Effects of Differential Tuition on Low-Income Undergraduate Students in Engineering

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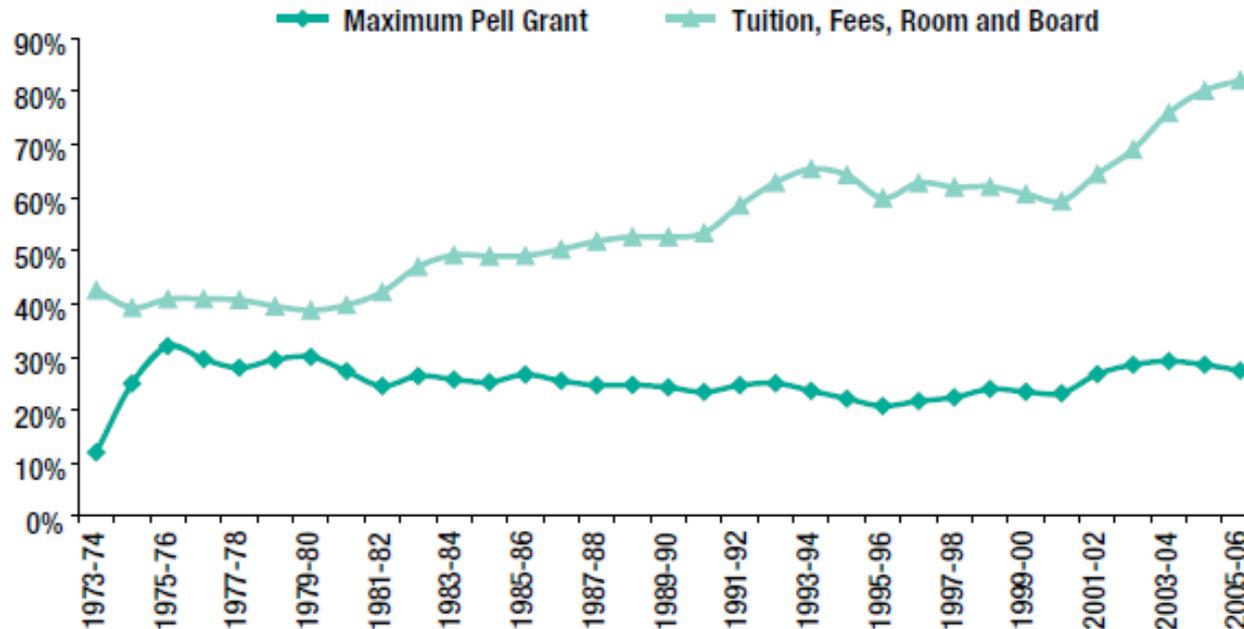
Pell Grants

- Provides federal financial aid to low-income students
- 1972- Legislation passed
- 1973- First awards given (Basic Educational Opportunity Grants)
- Voucher aid program that follows student
- "Purchasing power" impacted over time by inflation and rising tuition
- Current maximum award is $5,550 (2011-2012)

Pell Grants

Maximum Pell Grant and Average Tuition, Fees, and On-Campus Room and Board at Public Four-Year Institutions, as a Percentage of Average Income for Lowest Quintile Families: 1973–74 to 2005–06

Sources: U.S. Census Bureau, March Current Population reports; The College Board, *Trends in College Pricing: 2006*; U.S. Department of Education, Pell Grant End-of-Year Reports.

Tuition Differentials

- Institutional policy of charging different rates of tuition to different groups of students:

  - **Major**
  - Level of Education
  - Class Status
  - Specific Courses

- Reasons for implementing policy:
  - Higher costs of program delivery
  - Changes in tuition charges at peer institutions
  - Reduced state support
  - Construction and equipment
  - Attract high-salaried faculty

Research Questions

1. What are the rates of participation in Engineering by socioeconomic status?

2. What is the actual cost of pursuing a degree in Engineering by socioeconomic status?

3. Does financial aid (e.g., Pell Grants, state aid, institutional aid) enable low-income students to pursue an Engineering degree and persist to graduation?

4. Are low-income students less likely to persist and obtain a degree in Engineering as compared to their counterparts?

Data & Methods

- Project STEP-UP
  - STEM Trends In Enrollment & Persistence for Underrepresented Populations

- Mellon Foundation's Public University Database
  - 2 large, public, selective, research universities
  - First-time, full-time, in-state undergraduate students who filed FAFSA
  - 1999-2005

- Descriptive statistics and binary logistic regression

Demographics of Students (n=6,356)

Gender

- 51.8% Female; 48.2% Male

Race/Ethnicity

- 69.1% White; 10.8% African American; 11% Asian American; 6.8% Latino; 0.6% Native American

Pell Recipients (n=1,241)

- 55.5% Female; 44.5% Male
- 45.4% White; 26.4% African American; 16.1% Asian American; 10.2% Latino; and 0.5% Native American

Pell Recipients in Engineering (n=189)

- 27.5% Female; 72.5% Male
- 50.8% White; 16.9% African American; 19.0% Asian American; 11.6% Latino; 1.6% Other

Tuition, Fees, and Net Price

- 20% of all students initially majored in Engineering
- 15% of Pell recipients majored in Engineering

1999-2000		
Average Tuition & Fees	Engineering $6,400	Non-Engineering $5,938
Average Net Price	Pell: $4,528 No Pell: $10,875	Pell: $4,823 No Pell: $10,930
2004-2005		
Average Tuition & Fees	Engineering $8,881	Non-Engineering $8,266
Average Net Price	Pell: $13,559 No Pell: $12,391	Pell: $12,325 No Pell: $11,245

Financial Aid & Graduation

- Financial Aid
  - Engineering students received more grants and scholarships, and had fewer loans
  - Pell recipients in Engineering had highest calculated student need and highest total aid awarded
  - Amount and variety of financial aid sources initially offsets higher cost of Engineering for low-income students, but changes over time

- Graduation
  - 83%, of all students completed their degrees within six academic years, vs. 75% of Pell recipients, across all majors
  - 13% of graduates within Engineering received a Pell Grant
  - 25% of Engineering students no longer enrolled after six years were Pell recipients

Binary Logistic Regression Results

- Likelihood of completing a degree in Engineering
  - Being female reduced odds
  - Being African American, Latino, and receiving a Pell grant increased odds
- Negative impact of being female alerts to issues that need to be investigated further
- Positive impact for students of color counteracts mismatch hypothesis
- Access to Engineering a critical concern

Limitations & Future Research

- Limitations
  - Data
  - Pell indicator excludes other low-income students
  - Tuition, Differential and Pell increases in recent years
- Future Research
  - Examine alternative pathways and outcomes
  - Include other institutions and majors
  - Explore low-income high school students' financial readiness and awareness, as well as reactions to differential tuition charges
  - Contextualize differential tuition policies
  - Review current support services and programs

Implications

- Review institutional policies and benefits of differential tuition rates
- Increase recruitment efforts of underrepresented students, including low-income students
- Implement need-based financial aid at the department, college, or institution-level to strengthen aid packages in lieu of sufficient Pell aid
- Offer pre-college financial aid counseling and information to students and families to reduce potential sticker shock

Conclusion

- Differential tuition for low-income students majoring in Engineering offset by increased financial aid, but concerns about affordability over time

- Focus on issues of access to STEM programs for low-income students, including K-12 outreach and awareness programs

- The net price of attendance may require a significant percent of the family's income to pay for college

- Tuition rates are still increasing and power of Pell continues to decrease

Contact Information

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