

Smart Growth: Education, Skilled Workers, & the Future of Cold-Weather Cities

By **Edward L. Glaeser**, Harvard University

The overall share of Americans living in cities with more than 500,000 inhabitants fell in every decade between 1950 and 1990, until finally rising in the 1990s. But the renaissance has been uneven.

Cities such as St. Louis, Pittsburgh, and Buffalo saw population continue to decline through the 1980s and 1990s. In contrast, while Boston's population fell each decade between 1950 and 1980, it has risen for two decades, from a low of 563,000 people in 1980 to 589,000 in 2000.

What distinguishes places like Boston that have stemmed their population decline? In a word: education.

The residents of faster-growing cities are better educated than their counterparts in struggling urban areas. The benefits of education are even stronger for entire regions. Education, moreover, is particularly important for cities and regions that have cold winters.

This finding suggests that strategies that increase the level of local human capital are likely to produce economic growth. Attracting growing numbers of high-skilled workers requires that government provide high-quality

public schools, safe streets and neighborhoods, and reasonably priced housing in cost-effective and equitable ways.

The Role of Weather

Cold-weather areas such as Boston face steep obstacles to growth. Cities with average January temperatures under 30 degrees Fahrenheit grew in population only one-third as quickly from 1960 to 1990 as did cities with average January temperatures above 50 degrees. The shift of population toward the Sun Belt can also be seen at the state level: while population in the colder 25 states grew 95 percent between 1920 and 1980, the warmer 25 states saw their average population grow 309 percent (see Figure 1).¹

Seen over the long term, the invention of air conditioning and medical advances against tropical diseases tilted growth toward warmer metropolitan areas. Meanwhile, as transport costs have fallen, the proximity of "cold" states to rivers and ports has become less important, and places oriented to consumers have grown relative to places organized around production.

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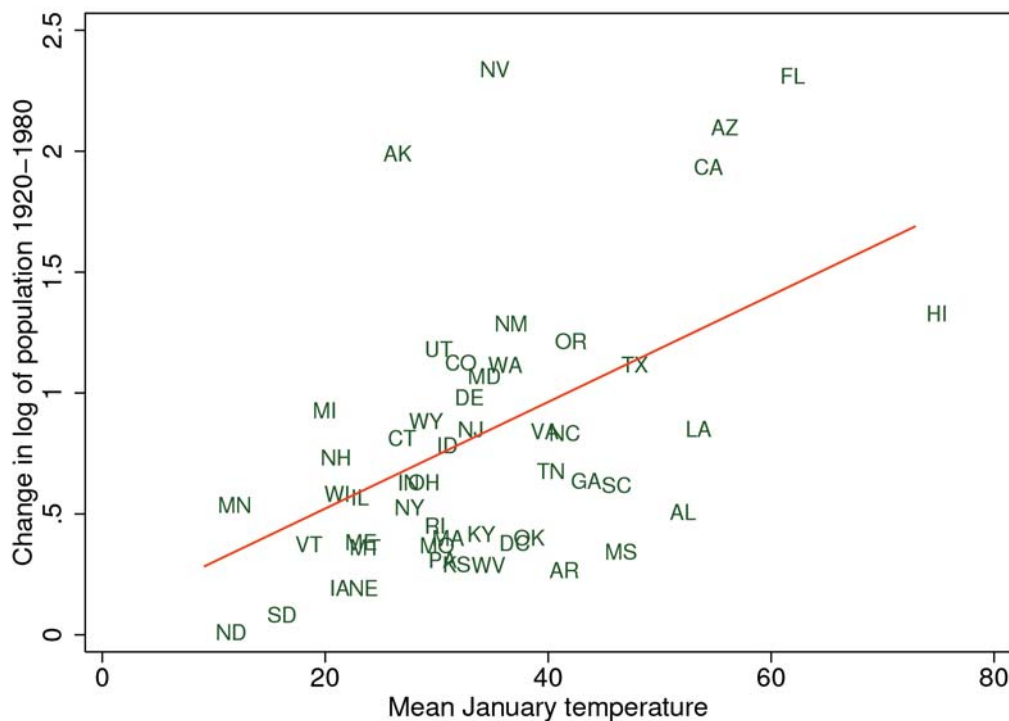
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Figure 1. Temperature and State Growth, 1920 - 1980



Skills and Reinventing Cities

Aside from climate, education may be the most powerful predictor of urban growth. In fact, for more than a century, in both the United States and Great Britain, cities with more educated residents have grown faster than comparable cities with less human capital.

The impact of skills on population growth appears to have been quite strong in recent decades. Among 238 metropolitan areas with more than 100,000 residents in 1980, the share of the adult population with at least a bachelor's degree varied widely. Between 1980 and 2000, the population of those where less than 10 percent of adults had at least a bachelor's degrees in 1980 grew on average by 13 percent. By contrast, among metropolitan areas where more than 25 percent of adults had at least a bachelor's degree, the average population growth rate

was 45 percent. Put another way, a 1 percent increase in the share of a region's population over the age of 25 who held at least a bachelor's degree in 1980 was associated with a 1.5 percent increase in the population growth per decade between 1980 and 2000.

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There is no consensus, however, on the causes or implications of this relationship.

Table 1. High-Skilled and Low-Skilled Cities With More Than 250,000 Residents, 2003
(Percent of population over 25 years of age with BAs)

Rank	Place	Percent	Rank	Place	Percent
1	Seattle, WA	51.6	52	Anaheim City, CA	21.5
2	Raleigh, NC	49.5	52	Corpus Christi City, TX	21.5
3	San Francisco, CA	48.6	54	St. Louis, MO	21.4
4	Washington, DC	44.2	55	Memphis, TN	21.0
5	Minneapolis, MN	42.5	56	Fresno, CA	20.7
6	Boston, MA	42.2	57	Milwaukee, WI	20.6
7	Denver, CO	40.8	58	Philadelphia, PA	19.9
8	Austin, TX	40.2	59	Bakersfield, CA	19.8
9	St. Paul, MN	39.7	60	Toledo, OH	19.1
10	Lexington, KY	39.5	61	Las Vegas, NV	18.9
11	Atlanta, GA	38.9	62	Miami, FL	18.0
11	Charlotte, NC	38.9	63	El Paso, TX	17.0
13	Colorado Springs, CO	38.2	64	Stockton, CA	15.0
14	Oakland, CA	37.1	65	Cleveland, OH	14.3
15	Portland, OR	36.8	66	Newark, NJ	11.4
15	San Diego, CA	36.8	67	Santa Ana, Ca	10.7

Source: U.S. Census Bureau, 2003 American Community Survey Summary Tables.

Notes: Some places are tied. The figures refer to places with populations greater than 250,000.

The reinvention hypothesis is just one of several possible explanations for the success of skilled cities over the past four decades. But evidence not only affirms this view; it also casts doubts on other theories that purport to explain the connection between skills and population growth

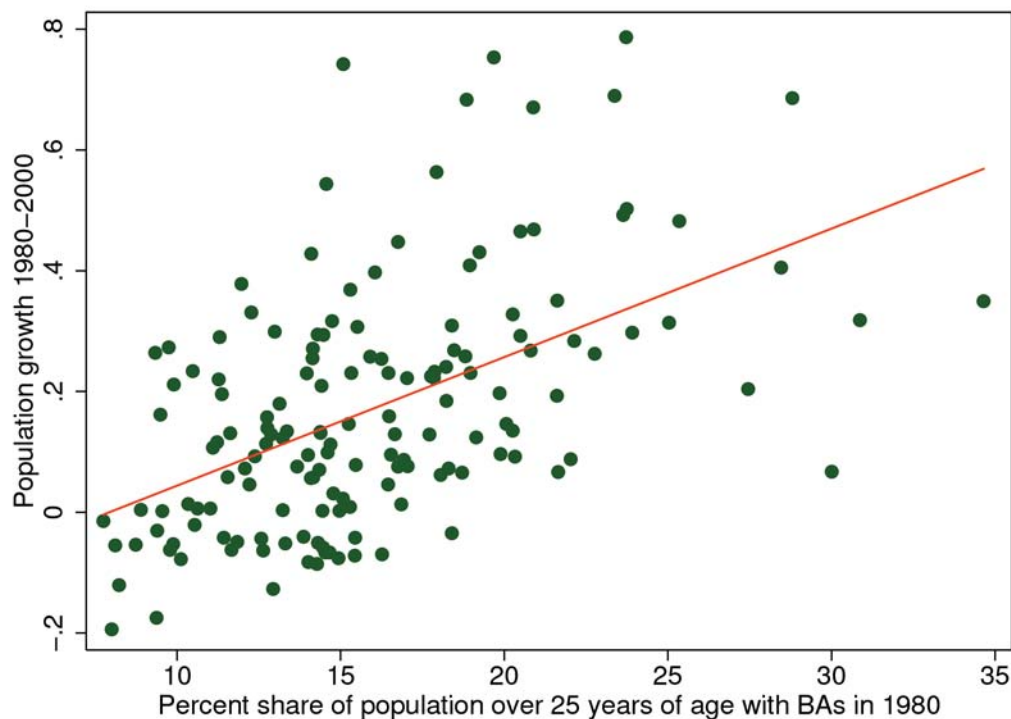
Skills really do lead to growth.

Researchers face the perennial problem of confusing causation with correlation. Do highly skilled workers generate economic expansion? Or do well-educated individuals choose to live in more dynamic metropolitan areas? If we were to look only at the percentage of college-educated adults and the

population growth rate, we could not separate cause from effect. To address this problem, we need a measurement that predicts education levels but is not itself affected by growth. Because college starts and closings are rare events, the number of colleges per capita located in a metropolitan area before World War II satisfies this requirement. The number of colleges strongly predicts the level of education in any given metropolitan area decades down the line. But, just as important, it is fixed historical data that is not itself affected by later population growth.

The number of colleges per capita in a metropolitan area in 1940 turns out to be a remarkably good predictor of the rate of population growth in that area between 1970 and 2000. For cities or larger

Figure 2: Cold-Weather Metropolitan Growth and Education 1980–2000



metropolitan areas, those with twice as many colleges in 1940 as similar areas were likely to witness 4 percent faster population growth per decade after 1970. This is powerful evidence that high skill levels cause high growth rates—not vice versa.

Cold-weather cities especially need skills to grow.

Higher skills have a much greater impact on growth rates in cold-weather metropolitan areas than in warmer areas. Among the 153 major metropolitan areas with average January temperatures below 40 degrees, a 1-percent increase in the share of a region's population that held at least a bachelor's degree in 1980 was associated with a 2.1 percent increase in the region's population between 1980 and 2000 (see Figure 2). Such data suggest that foul-weather cities cannot rely on residents

sticking around when their economy is not booming. They are far more handicapped by skills deficits and gain more from higher skills.

Skill levels affect growth throughout the metropolitan area more than central cities.

College education is a more powerful predictor of population growth in the metropolitan area than in the city itself. Cities and their surrounding suburbs generally comprise a single labor market. When highly skilled workers move into one part of a metropolitan area, the positive effects on growth extend to surrounding areas as well. Although high skill levels within an area's central city increase its growth, the effect is directed outwards as many skilled residents choose over time to live or work in the nearby suburbs. Whereas a 1 percent increase in the share of a city's adult population with a college diploma in 1980 led, on average, to a 0.2

percent rise in population growth over the next two decades, the same 1 percent increase across a metropolitan area yields an average rise of 0.5 percent in the region's population over the next two decades.

It pays to live in a skilled city.

Highly skilled workers may flock to skilled cities because they want to live near other well-educated people. If that were the case, all else being equal, well-educated workers should be willing to accept lower salaries for the privilege of living in skilled cities. In fact, the reverse is true. In metropolitan areas where the share of college graduates rose by 10 percent more than in otherwise similar areas, family incomes also grew 10 percent faster.

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At first glance, this should not be surprising. People who earn college degrees tend to garner higher salaries. In fact, highly skilled people not only earn more money themselves, but their neighbors—even their unskilled neighbors—seem to reap higher wages as well. Economist Enrico Moretti, for example, found that a 1 percent point increase in the college-educated population of a metropolitan area raises everybody else's average wages by 0.6 to 1.2 percent.² Skills seem to bring higher returns to places, not just to the particular individuals who possess those skills.

But why would employers pay more to lure highly educated workers to skilled cities if these are inherently more desirable places to live? One possibility

is that skilled cities grow rapidly and the growth creates problems such as congestion that make them less attractive. As a result, highly skilled workers demand extra compensation to live in fast-growing cities. Alternatively, highly skilled workers may be more productive when surrounded by well-educated colleagues. Since worker productivity is higher in skilled cities, then wages are higher too.

Skilled workers + restrictive housing regulations = rising home prices.

Not only does population tend to grow faster in more-educated metropolitan areas; housing prices in skilled cities also grow more than in other metropolitan areas. One possible explanation might be that well-educated individuals favor stricter zoning and land-use regulations. In less-skilled cities, developers respond to rising demand by constructing new residential units: building upward, sprawling outward, and filling in undeveloped land. In skilled cities, though, legal constraints inhibit new construction, so growing demand for housing leads to faster-rising prices.

Whatever the precise mechanism, the effect of higher skills on rising housing prices seems to operate through regulatory controls. In Massachusetts, the municipalities with higher shares of college graduates also post the highest increases in home prices. By contrast in Texas, where construction permits are granted far more readily, higher-skilled municipalities do not have higher increases in housing prices. Although skills tend to produce higher growth—especially in cold cities—other impacts from higher skills depend on how areas regulate growth.³

Can Cities “Skill” Their Way to Growth?

Clearly, policymakers in metropolitan areas want to attract highly skilled workers to their cities. Well-educated residents

can increase population growth, raise average family incomes, and bolster revenues from local property taxes. But what can policymakers do to lure well-educated workers to their cities?

Richard Florida, a professor at Carnegie Mellon University has argued in his bestselling book, *The Rise of the Creative Class*, that cities need to attract “scientists, engineers, artists, musicians, designers and knowledge-based professionals” to sustain growth. One way to attract these “creative sector” workers, he contends, is to build diverse, tolerant communities that will be attractive to inventors who generate new patents, artistic “bohemian” types, and large gay populations.

Certainly, strong evidence supports the argument that discrimination is economically counterproductive. But the “creative sector” reflects skills more than lifestyle choices. The average skilled person is not a young bohemian or artist living someplace like Greenwich Village. She is more likely a 40-year-old suburbanite.

Cities such as Boston and Madison, Wisconsin—with well-established and firmly rooted educational institutions—enjoy built-in advantages in luring highly skilled workers. Universities rarely relocate, and graduates often settle down where they attend college, which is important because the share of adults with college diplomas living in a given city in 1980 also serves as an excellent predictor of the education levels 10 years down the line.

Of course, municipal officials cannot directly affect the number and quality of colleges and universities within their cities. Still, a few key principles can benefit all cities and regions:

Invest in K-12 education.

Officials can facilitate growth by focusing attention on elementary and secondary education. Highly skilled individuals who are concerned about their children will look for homes in areas with good public schools. Neighborhoods and communities that feature stellar public schools will attract more college-trained parents.

Improving education is also important because evidence suggests that individual cities and towns with high dropout rates benefit less when their broader metropolitan area grows. Individuals and businesses

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appear to avoid high-dropout communities, perhaps because high dropout rates are a signal of other social problems.

Do not let tax rates skyrocket.

Money for education has to come from somewhere. Cities, however, must be careful about turning to taxes as their seed corn for growth, because high levies can drive away businesses and high-skill residents. Though spotty long-term data on urban taxes makes pinpointing the precise impacts difficult, using 1980 data as a proxy for historical levels of municipal taxes shows that cities with higher taxes experienced significantly slower growth between 1920 and 1980. Specifically, cities with a tax rate that was 1 percent higher relative to income grew 6 percent more slowly than otherwise comparable cities.

Municipal governments that struggle to raise revenues unfortunately face difficulty in improving local schools. Cities with a shrinking tax base face a Catch-22 situation: raise taxes and risk driving out highly educated residents, or do not spend on schools and drive out the same highly educated residents. For such cities, state and federal funds can play a major role in avoiding this self-perpetuating cycle. This is the

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basic concept behind the Massachusetts’ school-finance system, which commits the state to aiding schools in the communities least able to fund them.

Safe streets keep cities strong.

Not surprisingly, individuals seem to avoid high-crime areas. In fact, high murder rates are associated with low growth rates and other studies have found that a causal link between crime and city depopulation.⁴ This suggests that Boston’s nationally recognized success in policing can only contribute to its economic success. (Although homicides have risen since 1999 in Boston, they remain less than half their 1990 peak, and other violent crime has continued to fall.) Thus, crime-reduction not only may make our cities’ streets safer; it also may make our cities’ economies stronger as well.

Growth needs housing development.

Most people think of “affordable housing” as an issue about poor people. But growing metropolitan areas that stifle new construction find that soaring home prices become a problem for people at all skills levels. Educated workers are more difficult to lure to a city when they must downsize their housing expectations.

Cold cities cannot be complacent.

Cities that cannot draw residents with their sunny weather need to be especially concerned about skills. When economic trends turn against cold-weather cities, they must have the skills to reinvent themselves.

In fact, just as residents of Greater Boston have been digging themselves out from snowstorms for nearly four centuries, the city and the region have been bouncing back from economic downturns for almost as long. Over the years, Bostonians have managed to adapt to the harsh winter climate while also adapting to changing economic climates. They have done this by courting skilled individuals, not individual firms.

Greater Boston’s experience is not unique: better-educated cold-weather metropolitan areas with higher-skilled workforces such as Minneapolis-St. Paul and Missoula have endured the population shift toward the Sun Belt by reinventing themselves, and by being places that skilled individuals are reluctant to abandon even during hard economic times. Such regions are most likely to attract well-educated residents and produce sustained long-term growth when they invest in education, aggressively fight violent crime, encourage housing development, and rely on reasonable and fair tax systems.

Endnotes

1. Change in the logarithm of state population is loosely interpreted as the change in percentage. The logarithmic change is used here instead of percentage change because it tends to be less sensitive to extreme values, especially among states that begin with a particularly low level of population. Massachusetts' population grew during this time by 49 percent; the change in the log of its population was 40 percent.
2. Enrico Moretti, Estimating the social return to higher education: evidence from longitudinal and repeated cross-sectional data," *Journal of Econometric*, 121, nos. 1-2, (July - August 2004).
3. Edward Glaeser, Joseph Gyourko, and Raven Saks, "Why Have Housing Prices Gone Up?" National Bureau of Economic Research Working Paper 11129 (February 2005).
4. Julie Berren Cullen and Steven Levitt, "Crime, Urban Flight, and the Consequence for Cities," *Review of Economics and Statistics*: 81, No. 2 (May 1999).

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"The Curley Effect: The Economics of Shaping the Electorate ,"

by Edward Glaeser (Harvard University) and Andrei Schleiffer (Harvard University), *Journal of Law, Economics, and Organizations* 21 (2005): 1-19.

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