

*How Geography Shapes Postsecondary Opportunity:
Upward Mobility in Education Deserts*

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Geography plays a central role in shaping opportunity in the United States. The magnitude of this relationship is strong, where the chances of escaping poverty or gaining upward mobility depend largely on where one lives (Chetty, Hendren, Kline, & Saez, 2014). Communities with the highest levels of social and economic inequality have the lowest mobility rates, resulting in a complex set of social forces creating and reinforcing inequality. While there is no single solution to reversing intergenerational inequality, colleges and universities likely play an important role to that end. For example, Chetty et al. (2017) recently found that low-income students attending broad-access colleges tend to earn more than their parents, suggesting these institutions are uniquely situated to promote upward mobility. This is consistent with the high levels of intergenerational mobility found in other broad-access public college settings (Attewell & Lavin, 2007).

Unfortunately, the distribution of broad-access public institutions is uneven across the United States where some communities have several options nearby while others have few. The geographic location of colleges matters because most students (66 percent) enroll in a college within just 25 miles from their permanent home address (U.S. Department of Education, 2013).¹ If there is only one broad-access college nearby, then the community has few chances to promote upward mobility through postsecondary education. In these “education deserts,” public broad-access colleges play a unique and even more significant role in promoting upward mobility.

This paper identifies 133 community colleges operating in education deserts, finding they tend to have *higher* rates of upward mobility than other colleges. This is surprising because students living in education deserts have the fewest choices, yet their local public option tends to have higher-than-average mobility rates. This is important because with more students working full-time and caring for dependents, local communities must ensure there are public broad-access

options available to help meet the educational needs of students who need to stay close to home for familial or economic reasons (Turley, 2009). Even having just one public broad-access college nearby can expand opportunities and promote upward mobility.

College Choice and Geography

Most students attend broad-access colleges and universities admitting more than 90 percent of applicants. Using data from the U.S. Department of Education's Integrated Postsecondary Education Data System, Table 1 shows fall undergraduate degree-seeking enrollments by college selectivity. Approximately 57 percent of public sector students enroll in a broad-access institution admitting 90 percent of all applicants; nationwide, half of *all* undergraduate degree-seeking students attend these institutions. In the private non-profit sector, colleges tend to be more selective and most students attend an institution admitting less than 75 percent of applicants.

Table 1:

	<i>Percent admitted</i>				Total
	<50%	50% to 75%	75% to 90%	90%+	
Public two-year	7,046	26,804	5,919	5,592,463	5,632,232
Public four-year	1,006,268	2,671,341	1,464,012	1,210,913	6,352,534
Private non-profit	720,636	996,807	432,442	482,898	2,632,783
Total	1,733,950	3,694,952	1,902,373	7,286,274	14,617,549

Undergraduate enrollment by institutional selectivity

As technology and travel expenses have fallen over time, students have become more mobile in their search for colleges (Hoxby, 1997; Long, 2004). However, the most mobile students tend to be those from more advantaged social backgrounds and from racial/ethnic majority groups (Niu, 2014; Shaw, Kobrin, Packman, & Schmidt, 2009). Most students do not cast national or even regional nets when applying for colleges; rather, the majority of undergraduates looking for four-year colleges only apply to one or two institutions (Avery, Howell, & Page, 2014). Therefore, the image of a highly mobile student shopping around for several colleges is not representative of the typical college student. Most students attend a college located within commuting distance from home, as displayed in Table 2 below.

Table 2:

<i>Distribution of students' distance</i>	<i>Miles from home</i>				<i>undergraduate from home, by sector²</i>
	0-24	25-49	50-99	100+	
Public two-year	83%	9%	4%	4%	
Public four-year	57%	11%	12%	20%	
Private nonprofit	41%	10%	11%	38%	
Total	66%	10%	7%	17%	

Most students attending community colleges and public four-year universities are within 25 miles from home. Alternatively, nearly half (49 percent) of all students attending private non-profit universities travel at least 50 miles from home. This is in part due to the profile of students who enroll in each sector, where private non-profit institutions draw both from a wider applicant pool and select students who are more likely to fit the “traditional” view of a college student living on campus, enrolling full-time, and not caring for dependents (Ehrenberg, 2012; Perna,

2010). In the public sector, students are less likely to fit this description and consequently place and the location of college becomes an important part of the college-choice process (Turley, 2009). These differences are drawn along lines of race and class, where students most affected by geography and those attending broad-access institutions tend to be lower-income and Latino or Black (Kirst, Stevens, & Proctor, 2010).

When communities have colleges nearby, they tend to have higher college participation rates and educational attainment rates. Earlier studies examining the role of community college location on college access established this relationship (Card, 1993; Kling, 2001; Rouse, 1995). Further research extended this work by documenting how proximity to college is particularly important for members of under-represented communities and that the location of college can impose costs on these communities (Briscoe & De Oliver, 2006; Turley, 2009). The location of colleges varies by state and region, yet researchers consistently find negative relationships between distance to college and enrollment (Do, 2004; Franklin, 2013; Griffith & Rothstein, 2009). Distance also shapes educational opportunities through familial and cultural commitments keeping students close to home, especially for students from rural, Latino/a, or Black families (Ali & Saunders, 2008; McDonough, Antonio, & Trent, 1997; Perez & McDonough, 2008).

Upward Mobility Report Cards

This study uses Chetty et al.'s (2017) mobility report card data to determine college mobility rates across the country. To calculate mobility rates, they take the fraction of a) the percent of students who come from the bottom 20 percent of the income distribution as a teenager relative to b) the percent of these students who reach the top 20 percent of the income distribution by age 32. Nationwide, this "bottom-to-top" mobility rate is approximately 1.7 percent regardless of college attendance; importantly, Chetty et al. note (2017, p. 3) that mobility

rates would be 4.0 percent in a perfectly equal society, indicating national mobility rates are far from equal. The mean bottom-to-top mobility rate is 1.98 for college-goers and 1.33 for non-goers, though this rate varies considerably by sector.³

While this measure of mobility is helpful, it represents movement across two extreme tails of the income distribution; an alternative measure can be created using the Chetty et al. (2017) publicly accessible dataset.⁴ Table 3 shows all possible combinations of upward mobility, each of which are calculated the same way as bottom-to-top mobility but for different mobility bands. For example, this table shows that 2.6 percent of college students went from the first quintile to the second quintile (going from the lowest to second-lowest income quintile). But it also shows the bottom-to-top mobility rate, or those who moved from the bottom to the top.⁵

Table 3:
Upward mobility rates by mobility band and sector

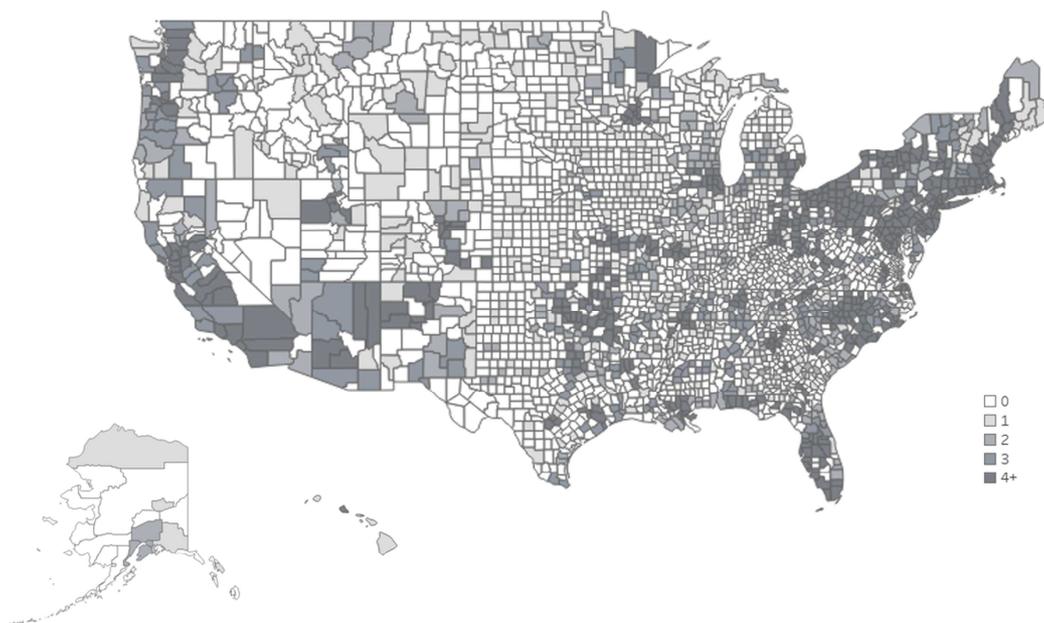
	Public two-year	Public four-year	Private non-profit	Total
1st-2nd	0.044	0.023	0.013	0.026
1st-3rd	0.043	0.027	0.016	0.028
1st-4th	0.029	0.028	0.018	0.024
1st-5th	0.017	0.023	0.017	0.018
2nd-3rd	0.026	0.036	0.032	0.031
2nd-4th	0.042	0.042	0.033	0.038
2nd-5th	0.026	0.036	0.032	0.031
3rd-4th	0.056	0.055	0.051	0.054
3rd-5th	0.038	0.051	0.054	0.048
4th-5th	0.048	0.075	0.084	0.069

Calculating these alternative mobility rates offers a more granular view of intergenerational mobility across institutions, allowing us to see whether mobility changes at different points of the distribution. For example, students who attended community colleges

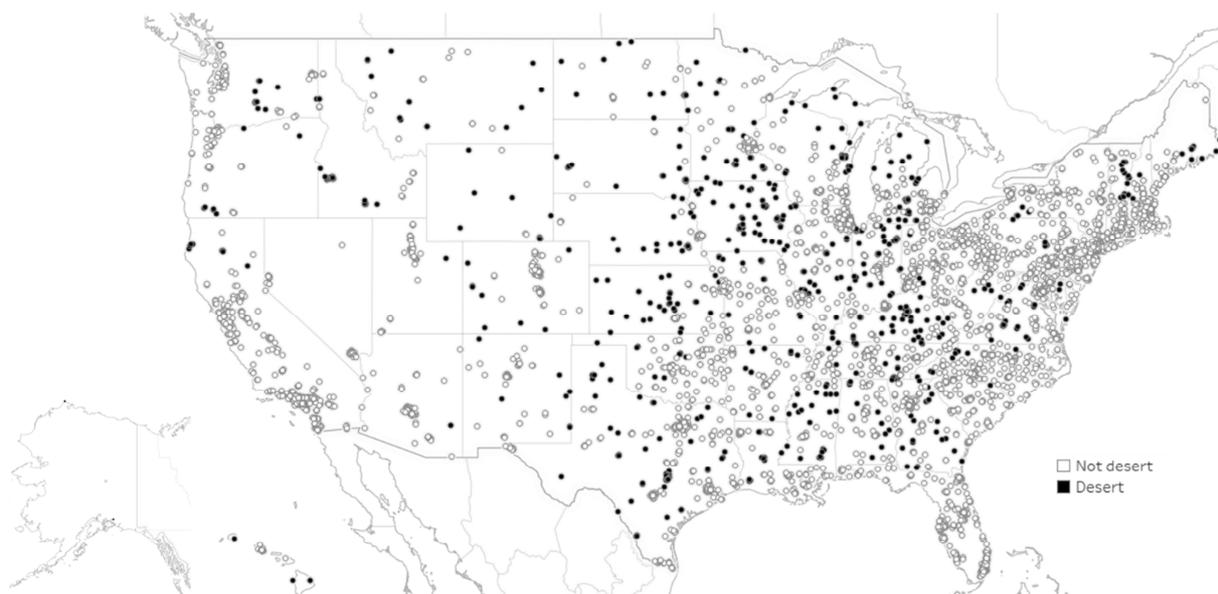
experienced above-average mobility rates when moving from the lowest quintile to the second, third, and fourth quintiles. They also experienced above-average mobility when moving from the second and third quintiles to the fourth. Public two-year colleges (hereafter, “community colleges”) generally have high mobility rates for students who came from low and middle-income families and less mobility for those coming from higher income families. Similar patterns occur for public four-year colleges, though their above-average mobility rates often come when moving students into the fourth and fifth quintiles. Non-profit colleges have below-average mobility for students who come from low-income families, while their highest mobility rates come at the top-end of the income distribution (e.g., moving students from the third and fourth quintiles into the fifth).

Identifying education deserts

Although public broad-access colleges offer opportunities for upward mobility, particularly for low and middle-income students, they are not evenly distributed across the country. Some communities have none nearby, while others have several and still others have but one, as shown in Figure 1. This map counts the number of public broad-access colleges per commuting zone, where those with the most colleges nearby are shaded in darker colors. Similar to metropolitan and micropolitan statistical areas, a “commuting zone” is a cluster of counties sharing a high degree of economic and social integration (Tolbert & Sizer, 1996; U.S. Department of Agriculture, 2016). But unlike metro/micro areas, commuting zones are not based on population size and they include rural counties, meaning all 3,141 counties in the United States are associated with one of 709 commuting zones. The average commuting zone has two community colleges and one public four-year university.⁶

Figure 1:*Number of public broad-access colleges per commuting zone*

When a commuting zone has: (a) zero public broad-access colleges or (b) *one* community college is the sole public broad-access institution nearby, it is classified as an “education desert” in this paper.⁷ In these communities, students have no alternative options located nearby if they are interested in attending a public broad-access institution. To the extent alternative colleges exist in these communities, they are by definition a public or private non-profit four-year institution that has selective or moderately selective admissions. Approximately 11 percent (n=828) of the nation’s 7,372 colleges and universities are located in education deserts.⁸ These institutional also account for about 11 percent of the nation’s undergraduate degree-seeking student population (1.8 million of 16.0 million). Education deserts are disproportionately public, where 81 percent of students enroll in the public sector compared to 74 percent in non-deserts.

Figure 2:*Location of colleges by education desert status*⁹

For example, the commuting zone of Chattanooga, Tennessee, has an adult population of nearly 205,000 across an eight-county area. There are 12 colleges located here, enrolling approximately 25,000 undergraduates: two publics enrolling 18,500 and ten privates enrolling 6,500. The two publics include a community college (Chattanooga State Community College) and a moderately selective public four-year university (University of Tennessee - Chattanooga) admitting around 75 percent of applicants. Despite being the only public broad-access college nearby, Chattanooga State Community College plays a unique role in this commuting zone because of its 4.4 percent mobility rate for first-to-second income quintiles, which is higher than the commuting zone (2.4 percent) and national average (2.6 percent), yet equal to the average community college (4.4 percent).

Data and Analysis

The analysis merged institution-level data from the U.S. Department of Education’s Integrated Postsecondary Education Data System (IPEDS) and College Scorecard with Raj Chetty et al.’s (2017) Mobility Report Card. The merged IPEDS-Scorecard data (n=7,330) provides admission, enrollment, transfer, and basic directory information on each college in the sample. The IPEDS-Scorecard directory information provides georeferenced data including county FIPS, Census region, and latitude and longitude, enabling a merge with the Chetty et al. (2017) county-to-commuting zone crosswalk.¹⁰ Additional county-level data for 2013 were then aggregated to each commuting zone, including: adult population (age 25-64), personal income, unemployment, and educational attainment data from the U.S. Census Bureau-National Center for Health Statistics (2014), Bureau of Economic Analysis (2015), Bureau of Labor Statistics (2014), and the Census’ American Community Survey (2015), respectively. These merges provide insights into the economic and demographic characteristics of the surrounding communities in which colleges and universities operate, namely allowing for the identification of “education deserts” – commuting zones with zero or one public broad-access institution.

While the IPEDS-Scorecard data includes nearly the full universe of colleges and universities located in the United States, the Mobility Report Card data is more limited in its coverage. After merging this data to the files described in the prior section, the final analytical sample (n=1,740) resulted in 607 public two-year, 415 public four-year, and 718 private non-profit colleges, or 53 percent of institutions in these three sectors (U.S. Department of Education, 2015). These 1,740 institutions enrolled 10 million undergraduate degree-seeking students in 2013-14, which is approximately 57 percent of the nation’s total (17.4 million).¹¹ Table 4 provides descriptive statistics for these variables.

Table 4:

Descriptive statistics of variables used in analysis

	Full sample		Education deserts	
	mean	s.d.	mean	s.d.
Undergraduate Enrollment	5,758	6,566	4,232	5,735
Percent White	0.61	0.21	0.71	0.17
Percent Black	0.14	0.17	0.10	0.13
Percent Hispanic	0.11	0.13	0.09	0.13
Percent Admitted	0.79	0.22	0.79	0.20
Percent Low Income	0.48	0.19	0.44	0.18
Transfer-out Graduates	0.08	0.03	0.09	0.03
Mid-Eastern	0.18	0.26	0.03	0.16
Great Lakes	0.16	0.38	0.03	0.16
Plains	0.10	0.36	0.18	0.39
Southeast	0.27	0.30	0.28	0.45
Southwest	0.09	0.44	0.25	0.43
Rocky Mountains	0.03	0.28	0.12	0.33
Far West	0.11	0.18	0.07	0.25
Mountain	0.11	0.31	0.04	0.20
CZ Number of Colleges	13.58	16.49	2.27	1.41
CZ Adult Population	445,491	965,476	61,954	100,110
CZ Per Capita Income	43,359	12,281	38,385	8,309
CZ Percent BA+	0.28	0.10	0.23	0.08
CZ Unemployment Rate	0.07	0.02	0.07	0.02
CZ Gini Coefficient	0.46	0.08	0.40	0.08
CZ Upward Mobility	0.08	0.03	0.10	0.04
n	1740		299	

The outcome of interest is each college's upward mobility rate, which is a continuous variable believed to be shaped by both the college and the economic/demographic characteristics of its commuting zone. Accordingly, the analysis implements the following ordinary least squares regression model:

$$y_i = \alpha + \beta * Des_i + \beta * X_{iz} + \varepsilon$$

where y is the mobility rate for each institution (i), Des measures whether the college is located in an education desert, and X is a vector of the institutional and commuting zone controls described in Table 4, while the error (ε) is clustered at the commuting zone.

Limitations and Considerations

When interpreting results, please note the following data limitations. First, the Mobility Report Card includes just over half of all colleges and undergraduate students in the United States; it is not the full universe of colleges or college students. Additionally, the analytical sample excludes private for-profit and online colleges because so few for-profits were included in the Mobility Report Card and because many are not strictly brick-and-mortar institutions located in commuting zones (all colleges public or private that operate primarily online are excluded from the analysis). The Mobility Report Card assigns students to the college “most-attended” by age 20 and follows students into their early 30s, regardless of whether the student graduated from their assigned college. Therefore, mobility rates should be interpreted as having contact with a college and not graduating from a college.

Key Findings

After controlling for a number of college and commuting zone characteristics, three key findings emerge from this analysis: 1) upward mobility is often *higher* in education deserts, 2) *community colleges* in deserts account for much of this difference, and 3) community college mobility is concentrated at the *lowest* end of the income distribution. The tables and figures below are all based on the estimates produced in the regression tables presented in Appendix A.

Upward mobility is often higher in education deserts. Table 6 presents the regression-adjusted upward mobility rates for each mobility band after controlling for each college’s enrollment profile and local commuting zone characteristics. These estimates represent the

average adjusted predictions for each institution in the analysis, based on the regression estimates for the full model using Stata's *margins* command. For example, after controlling for college and commuting zone characteristics, community colleges operating in non-deserts have an average mobility rate of 2.8 percent. Community colleges in education deserts have mobility rates of 3.0 percent, or 0.02 percentage points higher than non-deserts.

Table 6:

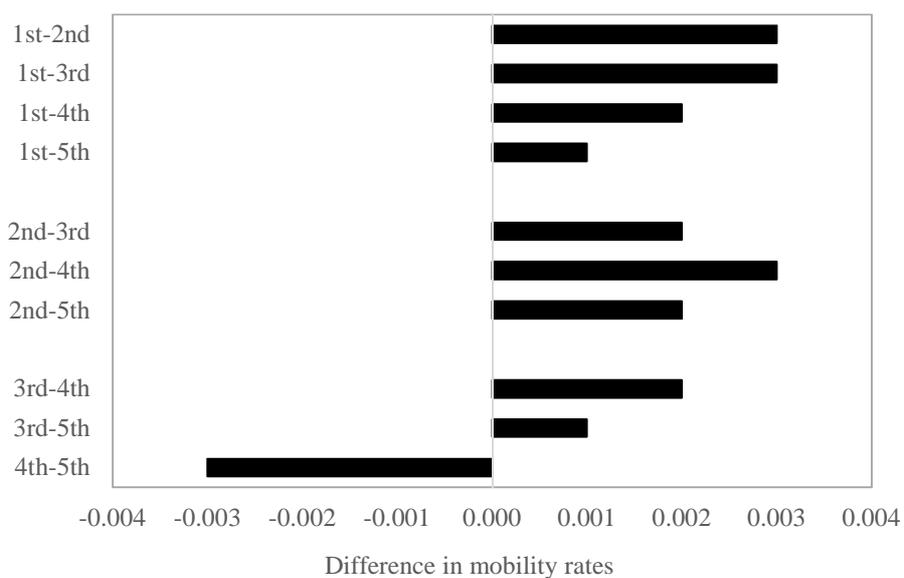
Regression-adjusted upward mobility rates by mobility band and sector

	<i>Non-deserts</i>			<i>Deserts</i>		
	Public two-year	Public four-year	Private non-profit	Public two-year	Public four-year	Private non-profit
1st-2nd	0.028	0.024	0.025	0.030	0.026	0.027
1st-3rd	0.027	0.028	0.028	0.032	0.030	0.029
1st-4th	0.018	0.029	0.026	0.022	0.031	0.028
1st-5th	0.014	0.022	0.019	0.017	0.023	0.020
2nd-3rd	0.027	0.035	0.031	0.032	0.035	0.031
2nd-4th	0.030	0.044	0.041	0.035	0.046	0.044
2nd-5th	0.027	0.035	0.031	0.032	0.035	0.031
3rd-4th	0.045	0.060	0.057	0.047	0.062	0.062
3rd-5th	0.044	0.050	0.049	0.046	0.051	0.050
4th-5th	0.068	0.073	0.069	0.066	0.072	0.064

Figure 3 plots the regression coefficients for colleges located in education deserts versus those in non-deserts. Colleges located in deserts have average mobility rates that are significantly higher than community colleges in non-deserts for five of the ten mobility bands. For example, the predicted first-to-second quintile mobility rate is 2.8 percent for colleges located in education deserts and 2.6 percent in non-deserts. This .2 percent difference is statistically significant and we find similarly sized (and statistically significant) differences when moving from the first-to-third and from the first, second, or third-to-fourth quintiles. The other differences, including the

only negative one found in the fourth-to-fifth quintile, are not statistically distinguishable from zero. Therefore, even if a college operates in a community with few public alternatives nearby, that college often has above-average mobility rates.

Figure 3:

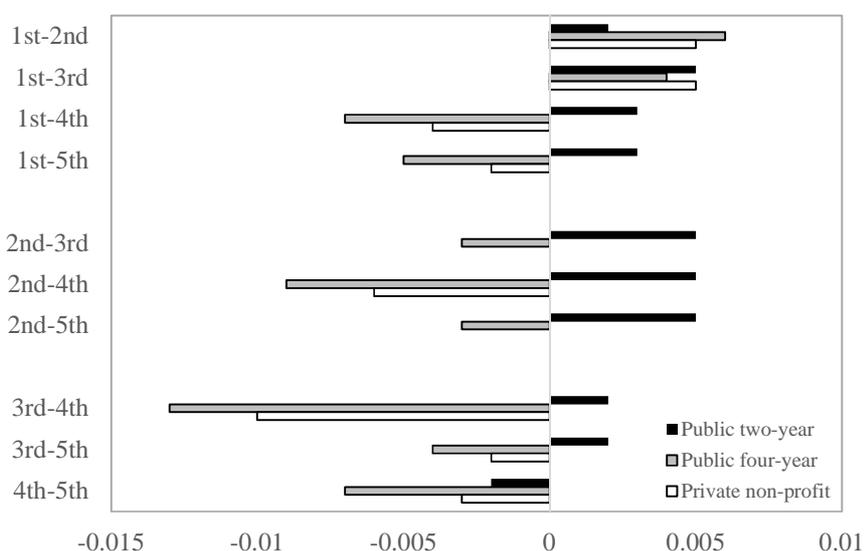


Regression-adjusted differences in mobility rates for education desert versus non-desert colleges

Community colleges in deserts account for much of this difference. While the first finding lends support to the possibility that isolated colleges play an important role in shaping mobility, we now shift attention to the unique role community colleges play in their local communities. Since education deserts are defined as communities with no or only one public broad-access institution, the previous finding could simply be driven by highly-selective colleges located in places with no or only one public community colleges. This does not appear to be the case, as shown in Figure 4 below where upward mobility rates for community colleges is often significantly higher than other colleges.

Figure 4:

Difference in community college mobility rates for colleges operating outside of education desert



Upward mobility rates for community colleges operating in education deserts are consistently higher than community colleges operating outside of education deserts. Across all

income mobility bands except for fourth-to-fifth, community colleges located in education deserts have 0.3 to 0.5 percent higher mobility rates than community colleges in non-deserts. This relationship is statistically significant in six of ten mobility bands, but only when moving from the first two income quintiles to the third or higher. For example, the average community college operating outside an education desert has a first-to-third mobility rate of 2.7 percent, but this is 3.2 percent in education deserts. This 0.5 percent difference is statistically significant, suggesting community colleges serving education deserts have higher mobility rates than those in non-deserts.

While community colleges in education deserts have higher mobility rates than those located in non-deserts, the mobility rates are not large enough to surpass the mobility offered by public four-year or private non-profit colleges. For example, the average public four-year university not located in an education desert has a third-to-fourth upward mobility rate of 6.0 percent. Community colleges located in education deserts have 4.7 percent, a full 1.3 percent lower (as displayed in Figure 3 and Appendix B). While community colleges operating in deserts have higher mobility rates than those in non-deserts, their mobility rates are not as high as other types of colleges operating outside education deserts. This is consistent with the descriptive statistics presented in Table 3, where mobility rates at the high-end of the income distribution are typically lower for community colleges. That is, public four-year and private non-profit colleges have greater mobility success when enrolling students from wealthier families while community colleges have higher mobility rates for students from lower-income families.

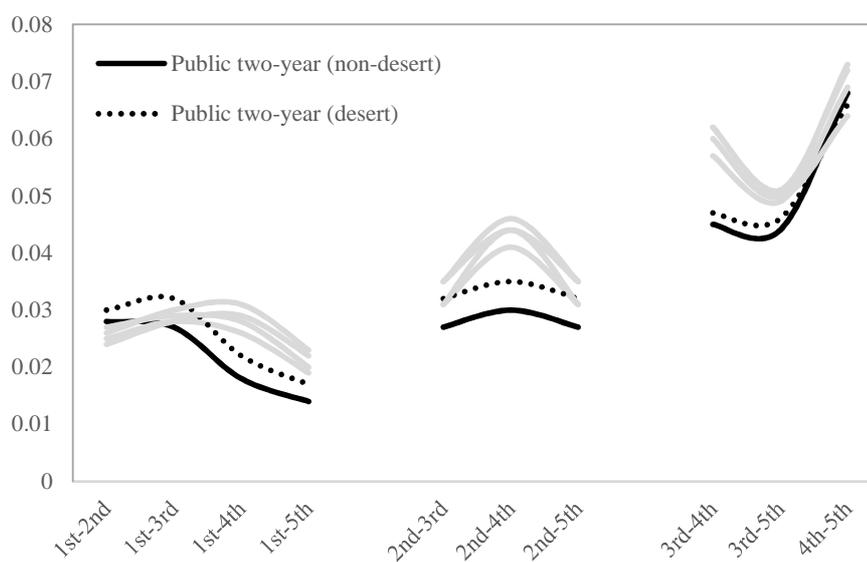
Community college mobility is concentrated at the lowest end of the income distribution.

In both of the previous findings, education deserts in general and community colleges in particular are associated with higher upward mobility rates than colleges operating outside of

deserts. But these differences are not found across all ranges of the income distribution; in fact, most of the difference in upward mobility rates occurs at the lowest-end of the income distribution. Figure 5 shows this phenomenon by presenting the regression-adjusted mobility rates for community colleges in and out of deserts.

Figure 5:

Regression-adjusted mobility rates for public two-year colleges¹²



In this figure, we see few instances where community colleges have higher mobility rates than other sectors: the first-to-second and first-to-third mobility bands are where community colleges produce higher mobility rates than any other sector. But moving up to higher bands, these institutions (regardless of desert status) tend to have lower mobility rates than other institutions. Mobility still rises, but the relative position of community colleges compared to other institution types starts to diminish at higher ends of the mobility distribution. That these results diminish the further one goes up the mobility distribution suggests community colleges

(and those in deserts, in particular) play a significant role in promoting upward mobility for people born into the poorest families.

Implications and Conclusion

When students choose colleges, they often stay close to home and search for institutions that are within commuting distance. This is particularly the case with today's college students, who are more likely to be older, care for dependents, and attend college part-time. For these students, having public broad-access colleges nearby can be an avenue to upward mobility; however, many communities across the country have limited access to these institutions. In fact, many communities have only one public broad-access institution from which students can choose to enroll. In these "education deserts," the local college has an extraordinary role in promoting upward mobility because it is one of the few social institutions that can move people out of poverty and up the income distribution. But does this happen? This study sets out to answer this question, concluding "yes," colleges operating in education deserts tend to have higher than average mobility rates.

This is a surprising and important finding with three main implications. First, it complicates the notion that "shopping around" for college will necessarily yield better educational outcomes for students. While more choices can expand opportunities (Smith, 2014), the results presented here suggest having few choices can still generate positive outcomes. That is, just because a student has one public option nearby does not necessarily mean they will have poorer life chances. Even when students have limited access to colleges – public broad-access institutions, in particular – they have a good chance at improving their upward mobility rate. An implication of this finding is that students who need to stay close to home for college are not necessarily harmed by having fewer public options; their local public college may be an effective

avenue out of poverty. Therefore, policy solutions to help students “shop around” for colleges may be of little utility to a student who needs to stay near home and their local public option already promotes upward mobility.

Second, this study affirms the notion that community colleges are an important social institution – and arguably one of the most important – for local communities. Having a public broad-access college nearby is likely to promote mobility that can ultimately help reverse intergenerational inequality. While this study cannot draw causal inference, results should be interpreted in light of research on the returns to education, which consistently find positive economic and social benefits associated with an additional year of schooling. Associates degree earners, in particular, have high economic gains over high school diplomas and other shorter-term credentials (Belfield & Bailey, 2017). And considering that nearly half of all bachelor’s degree recipients attended a community college at some point in time, the upward mobility rates described here are likely to represent a conservative estimate of community colleges’ role in promoting upward mobility (National Student Clearinghouse, 2017). Therefore, states seeking to improve upward mobility for citizens may choose to invest in educational opportunities for communities with low mobility rates. Opening a community college where there currently is none may be an effective way to promote mobility. If a selective public four-year institution is the only public option located nearby, then opening access (via admissions policy) to local residents may be another viable pathway for improving upward mobility.

Third, this study found some of the greatest mobility occurs at the lowest-end of the income distribution. On one hand, this is a positive finding because it shows how colleges can lift people out of poverty. On the other hand, it is uncommon for colleges in education deserts to experience high mobility rates at the top-end of the income distribution. As a result, a person

living in an education desert may need to attend college outside their commuting zone in order to experience the highest mobility gains. Whether this is feasible for students working full-time and caring for dependents is worthy of further research. It is also unclear what specific public policy instruments would be most effective and fair in terms of facilitating geographic mobility. One solution may be expanding online education, but the literature to date leaves much to be desired in terms of the quality of education received via online platforms (Bettinger & Long, 2016; Jaggars, Edgecombe, & Stacey, 2013; Xu & Jaggars, 2013). Another may be converting two-year colleges into four-year institutions, or at least encouraging these institutions to offer more advanced degrees beyond the associate's. Regardless of the solution, the question remains whether moving the lowest-income groups into the second or third quintiles is sufficient for upward mobility.

This study set out to explore whether communities with the fewest options nearby still experienced high mobility rates, and the short answer is “yes.” Even when choices are few, students can still experience high mobility rates through their local public broad-access college. This should help researchers and policymakers rethink the contributions of these colleges, especially when these institutions are under public scrutiny for perceived poor performance outcomes. By focusing on social mobility as an outcome, rather than graduation rates, affordability, or retention, then public broad-access institutions perform quite well compared to other types of colleges. This is especially true in communities with the fewest choices nearby, suggesting that the local public college plays a crucial yet perhaps underappreciated role in promoting upward mobility.

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End Notes

¹ Data excludes students enrolled exclusively online (variable name “ALTONLN2” in the National Postsecondary Student Aid Survey).

² National Postsecondary Student Aid Study, 2012, using variables: SECTOR4, DISTANCE and ALTONLN2, and WTA000. This excludes students enrolled exclusively online.

³ See Panel C of Table 1, page 64 in Chetty et al. (2017).

⁴ To download the data, go to <http://www.equality-of-opportunity.org/data/>

⁵ Note it still includes the “bottom-to-top” mobility rate represented by “1st to 5th” which is slightly lower than that reported by Chetty et al (2017) since this analysis excludes public universities reporting as systems (e.g., University of Wisconsin System rather than University of Wisconsin-Madison or University of Wisconsin-Milwaukee).

⁶ Table 4 presents statistics on the number of colleges per commuting zone, resulting in different estimates that this figure. This is because the figure stated in this sentence includes commuting zones with no colleges, while Table 4 includes only those commuting zones with one or more colleges.

⁷ This definition is slightly broader than Hillman & Weichman’s (2016) earlier classification that defined deserts as commuting zones with *no colleges* in part “a” rather than *no public broad-access colleges* as we use in the current study.

⁸ 7,372 represent the total IPEDS count for 2013, including degree-granting and non-degree granting institutions.

⁹ Please see this interactive map for data and details:

<https://public.tableau.com/profile/publish/WilliamMaryMobilityConference/Sheet1#!/publish-confirm>

¹⁰ Institutions with a majority of students enrolled online were excluded.

¹¹ This comes from the College Scorecard variable “ugds” which measures fall enrollments, derived from IPEDS.

¹² Gray lines represent public four-year and private non-profit colleges in and out of deserts.