people think of thriving economies, the first states that come to mind are California and Massachusetts, or even Florida. These places, however, are nowhere to be found in the top-ten list for (overall) economic development.

1.5   Pictures are Worth 1,000 Words

Throughout the book, we'll examine how a wide variety of regional characteristics affect the economic development of states and US metropolitan areas. The specific characteristics that we'll consider—things like

taxes, human capital (e.g., people with college degrees), and the presence of amenities (e.g., nice weather)—are selected to represent strategies that regions around the country leverage to encourage the growth of good jobs. Our discussion and analysis of these strategies, as well as the regional characteristics chosen to represent them, will follow a common routine.

The beginning of each chapter will identify a strategy and articulate the basic logic for why we might expect it to support the growth of good jobs in a region. You should be able to absorb a strategy's basic logic, if you don't already know it, in less than 60 seconds. Think of it as a strategy's "elevator pitch," or speed dating introduction. We'll then delve a little bit deeper and look at how others (academics and other researchers) have examined the strategy and what they found. The purpose here is to provide a flavor of past work on the subject, without going overboard. Given that most of the topics could be (and have been) books in themselves, a comprehensive review of other studies—even some that are highly relevant—is beyond our scope.

My favorite part of the chapters is when we examine if—and how—the economic development indicators are related to the regional characteristics used to represent the various strategies. This is how we put them to the test. For these exercises, we typically look at how a region's characteristics back in 1990 affected its economic development moving forward (recall that the employment and income indices have components that measure growth from 1990 to 2014). This means that, throughout the book, much of our discussion about states and US metropolitan areas will focus on how they looked over 25-years ago. This will provide a trip down memory lane to some, and a history lesson to others. Each chapter ends with a discussion of the lessons learned from the analysis and a few principles that regions should consider when using the strategy in the pursuit of economic development.

To provide an idea of the type of analysis that we have in mind, Fig. 1.2 is a scatter plot showing the relationship between the economic development index of US states and a measure of the popularity of each state's "most distinctive" musical artist.[19] I chose this silly example (and the use of Last.fm "scrobbles" as an indicator of popularity) because, as much as I enjoy listening to music, I have no reason to believe that this regional characteristic will have an effect—one way or another—on economic development. Thus, you are invited to pay more attention to the method of analysis than to the subject matter.
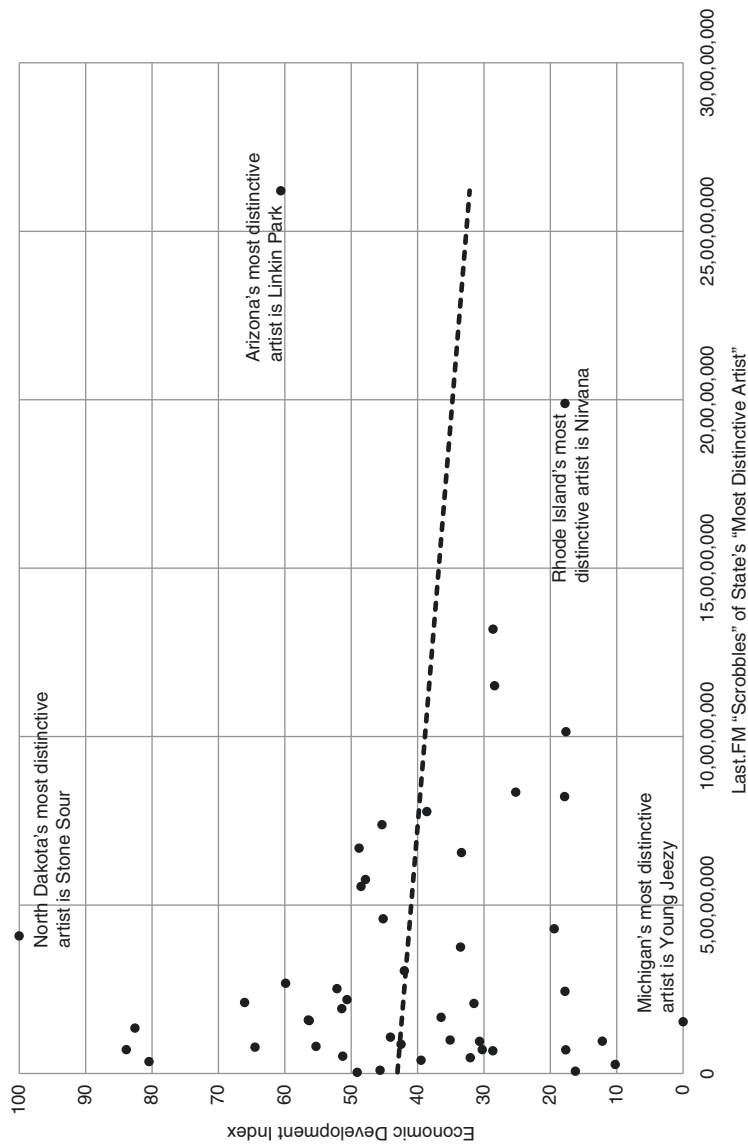
Fig. 1.2 The popularity of a state's most distinctive music artist has no effect on the growth of good jobs

Scatter plots, like the one shown in the figure, are useful tools to examine the statistical relationship between two variables. The variable that you are trying to explain—throughout the book, we'll be interested in the factors that affect one of the economic development indices—is typically placed on the vertical ("up and down") axis. The variable that you are testing for an impact—in most cases, a regional characteristic that represents a given strategy—is placed on the horizontal ("side to side") axis.

Figure 1.2 shows the combinations of state economic development index values and the counts of scrobbles (of the state's most distinctive musical artist) for 49 states (Alaska is missing due to the inavailability of information on its most distinctive artist). If you were interested in any particular state, you could actually find it on the scatter plot. Looking at a single point would tell us a lot about that state—its economic development index value and the popularity of the state's most distinctive artist—but nothing about whether music popularity affects the growth of good jobs.

That's where the trend line, shown in the figure, is useful. It summarizes, for all regions, the relationship between the two variables displayed on the scatter plot. An upward-sloping line would suggest a positive relationship between a state's economic development and the popularity of its most distinctive musical artist—that is, this measure of musical popularity is associated with more robust growth of good jobs. A downward-sloping trend line would indicate that economic development is lower in places that favor more popular artists, while a flat trend line would suggest that economic development is unrelated to the popularity of a state's most distinctive artist.

As expected, the flat—although slightly downward-sloping—trend line in Fig. 1.2 follows our intuition of no connection between economic development and the popularity of a state's most distinctive musical artist. But what if the trend line had a more pronounced slope? Would it provide "enough" evidence to conclude that economic development is somehow tied to a region's taste in music?

Since looks can be deceiving (and sometimes it's hard to judge the strength of an impact with the naked eye), we'll use a regression-based approach to determine whether the results provide enough evidence to conclude either a positive or negative relationship. More specifically, we'll estimate a linear regression model where the dependent variable is an indicator of economic development (i.e., the employment, income, persistence, or economic development index) and the explanatory variable is the regional characteristic of interest. The trend line is shown as

a solid line when the regional characteristic has a statistically significant impact on the economic development indicator; otherwise, the trend line is dashed.[20]

To understand this book, you don't need to know very much about statistics. Just keep in mind that an upward-sloping trend line, combined with a relationship that is strong enough to register as statistically significant (i.e., the trend line is solid), suggests that the economic development indicator shown on the vertical axis is positively associated with the regional characteristic plotted on the horizontal axis. In other words, the strategy represented by the characteristic is "good" for economic development. On the other hand, a downward-sloping and solid trend line indicates that the strategy is "not so good" for economic development.

1.6   I Said "Catch-Up," Not "Ketchup"

Now that you're an expert on statistical analysis, I probably can't convince you that the amount of ketchup consumed in a region is a key factor affecting its economic development. That's sillier than the idea that the popularity of a state's most distinctive musical artist could have an impact on its economic development.

> But I said "Catch-Up Effect," not "Ketchup Effect."

Before we start to examine the types of strategies that regions use to support the growth of good jobs, let's first look at how "market forces" might impact the economic development of regions. For a lot of goods and services, economists have great faith in the power of markets—if left alone—to arrive at outcomes that are desirable to buyers and sellers, and even society as a whole. The three main factors that determine a region's economic development—that is, job growth, income, and employment persistence—are outcomes of labor markets influenced by the forces of demand and supply. In the case of these employment-based outcomes, the demand comes from businesses in the region that are looking to hire people and the supply is made up of local residents available to work. Most people trust markets to ensure that their favorite grocery store will have the items on their shopping list—ice cream, pasta, and (yes) ketchup. If markets can organize the transactions of millions of goods and services on a daily basis, can they encourage the growth of good jobs in the places where they're needed most?

An old theory about the growth of regions, known as the neoclassical regional growth model, suggests that market forces can lead to an outcome where places with low wages—i.e., areas in need of higher-paying jobs—experience more robust income growth than other regions (Barro and Sala-i-Martin 1995; Harris 2008). This is referred to as "convergence" in the parlance of economic growth studies, but we can call it the "catch-up effect" using less scientific jargon. If this process of convergence applies to states and US metropolitan areas, then we would expect places with low wages to catch up to more affluent regions.

The basic set-up of the neoclassical regional growth model is that workers combine with equipment and machinery—that is, physical capital—to produce a region's output. Places with an abundance of equipment and machinery per worker (i.e., a high capital-to-labor ratio) tend to be very productive and generate a lot of output per worker, which translates into high wages and incomes. On the other hand, productivity and wages are low in places where physical capital is scarce relative to the number of workers. An important assumption of the neoclassical regional growth model is one of "decreasing marginal returns." This means, in plain English, that adding more workers to a fixed amount of equipment and machinery will usually increase the total amount of output that is generated, but the extra (i.e., marginal) output from each new worker will be lower than the additional output from those who were hired earlier.

You don't need to look any further than your office's copy room to find an example of decreasing marginal returns. One person could make a lot of copies—say, 1,000 copies in ten minutes—by running all of the machines (assuming there's more than one) at the same time. Adding a second person to the copy room could probably increase the total amount of copies—say, 1,600 copies—as both workers use their own machines. But, consistent with decreasing marginal returns, the number of extra copies added by the second person (i.e., 600 additional copies) is lower than the output of the first individual (i.e., 1,000 copies) when working alone.

Taking the copy room example a few steps further, we can predict the behavior of workers who want to make copies and your boss who is looking for the best place to install a new machine. Your co-workers would seek out the copy room with the most machines relative to the number of other people (i.e., highest capital-to-labor ratio), because that's where they could make the most copies. Your boss, who's in charge of installing the machines, would place a new one in the room with the most

people relative to copiers—that's where it would do the most good. The process of people seeking out the copy room with the most machines per worker, and copiers being installed in the areas with the most workers per machine, would reach a logical stopping point when all of the rooms have the same number of people per copier.

> So what do copy rooms have to do with the growth and development of regions?

According to the neoclassical regional growth model, the same thing that makes an empty copy room attractive to someone who wants to make a lot of copies (i.e., the promise of high productivity) also makes a region with a generous capital-to-labor ratio attractive to workers—that is, high productivity and wages. Likewise, the reason why your boss would put a new machine in the room with the most people per copier is similar to why companies would locate in low-wage regions that are capital scarce. It's where they receive the biggest bang for their investment buck.

Bringing all of this back to the topic at hand, we can use insights from the neoclassical regional growth model to think about how market forces might affect the growth of jobs and incomes in states and US metropolitan areas. First, the neoclassical regional growth model predicts that low-wage regions, which are capital scarce, will experience more rapid wage growth than places that start out with higher wages. This type of catch-up effect, if it takes place, is good news for struggling regions. It means that market forces (i.e., companies investing in regions that provide the highest returns) will increase wages—an important part of what it means to achieve economic development—in places that are most in need of this type of boost.

Figure 1.3 is a scatter plot that provides evidence of converge—that is, less well-off regions growing faster than more affluent ones—occurring across US states. The vertical axis shows the average annual growth rates of per-capita income between 1900 and 1990, while income levels in 1900 are depicted on the horizontal axis.[21] The points in the scatter plot reveal a strong pattern and the downward sloping trend line shows a negative relationship between the income growth of US states and their starting position in 1900. In other words, consistent with the predictions of the neoclassical regional growth model, the low-wage states grew faster than those with more favorable starting positions. They "caught up" over time.
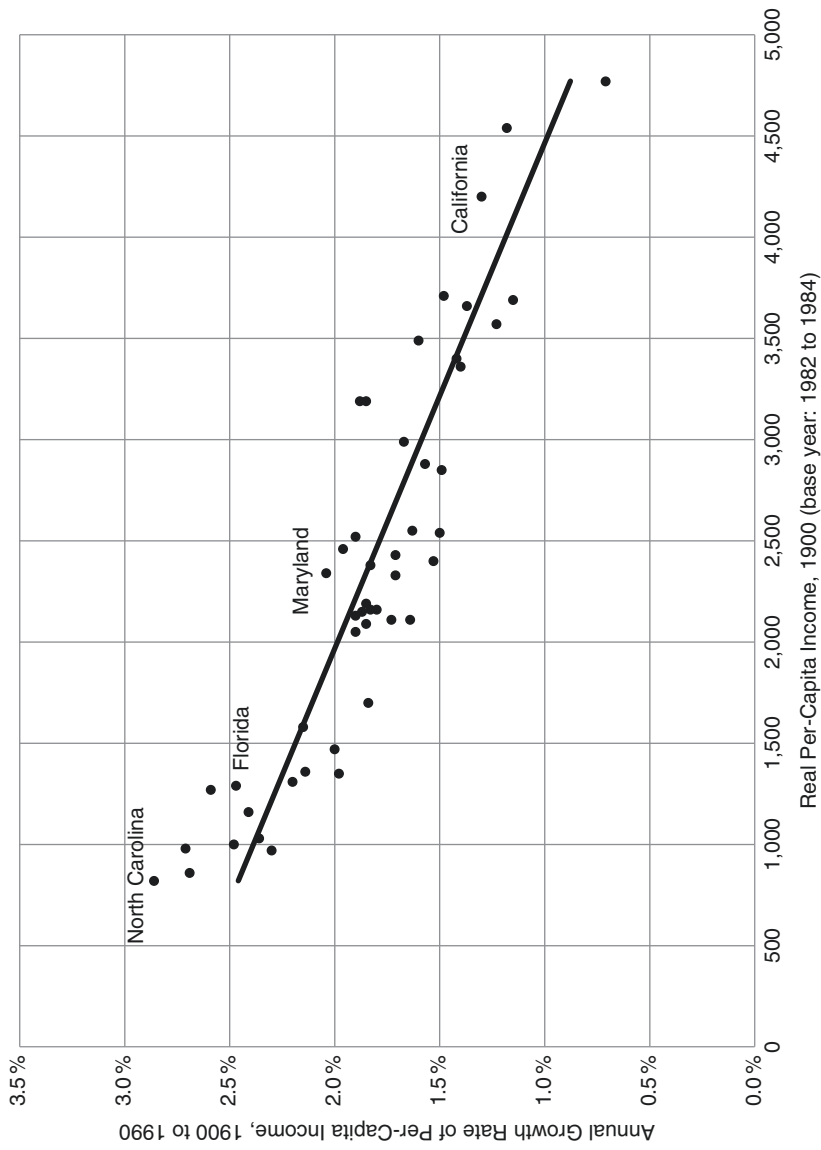
Fig. 1.3   Less-affluent states caught up to higher-income regions between 1900 and 1990

A second prediction of the neoclassical regional growth model is that people will seek out and migrate to the most productive places. Going back to the "copy room example," this is similar to the behaviour of your co-workers finding the place with the most machines per person, which provides the promise of the greatest productivity. Applied to the growth of regions, this idea suggests that places with high wages will experience more rapid population growth. Evidence in support of this type of behavior is shown in Fig. 1.4. Once again, we track per-capita income (as of 1900) on the horizontal axis (using data from Barro and Sali-i-Martin); but now the annual population growth of states (using Census data) is shown on the vertical axis. The upward-sloping trend line suggests that, indeed, high-wage regions were more attractive to workers. Just like you would select an empty copy room if you wanted to make a lot of copies.

The analysis of population growth in Fig. 1.4 provides a nice point of contrast to what we just learned about income growth, which is an important indicator of good jobs. Increases in population, on the other hand, are better characterized as "growth"—pure and simple. Attracting more people means that a place is growing, but it does not necessarily mean that people in the area are better off.

The state of Florida is an interesting exception to the rule that more robust rates of population growth occurred in places with higher initial incomes. The Sunshine State experienced the third highest rate of population growth between 1900 and 1990, despite having one of the lowest incomes at the turn of the twentieth century. Since Florida also had a relatively high rate of income growth (see Fig. 1.3), which we would expect given its low initial income level, it turns out to be the lone example of a region that experienced a simultaneous increase in "growth" (i.e., population growth) and "development" (i.e., income growth). As we'll see in a little while, Florida was ahead of its time in this respect.

Over most of the twentieth century, we can see in Fig. 1.5 that (with the exception of Florida) the regions with the highest growth rates of income—a key indicator of economic development—experienced the lowest rates of population growth, and vice versa. This outcome of the neoclassical regional growth model, which combines insights from the first two predictions related to where businesses will invest and people will move, suggests that "development" and "growth" might be difficult to achieve simultaneously. This is because the high productivity and wages that contribute to population growth make regions less attractive to businesses seeking out places to invest.
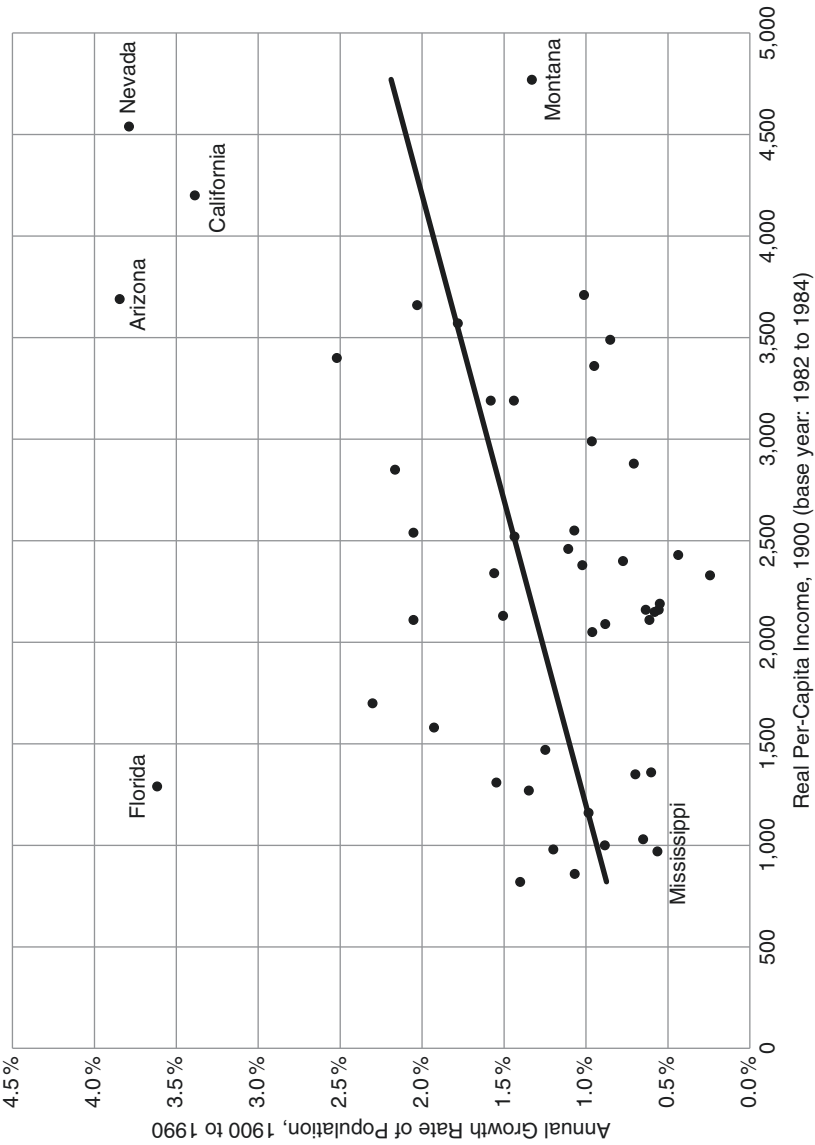
Fig. 1.4 People flocked to high-income states between 1900 and 1990
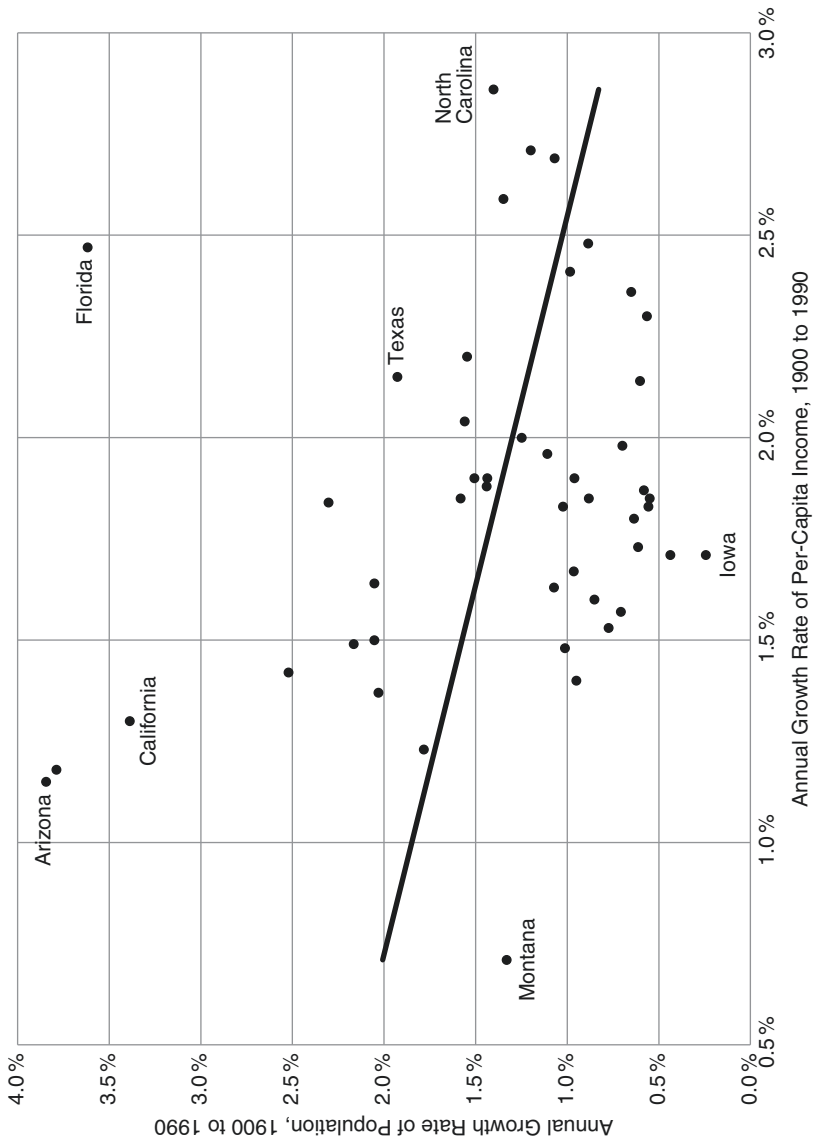
Fig. 1.5 Most states "grew" (i.e., population growth) or "developed" (i.e., income growth) between 1900 and 1990

These market forces, as described by the neoclassical regional growth model, provide mostly "good news" to struggling regions and low-wage workers. First off, the very feature that characterizes a struggling region—that is, its low productivity and wages—is the same thing that makes it attractive to businesses. In addition, the movement of people to high-wage regions suggests that mobility affords individuals the opportunity to improve their economic well-being.

1.7   SORTING AND INNOVATION HUBS

An extensive analysis conducted by Robert Barro and Xavier Sala-i-Martin (1995) generally found evidence of convergence taking place among US states and in other regions around the world, as predicted by the neoclassical regional growth model. Although the study by Barro and Sala-i-Martin covers a long time period—in the examples that we show, it is 90 years—the end dates are around (or before) 1990. Since then, and perhaps starting even a little earlier, things changed for US regions.[22] The winds of convergence switched directions and ushered in a new era in which some regions grew and developed—like Florida did between 1900 and 1990—while others fell behind.

How could this be? What happened to the US economy to change how basic market forces affected the economic development of regions?

The simple answer (for now) is that the United States changed from a manufacturing-based economy to one that relies more heavily on services and knowledge-based activities. This change did not violate the key assumption of the neoclassical regional growth model, but it occurred because the most important type of capital switched from physical (i.e., buildings and machinery) to human capital (i.e., brain power). So while it might still be the case that adding an additional worker to a piece of manufacturing equipment is subject to decreasing marginal returns, having one more person involved in a knowledge-based activity is not.

Revisiting our example about behavior in your own workplace, let's change the scenario from making photocopies to brainstorming new ideas for a marketing campaign. It was easy to see that the best place to make copies is the room with the fewest people relative to the number of copy machines. That's where people are most productive. It's also easy to appreciate that, for many people, the best environment for coming up with new ideas is a common space with the most minds at work. If given the choice of a packed board room or a cubicle by yourself, the most

productive place for the exchange of ideas is among your co-workers. That's because, unlike the task of making photocopies, the process of generating ideas is not subject to decreasing marginal returns as more people become involved.

If anything, the generation of new ideas is subject to increasing returns as more people are using and thinking about them. Whereas the places with the highest capital-to-labor ratios (i.e., the most productive regions) were not as attractive to firms deciding where to locate an old-style manufacturing plant, the places with the densest networks of human capital are the most desirable to new people and investments by knowledge- and idea-intensive businesses. In a knowledge- and idea-based economy, the behavior of businesses and individuals simply locating where they are most productive results in a divergence of "growing and developing" versus "declining" regions. This general concept is based on a family of economic growth models, as developed by Paul Romer (1986) and others, which are governed by increasing returns to scale. It's also at the heart of the ideas about regional economic development suggested by Richard Florida and Enrico Moretti.

Richard Florida's (2002) work on the Creative Economy discusses a "sorting" of people and economic activity in which some regions emerge as highly productive centers of creativity and idea generation, whereas other places are home to less idea-intensive work and lower levels of economic well-being. As a side note, it's interesting that Florida's research documents that the share of workers in creative occupations overtook those working in manufacturing and production-based jobs during the decade of the 1980s. This changing of the guard, occurring at end of the period of convergence shown in Figs. 1.3 and 1.4, provides credence to the idea that the US economy changed its orientation shortly before the turn of the twenty-first century. Likewise, Enrico Moretti (2012) explains that US regions are diverging (and not converging) and that the strongest economies—regions that he refers to as "innovation hubs"—are also the places best poised for additional development. In other words, Moretti argues—similar to Richard Florida's ideas about the sorting of people into creative places—that better-off regions will continue to grow and develop.

Can we find evidence of a sorting of places in which some regions are growing and developing, while others are not?

An interesting way to look at how market forces impacted regions starting around 1990, using examples that are more connected to the indicators used elsewhere in the book, is to look at the relationship

between the employment and income indices. Although the analysis focusing on the period of 1900 to 1990 has population change as a measure of "growth," we can use the employment index as an indicator of growing US regions. Figure 1.6 shows the employment and income indices of all 381 US metros. The solid and upward sloping trend line—indicating a positive and statistically significant relationship—suggests that some regions have high values for the employment and income indices, while others have low values for these measures of growth and development. The idea that (employment) growth and development (i.e., income) can occur in the same regions flies in the face of the trends (see Fig. 1.5) that ruled the day throughout most of the twentieth century.

The divergence of US metropolitan areas is best illustrated by comparing places such as Midland (Texas), Fargo (North Dakota), San Jose, and Boston to areas like Dalton (Georgia), Muncie (Indiana), and Pine Bluff (Arkansas). Between 1990 and 2014, Midland saw a 70 percent employment growth rate along with an 83 percent increase in real per-capita personal income.[23] That's growth and development! Over the same 24-year period, Muncie experienced a 7 percent decrease in employment and real per-capita personal income increased by a measly 5.9 percent. In other words, Muncie had fewer jobs and incomes (accounting for inflation) were almost the same in 2014 as they were in 1990. Whereas Midland (and Fargo, San Jose, Boston, and others) grew and developed, Muncie (and Dalton, Pine Bluff, and others) fell well behind the leaders for economic development.

Although the results shown in Fig. 1.6, suggesting a sorting of metropolitan areas, are strong enough to register as statistically significant, there are certainly some exceptions of places that are highly ranked by the employment index but not the income index—and vice versa. For example, Las Vegas has an employment index value of 69, suggesting strong growth between 1990 and the near present. Its income index value of less than ten, however, places Las Vegas 373rd out of 381 metropolitan areas. At the opposite corner of the figure is New Orleans. The Crescent City has a high income index value of 76, but it's one of the lesser-performing metros in terms of growth (employment index value of 30). Here's a metropolitan area with "good jobs," but not particularly strong growth. These examples and many others suggest that, despite the distinct trend of a sorting and divergence of US metros, it's not by any means a pattern that applies to all.

The rest of the book seeks to identify the regional characteristics—we'll look at factors such as a high level of exports per-capita, a large presence of
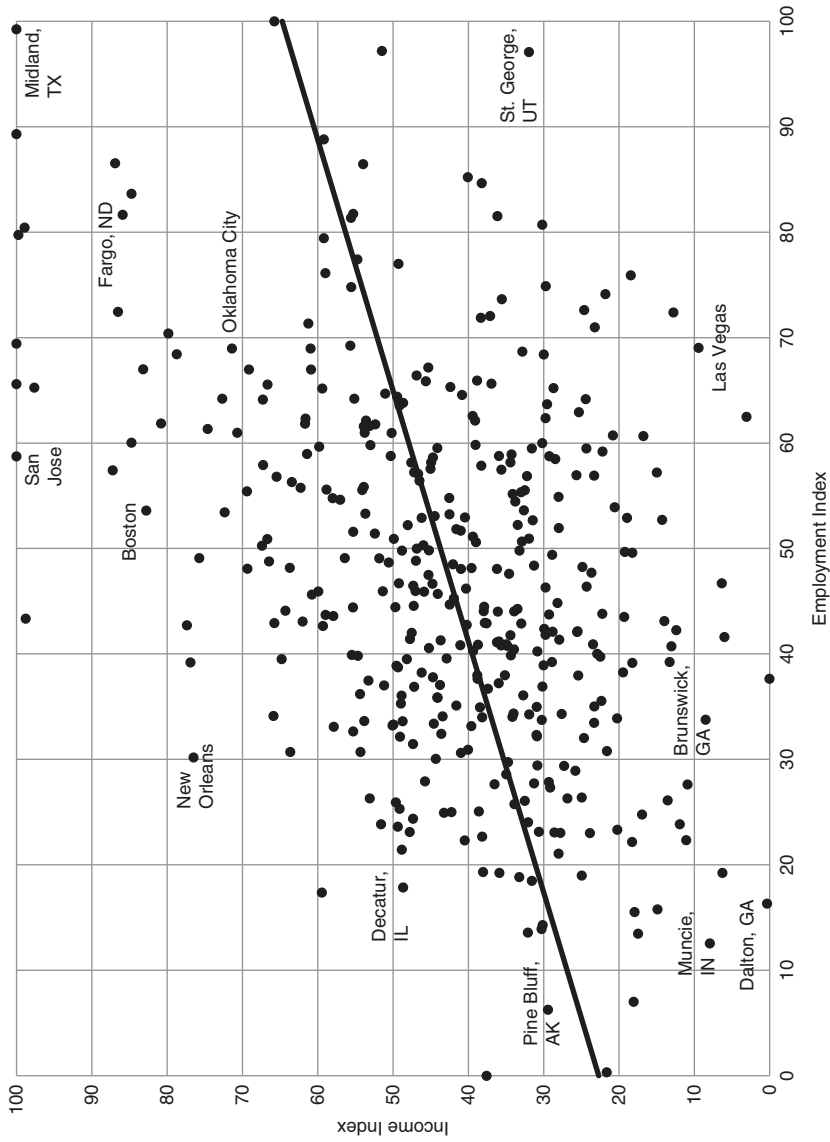
Fig. 1.6 Starting in 1990, some US metropolitan areas "grew" (i.e., employment index) and "developed" (i.e., income index)

small businesses, and a flurry of residential construction—that promote job growth, high incomes, and persistent employment conditions. Regional characteristics that support all three are likely to be the keys to economic development in today's economy. But even regional characteristics that support one or two of these indicators—without harming the other(s)—can be used by regions to help improve their residents' well-being.

Notes

1. Pew Research Center (2012) With Voters Focused on Economy, Obama Lead Narrows. http://www.people-press.org/2012/04/17/with-voters-focused-on-economy-obama-lead-narrows/. Accessed September 19, 2016.
2. Gallup (2013) Economy Remains a Diminished Top Problem in U.S. http://www.gallup.com/poll/163637/economy-remains-diminished-top-problem.aspx. Accessed September 19, 2016.
3. Gallup (2016) Economy Tops ' Minds as Most Important Problem. http://www.gallup.com/poll/189158/economy-tops-americans-minds-important-problem.aspx. Accessed September 19, 2016.
4. It's interesting that only 2 percent of those polled by Gallup in February of 2016 believed that the "gap between rich and poor" is the most important issue, despite it being the centerpiece of Bernie Sanders' campaign for the Democratic presidential nomination in 2016.
5. John Blair (1995) and others have also noted the importance of growth to economic development.
6. Metropolitan area definitions follow the U.S. Office of Management and Budget's February 2013 delineations. Executive Office of the President, Office of Management and Budget (2013) OMB Bulletin No. 13-01. https://www.whitehouse.gov/sites/default/files/omb/bulletins/2013/b-13-01.pdf. Accessed October 11, 2015.
7. In some of the indices presented throughout the book, more than one region is assigned a score of 100. This is because some of the variables (used to construct the indices) are "capped" at 100 when metropolitan areas have values that are more than three-standard deviations above the mean.
8. These industry employment shares were calculated using data from the U.S. Bureau of Labor Statistics.
9. The overall US employment growth rate was calculated using data from the U.S. Bureau of Labor Statistics.
10. The state- and metro-level figures used in the employment index (i.e., from 1990 to 2014, and 2004 to 2014) are from the U.S. Bureau of Economic Analysis. Some of the growth rates presented throughout the book used a "midpoint formula" for the calculations.

11. Employment growth rates were calculated using data from the U.S. Bureau of Economic Analysis.
12. State- and metro-level unemployment rates are from the U.S. Bureau of Labor Statistics.
13. State- and metro-level per-capita income figures are from the U.S. Bureau of Economic Analysis.
14. State- and metro-level monthly employment figures are from the U.S. Bureau of Labor Statistics.
15. The monthly employment dynamics statistic uses a method outlined by Chris Fawson, Dawn Thilmany and John Keith (1998). The figures are based on 12-month intervals.
16. Florida R (2014) The Roller-Coaster Economies of Vacation Towns. http://www.citylab.com/work/2014/08/the-roller-coaster-econo mies-of-vacation-towns/379207/. Accessed October 18, 2015.
17. Recall that more than one region may be assigned a score of 100. This is because some of the variables (used to construct the indices) are "capped" at 100 when metropolitan areas have values that are more than three-standard deviations above the mean.
18. Since 1990, Austin's population has surpassed one million residents.
19. Lamere P (2014) Exploring regional listening preferences. https://music machinery.com/2014/02/25/exploring-regional-listening-preferences/. Accessed July 12, 2015.
20. A 5 percent (two-sided) p-value is used as the cutoff to determine statistical significance. The p-value's magnitude is influenced by the number of observations used in the regression analysis—in our case, 50 states and 381 metropolitan areas. This means that the "size" of an impact could be similar in the analysis of states and metros, but it could pass the threshold for statistical significance for metros but not states.
21. The data used for both variables come from Barro and Sala-i-Martin (1995).
22. In Chapter 9, we'll revisit this idea that the patterns of convergence switched to divergence around 1990.
23. Metro-level employment and per-capita income figures are from the U.S. Bureau of Economic Analysis.

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Low Costs and the Growth of Good US Jobs

2.1   BEST PLACES FOR BUSINESS

Most farmers and gardeners, and even those of us who have trouble caring for an artificial Christmas tree, would tell you that a region's climate is vitally important to the growth of crops and other plants. In this context, climate refers to a wide range of natural characteristics such as weather conditions—for example, temperature and rainfall—as well as the length of the region's growing season and presence of certain types of pests. As a way to compensate for an unfavorable climate, farmers can take deliberate actions—for example, irrigation, use of pesticides and fertilizers, and even moving operations into a greenhouse—to help their plants bear fruit.

Similarly, an area's business climate encompasses a wide range of factors that are believed to determine its ability to grow good jobs. Just like a farmer can do things to help plants thrive, people—for example, elected officials, business owners, industry leaders, and even local residents—can help shape some aspects of a region's climate for economic development. This means that almost all of the regional characteristics that are covered in this book, from low taxes to high technology, fall under the broad umbrella of business climate. We even consider the impacts of pleasant weather, a crucial factor to farmers, in Chapter 7 that examines the impacts of a region's amenities on economic development.

Several times a year, there's a lot of talk about the business climate of US regions when various sorts of "best for business" rankings are released and dissected by local officials and the media. One of the best known

rankings is *Forbes* magazine's annual list of the "best states for business." The *Forbes* business climate rankings are figured as a combination of six broad categories of regional economic characteristics and outcomes.[1] A category titled "business costs" (e.g., costs of labor, energy, and taxes) captures the factors most closely related to the costs of doing business in a region. The other five categories used in the *Forbes* rankings are "regulatory environment" (e.g., labor regulations and availability of tax incentives), "labor supply" (e.g., educational attainment rates and net migration), "economic climate" (e.g., job growth and unemployment), "growth prospects" (e.g., venture capital investment, and business openings and closures), and "quality of life" (e.g., natural climate and crime rates).

In the categories listed above, notice that the broad group of "economic climate" includes job growth and unemployment, which are two of the variables used in the employment index to measure the economic development of states and metropolitan areas. On the other hand, factors such as educational attainment (part of the "labor supply" category), natural climate, and crime (part of "quality of life") are regional characteristics that are examined later in the book to see if they impact economic development. If we used the *Forbes* rankings (that are based, in part, on job growth and unemployment) to represent business climate, it's practically a given that we would find a positive relationship between the employment index and *this definition* of business climate. This means that, instead of using the "best states for business" rankings as given, we have to come up with a measure—comparable to what *Forbes* refers to as "business costs"—that can be used to examine the relationship between economic development (as we define it) and the costs of doing business in a region.

According to *Forbes*, Virginia was the top state for business climate in 2013, followed by North Dakota and Utah. About his state's top ranking for business, Virginia Governor Bob McDonnell said, "This award is a great testament to the commonwealth's transportation infrastructure, education system, skilled workforce, regulatory environment and excellent quality of life, all of which lead to strong economic growth" (Staff 2013). In his remarks, Governor McDonnell took a broad view—for example, infrastructure, education, and quality of life—as to why Virginia is good for business. It's interesting, however, that he did not mention low taxes or other business costs as contributing factors to the state's success. This might be because *Forbes* counted Virginia among the top-five states in four of the six broad categories used in the business climate rankings, with

"business costs" (Virginia ranks 22nd) and "growth projects" (Virginia ranks 17th) being the exceptions.

Utah Governor Gary Herbert had a more focused message after his state was recognized by *Forbes* as having the top business climate in 2012. He proclaimed, "Government should get off of your backs and out of your wallets" (Hall 2013). Regarding his own state, Governor Herbert suggested, "We have a fertile environment for entrepreneurs and business." After losing the title to Virginia in 2013, Utah regained the top spot in the *Forbes* rankings in 2014 and 2015. About the 2014 rankings, *Forbes* noted Utah's low energy costs and strengths in the areas of high technology, life sciences (similar to biotechnology), and financial services (Badenhausen 2014). Later in the book, we'll look at high technology and biotechnology, and examine the impacts of financial and other producer services on economic development.

But, for now, let's start with the effects of "business costs" on the growth of good jobs in US regions. The specific cost items considered in this chapter are taxes, energy prices, and labor costs.

2.2   You Get What You Pay For

The logic underlying a low-cost economic development strategy is straightforward. Businesses typically have an objective of profit maximization, and costs—along with revenues—are an important part of a company's bottom line. Places with less expensive costs of doing business should, therefore, be more attractive to establishments seeking out new locations. Likewise, proponents of this approach to economic development believe that low costs help the competitiveness of incumbent companies (i.e., those already operating in a region) as well.

An argument often raised against a low-cost economic development strategy is that "you get what you pay for," and higher taxes could be the bill for a greater provision of public services (e.g., roads and bridges, K-12 education, libraries, and parks), or—in the case of labor costs—high wages are the price to pay for a productive workforce. If high taxes, in fact, go hand-in-hand with better quality public services (and if these services are valued by businesses and the workers they are trying to attract), then a strategy of cutting taxes—along with the services that they support—could be counterproductive in the pursuit of economic development.

The issue of how taxes affect state and local economic development received a lot of attention from economists during the 1980s and 1990s.

The studies conducted around this time sought evidence related to a long-standing idea that taxes have very little impact on business location, as suggested by John Due (1961) in the early 1960s. The wave of studies conducted some 25 years following Due's work include several articles by Timothy Bartik (1985, 1992), as well as contributions by numerous others (Phillips and Goss 1995; Wasylenko 1997). This research, which examined and summarized results from a lot of different regions, generally found that taxes have a detrimental effect on state and local economic activity. These results called into question John Due's earlier findings of "no effect" of taxes on the behavior of businesses.

A noteworthy feature of these studies and others on the topic is that, although many researchers found that taxes have a negative effect on regional economic activity, the range of impacts is very wide. For example, Timothy Bartik's (1992) survey of the literature suggests that it requires between $2,000 and 11,000 in lower taxes to support an additional job. Accounting for inflation, this translates to between about $3,400 and 19,000 in lower taxes per job. Such a wide range of results from past studies could mean that the impacts of taxes are very situation specific (i.e., they matter in some places, but not others; some taxes matter, but not all types; etc.) or this lack of precision might arise because measuring the impacts of taxes is tricky business. This difficulty arises because taxes, which adversely impact a company's bottom line, are used to pay for public services that are needed for commerce to take place. In fact, a common explanation offered when studies find that taxes have no impact, or when they're even found to increase economic activity, is that higher taxes often go along with a greater provision of public services—so it's hard to disentangle the two.

A few studies, including an article that I published with Kathleen Bell (Gabe and Bell 2004), address this issue head-on with a "balanced-budget" constraint built right into the analysis (Helms 1985; Mofidi and Stone 1990). As the name implies, this constraint means that a decrease in taxes is accompanied by a reduction in government spending, and vice versa. Using this approach allowed us (and others) to incorporate the simultaneous impacts of taxes and government spending on regional economic activity. Studies with balanced-budget constraints generally show that, controlling for the amount of government spending in a region, taxes have a detrimental effect on economic growth. In other words, people and businesses don't like taxes for the sake of taxes. When they are used to pay for certain types of public services, however, the tax impact remains negative—that is, taxes lower economic growth—but it is offset (or can

even be overshadowed) by the positive impacts associated with the provision of these services. This means that, while people and businesses don't like taxes, they can be tolerated if the money they generate is spent on the "right" things.

One of the best known theories of public finance is Charles Tiebout's (1956) idea that households "vote with their feet" and select the community that provides their desired mix of public services (e.g., school quality, public parks) and taxes. Because people have different preferences—and even a person's perception of what's important can change over time—this theory of "household sorting" is consistent with growth occurring in low-tax regions with sparse public services, as well as other households selecting regions with more extensive services that are paid for by higher taxes. It's just a matter of preferences.

In a series of articles that examined the effects of business climate on state economic development, the research team of Jed Kolko, David Neumark, and Marisol Cuellar Mejia (2012, 2013) considered two broad measures that they termed as "tax-and-cost" and "productivity/ quality-of-life" indices. The tax-and-cost index includes factors such as taxes, other (non-tax) costs of doing business, the size of the public sector, government regulations, and the like. The *Forbes* business climate categories of "business costs" and "regulatory environment" are, more or less, captured by what Jed Kolko and colleagues refer to as "tax-and-cost." The productivity/Quality of Life Index (QOL) index is a collection of factors ranging from business incubation and public infrastructure (i.e., regional attributes that influence the productivity of businesses) to crime and health insurance (i.e., attributes that affect a region's quality-of-life).

The research found an inverse relationship between the states' rankings according to these two business climate indices; places with "good" tax-and-cost rankings fare worse in terms of productivity/ QOL, and vice versa. Such an arrangement allows for the type of household sorting—that is, "voting with your feet"—suggested by Charles Tiebout. That is, some businesses and households might choose to locate in low-tax states with a lighter provision of infrastructure and government funded services, while others might prefer states with higher taxes and more public services.

Detailed statistical analysis conducted by Jed Kolko and colleagues revealed that, of these two broad business climate indicators, the tax-and-cost index is a better predictor of state economic growth. They found that the long-term growth of states was more robust in places that

scored well according to the tax-and-cost index than in states where it is more costly to do business. On the other hand, the productivity/QOL index had very little bearing on state growth and, if anything, it performed in the opposite direction of what you might expect. States that ranked better according to this business climate index performed no better—and, in some cases, worse—in terms of long-term growth than lower ranked places according to the productivity/QOL index.

Although these results suggest that state taxes and the costs of doing business in a region matter for economic growth, Kolko et al. (2012) tempered their findings with a warning that "the role of these policies should not be overstated." In an extension to the main analysis, the research team found that the impact of the tax-and-cost index on state growth was overshadowed by other regional characteristics such as population density and the types of industries present in the region. This means that other regional characteristics—and we'll examine many of them later in the book—tend to have larger impacts on economic growth than the effects associated with taxes and other costs of doing business.

2.3   Effects of Business Costs on Economic Development

With all of this as a background, let's look at the effects of business costs on the indicators of regional economic development that we defined in Chapter 1. Although most other chapters of the book—with the exception of the chapter on amenities—will devote almost equal time to the analysis of states and metros, our look at taxes and other costs of doing business has a greater emphasis on states. This is because our measures of business climate, especially taxes and energy costs, do not vary very much within a state. Or, at least, the variation across states is typically greater than the variation within them. Take, for example, the case of taxes. Although some taxes, such as property tax rates, are determined by the city or town of location, many key tax rates (e.g., personal and corporate income taxes) are set by state (and federal) policy. Similarly, electricity rates—often used to represent the price of energy in business climate indices—are typically regulated by public utility commissions in each state.

Other costs of doing business, however, may differ widely across metros, even those located in the same state. An example here is the cost of labor—that is, wages and salaries. In California, for instance, the

metro-level payroll per worker in 1990 ranged from about $16,000 in El Centro to almost $32,000 in the San Jose metropolitan area.[2] The average metro-level payroll per worker, figured across California metros, was about $21,000 (with a standard deviation of around $3,300). To account for these types of differences in business climate factors within states, as well as across state lines, a section near the end of this chapter will examine the effects of a business cost index that incorporates metro-level taxes and labor costs, along with state-level taxes and energy costs.

But let's start with an analysis of state-level business costs.

The state-level business cost index, measured as of 1990, is made up of three components: the state (and local) tax burden, electricity rates, and average labor costs. The tax burden figures come from The Tax Foundation, which is the same source used by *Forbes* magazine in its rankings of the best states for business.[3] The Tax Foundation defines "tax burden" as the "amount of state and local taxes paid by state residents to both their own and other governments" divided by "each state's total income." Statistics show that the percentage of income devoted to taxes in 1990 was considerably higher in states at the top of the list—places such as New York, Wisconsin, and New Jersey (with tax burdens of almost 11 percent or higher)—than in the lowest-taxed states (e.g., Alaska, Wyoming, Nevada, and Tennessee had tax burdens of 7.5 percent or lower). For many businesses and households, the difference between a few percentage points of income devoted to taxes could be noticeable.

As is the case with the state and local tax burden, there was in 1990—and still is today—high variability in electricity rates across states. Data from the U.S. Energy Information Administration show that three states—Washington, Idaho, and Montana—had electricity rates of less than four cents per kilowatt hour. About one-third of states had electricity prices of 6 to 8 cents per kilowatt hour in 1990, while about 20 percent of the states paid more than eight cents per kilowatt hour.[4] The overall spread from 3.4 to 9.5 cents per kilowatt hour is quite large, as a savings in electricity costs of even a couple of cents (per kilowatt hour) could translate into substantially lower costs for energy-intensive businesses.

If you sense that a trend is emerging, then the state-level labor cost figures won't disappoint. There's considerable variation among states in this regional characteristic, too. Although the average payroll per worker in 1990 ranged from $20,000 to 25,000 in 46 percent of the states, it was

between $15,000 and 17,500 per worker in five states (e.g., South Dakota and Montana) and over $25,000 per worker in six states (e.g., Alaska and Delaware).[5] Just like a firm that uses a lot of energy would notice the difference between paying, say, four and nine cents per kilowatt hour of electricity, a large employer could see substantial differences in labor costs across states.

When thinking about these differences in labor costs, however, we need to keep in mind that high wages are actually an indication of a productive workforce. This means that robust wages, as they lead to high levels of personal income, are a sign of "good jobs" in a region and, hence, economic development as it's defined. Whereas businesses consider wages as a "cost" when considering where to locate—that is, they are part of a region's business climate—an increase in productivity (resulting in higher wages) is also an objective of economic development policy. This idea of high wages representing a "benefit" of economic development and a "cost" to local businesses illustrates the balancing act that policymakers face when implementing a low-cost strategy. Promoting (and trying to maintain) low labor costs in a region might be attractive to businesses, but they are hardly a selling point to households looking for a place to locate.

Similar to the economic development indicators described in Chapter 1, the business cost indices are measured on a scale of zero to 100, where a value of 100 indicates the best—that is, lowest-cost region. The top-five states for (overall) low business costs in 1990 were Wyoming, Montana, South Dakota, Tennessee, and Nevada. A summary of the states counted among the top ten for each of the three individual categories of low taxes, energy prices, and labor costs reveals a couple of interesting findings. First off, a total of 25 states—so one-half of the country—are among the lowest-cost regions in at least one of the categories: 20 states make one of the top-ten lists, and the other five (Idaho, Montana, South Dakota, Tennessee, and Wyoming) are included on two of the lists. This means that a relatively large number of states are considered to be a low-cost region, in at least one dimension. Second, the top-ranking states for low costs of doing business are reasonably diverse in terms of geography. Southern states such as Tennessee, Mississippi, and Kentucky are among the lowest-cost states, as are places in the multi-state region encompassing the Dakotas, Wyoming, Idaho, and Montana. Notably absent from the lists of the lowest-cost states for doing business are places in the Northeastern (and Midwestern) United States. The four most expensive

states for doing business in 1990—according to the (overall) business cost index that captures taxes, energy prices, and labor costs—were New York, New Jersey, Connecticut, and Massachusetts.

Since some of these measures are within the purview of policymakers, it would stand to reason that a region's elected officials could have some influence on its costs of doing business. To investigate this idea, Fig. 2.1 shows the relationship between the (overall) business cost index in 2010 and the number of years between 2001 and 2010 that the state had a Republican governor.[6] This business cost index for 2010—which was formed by applying equal weights to the tax, energy cost, and labor cost indices—is similar to the business cost index for 1990 (described above); only the years are different.

Although Fig. 2.1 looks a little strange because the points only appear along the horizontal axis in increments of 1.0 (and there were no states that had Republican governors for one, three, five, or nine of the years), it reveals a pretty wide distribution of political affiliations across the states. For example, ten of the states (e.g., North Dakota, Connecticut, and Utah) had Republican governors over the entire period, while seven states (e.g., Iowa, Oregon, and Washington) did not have a Republican governor in any of the years. States had, on average, Republican governors in 5.1 of the ten years between 2001 and 2010.[7]

It is also worthy of mention that the 2010 business cost index, plotted along the vertical axis, tracks reasonably well with the *Forbes* "business costs" category used in its rankings of the best states for business in that year. *Forbes* is said to incorporate information on taxes, energy costs, and labor costs into its rankings, but it uses uneven weights and it is unlikely that we used the exact same data sources.[8] Nevertheless, the rank-order correlation between the *Forbes* "business costs" category and our index shown in Fig. 2.1 is 0.64, which suggests that both approaches are capturing many of the same things.

As shown at the top of Fig. 2.1, the best five states for low business costs in 2010 were South Dakota, Montana, Mississippi, Wyoming, and Nevada. Two of these states—South Dakota and Wyoming—were also among the top-five states for low business costs, according to *Forbes* magazine. The three lowest-ranked states for business costs (i.e., the most expensive places) in our analysis are Connecticut, New Jersey, and New York. Similarly, these states hover near the bottom of the "business cost" category rankings—45th, 46th, and 43rd, respectively—according to *Forbes*.
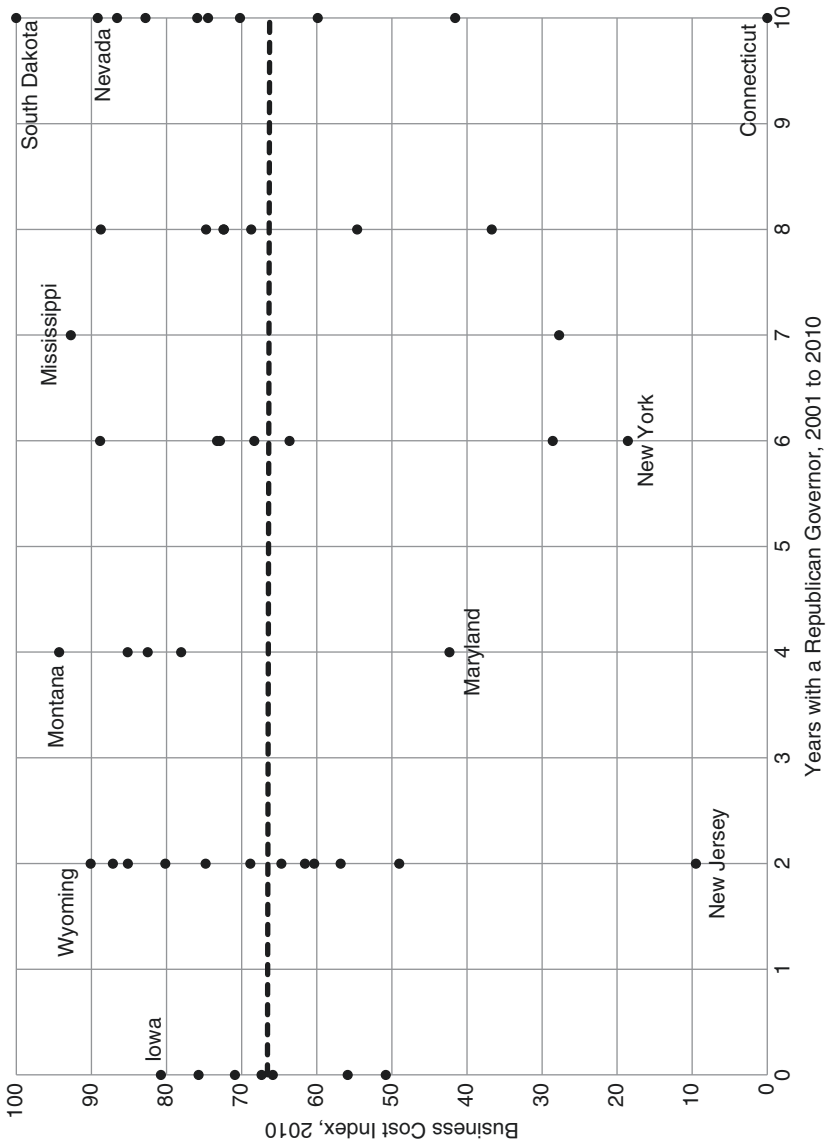
Fig. 2.1   The political affiliation of a state's governor has no effect on its costs of doing business

Recalling that the business cost index is constructed such that higher values correspond to lower costs, an upward slope of the trend line in Fig. 2.1 would suggest that having more years of a Republican governor is associated with lower costs of doing business in a state. The actual trend line, however, is almost perfectly flat. This suggests that the political affiliation of a state's governor between 2001 and 2010 had no bearing, one way or another, on its costs of doing business.

A noteworthy tidbit shown in Fig. 2.1 is that South Dakota and Connecticut—the states with the lowest and highest business costs, respectively—both had Republican governors over the entire period of 2001 to 2010. It is also the case that the top-ten states for low business costs in 2010 have a wide range in the number of years with Republican governors. Two of the top-ten states had Republican governors for two years (and four years), three states for all ten years, and a single top-ten state for low business costs had Republican governors for six, seven, and eight years. All of these findings are consistent with the result, summarized by the flat trend line, that there's "no relationship" between a state's costs of doing business and its highest leader's political affiliation.

So now comes the big question: Are low business costs good for economic development? The answer is, like a lot of things in economics, "sort of."

Figure 2.2 is a scatter plot showing the relationship between the employment index (measured from 1990 to the near present) and the business cost index from back in 1990.[9] Since both indices are constructed such that higher values mean "better" outcomes—that is, more robust employment conditions and lower costs of doing business—an upward slope of the trend line would suggest that low business costs are associated with an increase in employment growth. The actual trend line in Fig. 2.2 is upward sloping and shown as a solid line, indicating a positive and statistically significant effect of low business costs on the employment index of states.

This means that, at least for states, having low costs of doing business is beneficial for employment growth. It is worth looking at a few states to examine, in more detail, the relationship between the employment and business cost indices. Let's start with a few places that could be held up as examples of low costs being good for regional employment. As shown in Fig. 2.2, Wyoming is the best state for low business costs in 1990 and it's the fifth-ranked states according to the employment index. North Dakota
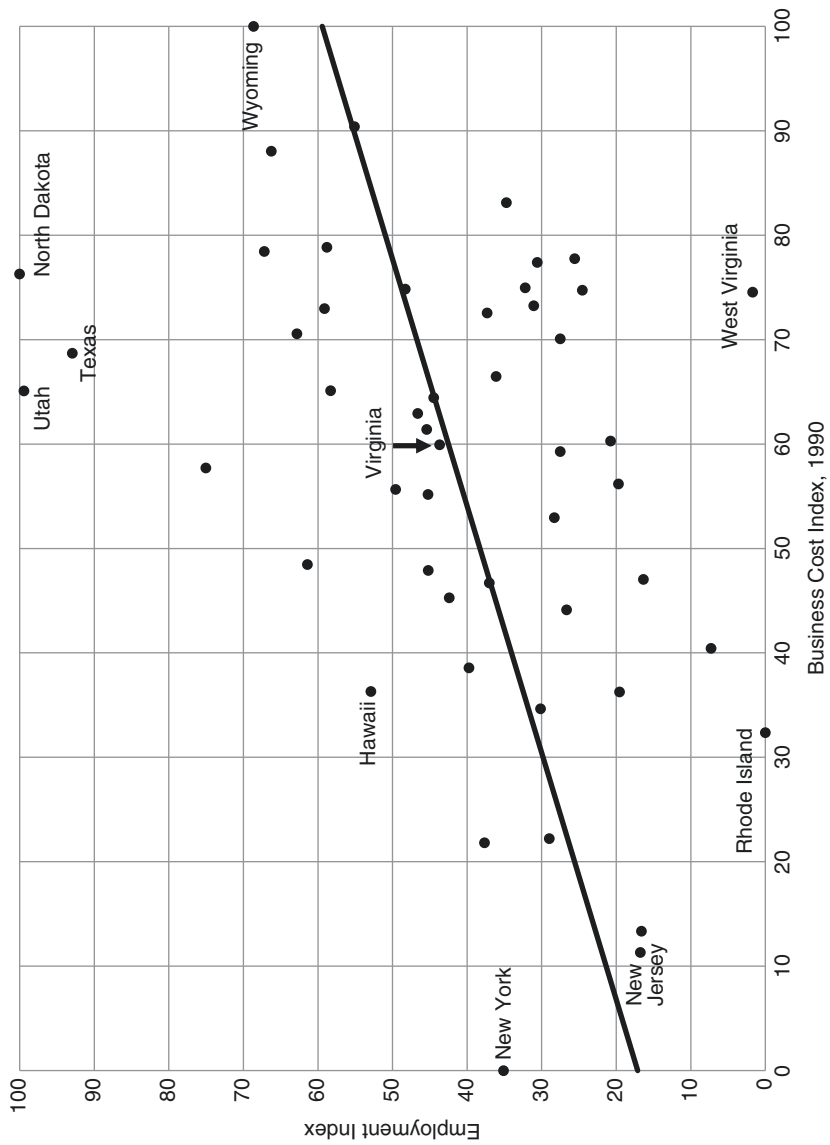
Fig. 2.2 Low costs help the (employment) growth of states

and Texas are other examples of states with combinations of low business costs and strong performance according to the employment index. The outcomes of these particular cases, along with the relationship for all states summarized by the trend line, could be used to argue in favor of a low-cost strategy to support the growth of regions.

At the bottom left corner of Fig. 2.2 are examples of states—for example, New York, New Jersey, and Rhode Island—with the highest costs of doing business in 1990 and relatively poor performance according to the employment index. The experience of these states is also consistent with the idea that low costs are good for employment growth; or—as is the case for New York, New Jersey, and Rhode Island—high business costs are a detriment to growth. But not all states follow this pattern. West Virginia is the 13th-ranked state for low business costs, yet it's the second-worst performer according to the employment index. Both New York and New Jersey, with more expensive costs of doing business, have higher employment index values than West Virginia. This means that having low business costs provides no guarantee of rosy employment conditions.

You might be wondering where Utah and Virginia are situated in the scatter plot showing the relationship between the employment index and costs of doing business. Recall that the governor of Utah—perched at the top of the hill with the best business climate according to *Forbes* in 2012 (and again in 2014 and 2015)—claimed that "government should get . . . out of your wallets." The governor of Virginia, who took top billing in *Forbes'* 2013 business climate rankings, mentioned everything (e.g., infrastructure, education, and quality of life) except for the costs of doing business. As it turns out, Utah did not make the top-ten list for low business costs in 1990—it was ranked 22nd—but its ranking improved to 12th place in 2010. (Of course, Utah's improved performance in 2010 is more relevant to the *Forbes* rankings in 2012, 2014, and 2015.) Back in Chapter 1, we saw that Utah is the third-ranked state in terms of overall economic development. Utah is also the second-ranked state according to the employment and persistence indices. The governor of Utah, therefore, is accurate in saying that "we have a very fertile environment for entrepreneurs and business"—it's just unlikely to be the result of having extremely low costs.

Now, moving our attention to Virginia, we find that it was the 27th-ranked state according to the business cost index in 1990, and this ranking fell to 42nd place by 2010. This means that, as of 2010, only a handful of

states—for example, New York, New Jersey, California—had higher costs of doing business than Virginia. Of the three components of the business cost index, Virginia performed best (i.e., lowest cost) in 1990 according to the tax index, where it was the 23rd-ranked state. Virginia is the 22nd-ranked state according to the employment index, which is a slightly better ranking that its 27th place for (overall) business costs. It's interesting that Virginia's employment index value is almost exactly what would be predicted based on the state's costs of doing business. That is, the point corresponding to Virginia in Fig. 2.2 is very close to the trend line that summarizes the relationship between the employment and business cost indices.

All things considered, the analysis shown in Fig. 2.2 suggests that having low costs of doing business is good for the growth of regions. Of course, we don't know yet the exact costs that matter—whether it's taxes, energy, or labor costs—or if business costs impact other aspects of economic development.

Here's where things get a little more interesting.

Figure 2.3 summarizes the impacts of the individual components of business costs on all four of the economic development indices. The bar charts shown in the figure are estimates of the relationship between the economic development indicator and a particular category of business costs, where bars above the zero line mean that low costs have a positive effect on the selected indicator.[10] Specifically, the bars represent the number of standard deviations that the economic development indicators change—either positive or negative—when the business cost indices increase by one-standard deviation.[11] A bar is shaded when the relationship is statistically significant; otherwise, it's not shaded.

To get your bearings in the figure, it shows that a one-standard deviation increase in the business cost index is associated with almost a 0.4-standard deviation increase in the employment index—that's the relationship summarized by the trend line in Fig. 2.2. A quick scan across Fig. 2.3 shows that this result is not a fluke, yet—at the same time—it's an exception to the rule. The finding that low business costs have a positive effect on employment growth is not a fluke, because the results also show that low energy prices and labor costs—two of the three specific types of costs considered—are associated with higher values of the employment index. Nevertheless, another main result shown in Fig. 2.3 is that the cost indices do not have an effect—one way or another—on the income, persistence or (overall) economic development indices. This suggests that the effects of

Fig. 2.3 Low costs help the employment growth of states, but not other aspects of economic development

business costs on employment, which are quite robust, are an exception to the rule. All of this leads us to the conclusion that having low costs of doing business helps the (employment) growth of states, but it does not influence the growth of good jobs.

This main result should not come as too much of a surprise, given the importance of wages and salaries to our definition of regional economic development. The results shown in Fig. 2.3 suggest that having low costs of doing business in 1990 had no effect—one way or another—on the income index, measured from that time to the near present. Although low costs might attract economic activity—that is, people and businesses, which contribute to employment growth—they do not support the types of investments that lead to higher productivity as reflected by a region's wages and salaries.

2.4   Business Costs and the Economic Development of US Metropolitan Areas

To go beyond our analysis that focuses on differences across states—and to account for variability within them—let's now examine the relationship between economic development and the costs of doing business in US metropolitan areas. Here, we use a business cost index that has four components: the tax burden and electricity rates data used in the analysis of states, and metro-level specific indicators of taxes and labor costs.[12]

For the first two components, we simply match the state-level tax burden and electricity rates to where the metropolitan areas are located. In cases where these places straddle state lines, which are fairly rare, the tax burden and electricity rates are determined using data from multiple states and they are weighted by the percentages of the metropolitan area's population located in each state. The metro-specific tax and labor cost figures, however, introduce more variation across regions—even those located in the same state. For example, although the San Jose and El Centro metropolitan areas share the same state tax burden and cost of electricity in California, these regions differ substantially (as noted above) in terms of labor costs—for example, average payroll per worker of about $16,000 in El Centro, compared to about $32,000 in San Jose.

Figure 2.4 shows the relationship between the employment index of US metros areas and the four-pronged business cost index. As was the case in our analysis of states, the business cost index is constructed such that
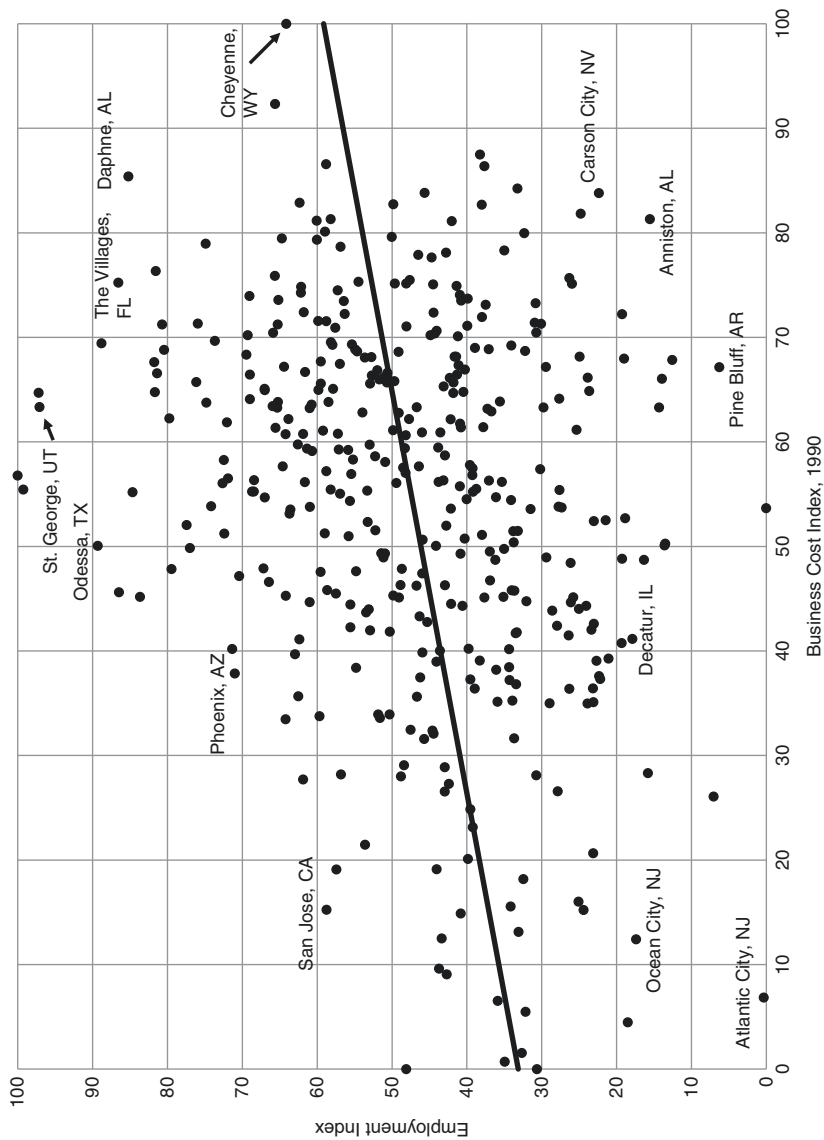
Fig. 2.4 Low costs also help the growth of US metropolitan areas

lower-cost metros have higher index values. The metros with the lowest costs of doing business include places such as Casper (Wyoming), Walla Walla (Washington), Carson City (Nevada), and Johnson City (Tennessee). The low-cost metros tend to be among the smallest regions in terms of population size, and most of them are located in states with relatively inexpensive costs of doing business.

The upward-sloping and solid trend line suggest that, similar to what we found in the analysis of states, having low costs of doing business is good for the growth of US metropolitan areas. Regions such as St. George (Utah), The Villages (Florida), Daphne (Alabama), and Cheyenne (Wyoming) have relatively high values of the business cost and employment indices. These are places with low business costs and robust employment conditions. On the other hand, Atlantic City and Ocean City, New Jersey, are both characterized by high costs of doing business and low values of the employment index.

Just like we found for states, there are many exceptions to the general rule that low costs of doing business help the growth of regions (or, in the case of the New Jersey metros, high costs are detrimental to employment growth). For example, Carson City, Nevada, has a relatively low employment index value even though it's among the top metros for low business costs. In the opposite corner of Fig. 2.4, San Jose has a reasonably high employment index value despite having high costs of doing business. Certainly, a high-tech startup looking for a place to locate would select San Jose—to be around similar Silicon Valley companies—even with its relatively high costs.

In Fig. 2.5, we see that the result of low business costs leading to more robust employment conditions applies to the entire sample of metros (as shown by the trend line in Fig. 2.4), as well as the subsets of small metros and those with one million or more residents. In addition, the analysis shows that having low costs is good for the employment persistence of metros with fewer than one million people. As described in Chapter 1, this economic development indicator captures the "ups and downs" of monthly employment and how well regions recovered after the Great Recession. The combination of low business costs having positive effects on growth and employment persistence translates into a positive impact on the (overall) economic development index of small metros, and for the sample of "all metros" as well.

A comparison of the results for states and metros shows that, at both levels of geography, having low costs of doing business does not affect the
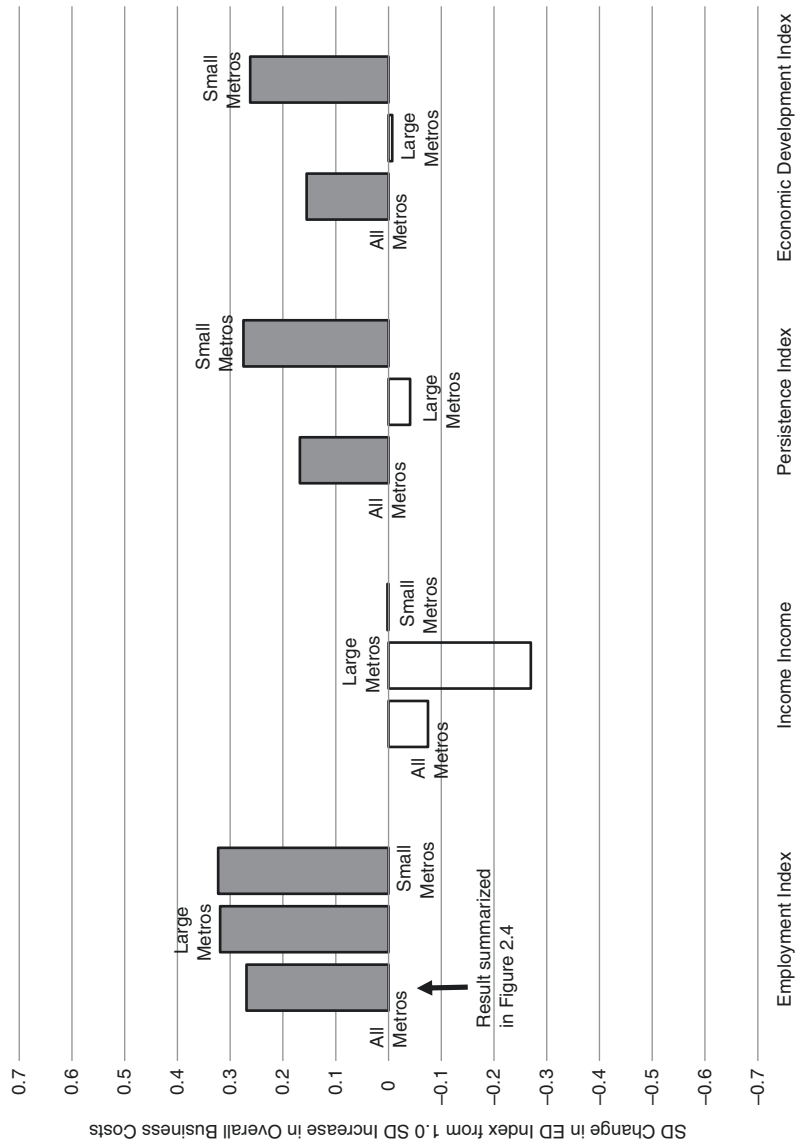
Fig. 2.5 Low costs help the economic development of small US metropolitan areas, mainly through impacts on the growth and persistence of employment

income index. Another similarity from the analysis of states and metros is the very robust finding of a positive relationship between regional employment conditions and having low costs. The positive relationship between (overall) economic development and the business cost index exceeds the threshold for statistical significance in the analysis of metros, but not for states.

Although our analysis of states uses a very different approach than the one employed by Jed Kolko et al.(2013)—who looked at the growth of gross state product between 1997 and 2008—results from both studies provide evidence that having low business costs are associated with improved state-level economic conditions. Our analysis shows that low business costs have a positive effect on (employment) growth, but not the other aspects of statewide economic development; the study by Kolko and colleagues found positive impacts associated with their tax-and-cost index, but these impacts were overshadowed by those attributed to non-business climate factors.

To come full circle, we can wrap-up the analysis of business costs by looking at the relationship between our measures of economic development and the business climate indices used by Jed Kolko and colleagues. Lucky for us, they actually reported the values of their business climate measures—both the "tax-and-cost" and the "productivity/QOL" indices—in a journal article published in 2013. Figure 2.6 is a scatter plot showing the relationship between our employment growth index and the tax-and-cost business climate index developed by Kolko and colleagues. Unlike our business cost indices (e.g., the one used in Fig. 2.2) that are constructed such that higher values indicate lower costs, the tax-and-cost business climate index developed by Jed Kolko, David Neumark, and Marisol Cuellar Mejia has smaller values when costs are lower. This means that a downward-sloping line in Fig. 2.6 would suggest that lower taxes and business costs (as measured by Kolko and colleagues) have a positive impact on regional employment conditions.

Similar to what Jed Kolko, David Neumark, and Marisol Cuellar Mejia found when they examined the growth of gross state product, our analysis reveals a negative relationship between the employment growth index and the tax-and-cost business climate index. In other words, states with lower (i.e., better) average rankings in this aspect of business climate experienced more robust employment conditions. This result is not only consistent with the research of Kolko and colleagues but it's also similar to our results (see Fig. 2.3) that generally found positive (and statistically significant)
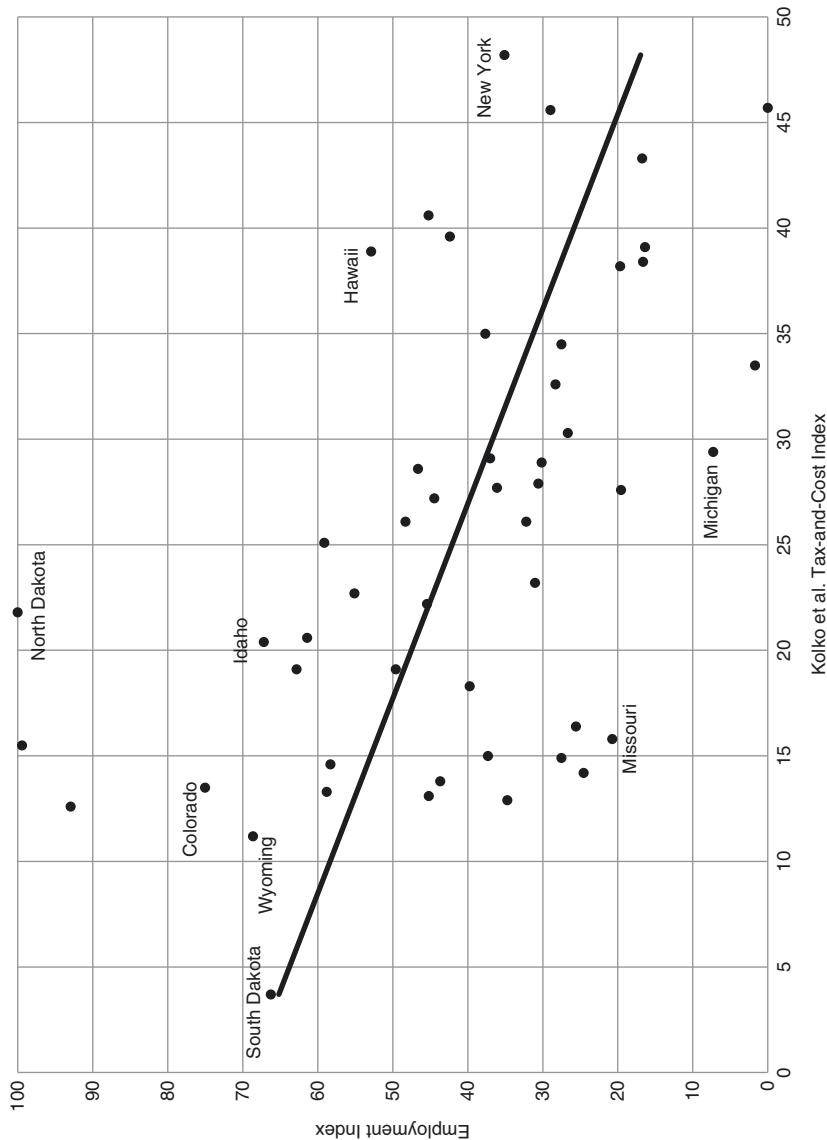
Fig. 2.6 Analysis using the "tax-and-cost" index developed by Jed Kolko and colleagues shows a familiar bottom line of low business costs helping the growth of states

relationships between (employment) growth and the business cost indices that we constructed.

Along with showing a familiar bottom line—that low costs are good for the growth of regions—a close look at Fig. 2.6 reveals some other features in common with our earlier analysis of business costs and state employment conditions. Jed Kolko, David Neumark, and Marisol Cuellar Mejia have New York as the worst-performing state according to their tax-and-cost index (where lower values indicate higher costs), and we show a similar result—that is, New York is the worst-performing state according to our business cost index—in Fig. 2.2. Jed Kolko and colleagues have South Dakota and Wyoming as the top two states for low taxes and business costs, while these states are the first- and third-best performing regions according to our business cost index.

But the similarities don't stop there. We examined the effects of the tax-and-cost index developed by Jed Kolko and colleagues on the income, persistence, and (overall) economic development indices and—similar to what is shown for our business cost index in Fig. 2.3—there's no relationship (either positive or negative) between these indicators of state economic development and the "borrowed" tax-and-cost index. Once again, we find that low business costs are good for the growth of states, but they do not contribute to an increase in overall statewide economic development.

2.5   Low Costs and the Pursuit of Economic Development

This chapter began with the simple premise that businesses, motivated by an interest in profit maximization, might favor regions with low taxes, inexpensive energy prices, and cheap labor costs. Makes perfect sense, given that every dollar spent reduces a company's bottom line. If, in fact, businesses are more apt to locate and invest in regions with low business costs, then we'll find that inexpensive places for doing business perform better than their more costly counterparts in the growth of good jobs.

Some elected officials believe that providing a low-cost location is paramount in the pursuit of economic development, so much so that the concept of a "positive business climate" is often used interchangeably with "low taxes and costs." When a governor or other state and local policymaker proclaims that a region "needs to improve its business climate," she

or he is typically lobbying for a reduction in taxes or other costs of doing business. It's usually not a call for better amenities, or a tax hike to provide additional funding for roads and education.

Our look at the costs of doing business across US regions—examining states and then metros—and its impact on economic development reveals some interesting findings.

First off, we found very wide variability across states in taxes, energy prices, and labor costs. In some cases, the most expensive states for doing business have costs that are almost twice as high as the lower-cost regions. Such a wide spread means that, if costs were all that mattered, companies could seek out relatively inexpensive places to do businesses. The lowest-cost regions for business include states in the Great Plains (e.g., the Dakotas and Montana); and southern (e.g., Mississippi) and western (e.g., Idaho and Wyoming) United States. Notably absent are places in the Northeastern, Mid-Atlantic, and Midwestern United States. There are lots of reasons why business costs differ across regions—including the preferences of households and companies for different bundles of taxes and government spending—but we can rule out the political affiliation of a state's governor as one of them. We found that the number of years with a Republican governor over the ten-year stretch of 2001 to 2010 had practically no bearing, one way or another, on a state's costs of doing business in 2010.

A key result from our analysis is that being a low-cost region for business is good for employment growth, but we didn't always find similar positive impacts for the other aspects of economic development. When looking at metropolitan areas, we found that—along with promoting employment growth—low business costs contribute to higher employment persistence. But the results do not provide any evidence whatsoever that low business costs are associated with more favorable outcomes for the income index. All things considered, the results suggest that low costs are important in the pursuit of jobs, but not necessarily high-paying jobs. Our findings that low costs are good for employment growth are very robust (i.e., supported by several types of analysis examined in the chapter) and they are similar to the results of Jed Kolko, David Neumark, and Marisol Cuellar Mejia. These researchers found that states with better tax-and-cost business climate rankings tend to grow faster than places with less-favorable rankings (i.e., higher-cost regions).

These results, along with the oft-noted observation that the primary objective of many elected officials is to provide "jobs, jobs and more jobs," suggest that the emphasis policymakers place on being a low-cost location

makes sense—at least given their point of view.[13] That is, states and metros with low costs of doing business tend to have more rapid rates of employment growth, which provides the appearance of a thriving economy. Elected officials can point to these employment-based outcomes as "proof" that a low-cost strategy is good for the region's economy. Our findings that being a low-cost region does not support high incomes—one of the main qualities of having good jobs in a region—are not too surprising either. Promoting low labor costs to provide an inexpensive location for businesses is clearly at odds with offering high-paying jobs.

The analysis presented in this chapter—along with the results and advice suggested in other studies on the topic—support the following principles for using a low-cost strategy in the pursuit of economic development.

Principle 1: Having low costs of doing business is an economic growth strategy, but not an economic development strategy. A strategy of lowering the costs of doing business might be appropriate for regions with high unemployment that are in need of jobs. When discussing the definition of economic development in Chapter 1, we noted that "almost any job" could improve economic conditions in regions with high unemployment. Although low business costs won't likely lead to higher incomes in a region, they appear to be able to encourage employment growth.

Principle 2: Taxes are one of many costs faced by businesses, and a whole host of other regional characteristics are more important in the pursuit of economic development. Discussions about the business climates of regions often revolve around the topic of taxes. Of the three business climate measures considered in this chapter, however, taxes is the only one that does not have an effect on the employment growth of states. Likewise, as found by Jed Kolko, David Neumark, and Marisol Cuellar Mejia—and as we'll see in later chapters of this book—numerous other regional characteristics have larger impacts on economic growth and development.

Principle 3: Take a "balanced" approach when discussing taxes, wages, and other costs of doing business. It's probably counterproductive to frame conversations about a region's business climate in a way that divides the community into a battle of "us versus them." For instance, some businesses and even elected officials perceive high wages as a "cost" to avoid, whereas people working in a region think of high wages as a "benefit." Likewise, taxes can be thought of as a "cost" to some individuals in a region, while the services that taxes pay for provide "benefits" to others. The reality of the situation is that all parties involved—local residents,

businesses, and elected officials—benefit from having productive companies and workers in a region. Starting from this premise, instead of choosing sides in an "us versus them" competition, the expenditures made by businesses and households—whether it's taxes, wages and salaries, or spending on energy—can be evaluated in terms of their impacts on regional productivity, either now or in the future.

NOTES

1. More information about these rankings, including the most recent list of the "best states for business," is available at the *Forbes* magazine website, www.forbes.com.
2. The metropolitan area payroll per-worker figures were calculated using data from County Business Patterns of the U.S. Census Bureau.
3. The Tax Foundation State and Local Tax Burdens, 1977–2012. http://taxfoundation.org/article/state-and-local-tax-burdens-1977-2012. Accessed June 10, 2016.
4. http://www.eia.gov/electricity/data.cfm#sales. Accessed June 10, 2016.
5. State-level payroll per-worker figures were calculated using data from County Business Patterns of the U.S. Census Bureau.
6. Political affiliations of state governors are from the National Governors Association.
7. Since some states had Independent governors over the period, it is not the case that states had Democratic governors an average of 4.9 years between 2001 and 2010.
8. The methodology used by *Forbes* to come up with its best states for business rankings is available at the *Forbes* magazine website, www.forbes.com.
9. Recall that the employment index is based on employment growth from 1990 to 2014, and 2004 to 2014; and the unemployment rate in March 2015.
10. Recall from Chapter 1 that these effects are estimated from a regression analysis where the dependent variable is the economic development indicator and the explanatory variable is the regional characteristic of interest, in this case a category of business costs.
11. These bar charts are scaled from a minimum of –0.7 to a maximum of 0.7 to cover the range of impacts associated with regional characteristics presented in other chapters of the book.
12. The metro-level tax burden figures were calculated using data from the 1992 Census of State and Local Governments, U.S. Census Bureau.
13. Paul Courant (1994) suggests that politicians prefer the "one-syllable" words of "jobs, jobs, jobs."

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Winning Industries and the Growth of Good US Jobs

3.1 Most Influential Ideas About Economic Development

In a 1998 journal article, Andrew Isserman laid out what he believed to be the four most "successful and influential" ideas about the growth of regions that elected officials and economic development professionals follow in the pursuit of good jobs. These are (1) industry clusters provide competitive advantages to their members, (2) small businesses are important sources of job creation, (3) regions are helped by having industries that export goods and bring in money from other places, and (4) the "multiplier effect" means that changes in one business or industry have ripple effects that spread through a region's entire economy. Although Isserman made these observations almost two decades ago and the article was written about US rural areas, I think that they still apply today for most regions of the country.

The importance of small businesses to economic development is covered at length in Chapter 5, and the topic of multiplier effects will come up (again) in Chapter 6 in the discussion of high technology. So, for now, let's start with an analysis of industry clusters and export industries. Although these ideas about economic development have different intellectual roots and suggest different types of policies, they are similar in their focus on targeting the types of sectors that can help a region thrive. This practice of industry targeting is also known as "picking winners."

The logic underlying a strategy of picking winners is that the types of industries present in a region can affect its growth and development. The exact explanation for how industries matter depends on the specific approach that you have in mind. A cluster-based approach usually has an end goal of achieving a critical mass of similar businesses in a region—along with the infrastructure, organizations and policies that support them. Such an arrangement helps the competitiveness of these companies and the region as a whole. If the goal of picking winners is to increase exports, the logic underlying this strategy is that money coming from outside the region encourages additional growth as these dollars are spent locally on items such as business services, restaurant meals, retail goods, and even haircuts.

This notion that each dollar's worth of exports has more than that amount of impact on the local economy is the idea behind an "export-base multiplier." An export-base multiplier of, say, 1.4 would mean that $1 million of exports results in $1.4 million of total economic activity; that is, the original $1 million of exports plus an additional $400,000 supported by the spending of businesses and workers in the region (e.g., manufacturing companies purchasing local marketing services, and workers buying haircuts from the town barber).

The idea of "multiplier effects" that Andrew Isserman (1998) had in mind, when discussing the most influential ideas about regional economic development, goes beyond export industries and could apply to any type of company that enters a region, or even one that expands its operations. That is, businesses of all types—those that are part of an industry cluster, an exporter, or otherwise—impact their surrounding areas through the local purchases they make and the spending of their employees. So for manufacturing plants and resort casinos, or anything in between, policymakers want to know the total impact—including multiplier effects—of new or expanding businesses. We'll revisit this topic of multiplier effects in a later chapter about high technology. For now, however, the focus is on industry clusters and export-oriented industries.

3.2   What is All the Fuss About Industry Clusters?

Wherever you go, state and local officials are practically giddy about the thought of having an industry cluster. They love them, even though very few elected officials know exactly how to support—or even spot—a

cluster. On the magical qualities of clusters, Jean-Claude Prager and Jacques-Francois Thisse (2012, p. 102) explain,

> "Valleys" of all kinds have proliferated—Glenn Valley, Silicon Wadi, Medicon Valley, etc., not to mention the innumerable Biotech Valleys— often with no content other than wishful thinking on the part of politicians. Clusters have become a sort of catch-all concept for a wide variety of concrete situations. . . . In many countries, advanced or developing, it is widely believed that introducing a cluster policy suffices to ensure industrial development and prosperity. The policy actually used and its effectiveness seem to be of little importance, as long as the magic word is used.

Although an in-depth analysis of clusters and the policies that support them is beyond our scope—other books have been written about the topic—a brief discussion is useful to understand how clusters are related to the practice of picking winners.

We can think of an industry cluster as a geographic concentration of businesses that make the same (or related) types of goods and services, as well as the organizations (and infrastructure and policies) that provide a supporting network to these businesses and help them grow.[1] The idea of geographic concentration means that businesses in a cluster are located in close proximity, and there needs to be a lot of them (or, at least, a lot of these types of businesses compared to their relative numbers in other places). This part about geographic proximity is key because the businesses have to be close enough so that the cluster can be identified and, more importantly, its members can interact in ways that benefit the companies and surrounding region. The high-tech cluster in Silicon Valley, the high-fashion cluster in Milan, and the insurance cluster in Hartford, Connecticut: all three of these well-known clusters (and most other ones, too) are known by their locations—that is, the "Valley" in Silicon Valley—as much as their products and services.

The second part of the definition—same (or related) types of goods and services—means that the businesses in a cluster are producing similar things, making inputs used by other members of the cluster, or serving the same customers. The former (i.e., "producing similar things") describes a cluster of textile plants in North Carolina, while the latter (i.e., "serving the same customers") characterizes a tourism cluster down the road in Myrtle Beach, South Carolina, which is comprised of the hotels, restaurants, waterslides, golf courses, and even the *Ripley's Odditorium* that serve visitors to the area.[2]

Last, but not least, the final part of the definition—organizations that provide a supporting network and help them grow—underscores the idea that the success of clusters goes beyond the businesses and products (or services) that define them. The supporting networks vary widely; it could be local infrastructure, shared marketing, education and training programs, or regional policies and technology transfer that help the cluster flourish.

The key to a cluster-based economic development strategy is that when you have lots of firms (and their workers) doing similar (or complementary) things in a confined space, you end up with benefits that are external to the businesses—but these impacts are internal to the cluster and shared by others. Using more technical jargon, we can say that the actions of the businesses and workers that make up a cluster provide "positive externalities" to other members of the cluster.

A related idea that increasing the amount of economic activity in a confined space could provide a benefit to a business itself—that is, one that is internal to the company—should come as no surprise. This is the premise of "economies of scale," which explain why firms would rather make their products at one plant and ship them to their customers elsewhere than operate plants wherever they are located. Firms incur fixed costs (i.e., costs that do not depend on the amount of production) for every plant they operate, so the average cost of production declines with each unit that goes out the door.[3]

Although these economies of scale that are internal to businesses are easily understood, it might take some more explanation to convince you that an increase in the overall amount of economic activity occurring in a cluster can provide benefits to others. Such a recognition of the power of clusters goes all the way back to the writings of Alfred Marshall. In 1890, he came up with the "big three" benefits of industry clusters: knowledge spillovers, the availability of specialized inputs, and a pooled labor force.[4]

A knowledge spillover occurs when ideas and information about an industry are shared among cluster members. Such a flow of information—made easier when firms are located in close geographic proximity—is a benefit that is external to any given business, but is internal to the cluster itself.[5] On the subject of knowledge spillovers, Marshall (1890) wrote:

> The mysteries of the trade become no mysteries; but are as it were in the air, and children learn many of them unconsciously. Good work is rightly appreciated, inventions and improvements in machinery, in processes and

the general organization of the business have their merits promptly discussed; if one man starts a new idea it is taken up by others and combined with suggestions of their own; and thus become the source of further new ideas.

Marshall's explanation that the "mysteries" about an industry and its practices are "in the air" is the essence of knowledge spillovers.

Another benefit of industry clusters, the availability of specialized inputs in the region, comes from the simple fact that the demand for goods and services used by businesses operating in a local industry increases with the number of companies that purchase them. Alfred Marshall (1890) explained that:

the economic use of expensive machinery can sometimes be attained in a very high degree in a district in which there is a large aggregate production of the same kind [that is, a cluster], even though no individual capital employed in the trade be very large. For subsidiary industries devoting themselves each to one small branch of the process of production, and working it for a great many of their neighbours, are able to keep in constant use machinery of the most highly specialized character . . .

In other words, a company that uses "expensive machinery" to produce specialized inputs will locate near a critical mass of firms that use these goods.

Alfred Marshall wrote about the "machinery" used by companies that provide inputs to a cluster, but the same logic applies to specialized producer services. Consider, for a moment, the location choice of a law practice that specializes in intellectual property rights related to the bio-technology industry. Although this company would be unlikely to locate in an area that attracted its "first" biotech firm, a large industry cluster would be attractive to this law office as well as other businesses that provide services to life sciences companies.

If a cluster can provide enough demand to support the "economic use" of expensive machinery and attract a supply chain of goods and services providers, a group of similar businesses can also capture the attention of local officials. While a single company (unless it's really large) might have trouble convincing a region to develop policies or invest in infrastructure that are specific to its needs, a critical mass of businesses lobbying for such changes makes a region's governing body more likely to implement them—and it should.

The third benefit of industry clusters, noted by Alfred Marshall, is a pooled labor force. This benefit arises because a large concentration of businesses in an industry is a magnet to workers with the types of skills the companies need. As is the case with all three of the benefits of industry clusters, an individual company might not consider this externality it provides to other businesses in the region. Setting up shop around similar companies, however, might benefit the entire cluster when a deeper pool of labor is available to help other businesses expand.

In his own words, Marshall (1890) describes this benefit of clusters as

a great advantage from the fact that it offers a constant market for skill. Employers are apt to resort to any place where they are likely to find a good choice of workers with the special skill which they require; while men seeking employment naturally go to places where they expect to find a good market for their skill, in consequence of the presence of many employers who require its aid. The owner of an isolated factory is often put to great shifts for want of some special skilled labour which has suddenly run short; and a skilled workman, when thrown out of employment in it, has no easy refuge.

Industry clusters provide such a refuge to workers (and they benefit employers, too).

Michael Porter (1990, 2000), who is the person most closely associated with the present-day strategy of industry clusters, can tick off numerous other benefits in addition to Marshall's big three. These include the availability of supporting infrastructure—physical, administrative, information, and science and technology—and the role of local demand for products made by cluster members. At the heart of Michael Porter's cluster-based theory is the idea that they foster cooperation and competition. The signs of cooperation include firms working together to promote local policies (or marketing efforts) that support the cluster, and businesses—as a group—providing enough demand for local services and infrastructure that are important to cluster members. Competition among cluster members, according to Porter, encourages them to improve their goods and services through product enhancements and seeking out better methods of production.

Although businesses of all shapes and sizes can potentially be involved in the types of cooperative activities and competitive behaviors characterized by clusters, it is often groups of smaller and locally owned companies

that stand to benefit the most from belonging to a cluster. Ann Markusen (1996) developed a typology of industrial districts in which these types of businesses (of course, involved in the production of similar types of goods or services) are referred to as "Marshallian clusters." This is an appropriate label given that these types of clusters are most likely to accrue the big three benefits described by Alfred Marshall.

Another type of cluster described by Markusen is the hub-and-spoke variety, which is comprised of one (or a few) very large company(ies) along with a supply network that serves the "hub business." Whereas the organizational structure of a Marshallian cluster is characterized by lots of small companies forming wide ranges of networks and sub-networks (that determine the flow of ideas and workers, as well as the nature of cooperation and competition among cluster participants), the pecking order in a hub-and-spoke cluster is clear: the large hub company arranges the network of suppliers to best suit its need. Information flows from the hub company to its suppliers in the hub-and-spoke cluster, whereas it circulates among all members—often in a less organized fashion—in a Marshallian cluster.

A third type of cluster in Ann Markusen's typology is a satellite platform. This type of cluster, which resembles industrial parks found at the outskirts of many US cities and towns, is characterized by several branch plants of multi-establishment firms that are located in the same place. In satellite platform clusters, the plants do not require much of a local supply network (if they did, the cluster might become a hub-and-spoke variety). Because the branch plants are often controlled by the firms' headquarters located outside the region, the usual signs of clusters—that is, cooperation and information sharing among members, or even competitive behavior—are often absent in satellite platform clusters. Even though a causal glance at a satellite platform might appear to reveal some of the benefits associated with clusters, there is usually very little interaction among companies. That's because these branch plants typically take their marching orders from their corporate headquarters, wherever they might be.

The final entry in Ann Markusen's typology is state-anchored clusters. This type of cluster is characterized by the presence of a large public or nonprofit organization—say, a university or military base—along with the types of businesses that locate around such an organization. Just like a region such as Detroit is synonymous with the presence of automakers in the case of a hub-and-spoke cluster, places such as Champaign-Urbana (Illinois) and State College (Pennsylvania) are known as college towns;

and Fort Hood (Texas) is recognized as the location of a large military base. Although other companies are often attracted to (and supported by) the organization that defines a state-anchored cluster, the extent to which businesses interact (and generate the types of benefits described by Alfred Marshall and Michael Porter) depends on the exact nature of the state-anchored cluster.

As an example of where a state-anchored cluster might generate benefits along the lines of those proposed by Alfred Marshall, a private company started by engineering professors from a nearby university derives benefits from knowledge generated on campus, and both partners—the private company and university—mutually benefit from the relationship.[6] On the other hand, a private bookseller located in that same college town might compete with the university bookstore (and on-line bookstores, for that matter) in what is more likely to be a zero-sum game. Finally, a submarine sandwich shop located next to campus benefits from the constant source of hungry customers (including economics professors), but the university cafeteria probably does not feel the impact of the grinders that go out the door.

3.3   Let us Not Forget About Export Industries

Just like we could fill an entire book about industry clusters, the same thing can be said about the economic development strategy of building and expanding a region's export base—although the former topic is a little more *en vogue* these days. However, compared to industry clusters that everyone seems to want but few truly know how to implement, the idea of pursuing economic development through an increase in exports is relatively straightforward to understand.

In a 1955 journal article, Douglass North explained how a region's economy can be separated into sectors that export goods outside the region (i.e., "basic" industries) and those that provide goods and services for mostly local consumption (i.e., "residentiary" industries). He argued that a region's economic fate depends heavily on its ability to gain a competitive advantage in one or more basic industries. The income that comes into the region from the sales of these exported goods is then re-spent locally in the residentiary sectors. The process by which the money coming into the region leads to additional economic activity is referred to as a "multiplier effect"—or, more specifically—an "export-base multiplier."

The idea underlying an export-oriented economic development strategy is that the growth of basic sectors—that is, exports—leads to an even larger impact on the regional economy via the export-base multiplier. This means, from a practical standpoint, that local policymakers are tasked with identifying the sectors with the strongest prospects for becoming viable sources of exports from the region. It could be a manufactured good, resources that are valued outside the region (the examples of wheat, flour, and lumber in the Pacific Northwest were used by Douglass North), or even an experience that is desired by tourists. Tourism can be thought of as part of a region's economic base despite the fact that it does not usually involve exporting goods (other than the souvenirs and other purchases that visitors take home with them) outside the region. The expenditures made by tourists, however, bring money into a region, which—similar to the earnings of export businesses—can stimulate additional economic activity in residentiary sectors.

In some respects, an export-oriented economic development strategy can be thought of in the broader context of a cluster-based approach. In fact, Douglass North described export-led regional growth using similar arguments to what Alfred Marshall laid out as a foundation for the present-day strategy of enhancing industry clusters. North (1955, p. 248) wrote, "As regions grew up around the export base, external economies [we referred to these earlier as 'externalities'] developed which improved the competitive cost position of the exportable commodities. The development of specialized marketing organization, improved credit and transport facilities, a trained labor force, and complementary industries was oriented to the export base." Thus, according to Douglass North, a strong export industry has many of the same benefits as those generated by industry clusters.

This does not mean, however, that all cluster-based strategies have an objective of expanding a region's exports. A cluster-based approach focuses on the interactions among the companies and their workers, and even the organizations that make up the cluster's supporting network. The main objective of a cluster is increasing the productivity of businesses and the surrounding region through the right mix of cooperation and competition among its members. This might lead to an increase in exports from the region, but it's not the prime focus of clusters. In the implementation of an export-based strategy, on the other hand, finding ways to cut costs is a much higher priority. In the quote that you just read about Douglass North's ideas regarding export-driven growth, he explicitly tied the

"external economies" of a basic industry to an "improved ... competitive cost position" for the sector.

So, although there are differences in how you implement an industry cluster or export-oriented economic development strategy, the process often starts by identifying a few goods or services, or an industry sector to target. The practice of deciding the exact sector(s) to target is one of "picking winners."

3.4   PICKING WINNERS AND ECONOMIC DEVELOPMENT

Probably the best known measure of an industry's relative size and importance in a region is its location quotient. This statistic tells us the extent to which a region specializes in a given sector of the economy. A location quotient is found by calculating the share of a region's employment (or businesses) in the industry of interest, and dividing this percentage by the share of US employment (or businesses) in that sector. If the percentage of a region's businesses (or employment) in a particular industry (e.g., 1.1 percent of the establishments in California were in the motion pictures industry in 1990) is greater than the comparable percentage nationwide (e.g., 0.5 percent of all US establishments were in motion pictures in 1990), then the ratio of these 2 percentages—that is, the location quotient—is greater than 1.0.[7] Such values signify that the region has a relative abundance of businesses (or employment) in the sector, and the region specializes in it. A location quotient of less than 1.0 means that the region is under-represented in the industry (i.e., no specialization).

Providing some concrete examples, we calculated location quotients to measure the state-level specialization of textile mills in 1990. The location quotient for North Carolina suggests that, as a percentage of the total number of businesses in the state, it has 7.62 times more textile mills than you would expect based on national averages. That's quite a specialization. Overall, the textile industry location quotients for all states indicate that Southern (e.g., South Carolina, Georgia, and Alabama) and Northeastern (e.g., Rhode Island and Maine) regions had the highest specializations in textile mills (as of 1990).[8]

As another example, we calculated location quotients for all 381 US metropolitan areas to examine regional specialization in the computer and data processing sector. With a location quotient of 3.37, San Jose—the heart of Silicon Valley—had over three times more of these businesses in 1990 than would be expected based on national averages. High

specializations in computer and data processing services are also found in places such as Boulder (Colorado), San Francisco, Boston, and Provo (Utah). A common characteristic of several of the metros that specialize in computer and data processing services—for example, Ann Arbor (Michigan) and Corvallis (Oregon)—is that their regions are the hosts to major universities.

Along with these measures of specialization for textiles, and computer and data processing services, we calculated state- and metro-level location quotients for 58 individual sectors in the seven industrial categories of (a) Agriculture, Forestry, and Fishing; (b) Mining; (c) Construction; (d) Manufacturing; (e) Transportation and Public Utilities; (f) Finance, Insurance, and Real Estate; and (g) certain types of services.[9] We omitted from this analysis industries such as retail trade and healthcare because they are less likely to be candidates for industry clusters and export promotion.

Healthcare services are important to local residents, but they are typically available—in roughly equal proportions to the population—in most states and metropolitan areas. For example, the location quotients calculated for an industry category of "health services" are between 0.8 and 1.2 in about three-out-of-four US metropolitan areas. This means that a relatively low percentage of metros have either an over- or under-abundance of health services providers (we'll learn in Chapter 8 that "older" regions tend to have more of these businesses). The same patterns are found for many types of retail stores. That is, most types of retailers (e.g., grocery stores, general merchandise outlets) are ubiquitous in that they are found just about everywhere in roughly equal proportions to the overall economy. Location quotients for the "miscellaneous retail" sector—this includes drug stores, sporting goods shops, liquor stores, gift shops, and florists—are between 0.8 and 1.2 in 85 percent of US metros. Yes, in 1990, you could purchase a baseball mitt or bottle of wine just about anywhere.

Figure 3.1 is a scatter plot showing the relationship between a state's economic development and the specialization in textile mills in 1990. The trend line is downward sloping, but the negative effect of textile manufacturing on the growth of good jobs is not strong enough to register as statistically significant. Later, we'll see that having a specialization in many other types of manufacturing sectors is associated with a reduction in economic development.

An interesting finding implied by Fig. 3.1 is the sector's high geographic concentration in a handful of states, which we hinted at earlier. Thirteen states have location quotients for textiles mills of over 1.0, but
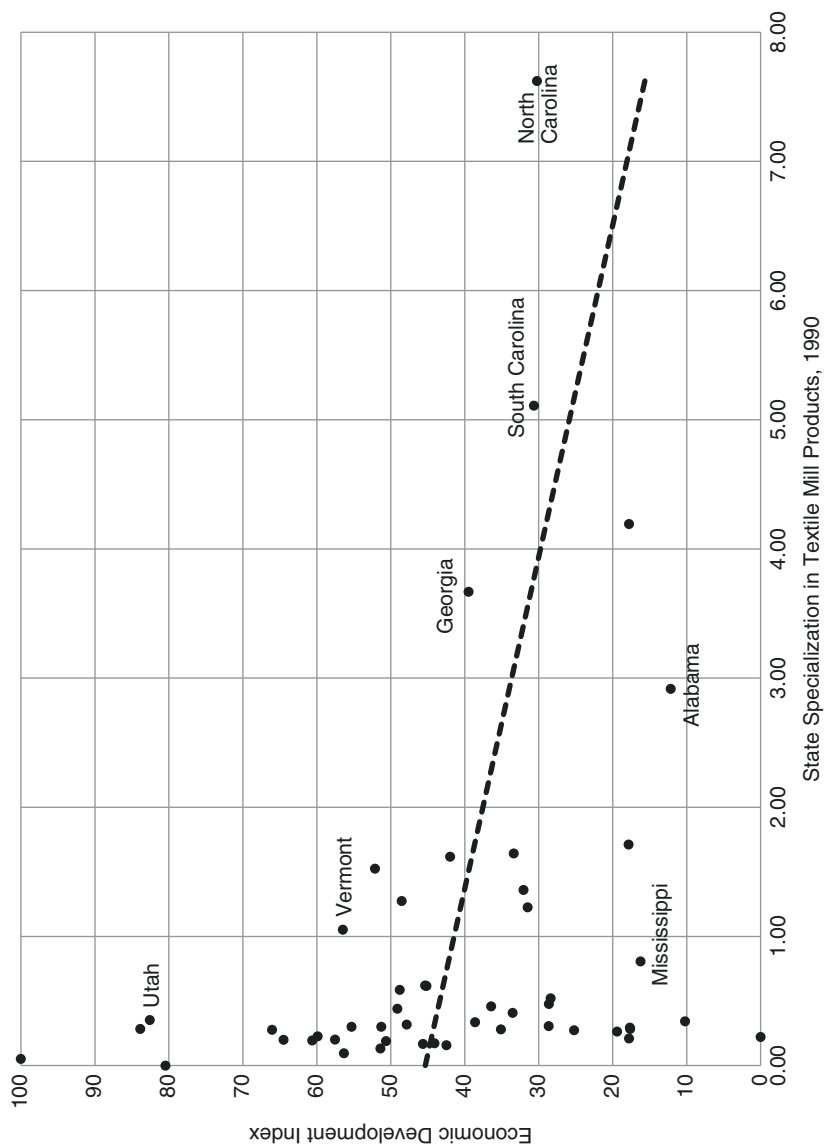
Fig. 3.1 Textiles plants have no effect on the economic development of states

only five of these state have location quotients that exceed 2.0. The rest of the states (i.e., those in the left side of the figure, close to the vertical axis) are under-represented in textiles mills. The overall pattern indicates that a few states (e.g., South Carolina, Georgia, and Rhode Island) had textile plants in 1990, while most did not. This is a textbook example of what is means for an industry to be geographically concentrated.

Looking at a few specific points in Fig. 3.1, we see that the top-seven states for textile mills have economic development index values that are below 40. Focusing on just these few observations, it does not appear that textiles manufacturing is the key to state economic development. It's also the case, however, that North Dakota and Michigan—the top- and bottom-ranked states for economic development—have nearly identical location quotients for textile mills (at around zero). This means that both of these states had very few textile plants in 1990. These results, along with the very large spread of economic development index values for states with location quotients of between zero and one, are consistent with the overall finding that the presence of textile mills in 1990 had no effect, one way or another, on the economic development of states.

Figure 3.2 shows the relationship between the economic development of US metropolitan areas and the specialization in computer and data processing services. The trend line is upward sloping and, although the points in the scatter plot show a reasonably large spread around this pattern, the relationship is statistically significant. The points in the figure also reveal that the computer and data processing services sector is less geographically concentrated (among metros) than textiles mills (among states). Although the industry is characterized by a few metros with location quotients that exceed 2.0, there are 64 areas—or roughly 17 percent of the total—with location quotients of between 1.0 and 2.0. Another 36 percent of US metropolitan areas have location quotients for computer and data processing services ranging from 0.5 to 1.0. This means that roughly one-half of all US metros have location quotients of between 0.5 and 2.0 for computer and data processing services, compared to just one-quarter of states with location quotients in this range for textile mills.

It's interesting to note that the top-five metros for economic development have location quotients for computer and data processing services of 3.37 (San Jose), 1.71 (Austin), 0.76 (Midland, Texas), 0.18 (Odessa, Texas), and almost zero (The Villages, Florida).[10] The metropolitan area of Kokomo, Indiana, which is at the other end of the spectrum with the
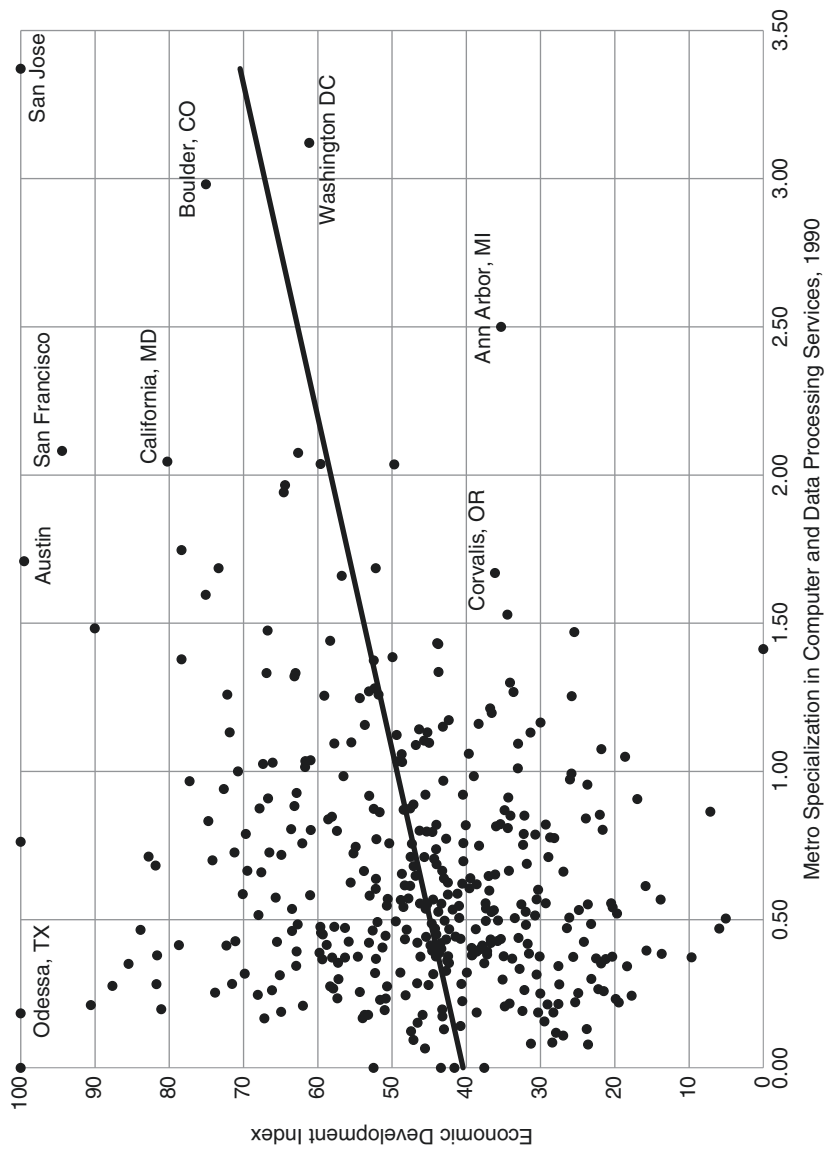
Fig. 3.2   Computer and data processing businesses help the economic development of US metropolitan areas

lowest economic development index score, has a location quotient of 1.41 in this sector. This places the worst-performing metropolitan area squarely within the range of location quotients belonging to the top-five regions for overall economic development. This means that—despite our finding of a positive relationship between economic development and a metropolitan area's location quotient in computer and data processing services—having a specialization in this sector is not a prerequisite for the growth of good jobs.

As fun as it would be to show and discuss scatter plots for all 58 of the industries that we examined, to economize on space and time we simply identify the sectors in which regional specialization has a positive or negative (and statistically significant) effect on economic development. Table 3.1 lists all 58 of the industries studied, and we use [+] and [−] symbols to indicate the sectors where industry specialization has a statistically significant effect on the economic development of states, the entire sample of metros, metros with one million or more people (i.e., large metros), and metros with fewer than one million people (i.e., small metros). Cells in the table have zeroes [0] in cases where the relationship between economic development and the industry location quotient is not statistically significant.

Since we're most interested in broad themes related to the factors that support the growth of good jobs—and want to get too hung up about any one individual result—the sectors found to have positive or negative effects on economic development are organized into groups. Of course, a few sectors don't fit nicely into these groups—but most do. The first theme of note is the importance of energy- and transportation-related sectors to regional economic development. Oil and gas extraction—a key sector in states such as Wyoming, Oklahoma, and Texas; and metros including Midland (Texas), Casper (Wyoming), and Lafayette (Louisiana)—has an across-the-board positive effect on economic development, and several transportation-related sectors have a positive effect on the economic development of (small) metropolitan areas.

Our findings pertaining to several subsectors of transportation and public utilities (e.g., water and air transportation, communications) suggest that a region's connectedness to the rest of the world supports the growth of good jobs. One of the major economic forces over the period of study has been an increase in globalization and the movement of products and services around the world. Our results suggest that the US metropolitan areas that were best equipped to participate in the global economy—that is, those with relatively large shares of businesses

Table 3.1   Effects of industry specialization on regional economic development

	States	All Metros	Large Metros	Small Metros
Agriculture, Forestry, and Fishing				
Agricultural Services	[0]	[0]	[0]	[0]
Forestry	[0]	[0]	[0]	[0]
Fishing, Hunting and Trapping	[0]	[0]	[0]	[0]
Mining				
Metal Mining	[0]	[0]	[0]	[0]
Coal Mining	[0]	[0]	[0]	[0]
Oil and Gas Extraction	[+]	[+]	[+]	[+]
Nonmetallic Minerals	[0]	[0]	[−]	[0]
Construction				
General Contractors and Operative Builders	[0]	[−]	[0]	[−]
Heavy Construction	[+]	[+]	[0]	[+]
Special Trade Contractors	[0]	[0]	[−]	[0]
Manufacturing				
Food and Kindred Products	[0]	[0]	[0]	[0]
Tobacco Products	[0]	[0]	[0]	[0]
Textile Mill Products	[0]	[−]	[0]	[−]
Apparel and Other Textile Products	[0]	[0]	[0]	[0]
Lumber and Wood Products	[−]	[−]	[0]	[−]
Furniture and Fixtures	[0]	[0]	[0]	[0]
Paper and Allied Products	[−]	[−]	[−]	[−]
Printing and Publishing	[0]	[0]	[0]	[0]
Chemicals and Applied Products	[−]	[0]	[0]	[0]
Petroleum and Coal Products	[0]	[0]	[−]	[+]
Rubber and Misc. Plastic Products	[−]	[−]	[−]	[−]
Leather and Leather Products	[0]	[0]	[0]	[0]
Stone, Clay, and Glass Products	[0]	[−]	[−]	[0]
Primary Metal Industries	[−]	[−]	[−]	[−]
Fabricated Metal Products	[−]	[−]	[−]	[−]
Industrial Machinery and Equipment	[−]	[−]	[0]	[−]
Electronic and Other Electric Equipment	[0]	[0]	[+]	[0]
Transportation Equipment	[−]	[0]	[0]	[0]
Instruments and Related Products	[0]	[0]	[+]	[0]
Misc. Manufacturing Industries	[0]	[0]	[0]	[0]
Transportation and Public Utilities				
Local and Interurban Passenger Transit	[0]	[0]	[0]	[0]
Trucking and Warehousing	[0]	[0]	[−]	[0]

Table 3.1 (continued)

	States	All Metros	Large Metros	Small Metros
Water Transportation	[0]	[+]	[0]	[+]
Transportation by Air	[0]	[+]	[0]	[+]
Pipelines	[+]	[+]	[0]	[+]
Transportation Services	[0]	[+]	[+]	[+]
Communication	[+]	[+]	[0]	[+]
Electric, Gas, and Sanitary Services	[0]	[+]	[0]	[+]
Finance, Insurance, and Real Estate				
Depository Institutions	[0]	[−]	[0]	[−]
Nondepository Institutions	[0]	[0]	[0]	[0]
Security and Commodity Brokers	[0]	[+]	[0]	[+]
Insurance Carriers	[0]	[0]	[0]	[0]
Insurance Agents, Brokers, and Service	[0]	[0]	[0]	[0]
Real Estate	[0]	[+]	[+]	[+]
Holding and Other Investment Offices	[0]	[+]	[+]	[+]
Services				
Hotels and Other Lodging Places	[+]	[0]	[0]	[0]
Advertising	[0]	[+]	[0]	[0]
Credit Reporting and Collection	[+]	[+]	[0]	[0]
Mailing, Reproduction, and Stenographic	[0]	[+]	[+]	[0]
Services to Buildings	[0]	[0]	[0]	[0]
Misc. Equipment Rental and Leasing	[0]	[+]	[0]	[+]
Personnel Supply Services	[0]	[+]	[+]	[0]
Computer and Data Processing Services	[+]	[+]	[+]	[+]
Miscellaneous Business Services	[0]	[+]	[+]	[0]
Amusement and Recreation Services	[0]	[−]	[0]	[−]
Legal Services	[0]	[+]	[+]	[+]
Museums, Botanical, Zoological Gardens	[0]	[0]	[0]	[0]
Engineering and Management Services	[0]	[+]	[+]	[+]

in transportation and communications industries—fared better in the growth of good jobs than places that were under-represented in these sectors. It's interesting that the transportation and communications sectors are particularly important to the economic development of small metros, but less so for larger metropolitan areas. Moving goods and information (in the case of the communications industry) is important to less-populated regions because it connects businesses in these places to larger markets located elsewhere.

A second main theme revealed by Table 3.1 is that, for the most part, having a specialization in manufacturing is associated with lower levels of economic development. This result holds for states and metropolitan areas, both large and small. A couple of noteworthy exceptions to this rule are the positive effects of two manufacturing sectors—"electronic and other electric equipment" and "instruments and related products"—on the economic development of large metropolitan areas. These results stick out because these two manufacturing subsectors are closely associated with the use of high technology. As we'll see later in the book, the deployment of high-technology—along with having an abundance of human capital (i.e., education and skills), and new goods and services (e.g., patents)—is especially important to the success of large metros.

Similar to our explanation for why having a specialization in transportation-related industries is good for the economic development of (smaller) metros, our results pertaining to manufacturing show the other side of the coin for the impacts of increased globalization. Between 1990 and 2014, the US economy experienced 40 and 23 percent reductions in the number of manufacturing employees and establishments, respectively.[11] Research by Lori Kletzer (2005) found that—between 1979 and 2001—7.45 million manufacturing workers were displaced in "high import-competing" sectors. A study by the research team of Daron Acemoglu, David Autor, David Dorn, Gordon Hanson, and Brendan Price (2016) found that, between 1999 and 2011, international competition from China alone lowered US manufacturing employment by an estimated 2.0 to 2.4 million jobs. The substantial losses in US manufacturing—those due to increased global competition and other factors (e.g., technological change)—over the period of study means that regions with this sector as an anchor to their economic base faced tremendous challenges in the pursuit of economic development.

A third theme revealed in Table 3.1 is the importance of technical and financial services to the economic development of US regions. This group includes sectors such as computer and data processing services, engineering and management services, legal services, and insurance. Although these sectors provide different types of services, most of them have in common the creation, dissemination, and/or heavy reliance on the use of information. Just like transportation-related industries can help connect US metropolitan areas to the rest of the world, sectors that are involved in

the creation (and flow) of knowledge and information can help regions prosper in the global economy.

Niles Hansen (1990) explained that producer services—for example, finance, insurance, and real estate; legal services; data processing—help the productivity of US metropolitan areas by enhancing their "division of labor." This idea of greater efficiency through a more finely grained division of labor, which dates all the way back to 1776 and the writings of Adam Smith, means that the availability of a wide range of producer services allows all companies—the service providers and the establishments that they support—to specialize in a narrow range of activities and utilize the expertise of others when necessary. Companies, especially smaller ones, do not need to develop and maintain internal competencies related to engineering and management practices, law, and other types of information that they need. Rather, they can devote their energies to what they do best, and use other experts—that is, the local service providers—to help their companies grow.

The results shown in Table 3.1 suggest that, in many cases, there are differences among the sectors that impact the economic development of states and US metropolitan areas. For example, many of the transportation (e.g., water, air, and transportation services) and services (e.g., engineering and management, legal services, miscellaneous business services) sectors that are important to the economic development of metros do not matter much for states. In the case of producer services, the mechanisms by which these sectors enhance economic development—that is, transmitting information and providing a greater division of labor—are unlikely to translate across regions as large as states. The only sectors with across-the-board positive effects on regional economic development are oil and gas extraction, and computer and data processing services. As most of us are aware, energy and computer processing are probably two of the most important factors impacting the US and global economies over the last several decades.

Just like there are differences among the sectors impacting the economic development of states and metropolitan areas, we also find differences in the industries that support the growth of good jobs in large and small metros. Air and water transportation sectors, and the communications industry have positive effects on the economic development of small metros (i.e., those with less than one million people in 1990), but they did not affect the growth of good jobs in large metropolitan areas. This means that, as noted above, the roles that these sectors play in connecting regions to the rest of the world are especially important to smaller areas.

3.5   Is Past Performance a Guarantee of Future Results?

Now that we know the types of industries that support the growth of good jobs, we can look at whether economic development officials—back in 1990—could have had any inkling about the importance of these sectors. If so, they could have focused their economic development efforts around these "winning" industries. This involves a trip even further back in time, so to speak, to look at whether the growth of a sector in the recent past—that is, from 1975 to 1990—was a good indication of its future impact on regional economic development (from 1990 to the near present). Of course, if a sector comprising a large part of the economy were growing, it would probably bode well for regions that specialize in it. But the industries that we're studying (recall that we're not looking at sectors such as healthcare and retail) accounted for, on average, only 0.7 percent of the overall economy—that is 1 out of every 140 establishments. This means there's no guarantee that a specialization in even the fastest-growing sector will have a positive impact on economic development. After all, the economic development indicators are based on a region's "total" employment and income, which include all sectors of the economy.

In Fig. 3.3, we look at the extent to which the past growth of an industry nationally is a good harbinger of its impact on the economic development of US metropolitan areas. The analysis summarized in the figure is a little different than what we've looked at so far. Whereas much of our earlier analysis focused on differences across regions—that is, 50 states or 381 metropolitan areas—this analysis is concerned with differences across 48 industries.[12] The horizontal axis of the figure shows the growth rate of the industry nationally between 1975 and 1990, and the effect of industry specialization on the economic development of US metropolitan areas is placed on the vertical axis.

To get our bearings straight, let's look at the "primary metal industries" sector. We already know from Table 3.1 that this sector is characterized by a negative relationship between economic development and metro-level specialization. Now, we observe in Fig. 3.3 that a one-standard deviation increase in a metropolitan area's location quotient in the primary metal industries sector is associated with a 0.24-standard deviation decrease in the region's economic development index.
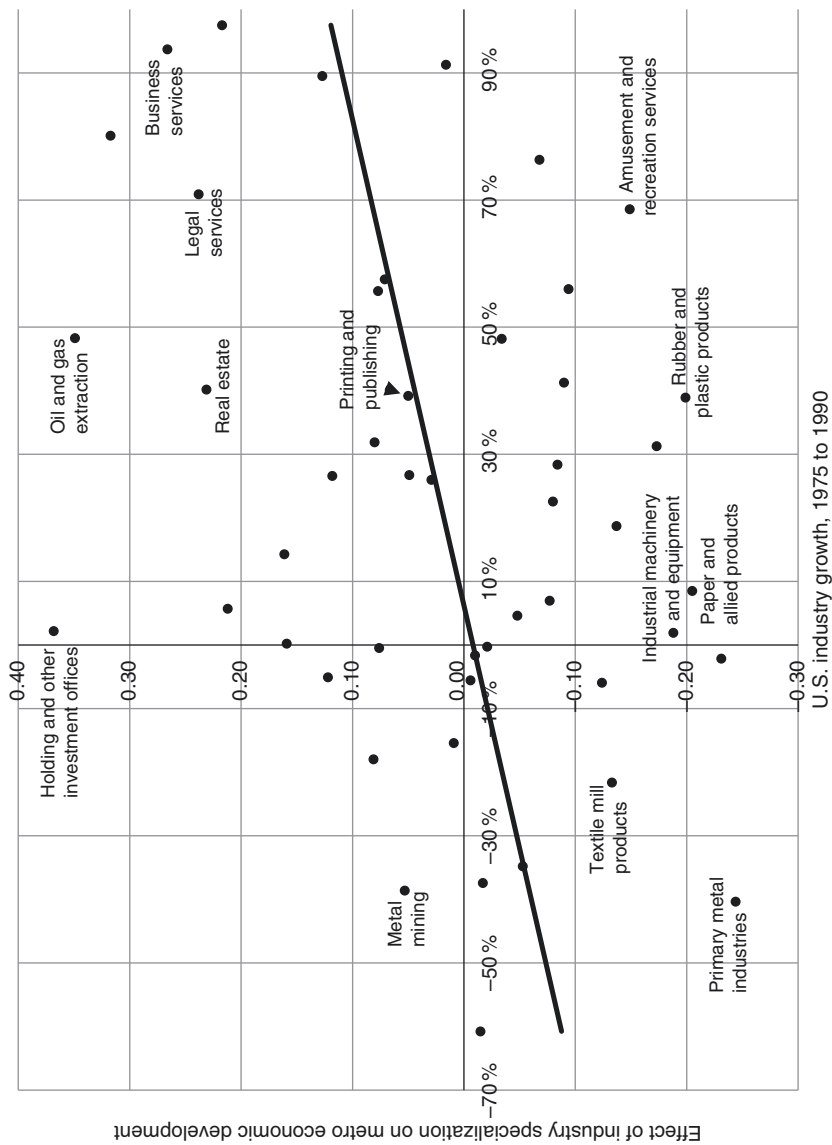
Fig. 3.3 Sectors that grew faster nationally between 1975 and 1990 had larger impacts on the economic development of US metropolitan areas

We also see in the figure that US employment in primary metal industries fell by 40 percent between 1975 and 1990, so there was "writing on the wall" about the future prospects for this sector. It might have been difficult to imagine, however, that the primary metal industries sector—making up (at most) 0.8 percent of all businesses in a metropolitan area—could be characterized by such a large negative relationship between the economic development of metropolitan areas and regional specialization.

In the opposite corner of Fig. 3.3, we see that the legal services sector—which had one of the fastest growth rates of employment between 1975 and 1990—is characterized by a positive relationship between economic development and metro-level specialization. At the top of the figure, we see that the sector with the largest impact of industry specialization on economic development—the "holding and other investment offices" industry—exhibited a very modest employment growth rate (about 2 percent) between 1975 and 1990. It's interesting that the industrial machinery and equipment sector, which also grew by about 2 percent, is characterized by one of the largest negative impacts of industry specialization on the economic development of US metropolitan areas.

The figure's upward-sloping and solid trend line suggests that the growth of an industry nationally between 1975 and 1990 was a preview of its impact on metropolitan area economic development from 1990 to the near present. Despite having a positive relationship that is strong enough to register as statistically significant, the wide range of points away from the trend line suggests that not all industries fit this overall pattern. For example, the real estate, printing and publishing, and rubber and plastic products industries all had employment growth rates of about 40 percent between 1975 and 1990. Yet, the impacts of these industries on regional economic development are quite different. Having a specialization in real estate is associated with higher levels of economic development, there's not a statistically significant relationship between the economic development of metropolitan areas and specialization in the printing and publishing industry, and we found a negative relationship between the economic development of metros and having a specialization in the rubber and plastic products sector.

All of this suggests that picking winners is not an exact science.

3.6   REGDIONAL ECONOMIC DIVERSITY AND THE GROWTH OF GOOD JOBS

Even if regional officials had a crystal ball (or could target sectors that exhibited recent growth), it would be difficult to turn a region's economy on a dime and all of the sudden come up with a specialization of winning industries. Wouldn't it be easier to take a pass on picking winners and attempt to have a diverse regional economy? After all, financial planners suggest a diverse portfolio for investments. Does the same logic follow for regional economic development?

The effects of industry diversity on the economic performance of US regions received a lot of attention during the 1980s and 1990s (Kort 1981; Malizia and Ke 1993; Wagner and Deller 1998). In most studies, the analysis focused on the impacts of having a diverse economy—that is, employment spread over a lot of industries—on the stability of regions. Much of the past research on regional industry diversification suggests that it does, in fact, reduce fluctuations in regional economic conditions. Thus, the strategy of using diversification to reduce the variability of outcomes acts in a similar way for regions as it does for stock portfolios. Taking this line of research in a slightly different way, I examined the effects of regional stability—with a focus on seasonal fluctuations in economic activity—on business location decisions (Gabe 2007). The main idea uncovered by this study is that businesses, especially service providers, seek out regions that provide stable economic conditions over time. On the other hand, I found lower levels of new business activity in regions characterized by high seasonal fluctuations in employment.

As a first step to examining the question of whether having businesses spread across a lot of sectors is good for economic development, we calculated a statistic measuring the diversity of the industries present in states and US metropolitan areas. There are several approaches that researchers have taken to measure the industrial diversification of regions, such as using a variety of indices that indicate the extent to which employment is evenly spread across industries. For our purposes, we utilize the Hachman index of industrial diversification, which compares a region's industrial structure to that of the overall US economy. High values of the Hachman index indicate that the region and US economies have more similar

industrial structures. Lower values of the Hachman index, on the other hand, imply that the region of interest has an industrial structure that differs from the US economy; this means that the region is overrepresented in some industries and underrepresented in others.

Figure 3.4 summarizes the effects of regional economic diversification on the economic development of states and metros. The results generally show that having a more diverse economy—that is, one that looks more like the national economy as a whole—is negatively associated with the growth of good jobs in US metropolitan areas. For example, a one-standard deviation increase in the Hachman index is associated with a 0.23-standard deviation decrease in the income index for metropolitan areas. Industry diversity has no effect, one way or another, on the economic development of states.

3.7   Exports and Regional Economic Development

The results presented up to this point have identified some "winning" sectors for the economic development of US regions, which provides insights into the types of clusters—for example, energy and transportation, computer technology, producer services—that support the growth of good jobs. Although another aspect of picking winners is a strategy aimed at identifying and expanding export-oriented industries, our findings so far don't tell us much as all about the impacts of exports on regional economic development.

In Fig. 3.5, we look at the effects of exports (per capita) on the economic development of states. Some of the top states for exports per capita—in 1995, the starting point for this analysis—were Michigan (presumably due to the state's automobile industry), California, and Washington. The results summarized in the figure indicate that the amount of exports per capita have no effect, one way or another, on the economic development of states. In fact, the effects on all four of the economic development indicators are about as close to zero as you can get.

It's interesting that—despite the strong intuitive connection between exports and the growth of regions (and what we learned earlier about the importance of "connectedness" via transportation- and information-related industries), some economists are not sold on the economic development benefits of exports. In a response to Douglass North's article written back in 1955, Charles Tiebout (1956, p. 161) suggested, "[t] here is no reason to assume that exports are the sole or even the most
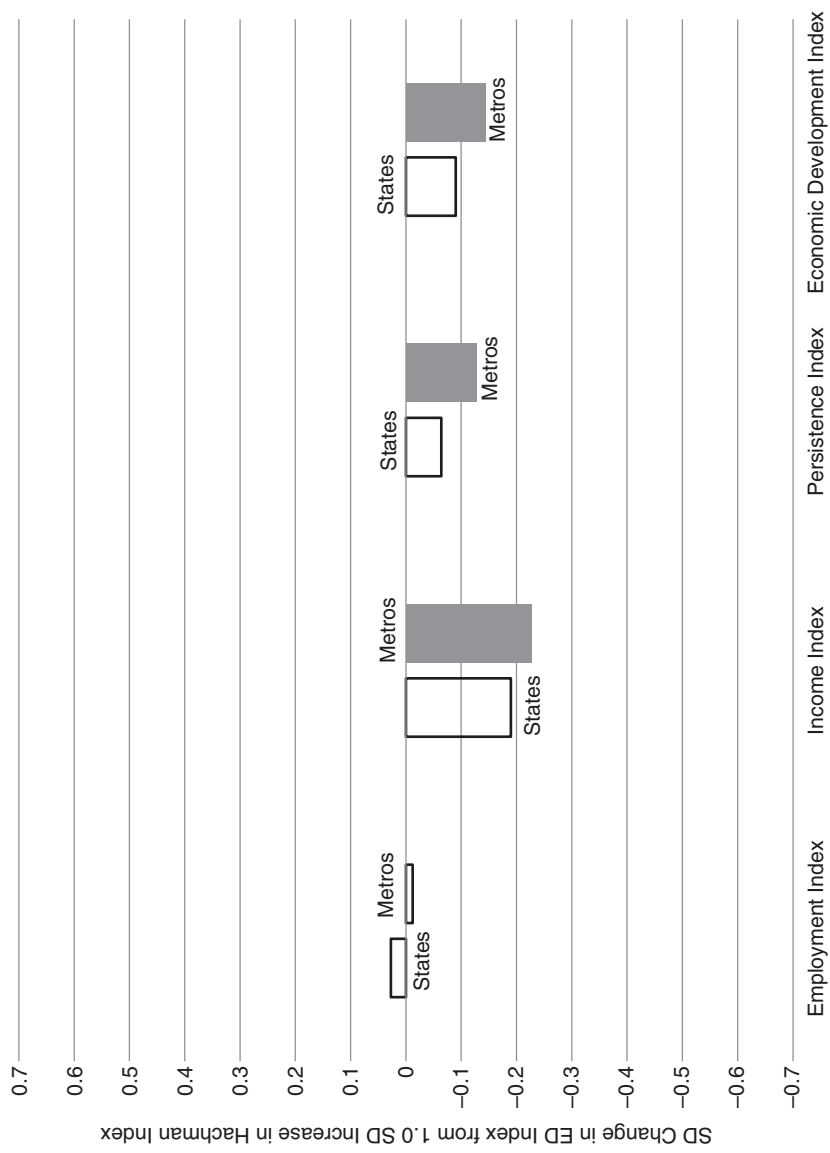
Fig. 3.4 Industry diversification has a negative effect on the economic development of US metropolitan areas
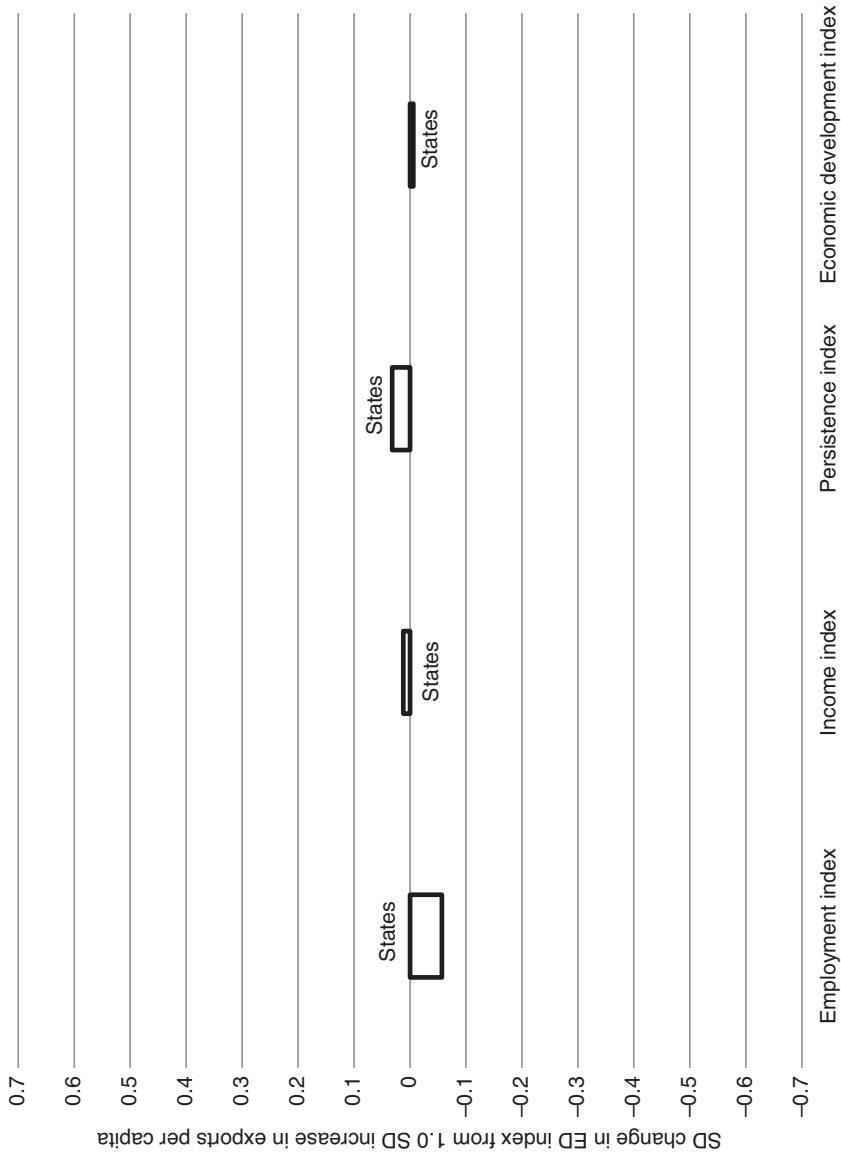
Fig. 3.5 The amount of exports per capita has no effect on the economic development of states

important autonomous variable determining regional income. Such other items as business investment, government expenditures, and the volume of residential construction may be just as autonomous with respect to regional income as are exports."

This brings us back to the important distinction, mentioned earlier, between cluster- and export-oriented approaches to regional economic development. With clusters, the emphasis is on increasing the competitiveness and productivity of businesses in the local industry (and its supporting network). This could happen through a variety of sources (e.g., knowledge spillovers, availability of specialized inputs, labor market pooling). With an export-based approach, these external benefits might happen—but they are not the primary focus. Whereas increased productivity is the ultimate goal of clusters, export-enhancing strategies tend to have a greater emphasis on lowering costs. The strong international competition from outside the United States—that is, we saw earlier that competition from businesses in China led to substantial US job losses in manufacturing—makes a low-cost strategy particularly difficult to succeed.

3.8 GOOD MANUFACTURING JOBS

What we've learned so far in this chapter is that the types of industries present in a region matter for economic development, but exports are hardly a driver of the growth of good jobs. Energy- and transportation-related industries are important to regions, as are sectors involved in the production and dissemination of information and producer services. Notably absent in our discussion of sectors that enhance economic development is manufacturing. In fact, manufacturing is prominent in the group of sectors that are associated with lower levels of economic development.

So much for "good manufacturing jobs." Despite the almost universal objective of policymakers to attract "good" manufacturing jobs, is this sector—in fact—a bad word for economic development? If having a high share of manufacturing plants relative to national averages is a detriment to the growth of good jobs, should regions discourage their location? That would sound crazy, given elected officials' obsession with attracting manufacturing jobs. As it turns out, the evidence suggests that it would be a crazy strategy, too.

To take another look at the impacts of manufacturing, we examine the effects of a growing manufacturing sector on the economic development

of regions. Given the large size of many manufacturing plants and the network of suppliers that they can attract in a hub-and-spoke cluster, it seems like a safe bet that the expansion of a region's manufacturing sector helps the growth of good jobs. This is exactly the result of a study by Michael Greenstone, Richard Hornbeck, and Enrico Moretti (2010). The research team used information from *Site Selection* magazine to identify the US regions where "million dollar plants" set up their operations, as well as the places that were not selected (i.e., the "runner-up" choices). Such an approach provides a natural experiment that allows a comparison between what happened in places that "won" the new plants as compared to other places—viewed by the firms as close substitutes—that narrowly "lost" them. As it turns out, the results of the analysis show that the counties that "won" and "lost" the plants were similar before the million-dollar plants came to town. This point, although it may not seem remarkable, strengthens the argument of a natural experiment.

Michael Greenstone and colleagues found that the fortunes of the winning and losing regions diverged in the years following the new plant's location. Existing plants in the places where the new plants located had total factor productivity (TFP) values that were 12 percent higher than the TFP of incumbent facilities in the runner-up counties. Interestingly, the impact that the new plants had on the productivity of other businesses was higher in facilities with similar types of workers and technologies. These results, which not only point to the productivity -enhancing impacts of large manufacturing plants, provide evidence that is consistent with Alfred Marshall's ideas about the benefits of industry clusters.

To examine the effects of new manufacturing plants on the growth of good jobs, we can analyze the impacts of the percentage change in the number of manufacturing establishments on the economic development of US regions. As a frame of reference, we also look at the effects of the percentage change in the number of nonmanufacturing businesses on regional economic development. The results summarized in Fig. 3.6 show that having a one-standard deviation higher percentage change in the number of manufacturing plants between 1990 and 2014 is associated with a 0.63-standard deviation increase in the economic development of states. A similar increase in the percentage change in the number of non-manufacturing establishments is associated with a 0.48-standard deviation increase in state-level economic development. The results focusing on US metropolitan areas are reversed, but—at both levels of geography—a growing manufacturing sector is good for the economic development of regions.
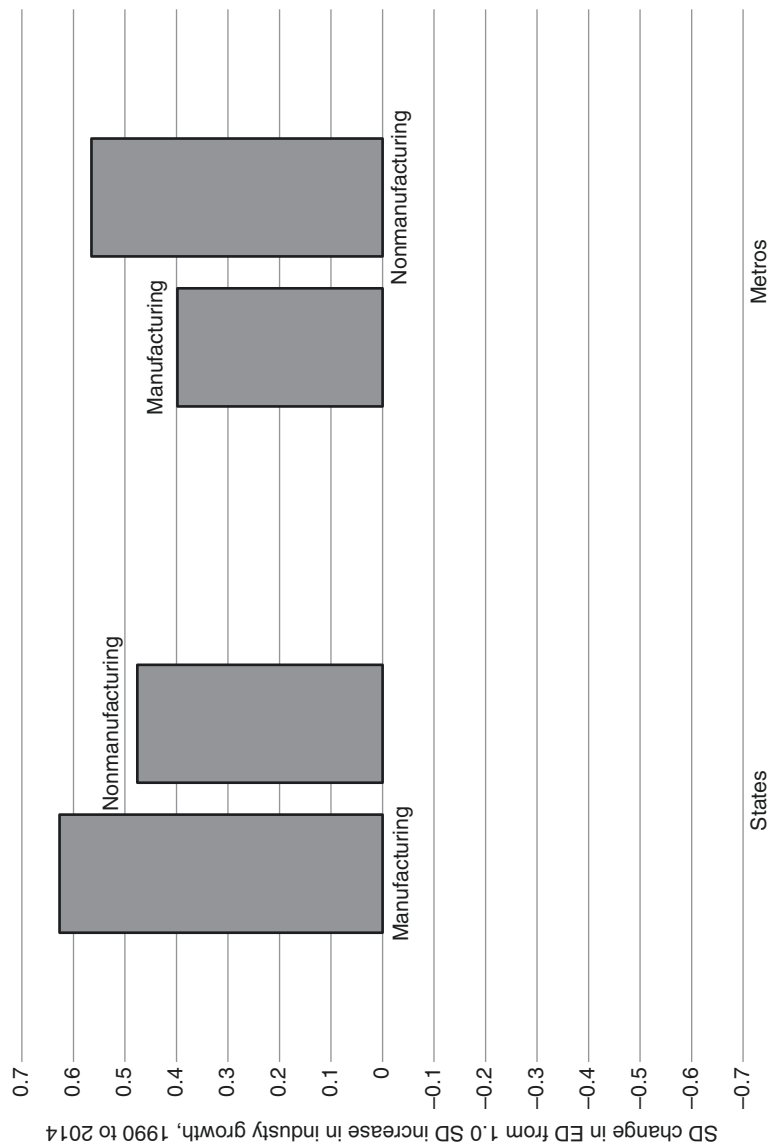
Fig. 3.6 A growing manufacturing sector helps the economic development of US regions

These results, which suggest that new manufacturing plants help a region's economy, should come as no surprise to many economic development professionals. For decades, they have devoted a lot of their time—and resources, in the form of tax and other locational incentives—in search of manufacturing prospects for business recruitment.

Our findings pertaining to the effects of new businesses—manufacturing and non-manufacturing companies—on regional economic development provide a nice balance to our earlier results, which focused on the effects of industry specialization (measured as a single point in time) on the growth of good jobs. First off, the most recent results show that—contrary to what we found earlier—manufacturing is not a "dirty" word when it comes to regional economic development. In fact, regions with manufacturing sectors that grew (or even declined more slowly than other regions) experienced more favorable economic development outcomes than others. The result that "growth" in manufacturing is beneficial to the expansion of good jobs, however, leads to a second important point. That is, regions with a lot of manufacturing businesses (i.e., a high specialization) tended to perform poorly in terms of (overall) economic development. This is because places with the highest specializations in manufacturing in 1990 were not the same ones that experienced the largest percentage changes in the number of plants.[13] This result is consistent with a "convergence" of manufacturing activity—in other words, manufacturing spread out across US regions and abroad.

A third interesting finding is that the impacts on economic development from an expansion of non-manufacturing businesses are similar—that is, lower for states, higher for metros—to those associated with the percentage change in the number of manufacturing plants. This means that attracting businesses of all types can help regions, which should come as no surprise given that "growth" is a key component of economic development. An important difference between manufacturing and non-manufacturing businesses, however, is that—for many types of non-manufacturing sectors; for example, computer and data processing, producer services—"having" a specialization in the sector is also good for economic development, which was not the case for most types of manufacturing.

3.9   Picking Winners and the Pursuit of Economic Development

This chapter started with the simple premise that the types of industries present in a region is an important factor affecting its growth and development. After all, a region's industrial structure determines its prospects

for clusters and export promotion. Although the underlying motivation and specific strategies used in the pursuit of good jobs may differ, I treated the approaches of cluster- and export-oriented economic development as one of "picking winners."

Our analysis of the relationship between the economic development of regions and the presence (and growth) of industries generated some interesting findings. First off, we found that the types of industries present in a region influence the growth of good jobs. Specifically, having a specialization in energy and transportation, and certain types of information- and knowledge-intensive services is associated with an increase in economic development. On the other hand, there's a negative relationship between the economic development of US regions and having a specialization in many types of manufacturing sectors. These findings are, no doubt, influenced by the structural changes occurring in the US economy—moving from a goods-based orientation to a greater emphasis on information and services.

A second main finding is that the amount of exports per capita has no effect on the economic development of states. This result might seem at odds with the macroeconomic trends of increased trade and globalization, but it provides additional insights into how US regions are impacted by these forces. Regions that produced manufactured goods or were heavy exporters in 1990 did not benefit from globalization—in fact, manufacturing regions were hurt by it—but rather it was the areas that produced information- and knowledge-based services (as well as regional transportation hubs) that gained the most.

A third (and closely related) result from our analysis of "picking winners" is the mixed effects of manufacturing on regional economic development. Having a high specialization in manufacturing in 1990 was not a good omen for economic development over the next quarter of a century. Nevertheless, regions with growing manufacturing sectors—or expanding non-manufacturing industries, for that matter—experienced positive economic development outcomes.

These findings, along with the results and perspectives from other studies on the topic, support the following principles for the approach of picking winners in the pursuit of economic development.

Principle 1: Pay attention to the industries present in a region, and their recent growth and prospects for the future. Our results suggest that industries matter, and the past performance of these sectors give a preview of their future impacts on the economic development of regions. Although not all growing sectors helped the economic development of regions,

tracking national trends in a region's key industries can help provide an indication of how well the region might perform in the future. But it's not just the recent growth of key industries that matters for a region's future success. As explained by Michael Porter and others, the ways in which industry clusters are organized and how their member businesses (and supporting institutions and organizations) interact with each other determine the fate of clusters and their host regions. This means that "taking the pulse" of industries present in a region involves examining their health nationally (i.e., are they growing sectors?) and locally (i.e., are the businesses functioning in a way that promote the right mix of collaboration and competition?).

Principle 2: Think about a region's "position" in the global economy, and develop strategies that take advantage of the opportunities and mitigate the threats due to international (and domestic) competition. Elected officials and economic development professionals need to start from the premise that all regions are impacted by globalization. Just like it's advised to monitor the growth of key sectors and the functioning of regional industry clusters, it's also important to identify a region's exposure to international competition and its position in the global economy. A region with extensive transportation facilities and infrastructure (and easy access to national and international markets) or an abundance of information and service providers is apt to experience very different impacts due to globalization than a place that exports manufactured goods (that can be produced at a much lower cost elsewhere). Properly matching economic development strategies to the opportunities and threats posed by global competition will help a region in the pursuit of good jobs.

Principle 3: Have a balanced and realistic view about the future of existing manufacturing businesses, as well as the prospects for attracting new ones. An almost universally defining characteristic of elected officials—both state and local, and those on a national stage—is a strong desire to enhance manufacturing production and employment. The decades-long trends in US manufacturing, however, suggest this is a tall order. Our results, which show different impacts on economic development from *having a specialization* in manufacturing as compared to from *experiencing growth* in the number of manufacturing plants, suggest that regional officials should remain even keeled and balanced in their pursuit of manufacturing businesses. Keep the region open and attractive to new manufacturing plants—they are good for economic development, after all—but also be realistic that

established manufacturing plants are likely facing threats to their local operations. The exact level of danger depends on the specific types of manufacturing plants operating in the region.

NOTES

1. Michael Porter (2000, p. 16) defines clusters as "a geographically proximate group of interconnected companies and associated institutions in a particular field, linked by commonalities and complementarities."
2. http://www.ripleys.com/myrtlebeach/#odditorium. Accessed May 5, 2016.
3. The idea that fixed costs of production can influence the location of industry is at the heart of Paul Krugman's (1991, 1992) "increasing returns models."
4. More recent studies have examined the factors—for example, knowledge spillovers, labor market pooling—influencing the geographic concentration of industries (Rosenthal and Strange 2001; Ellison et al. 2010).
5. Knowledge spillovers are also important to the economic development of big cities. The idea here, as explained by Gilles Duranton and Diego Puga (2004), is that information flows more easily among people and businesses in densely populates regions.
6. An article by Jaison Abel and Richard Deitz (2012) shows that on-campus research and development activities increase the demand for human capital in a region.
7. Information on the number of establishments by industry category is from County Business Patterns of the U.S. Census Bureau.
8. These location quotients are calculated using data from County Business Patterns of the U.S. Census Bureau.
9. The first six categories listed (e.g., Mining, Construction, Manufacturing) are major industry groups under the Standard Industrial Classification (SIC) typology. The final category listed (i.e., "certain types of services") includes some—but not all—sectors included in the Services (SIC) major industry category.
10. It's interesting that, of the top-five metropolitan areas for economic development, the two with the highest specializations in computer and data processing services—San Jose and Austin—also happen to be the two most-populated metros of the bunch. We learn throughout the book that the types of regional characteristics that support the growth of good jobs are quite different for large and small metropolitan areas.
11. These figures are calculated using data from County Business Patterns of the U.S. Census Bureau.
12. The number of industries (i.e., 48) analyzed in Fig. 3.3 is lower than the 58 shown in Table 3.1 because the 1975 to 1990 US growth rates are unavailable for some sectors. Several business services that are shown separately in

Table 3.1 (e.g., Advertising, Computer and Data Processing Services, Miscellaneous Business Services) are combined into a single category of Business Services in Fig. 3.3.

13. This result of a converging manufacturing sector is explained, in more detail, in Chapter 9.

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Human Capital and the Growth of Good US Jobs

4.1 Listen to Your Teacher

If you were ever caught napping in school, your teacher might have hollered, "Wake up! You'll need these skills to get a good job." Back in the 1980s (during my teen years), you might not have believed this warning. As discussed in Chapter 1, the big-hair decade of the 1980s ended prior to the advent of the World Wide Web (and much of the computer technology used today) and when only a minority of high school graduates attended college. Many others were able to find work in "hands-on" professions, as the manufacturing sector still accounted for 16 percent of US employment in 1990.[1]

Fast forward about 25 years and you realize that your teacher was right (they always are). Between 1990 and 2014, US manufacturing employment declined by 40 percent, whereas employment in the engineering services sector grew by 57 percent.[2] Employment in US hospitals, an important subsector of the healthcare industry, expanded by 34 percent over this same period. These trends of an expanding services sector—with a greater emphasis on information, and education and skills—are unlikely to reverse course anytime soon, if ever.

In an old-style manufacturing-based economy, goods were produced (and entire regions were built) around the intersection of workers and machines. Equipping people with more and better equipment made them more productive and increased their wages. Today's services and

knowledge-based economy—and even much of the "advanced" manufacturing that takes place in America—relies more heavily on human capital (defined as the education and skills used by workers in the production of goods and services) than the acquisition of buildings and heavy equipment. Indeed, in his book titled *Triumph of the City*, Edward Glaeser (2011, p. 27) proclaims that, "Human capital, far more than physical infrastructure, explains which cities succeed."

The logic underlying a human capital-based economic development strategy is that education and skills—two key elements of a person's human capital—tend to make workers more productive. And, as famously noted by Paul Krugman (1997, p. 13), "Productivity isn't everything, but in the long run it is almost everything." The strong connections between human capital and productivity—and then productivity and wages—mean that jobs requiring high levels of human capital are good jobs. In addition to the impacts of education and skills on wages, high-human capital workers are thought to be more resourceful in the face of adverse economic conditions. (Incidentally, this idea is at the heart of the "Reinvention City" explanation—suggested by Edward Glaeser and Albert Saiz (2003)—for the robust population growth rates experienced by high-human capital cities.) This trait of educated and skilled workers suggests that human capital is good for employment persistence, too.

We can see the impact of human capital on productivity by looking at the distribution of wages by an individual's level of educational attainment. In 2015, the median weekly earnings of a full-time worker (age 25 and older) with a high school degree was $678, compared to $1,137 for someone with a bachelor's degree.[3] Full-time workers with professional degrees earned median weekly earnings of $1,730 (almost three times the earnings of those with a high school diploma), which is a little higher than the $1,623 in median weekly earnings for someone with a doctoral degree. The fact that people with more formal education tend to make more money is one of the most robust empirical findings in economics (Card 1999). With the high wages that they earn, it should be no surprise that having a lot of educated workers is good for the economic development of regions.

Another explanation for how human capital improves the economic development of regions is less visible, but equally as important. In addition to lifting regions through their own high productivity, workers with an abundance of human capital also help enhance the productivity of those around them.[4] So, similar to the explanation for why industry clusters are

good for regional economic development, the presence of individuals with high levels of human capital provides external benefits to others as well. Put another way, having a critical mass of educated and skilled workers provides benefits that are shared by everyone in the region.

4.2   Importance of Human Capital

The broad concept of capital, going beyond just education and skills, can be thought of as the things—usually acquired through earlier sacrifice—used to make something else. Physical capital is typically made up of the machinery, equipment, and buildings that are used to produce goods and services. These "goods and services" are the "make something else" part. The "acquired through earlier sacrifice" part of physical capital comes from the fact that investing in machinery, equipment, and buildings happens when we devote resources to things that cannot be consumed today. Increasing a nation's stock of physical capital means that, at one time, the country lowered its consumption and increased its savings. Although the tired cliché that, "there's no such thing as a free lunch" can apply to the discussion of postponing current consumption to acquire more physical capital, a more intuitive—but equally played out—saying would be "you can't have your cake and eat it, too."

With human capital, the "make something else" part is that a person's education and skills are used on the job to produce goods and services. The "earlier sacrifice" is often the education and training that people obtain. These activities take time, but they provide a reward of greater productivity in the future. Thinking of the acquisition of human capital in terms of opportunity cost—that is, "no such thing as a free lunch"—a textbook example used in most every *Introduction to Economics* course is that a large part of the cost of acquiring an education is the foregone earnings that students give up to attend college.

From our earlier look in Chapter 3 at the industries that contribute to economic development, we can already guess that the types of capital most important to the success of US regions have probably changed over time. Back when the amount of manufacturing activity occurring in a region was a strong indicator of its economic success, physical capital ruled the day. You could figure out all you needed to know about a region's prosperity simply by counting its smokestacks. In today's ideas- and knowledge-based economy, where the movement and dissemination of information is key, tallying up the number of people with college

degrees—or, better yet, the presence of individuals in certain key occupations—might be a better way to get a handle on a region's potential for economic development.

4.3   COLLEGE ATTAINMENT AS AN INDICATOR OF HUMAN CAPITAL

The effects of human capital on the growth and prosperity of regions have been examined extensively, and the research almost universally suggests that human capital is good for economic development. A study by Glaeser and Saiz (2003) documents the magnetic effects of high-human capital regions. In US metropolitan areas with college attainment rates of less than 10 percent of adults, population growth rates averaged 13 percent between 1980 and 2000. In metros with college attainment shares of over one-in-four adults, the areas grew by an average of 45 percent. That's a population growth rate over three times larger in high-human capital regions.

Glaeser and Saiz considered a few explanations for these findings: the "Consumer City" explanation that educated residents are, in themselves, a draw to other educated people; the "Information City" explanation that densely settled cities encourage the flow of knowledge and ideas that are generated and used by educated workers; and the "Reinvention City" explanation that the presence of highly educated workers is vital to a region's ability to survive bad economic shocks. Of these three alternatives, the Reinvention City explanation found the strongest empirical support, based on the results showing that human capital matters most in declining regions. In addition, the researchers found that an increase in the presence of college educated adults accelerated the process of moving from manufacturing to other industries during the second half of the twentieth century. This result is also consistent with the idea that human capital helped cities reinvent themselves, which contributed to their growth.

Along with enhancing economic development by helping regions reinvent themselves in the face of economic misfortune, the presence of college educated workers is good for regional economic development because these people make others around them more productive (Moretti 2004a). This phenomena is referred to as a "human capital externality." Similar to the "knowledge spillover" externalities discussed in the context of Marshall's big three benefits of industry agglomeration, a human capital externality is a productivity bump to others working in close proximity to educated and skilled workers.

A study by James Rauch (1993) found that increasing the average education of people in a metropolitan area by one additional year of schooling results in almost a 2.8 percent increase in overall productivity. What's more, the types of human capital externalities uncovered by Rauch have different effects on people across the education spectrum. Enrico Moretti (2004b) found that a one-percentage point increase in a city's college attainment share results in a 0.4 percent increase in the earnings of those with a college degree. This result implies that college educated workers are better off in places with an abundance of high-human capital workers. Although it is not too shocking that college educated workers benefit from being around others with similar levels of education, Moretti's results on the impacts of human capital externalities on those with less than a college education might come as more of a surprise. A one-percentage point increase in a city's share of workers with a college degree increases the earnings of high school graduates by 1.6 percent—that's four times the size of the impact on those with a college degree—and the earnings of high school drop-outs by 1.9 percent—the largest impact of them all. This means that human capital externalities help everyone in a region, but the size of these benefits gets smaller for those who have more education.

Considering the role that educational attainment plays in the reinvention of regions and the human capital externalities uncovered by James Rauch and Enrico Moretti, it stands to reason that the share of college educated workers in a region has a positive effect on its overall productivity. Jaison Abel and I found such a result in a study that examined the productivity of US metropolitan areas during the early 2000s (Abel and Gabe 2011). Our research shows that a one-percentage point increase in the proportion of residents with a college degree is associated with a 2 percent increase in regional GDP per capita.

With human capital externalities identified as a mechanism by which education and skills help the growth and vitality of regions, it logically follows that the share of college educated workers would have larger impacts on productivity in more densely populated areas—where ideas flow more freely among workers. This is exactly what Jaison Abel, Ishita Dey, and I found in our research (Abel et al. 2012), and it's also an important result from a study by Edward Glaeser and Matthew Resseger (2010). Both of these studies examined the effects of urbanization—that is, city population size and density—on regional productivity. This topic has received a lot of attention over the years and a reoccurring result is

that, in fact, productivity is higher in larger and more densely populated areas (Sveikauskas 1975; Ciccone and Hall 1996). Our research and the project by Glaeser and Resseger incorporated an interesting twist of analyzing the impact of urbanization in concert with the effect of human capital. This tells us the extent to which human capital augments the positive effects of urbanization on productivity found in a lot of other studies.

The study by Edward Glaeser and Matthew Resseger found that the effect of population size on productivity is considerably stronger in places with a higher share of skilled (i.e., college educated) workers. Similarly, the article that Jaison Abel, Ishita Dey, and I wrote shows that an increase in population density in highly educated regions has a substantial positive impact on productivity, while an increase in density has virtually no impact on output per worker in places with lower levels of college attainment. This should not be too surprising. Cramming more educated and skilled people together (where they can interact with each other and generate human capital externalities) in a confined space provides a productivity lift, which does not occur from squeezing together more people with less formal education.

The studies described above only scratch the surface on the research that has examined the effects of human capital on regions. Although they focused on different aspects of economic development—earnings, productivity, and growth—the studies generally found that human capital helps the prosperity of regions. Another similarity of these studies, which is a little more subtle, is that they all use measures of formal education—for example, average years of schooling, share of the population with a college degree—as the indicator of human capital.

In recent years, this practice of treating human capital and educational attainment as one in the same has changed.

4.4   Occupations and Skills

You might recall from the beginning of the chapter that human capital can be thought of as the education and skills (and the experience and know-how, for that matter) that people use in their jobs. The amount of formal education that a person has completed, therefore, is a fairly narrow indicator of a worker's human capital. In fact, the number of years of schooling tells us very little about the skills a person has acquired and those that he or she uses on the job.

Someone with a high school diploma could be a skilled computer programmer, whereas a person with a college degree could have strong managerial skills. According to the amount of formal education, the college educated "manager" would appear to have considerably more human capital than the "programmer" with a high school degree. But, in reality, these workers are both skilled—albeit in different areas. Knowing the amounts of education these individuals have completed does not tell us about their specific skills (i.e., computer programming or managerial skills). Suppose, however, we knew that the person with a high school diploma designed custom websites for a living and the college graduate is employed as the general manager of a large resort hotel. Knowing the individuals' jobs, with no regard to the amount of formal education they have completed, would give us a better idea of the skills these workers possess.

In recent years, many researchers have started using a person's occupation, along with educational attainment, as a way to measure human capital (Feser 2003; Markusen 2004). Whereas educational attainment tells us "how much" someone knows (as Marigee Bacolod et al. (2009) call it, "a vertical orientation" of human capital), a person's occupation provides an indication of the types of skills that he or she uses on the job (or, "a horizontal orientation" of human capital). One of the best known examples of an occupation-based approach to regional economic analysis is Richard Florida's (2002) work on the creative economy. Florida identified certain occupational categories—for example, computer and mathematical, and architecture and engineering jobs—as part of the "creative economy," and his research has documented the importance of these types of occupations and creativity, in general, to the economic development of regions.

It is well documented in Florida's research that creative occupations have risen substantially as a share of total US employment in recent decades. The percentage of employment in the Creative Class expanded from 24 percent of the workforce in 1980 to about one-third of US workers in 2010 (Florida 2012). The growth of creative occupations happening alongside the decline of working occupations (e.g., production; installation, maintenance, and repair jobs) points to a picture similar to what we discussed earlier about the loss of manufacturing jobs and increases in sectors such as engineering services and healthcare. Although the industry-based (e.g., manufacturing, engineering services) employment figures are categorized based on a firm's product or service and an

occupational-based approach focuses on the types of tasks performed by workers, there is some overlap between—for example—the manufacturing industrial sector and workers in production-oriented occupations.

Research on the creative economy shows that, along with its growth in terms of the share of overall US employment, these occupations help the productivity of regions. A study by Richard Florida et al. (2008) found that creativity has a stronger impact than educational attainment on the labor productivity of regions. Likewise, a chapter that I contributed to the *Handbook of Creative Cities* shows that the impact on a person's own earnings is higher from having a creative occupation than a college degree (Gabe 2011). Along with the positive impact on earnings associated with having a creative occupation, my research found that the return to creativity is typically higher in regions with a greater overall employment share of creative workers. This provides some evidence of human capital externalities among individuals in creative occupations, similar to the benefits that college-educated workers provide to others in a region.

These studies suggest that having a high share of creative workers in a region is likely to be good for employment and income—two of the main indicators of economic development. To examine the resilience of creative occupations, Richard Florida, Charlotta Mellander, and I conducted a study that looked at the employment prospects of individuals during the Great Recession (Gabe et al. 2013). We found that creative workers fared better than those in working and service occupations during the recession, and this impact associated with having a creative occupation is larger than the effect from having a college degree. We explained these findings—similar to the concept of a "Reinvention City" proposed by Edward Glaeser and Albert Saiz—in the context of creative workers being able to re-invent themselves and adapt to the negative economic shock of the Great Recession.

Just like we can use data on the number of workers in certain occupations to measure the growth and impacts of the creative economy, we can use information on a region's entire workforce to determine the use and importance of a wide range of skills and abilities. The O*NET database, developed by the U.S. Department of Labor, provides information on dozens of job-related attributes and characteristics (e.g., skills, interests, knowledge) of US occupations.[5] With information from this database and statistics on the numbers of workers by occupation in a region, it's a relatively straightforward task to develop profiles that measure a region's relative skill level or knowledge (about a wide range of topics) compared to other places. These profiles, along with data on the shares of college

educated workers, give a broad picture of the types of human capital available in regions.

In a study that I conducted with Jaison Abel (Abel and Gabe 2011), we went beyond our analysis of the effects of college attainment on productivity and examined the impacts associated with a region's (workforce) knowledge about a wide range of subjects—such as sales and marketing, chemistry and, even, public safety and security. Our analysis showed that the effects on regional productivity varied by subject, but the largest positive impacts were associated with knowledge about information technology, and certain types of business services. There are obvious parallels between these findings and the results from Chapter 3 showing the industry-based effects of communication, computer and data processing, and producer services on regional economic development.

As it turns out, the types of subjects that we found to have positive effects on the productivity of regions—topics such as computers and electronics, engineering and technology, telecommunications, and economics and accounting—are included among the knowledge areas that also generate human capital externalities. Another study that I conducted had a focus on the impacts of knowledge—the same topics that we used in the analysis of regional productivity—on the earnings of US workers (Gabe 2009). I looked at the impacts of a person's own knowledge to measure the "private returns" to knowledge, as well as the "social" returns to knowledge associated with the share of high-knowledge workers in a region. It's interesting that the research found positive private and social returns to knowledge areas such as computers and electronics, engineering and technology, telecommunications, and economics and accounting. This means that people with knowledge about these topics are rewarded in the labor market (i.e., private returns to human capital) and their activities improve the productivity of others around them (i.e., human capital externalities).

Once again, in light of the industries found in Chapter 3 to have positive impacts on economic development, the types of skills and knowledge that generate human capital externalities should come as no surprise. The knowledge areas of administration and management, economics and accounting, computers and electronics, law and government, and telecommunications are closely related to industries involved in the production and distribution of ideas and information (e.g., engineering and management services, legal services, computer and data processing services).

Now, let's see how various dimensions of human capital affect the economic development of US regions.

4.5   Effects of Education, Creativity, and Skills on Economic Development

We'll begin our analysis of human capital with a focus on educational attainment—more specifically, the percentage of a region's workforce with at least a four-year college degree.[6] Looking at states, we find that the top-ten places for workforce college attainment are mostly located in the Northeast (e.g., Massachusetts, Connecticut, and Vermont) and Mid-Atlantic (e.g., Maryland and Virginia) regions. There are no states in the Deep South (the closest is Virginia) or anywhere resembling the Midwest. The Western United States is represented by California and Colorado, but states such as the Dakotas, Wyoming, and Montana—which all figure prominently in the top states as ordered by the economic development index—are not among the top places for workforce college attainment. For example, North Dakota and Wyoming had college attainment rates of close to 20 percent in 1990, which places them well outside the top-ranking states.

Moving to an analysis of metropolitan areas, we find that the most educated regions—places such as Boulder (Colorado) and Ann Arbor (Michigan)—had college attainment rates of over 40 percent of the region's workforce in 1990. These are remarkably high rates of college attainment, especially considering that the average figure across all 381 metropolitan areas was around 20 percent. At the other end of the spectrum, we see that 23 percent of the metropolitan areas—or, 87 in all—had college attainment rates of less than 15 percent; and four metros had less than one in ten workers with a college degree. With another 143 of the metros having college attainment rates of between 15 and 20 percent, we find that about 60 percent of US metros had college attainment rates of less than one in five workers in 1990. If—as suggested earlier in this chapter—counting people with a college degree provides a good indication of a region's ability to grow good jobs, then quite a few metros were well behind the leaders (i.e., those places with over 40 percent of workers holding a college degree) in the pursuit of economic development.

Along with Boulder and Ann Arbor, other top metros for workforce college attainment include smaller regions such as Ames (Iowa), Lawrence (Kansas), Corvallis (Oregon), and State College (Pennsylvania), as well as a handful of larger metropolitan areas such as Washington DC, San Jose, San Francisco, and Boston. If this list of smaller metros—that is, Ames, Lawrence, etc.—was an "answer" on the television game show *Jeopardy*,

the correct question would be, "What are some U.S. metropolitan areas with big universities?" The larger metros, cited above as having high shares of workforce college attainment, are well known for vibrant high technology sectors and are often counted among the leaders in the US knowledge economy.

In Fig. 4.1, we see a positive and statistically significant relationship between the economic development of US metropolitan areas and the share of the workforce with at least a college degree. The results, however, are far from overwhelming. Although the trend line is upward sloping, our analysis summarized later in this chapter shows that a one-standard deviation increase in the share of college educated workers is associated with just a 0.26-standard deviation increase in the economic development index of US metropolitan areas. In addition, the 27 metros with college attainment rates of more than 30 percent of the workforce have economic development index values that range from 26 to 100. So it's hardly the case that all of the best-performing places for human capital—that is, according to college attainment—exhibited the most robust growth of good jobs.

We also see, similar to what we found when looking at the computer and data processing services industry in Chapter 3, a wide split among the very highest ranking metros for economic development. San Jose, Austin, and Midland, Texas, are among the leaders for college attainment and economic development, while Odessa (Texas) and The Villages (Florida) are top places for economic development despite being near the bottom of the pack for college attainment. In fact, these two regions had college attainment rates below that of Kokomo (Indiana), the worst-performing metropolitan area for economic development.

Figure 4.2 summarizes the effects of workforce college attainment on the economic development of US regions—states and metropolitan areas. To get your bearings in the figure, the shaded bar corresponding to the economic development of "all metros" has a height of 0.26, interpreted to mean (as mentioned above) that a one-standard deviation increase in the workforce college attainment rate is associated with a 0.26-standard deviation increase in the economic development index score of US metros.

The most compelling results shown in Fig. 4.2 are the impacts of workforce college attainment on the income indices: they're positive and statistically significant across the board. These findings suggest that human capital raises the productivity of workers, which is reflected by their high wages. It's also interesting that the biggest impact of college attainment
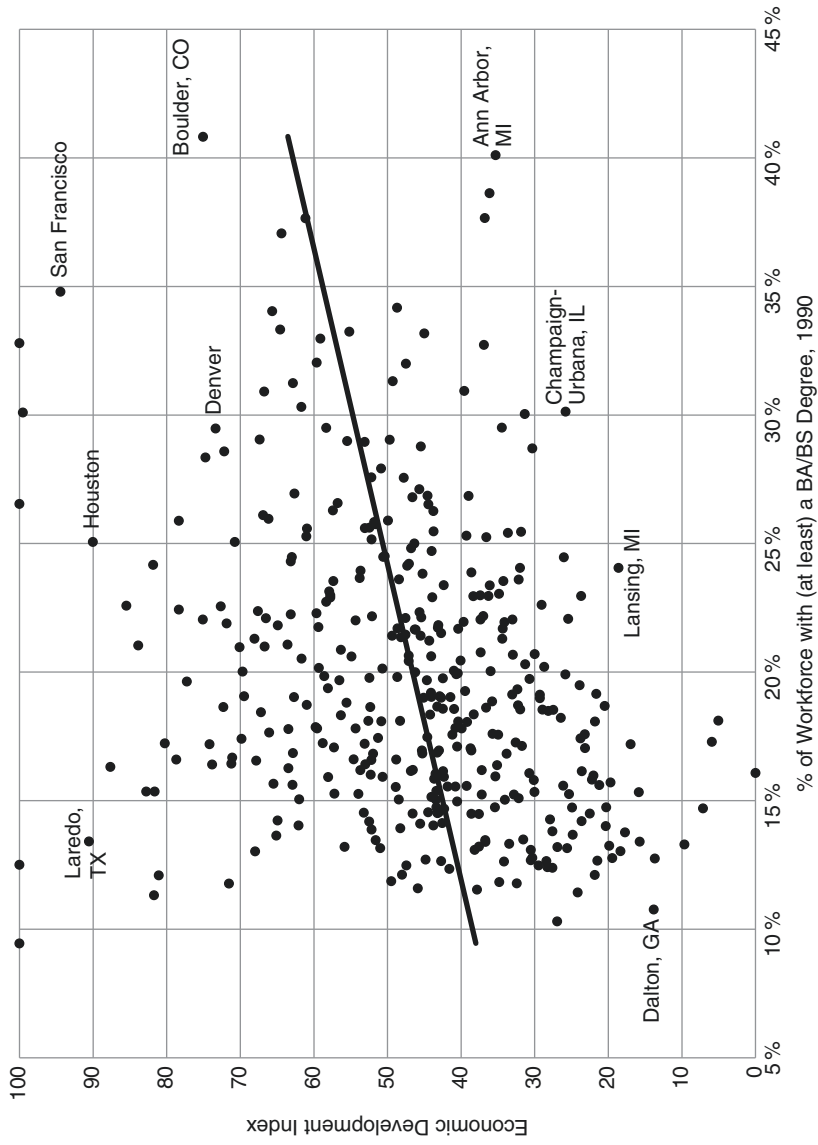
Fig. 4.1   A highly educated workforce helps the economic development of US metropolitan areas
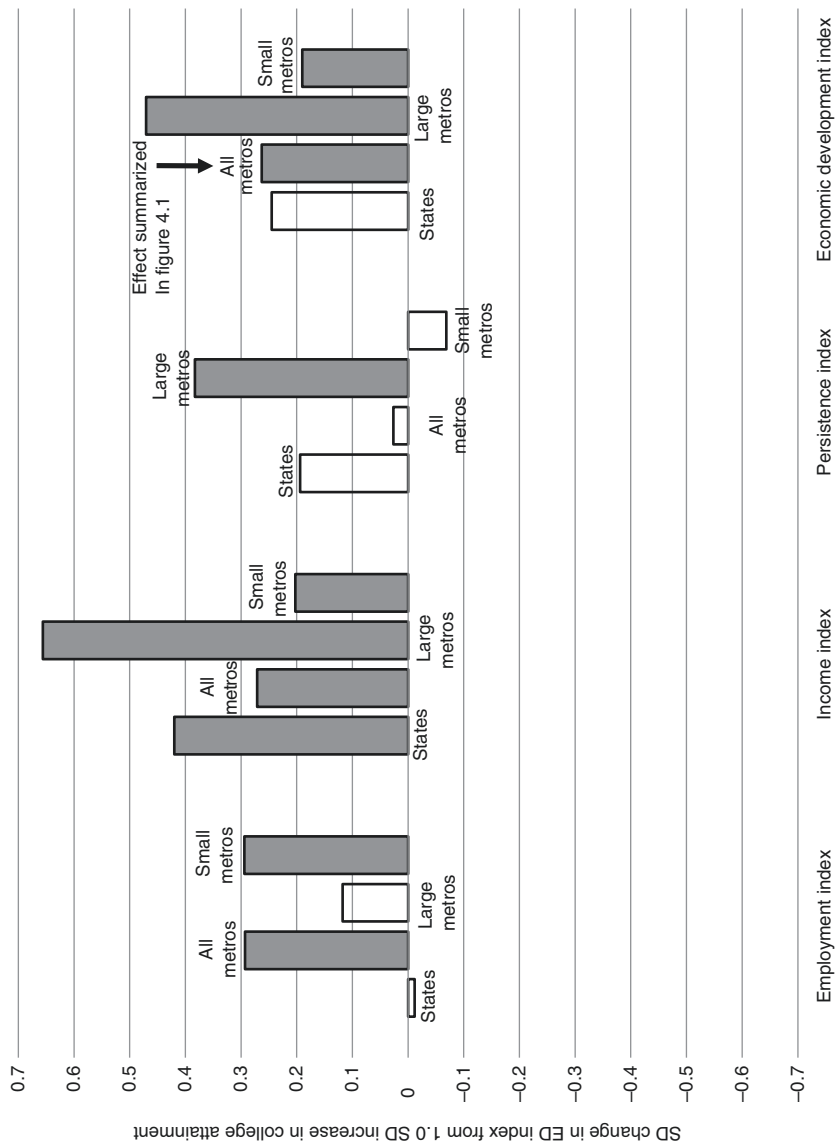
Fig. 4.2 Education is particularly beneficial to the economic development of large US metropolitan areas

on income is found for large metropolitan areas. This result is consistent with research (the studies discussed earlier by Glaeser and Resseger (2010); and Abel et al. (2012)) that found a positive interaction between urbanization and the effects of human capital. That is, human capital is especially important in large and densely populated urban areas. The rest of the results summarized in the figure suggest that college attainment is positively associated with the employment index of metropolitan areas, presumably due to its effect in smaller regions. But, aside from this result, the positive relationship found between the (overall) economic development of regions—especially larger metros—and college attainment is largely due to its effect on the quality of jobs.

Whereas college attainment has a positive effect on the economic development of metropolitan areas—and the impact is especially pronounced in large metropolitan areas—no such effect is found for states. Perhaps the most logical explanation for this (lack of) result is that the large land area of states hinders the flow of human capital externalities. The idea that educated workers can help the productivity of others makes sense when the "others" are counted in the same labor force, but it becomes less plausible when the "others" could be located several hundred miles away.

Another explanation for the finding of "no effect" of workforce college attainment on the economic development of states is the breadth of the human capital measure used. When I think about some of my friends and family members with college degrees, the types of skills and knowledge they possess range from engineering and technology, to journalism and law enforcement. Now, if I think about my friends and colleagues who are economists, the skill set becomes a little more homogeneous. We all have reasonably strong math skills, computer programming skills, and abstract thinking skills. What could be more abstract than the downward-sloping demand and upward-sloping supply curves that are at the heart of most beginning economics courses? My friends who chose the less dismal profession of engineering have strong math and computer skills, as well as problem solving and mechanical skills. If you needed someone to program a computer, you could probably find an economist or engineer who is up to the task. If you needed someone to fix a computer, you might have better luck with an engineer.

In Richard Florida's research on the creative economy, described above, he identified the importance of using creativity on the job as a common thread among several broad occupational categories. More

specifically, Florida came up with a two-tiered definition of the creative economy: the creative core and creative professionals. The creative core is made up of computer and mathematical; architecture and engineering; life, physical, and social science; education, training, and library; and arts, design, entertainment, sports, and media occupations. These occupations accounted for about 12 percent of the overall US workforce in 1999 (Florida 2002). The segment of creative professionals is comprised of management; business and financial operations; legal; and healthcare practitioners and technical occupations. These jobs made up another 18 percent of the workforce in 1999, which means that the entire creative economy had 30 percent of all US jobs around the turn of the century.

The top-ten states according to the percentage of employment in creative occupations has nine states in common with those cited among the top regions for the share of the workforce with a college degree, but the exact rankings are a little different.[7] The "new state" counted among the leaders for the creative economy is North Dakota, which replaces California from the list of the top states according to workforce educational attainment. This switch from California to North Dakota might seem inconsequential at first glance, but it's actually quite noteworthy in light of North Dakota's relative standing as measured by the percentage of the workforce with a college degree. North Dakota is around the middle of the pack for college attainment—28th out of 50 states, to be exact—and almost indistinguishable from Michigan in this measure of human capital. When we define human capital based on the use of creativity on the job—that is, occupations such as scientists, engineers, artists, and educators—North Dakota is situated among states such as Colorado, New York, Vermont, and Virginia. That's good company.

Moving to an analysis of metropolitan areas, we see that 16 regions are among the top-twenty places for workforce college attainment and the share of workers in creative occupations.[8] The four regions that are included among the top-twenty metros for creative economy employment, but not workforce educational attainment, are Huntsville (Alabama) Rochester (Minnesota), Champaign-Urbana (Illinois), and Austin. These metros replaced Lawrence (Kansas), State College (Pennsylvania), Fort Collins (Colorado), and Midland (Michigan), which are among the top-twenty metros for workforce college attainment but not employment in creative occupations. Despite the overlap in the states and metropolitan areas included among the top regions for educational attainment and the creative economy, having a college degree

and working in a creative occupation are not one in the same. In the book chapter that I published in the *Handbook of Creative Cities*, I found that 67 percent of workers in occupations requiring "high creativity" have at least a college degree, whereas 23 percent of the people in non-creative jobs have a college diploma on their wall (Gabe 2011).

The effects of a region's share of the workforce in creative occupations on state and metropolitan area economic development are summarized in Fig. 4.3. The results show that, unlike what we found in the analysis of college attainment, there's a positive and statistically significant relationship between the economic development of states and the share of employment in creative occupations. Specifically, a one-standard deviation increase in this measure of human capital is associated with a 0.47-standard deviation increase in the economic development index of states. This impact is considerably larger than the 0.25-standard deviation increase in the economic development index (of states) associated with a one-standard deviation increase in the share of college educated workers (see Fig. 4.2).

Other than the finding of creative economy employment having a positive effect on the economic development (and employment persistence) of states, which was not the case in our earlier analysis, the results for these first two measures of human capital are similar. The largest impact associated with creative economy employment, which we found earlier for college attainment, is a substantial positive effect on the income index for large metropolitan areas.[9] Likewise, the results for college attainment and creative economy employment are similar in their positive impacts on the employment index of small (and all) metros.

Our analysis of the creative economy demonstrates the utility of an occupational-based approach to examining the effects of human capital on economic development. So why stop here? Just as we looked at the effects of certain types of industries on regional economic development, we can do the same thing for occupational categories. Focusing on occupations, after all, provides a good indication of the types of skills that people use in their jobs.

Table 4.1 summarizes the effects of 22 broad occupational categories on the economic development of regions. The table's set-up is similar to what we used in our analysis of industries back in Chapter 3. Cells with a [+] sign indicate a positive and statistically significant impact on the overall economic development index, a [−] sign denotes a negative and statistically significant impact, and a [0] means that the share of employment in the occupational category does not have a significant effect on economic development.
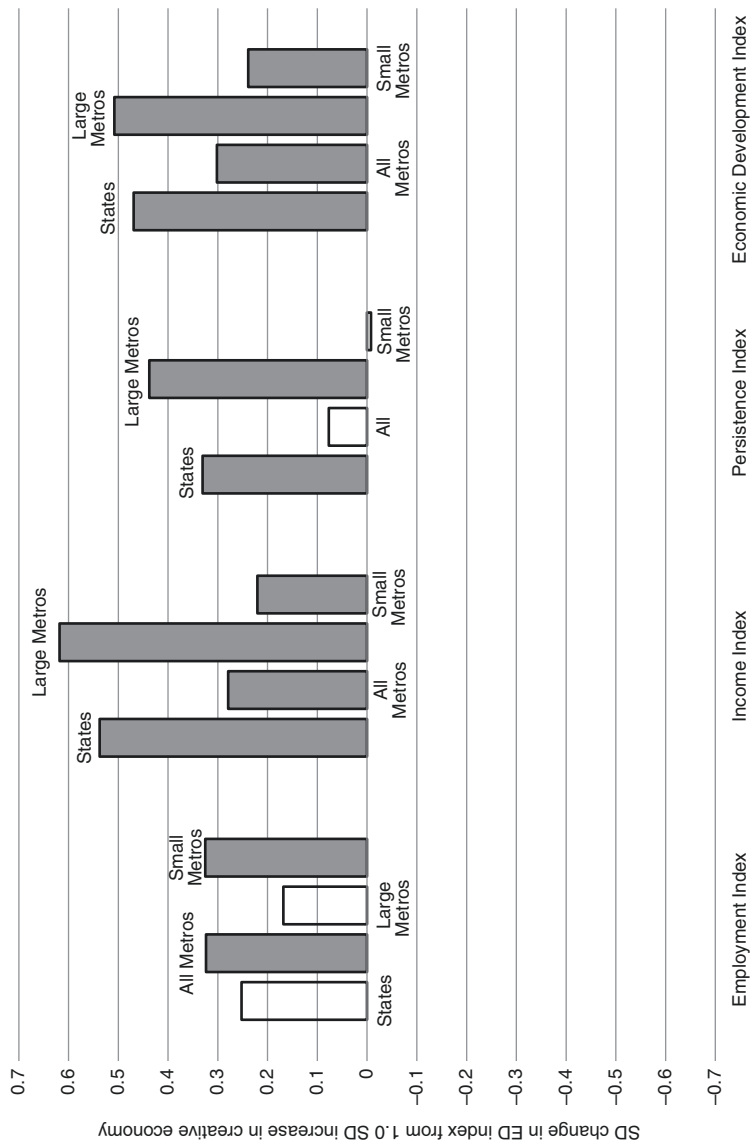
Fig. 4.3 A creative workforce helps the economic development of US metropolitan areas and states

Table 4.1 Effects of occupational employment on regional economic development

Occupational Category	States	All Metros	Large Metros	Small Metros
Management	[+]	[+]	[+]	[+]
Business and Financial Operations	[0]	[+]	[+]	[+]
Computer and Mathematical	[0]	[+]	[+]	[0]
Architecture and Engineering	[0]	[+]	[+]	[0]
Life, Physical, and Social Science	[0]	[+]	[+]	[+]
Community and Social Service	[0]	[0]	[−]	[0]
Legal	[0]	[+]	[+]	[+]
Education, Training, and Library	[+]	[+]	[0]	[+]
Arts, Design, Entertainment, Media, and Sports	[0]	[+]	[+]	[+]
Healthcare Practitioners and Technical	[0]	[0]	[−]	[0]
Healthcare Support	[0]	[−]	[−]	[0]
Protective Service	[0]	[0]	[0]	[0]
Food Preparation and Service	[+]	[0]	[0]	[0]
Building and Grounds Cleaning & Maintenance	[0]	[0]	[0]	[0]
Personal Care and Service	[+]	[+]	[+]	[+]
Sales and Related	[0]	[+]	[0]	[+]
Office and Administrative Support	[0]	[+]	[0]	[+]
Farming, Fishing, and Forestry	[0]	[−]	[0]	[−]
Construction and Extraction	[0]	[+]	[0]	[+]
Installation, Maintenance, and Repair	[0]	[0]	[0]	[0]
Production	[−]	[−]	[−]	[−]
Transportation and Material Moving	[0]	[−]	[−]	[0]

The results summarized in Table 4.1 suggest that several of the occupational categories found to support the growth of good jobs—for example, management; life, physical, and social science; and computer and mathematical—figure prominently in Richard Florida's creative economy. So these results are similar to what we found before. In addition, a few occupational groups involved in services and commerce—for example, personal care and service; and sales and related—are positively associated with (overall) economic development.

A comparison of the results for large and small metropolitan areas provides some additional insights—related to what we found earlier in the analysis of industries—into the factors that impact the economic development of different-sized regions. First off, the technology-related

occupational groups of computer and mathematical; and architecture and engineering increase the economic development of large metropolitan areas, but not smaller regions. In Chapter 3, when we looked at the "winning" sectors for economic development, we also found that the technology-related industries—in particular, the manufacturing sectors of "electronic and other electric equipment" and "instruments and related products"—positively impacted the economic development of large (but not small) metropolitan areas. On the other hand, the occupational categories of office and administrative support; sales and related; education, training, and library; and construction and extraction have positive effects on the economic development of smaller metropolitan areas.

Moving from an analysis of workforce college attainment to the effects of creativity and now the broad occupational categories provides a clearer picture of the human capital and specific types of skills available in the workforce. Whereas an education-based measure tells us "how much" someone knows, an occupation-based measure of human capital reveals a person's skills and day-to-day work activities. To move one step further in our characterization of the human capital available in US regions, we can use information on the exact skill requirements of occupations. As noted above, the occupational information network—O*NET for short—is a database that tells us everything there is to know about a job—for example, the skills used and worker abilities, and the amount of education and experience required. The O*NET is based on surveys of workers across a wide range of occupations, as well as input from professional occupational analysts. For the types of skills needed on the job, the O*NET database covers 46 areas, ranging from "reading" and "mathematics" to "trouble-shooting" and "repairing."

Figure 4.4 shows the relationship between the economic development of US metropolitan areas and the workforce skill of "idea generation." I selected this skill category given the earlier results, for industries and occupations, suggesting that knowledge- and idea-based activities have eclipsed hands-on skills as a key factor affecting the economic development of regions. The results suggest that, indeed, skills related to idea generation have a positive and statistically significant effect on metropolitan area economic development. Although the economic development index shown on the vertical axis is familiar by now, the skills-based index plotted on the horizontal axis is new. This score is a weighted average of the skill's rating—both its importance to the job and the level of skill needed—for occupations present in the region.[10]
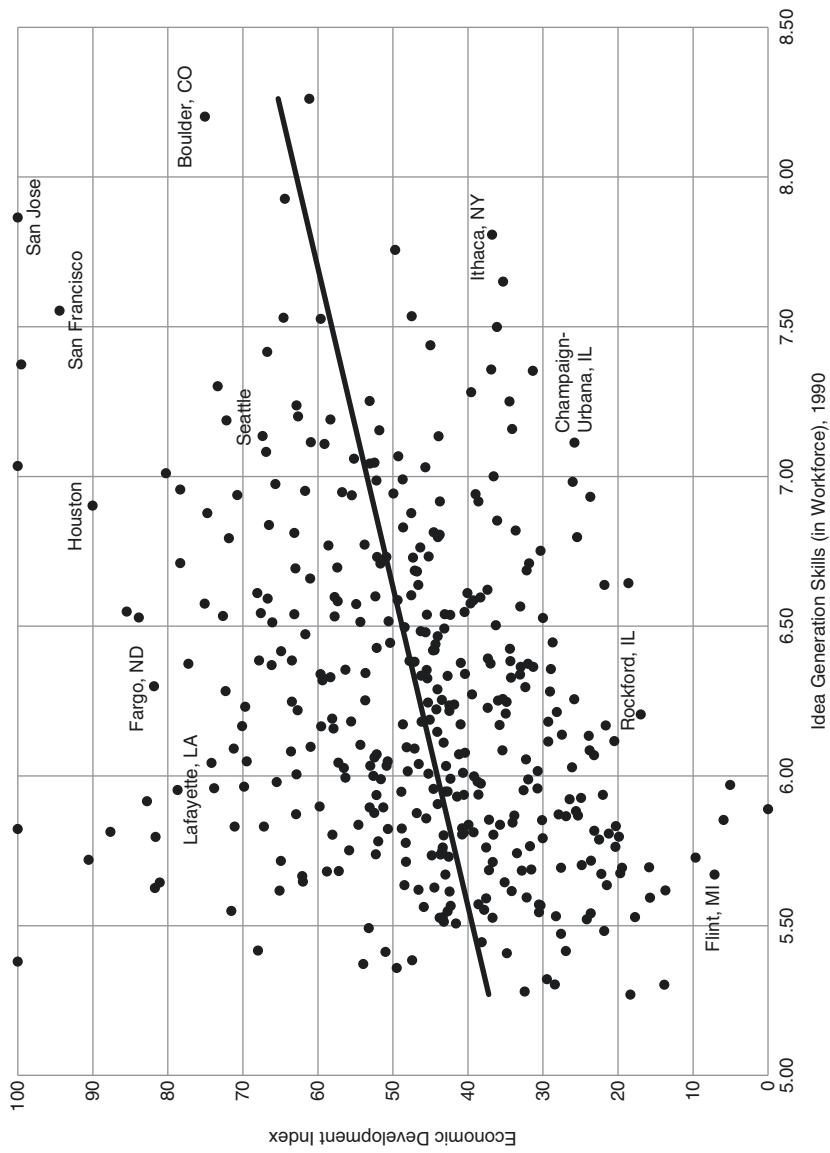
Fig. 4.4 Idea generation skills help the economic development of US metropolitan areas

Table 4.2 Effects of workforce skills on regional economic development

Skill	States	All Metros	Large Metros	Small Metros
Reading Comprehension	[0]	[+]	[+]	[+]
Active Listening	[0]	[+]	[+]	[+]
Writing	[0]	[+]	[+]	[+]
Speaking	[+]	[+]	[+]	[+]
Mathematics	[0]	[+]	[+]	[+]
Science	[0]	[0]	[+]	[0]
Critical Thinking	[0]	[+]	[+]	[+]
Active Learning	[0]	[+]	[+]	[+]
Learning Strategies	[+]	[+]	[+]	[+]
Monitoring	[0]	[+]	[+]	[+]
Social Perceptiveness	[+]	[+]	[0]	[+]
Coordination	[0]	[+]	[+]	[+]
Persuasion	[0]	[+]	[+]	[+]
Negotiation	[+]	[+]	[+]	[+]
Instructing	[+]	[+]	[+]	[+]
Service Orientation	[+]	[+]	[0]	[+]
Problem Identification	[0]	[+]	[+]	[+]
Information Gathering	[0]	[+]	[+]	[+]
Information Organization	[0]	[+]	[+]	[+]
Synthesis/Reorganization	[0]	[+]	[+]	[+]
Idea Generation	[0]	[+]	[+]	[+]
Idea Evaluation	[0]	[+]	[+]	[+]
Implementation Planning	[0]	[+]	[+]	[+]
Solution Appraisal	[0]	[+]	[+]	[+]
Operations Analysis	[0]	[+]	[+]	[+]
Technology Design	[0]	[0]	[+]	[0]
Equipment Selection	[−]	[−]	[0]	[−]
Installation	[−]	[−]	[0]	[−]
Programming	[0]	[+]	[+]	[+]
Testing	[−]	[0]	[+]	[−]
Operation Monitoring	[−]	[−]	[0]	[−]
Operation and Control	[−]	[−]	[−]	[−]
Product Inspection	[−]	[−]	[0]	[−]
Equipment Maintenance	[0]	[−]	[−]	[−]
Troubleshooting	[0]	[−]	[0]	[−]
Repairing	[0]	[−]	[−]	[−]
Visioning	[0]	[+]	[+]	[+]
Systems Perception	[0]	[+]	[+]	[+]
Identifying Downstream Consequences	[0]	[+]	[+]	[+]
Identification of Key Causes	[0]	[+]	[+]	[+]

Table 4.2   (continued)

Skill	States	All Metros	Large Metros	Small Metros
Judgment and Decision Making	[0]	[+]	[+]	[+]
Systems Evaluation	[0]	[+]	[+]	[+]
Time Management	[0]	[+]	[+]	[+]
Management of Financial Resources	[0]	[+]	[+]	[+]
Management of Material Resources	[0]	[+]	[+]	[+]
Management of Personnel Resources	[0]	[+]	[+]	[+]

Metropolitan areas such as San Jose, San Francisco, Seattle, Boulder (Colorado), and Ithaca (New York) are among the top-rated places for the workforce skill of idea generation. Although several of the top-rated places are also among the leaders for economic development, Ithaca and Champaign-Urban (Illinois) are highly ranked for idea generation, yet they have relatively low economic development index scores. Conversely, a few metros such as Fargo (North Dakota) and Lafayette (Louisiana) have relatively high scores for economic development despite being in the middle (or even bottom) of the pack for workforce skills in idea generation.

A scan of Table 4.2 shows that the skill of idea generation is just one of many found to have positive and statistically significant effects on the economic development of US regions. Basic skills such as writing and mathematics, critical thinking skills—emphasized in a lot of university degree programs—coordination, negotiation, judgment, conceptualization (e.g., systems perception, identification of key causes), and management (time, financial, material, and personnel) skills are among a long list of those found to support the growth of good jobs in US metros. In what's becoming a reoccurring theme, a few technology-oriented skills such as technology design, and science enhance the economic development of large, but not small, metropolitan areas. Whereas technology is important to large metropolitan areas—consistent with our findings related to industries (e.g., "electronic and other electric equipment" and "instruments and related products") and the broad occupational groups (e.g., computer and mathematical, architecture and engineering)—skills related to information (gathering and organizing) enhance the economic development of large and small regions.

The results summarized in Table 4.2 reveal some fascinating differences between the types of skills that help the economic development of states

and metropolitan areas, and even some discrepancies across large and small metros. Whereas most of the skills have statistically significant effects on the economic development of metropolitan areas, only 12 of the 46 skills have statistically significant effects on the economic development of states. Several skills related to manufacturing and production are negatively associated with the economic development of states, and a few skills that deal with interpersonal communications (e.g., speaking, social perceptiveness, negotiation) contribute to the growth of good jobs. However, similar to what we found for industries, our results related to workforce skills suggest that technology, ideas and information are very important to the economic development of metropolitan areas, but not so much for states.

It's also interesting, and not too surprising, that many of the skills found to help economic development involve "non-routine" tasks—things like "complex communications" and "expert thinking"—that are unlikely to have been replaced by computers and increased automation. Research by David Autor, Frank Levy, and Richard Murnane (2003)—and Levy and Murnane (2004)—examine technology-enhanced changes in the US labor market, and point to "routine analytic" (e.g., repetitive calculations) and "routine manual" (e.g., assembly) tasks as being particularly vulnerable to replacement by computers and other forms of automation. On the other hand, non-routine tasks—things such as persuading others and management—are considered by David Autor and colleagues to be complements (rather than substitutes) to greater technology use. The list of skills that help regional development—for example, persuasion, implementation planning, management of personnel resources—is practically a roster of skills that involve non-routine tasks. Conversely, several of the skills found to have a negative effect on economic development—for example, operation monitoring, operation, and control—are more repetitive in nature and subject to greater replacement through enhanced technology use.

4.6   Human Capital and the Pursuit of Economic Development

This chapter began with the simple premise that human capital, by increasing the productivity of educated and skilled workers (as well as those around them), is good for regional economic development. Although human capital is a broad concept that describes a person's education and

skills (and experience and know-how), past research—especially studies conducted prior to around 2000—typically measured it using college attainment. More recent studies on the topic have taken a broader perspective and incorporated occupational-based (e.g., Richard Florida's creative economy) approaches to measuring human capital and skills.

An almost universal finding in economic research is that human capital increases a person's own earnings. For the study of regional economic development, an even more important finding from past studies is that human capital externalities enhance the productivity and earnings of others, too. Our results show that college attainment (i.e., the share of the workforce with a college degree) has a positive effect on the economic development of US metros. These results are due, in large part, to the impacts of educational attainment on the income index. This effect of college attainment on income is especially robust for large metros, which is consistent with studies finding that urbanization works hand-in-hand with human capital to increase productivity. We found a positive effect of workforce college attainment on the employment index for smaller metros, but not larger regions or states.

Moving to some more specific indicators of human capital, we found that the types of occupations present in a region affect the growth of good jobs. Occupational groups that fall into Richard Florida's definition of the creative economy (e.g., management; computer and mathematical; life, physical, and social science occupations) are found to enhance the economic development of regions, and we found similar results for some occupational categories related to commerce and services.

Our most detailed look into how human capital affects economic development focused on the actual skills used by workers on the job. Here, we found that skills pertaining to management (time, financial, material, and personnel resources), dealing with others (e.g., persuasion, negotiation, social perceptiveness) and the old standbys of technology (computer programming and technology design) and information (generation and evaluation) enhance the economic development of metropolitan areas. It's interesting—and consistent with earlier findings—that technology-oriented skills help the growth of good jobs in larger metropolitan areas, whereas skills that deal with information and ideas are important to metros of all sizes.

In addition to the positive impacts related to workforce skills about technology, commerce and how to move ideas, which was hinted at earlier

in our analysis of industries, we learned in this chapter about the importance of creativity and critical thinking skills. These findings suggest that—at its essence—human capital helps economic development by providing a workforce that is capable of inquiry and discovery, understanding broad and complex ideas, and coming up with new ways to solve problems. The types of skills that are negatively associated with economic development include those related to production-oriented tasks such as operation and control, product inspection, and equipment maintenance. It's no wonder, then, that we found the share of workers in production occupations has a negative effect on the economic development of US regions.

The analysis presented in this chapter—along with the results and advice suggested in other studies on the topic—support the following principles for using a human capital-based approach in the pursuit of economic development.

Principle 1: Encourage the acquisition of human capital. Human capital is an important factor—perhaps the most important factor—explaining the productivity of workers and regions. At one time, state and local officials sought to attract manufacturing plants (and the investments they made in buildings, machinery and equipment) as a way to increase a region's productivity and wages. These same benefits can be acquired in today's economy through the acquisition of human capital.

Principle 2: The effects of human capital on regional economic development differ between states and metropolitan areas, and even across different-sized metros. High human capital workers are needed about everywhere. Doctors, teachers, and other health and human services providers—occupations that typically require at least a college degree—are important to regions large and small. In some rural areas, workers in these occupations—along with jobs such as accountants and some managers—account for a large share of the region's college educated (Abel et al. 2014). In more densely populated urban areas, the ranks of the college educated also include a greater share of computer programmers, engineers, data analysts, finance professionals, and marketing gurus. Human capital externalities are especially strong in densely populated areas as a result of these types of creative jobs and their day-to-day work activities that benefit from a lot of face-to-face contact.

Principle 3: Consider a skills- and occupational-based cluster strategy to complement a region's industry clusters. The previous chapter described the

benefits of clusters—for example, pooled labor force, knowledge spillovers, and availability of specialized inputs and machinery—in the context of a strategy of "picking winners" for regional industry specialization. These same types of benefits apply to occupations and, in some cases, they are even stronger. In the case of knowledge spillovers, the idea of industry clusters is that they can help facilitate the flow of information about how goods are produced; or, as Alfred Marshall calls them, "the mysteries of the air." If knowledge spillovers can help the growth of industries, which are defined on the basis of the good or service produced by a firm—which can employ all sorts of occupations—then imagine how knowledge spillovers could help the productivity of workers that use the same types of skills in their jobs.

Once you think about a region's occupations in the context of clusters, it opens up a whole new approach to economic development with a focus on the skills available in the workforce. Just like we suggested, in Chapter 3, the principle of monitoring the health and outlook of a region's industries, the same thing can be said for its occupations and skills. And similar to our warning that some industries are subject to greater threats from international competition, specific types of skills—what Autor et al. (2003) refer to as "routine" and "repetitive"—are declining in importance as they can be performed through automated systems.

NOTES

1. This figure was calculated using data from the U.S. Bureau of Labor Statistics.
2. These statistics were calculated using data from County Business Patterns of the U.S. Census Bureau.
3. These figures are from the U.S. Bureau of Labor Statistics.
4. Vijay Mathur (1999) also argues that human capital helps regions "directly" through the high productivity of educated and skilled workers and "indirectly" through "spillover effects."
5. For more information about O*NET, see the article by Norman Peterson and (numerous) colleagues (2001).
6. Educational attainment figures are from the U.S. Census Bureau.
7. These nine states are Colorado, Connecticut, Maryland, Massachusetts, New Hampshire, New Jersey, New York, Vermont, and Virginia.
8. These metros are Ames (Iowa), Ann Arbor (Michigan), Boston, Boulder (Colorado), Bridgeport (Connecticut), Columbia (Missouri), Corvallis (Oregon), Durham-Chapel Hill (North Carolina), Gainesville (Florida),

Iowa City (Iowa), Ithaca (New York), San Francisco, San Jose, Santa Fe (New Mexico), Trenton (New Jersey), and Washington D.C.

9. A study by Brian Knudsen et al. (2008) also found a positive interaction between the effects of big cities (i.e., population density) and creativity.

10. For more information about how I connected the O*NET variables to the workforce employment figures of states and US metropolitan areas, see the articles by Jaison Abel et al. (2014), and Todd Gabe (2009).

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Small Businesses and the Growth of Good US Jobs

5.1   Are Small Businesses Potent Job Creators?

Let's go back for a moment to Andrew Isserman's (1998) list of the most influential "theories" that policymakers have consulted in the pursuit of economic development. Two of the four—industry clusters and enhancing exports—present a challenge, one way or another, of identifying and then growing industries that will help a region's economy. The chapter on "picking winners" covered these ideas in one fell swoop (and we'll talk about industry multiplier effects, also noted by Isserman, in the next chapter).

This leaves us with one more concept—the important role of small businesses to job creation—that Andrew Isserman felt had a strong influence on economic development practice and policy.

Ever since David Birch's (1981) study documenting the importance of small (and young) establishments to job creation in the United States, economic development officials have looked to grow their regions through the promotion of small businesses. His research showed that 66 percent of the US job creation between 1969 and 1976 came from businesses with 20 or fewer workers, and businesses with 21–50 and 51–100 workers accounted for 11.2 percent and 4.3 percent of the US job creation, respectively. That's a whopping 80 percent of job creation coming from businesses with 100 or fewer workers.

Policymakers would take notice of these figures, indeed.

The logic underlying an economic development strategy focusing on small businesses is that, according to David Birch's study and the research of others, they create more jobs than larger companies. Furthermore, small and young (i.e., recently formed) businesses are believed to be more innovative and entrepreneurial than their larger and more established counterparts. After all, the process of setting up a small business often starts with an idea or innovation that the owner—that is, entrepreneur—wants to exploit. The combination of robust job creation and high levels of innovation suggests that small businesses can help the growth of good jobs in a region.

A strategy aimed at helping small businesses can also be thought of as "more diversified" than one that seeks to attract (or retain) large companies. Regions that devote a lot of their economic development resources to landing large manufacturing plants (and other big companies) are putting most of their economic development eggs in one basket—although they could be proved to be golden if one or more were to hatch and a large company were to come to town. Programs designed to help small businesses, on the other hand, often spread assistance across a greater number of recipients. As we'll see later in this chapter, small businesses outnumber large companies by a wide margin. For example, the United States had over 560 establishments employing one to four people in 2014 for every one business with 1,000 or more workers.[1]

Another aspect of small business assistance efforts is that they are often "local" in nature. Economic development initiatives that help small businesses usually focus on companies that are already operating in a community, and programs that assist potential entrepreneurs—that is, people who might start up a new company—are often pitched to locals. On the other hand, efforts aimed at attracting large branch plants of already formed companies tend to target multi-establishment firms with headquarters located elsewhere.

The upsides of helping small businesses, however, are tempered by the realization that lots of successes are needed to add up to very much in the way of job creation. Meeting a target of 25,000 new jobs in a region would require that this many small companies—say, employing five workers—added one job each. That's a lot of companies needing to grow by 20 percent, which is no small feat.

How realistic is it, then, to grow good jobs with small businesses?

In the years since David Birch's research, the role of small businesses in the economy has been examined extensively—there's even an academic

journal titled *Small Business Economics.*[2] Since studies focusing on small businesses have covered multiple indicators of growth and development (e.g., job creation, innovation, wages, and salaries), used different geographic scales of analysis (e.g., county-level, nationwide) and looked at countries around the world, it would be difficult to come up with a consensus regarding the impacts of small businesses on the growth of good jobs. But, given the wide range of results that researchers have found, I think we can safely say that the evidence is mixed on the effects of small businesses on economic development.

One way of looking at the role of small businesses in job creation is by examining the relationship between the employment growth of individual businesses and their initial size. A decades old theory of firm growth, referred to as Gibrat's Law, suggests that an establishment's growth rate is unrelated to its initial size (Hart and Prais 1956). This means that large and small companies have the same likelihood of experiencing a growth rate of, say, 20 percent. In other words, Gibrat's Law implies that small establishments do not grow any faster than larger ones.

Numerous studies conducted since Gibrat's Law was proclaimed over 50 years ago have examined the employment growth of firms and, as a general rule, most of them break the law and find that smaller businesses have higher growth rates than larger businesses (Evans 1987; Hall 1987). Furthermore, these studies also typically find a negative relationship between business growth rates and the number of years they have been in operation (i.e., the establishment's "age"). That is, smaller and younger businesses tend to grow faster. It's also the case, however, that—along with growing faster than their larger and more established counterparts— small and young businesses have a lower probability of "survival." In other words, small and young businesses are more likely to go out of business.

These findings related to the growth and survival of small (and young) businesses present a challenge to examining their impacts on overall job creation. First, you have the fact that many business startups begin operations small, so—at any point in time—you have a certain number of jobs in a region that are accounted for by these small businesses that recently opened. But, if you're interested in aggregate job growth over time, these gains from new entrants need to be offset by the loss of jobs from the small (and young) businesses that closed. Finally, for companies that remain in operation over time, you have the tendency that small (and young) establishments tend to grow faster than other businesses.

This all means that the impacts of small businesses on overall regional employment growth depend greatly on whether you're looking at gross job creation (i.e., just focusing on the sources of new jobs) or net job change (i.e., balancing new jobs with employment losses), as well as whether you are looking at job changes due to entry and exit (versus employment growth and decline in already existing establishments that did not go out of business). Figuring out whether small businesses have an overall "net positive" or "net negative" impact on aggregate job growth requires an analysis of regional employment dynamics, which accounts for firm births and deaths, as well as the expansions and contractions of incumbent (i.e., existing) companies.

A study of US employment dynamics by Steven Davis, John Haltiwanger, and Scott Schuh (1996a, 1996b) challenged the conventional wisdom—held by many economic development professionals and policymakers who were aware of David Birch's study—that small businesses were responsible for the majority of jobs created in the United States. The research team of Davis, Haltiwanger, and Schuh had access to U.S. Census data from 1972 to 1988 on individual manufacturing plants, which allowed for a detailed analysis of business births and closures, as well as the expansions and contractions of incumbent establishments.

Results of the extensive analysis by Steven Davis and colleagues were striking and almost completely contrary to what was reported by David Birch. They found that manufacturing plants with 100 or more workers were responsible for two-thirds of job creation between 1972 and 1988, and plants that were larger yet—those with 500 or more employees—were responsible for one-half of job creation. These gains associated with growing plants were offset by almost identical losses in large manufacturers that declined over the period. The findings that large manufacturing plants accounted for the highest percentages of job gains and losses should come as no surprise, since these establishments made up 77 percent (plants with 100 or more workers) and 42 percent (plants with 500 or more workers) of manufacturing employment.[3]

Steven Davis et al. (1996b) also found that larger plants were much more likely to stay in operation than smaller manufacturers, and new jobs that were created had a much higher chance of being around one-year later in the larger plants. They interpreted these findings to mean that "larger employers offer greater job durability." Looking at smaller businesses, Steven Davis and colleagues found that manufacturing plants with fewer than 100 employees had much higher gross job creation rates than

larger manufacturers, but similarly robust job destruction rates. The biggest lesson learned from this analysis of US manufacturers is that the net job creation rates of these companies were unrelated to employment size. That is, small plants were no better or worse than large manufacturers at job growth after accounting for the influence of overall job creation and destruction.

Recognizing the important differences in the main findings reported by David Birch—that is, small businesses are responsible for the vast majority of job creation—and Steven Davis, John Haltiwanger, and Scott Schuh—that is, small manufacturers are no better than larger plants in terms of job creation—the research team of David Neumark et al. (2011) re-opened the debate with a study of the growth of all types of businesses between 1992 and 2004. The results of David Neumark and colleagues can be described as a middle ground to the findings uncovered in these earlier studies. Specifically, they found that small businesses are responsible for more job creation than larger companies (this is based on an analysis of net job change, which accounts for new jobs as well as those that were destroyed). This is consistent with the results of David Birch and supports the conventional wisdom that small businesses are very important to the economy. The research of David Neumark, Brandon Wall, and Junfu Zhang, however, also suggests that small businesses are only slightly better than larger companies for job creation. This result holds for nonmanufacturing and manufacturing businesses, where the latter was the focus of the analysis conducted by Steven Davis and colleagues.

A balancing of these studies (as well as others) suggests that small businesses are probably not as good at creating jobs as suggested by David Birch, but they may have at least a slight edge over larger businesses (in contrast to the analysis of Steven Davis and colleagues). The impacts of small businesses on job growth, however, are likely to differ by industry and, perhaps, region; and these impacts might even wax and wane over time. With there being no consensus about the impacts of small businesses on job creation, what about other outcomes that might contribute to economic development? For instance, we speculated earlier that small businesses are more innovative than their larger counterparts. Do research studies support this idea?

A study by Zoltan Acs and David Audretsch (1988) examined a novel dataset that included information on new innovations occurring in each industry of the US economy. They found that industries dominated by larger firms—for example, aircraft manufacturing and pharmaceuticals—tended to be more innovative than sectors comprised of smaller

businesses. Although this finding could suggest—at first glance—that larger businesses are more innovative, digging deeper into the data Zoltan Acs and David Audretsch found that smaller firms (in these industries characterized by large companies) are the sources of the higher innovation. They interpret this finding to suggest that smaller firms need to be more innovative to survive and (borrowing from the research of Richard Caves and Thomas Pugel (1980)) concluded that smaller companies use different business strategies than their larger competitors.

Offering another perspective on the innovativeness of small businesses, a study by Todd Idson and Walter Oi (1999) shows that larger plants (in several manufacturing industries) tend to adopt more types of technologies than their smaller counterparts. These results related to technology use are not exactly in line with what Zoltan Acs and David Audretsch uncovered in their study of small businesses and innovation. This means that, just like we found when looking at job creation, the jury is still out on the innovativeness of small businesses.

A finding related to business size that is rarely disputed (in fact, the result has been described as "ubiquitous") is that workers earn more money in larger firms than in smaller companies. The research by Todd Idson and Walter Oi supports numerous studies showing a positive relationship between employee earnings and firm size (Brown and Medoff 1989; Bayard and Troske 1999). Reasons cited for the higher productivity and wages offered by large firms are that they use a greater number of technologies (as mentioned above), and Todd Idson and Walter Oi (1999, p. 107) speculate that "larger firms organize around teams, establish higher effort standards, and recruit, train, and retain more-productive employees."

Overall, the research on small businesses suggests that it's hard to say definitively whether or not they're any better than large companies in supporting regional economic development. Some studies show that small businesses contribute to employment growth, but then other research concludes that they also tend to pay lower wages. Furthermore, the fact that business survival rates tend to increase with company size suggests that having a lot of small establishments in a region could reduce the persistence of employment. Part of the reason for this lack of consensus about the performance of small businesses is that all of them are different and perhaps, even more important, they mean something different to their owners. Some small businesses (e.g., high-tech startups) could be launching pads for new innovations and the companies—made up of,

say, a scientist and a couple of support staff—could grow quickly if the ideas or new products catch on in the market. Other small businesses (e.g., a small motel or even a goods producer) could be formed simply to provide an employment opportunity for the owner and a few others. Whereas some small businesses are formed to exploit an opportunity (e.g., the high-tech start-up), others are started out of necessity.

The news that small businesses are not the drivers of growth and innovation that they are perceived to be might not be too surprising to their owners. A study by Erik Hurst and Benjamin Pugsley (2011) used surveys of small business owners to examine the factors that influenced their decisions to start a business, as well as their expectations for the company in terms of its growth and innovative activities. The study concluded that "the vast majority of small business owners do not expect to grow, report not wanting to grow, never expect to innovate along observable dimensions, and report not wanting to innovate along observable dimensions."

Wow! These findings take the air out of the sails of small business advocates.

If small business owners have little interest in growing or innovation, what's in it for them? The most common response found by Erik Hurst and Benjamin Pugsley was that the owner "liked being their own boss and liked the flexibility that small business ownership provided." In fact, these types of "non-pecuniary benefits" were more important motivators of starting a business than wanting to bring a particular good or service to the market.

The observation that some small businesses experience substantial growth, balanced by these survey results indicating that most small business owners do not even have an interest in growing, suggest that the positive impacts on job creation attributed to small businesses are due to the actions of a few. That is, a handful of small businesses grow by a lot, while most do not grow (or even want to expand) at all. This idea that a relatively small number of companies account for a disproportionately large percentage of job creation is consistent with David Birch and James Medoff's (1994) concept of the so-called gazelle establishments (Birch and Medoff 1994). They categorized businesses into groups of "mice" (small businesses that stay small), "elephants" (large businesses) and the just-mentioned "gazelles" (small establishments that rapidly expand).

A study by Zoltan Acs, William Parsons, and Spencer Tracy (2008) revisited the idea of gazelle-type businesses and re-conceptualized them as

"high-impact firms"—defined as companies whose sales "at least doubled" and have an employment growth quantifier (i.e., absolute change in employment multiplied by its percentage change) of two or more over a four-year period. Zoltan Acs and colleagues found that these high-impact firms—which accounted for just 6 percent of all US companies (across all age and size categories)—were responsible for almost all of the employment and revenue growth in the US economy. This research certainly suggests that, instead of focusing on small or large establishments, policymakers should attempt to cultivate as many high-impact (e.g., gazelle) firms as possible.

Although we just spent a fair amount of time pondering the role of small (and large) businesses in economic development, I could have summed it up in just a few sentences from a study by Kelly Edmiston (2007). He concluded that:

> small businesses may not be quite the fountainhead of job creation they are purported to be, especially when it comes to high-paying jobs that are stable and offer good benefits. Big firm-jobs are typically better jobs. Moreover, while small businesses are important innovators in today's economy, so are large businesses. There is no clear evidence that small businesses are more effective innovators.

Let's see what small businesses mean to the economic development of states and US metropolitan areas.

5.2   Effects of Small Businesses on the Growth of Good Jobs

As a backdrop to our analysis of the effects of small (and large) businesses on regional economic development, we'll first look at the distribution of US companies and employment by establishment size. As shown in Table 5.1, almost three-quarters of US establishments had fewer than ten workers in 2014. This statistic, which shows that the United States is truly a country of very small businesses, is made all the more impressive when we consider that these numbers do not include sole proprietors (that do not employ any workers).[4] Adding these "non-employers" to the mix, we find that businesses with fewer than ten employees—including a vast amount of non-employers (e.g., almost 24 million in 2014)—would make up no less than 94 percent of all US enterprises.

Table 5.1 Employment size distribution of US businesses, 2014

Employment size	Number of establishments	% of total establishments	Employment	% of total employment
1 to 4	4,121,512	54.5%	7,038,533	5.8%
5 to 9	1,405,860	18.6%	9,308,423	7.7%
1 to 9	5,527,372	73.1%	16,346,956	13.5%
10 to 19	964,582	12.8%	13,032,111	10.8%
20 to 49	665,899	8.8%	20,058,306	16.6%
50 to 99	224,802	3.0%	15,435,354	12.7%
100 to 249	128,244	1.7%	19,250,379	15.9%
250 to 499	32,743	0.4%	11,209,793	9.3%
500 to 999	12,100	0.2%	8,270,363	6.8%
1,000 or more	7,343	0.1%	17,476,617	14.4%
250 or more	52,186	0.7%	36,956,773	30.5%

Source: County Business Patterns of the U.S. Census Bureau

At the other end of the business size spectrum, we see in Table 5.1 that less than 1 percent of all US establishments—once again, focusing on "employers" and not including the "non-employers"—have 250 or more workers. And only about one-tenth of one percent—or, 1 out of 1,000 companies—employ one thousand or more workers. This means that large employers are very rare, indeed.

Although businesses with 250 or more employees make up an almost miniscule percentage of all US establishments, they accounted for over 30 percent of all jobs in 2014. In others words, about one in every three workers receive a paycheck from an establishment with 250 or more employees. Even more impressive is that 14 percent of all jobs are in establishments with 1,000 or more employees, despite the fact that these very large businesses occur in the economy at a frequency of less than one out of every 1,000 companies. Moving back to the small end of the business size spectrum, we see that establishments with fewer than ten employees have 14 percent of US employment—a percentage similar to the workers accounted for by companies employing one thousand or more people. The difference is that it takes over 5.5 million of the small establishments to provide 14 percent of all US jobs, whereas a similar share of US jobs is supported by just 7,343 (!) of the largest companies.

The lesson from Table 5.1 is clear. Small businesses make up the lion's share of all US employers, but—although their overall contributions to US employment are important—they account for a disproportionately low

proportion of all US jobs. Large establishments, on the other hand, are quite rare in the economy—yet they support a disproportionately high percentage of overall employment.

Figure 5.1 shows the relationship between the economic development of states and the share of businesses with fewer than ten employees in 1990. Although they focus on different years—1990 as compared to 2014—the values on the horizontal axis of Fig. 5.1 (ranging between 71 and 80 percent among states) measure the same thing as the 73.1 percent of all US businesses employing one to nine workers shown in Table 1. The upward-sloping and solid trend line suggests that having a greater share of small businesses in 1990 helped the growth of good jobs in US states.

In the right side of Fig. 5.1, we see that Wyoming, Montana, and Vermont had the highest shares of small employers—at over 79 percent—and some of the other top states for small businesses were the Dakotas, Alaska, and Maine. The top-ten states for small businesses include a mixture of large—for example, New York—and more sparsely populated—for example, Montana, Vermont, and Maine—states.[5] The top-ten states for small businesses, however, are devoid of any places located in the Southern United States. In fact, Colorado is the most southerly state in the top ten—although Florida ranks eleventh nationally for the share of small businesses in 1990.

> Perhaps small businesses (like Olaf the Snowman) melt in the heat.

Ohio, Indiana, Illinois, and Michigan are among the states with the lowest shares of small businesses. These states also tend to be among the worst performers in terms of economic development. Utah, Texas, and Maine are some of the more pronounced outliers to the overall trend shown in Fig. 5.1. Utah and Texas are among the top performers for economic development despite having small business shares of less than 75 percent, whereas Maine is an outlier in the other direction. The Pine Tree State has a small business share of 78 percent, placing Maine seventh nationally, yet it has an economic development index score of less than 20.

In Fig. 5.2, we see that a metropolitan area's share of large businesses, defined as companies employing 250 or more workers, has a negative and statistically significant effect on the growth of good jobs. Several of the top metros for large businesses—Dalton (Georgia), Morristown (Tennessee), and Rocky Mount (North Carolina)—have economic development index
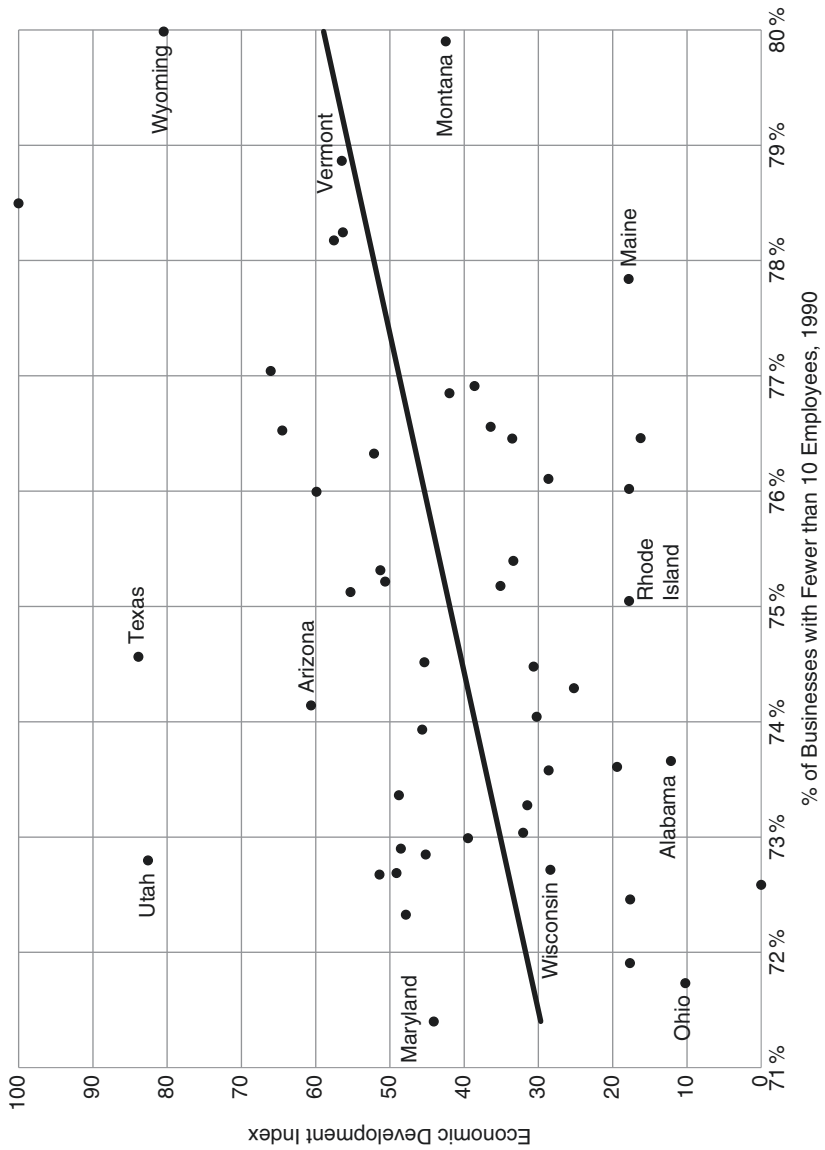
Fig. 5.1   Small businesses help the economic development of states
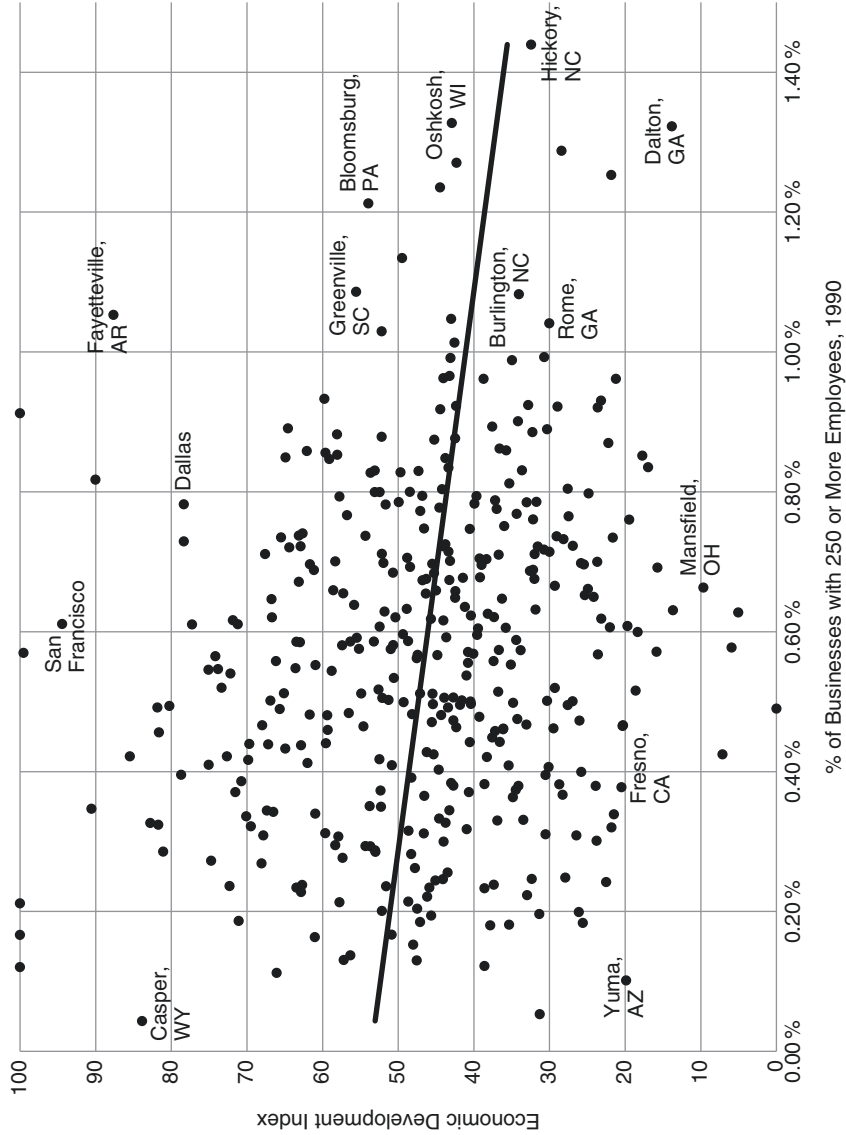
Fig. 5.2 Large businesses are associated with lower levels of economic development in US metropolitan areas

scores that place them in the bottom half of all regions. Likewise, three of the metros with economic development index scores of 100—Odessa (Texas), Midland (Texas), and The Villages (Florida)—have large business shares of about 0.20 or below. This means that (at most) only 1 out of 500 businesses, in these top-performing metros for economic development, employed 250 or more workers in 1990.

In Fig. 5.3, we pile on additional evidence suggesting that the presence of large businesses was not a particularly good sign for the economic development of regions. The scatterplots shown in Figs. 5.1 and 5.2 are summarized in the far-right side—a one-standard deviation increase in a state's share of small businesses is associated with a 0.36-standard deviation increase in economic development, while a similar-sized increase in a metro's share of large businesses is associated with a 0.17-standard deviation decrease in the growth of good jobs.

These impacts on economic development, especially the findings pertaining to large businesses, do not appear to be a fluke. Figure 5.3 shows that seven of the eight bars corresponding to large businesses are below zero and shaded—suggesting negative and statistically significant impacts. The lone exception is the impact of the large business share on the employment persistence of metropolitan areas, which is not strong enough to pass the threshold for statistical significance. When it comes to small businesses, the share of establishments with fewer than ten employees in 1990 has positive and statistically significant effects on the income indices (measured from 1990 to the near present) of states and metros, while small businesses have a positive and significant effect on the employment index of metros—although this effect is rather small in magnitude.

From the looks of things, David Birch's results—suggesting the importance of small businesses to economic vitality—appear to shine through in our analysis of US economic development. But how can this be, given that large employers make up such a high share of all US jobs (and big companies tend to pay higher wages, too)?

Although there's probably no single (or conclusive) answer to this question, we can conduct some additional analysis to shed some light onto the results showing that small businesses are good for—while large businesses appear to be a detriment to—the economic development of US regions. Our first extension involves accounting for differences across industries in the average size of establishments. As we learned in Chapter 3, the industrial structure of regions matters for economic development and, because certain industries are more prone to having big
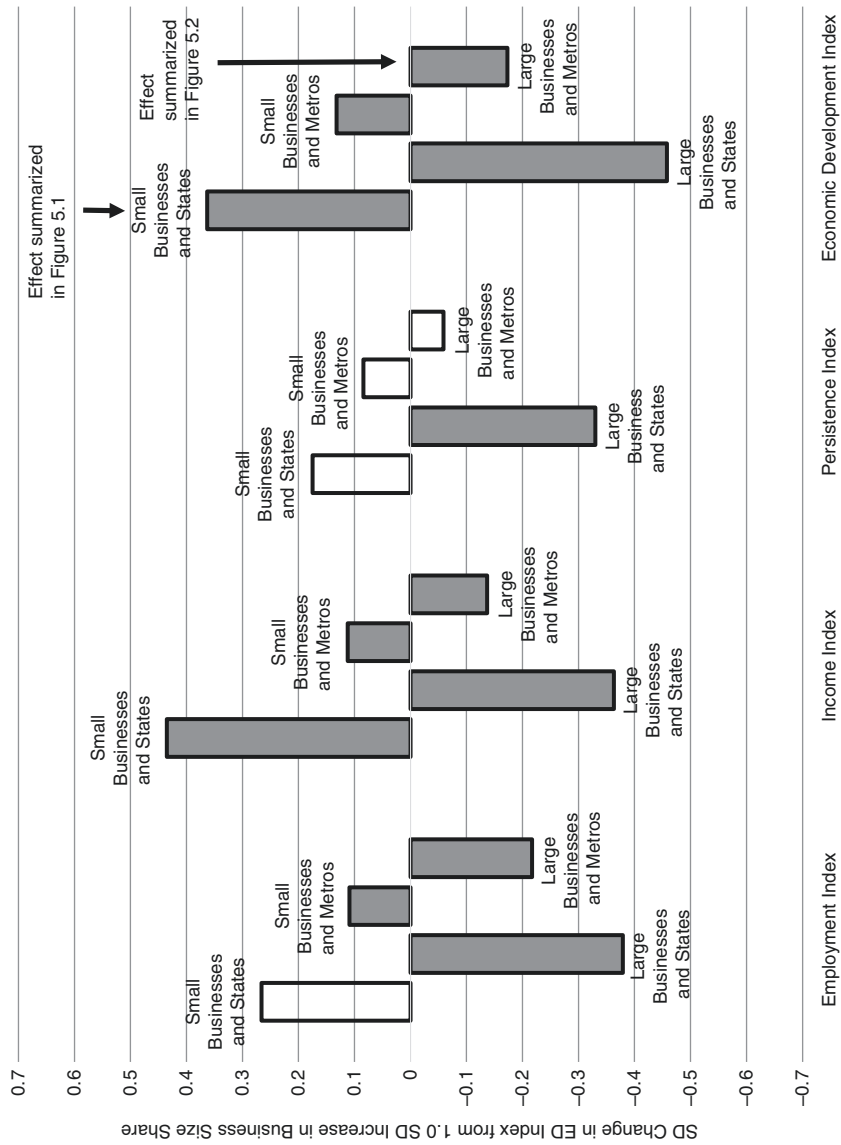
Fig. 5.3   Small and large businesses have very different impacts on the economic development of US regions

companies (e.g., many manufacturing plants are large), the impacts of industry could be showing through in our results pertaining to establishment size.

Looking back again at Fig. 5.2, we see that Hickory (North Carolina), Dalton (Georgia), Oshkosh (Wisconsin), and Burlington (North Carolina) were among the top US metropolitan areas for large businesses in 1990, with more than 1 out of 100 establishments employing at least 250 workers. These regions are also well known for manufacturing: Burlington, Dalton, and Hickory are among the top metros for textile mills—all have location quotients that exceed 20.0—while Oshkosh had a strong presence in paper and allied products manufacturing. Along with having relatively high shares of large businesses and regional specializations in manufacturing, these metros share the common trait of being among the least-populated US metropolitan areas.

It's not just small metros that specialize in manufacturing, however, that are among the leaders for large businesses. Las Vegas, with a population of over 750,000 people in 1990, certainly does not fit the mold of Burlington, Oshkosh, and Hickory. But Las Vegas is the 44th-ranked metro (out of 381 in total) for big businesses, helped by its many huge casino resorts and other hospitality businesses. It's interesting that—although the tourism-oriented metropolitan areas such as Ocean City (New Jersey), Glens Falls (New York), and Myrtle Beach are among the top regions for small businesses (ranked 1st, 16th, and 20th, respectively)—Las Vegas offers a brand of hospitality that places it among the top US metros for large employers.

So let's strip away the influence of industry and focus on the effects of "just" business size on economic development. To do this, we'll compare a region's actual share of small (and large) businesses to the share that would be predicted based on its industrial structure (and the size distribution of businesses nationally). For example, a region with an industrial structure that tilts toward manufacturing would have a high predicted share of large establishments, based on the average employment size of manufacturing plants nationally. If the actual share of large businesses in this region is even higher than what is predicted, then we'll know that it's truly a "large business region" (i.e., the region's relatively high share of large employers is not just because of the types of industries present). Likewise, a region that is heavy into services (e.g., legal, real estate) would have a high predicted share of small businesses, based on national averages. If the region has a high share of small businesses, but less than what is

predicted, we'll know that the place's status as a "small business region" is mostly due to its abundance of services establishments.

The case of Wisconsin demonstrates the utility of this approach to measuring the share of small businesses above or below what is predicted by the state's industrial structure. As shown in Fig. 5.1, the Badger State ranks 42nd among all states in terms of the share of small businesses, which should come as no surprise when considering the importance of manufacturing to the state's economy (Wisconsin ranked fourth nationally in 1990 according to the share of employment in the manufacturing sector). When we account for the fact that manufacturing plants tend to be large employers, we find that Wisconsin has a considerably greater share of small businesses than what is predicted based on its industrial structure. In fact, accounting for the influence of industry increases Wisconsin's ranking from 42nd to 32nd in terms of the importance of small businesses.

In Fig. 5.4, we see that some of the results—found in the earlier analysis—change after we adjusted the business size measures to account for the industrial structure of states and US metropolitan areas. Although the effects pertaining to large businesses barely budge, the impacts of small businesses on the economic development of regions change quite a bit— especially for metropolitan areas.

In the analysis summarized in Fig. 5.4, we find that a metropolitan area's share of small businesses, above or below what it predicted by its industrial structure, has no effect on any of the four economic development indicators. The effects labeled as "small businesses and metros" are depicted as bars that are slightly above the "zero line," but none of these effects are large enough to register as statistically significant. When focusing on small businesses, the main result that does not change from our original analysis is the positive effect on the income index of states, which is large enough to translate into a positive and statistically significant relationship between (overall) economic development and a state's share of small businesses (above or below what is predicted by its industrial structure).

Overall, after accounting for the industrial structure of regions, the positive effects of small businesses (mostly) disappear, but it still appears that large establishments do not contribute to the growth of good jobs. These findings certainly suggest that some of the positive effects on economic development attributed to small businesses might be, instead, due to the types of industries present in a region. As we saw in Chapter 3, regions that specialize in sectors such as engineering and management
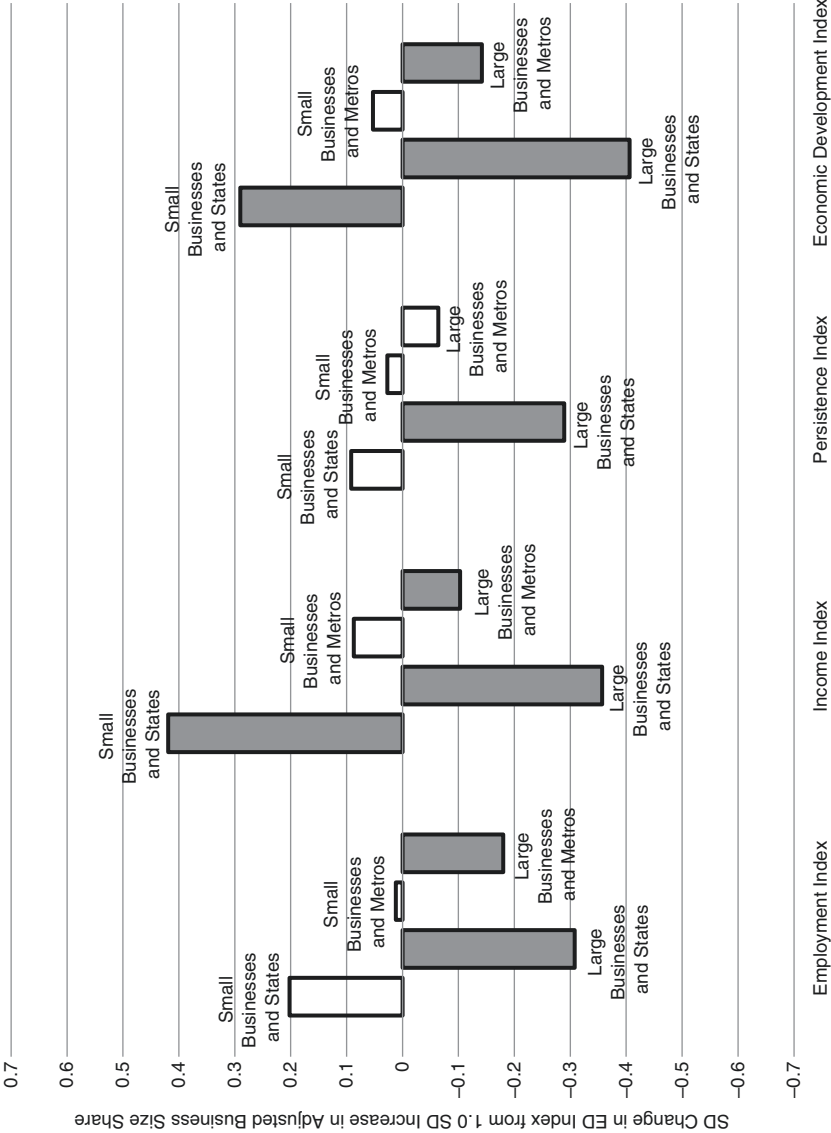
Fig. 5.4 The economic development benefits of small businesses to US metropolitan areas "go away" when we account for the size distribution of industries

services, computer and data processing services, and legal services tended to perform better than their counterparts in terms of overall economic development. The fact that these industries have relatively small average establishment sizes, combined with our result that some of the positive effects of small businesses "go away" when we account for the industrial structure of regions, suggests that the impacts attributed to small businesses in Figs. 5.1 and 5.3 are really due to the presence of certain key industries.

Although the positive effects of small businesses soften when we strip away the influence of a region's industrial structure, the negative effects associated with larger businesses appear to be rock solid. Does this mean that regions should close their borders to large businesses, or discourage small- and medium-sized establishments from growing? The answer to this question, which I feel silly for even posing, is a resounding "no!" And our next extension to the analysis of business size provides strong evidence of positive impacts on regional economic development that are associated with an increasing number of large businesses.

Now, instead of focusing on the percentages of businesses in US regions that fall into the size categories of small and large businesses—that is, measuring the presence of these types of establishments—we look at the change over time in the shares of these types of businesses. This will tell us if the economic development of regions is related to the changes in the shares of small and large businesses.

Figure 5.5 summarizes the effects of the "changing importance" of small and large businesses on the growth of good jobs. The changing importance is found by comparing the share of a region's establishments with fewer than ten employees (i.e., small businesses) and 250 or more workers (i.e., large businesses) in 1990—these are the values shown in Figs. 5.1 and 5.2—to the shares for the same business size categories in 2014. As an example of what we have in mind, North Dakota—the top state for economic development—had a large business share that grew from 0.3 percent in 1990 to 0.6 percent in 2014. That is a doubling of the share of large businesses. On the other hand, North Carolina saw a 20 percent reduction in its share of large businesses—from 0.8 percent to 0.6 percent—between 1990 and 2014.

The differences between Fig. 5.5 and what we saw previously in Figs. 5.3 and 5.4 are striking. In fact, Fig. 5.5 provides an almost mirror image of our earlier findings related to business size and economic
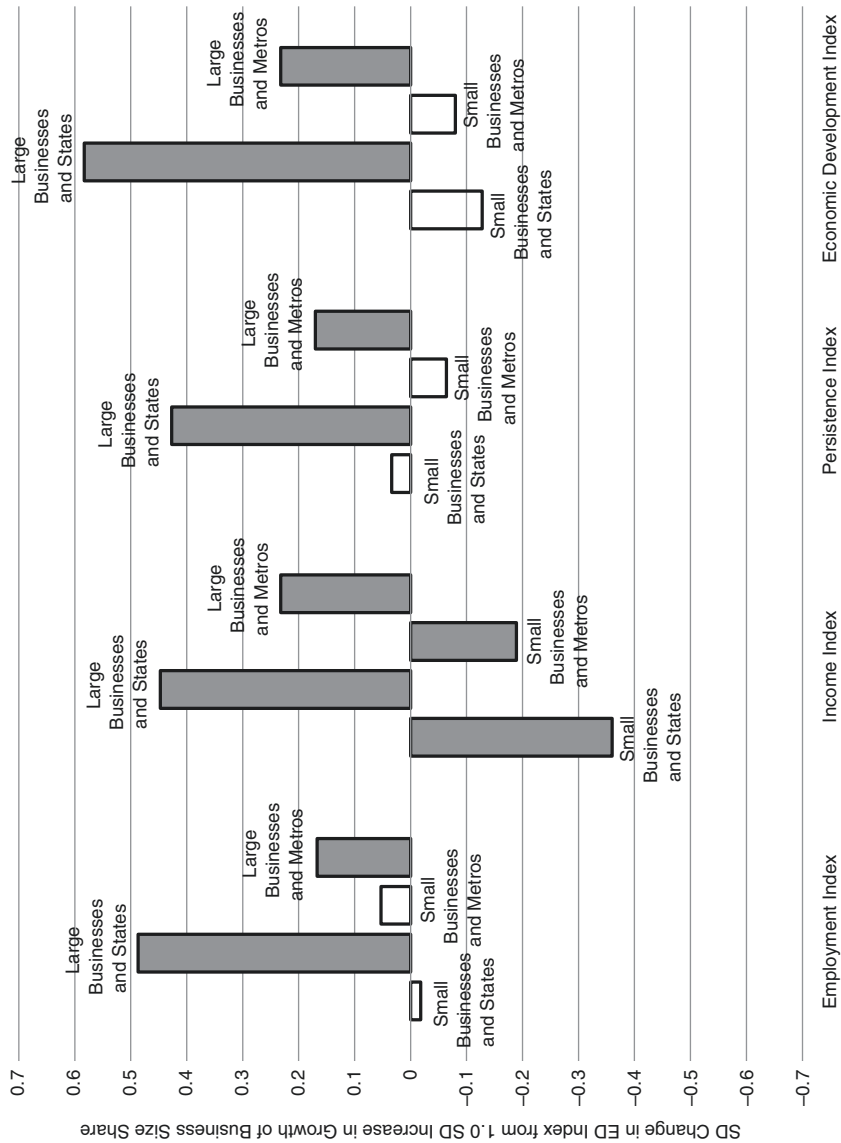
Fig. 5.5 An increase in the share of large businesses helps the economic development of US regions

development. Whereas before we found a negative relationship between economic development—in almost all of its manifestations—and a region's share of large employers in 1990, now we find that an increasing share of large businesses between 1990 and 2014 is associated with an increase in economic development. Conversely, an expanding share of small businesses in a region does not contribute to the growth of good jobs, and it actually has negative and statistically significant effects on the income indices of states and metropolitan areas.

In retrospect, the result that we should have expected—and see loud and clear in Fig. 5.5—is that having an increasing share of large businesses is good for economic development. In some ways, the growth of small businesses into medium-sized and then eventually large companies is the very definition of economic development. This transition from a small to large establishment generates job growth, which is a necessary ingredient for economic development. This growth, however, also translates into "good jobs" as larger companies tend to pay higher wages and they provide employment that is not subject to a lot of ups and downs, as well. In fact, the results shown in Fig. 5.5 suggest that an increasing share of large businesses is positively associated with more favorable employment, income, persistence, and (overall) economic development outcomes.

But, just like we didn't use our earlier results pertaining to the "presence" of large businesses to suggest their prohibition, we won't use our findings related to an expanding importance of small businesses to recommend that policymakers do an about face and ignore them after they gained so much attention from economic development officials after Birch's (1981) study. Rather, our results about the "presence" of small and large businesses, as well as the "change" in their respective importance over time, suggest the following conclusion: small businesses can enhance regional economic development because they sometimes grow into large companies.

5.3   SMALL BUSINESSES AND THE PURSUIT OF ECONOMIC DEVELOPMENT

This chapter started with the simple premise that small businesses are good for economic development. They are responsible for a large share of job growth—at least according to David Birch's influential study conducted over 30 years ago—and (paraphrasing the grunge rock band Nirvana) they "smell like entrepreneurial spirit."

Our first look at the effects of business size—initially, focusing on the presence of small and large establishments—on regional economic development found that, indeed, small businesses help the growth of good jobs. What's more, our initial results showed that the presence of large businesses was a detriment to the economic development of US regions. Although these results are consistent with David Birch's research touting the importance of small businesses, they did not seem to jive with statistics showing that large companies (employing 250 or more workers)—which occur at a frequency of less than 1 out of every 100 establishments—account for more than 30 percent of all US jobs. How could these large businesses be a bad sign for economic development given their overwhelming importance to overall US employment?

Our first thought was that these results pertaining to business size were "picking up" impacts on economic development that were, in fact, due to a region's industrial structure. After all, manufacturing plants tend to be large in size—at least compared to most service providers—and we already found a negative relationship between the growth of good jobs and several types of manufacturing industries. To strip away any potential effects related to industry, our second set of results focused on the relationship between economic development and the share of small (and, in a separate analysis, large) businesses above or below what is predicted by the industrial structure of regions. Several of the positive impacts that we attributed to small businesses in the initial analysis "went away" after accounting for industry, but the negative relationship between economic development and the presence of large businesses seemed as strong as ever.

As a final check of the effects of business size on economic development, we looked at the relationship between regional economic development and the changing importance of small and large establishments. In this analysis, we found that a growing share of large businesses is positively associated with all aspects of regional economic development, while an increase in the percentage of small establishments has no such effect on the growth of good jobs.

The analysis presented in this chapter—along with the results and advice suggested in other studies on the topic—support the following principles when using a business size strategy in the pursuit of economic development.

Principle 1: Economic development officials should focus their efforts around helping small establishments grow into larger companies. Some regions use statistics touting a high share of small establishments as an

indication that the area provides a good environment for small businesses and entrepreneurs. Although this may or may not be the case, a better sign of a fertile environment for small businesses would be a track record of having small establishments grow into larger ones.[6] Devoting resources to facilitate this transition could lower a region's share of small businesses, but the growth of the (once) small companies can help its overall economic development.

Principle 2: Local officials and economic development professionals need to recognize the differences in the motivations of small business owners—both in terms of why they are in operation and whether or not they even want to grow. Some small businesses are formed out of necessity (e.g., the owner cannot find other employment opportunities) or simply to provide jobs for the owner and a few other people. These situations call for economic development initiatives that make it easier for people to start businesses and keep them running smoothly, but it's doubtful that these small business owners are interested in programs aimed at helping them grow. Other businesses, however, start small and in relatively short order become larger companies. These types of businesses—referred to earlier as "gazelles"—are more likely to be on the lookout for economic development programs that can help facilitate rapid expansion. Knowing the makeup of a region's small businesses will help local officials develop the right mix of strategies to help all types of small operations.

Principle 3: Some large companies are like vintage sports cars—they provided thrills in the past, but require a lot of maintenance to keep them on the road. Having large employers in a region means that, at one time, the businesses experienced substantial growth. This period of growth might have provided a "worry free" source of jobs in the region, just like some new sports cars can provide several years of reasonably low-maintenance driving. But when a large company reaches maturity—just like when an automobile starts to show some rust (and other signs of wear and tear)—it can require additional maintenance to keep it performing well.

This means that regional officials should monitor the health of their largest employers through regular check-ups and maintenance. Although these companies are no longer gazelles—they might have become, using David Birch's characterization, "elephants"—they employ a sizable percentage of local workers. The types of economic development programs that can help these larger (and less slowly growing businesses) may be quite different than the strategies used to support the growth of small companies. Just like a region should support its gazelles in outperforming

their larger and more established competitors located in other places, that same area needs to help protect its elephants from being overtaken by their smaller and more aggressive competitors.

NOTES

1. This figure is calculated using data from County Business Patterns of the U.S. Census Bureau.
2. http://link.springer.com/journal/11187. Accessed 21 September 2016.
3. These figures are based on average plant size; see Table 1 from Davis et al. (1996b).
4. Nonemployer statistics are from the U.S. Census Bureau.
5. These states are Alaska, Colorado, Idaho, Maine, Montana, New York, North Dakota, South Dakota, Vermont, and Wyoming.
6. This recommendation is in-line with the suggestion of Zoltan Acs and colleagues (2008) who, in the context of high-impact firms, recommend that local officials cultivate these types of businesses instead of trying to increase "entrepreneurship overall."

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Technology and the Growth of Good US Jobs

6.1 THE BABE RUTH OF ECONOMIC DEVELOPMENT

Baseball has its homerun sluggers; fashion has its runway models. When it comes to economic development, the sexiest thing going is technology. Whether it's high-tech, biotechnology, or environmental- and energy-based companies, policymakers are looking to transform their regions into cutting-edge economies of the twenty-first century. Pursuing a technology-based economic development strategy shows the world that a region is forward looking, with an eye for finding better and more innovative ways to produce goods and deliver services. High-technology clusters—US regions such as Silicon Valley, North Carolina's research triangle, and Boston's Route 128—are practically revered among policymakers and economic development professionals.

The logic underlying a technology-based economic development strategy is simple. It's that technology—in its many forms—makes workers, companies, and entire regions more productive. But, beyond these immediate impacts, the deployment of technology is often self-reinforcing, in that its presence in a region makes a place even more attractive to future investments of the sort. If this second part about "self-reinforcing" growth sounds familiar, you're absolutely right. An important idea raised in Chapter 1 is that US regions are diverging or, to put it bluntly, the "rich are getting richer." An explanation for this phenomenon is that the economy is evolving—or, has already transformed—from a strong

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manufacturing bent to a heavier reliance on services, and technology- and knowledge-based activities. Whereas traditional manufacturing is subject to decreasing marginal returns—recall the example in Chapter 1 of getting less additional copies from an extra person working in a copy room—the ideas used to develop new technologies can be shared in a way that increases the productivity of others. Indeed, the increasing returns-to-scale growth models developed by Paul Romer (1990) and others typically point to the self-reinforcing nature of technology—often referred to in these models as "endogenous growth"—as a key factor affecting the economic outcomes of regions.

Going from the earlier chapters on industries (i.e., "Picking Winners") and people and skills (i.e., "Human Capital") to our current focus on technology highlights the different lens through which to view a region's economy. An industry-based orientation—that is, figuring out the best sectors to attract—is concerned with the types of goods and services that are made in a region. Some local officials and economic development professionals have a goal of landing, say, an automobile plant or other large manufacturing facility. Still others may want to attract a resort hotel. These are examples of an industry-based approach to economic development.

An occupation-based orientation focuses on the types of jobs—and their corresponding skills—that are present in the region.[1] As discussed in the chapter on human capital, there has been a growing interest in economic development strategies that seek to attract certain types of workers. Enhancing the creative economy—characterized by Richard Florida (2002) as artists, engineers, scientists, educators, and other creative occupations in a region—might be the best-known strategy of this kind. In some research that I conducted with Jaison Abel, we grouped occupations into knowledge-based clusters—that is, jobs that require similar types of knowledge—to examine the geographic concentration of human capital (Gabe and Abel 2011). I also worked with Mikaela Backman and Charlotta Mellander on a project that examined the effects of skills-based occupation groups—that is, jobs that use the same types of skills—on the growth and survival of Swedish businesses (Backman et al. 2016). These studies, and numerous others that are popping up in academic journals, are examples of an occupation- and skills-based orientation to economic development.

Last, but not least, a technology-based orientation to economic development is concerned primarily with "how" goods and services are being

made—particularly, the extent to which their production or distribution incorporates technology. Practically any type of business—say, even a lawn mowing service—can benefit from technology. A cutting-edge lawn mowing business could use an integrated software system to schedule and bill customers, and even determine the optimal route for planning a day's work. As noted by Michael Porter (2000, p. 19), "firms can be more productive in any industry if they employ sophisticated methods, use advanced technology, and offer unique products and services, whether the industry is shoes, agriculture, or semiconductors."

In this chapter, we'll look at several types of economic development strategies that attempt to grow good jobs through the use of technology. The specific brands of technology that we'll consider are high tech, biotechnology, environmental- and energy-based companies, and—for good measure—the so-called knowledge economy. These strategies are generally regarded as some of the more common approaches to technology-driven economic development.[2] Our earlier analysis hinted at a positive relationship between economic development, especially for large metropolitan areas, and the deployment of high technology. Although most of the manufacturing industries that we considered in Chapter 3 were found to have negative impacts on economic development, two important exceptions were the manufacturing subsectors of "electronic and other electric equipment" and "instruments and related products." As we'll see in a moment, these industries—along with other manufacturing and nonmanufacturing sectors—are classified as high technology.

6.2   High Technology

High technology is a somewhat vague concept, conjuring up images of automated robots producing semiconductor chips, or chemists in lab coats working to develop new pharmaceutical drugs. Edward Malecki (1984) defines high technology as "nonroutine economic activities directed toward developing new products and processes and toward small-volume production of innovative products and services." As such, Malecki distinguishes a high-tech production process—that is, "nonroutine activities" and "small-volume production"—from one that is based on a mass production of goods (or delivery of services) using more traditional means such as workers standing along an assembly line. These non-routine economic activities could be the use of automation (e.g., robots replacing workers) or even a novel application of computer technology.

Ross DeVol (1999) of the Milken Institute characterizes high-tech industries as those that invest a large amount in research and development, and sectors that employ high percentages of "technology-using occupations" such as engineers, scientists, and computer programmers. Malecki and DeVol approach the topic from different angles, but they convey the same general ideas about high technology. The research and development and "technology-using occupations" emphasized by Ross DeVol are often associated with the "nonroutine economic activities" and "innovative products and services" that Edward Malecki dubs as high technology. Although I can't think of a better definition than those offered up by others, the key thing to keep in mind is that high technology is a description of how things are made—and the "how things are made" usually results in innovation and higher productivity through research and development. It's difficult to come up with a more precise definition because what is considered high technology today could be routine in the future.

The study by Ross DeVol provided a very extensive treatment of high technology in the United States, and its impacts on regional economic development. His analysis covered a 20-year span of 1977 to 1997, a period over which high-tech sectors grew from 5.7 percent to 10.8 percent of gross US industry output—an almost doubling of the importance of high technology to the overall economy. More relevant to our analysis of states and metros, he found that the growth of high technology in US metropolitan areas was associated with sizable impacts on the region's economy. DeVol explains this finding in the context of a "high-tech multiplier."

This phenomenon—recall from Chapter 3 that a multiplier is the additional economic activity in a region supported by the expansion of an industry or business—occurs as high-tech companies and their employees spend money in the region on other goods and services. A high-tech multiplier is especially powerful, as we'll see in a moment, because these companies are very productive (i.e., they generate large amounts of output per worker) and their workers earn high salaries. In Richard Florida's (2002) book on the creative economy, which we discussed earlier in Chapter 4, he makes a similar argument about the impacts of creative workers on regional economies. By Florida's account, growth of the creative economy and its workers—just as Ross DeVol posited for high-tech businesses—leads to an increase in the demand for all sorts of goods and services.

An especially important feature of these types of multipliers is that the economic activity of interest—whether its high-tech businesses or creative workers—does not have to be particularly large relative to the other impacted sectors (counted in the multiplier effects). For example, Ross DeVol's high-tech industries grew from 5.7 percent to 10.8 percent of the US economy over the period of analysis—so almost 90 percent of the economy is not counted as high technology. Likewise, Richard Florida's Creative Class (33 percent of US employment in 2010) makes up a considerably smaller share of the nation's jobs than the services occupations (47 percent of employment) that creative workers help support. In fact, Florida (2012, p. 47) argues that, "the growth of the Service Class is in large measure a response to the demands of the Creative Economy." He adds, "the Creative Class has increasingly outsourced functions that were previously provided within the family to the Service Class."

Similar to the types of multipliers described by Ross DeVol and Richard Florida, Enrico Moretti refers to an "innovation employment multiplier" as a factor affecting the growth of cities. He describes how a new job in the "innovation sector"—very similar to what we mean by high technology—can support additional workers in personal services and other businesses in the local economy. The logic is the same as suggested by Ross DeVol and Richard Florida: jobs involving innovation (and technology, and creativity for that matter) are high paying and, thus, the spending of high-tech (and innovative and creative) workers can support other local jobs.

Analysis conducted by Enrico Moretti (2012) found that every new innovation-sector worker in a region can support an additional five jobs in other sectors of the economy. Two of these additional jobs are in high-paying occupations such as doctors and lawyers, while the remaining three positions are lower-paying, service-oriented jobs such as restaurant workers and retail clerks. These three lower-paying jobs are what Richard Florida had in mind when discussing the growth of service workers alongside the creative economy. Using Moretti's figures and counting the innovation-sector job and the two high-paying positions that it supports, three of the six jobs in question pay high salaries. That's a good return to attracting high-technology businesses.

Why do innovation-based, high-tech jobs have such a high multiplier?

First, as explained by Enrico Moretti (and Ross DeVol, in the context of high-tech employment), innovation-sector jobs—that is, positions that truly involve innovative activity—are very high paying. For example,

studies show that workers in high-tech industries (Hecker 1999)—and those employed by manufacturing plants that use a greater number of advanced technologies (Doms et al. 1997)—earn higher wages. Second, these jobs tend to be highly concentrated—even more so than traditional manufacturing—because the presence of a large mass of innovation-sector workers is attractive to others involved in similar activities. This type of "divergent" economic activity, as described by Enrico Moretti, increases the size of the multiplier even more.

It's interesting that, in some respects, using large multiplier effects as an explanation of the benefits of high-tech industries is very similar to the argument that local officials use for going after all sorts of manufacturing plants. The idea here is that—for high technology and manufacturing—any business with productive workers (i.e., high output per worker) tends to generate a large employment multiplier. A simple example, which I wish were true, can illustrate this concept.

Suppose that I have a money tree growing in my backyard and, working by myself, I can pull off vast sums of money every day. In essence, I am very productive because of the large amount of money generated per worker (that is, just me). Although manufacturing plants are not money trees (high-tech businesses are not either), they tend to have highly productive workers due to the large amounts of capital invested per worker (which results in high wages, just like the currency that I can pluck off of my money tree). The large amount of output per worker means that if companies devote a set percentage of their revenue to goods and services purchased in the region, the amount spent outside the company—but elsewhere in the region—is higher per worker than it would be if the company was less productive. The same logic applies to individuals. If two people spend the same share of their paycheck on local goods and services, the one who earns more money generates a larger employment multiplier. *Voila*! Companies that produce more output per worker (and workers that earn higher wages) tend to have larger multipliers than less-productive businesses (and workers).

A second benefit of high-technology businesses, beyond just their high productivity, is the "self-reinforcing" nature of their investments such that the presence of high-tech companies and workers improve a region's desirability to others. Indeed, Enrico Moretti—in his explanation of the "innovation employment multiplier"—cited the high geographic concentration of high-tech activities that result from this type of behavior. The phenomena of high-technology businesses attracting other companies of

the sort, which is similar to what Romer (1990) refers to as "endogenous growth," is what distinguishes high technology and its "innovation employment multiplier" from traditional manufacturing and its reasonably high employment multiplier.

Traditional manufacturing activities are often characterized by decreasing marginal returns, which we discussed in Chapter 1 in the context of the convergence of economic activity that took place during much of the twentieth century. This means that past investments in traditional manufacturing make a place less desirable to companies looking for a place to locate in the future, and allows less well-off regions to catch-up to others through the process of convergence. The self-reinforcing nature of high technology, on the other hand, means that past investments make a place a magnet for future activity, which contributes to regional divergence.

6.3   OTHER TECHNOLOGY-BASED APPROACHES

Also falling under the broad umbrella of technology-based approaches to regional economic development is a strategy aimed at supporting companies and organizations in the life sciences—better known as biotechnology. Like high technology, which is defined largely on the basis of "how" things are made, biotechnology is characterized by the nature of the research and development pursued by businesses more so than by their final products. A recent study found that the US biotechnology industry exhibited average annual growth rates (over the past decade) that exceeded 10 percent—a much faster growth rate than the economy as a whole (Carlson 2016). It's no wonder that practically every state has the goal of building a biotechnology industry cluster (Portz and Eisinger 1991)

In a study that I conducted (along with Tom Allen) on Maine's biotechnology industry (Allen and Gabe 2003), I learned firsthand how these types of scientific-based businesses straddle traditional industries lines—a feature of the biotechnology sector that was also noted by Robert Carlson (2016). If I were studying, say, the tourism economy of Maine, I could have identified the businesses of interest by selecting industries such as hotels and motels, restaurants and bars, and perhaps some sectors related to transportation, retail, and recreation. In our research on biotechnology, however, we had a much harder task. The study used the following definition of biotechnology, which is "any

technique that uses living organisms or parts of organisms to make or modify products, to improve plants or animals, or to develop micro-organisms for specific uses" (Busch et al. 1991). To come up with a count of establishments involved in these types of activities, we used several biotechnology business directories to identify the companies of interest.

A study by Barry Bluestone and Alan Clayton-Matthews (2013)—of the Kitty and Michael Dukakis Center for Urban and Regional Policy at Northeastern University—lays out an explanation for the positive impacts of life sciences (e.g., biotechnology) on economic development. The report describes life-science innovations in the context of a "new growth theory," in which technologies are not subject to decreasing returns to scale. This is in contrast to strategies aimed at attracting additional physical capital (e.g., manufacturing), which—according to "old growth theories"—is subject to decreasing returns. Since new scientific advances can be used "over and over" by multiple companies (unlike physical capital, which is a "rival" good), they can provide a true source of competitive advantage to regions where these technologies are available and shared.

I hate to come off sounding like a broken record, but this explanation offered for the positive economic impacts of biotechnology is identical to what we've been saying all along about the divergence of regions—or, as we have put it before—the rich getting richer. This means that, like other aspects of high technology and investments in the new economy, a region specializing in biotechnology is believed to have advantages that will help it grow and develop faster than other places.

An economic development strategy focusing on environmental- and energy-based businesses has a different orientation (of technology) than the approaches described above. Whereas high tech and biotechnology are characterized by "how" products are made, environmental and energy companies focus on the delivery of goods and services that are related to the environment (and energy) and might even help protect it. The indus-try marketing firm, Environmental Business International (EBI), breaks the environmental (and energy) industry into three segments: environ-mental services (e.g., testing, waste management, consulting), equipment (e.g., water and air pollution control equipment), and resources (e.g., water utilities, environmental energy sources). According to EBI, this sector expanded nationally from about $20 billion in 1970 to $170 billion in 1994 (Noble 1997). That's rapid growth.

Taking an occupation-based approach to the environment, the U.S. Bureau of Labor Statistics (BLS) defines "green jobs" as positions in companies that produce goods or services with an environmental benefit, or jobs that can make any company's practices have less of an impact on the earth. The main categories of "green goods and services" are renewable energy; energy efficiency; reduction of pollution, emissions, and waste; conservation of natural resources; and environmental compliance and education. According to a 2010 survey conducted by the BLS, the US economy had 3.1 million green jobs and these positions accounted for 2.4 percent of national employment (Sommers 2013).

A study by Mark Muro et al. (2011) of the Brookings Institute examined the "clean economy"—closely related to environmental technology— nationally, and its presence in US metropolitan areas. According to their figures, the clean economy accounted for about twice as many US jobs as biotechnology. It's interesting that, according to Muro and colleagues, the clean economy has a larger foothold (than the economy as a whole) in manufacturing and export-oriented industries. Given the simultaneous decrease in manufacturing (as we discussed in earlier chapters) and the expansion of clean technologies, the clean economy is becoming a larger share of the US manufacturing sector. Relevant to our earlier discussion of industry clusters, the study by Mark Muro and colleagues found that the clean economy grew faster is places where it already had a strong presence. This means that, like other technology-based sectors, the clean economy appears to be diverging.

6.4   THE KNOWLEDGE ECONOMY

We could probably find a few more approaches to technology-based economic development, but let's wrap things up with a discussion of the knowledge economy. As conceptualized by Fritz Machlup (1962), the knowledge economy is made up of industries and occupations that are involved in the production and distribution of information, described as "any human (or human induced) activity effectively designed to create, alter, or confirm in a human's mind—one's own or anyone else's—a meaningful apperception, awareness, cognizance, or consciousness of whatever it may be." When counting up the number of US jobs in the knowledge economy (and examining its growth over time), Machlup took an industry-based approach and identified a variety of sectors involved in

knowledge production: these broad sectors are education; research and development; media of communication; information machines; and information services. By Machlup's account, knowledge production accounted for about 30 percent of US GNP in 1958, and the knowledge economy was growing considerably faster than overall GNP in the years immediately leading up to that time.

There is admittedly some overlap between the knowledge economy and the presence of high-human capital workers in a region. That is, human capital-intensive occupations such as scientists, executives, and lawyers are often involved in the production and distribution of knowledge. But there are other aspects of Machlup's knowledge economy—for example, the production workers involved in the manufacturing of "knowledge machines" and the clerks that pass along (wholesale) product information—that may require lower levels of formal education.

The knowledge economy, as it was defined by Fritz Machlup, is examined in this chapter due to the fact that—like technologies that are deployed in a region—the presence of knowledge producing and transmitting workers can generate increasing returns in that one person's use of information does not diminish the amount that is available to others. Although this aspect of the knowledge economy makes it similar to the use of technology in a region (and human capital, with the externalities it generates), the knowledge economy differs from the other technologies considered—especially high technology—in terms of worker productivity. A defining characteristic of high-tech businesses and workers is their high productivity, supported by the large investments per-worker in technology. On the other hand, knowledge economy businesses typically require less investment (in terms of equipment and technology), which means their workers may have lower levels of measured productivity.

6.5   Effects of High Technology on Economic Development

Examining the effects of high technology on the economic development of US regions requires that we, first, come up with a way to measure the technology-based activities and investments of businesses. In a perfect world, we would have data on the types of technology used by US businesses and, given our period of analysis, this information would be

from about 1990 (or as close to this time as possible). Unfortunately, we live in an imperfect world and these figures are not readily available. Even if we were interested in only a specific business, the company might be hard pressed to tell us the types of technology it used over 25 years ago. In the absence of information on the amounts and types of technology deployed (as of 1990) in states and US metropolitan areas, we'll use the share of a region's businesses in selected industry categories as an indicator of high technology.

Figure 6.1 shows the relationship between the economic development of US metropolitan areas and the share of businesses in high-tech industries.[3] The specific industries counted in the mix are from Ross DeVol's Milken Institute study, which includes manufacturing—for example, subsectors of "electronic and other electric equipment" and "instruments and related products"—and high-tech services.[4] Focusing on the horizontal axis, we see a wide distribution across metropolitan areas in the percentages of businesses classified as high technology. About one-half of the regions shown had between 1 and 2 percent of their establishments in high-tech sectors. The bottom-10th and top-10th percentiles (not shown in Fig. 6.1) have less than 1.2 percent and greater than 3.3 percent, respectively, of their businesses in high-tech industries. This means that the top-10 percent of metros have more than 2.7 times as many high-technology businesses (as a share of all establishments) than the bottom-10 percent.

The top US metropolitan areas for high technology include the usual suspects of Silicon Valley (i.e., San Jose), Washington DC, San Francisco, and Austin, but also some less familiar places such as Huntsville (Alabama), Trenton (New Jersey), Oxnard (California), and Carson City (Nevada). In San Jose and Boulder, with high-tech business shares of over 7 percent, about one out of every 14 establishments is classified as high technology. That's a very high regional specialization in high-tech industries, compared to the average high-tech industry share of 2.2 percent across all 381 US metropolitan areas.

Figure 6.1 shows that high technology has a positive effect on the economic development of US metropolitan areas. Although the results pass muster in terms of statistical significance, a few of the highest-performing metros for economic development appear, once again, to fall outside of the overall pattern. The metropolitan areas of Odessa and Laredo, Texas, are top-ten regions for the growth of good jobs, yet they were in the bottom one-third of all metros for the share of high-tech
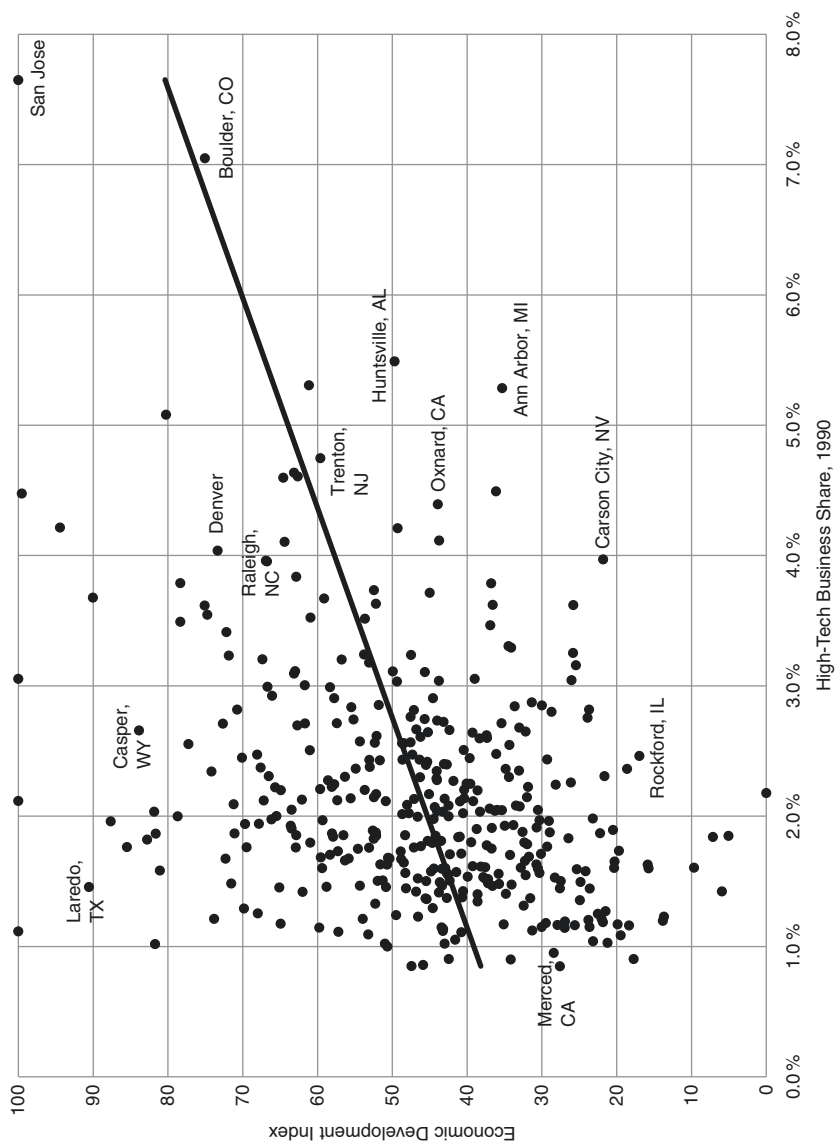
Fig. 6.1 High technology helps the economic development of US metropolitan areas

companies in 1990. Likewise, the top-five places for high technology are mixed in terms of their economic development index scores. San Jose and Boulder are among the leaders in the growth of good jobs, whereas Ann Arbor (Michigan) and Huntsville have economic development index values that are less than 50 or so.

Moving from metropolitan areas to states, the leaders in high-technology businesses (as a percentage of all companies) are California, Massachusetts, Colorado, New Hampshire, and Maryland. These states—and a few others—have between 3 and 4 percent of their businesses characterized as high technology, which is higher than the 2.7-percent share of all US establishments classified as such. With the exception of Colorado and the Southwestern states of Utah and Arizona, the top-ten regions for high technology are located on the coasts—mostly in the Northeast and Mid-Atlantic United States.[5]

In Fig. 6.2, we see that the positive relationship between the economic development of US metropolitan areas and high technology is influenced, in no small part, by the sizable impacts on the economic development of regions with one million or more people. Whereas the trend line for "all metros" shown in Fig. 6.1 is characterized by a 0.33-standard deviation increase in economic development corresponding to a one-standard deviation increase in the share of high-tech companies, this impact is almost twice the size (i.e., a 0.60-standard deviation increase in economic development) for large metropolitan areas.

The substantial impact of high technology on the economic development of large metropolitan areas is due to its effects on income and employment persistence, but not the employment growth of regions. This means that the deployment of high technology in 1990 contributed to the quality of jobs (i.e., high incomes and employment persistence are indicators of "good jobs") in large US metros, but not their growth (high technology, however, helped the growth of "all" metropolitan areas). In particular, the result pertaining to the income index is consistent with the idea that technology enhances the productivity of workers. It's also noteworthy that, for the most part, the share of high-tech businesses has no effect on the economic development of states. The only statistically significant impact is the positive effect of high technology on the employment persistence of states. But this effect is quite a bit smaller—that is, 0.34 compared to 0.56-standard deviations from a one-standard deviation increase in the share of high-tech businesses—for states than large metropolitan areas.
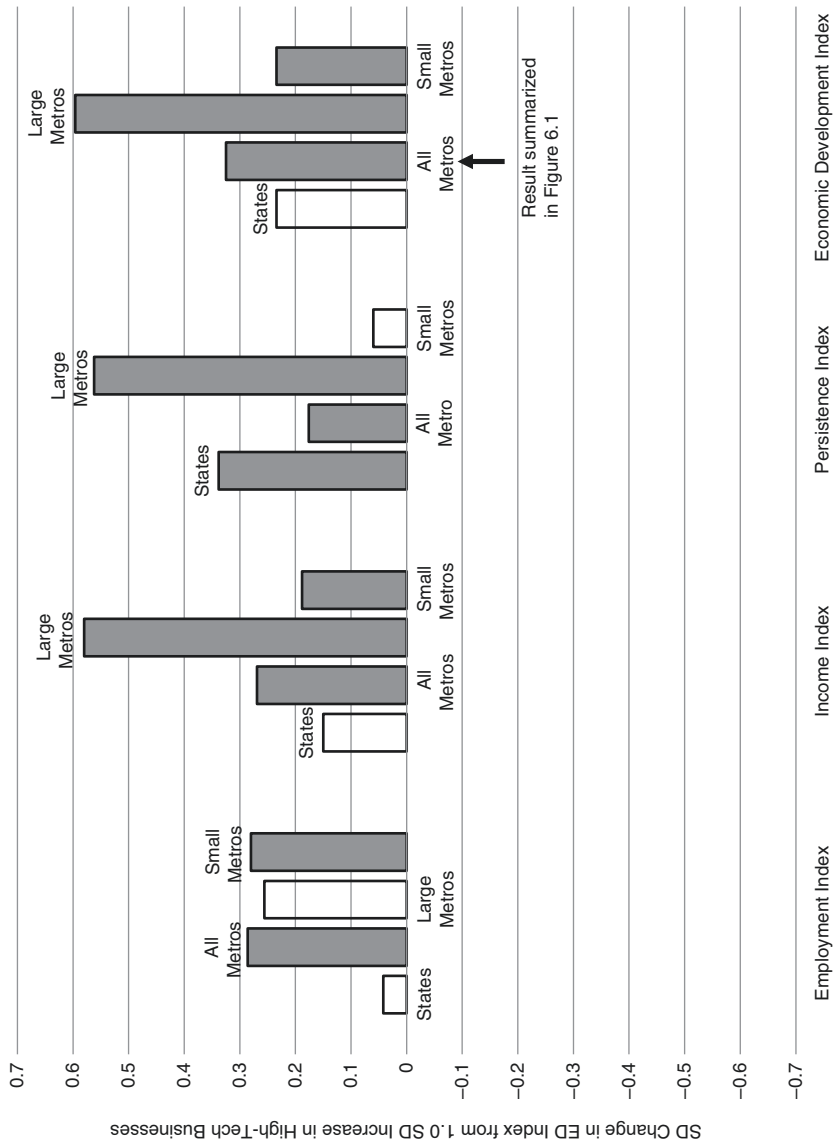
Fig. 6.2 High technology is especially important to large US metropolitan areas

6.6   IMPACTS OF BIOTECHNOLOGY, AND ENVIRONMENTAL AND ENERGY BUSINESSES

The next type of technology considered includes businesses that are involved in biotechnology-related products and services. The sectors counted as part of the biotechnology sector come from Barry Bluestone and Alan Clayton-Matthews' (2013) study of the impacts of "life sciences" on economic development. The list of industries covers manufacturing businesses (e.g., pharmaceutical drugs, laboratory analytical instruments) and nonmanufacturing companies (e.g., medical laboratories; research, development, and testing services) that are involved in biotechnology.

As might be expected, there's some overlap in the top states for biotechnology and high-tech businesses. The regions counted among the top-ten states for both types of technology are California, Colorado, Connecticut, Maryland, Massachusetts, New Jersey, and Utah.[6] The inclusion of these states as top places for technology should come as no surprise. As discussed in Chapter 2, when explaining Utah's standing as a top state for business in the early 2010s, *Forbes* magazine noted Utah's involvement in biotechnology as one of its key strengths. Our results suggest that Utah was a top state for biotechnology (and high-tech businesses, in general) as far back as 1990. There's also some overlap—about two-thirds of the regions—in the lists of metropolitan areas that rank among the top-twenty places for high-tech businesses and biotechnology.[7] Places such as San Jose, Denver, Boston, and Washington DC are high-ranking metros according to the shares of establishments in both types of technology.

The environmental and energy sector includes companies that manufacture environmental equipment (e.g., pumps and pumping equipment, fabricated pipes, and pipe fittings) and provide environmental services (e.g., sanitary services, engineering services). In addition, the environmental and energy sector—as characterized by EBI (Noble 1997)—includes companies involved in water supply and energy sources. Whereas the top-ten states for high-tech companies and biotechnology had considerable overlap (i.e., seven states), the top regions for the environmental and energy sector have only two states—Colorado and Utah—in common with these other places. Unlike the top states for biotechnology and/or high-tech companies that have a strong presence on the east and west coasts—places such as Massachusetts, Virginia, Maryland, and California—the states that specialize in environmental and energy businesses are located

along the Gulf Coast (e.g., Louisiana, Mississippi) and Southwestern parts (e.g., New Mexico, Oklahoma) of the United States.[8]

Similarly, we find an almost entirely new group of metropolitan areas—that is, ones not cited among the top places for high-tech or biotechnology companies—in the list of top-twenty regions for environmental and energy companies. Several of these new metropolitan areas—for example, Baton Rouge (Louisiana), Anchorage (Alaska), and Casper (Wyoming)—have technology sectors that are very much oriented toward energy production. For example, Midland is well down the list in terms of high-tech businesses (54th out of 381 metros) and biotechnology (230th), yet it's the fourth-ranked metropolitan area for environmental and energy. This means that the technology businesses in Midland are mostly environmental- and energy-related companies; no doubt, in its case, involved in the energy sector.

Figure 6.3 summarizes the effects of biotechnology, and environmental and energy companies on the economic development of states and US metropolitan areas. This figure is a little different than the last few pictures that we've looked at because—in order to cover two regional characteristics—the effects are analyzed for (all) metros, but not by population size. We see that both types of businesses have positive effects on all four of the economic development indicators for metropolitan areas—although the magnitudes of the effects are a little larger for environmental and energy companies than for biotechnology. In the analysis of states, on the other hand, we do not find statistically significant effects between the two types of businesses and any of the four economic development indicators.

The similarity of the results for the three types of businesses considered—high-tech, biotechnology, and environmental and energy companies—is noteworthy because, as described above, the top places according to these regional characteristics are somewhat different, especially for environmental and energy establishments compared to the other two groups. Even with these differences, however, none of the three regional characteristics have much of an effect on the economic development of states—yet the results are quite large and generally statistically significant for metropolitan areas. These trends could have probably been foreshadowed when we covered the basic logic behind a technology-based economic development strategy. The ideas that technology helps productivity and, perhaps even more important, that the presence of technology in a region makes future investments more attractive to businesses are most likely to hold water in large and densely settled cities (where there's an easier flow of technology-based externalities).
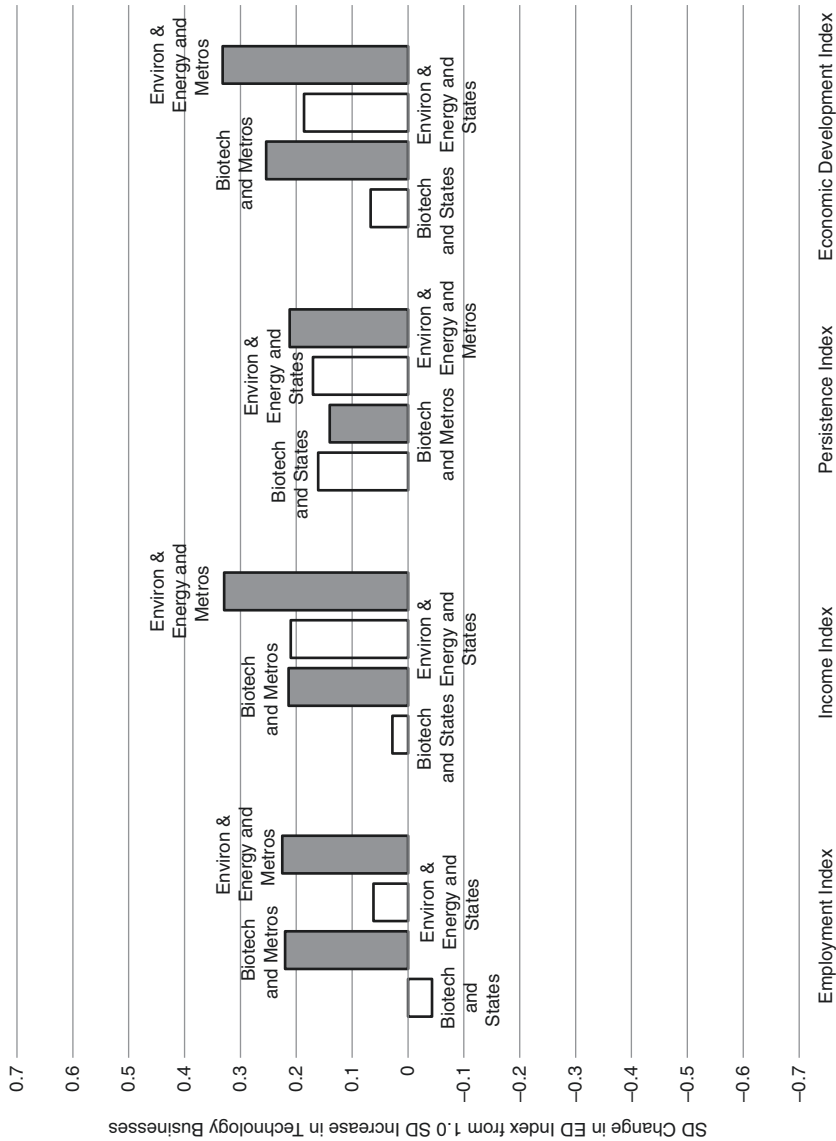
Fig. 6.3 Biotechnology, and environmental and energy businesses help the economic development of US metropolitan areas

6.7   Impacts of the Knowledge Economy on Regional Economic Development

Having our fill of technology, let's now move to an analysis of the knowledge economies of US regions. For this, we use the definition and industry categories proposed by Fritz Machlup in his 1962 book, *The Production and Distribution of Knowledge in the United States*. According to Machlup, the knowledge economy is made up of businesses and workers in industries such as printing and publishing, computer and office equipment manufacturing (e.g., information machines), finance, insurance (e.g., information services), communication, education, and research and development.

Figure 6.4 shows the relationship between the economic development of US metropolitan areas and the share of knowledge economy businesses in 1990.[9] Metropolitan areas such as New York, Chicago, Cleveland, and Miami are highlighted on the far-right side of the figure, indicating that they're among the top regions for the knowledge economy.[10] These places, which include some of the country's biggest cities, are not among the top metropolitan areas for high-tech, biotechnology, or environmental and energy businesses. Other large metros—places such as San Jose, Denver, and Los Angeles—have high shares of knowledge economy businesses and are strong in these other areas of technology.

We also find some differences among the top states for the knowledge economy, as compared to those noted for high-tech, biotechnology, and environmental and energy companies.[11] Places such as Colorado and Utah are among the leaders for technology and the knowledge economy—like we found for San Francisco and Houston—but places such as Hawaii and Florida crack the top-ten states for the knowledge economy despite not making any of the other technology-oriented top-ten lists. This makes these warm weather states similar to what we found for, say, New York City and Cleveland in the analysis of metropolitan areas. When it comes to businesses that involve producing and sharing information with others— that is, the knowledge economy—Hawaii and Florida are right up there with the usual suspects of Colorado, California, and Utah. The Aloha and Sunshine states, however, are not among the leaders for human capital, or any of the other technology-based companies. In the case of Hawaii and Florida, many of the knowledge economy workers are involved in sharing information with people, including tourists, just like many of the knowledge economy workers in New York and Cleveland are sharing information that is not related to technology.
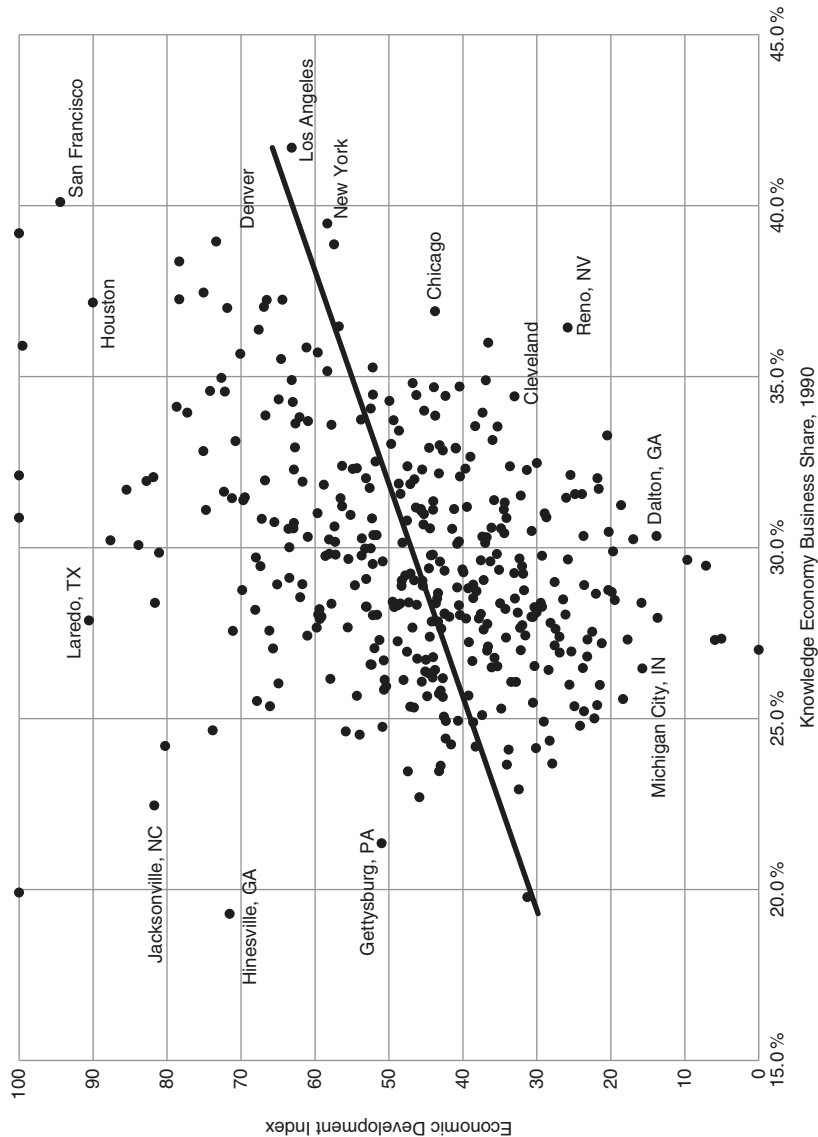
Fig. 6.4 The knowledge economy helps the economic development of US metropolitan areas

Figure 6.4 shows that the percentage of businesses in the knowledge economy has a positive and statistically significant effect on the economic development of US metropolitan areas. It's interesting to see that, as was the case for high-tech and biotechnology companies, some of the very top metropolitan areas for economic development—places such as Midland (Texas), Jacksonville (North Carolina), and Bismarck (North Dakota)— are in the middle to the bottom of the pack for the knowledge economy. That said, a few of the top places for the knowledge economy—examples being San Francisco, San Jose, and Austin—also rate high according to the overall economic development index.

Figure 6.5 summarizes the effects of the knowledge economy on the economic development—all four indicators—of states and metropolitan areas. The two most noteworthy findings are that the sector's impact on states is limited to a positive relationship between the persistence of employment and the share of businesses in the knowledge economy; and the effects for metropolitan areas with one million or more people are considerably larger than those for regions with fewer than one million people. Clearly, like we found for high-tech, biotechnology, and environmental and energy companies, the economic development benefits associated with the production and distribution of knowledge are stronger in large and densely populated areas.

6.8   Technology and the Pursuit of Economic Development

This chapter started with the premise that the presence of technology in a region supports the growth of good jobs. The logic here is twofold: workers are made more productive by greater technology use, and the deployment of technology is self-reinforcing by making future investments in the region even more attractive to other businesses. Unlike investments in low-tech equipment and machinery, which are subject to diminishing returns, the roll out and use of advanced technologies have external benefits that make others in a region better off.

We looked at three types of businesses—high-tech, biotechnology, and environmental and energy companies—and (for good measure) examined the knowledge economy as well. Although there's some overlap in the regions that are counted among the top places for these different types of establishments, it appears that the four regional characteristics provide a
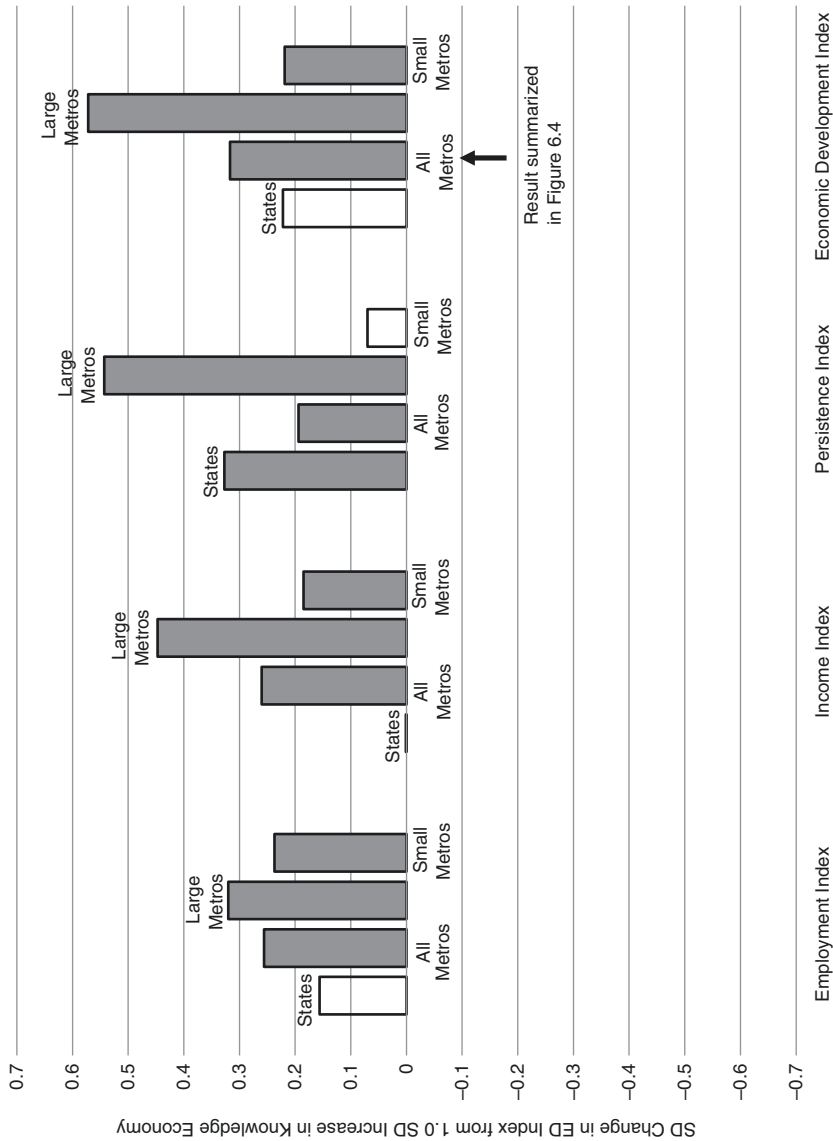
Fig. 6.5 The knowledge economy is particularly beneficial to the economic development of large US metropolitan areas

sufficiently distinct and broad picture of the types of technology used to promote economic development.

The main theme emerging from the analysis—in fact, it's very easy to see—is that technology in all of its forms helps the growth of good jobs in metropolitan areas, but the effects of technology on the economic development of states are not as pronounced. Focusing on metros, the positive effects of technology on the income index suggest that it raises the productivity of workers and businesses, and perhaps even supports future investments of the sort. Second, the positive effects of technology on the employment index (for "all" metropolitan areas and those with fewer than one million people) are consistent with Enrico Moretti's concept of an innovation employment multiplier. That is, "innovation-sector" companies help employment growth because workers in these companies support additional jobs in personal services and other local businesses. The icing on the cake is that the technology-driven employment growth in US metros is not subject to a lot of ups and downs. All of these results, taken together, suggest that technology is good for the economic development of US metropolitan areas.

Another result that registers loud and clear is that the economic development benefits of technology tend to be more pronounced in large metropolitan areas than in less-populated regions. For high technology and the knowledge economy, the "bars" shown in Figs. 6.2 and 6.5 are about twice as high for the larger metropolitan areas. As noted above (and mentioned in earlier chapters), this means that information and ideas about technology and knowledge tend to travel more easily in large and densely settled places. Taking this line of reasoning one step further, we find that the impacts of technology—as they were for human capital, too—are very modest for states. The main idea behind innovation-based externalities—which suggest that technology and knowledge are rising tides that lift other boats—makes sense when you are in the same body of water (i.e., in reasonably close proximity to where it's deployed), but it seems a little far-fetched when your boat is docked in a different lake located several hundred miles away.

The analysis presented in this chapter, as well as the results and advice suggested in other studies on the topic, support the following principles for the use of technology in the pursuit of economic development.

Principle 1: Technology, in all of its forms, helps the economic development of US metropolitan areas. Our findings suggest that high-tech, biotechnology, environmental and energy companies, and the knowledge economy are good for economic development. Chances are, if we had considered other

types of technology, we would have uncovered similarly positive economic development benefits. The consistency of these results is due to the fact that, despite the differences in the exact types of businesses, these strategies—especially high technology and biotechnology—are similar in their focus on "how" things are made. For instance, the common thread joining high-tech and biotechnology businesses is the extent to which the production of goods and services incorporates innovative practices and/or is characterized by substantial investments in research and development. Our results showing that all sorts of technology help economic development should not be surprising, given that technology—at its heart—is used to make workers more productive. And productive workers translate into good jobs.

Principle 2: Technology contributes to income and employment growth. The explanation for how technology raises incomes is very similar to the one we used in the chapter on human capital. That is, technology increases incomes as a result of making people more productive. But, in addition to its impact on productivity, technology (and human capital, for that matter) contributes to the growth of US metropolitan areas. This effect on growth is attributed to an "innovation-based" multiplier, in which workers in technology-based companies support additional jobs in the regional economy.

Principle 3: The impacts of technology on economic development are more pronounced in larger (and more densely settled) metropolitan areas. One of the main arguments supporting a technology-based economic development strategy is that the presence of these companies and workers makes future investments more attractive to others. The idea here is that the benefits of technology are not subject to decreasing marginal returns, as is the case for investments in traditional manufacturing such as buildings and machinery. These attractive forces of high technology are strongest in large and densely settled areas, more so than in spread out regions such as states.

Notes

1. To differentiate between industry- and occupation-based approaches to economic development, Edward Feser (2003) refers to the former as focusing on "what people make" and the latter as "what people do" in their jobs.

2. I purposely left out information technology, another technology-based approach, because we've already (indirectly) looked at the impacts of IT on economic development. In the chapter on "Picking Winners," we found a positive relationship between economic development and a region's

specialization in the communications sector. Likewise, our analysis of work-force skills in the chapter on "Human Capital" showed that (computer) programming skills have a positive effect on economic development. Given that information technology involves the use of computers to analyze, store and communicate information, we can imply from our earlier results (per-taining to communications and programming) that IT is probably good for the economic development of regions.

3. The shares of high-tech businesses (as of 1990) in US metropolitan areas and states are estimated using *County Business Patterns* data of the U.S. Census Bureau.

4. Ross DeVol (1999, Table 2.1) counts the following sectors as high-tech-nology: drugs; computer and office equipment; communications equip-ment; electronic components and accessories; aircrafts and parts; guided missiles, space vehicles and parts; search, detection, navigation, guidance, aeronautical, and nautical systems, instruments, and equipment; laboratory apparatus and analytical, optical, measuring, and controlling instruments; surgical, medical, and dental instruments and supplies; telephone commu-nications services; computer programming, data processing, and other com-puter related services; motion picture production and allied services; engineering, architectural, and surveying services; and research, develop-ment, and testing services.

5. These states are Arizona, California, Colorado, Connecticut, Maryland, Massachusetts, New Hampshire, New Jersey, Utah, and Virginia.

6. The shares of biotechnology businesses (as of 1990) in states and US metropolitan areas are estimated using *County Business Patterns* data of the U.S. Census Bureau.

7. The 13 metropolitan areas counted among the top-twenty regions for high-tech and biotechnology businesses are Ann Arbor (Michigan), Boston, Boulder (Colorado), Bridgeport (Connecticut), Corvallis (Oregon), Denver, Los Angeles, San Diego, San Jose, Santa Barbara, State College (Pennsylvania), Trenton (New Jersey), and Washington DC.

8. The shares of environmental and energy businesses (as of 1990) in states and US metropolitan areas are estimated using *County Business Patterns* data of the U.S. Census Bureau.

9. The shares of knowledge economy businesses (as of 1990) in US metropo-litan areas and states are estimated using *County Business Patterns* data of the U.S. Census Bureau.

10. The top-twenty US metropolitan areas for the share of knowledge economy businesses are Albuquerque (New Mexico), Atlanta Austin Boulder (Colorado), Bridgeport (Connecticut), Chicago, Dallas, Denver, Honolulu, Houston, Los Angeles, Miami, New Orleans, New York, Phoenix, Reno (Nevada), Salt Lake City, San Diego; San Francisco, and San Jose.

11. These states are Arizona, California, Colorado, Florida, Hawaii, Illinois, New Jersey, New York, Texas, and Utah.

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Amenities and the Growth of Good US Jobs

7.1 ECONOMIC DEVELOPMENT PARTIES

Whether you're into lavish cocktail parties or informal church socials, the subjects of industry clusters, human capital, and even business climate rarely come up in casual conversation with others. Unless you work in the economic development profession, these topics are a little too dry for small talk. When it comes to ice breakers, people are more accustomed to conversing about the weather. Whatever the current condition, you'll feel at ease with a stranger by saying "nice day, isn't it?" or "sure has been snowy the last couple of days...how much did you get?"

As it turns out, weather is more than just a topic of chitchat around the water cooler or at parties of economic development professionals. Nice weather can be thought of as an amenity, which is a draw to households looking for a place to live or even companies searching for a new location. Along with nice weather, amenities include a wide range of regional characteristics that increase a location's desirability to households and businesses. Low crime, lots of fun things to do (e.g., arts and recreation), and even an abundance of restaurants and nightlife rank high on the "must have" lists of many individuals.

The logic underlying an amenity-based strategy is that having "nice things" promotes economic development in a region by attracting people—especially high-skilled individuals and those who can live anywhere—and the presence of these workers helps the growth and productivity of businesses. Looking at it a slightly different way,

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amenities promote the growth of good jobs as business owners and entre-preneurs seek out places where workers—and even they—would like to live.

This explanation about the impacts of amenities rests on the premise that population growth—as people seek out nice things—is followed by an expansion of local jobs, which is an important ingredient of economic development. In what could be described as a classic example of the "chicken versus egg" debate, we can ponder whether population growth leads to an increase in the number of jobs, or if it's that job growth attracts people.[1] Although economists typically believe that employment and population growth are mutually reinforcing, an amenity-based economic development strategy is based on the idea that an increasing population provides a spark to get the ball of regional prosperity rolling.

With the decline of US manufacturing—at one time, an important source of jobs in some rural areas—and the large populations that are required for certain types of services and knowledge-based activities to thrive (Storper and Venables 2004), amenities have become an increas-ingly important part of the economic development efforts of many non-metropolitan areas. Although local officials would not object if a region's suite of amenities lured a new company in search of a place for its workers and executives to live, amenities are promoted in some rural areas as part of a broader tourism-based strategy, or even in an effort to attract retirees.

Research conducted in the late 1990s by David McGranahan (1999) of the U.S. Department of Agriculture found that natural amenities were a primary determinant of rural population change between 1970 and 1996. Places identified as having high natural amenities—for example, pleasant climate, presence of lakes and rivers, and varied topography—had popula-tion growth rates that averaged 120 percent, while rural areas character-ized by low natural amenities had population growth rates that averaged only 1 percent. That's a huge difference. McGranahan's analysis of popu-lation growth in rural counties suggests that amenities are important to people in terms of where they choose to live. But for amenities to enhance regional economic development, they will need to impact employment and wage growth, as well.

The research team of Steve Deller, Tsung-Hsiu Tsai, David Marcouiller, and Donald English (2001) examined the impacts of a wide range of amenities on the population, employment, and wage growth of rural coun-ties between 1985 and 1995. The analysis revealed that all three of these indicators of economic growth are positively impacted by at least one of the amenity measures (some of the growth indicators are impacted by more

than one type of amenity) that represent the region's climate, presence of recreational facilities, the terrain and land resources, water coverage, and the availability of wintertime (i.e., snow-related) activities. It's no surprise that the climate and land variables, which were the focus of David McGranahan's study, had positive impacts on population growth in the analysis conducted by Steve Deller and colleagues. This research team also found that a region's terrain and land resources influence employment growth, whereas climate does not, and neither of these natural amenities have an effect on the growth of per-capita income. The per-capita income growth of rural US counties was positively related to the presence of recreational facilities and wintertime activities/snow (both of these amenities positively impacted all three measures of growth), and an area's water coverage (which also positively impacted population change, but not employment growth).

All things considered, the studies of rural areas by David McGranahan, and Steve Deller and colleagues suggest that amenities are important to population growth, as well as the growth of employment and income—two measures that figure prominently in our definition of economic development.

The picture of amenities that comes to mind in an urban context looks different than, say, the outdoor recreational opportunities and varied topography that are important to the growth of rural areas. For those who enjoy "city life," climate is probably important (just like it is in rural areas), but arts and culture (e.g., a symphony orchestra or winning baseball team) and even an abundance of good restaurants can serve as a draw to people. Furthermore, disamenities—that is, features of a region that most people would prefer to avoid—such as crime and congestion might take on a greater importance in urban areas.

Edward Glaeser's concept of a "consumer city" brings the role of urban amenities to the forefront as a factor influencing the attractiveness (and perhaps growth) of US metropolitan areas. Glaeser, Jed Kolko, and Albert Saiz (2001) consider four main types of urban amenities: availability of a wide variety of services (e.g., restaurants, live theatre) and consumer goods; pleasant aesthetics (e.g., interesting architecture) and setting (e.g., weather); good public services (e.g., high-quality schools and low crime); and the ease with which people can navigate the city. The idea of a consumer city, which goes beyond the notion that businesses and households simply prefer to locate around nice amenities, is that amenity-rich metropolitan areas can actually provide "productivity advantages" to individuals. In other words, what industry clusters can do for its

businesses—that is, provide a competitive advantage—is what amenities and other features of a consumer city can do for its households.

Research by Edward Glaeser, Jed Kolko, and Albert Saiz uncovered that high-amenity cities experienced more robust population growth than less desirable places between 1977 and 1995. In particular, they found that several climate/natural amenity variables (e.g., warm temperatures, low precipitation, and proximity to the coast), as well as consumer amenities such as live performance venues and the availability of restaurants had positive effects on the population growth of cities. The presence of bowling alleys and movie theaters, on the other hand, had negative effects on population growth; while Edward Glaeser, Jed Kolko, and Albert Saiz found that art museums did not have an effect—one way or another—on population change.

Whereas the types of research studies outlined above examine the effects of amenities on the growth and development of regions—for example, population, employment, and income change—another line of inquiry seeks to understand more clearly the types of local features that people value based on their willingness to accept lower wages and/or pay higher housing prices just to be around them.

7.2   The Price to Pay for Amenities

The hedonic approach to studying amenities (as developed by Jennifer Roback (1982), Sherwin Rosen (1974), and others) is based on the premise that—because people are free to live wherever they wish and (to put it bluntly) some locations are simply better places to reside than others—individuals need to be compensated to live in areas that are low in amenities (or high in disamenities). This compensation to live in amenity-poor areas can come in the form of higher wages, lower housing costs, or both. Conversely, people should be willing to accept lower wages and/or pay higher housing prices to set up residence in places with an abundance of amenities (or a lack of disamenities). This idea—that is, we can use prices of the things that are sold in markets (e.g., housing and labor markets) to place a value on amenities—is at the heart of studies on "non-market" valuation.

Here's an illustration of how it works.

For items that you can purchase in stores, such as a Cincinnati Reds hat or a Stereophonics CD, economists can figure out how much people value the goods by analyzing the prices consumers pay and the amounts of the goods that are transacted in markets. A good priced at $10 will be

purchased by individuals who value it at more than this amount, while others will pass on it. I'm a Cincinnati Reds fan and would place a $15 value on a new hat. Finding a lid priced at $10, which I would purchase, provides me a five-dollar "benefit."

For things that are not sold in stores—for example, a pretty view or comfortable climate—we cannot rely on the same types of prices and market outcomes to tell us how much people value them. We can, however, examine the prices that people pay for their homes, which differ in terms of their proximity to amenities. Using a statistical analysis that accounts for, among other things, differences in a dwelling's structural characteristics such as the square footage and number of rooms—this is what appraisers do when they estimate a home's value—we can come up with a dollar value that is placed on the amenities where the home is located. This is the essence of hedonic analysis.

The principles of hedonic analysis call into question the logic that pleasant amenities can lead to high population (or employment) growth, as well as the idea that amenities can lift earnings in a region. To see this, let's look at the effects of amenities on employment growth through the lens of hedonic analysis. If people did not "pay" for amenities through lower wages or higher housing and land costs—that's the premise of hedonic analysis—then no doubt mostly everyone would flock to amenity-rich places. Such a large influx of people to places such as Honolulu and Santa Cruz, California (the US metropolitan areas with the highest amenity scores, according to the research by Edward Glaeser, Jed Kolko, and Albert Saiz) would increase the demand for—among other things—housing construction, retail goods, and a variety of services. Local entrepreneurs and companies would, no doubt, respond to these market forces by starting new businesses and hiring more workers.

Of course, as noted above, this scenario of people moving into amenity-rich places would only take place in a make-believe world where people do not have to "pay" for proximity to sun and surf, and thus land is no more expensive in Honolulu and Santa Cruz than it is where you live (assuming you're not one of the lucky few). The world according to the principles of hedonic analysis, however, is one where people pay for nice things either by receiving lower wages or paying more for housing and land. This means that some people—for example, those with weaker preferences for amenities—would rather live and work in (insert where you currently live) than take a pay cut and probably end up renting a small apartment in Honolulu. Continuing this line of reasoning suggests that, if wages and housing prices

truly reflect differences across regions, the presence of amenities will not necessarily translate into higher population and employment growth.

Paul Gottlieb's (1994) survey of the academic research on amenities and regional economic activity uncovered several studies that found limited impacts of amenities. Similarly, Mark Brown and Darren Scott (2012) summarize past work on the topic showing that the availability of jobs in a region has stronger impacts than amenities on the decisions of where people live. For example, Allen Scott (2010) found that amenities have virtually no effect on the location choices of engineers, with the exception of nice weather attracting those who are close to retirement age. Although it's not unusual for research projects on similar topics to come up with different conclusions, the key point here is that the results of these studies provide a different perspective regarding the impacts of amenities—and these "non-results" are consistent with the idea that amenities are already priced into local labor and housing markets.

The theory of hedonic analysis also calls into question the impacts that amenities might have on earnings—especially the notion that regional amenities will lead to higher incomes. Given that the whole premise of hedonic analysis is that people pay to be around amenities by accepting lower wages (and/or paying more for housing), it seems unlikely that amenity-rich places would experience significantly higher rates of income growth than regions that are less desirable places to reside. So what gives? Why does the hedonic approach to examining amenities have such different predictions for regional economic impacts than the empirical analysis conducted by David McGranahan and Steve Deller (and colleagues) in rural areas, and Edward Glaeser (and colleagues) in cities?

The answer lies in the extent to which a region's labor and housing markets are in "equilibrium," as opposed to a situation where these markets are in "disequilibrium." You might recall from any *Introduction to Economics* course the "X marks the spot" market equilibrium at the price where the quantity demanded equals quantity supplied of a good or service. In simple terms, the equilibrium price is one where buyers purchase the same amount of goods and services that sellers are willing to bring to market. When a market is in equilibrium, the prices and quantities are not expected to change very much unless there are fundamental changes in the demand (e.g., tastes and preferences, consumer incomes) or supply (e.g., technology, input prices) of the good or service.

A market is in disequilibrium, on the other hand, when the market price is such that buyers want to purchase more or less of a good than businesses want to sell. Disequilibrium prices, therefore, lead to shortages or surpluses of goods and services. If buyers want more of a good than what is provided by sellers (this would happen when the market price is below the equilibrium price), consumers would "bid up" the price until it reaches equilibrium. This means that disequilibrium in a market will induce changes to prices and quantities even if there are no fundamental changes in the demand and supply of the good.

The hedonic approach to valuing amenities treats markets as if they are in equilibrium. People in amenity-rich areas are okay with paying higher housing prices and/or receiving lower wages, because these individuals place a premium on living near the amenity (or, in the case of climate, having the amenity "live" around them). A feature of housing and labor markets reaching an equilibrium is that people have already selected their optimal locations—based on the mix of amenities, housing costs, and wages—and no additional changes will take place (unless there are fundamental changes in demand or supply). This is why hedonic models may not predict large impacts of amenities on employment and income growth.

On the other hand, the framework used by Steve Deller, Tsung-Hsiu Tsai, David Marcouiller, and Donald English to examine the effects of amenities on population, employment, and income growth starts from the premise of markets being in disequilibrium. This means that local labor and housing markets do not completely account for the premium that people place on living near amenities. Since amenities are not "priced" correctly in these markets, some people may choose to move to places with more favorable combinations of amenities, wages, and housing prices. This type of behavior, which is consistent with markets being in disequilibrium, could lead to amenities-driven regional growth.

Let's see what our analysis shows about the impacts of amenities on the economic development of US regions.

7.3   EFFECTS OF AMENITIES ON ECONOMIC DEVELOPMENT

Our study of the impacts of amenities on the growth of good jobs focuses primarily on metropolitan areas, although we look briefly at states near the end of the chapter. This is because, as is probably the case for some of the other regional characteristics considered elsewhere in the book, amenities

are very specific to a place and can exhibit wide heterogeneity within a state. For instance, several metropolitan areas in California are among the top regions for warm January temperatures, while others in the Golden State are among the top places for cool temperatures in July.[2] It would, therefore, be hard to classify California as either "hot" or "cool." Other amenities, such as (low) crime rates and the presence of arts and recreation businesses, can also vary widely across metropolitan areas—even when compared to those located nearby.

Figure 7.1 shows the relationship between the economic development of US metropolitan areas and the average (low) temperature during the month of January.[3] If warm winter temperatures are good for economic development, then we'll see an upward-sloping (and solid) trend line. The relative placement of the metros listed, from left to right, should come as no surprise. Fairbanks, Alaska, is the metropolitan area with the coldest average low temperature, while Honolulu is the warmest place in January. The warm-weather metropolitan areas represented by the points on the far-right side of Fig. 7.1 are mainly located in Hawaii, Florida, Texas, and California.

The solid and upward-sloping trend line suggests that warm January temperatures have a positive effect on economic development. That is, good jobs "go south" for the winter—just like everyone else. The metropolitan areas with the coldest—that is, most comfortable—average July temperatures are spread across considerably more states and, as mentioned previously, California has places that are among the top regions for warm January and cool July temperatures. Whereas Florida dominates the list of top metropolitan areas for warm winters (14 of the 20 warmest metros in January), the states of Washington (6 metros), California (4 metros), Alaska (2 metros), Maine (2 metros), and Oregon (2 metros) account for most of the top-twenty metropolitan areas with the coolest summer temperatures. The regions with the lowest amounts of annual precipitation do not come as any surprise. All 20 of the driest US metropolitan areas are located west of the Mississippi River.

The results summarized in Fig. 7.2 suggest that warm January (low) temperatures, hot July (high) temperatures, and dry conditions are good for regional economic development. These impacts on (overall) economic development are mainly due to the effects of these pleasant conditions—that is, if you like warm and dry weather—on the growth and persistence of employment. On the other hand, there's a negative relationship between the income index and both of the temperature variables. Taken together, these results suggest that—whereas people are attracted to warm
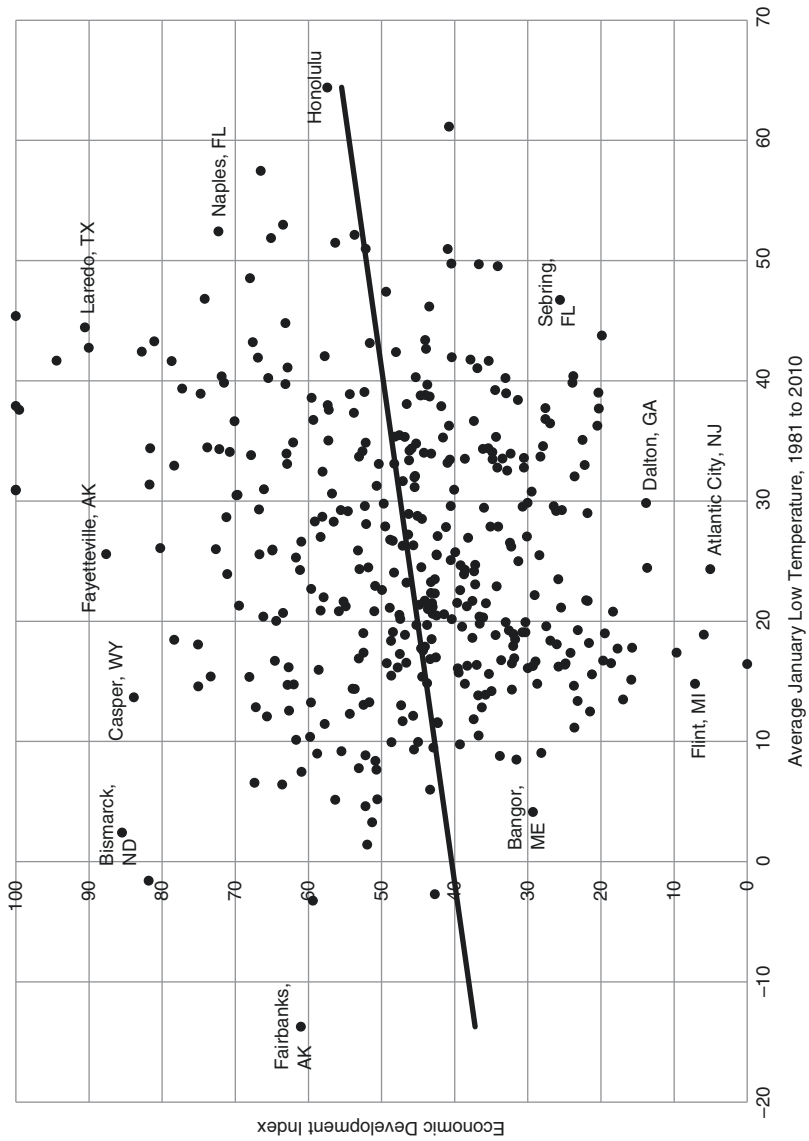
Fig. 7.1 Warm January temperatures help the economic development of US metropolitan areas
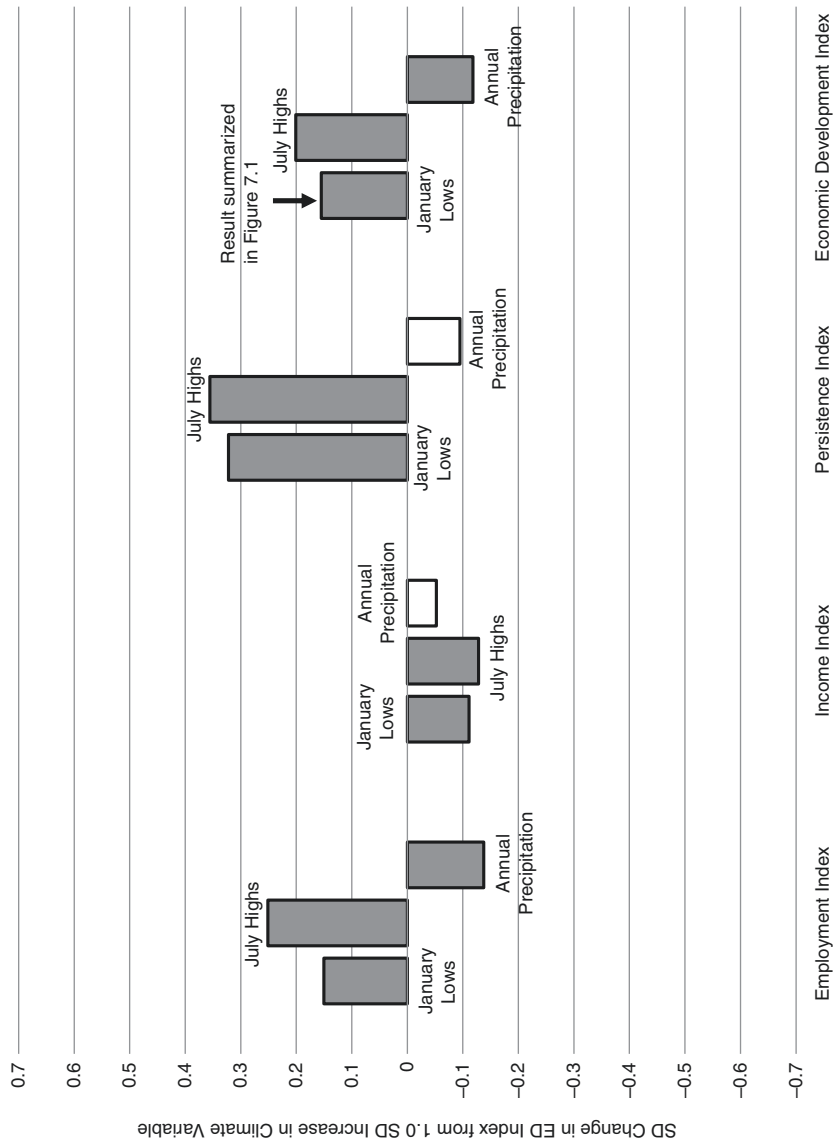
Fig. 7.2 Warm and dry weather help the employment growth and persistence of US metropolitan areas

and dry places (i.e., a positive impact on growth, without a lot of ups and downs in employment)—the types of investments that enhance productivity and earnings have not migrated to these warmer places. These results are consistent with studies showing the impacts of climate conditions on household location decisions. For example, Allen Scott found that warm winters was the only amenity (of the ones he considered) to have an impact on the location choice of engineers. Likewise, research by Jordan Rappaport (2007) points to the importance of a pleasant climate.

Now, let's move to an analysis of a few non-climate measures.

The first one that we'll consider is the violent crime rate, which is obviously a disamenity.[4] Although this measure does not include property crimes, it is a reasonably good indicator of a region's safety. Given that the jurisdictions of police departments (and how crime statistics are reported) do not line up exactly with metropolitan areas (or even the counties that are combined to form metros), the crime statistics used here are—more often than not—for the "namesake" city of a given metro. Whereas, for example, the Austin, Texas, metropolitan area is defined as covering Bastrop, Caldwell, Hays, Travis, and Williamson counties, the crime statistics used in the analysis are for the Austin Police Department. Even with our focus on these "city" police departments, the annual crime figures are spotty (or missing) for some places. To overcome these data limitations, the crime rates used in the analysis are constructed as "averages" over the period of 1990–1994. In cases where crime statistics are available for all of these years, the crime rate used is the five-year average. In cases with missing values, the average is calculated using less than five years of data.

Unlike the climate measures, which had fewer states represented by the top-ranked metros, the list of the top-twenty safest metropolitan areas has places in 12 states—covering most regions of the country. The common thread among these top places for low crime is that they are some of the most sparsely populated regions [(e.g., Appleton (Wisconsin), Bloomsburg (Pennsylvania), Harrisonburg (Virginia), and Bangor (Maine)] that are classified as metropolitan areas. Figure 7.3 summarizes the effects of violent crime rates on the economic development of US metropolitan areas. Since crime is something that people want to avoid, a result that lower crime is good for economic development would be shown as a "bar" that is below the zero axis. Although a few of the bars are below the zero axis, none of them are shaded. This means that violent crime rates have no effect—one way or another—on the employment, income, persistence, or (overall) economic development of US metropolitan areas.
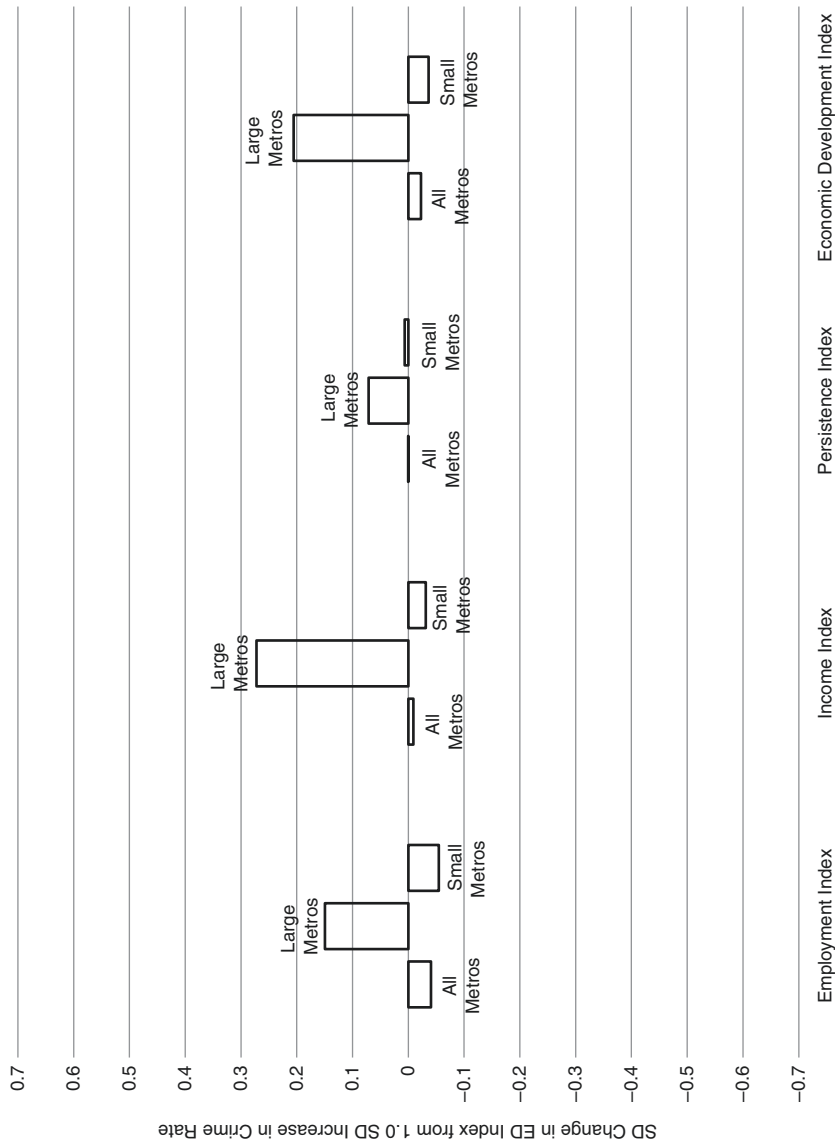
Fig. 7.3 Violent crime rates have no effect on the economic development of US metropolitan areas

Whereas crime is something that people don't like—that is, it's a dis-amenity—people are generally attracted by fun things to do. Recognizing that people's tastes differ, we'll focus on three types of businesses that provide things to do (i.e., arts and recreation establishments), eat and drink (i.e., restaurants and bars), and enjoy (i.e., book and music stores). Looking first at the arts and recreation sector, we find that well known "beach resorts"—for example, Ocean City and Myrtle Beach—and enter-tainment meccas such as Las Vegas and Nashville are among the top metropolitan areas for these businesses that provide fun things to do.[5] The top-twenty metros for arts and recreation—measured using location quotients—cover most regions of the country, as well as a mixture of places with an abundance of natural [e.g., Fairbanks (Alaska), Hot Springs (Arkansas), and Fond du Lac (Wisconsin)] and manmade (Nashville, Las Vegas) attractions.

The second category of businesses providing "fun things to do" is restaurants and bars.[6] Although this measure, which is also represented by location quotients, says nothing about the types of cuisine in a region or—more importantly—how delicious the food tastes, larger values indi-cate a higher percentage of eating and drinking establishments as a share of all businesses. Some of the top-ranked metros for restaurants and bars include Pueblo (Colorado), Eau Claire (Wisconsin), and Jacksonville (North Carolina). Five metropolitan areas—Ocean City (New Jersey), Myrtle Beach (South Carolina), Glens Falls (New York), Watertown (New York), and Utica (New York)—are among the top-twenty metro-politan areas for arts and recreation businesses, and restaurants and bars. The overlap of places that are highly ranked according to these regional characteristics should come as no surprise given the strong demand for arts and recreation activities by tourists and other amenity seekers, who also like to eat and drink.

The distribution (across all 381 metropolitan areas) of the location quotients for restaurants and bars is a little different than the spread for many of the other regional characteristics that we have examined thus far. You may recall from the analysis of, say, textiles plants or even January temperatures, that there's a wide variation in these measures across US metropolitan areas. For example, in the case of textiles plants, places usually either have several of these businesses (e.g., states such as North Carolina, Georgia, and Maine) or they don't have many at all. We referred to this phenomenon as textile plants exhibiting "high regional concentra-tion." It was also the case that January temperatures exhibited wide

variability, from a frigid average low of minus-14 degrees in Fairbanks, Alaska, to a much more comfortable January (average low) temperature of 64 degrees in Honolulu. This pattern of a wide variability across regions is generally not observed for restaurants and bars. Although a few metropolitan areas have a considerably higher percentage of their businesses that are restaurants and bars as compared to other regions, most places have location quotients for restaurants and bars that are close to 1.0. In fact, 298 of the 381 US metropolitan areas have location quotients for restaurants and bars of between 0.8 and 1.2. This means that places to eat and drink are practically ubiquitous. That is, they are equally available just about everywhere.

The final group of businesses providing "fun things to do" that we'll consider are music and book stores.[7] Although there are considerably fewer of these retailers today than in 1990 due to the availability of music and reading materials on-line, these businesses provided entertainment back in the day when people purchased albums and CDs for their listening enjoyment, and books to read. The metropolitan areas with some of the highest shares of music and book stores—places such as Ann Arbor (Michigan), College Station (Texas), and Lawrence (Kansas)—could have a *Jeopardy* answer (similar to the topic of places with high levels of workforce educational attainment) of "What are some of the better known U.S. college towns?" Yes, back in 1990 when these data were collected, university students purchased books, albums, and CDs in actual "brick and mortar" stores.

Unlike what we just described for restaurants and bars, but similar to the pattern uncovered for arts and recreation businesses, the location quotients for music and book stores have a reasonably large spread of values. The places with the highest specializations in these retailers had well over twice as many music and book stores (relative to all businesses) as compared to the national average. At the other end of the spectrum, with location quotients of around 0.50, some metros were severely under-represented in places to purchase books and music. And this was long before these items could be purchased on-line. Overall, 202 of the 381 US metropolitan areas had location quotients for music and book stores of between 0.8 and 1.2— that's almost 100 fewer places than was the case for restaurants and bars.

Although 35 metropolitan areas were counted among the top-twenty places for either arts and recreation businesses, or restaurants and bars, the combined top-twenty lists for the three types of businesses providing "fun things to do" have a total of 53 metros. This means that one out of seven US metropolitan areas have a reasonably high specialization in at least one

of these types of businesses. It's also noteworthy that only two of these 53 metros—Buffalo and Nashville—had one million or more people in 1990. Although we might refer to these types of businesses as "urban amenities," they are routinely found in greater relative abundance in some of the smaller metropolitan areas.

In Fig. 7.4, we see that places ranking high in amenities did not perform especially well in terms of our economic development indicators. Practically all of the bars in the figure are below the zero axis—suggesting negative impacts—and many of them are shaded to indicate that these effects are statistically significant. The negative effects of businesses providing "fun things to do" on economic development—statistically significant for arts and recreation, and restaurants and bars—appear to be due to their impacts on the persistence of employment. Whereas only one of the six impacts on employment and income are negative and statistically significant, all three of the regional business shares have negative and statistically significant effects on the persistence index.

In retrospect, these results should not come as too much of a surprise. In Chapter 1, we held up Ocean City, New Jersey, as an example of a region characterized by low persistence in employment. That is, Ocean City is subject to a lot of ups and downs in employment due to the tourism-dependent and seasonal nature of its economy. Although we featured Ocean City, we could have just as easily picked another tourism-dependent region such as Myrtle Beach (South Carolina), Panama Beach (Florida), or Glens Falls (New York). Now, several of these places with the lowest persistence of employment show up, once again, as the metropolitan areas with the greatest abundance of fun things to do. So it almost naturally follows, then, that the employment persistence of regions is negatively associated with having large shares of arts and recreation businesses, restaurants and bars, and music and book stores. These types of businesses are found in tourism-dependent regions, many of which are seasonal in nature.

7.4 Effects of "Overall" Amenities on Economic Development

The basic premise of an amenities-based economic development strategy is that "nice things" attract households and businesses seeking out places to locate. These location decisions translate into job growth—or so the theory
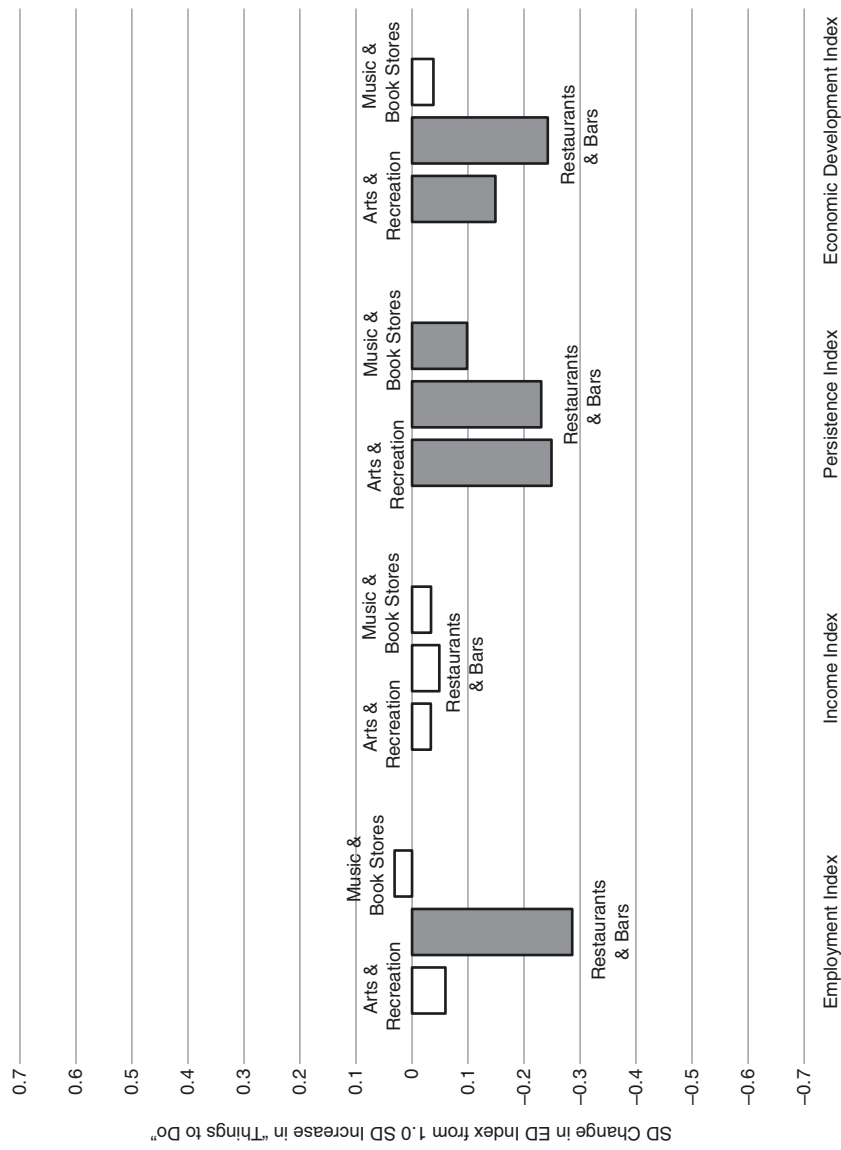
Fig. 7.4 Having fun things to do is negatively associated with the employment persistence of US metropolitan areas

goes—and, perhaps, other favorable economic development outcomes. The evidence presented so far, however, is mixed. Weather conditions—namely warm temperatures (both winter and summer)—appear to support the growth of good jobs. Surprisingly, crime rates have no impact on economic development and none of the three regional characteristics measuring "fun things to do" provide a lift to economic development. Although we have examined what I believe is a fairly diverse set of amenities, someone could make an argument that we're not capturing the correct things. Thus, our inability to detect stronger (and positive) amenity effects might be because we're focusing on the wrong regional characteristics. Maybe it's the presence of parks and hiking trails, and not restaurants and bars; or location near a beach instead of low crime rates that matters.

As another way to examine the impacts of amenities on economic development, we'll now turn to the regional attributes that people "tell us" are important. But instead of asking them directly the things that households value, we'll look at the behavior of individuals to figure out the types of places with an abundance of desirable amenities. To do this, we'll borrow ideas from the hedonic approach to valuing amenities. As described above, this method is based on the premise that households are mobile and, everything else being equal, people prefer places with high wages and low housing costs. Who wouldn't?

But, in reality, "everything else" is not equal and the regional characteristics viewed as amenities or disamenities differ across places. This heterogeneity is not random, however, and differences in wages and housing costs tell us something important about the desirability of places where people work and live. For example, a metropolitan area with high housing costs and low wages is believed to have very nice amenities. Why else would anyone (assuming people are mobile) want to live in a place with such unaffordable housing? On the other hand, an area with high wages and low housing costs must be a less desirable place to live. Otherwise, people would be settling there in droves.

The basic approach used here—which was also employed in a study by Edward Glaeser et al. (2001)—is to look at the relationship between housing values and incomes in a region. As logic would have it, housing values tend to be higher in places with more generous incomes. But, according to the theory of hedonic analysis, housing values that are considerably higher than what would be predicted (based on a region's incomes) are a sign that it has desirable amenities. Thus, Edward Glaeser and colleagues—and we use the same method in our analysis—treat the

residual of actual housing values (above or below what is predicted by incomes) as a measure of amenities.

Figure 7.5 shows the relationship between housing values and household incomes in 1990 for all 381 US metropolitan areas.[8] As would be expected, we find a positive relationship and a very strong pattern with most of the points in the scatter plot reasonably close to the curved trend line. The most interesting points are the metros that are furthest removed from the trend line. Metropolitan areas with high housing costs relative to incomes (i.e., points above the trend line) must have something desirable to attract people who will end up spending a relatively large chunk of their incomes just on housing alone. On the other hand, metros with low housing costs relative to incomes (i.e., points below the trend line) are those believed to have fewer amenities.

As shown in Fig. 7.5, some of the metropolitan areas with the highest housing values relative to incomes in the region—that is, those most removed from and above the trend line—include places such as Honolulu and Kahului, Hawaii; and Santa Cruz and San Luis Obispo, California. These are truly some of the most desirable places in the country to reside; so much so that people will tolerate very high housing costs relative to wages just to live there. As a specific example, the San Luis Obispo (California) metropolitan area has an estimated (i.e., point on the trend line) housing value of about $85,000, based on a median household income of around $31,000 (back in 1990). Actual housing values, however, were about $213,000—that's $128,000 more than what would be predicted based on incomes in the area. This difference is about 60 percent relative to the actual housing values in San Luis Obispo. People must really love this region along the California coast, in part because of its incredible weather, to put up with such unaffordable housing.[9] If housing values had been $85,000, which is what would be predicted based on incomes in the region, there would probably be a huge movement of people into San Luis Obispo.

The top-twenty metropolitan areas for desirable amenities can be summarized in one word: California! In total, 15 of the 20 places are in California and the rest are in Massachusetts (Barnstable), Hawaii (Honolulu), Arizona (Prescott), Oregon (Grants Pass), and Rhode Island (Providence). The largest differences between actual housing values and those predicted by household incomes are found in San Luis Obispo, Santa Maria, and Santa Cruz, California. These results suggest—as implied by songs such as California Dreaming (Mamas and the Papas), California
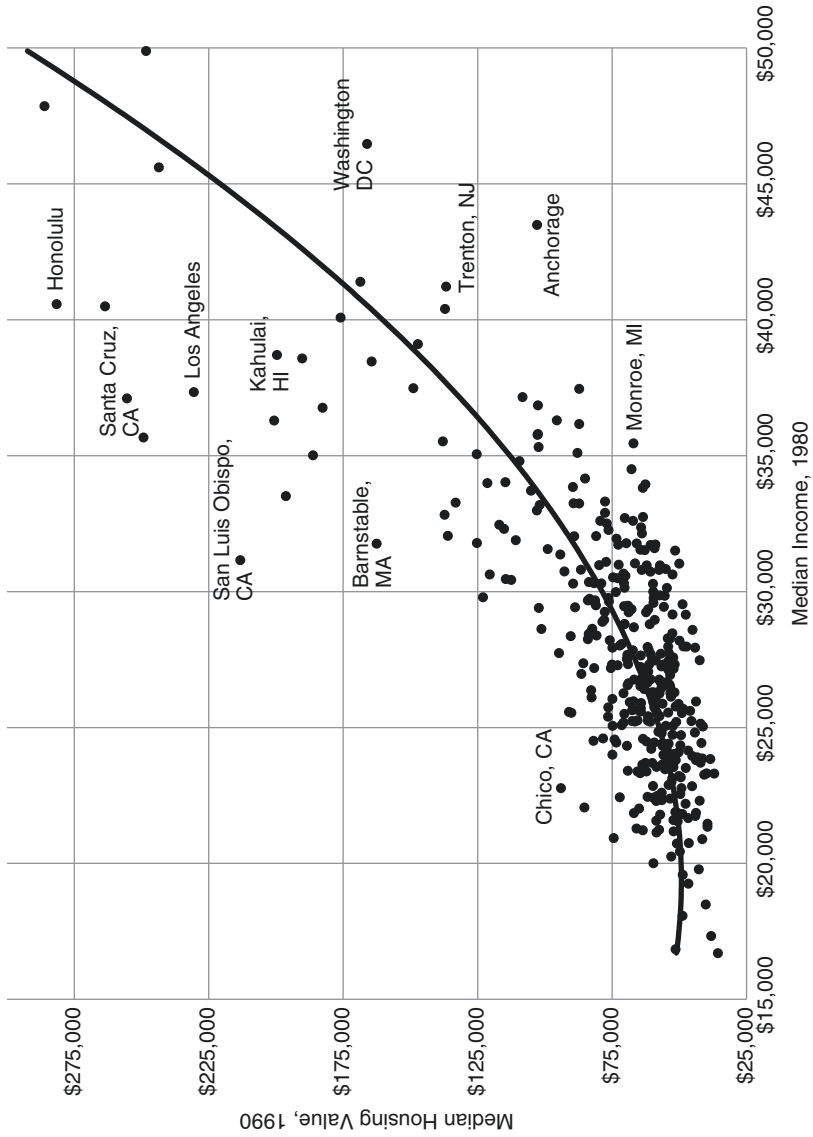
Fig. 7.5   Metros with high housing values relative to incomes—for example, Honolulu and San Luis Obispo, California—are believed to be rich in "overall" amenities

Girls (The Beach Boys) and Gurls (Katy Perry ft. Snoop Dogg), and California Love (Tupac ft. Dr. Dre)—that the Golden State is, indeed, a highly desirable, amenity-rich place to live. Sand, surf, mountains, wine country, and Hollywood ... what's not to like about California? These results are very much in line with the high-amenity regions identified by Edward Glaeser et al. (2001). Of the ten high-amenity metropolitan areas listed by Glaeser and colleagues, nine are located in California—and the other one is Honolulu.

In addition to the analysis conducted for metropolitan areas shown in Fig. 7.5, we also examined the relationship between statewide median household incomes and housing values to identify amenity-rich states. Here, we found the highest housing values relative to household incomes in Hawaii, California, and Rhode Island. Housing values are low compared to what would be predicted based on a state's incomes in Alaska, Michigan, and Indiana. The fact that California is among the top states for amenities should come as no surprise. The Golden State dominated the list of amenity-rich metropolitan areas, too. Hawaii's place in the top-ten states for amenities is no surprise either given its status as "paradise on earth" and popularity with tourists.

Figure 7.6 summarizes the effects of "overall" regional amenities, implied by the hedonic analysis, on the economic development of US metropolitan areas and states. The amenities variable is measured as the percentage difference between a region's actual housing value and its estimated housing value based on incomes in the region. As we found for most of the "specific" amenities examined when looking at metropolitan areas, we see that the measure of "overall" amenities has virtually no effect on the economic development of states. Not only are all of the bars unshaded, suggesting the impacts are not statistically significant, but they are very close to the zero axis—either slightly above or below.

The effects of amenities on state economic development (or lack thereof) should come as no real surprise, given that people need to live reasonably close to amenities in order to enjoy them. The large geographic area of most states means that desirable amenities in one part of the region are unlikely to have an impact on people located elsewhere. So we might not expect amenities to matter as much when measured at the state level. Diving a little bit deeper into our analysis of "overall" amenities and states, we find that the top three states for amenities—Hawaii, California, and Rhode Island—have economic development index values of about fifty or lower. It's also the case that, with the exception of North Dakota, five of
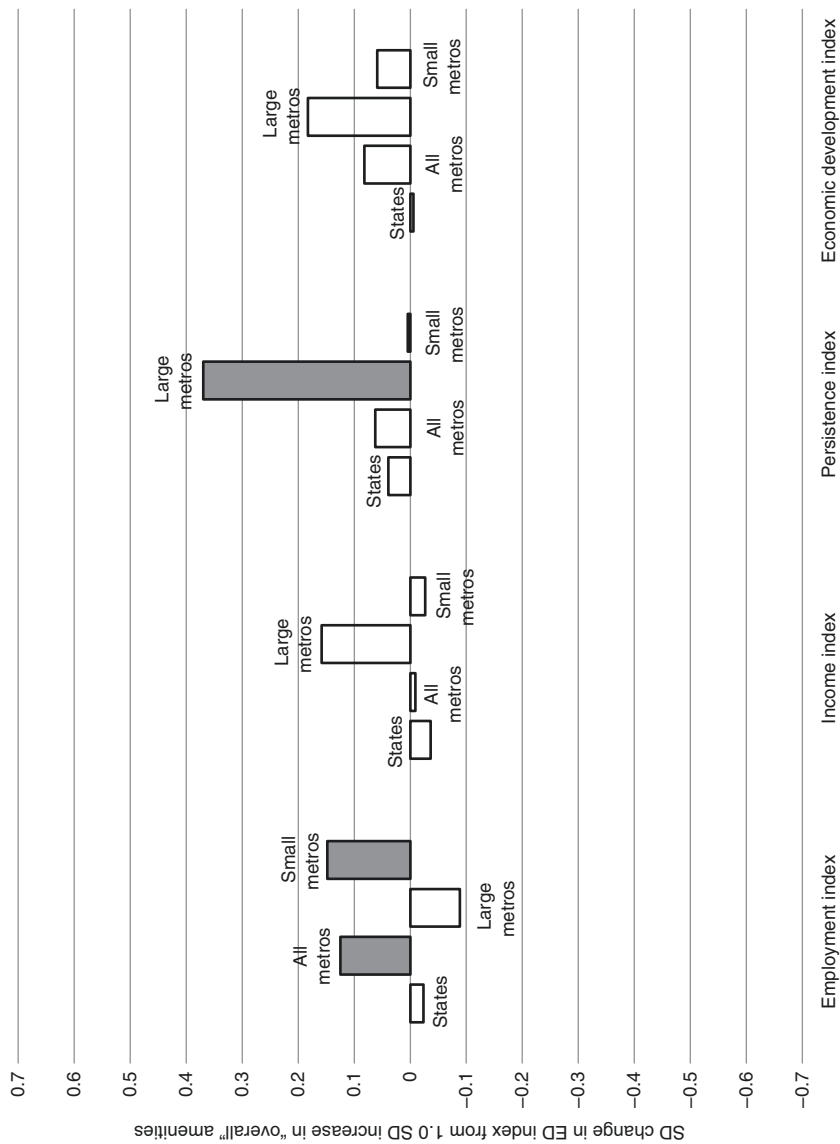
Fig. 7.6 "Overall" amenities don't have much of an impact on the economic development of US regions

the top six states for economic development have housing values that are lower than what is predicted based on their household incomes. In other words, most of the top states for economic development appear to be lacking in the amenity department. And in the case of North Dakota, its housing values are almost exactly what you would expect based on household incomes. This means that North Dakota is by no means a mecca for amenities—at least as they're implied by hedonic analysis.

Although many music artists (some noted above) have famously sung the virtues of California—a state believed to have desirable amenities—we see in Fig. 7.6 that the types of amenities that people are "willing to pay for" through the combination of high housing values and low incomes do not appear to be "good" for the economic development of states.

So much for California dreaming.

As it turns out, the measure of "overall" regional amenities does not have much of an effect on the economic development of metropolitan areas, either. The only statistically significant effects shown in Fig. 7.6 are positive impacts on the employment index (all metros, and those with fewer than one million people) and a positive relationship between the persistence of employment in large metropolitan areas and the measure of "overall" amenities. The results found for the employment index, shown in the left side of Fig. 7.6, are probably the most predictable. They can be interpreted to mean that having desirable amenities—as indicated by households' willingness to pay for them—is attractive to people and they lead to subsequent employment growth. This growth occurs, presumably, because people want to live near the amenities, even when they have to "pay" for them.

7.5   Amenities and the Pursuit of Economic Development

This chapter started with the simple premise that amenities are good for economic development. The logic supporting this claim is the idea that amenities, defined as regional characteristics that increase a location's desirability, are attractive to households and businesses looking for a place to settle down. The process of people and businesses moving into amenity-rich areas could, in turn, support the growth of good jobs. Or, so the theory goes.

Although the notion that local features such as nice weather, low crime, and lots of "fun things to do" might support economic development has strong intuitive appeal, past research on the topic provides mixed results about the impacts of amenities. One school of thought concerning amenities starts from the point of view that local housing and labor markets are not in balance and, thus, the willingness to pay for amenities is not already reflected in the value of homes and the wages earned in the local labor market. These disequilibrium models of amenities suggest that they can spur regional growth as households and businesses seek to locate around them. Another school of thought rests on the idea that local housing and labor markets are in equilibrium and, therefore, the premium that people place on amenities is already reflected in local housing values and incomes. If people have to pay for amenities through more expensive housing and lower wages, these pleasant local features are less likely to contribute to population and employment growth.

The main take away lesson from our analysis is that, with the exception of the positive effects of a pleasant climate (i.e., warm and dry) on regional economic development, the other amenity measures do not appear to support the growth of good jobs. Our findings that warm weather can impact economic development are not unexpected. In fact, when writing about the fortunes of US cities, Edward Glaeser (2011, p. 253) noted that, "Education is, after January temperature, the most reliable predictor of urban growth, especially among older cities." Finding that January temperatures has an impact on growth that is similar to the effect associated with college attainment places this climate-related amenity in good company, indeed.

The rest of the "specific" amenities that we considered had either no effect, or even a negative impact, on the economic development of US metros. First off, we found that violent crime rates—the sole disamenity considered—has no effect on the growth of good jobs. A possible explanation for this result is that, thankfully, violent crime rates are—in most places—not high enough to impact a sizable percentage of the population. The average violent crime rate across all US metropolitan areas (for which we had data) was less than 1,000 incidents per 100,000 residents, which translates into a less than 1 percent chance of falling victim to a violent crime.

Results pertaining to the industry specialization of businesses that provide "fun things to do" suggest that these types of establishments are actually associated with lower levels of economic development. These

result are mainly due to the negative effects of these types of businesses on the persistence of employment in a region. As noted earlier, places like Ocean City (New Jersey), Glens Falls (New York), and Myrtle Beach (South Carolina) are among the metropolitan areas with the largest shares of businesses in arts and recreation (and restaurants and bars), as well as the regions with the largest seasonal fluctuations in employment. So these areas that are popular with tourists do not provide jobs that last over time, which lowers their economic development index scores.

Our findings related to businesses providing "fun things to do" provide a nice contrast to what we learned about the impacts of pleasant weather on the economic development of US metropolitan areas. Whereas warm and dry conditions have large enough positive impacts on employment growth and persistence to more than offset their negative impacts on incomes, having a specialization in the types of businesses that we studied—for example, arts and recreation—does not provide a lift to employment conditions in the region. Pulling all of this together suggests that pleasant weather is a strong draw to households, and an expanding population contributes to employment growth that is not subject to a lot of ups and downs. On the other hand, having an abundance of fun things to do appears to be attractive mainly to tourists, as evidenced by the negative impacts of these types of businesses on employment persistence. But offering lots of fun activities, while important to tourists, does not attract enough households to have a positive impact on the employment growth of regions.

Our final look at the impacts of amenities on economic development borrowed insights from hedonic analysis, suggesting that we can use outcomes from regional housing and labor markets to figure out the local features that people are willing to pay to be around. Our study of housing values and median household incomes found that the most amenity-rich metros are places such as Honolulu and several metropolitan areas located in California. Unless you're a big fan of boredom and freezing temperatures and snow, it would be hard to argue with these results. With this information on "overall" amenities, we found that amenity-rich metros exhibited more robust employment conditions. So, once again (as was the case with pleasant weather), our analysis shows that amenities appear to affect the growth of regions primarily through an impact on households.

The analysis presented in this chapter, as well as the results and advice suggested in other studies on the topic, support the following principles for using amenities in the pursuit of economic development.

Principle 1: Amenities impact regions primarily through employment growth. The positive impacts of amenities, when we found them, were related to employment growth and (even) the persistence of employment (in the case of pleasant weather conditions). On the other hand, the amenity measures had no effect, or even a negative one, on the income index. Although high incomes are an important part of what it means for regions to have "good" jobs, when combined with low housing costs they are a sign—according to the theory of hedonic analysis—of a lack of amenities (or the presence of disamenities). So we would be hard pressed to expect amenities to have a positive effect on incomes in a region.

Principle 2: Pleasant weather is the most desirable amenity of all. Of all the amenities that we considered, the weather-related variables of warm temperatures and low precipitation had the strongest impacts, across the board, on the economic development of regions. The regional characteristics capturing "fun things to do"—on the other hand—appear to be important to tourists, but they do not provide a positive impact on (overall) economic development. In some respects, these results are not too surprising. People can enjoy nice weather 365 days a year, whereas most households take advantage of businesses providing "fun things to do" on an infrequent basis. Our results suggest that people will locate around the amenity of nice weather, and then presumably travel to places in search of "fun things to do."

Principle 3: Don't underestimate the value that people place on amenities. Our results were mixed for the effects of amenities on regional economic development, but this does not mean that they are not important to households. Our simple hedonic analysis revealed that some metropolitan areas had housing values that were substantially higher than what would be predicted based on incomes in the region. Places such as Honolulu and San Luis Obispo are clearly very desirable to households as evidenced by the high housing values, relative to incomes, that people are willing to bear. The fact that residents in these metros are willing to "pay" such a high price for amenities, in terms of very unaffordable housing, suggests that people place a very high premium on being around them.

NOTES

1. Many of these studies build off a framework proposed by Gerald Carlino and Edwin Mills (1987). Focusing on states (and using a structural vector autoregression approach), Mark Partridge and Dan Rickman (2003) find that

people are slightly more apt to follow jobs, but it really depends on the exact setting.

2. For example, Salinas, San Luis Obispo, San Francisco, and Santa Cruz are among the 15-coolest metros for July high temperatures; while Los Angeles and Oxnard are among the 30-warmest metros for January low temperatures. San Luis Obispo and San Francisco are ranked 31st and 35th in terms of warmest January low temperatures, suggesting that these places have some of the mildest year-round temperatures.

3. The climate variables—that is, January low temperature, July high temperature, and annual precipitation—are based on "30-year (1981 to 2010) normals" from the National Oceanic and Atmospheric Administration.

4. Violent crime rates are from Uniform Crime Reporting program of the U.S. Federal Bureau of Investigation.

5. Information on the share of arts and recreation establishments (as a percentage of all businesses) in 1990 is from *County Business Patterns* of the U.S. Census Bureau.

6. Information on the share of restaurants and bars (as a percentage of all businesses) in 1990 is from *County Business Patterns* of the U.S. Census Bureau.

7. Information on the share of book and music stores (as a percentage of all businesses) in 1990 is from *County Business Patterns* of the U.S. Census Bureau.

8. Information on housing values and median household incomes is from the U.S. Census Bureau.

9. San Luis Obispo is among the 15-coolest metros for July high temperatures, and this California metropolitan area is ranked 31st for warm January temperatures.

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New Products, Residents and Housing—and the Growth of Good US Jobs

8.1　You Cannot Listen to Hysteria on a Symphonium

Our world is constantly changing. Every day people are born, ideas are hatched, products are invented and brought to market, and homes and buildings are completed for our use. Sometimes new products replace the old (e.g., I heard an expert on the TV show *Pawn Stars* explain that the gramophone pretty much signaled the end of the symphonium), while other times new things add to the stock that is available for our consumption (e.g., when Def Leppard released the album *Hysteria* in 1987, the rock band did not remove *Pyromania*, which came out four years earlier, from its catalogue).

For most things, being new is synonymous with youth or only recently available. A "new" business has been in operation for only a short time, TV stations call a show "new" if it has never been broadcast, and radio stations tout a song as "new" during its first few weeks in heavy rotation. A new item can be totally different than what is currently available in the market, or simply an additional unit of an existing product or service. For example, a new restaurant could introduce a type of cuisine that no one around has ever tasted, or it could be an additional location of a hamburger joint that has outposts in every city and town across the United States. Likewise, a new product could be a novel invention that sets the stage for an entire industry, or it could be a slightly different style or design of a product that is practically ubiquitous.

Most relevant to our study of the economic development of states and US metropolitan areas, a region can be thought of as "new" or "old"

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along a variety of dimensions—for example, the demographics of its residents, where a region's businesses are situated along the product life-cycle of the goods and services they make, and the age of its buildings and structures. An area with lots of young residents, upstart businesses, and new residential construction exudes a positive energy that permeates the entire region. It could be any or all of these things—or even, "none of the above"—but it is hard to mistake the vibe that you feel in a place with new things happening.

The logic underlying a strategy of attracting and supporting new "stuff" to help the growth of good jobs is that economic agents—businesses, workers, and even products and services—typically grow faster (and spin off improvements in productivity and spillovers that benefit others) when they are young. Like the TV series that stays on the air for "one season too long," many things lose their edge and vibrancy with age.

A well-known theory about how new products and services contribute to economic growth and development is the idea of "creative destruction," as articulated by Joseph Schumpeter (1942) during the 1940s. He argued that a fundamental feature of capitalism is that the overall economy (and economies of regions) are pressured by constant forces of change. Churning occurs as new products and services are invented, which makes older ones less relevant and sometimes leads to their demise. Applied to regions, the theory of creative destruction means that the new innovations developed by entrepreneurs and businesses are important sources of economic growth, but this process also contributes to decline (either in the same region or elsewhere) when the ideas catch on in the market and overtake already existing products and services.

The product life-cycle theory, which is a staple in the fields of business marketing and management, provides some insights into how new products might impact economic development, and what happens as these products mature (Vernon 1966; Wells 1968). Applied to international trade, this theory suggests that goods evolve through several stages in their production and location. In the first stage right after a good is invented, production takes place in close proximity to where it was launched and rapid growth can occur if the item catches on in the market. In later stages, as a good matures and—if it maintains its share of the market—production becomes more standardized and it spreads to other regions (and countries).

This process of product maturation has important implications for regional economic development (Flynn 1994). Early stage production—that is,

immediately after a good is invented—relies more heavily on research and development, and the use of human capital. We learned in Chapter 4 that human capital—that is, education, creativity, and many types of skills used on the job—are good for the economic development of regions, especially large metropolitan areas. In later stages of a product's life-cycle, firms seek out regions with lower labor costs and, in some cases, production becomes more mechanized and requires less labor. These changes that occur along the product life-cycle suggest that regions specializing in mature goods and services may realize lower economic development benefits than regions with a greater abundance of new products.

A study by David Audretsch, Oliver Falck, Maryann Feldman and Stephan Heblich (2008) found that regions in Germany conform to a "spatial lifecycle" along the lines that are described above. They classified places along a variety of dimensions—e.g., a region's employment share in business services, the extent to which scientists and engineers work in small businesses, and the number of patents in an area—to segment regions according to whether they are "entrepreneurial" (i.e., early stages) or involved in "routinized activities" (i.e., later stages).

Research that I conducted shows that local industries made up of younger businesses (e.g., early stage life-cycle) had more new businesses begin operations than regions where the industry was comprised of older establishments (e.g., later stages) (Gabe 2003). Edward Glaeser et al. (1992) suggest that knowledge spillovers—one of the key benefits of industry specialization discussed in Chapter 3—might be more important to younger industry clusters. Taken together, the study by David Audretsch and colleagues, along with research suggesting that the benefits of clusters might diminish over time, suggests that regions are arranged at different points along the product life-cycle and this ordering impacts the growth of regions.

Indeed, new goods and services—which are often awarded patents by the US Patent and Trademark Office—have been found to raise the productivity of regions. A report by Jonathan Rothwell, José Lobo, Deborah Strumsky, and Mark Muro (2013) of the Brookings Institute provides a very extensive examination of the economic geography of patents, and the impacts of patenting on regional economic development. The research team's study of US metropolitan areas, using data over several decades (and as recent as 2010), shows that the number of patents awarded in a region increases productivity growth. This analysis controls

for other factors that are likely to contribute to productivity—things such as educational attainment and the types of industries present in the metropolitan area—to isolate the effect of patents. Jonathan Rothwell and colleagues uncovered an effect of patents on regional productivity that is slightly higher than the effect associated with educational attainment, which we found earlier to impact the economic development of US regions (especially large metropolitan areas).

In an extension to this analysis, the Brookings Institute study examined the effects of patent claims, a measure of the "quality" of patents registered in a region. Here, Jonathan Rothwell, José Lobo, Deborah Strumsky, and Mark Muro found that the number of claims to patents (in a metropolitan area) has a positive effect on productivity, and this impact is considerably larger than the effects ascribed to educational attainment and high-tech industry employment; once again, two regional characteristics that we found to enhance the growth of good jobs. These findings, along with a result that unemployment rates tend to be lower in places that are above-average for patents, suggest that we will find patents—that is, a measure of new inventions in a region—to be positively associated with the growth of good jobs.

Although these results could be viewed as great news in places that have a lot of patents—as well as a lot of "high quality" inventions—it appears that these regions are in the minority. Whereas many of the regional characteristics that we have studied—for example, textiles plants, businesses in arts and recreation, and high-tech industry employment—exhibit reasonably high levels of geographic concentration, the number of patents in a region takes this phenomenon to a whole new level. According to the Brookings Institute study, almost two-thirds of the patents they studied were generated by people in just 20 metropolitan areas—and these places accounted for only one-third of the US population. This is not to suggest that patents are a winner-takes-all proposition—that is, the "other" two-thirds of Americans are responsible for one-third of the patents—but certainly the scales are tipped in the favor of some places. Other research shows that patent citations also have strong patterns of geographic concentration—that is, you are more likely to find citations to existing patents coming from the same region than elsewhere (Jaffe et al. 1993). Taken together, these results show that patents and even their citations—which could, in theory, come from about anywhere—exhibit high levels of concentration.

8.2 New People and Buildings

We examine the "newness" of a region's residents along a couple of dimensions: the median age of its population and the percentage of people that recently moved into the area (in the years immediately before the period of analysis). Although most research on the topic suggests that new inventions (e.g., as represented by patents) are good for economic development, the impacts of new people—either young or recent newcomers—on a region are not so clear cut.

Issues related to the aging of the US population, and what the graying of the country means for the economy as a whole, have been examined from numerous angles (Cutler et al. 1990; Lumsdaine and Wise 1994). Economic challenges identified in macroeconomic (i.e., countrywide) studies on aging, which are likely to shape the economic fortunes of regions as well, are the lower labor force participation rates of older individuals—that is, they are more likely to be retired than working—and their lower fertility rates. These two factors contribute to an increase in the senior dependency ratio—that is, the number of retired people relative to the size of the workforce—and lower population growth rates. Given the close connection between population and employment growth, these two factors suggest that places with older residents are likely to grow slower than regions with more youngsters.

Along with the impacts of a state or metropolitan area's demographic profile on population (and employment) growth, the age of a region's workforce may also affect the performance of its businesses. In a study that I helped conduct with Mikaela Backman and Charlotta Mellander, we examined the effects of worker age—a proxy for experience—on the growth and survival of Swedish businesses (Backman et al. 2016). Our analysis revealed that the average age of an establishment's workers has a negative effect on its growth rate over time. In other words, companies made up of younger workers tended to grow faster (and were more likely to remain in operation) than businesses with older employees. This means that, not only does the age of a business—that is, the number of years it has been in operation—affect its growth (as we discussed in Chapter 5) but also the age of a company's workers impacts its performance.

Some of these negative impacts on the growth of regions, however, could be offset by higher demands for healthcare employment that come with an aging population. As we discussed at the beginning of Chapter 4,

employment in US hospitals rose by 34 percent between 1990 and 2014. This growth occurred alongside an increase in the median age of the US population from 32.8 years in 1990 to 37.4 years in 2014.[1] Using data from 2014, we find that older states typically have higher employment shares in healthcare and social assistance than younger regions. For example, older states such as Maine and West Virginia have over 20 percent of their workers in healthcare and social assistance jobs, compared to less than 15 percent of the workforce (in these jobs) in states with a younger median age such as Utah and Texas.[2]

Another potential bright spot from having an older population comes from studies showing that wages typically increase with a person's age. A widely used statistical approach for analyzing the factors that impact an individual's wage is a regression-based framework suggested by Jacob Mincer (1974). Two personal characteristics used in a "Mincerian" wage model are educational attainment—we saw in Chapter 4 that people with more years of schooling earn more money—and age (a proxy for the potential experience of workers). Empirical research using this method almost always shows a positive effect of age on earnings (although the effect is non-linear, so the impact of age reaches a peak and then falls). This means that older (i.e., more experienced) workers tend to make more money, which could contribute to a positive effect of a region's median age on per-capita income.[3]

Just like the impacts of population age on economic development could go either way, the effects associated with the percentage of newcomers in a region are not clear-cut. First off, having new people move into an area—if they are not balanced by an equal or greater number of existing residents moving out—can increase a region's population size, which often goes hand-in-hand with employment growth. So, it is probably a safe bet that we find a positive relationship between the employment index and our measure of new residents that recently moved into a region.

But what about these newcomers contributing to the growth of good jobs in a region? Here is where things get a little bit murkier.

Thinking back to our discussion of convergence and the "catch-up" effect in Chapter 1, you might recall that people are attracted to regions that offer the promise of high productivity and wages. This suggests, at first blush, that an influx of new people is probably a sign of a region's high productivity. If a region experiences an increase in population, however, the amount of capital to go around decreases and thus—according to the neoclassical regional growth model—a bunch of new workers without

a proportionate increase in business investment will actually lead to a reduction in wages. This means that an increase in the number of new residents—whereas it will likely result in employment growth—is not certain to enhance wages. It really depends on the actions of businesses and the amount of investment that occurs.

Perhaps the most outward sign of "newness" in a region is the sight of row after row of new residential housing. Without even knowing the exact city you are in, it is easy to find the new housing subdivisions that sprung up during the 1990s and 2000s. Simply take a drive around the city's perimeter highway—or, in some metropolitan areas, even further from the downtown—and take a look around. By its outward appearances, new housing might be perceived as beneficial to a region's economic development. Residential construction provides a boost to an area's employment (e.g., carpenters, painters, etc.) and new homes typically involve the purchases of major consumer goods such as appliances, furniture, and a big-screen TV for the den. So every new large housing development represents a lot of potential sales to retailers such as Best Buy, Ikea, and other furniture and appliance outlets.

Although the boost to the economy from purchases of new sofas and TVs is usually temporary—just like the lift from the construction employment itself—residential housing might have more lasting impacts through the nearby economic activity that it supports. When parts of a region are developed into new housing, the surrounding areas often become home to supermarkets, restaurants, shopping malls, and a variety of personal service providers. So, by its outward appearances and the additional economic activity that it supports, residential construction looks like it could lead to an expansion of good jobs—or, at least, employment growth—in a region.

But looks can be deceiving.

Describing the residential construction boom of the early 2000s and everything that went along with it—that is, new restaurants, retail stores, and an expansion of personal services—Richard Florida (2010) referred to the whole lot as a "great growth illusion"—or what a Texan might describe as "big hat, but no cattle." The great growth illusion, as described by Florida, is a slight of hand in which new housing and the development it spurs gives the appearance of growth (that is supported by a solid base coming from other sectors of the economy). If new housing and the retail stores, restaurants, and other services that go with it are, in fact, the outcome of growth occurring elsewhere in the local economy (e.g., manufacturing or other basic industries, high-tech businesses), then it is no

illusion. But if housing is growing as an industry in itself, then the growth (with no base to support it) can best be described as "smoke and mirrors."

To analyze the implications of this great growth illusion, Richard Florida and I examined the effects of housing development in the early 2000s on the severity of the Great Recession—which officially lasted from December of 2007 to June of 2009—in US metropolitan areas (Gabe and Florida 2013). We found that, although regions with greater percentages of their homes built during the early 2000s fared no better or worse economically than other metropolitan areas in the months leading up to the recession, these places that had experienced recent housing growth were more severely impacted by the recession.

In an extension to this analysis, we also looked at how the growth of a region's economy during the early 2000s—that is, whether or not residential construction appeared to have a solid base supported by other sectors—influenced the (adverse) impacts on unemployment associated with the Great Recession. Here, we found that the growth of construction occurring alongside a rapid expansion of retail and hospitality employment was a particularly bad combination for the impact of the Great Recession on a region's economy. On the other hand, construction growth occurring in concert with moderate growth of retail and hospitality jobs meant that the region fared about the same as other places during and immediately following the Great Recession.

8.3   Effects of New Goods and Services on Economic Development

Figure 8.1 shows the relationship between the economic development of US metropolitan areas and the number of patents (relative to a region's population size) in the years around 1990. The number of patents varies from year to year, so we use the average number of patents between 1990 and 1994, and divide this number by the metropolitan area's population. Also, since patents are somewhat rare in most places, the patent figures are reported per 100,000 people in the metropolitan area.

The top places for patents (relative to population size) are Midland (Michigan), Bay City (Michigan), Rochester (New York), Trenton (New Jersey), and San Jose.[4] All of these regions generated more than 100 patents per 100,000 people—that is, you can also think of these places as having more than one patent per 1,000 residents. Of course, if we were

simply examining the total number of patents—not adjusted for the size of place—the top regions (e.g., New York, Los Angeles, and Chicago) would read more like a list of the most populated US metropolitan areas. The top-twenty places for patents (per capita) around 1990 include a mixture of large (e.g., Minneapolis and San Jose) and small [e.g., Midland (Michigan) and Elmira (New York)] metropolitan areas, as well as places that are known for high technology (e.g., San Jose and Boulder) and manufacturing [e.g., Oshkosh (Wisconsin) and Rockland (Illinois)].

Although 15 regions generated more than 50 patents per 100,000 people, the vast majority of metropolitan areas had very low levels of patents relative to their population size. In fact, over 40 percent of US metros had fewer than ten patents per 100,000 residents, on average, between 1990 and 1994. This pattern of five metros having more than 100 patents per 100,000 people (and another ten metropolitan areas with between 50 and 100 patents per 100,000 people), while most areas have very few, means that the invention of new products and services exhibits very high geographic concentration. Likewise, as noted above, the study by Jonathan Rothwell, José Lobo, Deborah Strumsky, and Mark Muro found that a relatively small number of metropolitan areas account for a disproportionately large percentage of US patents.

The trend line in Fig. 8.1 is practically flat, suggesting that patents have no effect, one way or another, on the growth of good jobs in US metropolitan areas. Looking at the far-right side of the figure, we see that the top-five places for patents have economic development index values that range between 20 and 100—that is a wide variation in outcomes for these high-patenting locales. Another thing that jumps out at you is that several of the top places for economic development have very low numbers of patents (per capita). In fact, the metropolitan areas of The Villages (Florida), Odessa (Texas), and Midland (Texas), which all have economic development index values of one hundred, have patent rates of fewer than 20 per 100,000 people. Other very successful regions for economic development—places such as Jacksonville (North Carolina), Bismarck (North Dakota), and Casper (Wyoming)—also have patent rates near the bottom of the pack for all US metros.

The top states for patents (per 100,000 residents) include places such as Delaware, Connecticut, New Jersey, Massachusetts, and Minnesota.[5] Delaware has the largest number of patents per capita, despite not having any metropolitan areas that are counted among the top-twenty places for patents. States with the highest number of patents, adjusted for population
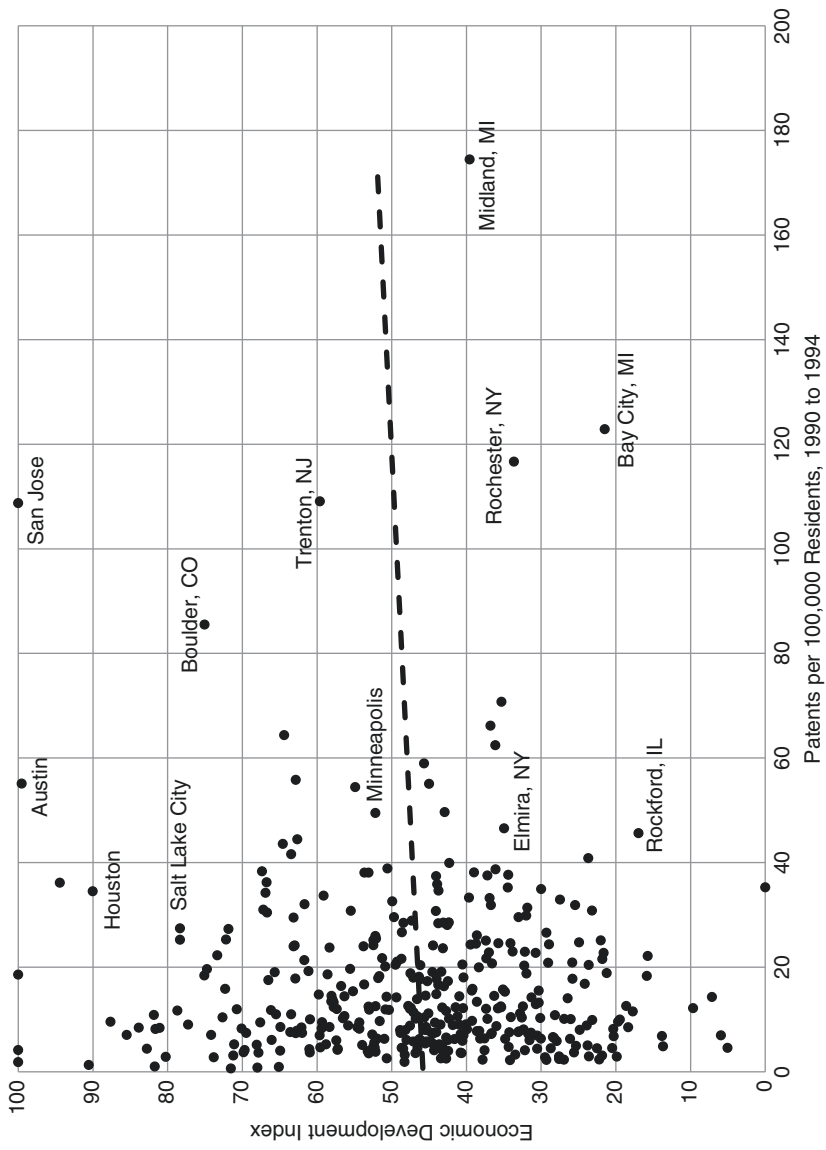
Fig. 8.1   The number of patents per capita has no effect on the economic development of US metropolitan areas

size, cover the west coast (California), the northeast (Connecticut, New Hampshire, and Massachusetts), and two states that annually battle it out (on the gridiron) for the Little Brown Jug (Michigan and Minnesota). It is interesting that, despite having four places among the top-twenty metropolitan areas for patents—Rochester, Ithaca, Elmira, and Albany—New York does not make the top-ten for states—it is ranked 11th for patents per capita. The performance of New York City, which generated 24 patents per 100,000 people (compared to over 100 patents per 100,000 people in Rochester) "pulled down" the statewide average (because New York City accounts for a sizable percentage of the state's population).

Figure 8.2 summarizes the effects of patents on regional economic development. In the right side of the figure, we see our previously discussed result that the amount of patents per capita does not have a statistically significant effect on the economic development of (all) metropolitan areas. As it turns out, the amount of patents per capita does not affect the economic development of states, either. The only effect that passes the threshold for statistical significance is the impact of patents on the income index of large metropolitan areas. This result suggests that new inventions—like we found earlier for human capital and technology-based businesses—work hand-in-hand with a large (and dense) population to increase the productivity of big cities.

But other than this result pertaining to the income index of large metropolitan areas, the number of patents per 100,000 residents has no effect—one way or another—on the growth, employment persistence or (overall) economic development of regions. What is going on?

A few things might explain these (lack of) results for patents. First, as noted above, the patent statistics covering the top few places for new inventions suggest that they generated only about one patent per 1,000 people. This means that, even in the regions with the largest intensity of new inventions, the awarding of patents are few and far between. The low frequency of patents stands in stark contrast to our analysis of human capital, in which the top places (e.g., Boulder and Ann Arbor, as discussed in Chapter 4) had over 40 percent of the workforce with a college degree. This means that, while patents rarely have a penetration of more than one per 1,000 people, college degrees are held by more than 400 out of 1,000 people in the places with the highest levels of human capital. It is possible, and even likely, that patents increase the output and/or productivity of the companies and individuals that hold them, but they are simply too scarce to lift the economic development of entire regions.
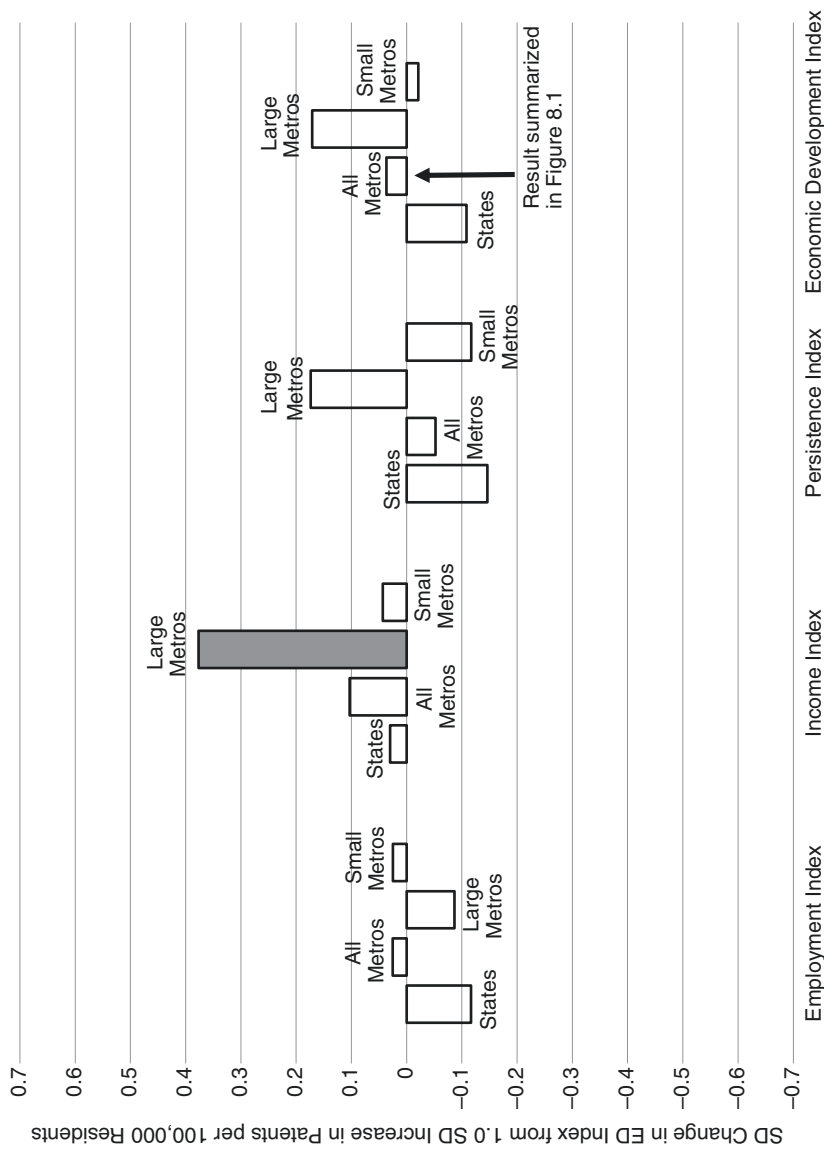
Fig. 8.2 Patents help the productivity (i.e., wages) of large US metropolitan areas

This explanation about the scarcity of patents is strangely similar to our explanation, from the previous chapter focusing on amenities, as to why violent crime rates had no effect—one way or another—on the economic development of US metropolitan areas. Of course, crime is a disamenity that people want to avoid and patents represent new inventions that ought to help the economic development of regions. But despite this obvious difference, violent crime and patents are similar in their scarceness—in fact, both are measured per 100,000 residents in a metro. Violent crime rates of 1,000 (which is above the average for the cities analyzed in Chapter 7) mean that one out of 100 residents was a victim of a violent crime (or, even fewer, as the same person could fall victim to a crime more than once). Patent rates of over 100 per 100,000 people (found in the top-five metropolitan areas for inventions) suggest that patents are even a rarer occurrence (than violent crimes).

Another explanation for our (lack of) results pertaining to patents is that their impacts on the companies and individuals that hold them might vary considerably, such that some new inventions result in a substantial bump to the growth of good jobs in a region while others have very little impact "outside the lab." Along the same lines, it is possible that the most successful patents provide benefits that go beyond the regions where they are registered (i.e., a company's headquarters or R&D facility) and provide economic development benefits to other places (e.g., where branch plants and production facilities are located). Under this scenario, it would be difficult to ascribe the economic development impacts of patents by examining the relationship between the growth of good jobs and where the new inventions were hatched.

8.4   Effects of New People and Buildings on Regional Economic Development

The first regional characteristic used to describe the "newness" of a region's population is its median age. Focusing on metropolitan areas, we find that the youngest US regions—places such as Hinesville (Georgia), Provo (Utah), Jacksonville (North Carolina), and Fairbanks (Alaska)—have median ages of less than 28-years old.[6] That is young! Although the 20 youngest US metropolitan areas have median ages that are below (or around) 30-years old, we need to look at places outside this group to really appreciate the abundance of youth in these areas. In

Sarasota, Florida, which is one of the oldest US metropolitan areas, the median age of its residents is 45-years old. This is about 20 years older than the median age of residents in Hinesville, Georgia. The places with the youngest median ages include a couple of college towns [e.g., Manhattan (Kansas) and College Station (Texas)] as well as several metropolitan areas in Texas—five of the twenty youngest metros are located in the Lone Star state. It is interesting that, with the exceptions of Hinesville and a couple of places in North Carolina (Jacksonville and Fayetteville), none of the 20 youngest metropolitan areas are located east of the Mississippi River.

Given these results for metropolitan areas, it is no surprise that Alaska, Utah, and Texas are among the top-ten states for the youngest median ages.[7] To follow the geographic patterns uncovered for metros, the youngest states—with the exceptions of Georgia and Louisiana—are located near the west coast or in the Southwestern United States. In fact, none of the top-ten states for the youngest populations are located in the Northeastern or Midwestern United States. Looking across all 50 states, the median age ranges from about 29 years in Alaska and Utah to about 37 years of age in Florida, Pennsylvania, and West Virginia. That is an almost eight-year spread in age between the youngest and oldest states. It might not sound like much, but eight years is long enough to create a mini "generation gap" among residents of different US regions.

Figure 8.3 summarizes the effects of having a young median age on regional economic development. Since a younger age corresponds with an "increase in youth," we "flipped" the sign of this regional characteristic so that a bar above the zero axis means that lower values for median age— that is, younger residents—are good for economic development. And this is pretty much what we found.

As one might expect, having a younger median age is positively associated with the employment growth of US metropolitan areas—both large and small—and states. This suggests that having a young population in 1990, which means that the area had a more youthful workforce over the period of analysis, is good for regional growth. The evidence pertaining to the effects of youth on other aspects of economic development are also generally positive. We find a positive relationship between the income index of metropolitan areas and having a young median age, although this effect appears to be driven mainly by regions with fewer than one million people. This suggests that having a young workforce (as of 1990) contributed to the productivity growth of small metros—presumably as
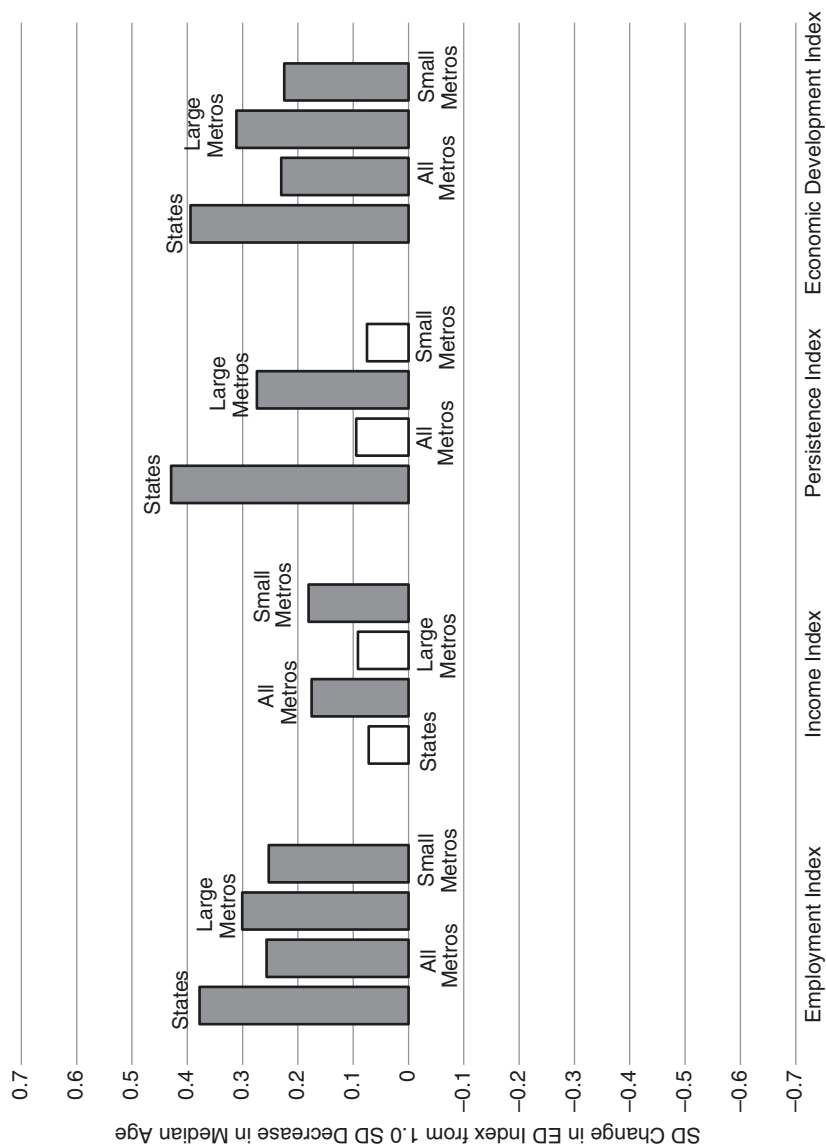
Fig. 8.3   Young residents help the economic development of US regions

people gained experience in their jobs. Likewise, having a young population is positively associated with the persistence of employment for states and large metropolitan areas. All things considered, we find a positive relationship between (overall) economic development and having a young median age in states and metropolitan areas.

Another way to look at the "newness" of a region's population is to consider the percentage of residents that recently moved into the area.[8] This is not a "net" migration figure, which also accounts for the individuals that moved out, but rather an indication of the share of a region's population that was recently—in our case, within the last five years—living somewhere else. The top US metropolitan areas for newcomers include places such as Hinesville (Georgia), Jacksonville (North Carolina), Lake Havasu (Arizona), and Las Vegas. Having several regions with large military bases (e.g., Hinesville, Jacksonville, and Killeen, Texas) along with a few college towns [(e.g., Manhattan (Kansas) and Lawton (Oklahoma)] among the top-twenty metropolitan areas for newcomers suggests that many of the places with the "newest" populations are dominated by state-anchored clusters, described previously as a large public entity (e.g., military base or university) and the businesses and other organizations that provide support to the cluster.

In our discussion of "Picking Winners" in Chapter 3, we explained that state-anchored clusters usually generate fewer external impacts, especially compared to the Marshallian clusters of small and locally owned businesses that are involved in the production of similar goods or services. Now we can add a rapid turnover of its surrounding population to the description of state-anchored clusters. In addition to the metropolitan areas with state-anchored clusters, other places with the highest shares of new residents tend to be retirement- and tourism-oriented destinations in the Southern United States (e.g., Orlando, Las Vegas, and Hilton Head Island).

Moving to an analysis of states, we find that Alaska and Hawaii, the nation's two newest additions, are among the top-ten regions for the highest percentages of newcomers, as are Nevada, Arizona, Florida, and New Hampshire.[9] This is the first time that both non-continental states are among the top-ten places for one of the regional characteristics. In Fig. 8.4, which summarizes the effects of newcomers on the economic development of regions, we see a positive relationship between the employment index—measured using data from 1990 to the near present—and the share of residents that moved into the region between
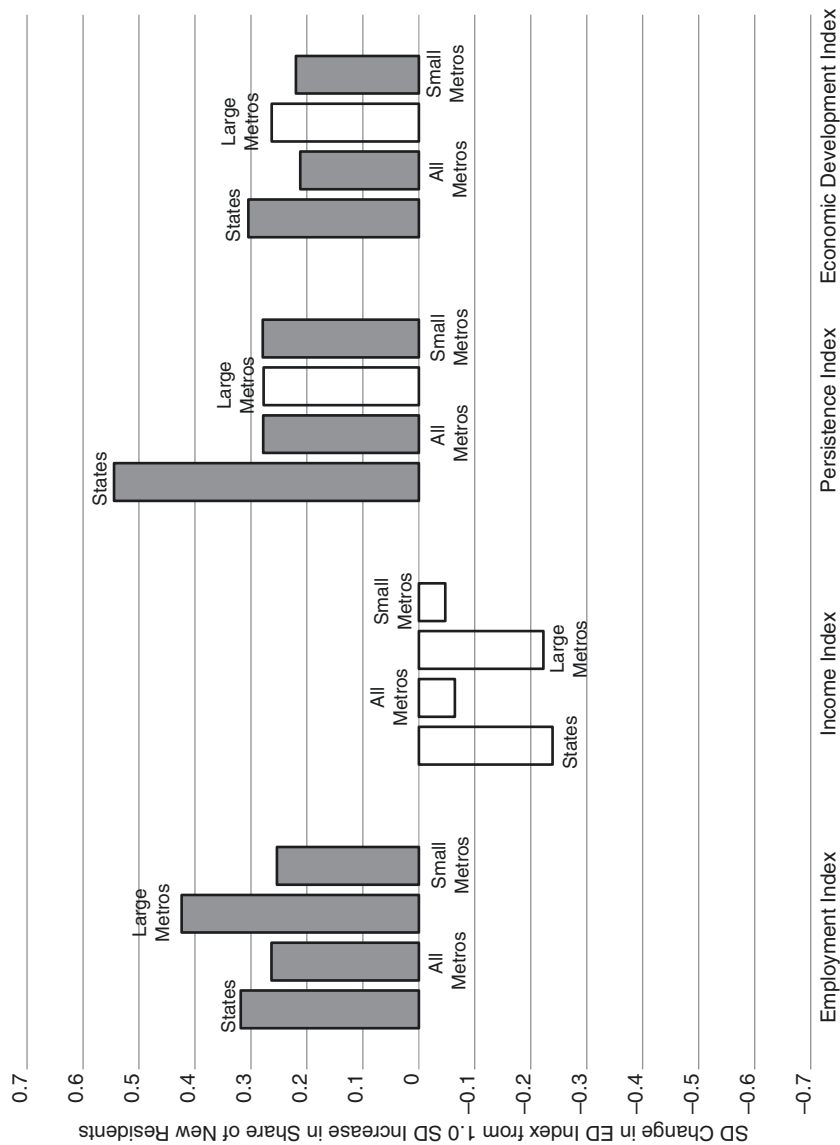
Fig. 8.4 Newcomers help the growth of US regions, but have no effect on productivity

1985 and 1990. Likewise, we find that the share of newcomers has a positive and statistically significant effect on the employment persistence of states and (small) metros. On the other hand, having a high share of new residents has no effect—one way or another—on the income index. This means that the positive effects of newcomers on (overall) economic development are due to their impacts on growth and the persistence of employment, but having a lot of new residents does not increase the productivity and wages of regions.

Our final measure of "newness" moves from people to their domiciles—that is, the percentage of a region's residential housing units that were built between 1985 and 1990.[10] The top-twenty metropolitan areas for the newest housing stocks, as of 1990, tend to be located in the Southern United States—for example, Florida (11 metros), Arizona (2 metros), and the Carolinas (2 metros). The top regions for new residential housing are a mixture of smaller—but growing—metropolitan areas [e.g., St. George (Utah), East Stroudsburg (Pennsylvania) and Sebring (Florida)], as well as some highly populated areas such as Atlanta, Orlando, and Las Vegas.

Similar to what we found for the distributions of the other measures of "newness," there is a wide range of values across regions for the share of new housing. At the high end of the range, there are places—for example, Naples (Florida), Las Vegas, and Riverside (California)—with upward of one in four homes built between 1985 and 1990. At the other end, there are metropolitan areas with less than one in 20 (or even fewer) homes that were new in 1990. It is interesting that Midland, Texas, despite its high ranking for economic development, had a relatively old housing stock—that is, less than 8 percent of Midland's homes were fewer than five years old in 1990.

The top states for new residential housing are Nevada, Arizona, and Georgia. With the exceptions of Nevada, Arizona and New Hampshire, all of the top-ten spots for new housing are located in the Southeastern and Mid-Atlantic regions.[11] The states with the least new construction (in terms of the homes built between 1985 and 1990) include Iowa, Wyoming, New York, Nebraska, and North Dakota. It is interesting that two of these states—North Dakota and Wyoming—are among the top states for overall economic development, despite the fact that they experienced very modest residential development in the years immediately leading up to 1990.

Figure 8.5 summarizes the effects of new housing on regional economic development. Here, we see that new housing development occurring between 1985 and 1990 contributed to employment growth in
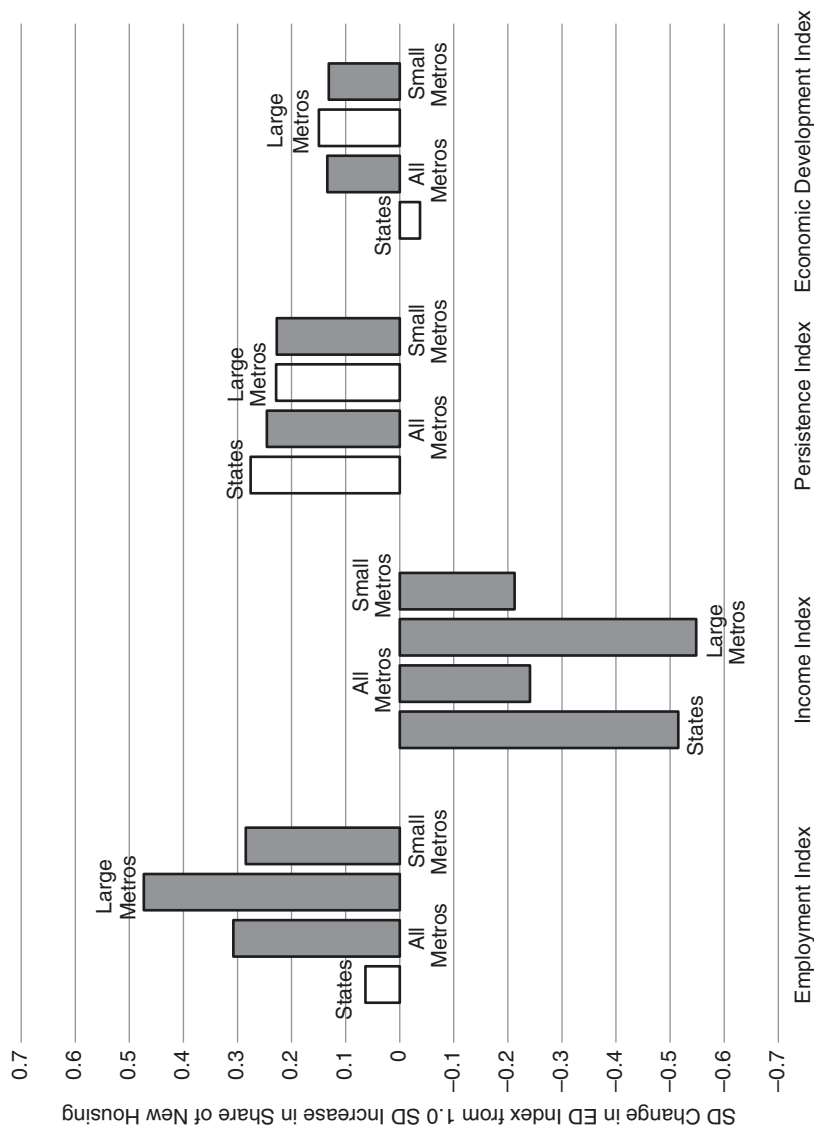
Fig. 8.5 New housing is a sign of growth, but not productivity, in US regions

future years; however, it is not matched with investments by businesses that raised (or even maintained) the productivity and wages of workers. Instead, there is a negative relationship between the income index of regions and the share of new housing. The positive effect of new housing on (overall) economic development is, therefore, almost entirely due to its impact on the growth and persistence (found in small metros) of employment.

The results summarized in Fig. 8.5—especially those pertaining to states and large metropolitan areas—are generally consistent with Richard Florida's ideas about the "great growth illusion" associated with residential housing development and everything that goes along with it (e.g., strip malls, chain restaurants, and various personal services). Regions with high shares of new residential housing exhibited signs of growth—that is, positive association with the employment index—yet the type of growth that occurred did not translate into high-paying jobs.

In some respects, our findings pertaining to the impacts of new residential housing on large metropolitan areas bring us full circle to the definition of economic development discussed way back in Chapter 1. We defined economic development as the growth of good jobs in a region, where "good" meant reasonably high-paying jobs that persisted over time. For metropolitan areas with one million or more people, the impacts of new housing register on only one part of the economic development equation—that is, the growth of jobs in a region. It is a good example of where employment growth, even when the impact is substantial (i.e., a one-standard deviation increase in the share of new housing is associated with close to a 0.5-standard deviation increase in the employment index of large metropolitan areas), does not necessarily equate to high-paying jobs.

8.5   NEW STUFF AND THE PURSUIT OF ECONOMIC DEVELOPMENT

This chapter began with the premise that new things—whether it is goods and services, people or housing—are good for the economic development of regions. The logic behind this idea is that many things tend to grow faster when they are new, and the transition from youth to maturity usually brings about improvements in productivity, too. We have proof of these impacts related to aging all around us. Hit songs and television shows pick up lots of new listeners and viewers shortly after they are

released. While established shows and songs might have large followings (and lots of fans), the growth in their popularity has leveled off. Professional football players, especially running backs, have very narrow windows of opportunity when they are at the top of their games. Even elite female tennis players can be thought of as reaching their primes before they can legally buy a drink.[12]

Do these same patterns apply to regions?

First off, our analysis of patents, used to represent new inventions (e.g., products and services) hatched in a region, does not support this idea that "new is better"—except in the case of the productivity of large metropolitan areas. In fact, we found that the number of patents per 100,000 residents had no effect whatsoever on the economic development of regions. Although the patents and inventions that they represent can have tremendously beneficial impacts on the companies where they are developed, the overall US economy and—in some cases—the entire world, these effects do not help the growth of good jobs in the regions where they are registered.

Next, we moved to an analysis of new people. Here, we considered the median age of a region's residents, as well as the percentage of people that are newcomers to the area. Focusing on age, the results show that young regions exhibited faster growth, and we also found positive effects of youth on the income and employment persistence indices. All of this suggests that having a young population, as of 1990, was good for the economic development of US regions from that time to the near present. With newcomers, we found that they are beneficial to the economic development of metropolitan areas—primarily because the share of new residents in an area is positively associated with the growth and persistence of employment. Newcomers, on the other hand, do not influence—one way or another—the types of investments made by businesses that impact a region's productivity and wages. The final type of "new stuff" that we considered was residential housing. Having a lot of new houses (as an "industry" in itself) may give the appearance of a strong regional economy, but—if housing growth is not supported by a strong base of activity in other sectors of the economy—it typically does not help the productivity of regions.

The analysis presented in this chapter, along with the results and advice suggested in other studies on the topic, support the following principles for leveraging "new stuff" in the pursuit of economic development.

Principle 1: There is a difference between young things that mature with age and a constant influx of new things. Having a young population (as of

1990) helped the growth and development of US regions from that time to the near present. This positive impact on economic development is the result of the high employment growth associated with youth, as well as an increase in productivity that comes along with a maturation of the labor force. On the other hand, a constant influx of new residents might lead to future growth, but it does not translate into higher productivity and wages.

Principle 2: The combination of hatching a lot of new goods and services, and having a large population is good for the productivity—but not growth—of US metropolitan areas. Although new inventions did not affect the (overall) economic development or even the growth of regions, our findings revealed a positive relationship between the income index and the intensity of patents (i.e., patents per 100,000 people) in large metropolitan areas. This phenomena, where the impact of a regional characteristic on income is more pronounced in metros with one million or more people, also occurred in the analysis of high-tech manufacturing facilities, and several measures related to education, creativity, and workforce skills. Collectively, these results suggest that the contributions of education and skills, technology, and (now we learn) new inventions are particularly beneficial to the productivity and wages of large metropolitan areas.

Principle 3: Implement policies that are "age appropriate" for a region. In earlier chapters on "Picking Winners" and "Human Capital," the principles that we suggested for economic development advised local officials to consider policies and initiatives that fit the industries and occupations that are present in a region. In this chapter, we recommend that policymakers pay attention to the "age" of a region as well. Knowing where a place is situated on the life-cycle of its businesses and industries, housing stock, and even its residents will help policymakers plan and implement initiatives that are "age appropriate" for the region.

Notes

1. Median age statistics are from the U.S. Census Bureau.
2. Information on the share of workers in healthcare and social assistance (as a percentage of total employment) is from *County Business Patterns* of the U.S. Census Bureau. State-level median age statistics are from the U.S. Census Bureau.
3. Since the effect of age on earnings is non-linear, at some point the impact of a region's median age on per-capita income might fall.

4. Information on the number of patents, in the years around 1990, comes from the U.S. Patent and Trademark Office.
5. These states are California, Colorado, Connecticut, Delaware, Idaho, Massachusetts, Michigan, Minnesota, New Hampshire, and New Jersey.
6. Median age statistics for 1990 are calculated using data from the U.S. Census Bureau.
7. These states are Alaska, California, Colorado, Georgia, Idaho, Louisiana, New Mexico, Texas, Utah, and Wyoming.
8. Information on the number of people who moved into a region (from a different state, between 1985 and 1990) is from the U.S. Census Bureau.
9. These states are Alaska, Arizona, Colorado, Delaware, Florida, Hawaii, Nevada, New Hampshire, Virginia, and Washington.
10. Information on the percentage of housing units, as of 1990, built between 1985 and 1990 is from the U.S. Census Bureau.
11. These states are Arizona, Delaware, Florida, Georgia, Nevada, New Hampshire, North Carolina, South Carolina, Tennessee, and Virginia.
12. Nate Silver (2012), in the book *The Signal and the Noise*, points to numerous cases (e.g., female tennis players, economics researchers) of an aging curve where people reach their primes at relatively young ages.

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Economic Development
in the United States

9.1　You Deserve a Prize

Congratulations! If you've made it to this point of the book, without just skipping to the end in hopes of finding some final words of wisdom, you have witnessed the results from well over 100 regional characteristics (recall that we considered a long list of industries in Chapter 3, and workforce skills in Chapter 4) that we examined for their impacts on the growth of good jobs. That's a lot of things that might affect the economic development of US regions. In this chapter, instead of introducing some new factors to the mix, we'll take another look at some of the regional characteristics that we considered earlier. And, this time, we'll use these characteristics to combine US regions—metros and then states—into groups that are similar along multiple dimensions. This will tell us about the broad "personality traits" of US regions, and how they affect the economic development of states and metropolitan areas.

　But let's start with a brief review. Fig. 9.1 shows the impacts of seven regional characteristics on the economic development of states and US metropolitan areas. These results provide a gentle reminder of some of the factors that we found to impact—and not to impact—the growth of good jobs. As fun as it would have been to revisit all of the regional characteristics that we examined earlier, doing so would have made this figure messier than a seventh-grader's bedroom. Instead, we picked just a single characteristic from each chapter (Chapters 2–8) to limit the clutter and provide a general idea of our past results. Seeing these characteristics

together also helps us judge their relative impacts on the growth of good jobs.

In Fig. 9.1, we are reminded that the keys to the growth of good jobs are human capital (represented by the share of workers in creative occupations) and (for metropolitan areas) technology. Other factors found to have positive impacts on the economic development of metropolitan areas, but not states, are low costs of doing business and a recent flurry of new residential construction. The results also show that amenities—in this case, represented by how much people are willing to the pay for them—have no impact on the economic development of US regions. On the other hand, the presence of large businesses and manufacturing industries (specifically, the primary metal sector) are negatively associated with the growth of good jobs.

Of course, this summary of our main results leaves out some important caveats and a lot of interesting back stories that provided additional context surrounding the regional characteristics that we studied. For example, recall that—in the case of manufacturing plants and large businesses—we found that an increase in their numbers (i.e., growth in manufacturing, or expansion in the percentage of large establishments) has a positive effect on the economic development of regions. The negative impacts shown in Fig. 9.1 are associated with the presence (not growth) of these types of businesses. That is, having a specialization in a manufacturing sector was typically a bad omen for the future growth and development of regions, as US manufacturing employment was severely impacted by the forces of technology change and global competition (Kletzer 2005; Acemoglu et al. 2016). Likewise, the results show that having a high percentage of large businesses, even after accounting for the industrial structure of regions, is associated with lower levels of economic development.

An interesting back story pertaining to amenities is that they might not impact economic development, as we defined it, yet they are highly valued by people living around them. In fact, the very high housing values relative to incomes in some areas—many of which have an abundance of amenities—are testament to the idea that people are willing to pay a lot (in the form of unaffordable housing) to live in amenity-rich regions. Because people have to pay for them, however, we're less likely to uncover strong impacts of amenities on the employment and income growth of US regions.

A caveat that we would have to offer for many of the regional characteristics—and it's so important that we show some additional results in Fig. 9.2—is that different features of regions affect "growth" and "development." Here, we summarize the impacts of the seven regional
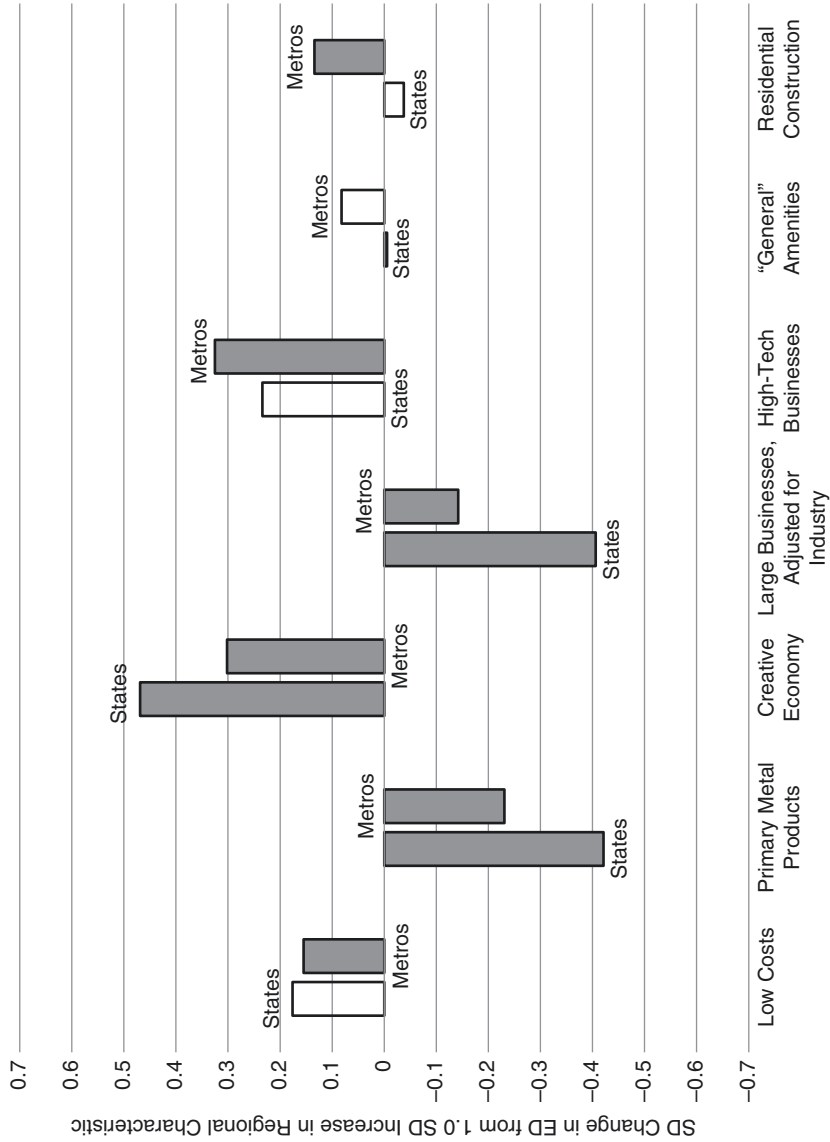
Fig. 9.1   The pursuit of economic development in states and US metropolitan areas
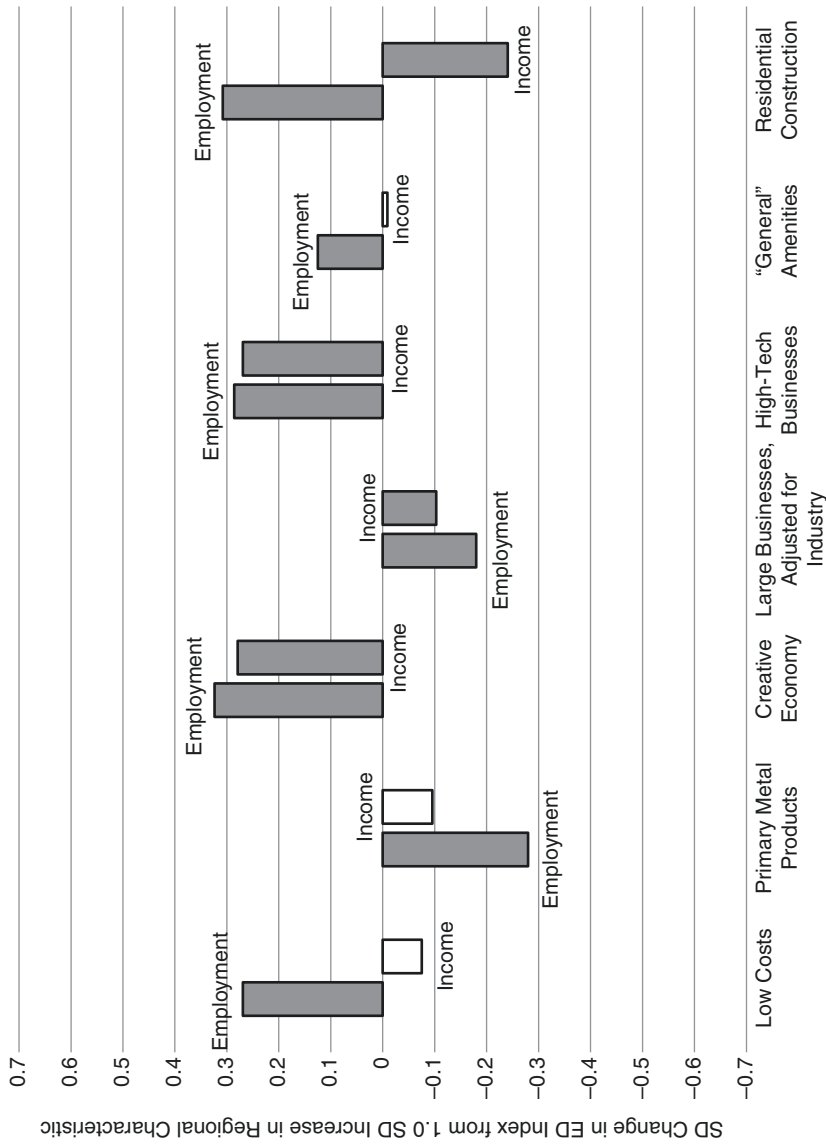
Fig. 9.2   The pursuit of growth (i.e., employment index) and development (i.e., income index) in US metropolitan areas

characteristics on the employment (i.e., growth) and income (i.e., development) indices of US metropolitan areas. Although we revisit these results for metros, many of the same patterns hold for states, too.

In the figure, we see that having low costs of doing business helps the (employment) growth of regions, but it has no effect on the income index. Recent new residential construction also contributes to employment growth, but this expansion does not translate into higher productivity and wages. Instead, the share of a metropolitan area's housing units constructed between 1985 and 1990 has a negative and statistically significant effect on the income index (measured from 1990 to the near present). A robust share of workers in creative occupations and a large percentage of high-tech businesses, however, increase the growth and development of US regions. These results of increasing employment (i.e., growth) and incomes (i.e., productivity) associated with human capital and technology are signs of regional divergence that we discussed way back in Chapter 1 of the book.

In fact, we motivated our interest in economic development by examining the forces of regional convergence and divergence. We learned in Chapter 1 that convergence occurred—for example, looking at US states between 1900 and 1990—as some regions experienced (population) growth while others saw increases in incomes. As these dual events played out, regions that started with lower incomes "caught up" to states that had been more affluent. Focusing on the economic development indicators related to (employment) growth and income, we also saw in Chapter 1 that the winds of convergence shifted to a new era of divergence around 1990. This occurred as some regions experienced growth (i.e., employment index) and development (i.e., income index), while other places performed worse according to both indicators. That is, some areas moved ahead of others and regional economic fortunes began to diverge.

An explanation for these patterns, offered up in Chapter 1, is that the market forces that led to convergence switched directions as the economy changed from an emphasis on manufacturing to a greater reliance on knowledge- and idea-based activities. So, in some respects, the results in Fig. 9.2—showing positive impacts of the creative economy and high-tech businesses on employment and income—bring us full circle to the discussion of divergence and why it's occurring. Regions in the United States, especially metropolitan areas, are diverging because factors like human capital (e.g., education, creativity, and skills) and technology make people

more productive, but they also have spillover effects that help others. These external impacts associated with human capital and technology contribute to a divergence of regions where some experience a growth of good jobs (e.g., employment and income), while others do not.

These results are in-line with the ideas about regional economic development proposed by Enrico Moretti (2012) and Richard Florida (2002). Moretti describes the economic advantages of innovation hubs, which are regions with high levels of technology and human capital. He describes a divergence of US regions as these innovation hubs outperform other places—a result similar to what is implied by Fig. 9.2. It's interesting that our findings related to creative workers and technology check off two of Richard Florida's "3Ts" (i.e., talent, technology, and tolerance) for regional economic development. In Florida's book titled *The Rise of the Creative Class*, he articulates a model of regional economic development where prosperity is attributed to a combination of talent and technology—which we show in Fig. 9.2—and tolerance (e.g., an openness to diversity).

9.2   The Personality Traits of US Regions

Our results that human capital and technology are good for economic development—along with the recognition that these characteristics are often attached at the hip—suggest that some regions are better described by a combination of attributes than by any individual feature. That is, a region's overall personality (and how it might impact the growth of good jobs) is made up of a combination of traits and not just a single defining characteristic.

To assemble US metropolitan areas into groups with similar traits, we use a cluster analysis approach and the seven regional characteristics shown in Figs. 9.1 and 9.2.[1] This method starts with all 381 metropolitan areas (that we have been studying) and then combines the two most similar regions—according to the seven characteristics—into a cluster.[2] So now, after the first iteration, we have one cluster of the two most closely related metropolitan areas and 379 metros that have not been grouped (yet). Next, the method combines the remaining two most similar metropolitan areas into a different cluster, or adds another metro to the original cluster. This method repeats itself over and over until the 381 metropolitan areas are whittled down to two clusters (that are typically not of equal size). You can "stop" the method before it reaches the final two clusters and, in our

case, we'll examine ten clusters that collectively account for all 381 metropolitan areas.

These clusters, which vary according to the number of metropolitan areas included, have unique personalities based on the seven regional characteristics. Of course, the exact metropolitan areas that fit into each of the ten clusters would be different if we had used other regional characteristics to join them. For example, if we had used January temperature as one of the variables, we would have likely ended up with a cluster that is made up of mostly warm weather (and, perhaps, a different cluster of cold weather) regions. The seven characteristics used to form the groups, however, offer a reasonably diverse set of features that help determine the ten distinct clusters.

One of the ten clusters is comprised of metropolitan areas with relatively large shares of workers in creative occupations and an abundance of high-tech businesses. This group of metros—which includes Boston, Raleigh and San Jose—is also characterized by the third-highest business costs (among the ten clusters considered). This high-creativity and tech-based cluster has the highest scores for all four of the economic development indicators—suggesting, once again, that regions with an abundance of human capital and technology achieved the trifecta of high growth, productivity, and strong persistence of employment. The combinations of employment and income growth are consistent with the patterns of divergence (i.e., "the rich getting richer") that we've discussed throughout the book. And, don't forget, that all of this happened despite these metropolitan areas having among the highest costs of doing business.

At the other end of the cost spectrum is a different cluster of US metropolitan areas characterized by the lowest costs of doing business. This cluster also has the third-highest (out of the ten clusters) share of "new" residential housing and is above average for amenities. So we could describe this cluster—which includes regions such as Asheville (North Carolina), Las Vegas, and Chattanooga (Tennessee)—as having residential growth fueled by low costs and a good quality of life. It's interesting that this cluster has the fifth-highest value of the employment index, but it has the second-lowest score for the income index. The metropolitan areas with low costs of doing business and an expansion of "new" residential housing experienced moderate (employment) growth, but these regional traits did not translate into a growth of good jobs.

The third-highest performing cluster according to the employment index is a group of metropolitan areas with the highest percentage of new residential housing and the second-highest score for amenities. This cluster—which includes metropolitan areas such as Myrtle Beach (South Carolina), Prescott (Arizona), and St. George (Utah)—also has the lowest share of large businesses (adjusted for industry structure) and the third-lowest percentage of workers in creative occupations. The group of metropolitan areas has desirable amenities and robust residential growth—similar to the previously mentioned cluster with the lowest costs of doing business—but this one has business costs that places it among the middle of the pack relative to all ten clusters. This cluster with substantial new housing—and the third-highest value of the employment index—is dead last according to the income index. Once again, a collection of "growing" metros, but this expansion does not necessarily result in good jobs.

The cluster with the lowest value of the employment index is characterized by the worst performance according to the amenities measure and share of new residential housing, and the lowest value for the percentage of high-technology businesses. This cluster—which includes Flint (Michigan), Kokomo (Indiana), and Springfield (Ohio) —also has the third-highest specialization in primary metal manufacturing. A different cluster with the highest specialization in primary metal manufacturing (and low shares of creative workers and new housing)—which includes the metros of Canton (Ohio), Erie (Pennsylvania), and Owensboro (Kentucky)—has the second-lowest value of the employment index.

Overall, the results of the cluster analysis are consistent with many of the findings reported throughout the book, and point to very different paths of growth and development for US metropolitan areas. A few groups of regions—characterized by low costs, reasonably high amenities, and recent residential development—exhibited strong performance in terms of the employment index, but these types of clusters had relatively low values according to the income index. These are classic examples of places with "growth" but not "development." The regions that grew and developed, on the other hand, had a one-two combination of high shares of creative workers and technology-based businesses. These metropolitan areas were able to diverge away from the others despite having relatively high costs of doing business. The types of metropolitan areas with the greatest challenges to growth and development are those that started with the highest

specializations in manufacturing. Even when paired with low costs of doing business, the regions with high manufacturing activity had among the lowest scores for the economic development indicators.

9.3   CLUSTERS OF STATES WITH SIMILAR TRAITS

Now let's move to a cluster analysis of states, where we'll use the seven regional characteristics shown in Figs. 9.1 and 9.2—just like we did for metros—to join states into groups with similar personality traits. The descriptions and accounts presented below are based on five state-level clusters, which is fewer than the ten examined for metropolitan areas; but keep in mind that there are over seven times more US metros than states.

Similar to what happened with the metropolitan areas, the cluster analysis organized the states into a group of regions with high marks for human capital (i.e., share of workers in creative occupations) and technology; and a different group of states that is characterized by specializations in manufacturing (i.e., primary metal manufacturing) and relatively low amenities. The other clusters include a group of states with inexpensive business costs, a dearth of large businesses, sub-par amenities, and very low residential construction; and a different cluster of states that ranks low for human capital and technology, but is a relatively strong performer for amenities and recent residential growth.

The fact that we have clusters of metropolitan areas and states with roughly the same personality traits—for example, state and metro clusters characterized by an abundance of human capital and technology; and groups of states and metropolitan areas that specialize in manufacturing—makes it more convenient for us to compare the state- and metro-level clusters in terms of their performance according to the economic development indicators. As it turns out, some of the regional personality traits that define the clusters have similar economic development outcomes for states and metropolitan areas, while other traits do not.

Let's start with the traits where the performance of the state- and metro-level clusters is nearly the same. This one's easy. The cluster of states—which includes Indiana, Michigan, and Ohio—with the highest specializations in primary metal manufacturing, and relatively low amenities and new residential construction has the lowest values of the

employment index, the persistence of employment, and the (overall) economic development index. Just like we found for metropolitan areas [e.g., the cluster that included Gadsden (Alabama), Michigan City (Indiana), and Wheeling (West Virginia)], states characterized as "high-manufacturing and low-amenity" regions performed the worst in terms of economic development.

In the analysis of states, however, the worst-performing cluster according to the income index is not the previously mentioned manufacturing-oriented cluster (it ranks second from the bottom out of the five state clusters), but it is a different group of states with the second-highest shares of new residential construction. This cluster—which includes states such as Alabama, Georgia, Nevada, and Tennessee—is characterized by its high rate of new housing construction (in the years leading up to the period of analysis), a high percentage of large businesses and the lowest percentages of creative workers. This means that a combination of low human capital, even when paired with a recent flurry of new residential construction, is not a recipe for the types of investments that raise productivity and incomes.

Although we find that—in the analysis of states—a lack of human capital goes hand-in-hand with low productivity (as is the case for the previously described cluster that includes Alabama, Georgia, and others), this does not mean that the highest-ranking cluster for human capital (and high technology) is the top-performing group of states according to the economic development indicators. Of course, this result—that the cluster known for human capital and technology (e.g., the group that includes Boston, Raleigh and San Jose) has the highest scores for economic development—was an important theme uncovered in the analysis of US metropolitan areas. But, for states, the cluster with the distinction of having the "most" human capital and technology—which includes places such as Connecticut, Massachusetts, and New York—has the highest value of the income index, and is in the middle of the pack in terms of the other measures of economic development.

This result for states—that is, the cluster with Connecticut and Massachusetts is not the top-rated one for economic development, despite it having the highest levels of human capital and technology—is quite different than what was uncovered in the cluster analysis of metropolitan areas. The general themes we found, however, are in-line with other results presented throughout the book. That is, we have consistently found that regional characteristics such as an abundance of educated

workers and high-technology businesses have some (positive) impacts on the economic development of states, but the results have been less-than overwhelming. These same regional characteristics, on the other hand, have consistently had the largest positive impacts on the economic development of metropolitan areas. An explanation for these differences in the factors impacting the economic development of states and metros, which we've found in several different settings throughout the book, is that the benefits of college attainment and high technology (and even patents) are due, at least in part, to the externalities that they generate. And these externalities—whether they're from human capital, technology, or the inventions of new products and services—are more likely to operate in and around cities.

The top-two groups of states according to the economic development indicators have different personality traits, and neither of them look very much like the human capital and technology-based cluster that topped the list of economic development in the analysis of metropolitan areas. The second-ranked cluster of states for overall economic development is characterized by average amenities, human capital that is above the average, and a high share of new residential construction. This cluster—which includes states such as Alaska, Texas, and Utah— has another common theme (not identified in the cluster analysis) of substantial energy resources (in the case of Texas and Alaska) that no doubt helped support the growth of good jobs in these places. The highest-ranked group of states for overall economic development is characterized by the lowest costs of doing business (among the five clusters), as well as the lowest shares of large businesses, high-tech businesses, and new residential construction. This cluster—which includes states such as the Dakotas, Wyoming, and Montana—exhibited strong performance in the growth of good jobs despite a lack of human capital and technology-based companies, and relatively scant new residential construction in the years leading up to the period of analysis.

9.4   Turning a Region's Economy on a Dime

The analysis presented throughout the book shows that there's no automatic path to the growth of good jobs—in other words, we found a wide range of economic development outcomes even for, say, metropolitan areas that are among the leaders for human capital and/or technology.

That said, the keys to a more vibrant regional economy (especially in the analysis of metropolitan areas) are reasonably clear. Now that we know what's important to the economic development of US regions, can we do anything about it? Put another way, how difficult is it for places to increase their relative standings according to some of the regional characteristics found to help the growth of good jobs?

For metropolitan areas, the goal is to increase a region's stock of human capital and technology. But, for places that are starting from the position of a deficit in these regional characteristics, this is a steep hill to climb. The explanations presented throughout the book about the impacts of human capital and technology have referred to the "reinforcing" nature of these attributes. This means that places with an abundance of educated (and creative and skilled) workers and technology-based companies are more attractive to similar workers and businesses in the future. This leads to a divergence of high-human capital workers and technology-based businesses.

Research by Christopher Berry and Edward Glaeser (2005) shows evidence of this type of divergence happening over recent decades. Focusing on US metropolitan areas, they found that the share of adults with at least a four-year college degree in 1990 had a positive effect on the change in the percentage of college-educated adults between 1990 and 2000. In other words, educated workers were attracted to places that started out with higher levels of human capital. An extension to this analysis compared patterns of convergence (or divergence) during the 1970s, 1980s, and 1990s. Results for the 1970s showed evidence of regional convergence, similar to the results (looking at economic outcomes between 1900 and 1990) that we discussed in Chapter 1. Recall that, for economic activities (e.g., manufacturing) characterized by decreasing marginal returns, regions that start behind the leaders are more attractive to future investments. This means that capital scarce and low-wage regions tend to grow faster in a manufacturing-based economy.

We explained in Chapter 1 how the winds of convergence changed directions around 1990 and ushered in a new pattern of regional divergence. An example of this changing of the guard is that, around 1990, the share of creative workers in the United States surpassed the percentage employed in "working class" occupations (Florida 2002). Now, we come full circle with the research by Christopher Berry and Edward Glaeser (2005, p. 433) that shows: "In the 1970s, poorer metropolitan areas were getting richer relative to richer metropolitan areas. In the 1990s, richer areas got richer relative to poorer areas."

An explanation for these changing patterns that we came up with in Chapter 1 was that market forces switched from convergence to divergence. This did not occur because traditional manufacturing activities all of the sudden began to generate increasing returns to scale, but it happened because the most important type of capital in the US economy switched from physical to human capital. In fact, analysis of employment data from 1990 to 2014 shows that the catch-up effect, consistent with decreasing marginal returns, is still at work in the manufacturing sector. For example, we found a negative relationship between the growth of manufacturing employment from 1990 to 2014 and its initial share of total regional employment in 1990.[3] That is, metropolitan areas that started with lower shares of manufacturing employment had higher (manufacturing) growth than other regions. Back in the day when manufacturing accounted for a larger percentage of the nation's total employment, these forces of convergence were potent enough to shape the relative fortunes of US regions. In today's economy, the patterns of convergence in traditional manufacturing are overshadowed by the strong tendencies of human capital- and technology-based activities becoming more geographically concentrated over time.

9.5   The Final Four

To conclude our study of the economic development of states and US metropolitan areas, we'll discuss four new principles that are based on the analysis from this chapter and the rest of the book. This brings the total to 25 principles that economic development officials should consult in the pursuit of good jobs.

Principle 1: The factors important to economic development differ between states and metros, and even among different-sized metropolitan areas. This idea that different regional characteristics affect the economic development of states and metropolitan areas has been a constant theme throughout the book—as well as in this chapter's analysis of metro- and state-level clusters of regions with similar personality traits. We found this result for characteristics such as college attainment, many of the workforce skills considered in Chapter 3, technology-based businesses, patents, and even the presence of amenities. The most common explanation for these occurrences (i.e., when a regional characteristic impacts metropolitan areas, but not states) is that the mechanism by which the attribute helps economic development does not "factor up" to the large scale of a state.

For example, human capital externalities don't reach across entire states and the impacts of amenities don't stretch that far, either.[4]

The differences between the characteristics important to the economic development of states and metropolitan areas also extend to differences in the regional attributes that impact the growth of good jobs in large and small metros. That is, the positive impacts of educational attainment, high technology, and patents are more pronounced in larger places, whereas regional characteristics such as a high specialization of air and water transportation businesses (and occupational categories of sales, education and construction) are more beneficial to the economic development of smaller metropolitan areas. Although our analysis focused on states and metros, and did not look at rural places, it's likely that the factors important to the economic development of nonmetropolitan areas might be different altogether. Given the differences that we've found across states and metropolitan areas—and between large and small metros—it would be difficult to speculate about the regional characteristics that encourage the economic development of rural areas.

Principle 2: Growth and economic development are not one in the same. At the beginning of the book, when discussing the definition of economic development, we explained that growth is a necessary ingredient for economic development. That is, in order to have an increase in good jobs, we need to have growth in the number of jobs. But we noted then, and will repeat it now, that an expansion of employment—even rapid growth—does not always translate into an increase in economic development.

We've witnessed numerous examples throughout the book of regional characteristics that have positive impacts on the employment index, but not the income index (or economic development index). This general idea came up again in this chapter—for example, low costs of doing business help employment growth, but not income (see Fig. 9.2)—and it was prominent in our discussion of the metropolitan area clusters. For instance, the group of metropolitan areas characterized by the lowest costs of doing business, recent housing construction, and nice amenities is a great example of a case where growth occurred without contributing to an increase in (overall) economic development.

Places with high growth rates of employment, even if incomes stay about the same, have all the trappings of a thriving regional economy—for example, lots of "help-wanted" postings, as well as the usual signs of residential and commercial construction. This type of growth provides ample opportunities for state and local officials to proclaim success

through various sorts of "ribbon-cutting ceremonies," and these regions may even fare well on lists of the top places for business. After all, a primary objective of many policymakers is to provide "jobs, jobs and more jobs" (Courant 1994).

Although some growing areas do not meet the additional (high) standards set for achieving economic development (i.e., income growth and employment persistence), these regions still may provide important benefits to their residents. For example, as noted in Chapter 1, job growth is especially welcome in regions with high levels of unemployment. Another thing to consider when thinking about high-growth regions—especially those that are blessed with amenities—is that, despite our finding that these places do not always experience substantial income growth, some residents are being compensated by sunshine (and other things they enjoy). That is, according to the hedonic method for evaluating amenities, "nice things" can be thought of as a substitute for high wages. This means that some people—that is, those with strong preferences for amenities— will happily live in amenity-rich areas despite earning low wages. So a combination of employment growth along with an abundance of pleasant amenities provides a mix that is as desirable to some people as places with higher incomes and fewer amenities.

Principle 3: Regions that are growing and developing are pulling away from the pack. Economic activities that are subject to decreasing marginal returns (e.g., traditional manufacturing) have a natural tendency toward convergence in that less well-off regions grow faster than more affluent and established areas. Such a catch-up process does not take place with knowledge- and information-based activities, where some regions are attractive to employment and income growth. Instead of convergence, these areas— even despite their high initial levels of productivity and wages—continue to grow and develop in what can best be described as "the rich getting richer."

The regional characteristics found to help the growth of employment and income generally fall under the categories of human capital and technology. Over the past quarter of a decade or so, the steep decline of US manufacturing and emergence of knowledge-based services and innovative activities have provided a "leg-up" to regions that are highly endowed in human capital and technology-based businesses. Many of these regions, especially in the analysis of large metropolitan areas, are among the top performers for economic development.

Principle 4: Economic development is difficult to achieve. The analysis presented throughout the book provides a roadmap to follow in the

pursuit of economic development—especially for metropolitan areas. That is, start with a foundation of high-human capital workers and technology-based businesses. I am pretty sure that mostly every economic development professional, and state and local official would gladly oversee this type of region. The problem is that it's hard to build such a place from scratch. The difficulty arises because the presence of these workers and businesses, in themselves, are attractive to others. This makes it hard for regions to play catch-up.

Back when the US economy had a greater emphasis on manufacturing, less well-off regions had a natural advantage in attracting new investments (through the process of convergence). Now, these disadvantaged regions face long odds in landing knowledge- and technology-based workers and businesses. Another challenge faced in the pursuit of economic development is that some regions, even those with the "right mix" of regional characteristics, under-perform compared to similarly endowed places. In what was a common finding throughout the book, we often noted the wide range of economic development outcomes for the highest-ranked places according to the regional characteristics considered. For example, we found that—even in our analysis of high-tech businesses and the share of the workforce with a college degree—the top-ten metropolitan areas had economic development index values that varied widely.

This combination that it's hard to attract human capital workers and technology-based businesses (unless you already have them), and that there's no guarantee of these regional characteristics supporting the growth of good jobs, makes the pursuit of economic development very challenging, indeed.

Notes

1. The term cluster analysis, as it's used in this chapter, describes a statistical-based approach to combine similar elements—on our case, metropolitan areas and states—into groups. In Chapter 3, the term cluster was used to describe the geographic concentration of businesses in similar or related industries.
2. For more information on the cluster analysis technique, which used a hierarchical method proposed by Joe Ward (1963), see the study by Todd Gabe et al. (2012).

3. This analysis is based on metro-level manufacturing employment data from the U.S. Bureau of Economic Analysis.
4. For example, a study by Stuart Rosenthal and William Strange (2008) shows a steep drop-off in the impacts of human capital spillovers as distance increases.

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