

DO COLLEGE TOWNS GROW FASTER?

By: Michelle Lam

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Introduction:

The local population growth has been of interest to academics and policymakers and is an important indicator of an area's desirability. For both metropolitan and non-metropolitan areas, a growing population is an indication that an area is a "desirable" place to live and work. Researchers have suggested that several characteristics have important effects on an area's population growth by affecting its desirability to current and prospective residents. Researchers, like Carlino and Mills (1987), recognized the importance of local employment. Looking at the relationship between the local human capital stock and local population growth some researchers had found strong and consistent evidence that adults in an area with a college degree is positively correlated with local population growth for cities (Glaeser). Glaeser also suggests that an area's ability to attract and retain a well-educated workforce depends positively on its existing level of human capital.

This relationship between the share of college educated workers and local population growth is thought to be due in part to the many other beneficial effects that educated workers have on their local labor markets. Researchers have suggested that educated workers make other workers in the area more productive. Other researchers have also suggested that educated workers improve the quality of life in the local area by facilitating the existence of endogenous consumer amenities such as parks, theaters, museums, and tolerance of others (Elvery).

Winters (2010) suggests that the connection between human capital and population growth is largely due to the growth of areas that are centers of higher education. Areas that have major colleges and universities receive a considerable in-migration from students pursuing higher education. Many of the students who move to an area for higher education are likely to leave the area after their education is complete, but a significant number may develop location-specific human capital and stay in the area after their schooling is complete. The ability of centers of higher education to retain ex-students causes both population growth and an increase in the average level of human capital. Winters tries to make sense of this explanation for metropolitan areas by separately examining the effect of human capital on the migration rates of those enrolled in higher education and those not enrolled in higher education. He finds that many of the differential in-migration to high human capital metropolitan areas is attributable to persons enrolled in higher education.

This paper will build upon the work of Winters (2010) by investigating the importance of student migration in the relationship between human capital and population growth for municipalities in Massachusetts.

It is worth noting that non-metropolitan areas may face greater challenges in attracting and retaining educated workers. Young college-educated workers may be attracted to large metropolitan areas because they offer higher wages (Elvery, 2010). By examining the role of student migration in each municipality population growth, this paper will offer some insight into the importance of higher education institutions in attracting educated persons to non-metropolitan areas.

The Theoretical Framework:

Looking at Sjaastad (1962), this paper views migration as an investment in human capital. Individuals will maximize their expected utility and choose to move to a new area if it will give them greater utility than their previous location and the utility difference is large enough to compensate for the costs of moving. If the

moving cost are sufficiently small, individuals will move to the location that gives them the highest utility. Although we must note that not everyone's values and desires are not the same; they will vary across individuals.

Winter (2010) paper it argues that student's pursuing higher education are more likely than non-students to move to high human capital area, because they are often the center of higher education. Although it is worth noting that many studies suggest that many of these people who move for higher education are very likely to leave the area once they complete their education (Winter).

Therefore, if location-specific human capital frequently motivates recent in-migrants to remain in the area where they completed their education, areas with a considerable university presence are likely to grow faster than those without, and student migration will play an important role in this growth. Furthermore, the growth will be from highly educated individuals, and the average level of human capital in the area is also likely to increase. Thus, the growth of areas may be strongly affected by their ability to attract and retain individuals pursuing higher education.

Methodology:

This study examines the relationship between human capital and growth by estimating an equation for municipalities with a population greater than 15,000 in Massachusetts between 2010 and 2015. The dependent variable presented in this paper is the population for each municipality. The independent variables used in this research are high school, bachelors, labor force, employed, unemployed, housing units, migration, college town and year. Table 1 displays a detailed explanation and summary of each variable.

Table 1

Variable	Description	Obs	Mean	Std. Dev.	Min	Max
population	population of municipality	156	49152.42	58740.06	13787	667137
highSchool	high school graduates or higher (population 25 years and over)	156	386.7756	405.0591	65	3415
bachelors	bachelor graduates or higher (population 25 years and over)	156	218.7179	248.9567	35	2062
laborForce	in the labor force (population 16 years and over)	156	487534.8	260246.3	39908	888057
employed	employed (population 16 years and over)	156	453548.5	246049.5	37218	832753
unemployed	unemployed (population 16 years and over)	156	33580.49	13979.4	2680	55154
housingUnits	number of houses	153	21352.48	30598.52	2594	272481
migration	Moved from Different County within same state + Moved from different state + Moved from abroad	156	881556.6	451569.1	69971	1567711
colTown	whether municipality is a college town	156	0.1153846	0.3205145	0	1
yr15	year 2015	156	0.5	0.5016103	0	1

The population is gathered from the Quick Facts, published by the United States Census Bureau. The report compiles together a model of the relation between human capital and growth from 2010 and 2015. All independent variables used for research in this paper are compiled from Massachusetts Department of Elementary and Secondary Education or Social Explorer.

Analysis:

A regression of population to all the independent variables was first used to determine which independent variable are insignificant, which were dropped from the final model. However, to ensure that none of the dropped variables were jointly significant, correlation between the independent variables were checked. All of which were jointly significant therefore I could not drop any variables.

More specifically, the following equation is estimated:

$$\begin{aligned} \text{population} = & B0 + B1\text{highSchool} + B2\text{bachelors} + B3\text{laborForce} + B4\text{employed} \\ & + B5\text{unemployed} + B6\text{housingUnits} + B7\text{migration} + B8\text{colTown} \\ & + B9\text{yr15} + u \end{aligned}$$

After regressing this model, at a 5% significance level bachelor's degree or higher (t-score of 3.04) and housing units (t-score of 4.88) are found significant. I then tested for heteroscedasticity and found that it was very heteroscedastic so I ran another regression accounting for this. Although, once I accounted for this, all variables became statistically insignificant at 5% level.

This regression suggests that there is a positive correlation between college towns and non-college towns. For every person who receives a bachelor's degree or higher it suggested that there would be an increase in population by 235 people. Surprisingly, a high school degree (or higher) and labor force was found to have a negative effect on population. But as stated before none of the variables proved to be statistically significant at a 5% level.

Limitations:

Some notable limitations throughout the research process is the lack of data due to resources and time constraint. Several municipalities in Massachusetts had insufficient data resulting to much of it missing. Not only will this lower the quantity of the data but this further hindered the final average number. Therefore, I decided to drop all municipalities that had a population of less than 15,000. Regarding the lack of resources, there were a plethora of data that was available for the counties in Massachusetts and unfortunately not for each individual municipality. To try broaden the range of my data I accounted for these and ran a separate regression based on county rather than municipality. Another limitation, due to time constraint, is was trying to account for relational causality. My data suggests that there is a positive correlation between population and colleges. But whether the number of colleges is a result of the population or vice versa was not considered. Finally, the last limitation that I encountered during this research process was a result that I only examined two time periods. Since the number of colleges does not change very often I was not able to include this variable within my regressions because I could potentially run into issues where this variable has no effect on the population.

Conclusions:

This paper strove to identify the relationships of population, high school graduate (or higher), bachelor's degree (or higher), labor force, employed, unemployed, housing units, migration and college town and year have on the importance of student migration in the relationship between human capital and population growth for municipalities in Massachusetts. As shown in the model there are no variables that are statistically significant. However, from figure 1, you can see that from 2010 to 2015 there was only a handful of towns that have a large significant change in population. Although, due to a lack of data as mentioned before I was not able to account for these which could have lead for a more significant result. Furthermore, figures 2, 3, 4 and 5 are geographic representations (in order as specified) of labor force, education, migration and income. They provide a great depiction of the clusters that are formed within Massachusetts. But as you see from these, an insignificant amount has changed over a five-year span.

To further expand on this this paper in the future I would like to study this relationship on a larger scale (i.e. New England, United States). Which would allow consider more variables that effect the change in population. To do so, I would need to consider other variables that could affect residency/ population such as weather, friendliness of residents, political views, etc.

One last final remark, it is important to note that nothing in this paper should be considered as indisputable. As stated earlier, population may play a bigger role on determining the number of colleges and vice versa. The agreeability of this paper is due to the fact that there has been evidence that suggests that an areas ability to attract and retain a well-educated workforce depends positively on its existing level of human capital, that educated workers make other workers in the area more productive and much more. Therefore, it is impossible to use just population as a single number to accurately explain whether college towns grow faster compared to other towns; which also makes it hard to say with certainty what solely makes a town grow faster.

Appendix:

Figure 1 (*Population Percentage Change 2010-15*)

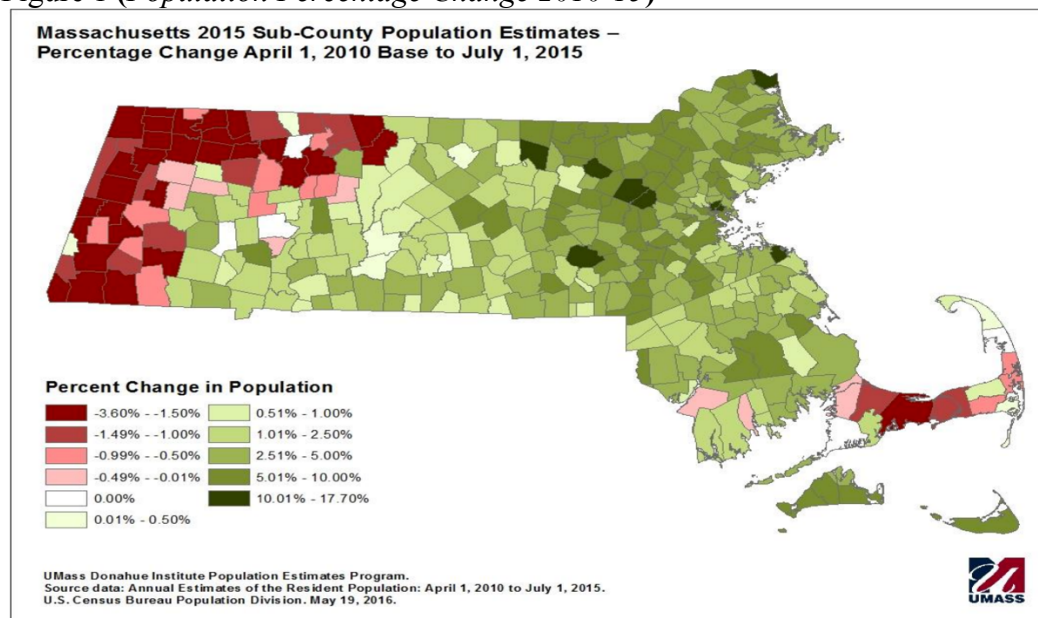


Figure 2(a) *Labor Force 2010*

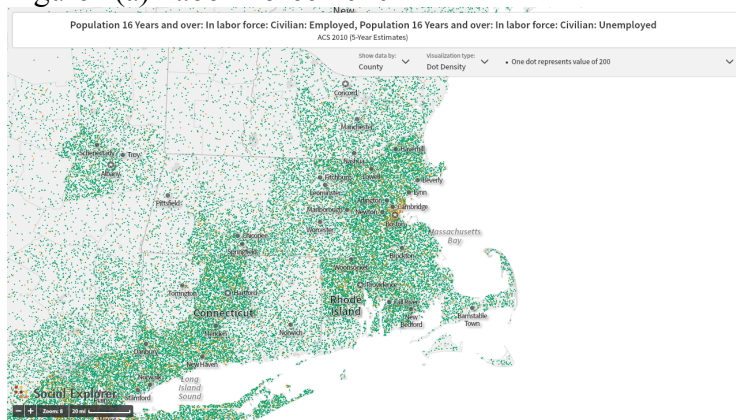


Figure 2(b) *Labor Force 2015*

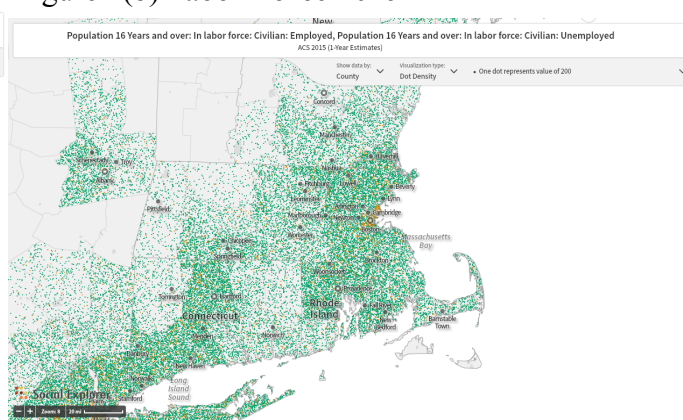


Figure 3(a) *Education 2010*

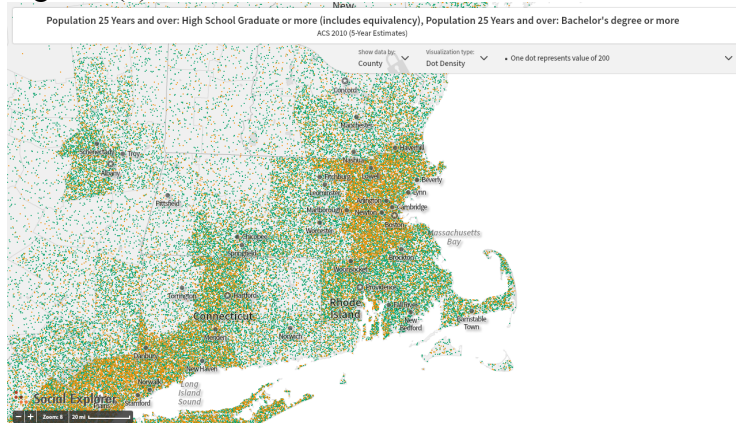


Figure 3(b) *Education 2015*

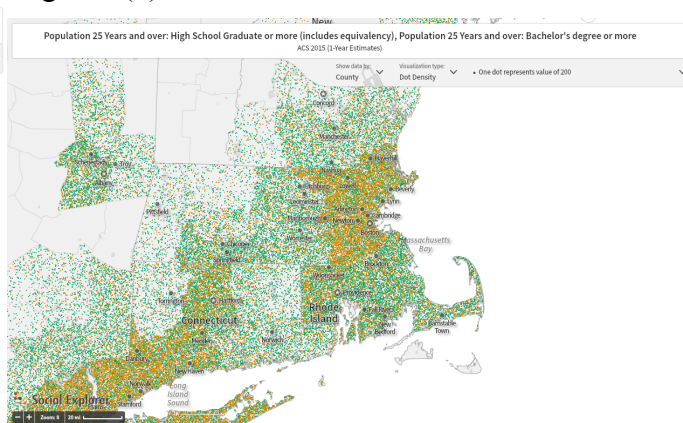


Figure 4(a) *Migration 2010*

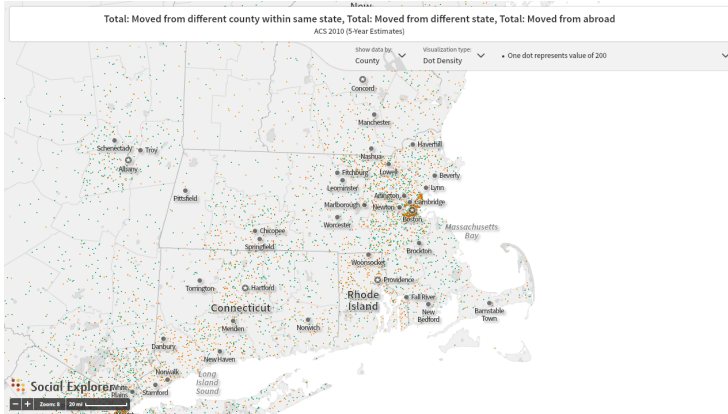


Figure 4(b) *Migration 2015*

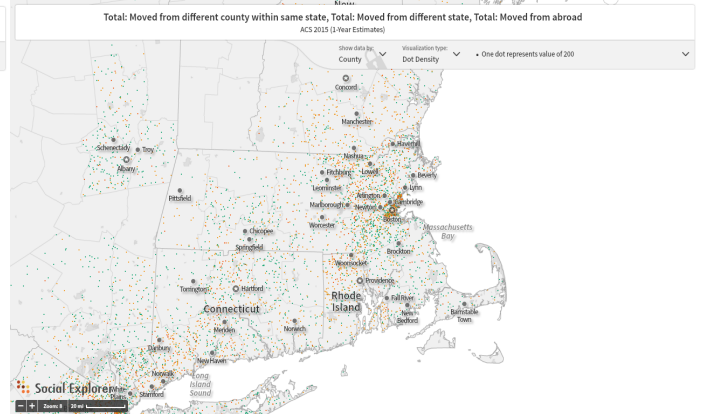


Figure 5(a) *Income 2010*

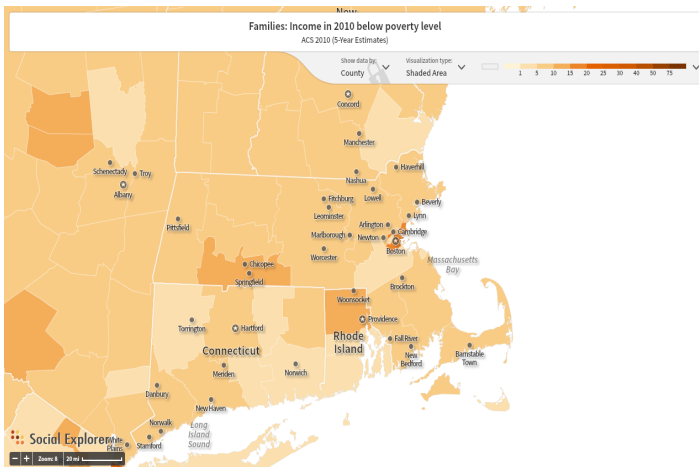
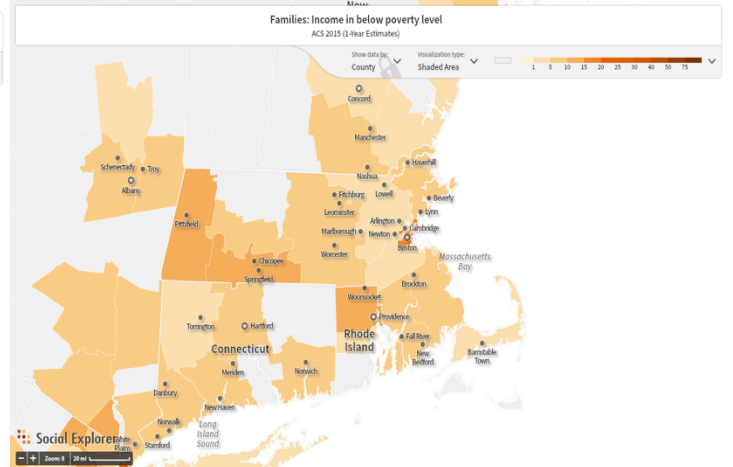


Figure 5(b) *Income 2010*



Michelle Lam
Econ 277: Urban Economics
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