Chapter 9
Shrinking Smart: U.S. Population Decline and Footloose Human Capital

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9.1 Introduction: The Case for Evaluating Urban Decline from a Human Capital Perspective

This chapter engages with one aspect of urban demographic change: how population loss and age structure within cities are related to an important driver of economic development: human capital accumulation. The impacts of demographic change will vary, depending on spatial scale of analysis, the drivers of change, and how population characteristics evolve as the change occurs. Where the latter is concerned, human capital stocks may be particularly sensitive to population change, especially loss. This is because higher educational attainment is associated with increased propensity to migrate and, in a context of local population loss, those with more human capital at their disposal are more likely to possess the necessary information, financial wherewithal, and agency to be able to leave. Pull factors are also involved, as growing, thriving locations seek to attract human capital from other locations. The sub-national competition for human capital, in the U.S. and elsewhere, thus plays out against, and contributes to, a backdrop of overall population change. This suggests that evaluations of area "health" or vitality, often measured most simply in terms of the population growth rate or increases in human capital stocks, might benefit from considering both simultaneously. Shrinking places that continue to grow their highly educated populations may be fundamentally different, especially from a responsive policy perspective, from those declining places that are also shedding one of their most important resources: human capital.

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The U.S. city scale offers a fruitful avenue for investigation of the interplays between population loss and human capital stocks. Although population loss affects a variety of types of areas in the United States, from rural to urban and from localized to more regional in scope, cities are the scale at which policy responses to decline have been best articulated. Perhaps because the country as a whole continues to grow, responses to depopulation or ageing at the national level have been muted. In addition, although cities are not the sole producers of human capital in the U.S., they are the main consumers. Cities are not only magnets for the highly educated, they are often ranked based on their ability to attract and retain those viewed to have the most choice in where to live, the college educated. Cities offer a unique intersection of urban competition for human capital and policy responses geared at coping with population loss.

There are two additional aspects of cities, population decline, and human capital that render this a topic worth pursuing. First, population loss is often associated with an aging process; below replacement-level fertility and selective out-migration tend to make places older. Age structure in turn influences human capital stocks. The share of the population earning at least a college degree has increased over time, such that demographically older places also tend to be less educated places. Since age and education are also implicated in the decision to migrate, multiple forces are simultaneously at work in determining any given city's levels of human capital.

Second, cities are also the focal point for population decline-related policy in the United States. One main stream of policy development is so-called "right-sizing" or "smart shrinkage," which focuses on policies that adapt a city's size (and infrastructure and services) to fit the current and future population and not the larger population of the past (Hollander and Németh 2011). These policies prioritize quality of life over the attraction of new inhabitants. This policy approach originates from planning and focuses on aspects of the built environment. Arguably, a complementary indicator of city health or quality of life would be measures of human capital stocks or intensity, as labor forms a key building block for existing and future quality of life and development. A city's ability to retain or attract the college educated—footloose human capital—can be viewed as a form of revealed preference of city inhabitants.

The main argument this chapter makes is that pure measures of population change alone are insufficient to judge the vitality of a city. And although implementation of "smart shrinkage" policies might serve as one sign of a city's commitment to quality of life in the face of depopulation, measurements of human capital stocks offer other advantages. Cities that maintain or increase their human capital stocks in the face of population decline may possess unobservable advantages. Because evaluation of urban population decline through a human capital lens is unusual, the goal of this chapter is to offer some introductory thoughts on the interactions between urban population change and human capital, and, using the U.S. as a case study, to identify declining cities that continue to accumulate human capital. A point of comparison is growing cities facing losses in human capital stocks.

This chapter's contribution can be thought of as a "proof of concept." Through descriptive statistics, it offers an initial and exploratory analysis of the interaction between human capital stocks and urban population change in United States cities. In doing so, the chapter provides some basic facts about these interactions and their

geography and also highlights conceptual and measurement challenges. The discussion highlights the value of considering the characteristics of those living in shrinking and growing cities—especially where education is concerned—and aims to enrich current conceptualizations of the urban shrinkage measurement and policy response. The remainder of the chapter is organized as follows. Section 9.2 provides some background, discusses related literature, and frames the analysis. Following that, data and methodology, along with background on recent population change and educational attainment in the U.S., are covered in Sect. 9.3. Section 9.4 contains results and discussion and the chapter closes with conclusions and policy recommendations in Sect. 9.5.

9.2 Urban Population Loss: Some Context

Spatial scale provides an important key to understanding the pervasiveness, importance, and impacts of population loss. At the global scale, of course, population continues to increase, due to continued above-replacement level fertility rates in many parts of the world, along with increased life expectancy. At the national level, many developed countries, such as Japan or Germany, are already confronting population loss and its attendant challenges (see Reher 2007 for a discussion of the demographic underpinnings of population decline at the national scale). Loss at this level is associated with an ageing of the population that affects labor markets and social policy provision, in particular pay-as-you-go retirement systems and healthcare (Coleman and Rowthorn 2011; Lutz et al. 2003).

At the sub-national scale, rural and urban areas in a large number of countries are affected by population decline. Ageing matters at this more localized scale, as well—area labor markets are likely affected, but so are municipal fiscal solvency, infrastructure provision, and even housing markets (see e.g. Carbonaro et al. 2016; Feser and Sweeney 2003; Franklin and van Leeuwen 2016; Martinez-Fernandez et al. 2012; or Wiechmann and Pallagst 2012). In some countries, loss at smaller spatial scales combines to push national population growth rates into negative territory. In other cases, loss in some parts of the country is more or less balanced out by growth in other areas—such that national statistics mask the extent (and even existence) of decline happening at the local level. The United States offers a case in point. Overall, the country continues to experience robust population growth, with an increase of almost 10% between 2000 and 2010. This growth, however, takes place within a context of significant population redistribution and loss at the local and regional scales—between 2000 and 2010 as well, about one third of U.S. counties lost population, as did 18% of cities of 100,000 and up. In some situations, the difference between population growth and loss can be explained by population characteristics: spatial unevenness in age structure and subgroup fertility rates means that some areas possess more of the "raw materials" for population growth than others (Franklin 2014a; Johnson and Lichter 2008). In general, however, the driving force behind variations in growth rates is internal and international

migration: when areas suffer economically or when cohorts age into retirement (or higher education), individuals are likely to move to other parts of the country, leading to loss for some areas and growth for others (Franklin 2014b). Areas and regions lacking in economic opportunities are unlikely to attract international migrants.

At the scale of the city, research and policy related to population loss encounter two challenges. First, how to measure decline and, second, how to respond to its impacts. The measurement of decline is complicated, with a variety of contributions to the literature seeking to classify cities by extent of decline—where the challenge is to define "extent" (e.g. Beauregard 2009; Short and Mussman 2013). Potential responses to the challenges posed by urban depopulation have emerged from the field of planning. Planning, which emphasizes the deliberate development and organization of the urban built environment, tends to view the impacts of population loss through that lens: numbers and locations of vacant properties; spatial distribution of households and service provision; or redevelopment of newly vacant land. The needs and characteristics of inhabitants are important mainly insofar as they describe the beneficiaries of planning policy. In terms of response to decline, Hollander et al. (2009) note that cities in both Europe and the U.S. have experienced extensive population loss and that the timing is ripe for development of new approaches to what appears to be imminent and irreversible loss. These emerging new approaches, "smart shrinkage" or "right-sizing," emphasize the ways in which land use and infrastructure can be made to work to the advantage of shrinking cities: the purposeful increase of greenspace and decrease of population density, as well as an emphasis on quality of life and social equity (see e.g. Hollander 2011). Demolition of vacant housing, increases in housing lot sizes, and reconfiguration of infrastructure provision each benefit current residents but also hold the potential to increase the overall attractiveness of a city, perhaps stemming the flow of departing inhabitants and also attracting new ones.

As a product of the planning discipline, it is logical that smart shrinkage should engage primarily with the structure and function of the built environment. A complementary approach—one deriving from the social sciences and, in particular geography and demography—considers the evolving socio-economic and demographic characteristics of those living in cities, both growing and shrinking. If, on the physical side, smart shrinkage allows cities to position themselves for renewed health and vitality, it is demography that provides raw materials in the form of inhabitants, who simultaneously benefit from right-sizing policies and also provide the labor that allows areas to function economically and socially. Cities of all types are regularly evaluated on their ability to attract and retain members of the "creative class." Although the creative class can be defined in terms of occupation or industry, it can also be generalized to include all those who are college-educated. And whether defined narrowly, in terms of the creative class, or more broadly, the educated benefit the cities they live in in myriad ways: they provide labor of a particular type, they prefer (or even demand) certain types of services and amenities, and their expectations for services and environmental mileau may be higher (Florida 2002; Florida et al. 2008). Research on human capital stocks, as well as

regularly updated rankings of cities' stocks, is thus seeking to increase understanding of the drivers of economic growth but also to find a proxy for urban dynamism.

In addition, the educated tend to be more footloose in terms of location. Where the less educated may be tied to an area, those possessing more human capital have a wider set of options when choosing where to live—they can vote with their feet (Sjaastad 1962; Lee 1966; Plane and Heins 2003; Plane et al. 2005). Certainly in the United States, where students often already migrate for higher education, the race for human capital at the city level has as much to do with attracting human capital as producing it in situ. This in turn has implications for the measurement of urban attractiveness or vitality within the context of urban population loss. Whatever factors are driving decline, whether economic, geographical, or even demographic, those cities that maintain or increase their human capital stocks may be more robust or resilient than their population change figures would otherwise suggest. In the case of economic decline and loss of jobs, at a minimum the possession of stable human capital stocks suggests potential for future growth. It may also mean that there remain strong and valid (and unobserved) economic reasons for remaining in the area rather than moving elsewhere. Likewise, if on the face of it a city's geographical location appears to be driving depopulation, but the educated remain (or continue to arrive), a city's position may be stronger than it first appears. Finally, even in the case of aging and out-migration, if the share of the population with a college degree increases, this is considerably better than the alternative scenario: an older and less educated populace.

9.3 Measuring Urban Population Change and Human Capital

To answer questions about the association between human capital stocks and population change in U.S. cities, this chapter employs data for 2000 and 2010 from the decennial census and the 2010 American Community Survey (ACS) 1-year sample. The ideal approach to studying demographic characteristics and population change would be to employ individual level migration data for U.S. cities. This would permit researchers to study how characteristics of in- and out-migrants are related to areal population loss or growth. Unfortunately, for the U.S., such data do not exist for the desired spatial and temporal scales. Instead, the units of observation are all cities with at least 100,000 inhabitants in 2010 and the variables of interest are aggregated measures for these cities. Of the 277 cities included in the sample, 49 experienced some degree of population loss between 2000 and 2010. Table 9.1 provides basic information about the sample. Relatively few cities in the U.S. are over one million inhabitants; the bulk of the cities included in the analysis range between 100,000 and 249,999 inhabitants. In addition, although on average these cities grew faster than the U.S. as a whole, the average rate of growth differed considerably by class size of city, with a fair amount of variation around the

Table 9.1 City sample and population change

City size (Population, 2010)	Average population change (St. Dev.), 2000–2010	Fraction experiencing decline, 2000–2010
Total (277)	17.95 (48.58)	0.18
>1,000,000 (9)	4.32 (6.51)	0.11
500,000–999,999 (23)	9.89 (12.97)	0.17
250,000–499,999 (40)	7.91 (15.48)	0.30
100,000–249,999 (205)	21.41 (55.49)	0.16

Count of cities in each category provided in parentheses. Population change figures represent average change across cities in each category

mean. The fastest growth on average, 21.41%, was in the smallest category of city, while the largest nine cities in the U.S. grew on average by only 4.32%. The right column of Table 9.1 shows the share of cities in each category that lost population during the study period. Of the 277 cities considered here, 18% lost population. In the largest-city category, only one city lost population: Chicago, Illinois. The category most impacted by population decline was the 250,000–499,999 range, with almost a third of cities reporting fewer residents in 2010 than in 2000.

Figure 9.1 shows study city locations in the contiguous 48 states.[1] Larger U.S. cities are located across the country, with several larger cities often co-located in the same larger metropolitan area (e.g. around Dallas, Texas or Los Angeles, California). Broadly speaking, three geographical types of shrinking city can be identified from the map: those cities in the deep South, those in the Rustbelt of the Midwest, and those cities—located mainly in very large conurbations such as San Francisco or Los Angeles—nestled close to other cities, which are growing. On the whole, cities located in the West and in the Atlantic South tended to experience population growth during this period.

Human capital is often measured in terms of the educational attainment of the adult population. This analysis uses the share of the population in a particular age category that has at least a bachelor's degree. The share is calculated for 2000 and 2010 and then differenced, yielding a percentage point change in human capital intensity (that is, the share of the population that is educated). As discussed above, ideally, individual-level migration data would be used to connect city characteristics (whether population decline or other city aspects) and human capital stocks. This would make it more straightforward to explain how a city's attractiveness draws or repels individuals with particular characteristics. Unfortunately, such data are not available for U.S. cities for the desired time period and so inferences must be drawn from aggregate changes in population characteristics—here, educational attainment—over time.

[1]The only city in the sample not located in the contiguous 48 states is Anchorage, Alaska.

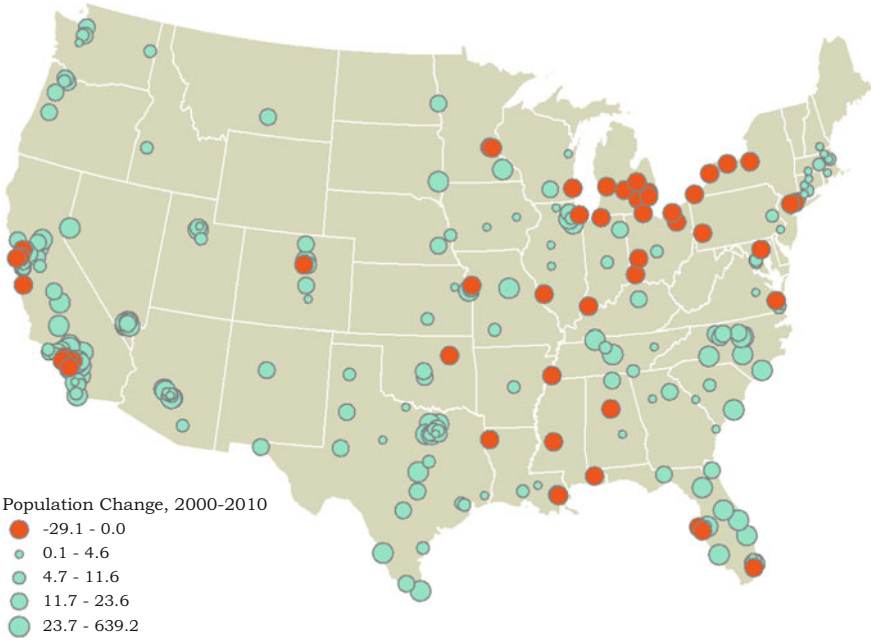

Fig. 9.1 City location and population change, 2000–2010. *Data source*: U.S. Census Bureau

Educational attainment tabulations in the U.S. generally use the population 25 and up with at least an undergraduate degree—with 25 being the age at which most individuals will have completed at least their first degree. Although it is typical for city rankings and research in the U.S. to employ the standard 25 and up measure of educational attainment, this statistic alone is not ideal, as it is dependent on the age structure of a given city's population. In most developed countries, and the U.S. is no exception, educational attainment has tended to increase over time. That is, younger generations are more likely to possess a college degree. The oldest age cohorts, conversely, are much less likely to have achieved this qualification. According to the 2000 decennial census, for example, 27% of 25–29 year olds had earned at least a college degree, compared to 20% of 60–64 year olds (U.S. Census Bureau 2000). Cohort differences in educational attainment mean that cities with larger elderly populations, for example, are likely to have smaller total shares of the adult population who are college educated, holding other factors constant. The reverse is true for newer, younger cities—these places will appear more educated than their older peers, simply because young people are more likely to be college educated.

An additional wrinkle is introduced into the measurement of human capital stocks when computing change over time. This is because the same individuals are not being measured in both points in time; rather individuals will have aged into the next cohort above. Put simply, when comparing 25–29 year olds in two time periods for a city, an increase in the share of the group with a college degree *should*

Table 9.2 Educational attainment by age, United States and cities of at least 100,000 in 2010

	U.S. total	Cities (100k+)				
	2000	2010	Percentage point change	2000	2010	Percentage point change
Age 25 and up	24.40	28.1	3.7	26.38	29.84	3.5
Age 25–34	27.54	31.1	3.6	28.84	32.31	3.5
Age 35–64	26.17	29.5	3.3	27.68	30.30	2.6
Age 65+	15.39	21.3	5.9	17.50	23.86	6.4

Educational attainment is measured by the percent of the population in that age group possessing at least a bachelor's degree. City values presented are mean percentages for the 277 cities with at least 100,000 population in 2010
Data source: U.S. Census Bureau

be observed, purely due to increases in college attendance over time for younger cohorts. The same will be true for the entire 25 and up population: between the two time periods, the older, less educated population will age out of the system, to be replaced by younger, more educated individuals.

For the purposes of the present analysis, educational attainment for the total adult population (25 and up) is employed, but cohort level changes are also included, in order to minimize the influence that temporal increases in educational attainment as well as age structure are having on results, and to highlight cross-cohort differences in human capital accumulation. Table 9.2 shows educational attainment in 2000 and 2010 for the U.S. and for the largest cities. Three trends are immediately apparent. On average, cities are more educated than the country as a whole. Second, both the nation and sample cities became more educated between 2000 and 2010, which is to be expected. Third, and also expected, for both geographies and time periods, larger shares of younger age cohorts are educated than older age cohorts.

Just as city size and population change are related (Table 9.1), so too are city size and human capital stock changes. Table 9.3 provides percentage point changes between 2000 and 2010 in the share of the population with at least a college degree. For the total adult population, the data indicate that smaller cities showed smaller average increases in human capital stocks—increases that were smaller than change at the national level. Of course, as noted above, this is at least partially due to age structure and changes over time in the propensity to earn a college degree. Cohort-level changes show a more nuanced association between city size and increases in human capital stocks. The 25–34 age cohort—of particular interest because they represent quintessentially footloose human capital, in that they are less likely to be married and to have children, and so are most likely to be able to "vote with their feet"—shows average increases higher than the national norm for the three larger categories of cities. The largest cities showed a particularly sizable increase in the share of this cohort with a college degree. Where the 65 and up age cohort is concerned, only the 250,000–499,999 category had increases that were slightly

Table 9.3 Percentage point change in educational attainment, 2000–2010, by city size

Change 2000–2010	City size (Population, 2010)			
	100,000–249,999 (N = 205)	250,000–499,999 (N = 40)	500,000–999,999 (N = 23)	1,000,000+ (N = 9)
College-educated 25+	3.33	3.58	4.24	3.98
Age 25–34	3.23	3.64	4.26	6.14
Age 35–64	2.48	2.83	3.54	2.35
Age 65+	6.50	5.78	6.18	5.96

Population change figures represent average change across cities in each category
Data source: U.S. Census Bureau

smaller than the national increase. Although these larger increases could be attributable to in-migration of retirees, in truth the bulk of the shift is probably due to higher educational attainment of those aging into the oldest cohort.

9.4 Changes in Urban Human Capital Stocks in the Face of Population Decline

To explore the connection between population change and educational attainment in larger U.S. cities, this section first assesses macro-level associations across different city size classes and geography, and then turns to the experiences of the largest cities, as well as those that experienced the most population loss between 2000 and 2010. In each case, overall educational attainment for the adult population (i.e. those 25 and up) is considered, along with cohort-level changes.

Decreases in the share of the adult population with a college degree are rare, whether a city grew or shrank between 2000 and 2010 (Table 9.4). When the educated share decreased, in fact, it was more likely to be observed in a growing (12 cities) than a shrinking (3 cities) city. These growing cities are likely those whose growth is fueled by in-migration (or retention) of adults without college degrees. Far more common is the case of declining population, with continued increases in terms of the share of the population that is educated. That is, for the population 25 and up, a city's population loss does not appear to impact its human capital stock *intensity*. Relative impacts may be much more substantial, of course, when other cities are experiencing much larger increases in educated shares. Across city size categories, shrinking cities in the three larger categories all had larger shares of the adult population with a college degree at the end of the study period. The three shrinking cities with declining human capital stocks appear in the smallest category (100,000–249,999).

Focusing on the entire population 25 and up obscures important differences that may exist across age cohorts. As a younger and more recently educated group, the 25–34 age cohort, for example, could be expected to be more sensitive to

Table 9.4 Population/education growth interaction, by age cohort and city size

City Size:	Pop +, Ed +	Pop +, Ed –	Pop –, Ed –	Pop –, Ed +	Total
25 years and up					
>1,000,000	8	0	0	1	9
500,000–999,999	19	0	0	4	23
250,000–499,999	26	2	0	12	40
100,000–249,999	161	12	3	29	205
Total	214	14	3	46	277
Ages 25–34					
>1,000,000	8	0	0	1	9
500,000–999,999	16	3	1	3	23
250,000–499,999	20	8	1	11	40
100,000–249,999	124	49	9	23	205
Total	168	60	11	38	277
Ages 35–64					
>1,000,000	6	2	0	1	9
500,000–999,999	18	1	0	4	23
250,000–499,999	25	3	0	12	40
100,000–249,999	131	42	12	20	205
Total	180	48	12	37	277
Ages 65 and up					
>1,000,000	8	0	0	1	9
500,000–999,999	19	0	0	4	23
250,000–499,999	28	0	1	11	40
100,000–249,999	163	10	1	31	205
Total	218	10	2	47	277

Data source: U.S. Census Bureau

population decline and its proximate causes. They might be more likely to move for suitable employment and also to exercise their preferences for certain types of urban amenities that might be less evident in a shrinking city. Thus, policies that succeed in retaining these individuals are especially desirable for shrinking cities. Members of this cohort are not only more likely to be educated than older cohorts, but are also very likely to eventually form households and have children. That is, by remaining in shrinking cities, this group contributes human capital, but also potentially, and importantly, children.

Table 9.4 indicates, that, compared to the total adult population, there were more shrinking cities that also experienced a loss in the share of educated individuals in this younger age cohort. Of the 11 cities that experienced a decline in educated youth stocks along with overall population loss, 9 were in the smallest city size category. Much more common (38 cities) was for cities to experience decline but to continue to accrue human capital in the 25–34 age group. Interestingly, a sizable share of growing cities saw decreases in the share of their young people with at least a college degree during this period. This could indicate cities that are growing quickly

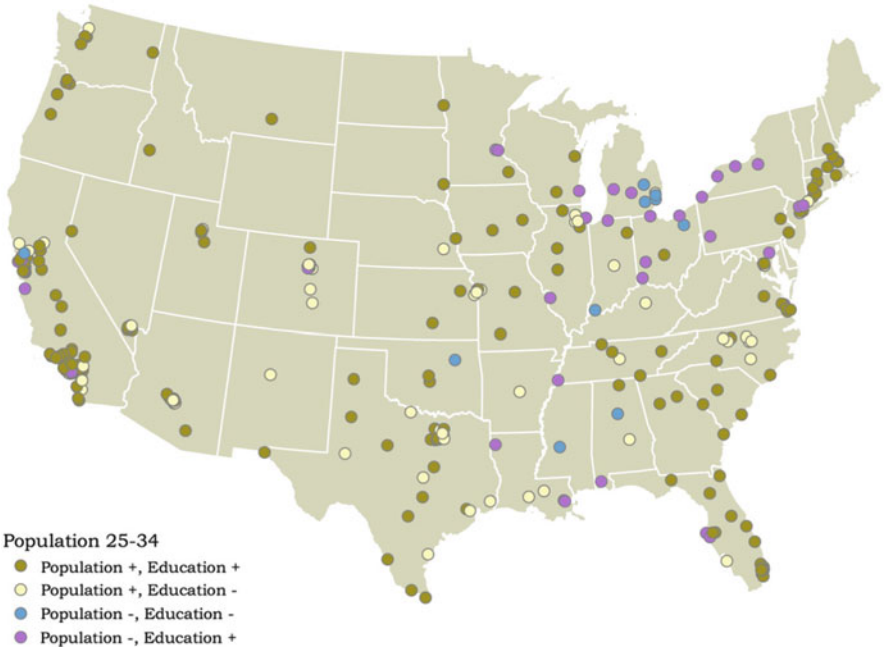

Fig. 9.2 Interaction between population change and change in the share of 25–34 year olds with a college degree, 2000–2010. *Data source*: U.S. Census Bureau

overall—through natural fertility and in-migration of younger people—without adding hallmarks of urban development such as jobs or amenities. Or these cities could be adding substantial numbers of 25–34 years olds, most of whom do not have a college education, thus diluting the share of the entire cohort that is educated. Where geography is concerned, it might seem logical that growing or shrinking cities with declining shares of youth human capital might tend to be located in particular parts of the United States. This does not appear to be true (Fig. 9.2). In fact, the dominant determinant, from the factors considered here, appears to be city size: decreases in youth human capital are evident throughout the country but in general tend to be smaller cities.

For older age cohorts, the pattern is similar. Shrinking cities may face many challenges, but human capital attrition does not appear to be one of them. The 35–64 cohort—prime working ages—was more educated in 2010 than in 2000 in over two thirds of the cities, whether they were growing or shrinking. As with the younger cohort, declines were more likely in growing cities than in shrinking cities and were found in each city size category. The decline-decline combination—in both population and the share of the population with a college degree—occurred only in the smallest category of cities. In the case of the oldest age cohort (65+), those at or above retirement age became more educated between 2000 and 2010; in only 12 of the sample cities was there a detectable decrease in the share of their population that was educated, and this was predominantly in growing cities, not

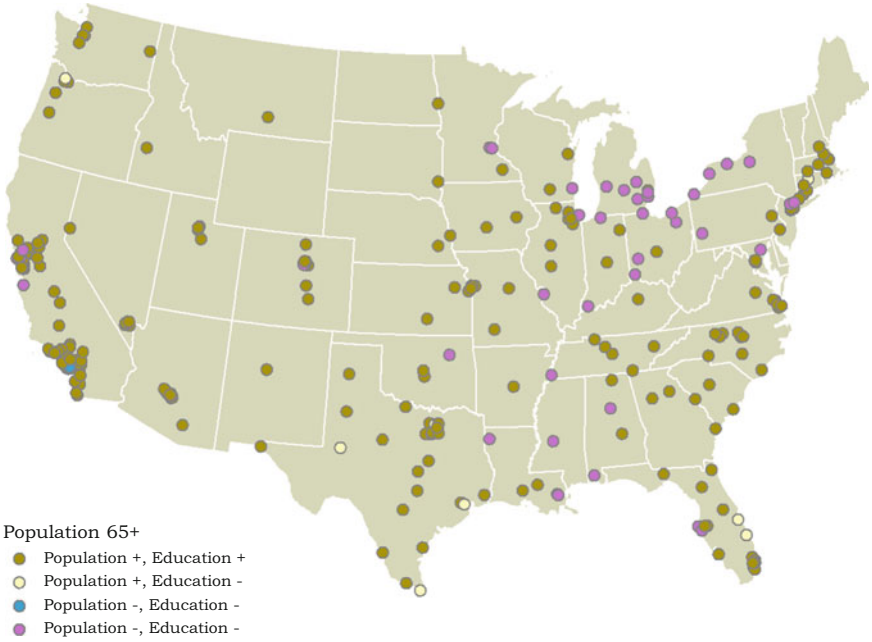

Fig. 9.3 Interaction between population change and change in the share of 65+ year olds with a college degree, 2000–2010. *Data source*: U.S. Census Bureau

shrinking. Given the sharp increase over time in university attendance, it is remarkable that any city should experience a decrease in the share of its elderly population with a college education. For this to occur, the mostly likely scenario would be that any increases due to cohort change (i.e. less educated elderly dying and being replaced by more educated elderly aging into that cohort) would need to be cancelled out by out-migration of the more educated in the cohort. Figure 9.3 highlights the predominance of increases in educational attainment among the 65 and up age cohort. Cities with decreases in shares of educated elderly were located throughout the country, but often in the South, particularly Texas and Florida.

With the exception of New Orleans, Louisiana and Birmingham, Alabama (both located in the South), the cities that experienced the sharpest population losses in the U.S. between 2000 and 2010 were located in what is generally referred to as the American Rustbelt (Table 9.5). New Orleans, which lost almost a third of its population during this period, is an unusual case as its precipitous loss is natural disaster related, being due to Hurricane Katrina and its aftermath in 2005. The relationship between educational attainment and population loss is varied. In some cases, such as New Orleans, Buffalo, or Pittsburgh, population decline is paired with notable increases in the share of the population with a college degree. For Pittsburgh and New Orleans, increases in human capital intensity are apparent across all age cohorts, whereas in Buffalo the increase is highest in the 25–34 age

Table 9.5 Population change and educational attainment, 2000–2010

City	2010 population	Change, 2000–2010				
		Population (percent)	Percent college educated			
			25+	25–34	35–64	65+
Highest population decline						
New Orleans, Louisiana	343,829	−29.1	7.3	11.2	5.6	6.4
Detroit, Michigan	713,777	−25.0	1.0	−0.2	0.8	3.0
Flint, Michigan	102,434	−18.0	0.1	−0.1	−1.7	5.8
Cleveland, Ohio	396,815	−17.1	1.9	4.0	1.5	1.6
Dayton, Ohio	141,527	−14.8	0.2	5.2	−3.1	3.9
Birmingham, Alabama	212,237	−12.6	1.6	−2.8	2.0	4.7
Buffalo, New York	261,310	−10.7	5.5	11.8	3.2	2.8
Cincinnati, Ohio	296,943	−10.4	4.8	4.0	3.8	8.1
Pittsburgh, Pennsylvania	305,704	−8.6	8.7	7.6	6.6	10.4
Toledo, Ohio	287,208	−8.4	1.6	3.3	0.2	3.5
Highest population growth						
Enterprise, Nevada	108,481	639.2	15.1	11.5	15.1	13.3
Surprise, Arizona	117,517	281.0	8.5	9.9	6.6	11.5
Frisco, Texas	116,989	247.0	6.3	−1.8	12.9	−1.4
Elk Grove, California	153,015	155.1	10.1	12.0	10.3	9.2
McKinney, Texas	131,117	141.2	6.5	2.5	8.9	3.0
Murrieta, California	103,466	133.7	5.2	5.2	6.9	−0.3
Gilbert, Arizona	208,453	90.0	2.0	−1.4	3.6	7.6
North Las Vegas, Nevada	216,961	87.9	5.8	4.1	7.3	1.1
Port St. Lucie, Florida	164,603	85.4	0.5	4.6	−0.4	−0.1
Victorville, California	115,903	81.0	1.9	0.5	1.4	5.7

Data source: U.S. Census Bureau

cohort. These increases could be due to in-migration of the college educated, or higher levels of out-migration of the less educated, resulting in larger shares of each cohort possessing a college degree. The evidence suggests that these cities are in some ways thriving; although they may suffer extensive population loss that almost assuredly impacts the built environment, they possess characteristics that render them attractive to the college educated, especially those in younger age cohorts. This is a sharp contrast to other shrinking cities, such as Toledo, Flint, or Birmingham, which have lost population but also seen human capital intensity decrease or increase only anemically (i.e. at a much slower rate than the U.S. as a whole).

Similar variation in human capital changes can be observed for the fastest growing cities in the U.S., as well. For the purposes of comparison, the bottom panel of Table 9.5 provides cohort level changes in shares of population that are educated for the ten fastest *growing* cities between 2000 and 2010. In many cases, these are cities that barely existed in 2000, especially in the western part of the

Table 9.6 Population change, 2000–2010, largest cities

City	2010 population	Change, 2000–2010				
		Population (percent)	Percent college educated			
			25+	25–34	35–64	65+
New York, New York	8,175,133	2.1	6.0	9.3	4.2	7.0
Los Angeles, California	3,792,621	2.6	5.2	9.3	3.0	6.5
Chicago, Illinois	2,695,598	−6.9	7.8	11.0	6.4	6.3
Houston, Texas	2,099,451	7.5	1.3	3.4	−0.3	4.1
Philadelphia, Pennsylvania	1,526,006	0.6	4.7	8.2	2.2	4.9
Phoenix, Arizona	1,445,632	9.4	2.2	1.6	2.0	3.9
San Antonio, Texas	1,327,407	16.0	2.1	3.3	1.0	4.2
San Diego, California	1,307,402	6.9	5.3	7.8	3.5	8.0
Dallas, Texas	1,197,816	0.8	1.2	1.4	−0.8	8.7
San Jose, California	945,942	5.7	5.0	4.7	5.5	6.8
Jacksonville, Florida	821,784	11.7	2.7	3.2	1.1	7.9
Indianapolis, Indiana	820,445	4.9	1.3	−1.9	1.7	3.9
San Francisco, California	805,235	3.7	5.9	10.3	4.2	7.4
Austin, Texas	790,390	20.4	3.3	1.5	3.9	6.3
Columbus, Ohio	787,033	10.6	2.6	2.4	2.6	4.2

Data source: U.S. Census Bureau

U.S. Some growing cities, such as Enterprise, Nevada or Elk Grove, California manage to pair a population boom with human capital accumulation across all age cohorts. Others, though, such as Frisco, Texas or Gilbert, Arizona, experience population increase but a relative dilution of the share of the population that is educated. That is, cohort size may increase over time, but the share of that cohort that is educated decreases. Taken together, the two panels in Table 9.5 suggest that population growth figures alone are not sufficient to give the full picture of a city's dynamism. Especially where population decline is concerned, considering changes to human capital endowments over time adds a valuable perspective.

A final perspective on population change and human capital comes from the largest U.S. cities. Table 9.6 provides these statistics for the 15 largest cities in the U.S. Of these cities, only Chicago experienced a loss in population between 2000 and 2010. Other cities, however, experienced negligible population increase—Philadelphia or Dallas, for example. On the other end of the spectrum, cities such as Austin, San Antonio, Jacksonville, and Columbus all experienced consider population growth during this period. Chicago, the largest city in the U.S. to experience population loss, still proved itself to be very attractive to the college educated. In each age cohort, the share of the population with a college degree increased more than the national average. Philadelphia, a slow-growing city, also showed itself to be attractive to the 25–34 age cohort, belying any suggestion of moribundity that might arise from its lack of growth. On the whole,

population increase alone does not seem to provide a full picture of the demographic change occurring within a city.

9.5 Conclusions: Being Smart About Shrinking Cities

Population decline and its attendant challenges are an increasingly relevant topic in many developed countries, even those, such as the United States, that continue to experience population growth at the national scale. For shrinking cities, one important avenue of research has been, simply: how to respond. Is a return to population growth a realistic goal? If not, what should policy and planning aim to accomplish for these places? The concept of "right-sizing" in planning argues that the best policies are those that help cities adjust to current and future smaller populations. By emphasizing land redevelopment, lower densities, and environmental amenities, places will function better, be more attractive to current residents, and potentially at some future date even attract new inhabitants. This chapter has argued that, while these policies are useful and offer a promising roadmap for shrinking cities the world over, they could be complemented by approaches that consider how the characteristics of those living in shrinking cities are evolving. Quality of life, after all (which right-sizing policies aim to maximize), is mediated by the characteristics of those living in the area—age, for example, is an important determinant of quality of life needs and expectations (Ruth and Franklin 2014). In particular, the human capital characteristics of a city are likely to change as a city shrinks. Those cities that maintain or grow their human capital may have a different path forward than those that are losing this valuable commodity.

This chapter has offered a preliminary assessment of the relationship between urban population loss and human capital stocks in the United States. The main conclusions that can be drawn from this exploratory study fall into two categories. The first is in terms of findings. Because of changes over time in the propensity to obtain a college degree, most places—whether growing or shrinking—should become more educated over time. And, indeed, this analysis finds that most shrinking cities in the U.S. have continued to gain in human capital, as measured by the share of the cohort with at least a college degree. This result, which of course merits further, more in-depth investigation, indicates that many shrinking cities are not as badly off as their population loss statistics might suggest: they still possess a very important raw material in the form of human capital. There are, however, shrinking cities which also appear to be losing their human capital. These cities tend to be on the smaller side and to be located throughout the U.S. If the norm is stability or growth in human capital even in the face of overall population decline, then one conclusion might be that cities such as Toledo, Ohio, which have also lost human capital, face more difficult challenges than cities such as Buffalo, New York, which have depopulated while still accumulating educated individuals, especially in the 25–34 age cohort.

The second set of conclusions that can be drawn from this analysis is methodological. Existing rankings of cities and their human capital stocks tend to ignore underlying demography, especially where educational attainment over time and age structure are concerned. In order to adequately measure the relationship between urban shrinkage and human capital, we need good measures that take into account cohort effects as well as changes to both numerators and denominators. Related to this, how do we generate benchmarks that allow us to identify cities that are outperforming expectations in terms of human capital retention? In the U.S. at least, this challenge is compounded by a lack of good data for small geographical units. Preferably, when cities lose population, it would be straightforward to identify the components of change that are responsible (i.e. natural decrease versus outmigration) and to connect those components of change to the characteristics of those entering and leaving the area.

In closing, although the analysis presented raises a variety of questions, it has also shown that an interesting avenue of research exists in the dual investigation of population loss and human capital stocks. It has also revealed that potential exists for development of models and measures that would increase our knowledge of the interaction of these two important topics. Effective policies that address population loss will benefit from expansion of the range of data inputs, assessments, and outcome evaluations that are employed to include human capital accumulation.

Key Policy Recommendations:

- Increased data provision for local areas that permits timely tracking of changes in demographic composition, especially educational attainment.
- Focus on attraction and/or retention of the 25–34 age cohort, as these individuals are entering economically productive ages and are also likely to form households and produce children.
- Continued or renewed allocation of resources to education will help increase attractiveness of shrinking cities but also increase local human capital stocks.
- Expansion of current "smart shrinkage" policy umbrella to include metrics for human capital attraction and retention.

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