

February 2011

Examining Factors Related to Enrollment Lower Net Tuition Associated with Higher Enrollment of Low-Income Students Nationally

Research has shown that low-income students do not enroll in or complete college at the same rate as their higher-income peers. As the changing demographics in the United States bring greater economic stratification, challenges to higher education enrollment and degree production will increase. This poses a problem for an economy that is predicted to require a higher proportion of individuals with a college degree.

BACKGROUND

A growing number of Americans live in poverty. According to the United States Census Bureau, the poverty rate in 2009 (14.3 percent) was at its highest level since 1994 and the number of people in poverty in 2009 (43.6 million) is the largest it has been in the 51 years the data have been published. Most recently, between 2008 and 2009, the poverty rate increased for children under the age of 18 (from 19.0 percent to 20.7 percent) and people age 18 to 64 (from 11.7 percent to 12.9 percent).

Along with the growth of the general population who are low-income, low-income student enrollment in postsecondary education has increased greatly over the past three decades. However, there is a large gap in the ratio of low-income and higher-income students who enroll (Wilder, 2007). While the college enrollment rate for students from low-income families has increased over the past 35 years, the rate for students from higher-income families has grown much faster. According to recent research the enrollment gap stands at 40 percent to 81 percent respectively (Engle and O'Brien, 2007).

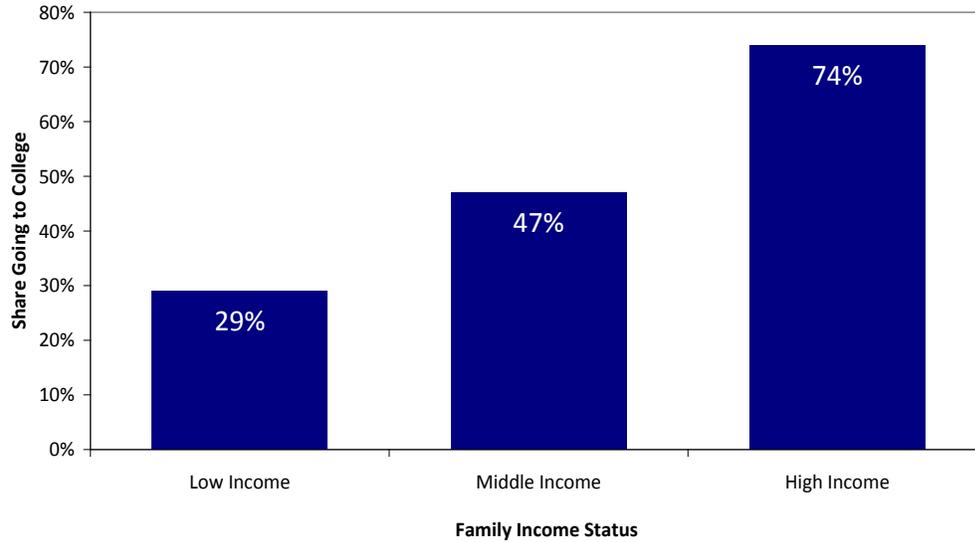
Lower enrollment rates of low-income students are not reflective of academic ability. When looking at high performing students, those who are low-income complete college at a lower rate. Chart 1 illustrates College Board research that supports this point; it looks at share of students attending college from a pool who had done well on an assessment in 8th grade. The share attending college is dramatically lower for low-income families (29 percent) compared to higher income (74 percent).

This is one in a series of research-based briefs prepared by the Minnesota Private College Research Foundation for Minnesota Private College Council members and other interested parties.

If you have a question or suggestion for a topic for a future issue brief, please contact the Research Foundation.

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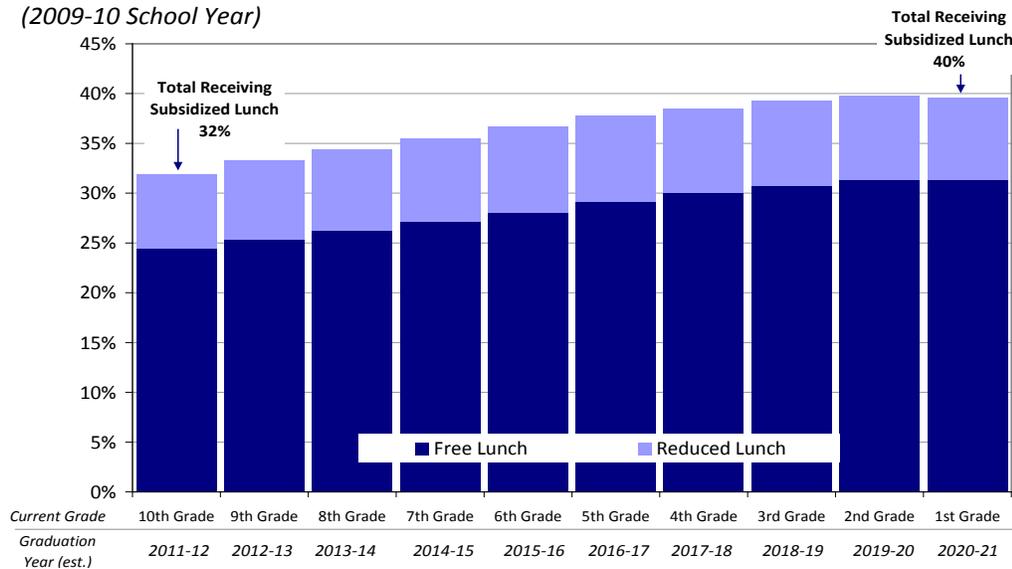
**Chart 1: High Ability Eighth Graders:
Low-Income Students Less Likely to Complete College**



Source: College Board *Education Pays* report 2007.

In Minnesota the coming years will see increases in high school graduates coming from low-income families. As illustrated in chart 2, 32 percent of 10th grade students in 2009 receive free or reduced lunch. This compares to 40 percent of first-graders in the same year. If this pattern holds, each graduating class will have a higher proportion of low-income students than the previous.

**Chart 2: Low-Income Student Growth:
Percent students receiving subsidized lunch by grade and anticipated year of graduation
(2009-10 School Year)**



Source: Minnesota Private College Research Foundation analysis of Minnesota Department of Education enrollment data.

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The under-representation of low-income students in higher education poses economic problems to the extent it contributes to the United States failing to maintain or increase postsecondary degree production. The likelihood of matching the jobs that will be created over the next decade and the education and training of our adult workers may be low if the proportion of low-income, college-age individuals enrolling in higher education does not increase. Further, postsecondary education and training is quickly becoming the only viable path to the American middle class. Estimates suggest that the postsecondary education and training system will fall short by three million or more postsecondary degrees; that kind of breakdown in the ability to meet employers' needs would have a negative impact on the economy and decrease access to a middle class (or greater) career (The Georgetown University Center on Education and the Workforce, 2010).

The country faces demand for more individuals to attain a postsecondary degree to keep pace with a global economy, replace retirees who have a college education and foster new economic growth. Thus, enrolling students from low-income families is crucial. Increasing aid to lower net tuition or improving college preparation has been offered as part of the solution to diminish the enrollment gap by socio-economic status. This research contributes to previous scholarly work on factors related to college enrollment by examining the relationship of grant aid and published tuition with low-income student enrollment at four-year institutions.

PREVIOUS RESEARCH SUMMARY

Previous research suggests that increases in cost negatively impact individuals' enrollment decisions (Leslie and Brinkman, 1987; Hossler, Braxton, and Coopersmith, 1989; Savoca, 1990; St. John, 1990; Kane, 1995; Heller, 1997; and Paulsen, 2002). Foundational research from Leslie and Brinkman's (1987) meta-analysis of 25 quantitative studies found evidence that tuition increases resulted in declines in the college participation rate of approximately 0.75 percent per \$100 tuition increase. Similarly, St. John (1990) found that a \$1,000 increase in tuition is related to a 2.8 percent decrease in enrollment.

While increases in cost are negatively associated with enrollment, financial aid has been found to improve enrollment odds. It is well documented using various methods that tuition remediation strategies (merit and/or need-based state and federal grants or loans) have been found to be predictors of individual enrollment decisions (Leslie and Brinkman, 1987; St. John, 1990; Moore, Studenmund, and Slobko, 1991; McPhearson and Schapiro, 1994; Reyes, 1994; Kane, 1995; Heller, 1997; Avery and Hoxby, 2000; and Perna and Titus, 2002). Receiving grant aid, whether the sources are from the institution or government, reduces published tuition. Published tuition after grant aid is referred to as net tuition. Avery and Hoxby (2000) found the student enrollment decision to be rational driven by receipt of financial aid. Earlier, St. John (1990) modeled the change in probability of enrollment given effects of tuition change, grants and loans and found that all variables had a role in effecting enrollment. Moore, Studenmund, and Slobko (1991) found only grant aid was most effective (meaning more effective than loan or tuition change) indicating \$1,000 in grant aid increases the probability of student enrollment by nearly eight percent.

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Along with net tuition paid after grant aid, other factors have been found to be related to enrollment decisions, such as parents' educational attainment and academic preparation in high school (Choy, 2002; Adelman, 2006). Further, demographic variables may be associated with changes in enrollment such as growth of various subgroups or the population in general. Controlling for demographic data is also part of this analysis.

DATA AND METHOD

Data for higher education variables are obtained from the Integrated Postsecondary Education Data System (IPEDS). For the year 2007-08, a total of 1,669 four-year degree granting (primarily baccalaureate or above) institutions were used to calculate state data aggregations. All 50 states and the District of Columbia are included in the research.

This research examines the association between multiple factors and low-income enrollment. Therefore, ordinary least squares (OLS) regression is suitable for the analysis. The OLS regression will examine the relationship that the eight independent variables have with the dependent variable enrollment rate of low-income students as measured by the percent of an institution's enrollment receiving Pell Grants.

Independent variables are obtained from IPEDS, National Postsecondary Student Aid Study (NPSAS:08), ACT and the United States Census Bureau. Descriptive statistics are provided in table 1. All independent variables represent the year 2007-08.

Data from NPSAS reflect college students from families at or below 200 percent of federal poverty guidelines for 2008. A limitation of the NPSAS data (Level of Low-Income Parent's Educational Attainment, Low-Income Students Years of Math Completed, and Percent of Low-Income Students Earning Advanced Placement Credit) is that these data represent the attributes of low-income students actually enrolled and not the attributes of all high school students prior to enrollment. If data reflected the latter, the results might better explain the relationship with later college enrollment.

Table 1: Descriptive Statistics for Variables in Analysis

	Minimum	Maximum	Mean	Std. Deviation
Percent Enrollment Pell	10.0%	41.0%	24.2%	6.0%
Published Tuition (000's)	\$33.7	\$238.5	\$136.4	\$46.8
Enrollment (000's)	0.1	7.4	1.7	1.6
Average Grant Aid (00's) – all sources	\$28.9	\$111.6	\$67.7	\$19.3
Median Household Income (000's)	\$37.8	\$70.5	\$52.1	\$8.5
Percent of Population in Poverty	6%	15%	9%	2%
Average ACT Composite	18.9	23.6	21.5	1.1
Level of Low-Income Parent's Educational Attainment	0	6.5	4.0	1.1
Low-Income Students Years of Math Completed	0	3.8	3.3	.8

Note: Advanced placement and total population were also considered for inclusion model but were removed due to multicollinearity problems.

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FINDINGS

Ordinary Least Squares (OLS) regression is appropriate as it can examine relationships between many variables at once — controlling for each one's effect on the dependent variable of interest. Table 2 summarizes the OLS regression results. Only the direction of relationship for statistically significant independent variables is provided (+ = positive, – = negative).

Table 2: OLS Regression Results Using Published Tuition Independent Variable

Independent Variables	Dependent Variable
	Percent Enrollment Receiving Pell Grant
Published Tuition	–
Enrollment	
Average Grant Aid (all sources)	+
Median Household Income	
Percent of Population in Poverty	+
Average ACT Composite	
Level of Low-Income Parent's Educational Attainment	
Low-Income Students Years of Math Completed	

DISCUSSION

Findings in table 2 indicate a positive relationship between the percent of enrollment receiving Pell Grant and average grant aid received as well as the percent of a state's population in poverty. Additionally, there is a negative relationship between published tuition and low-income enrollment. This passes a face validity test and supports previous scholarly work examining factors related to enrollment. Specifically, the research confirms the relationship that higher grant aid and/or lower tuition corresponds with higher enrollment of low-income students.

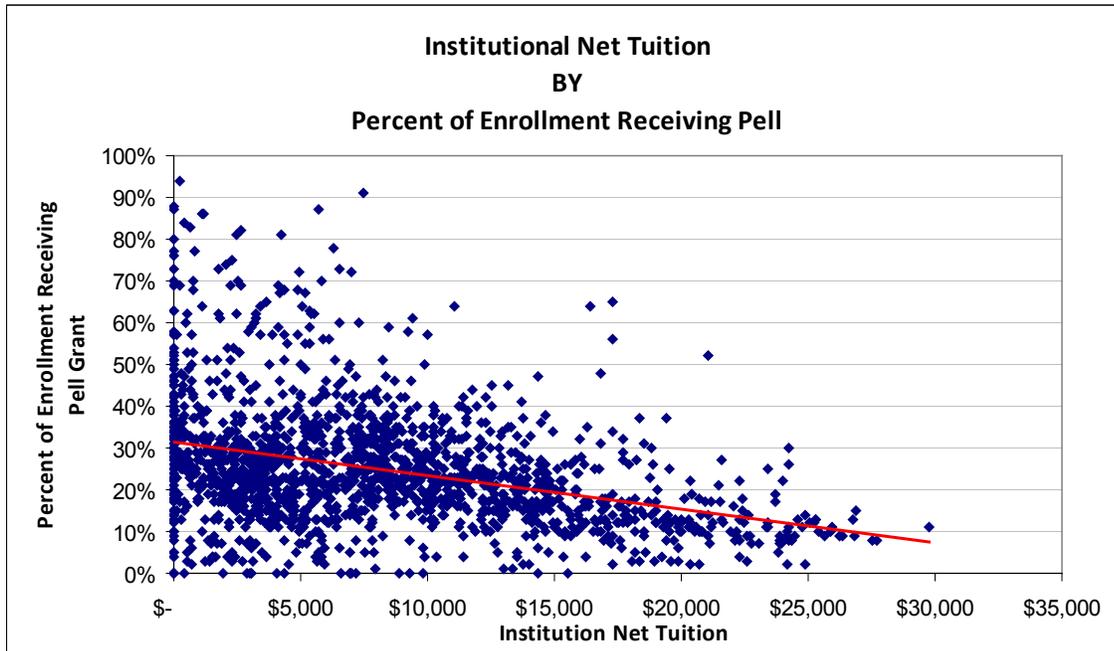
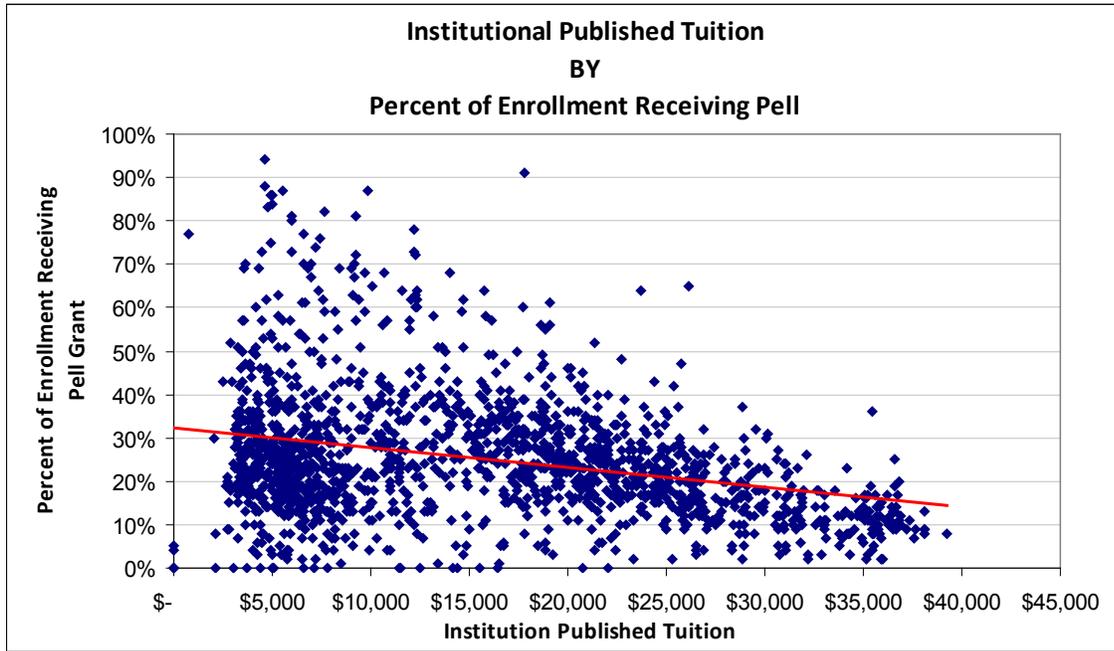
The negative relationship between low-income enrollment and published tuition may suggest that institutions with higher tuition and low levels of grant aid see lower rates of enrollment of the low-income population. This could be the effect of student sticker shock or a rational decision based on costs being too high. To lower costs, institutions use federal and state grant aid and institutionally funded grant aid. This aid lowers the net price paid and according to this research and previous scholarly work, has a positive relationship with enrollment.

For policymakers this suggests that higher education policy can have a role in increasing low-income student enrollment. Increasing published tuition may have a negative effect on the enrollment of low-income students. However, when that published tuition is mitigated by grant aid, the lower net tuition may lead to increased enrollment. Additionally, higher published tuition alone is not necessarily a problem as affluent students, able to pay the full price, contribute to institution operational costs and to the ability of institutions to provide institutional grant aid. This model of higher education would be considered “high tuition, high aid.” It is important for states with this policy framework is to ensure that grant aid keeps up with inflation or risk becoming a high tuition state with moderate or low aid. This latter condition would lead to lesser low-income enrollment, as suggested by the findings in this research.

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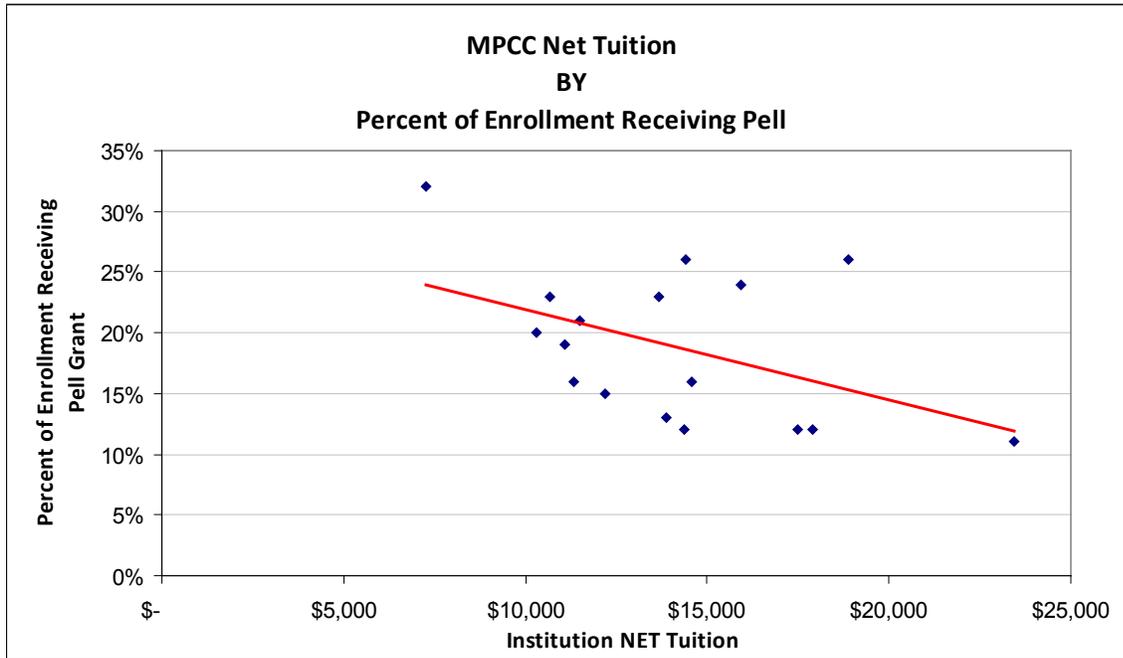
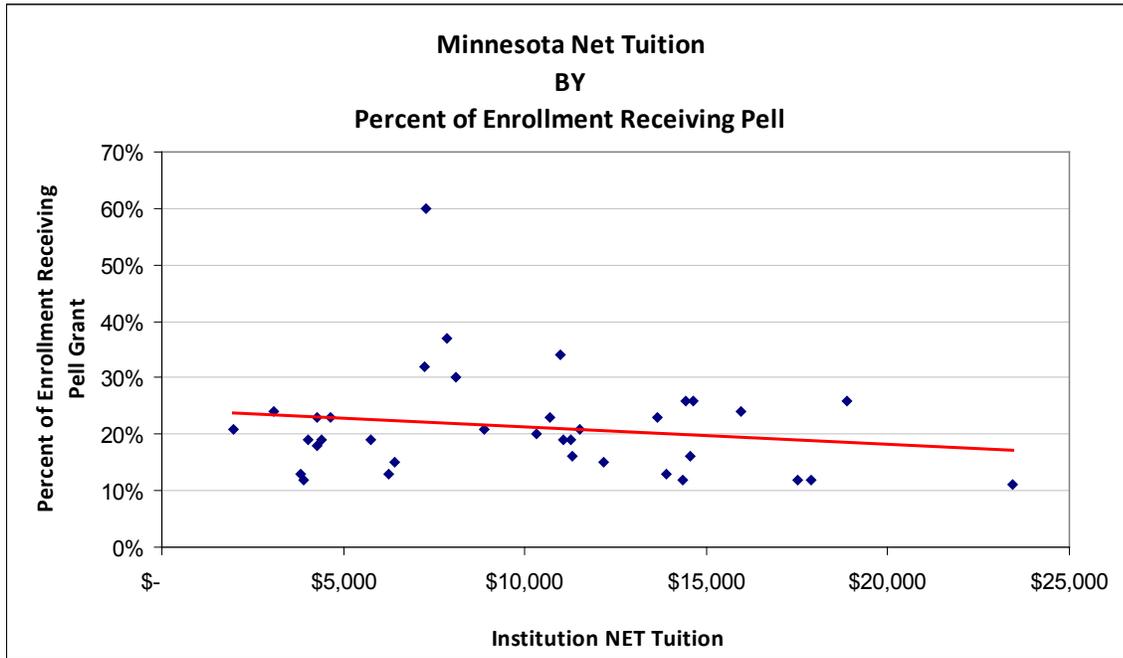
SUPPLEMENTAL DATA

All Institutions Nationally



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Minnesota Institutions



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