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

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

- Major
- Class Status
- Level of Education
- 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

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<thead>
<tr>
<th></th>
<th>1999-2000</th>
<th>2004-2005</th>
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<tbody>
<tr>
<td>Average Tuition &amp; Fees</td>
<td>Engineering $6,400</td>
<td>Engineering $8,881</td>
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<tr>
<td></td>
<td>Non-Engineering $5,938</td>
<td>Non-Engineering $8,266</td>
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<tr>
<td>Average Net Price</td>
<td>Pell: $4,528</td>
<td>Pell: $13,559</td>
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<td></td>
<td>No Pell: $10,875</td>
<td>No Pell: $12,391</td>
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<tr>
<td></td>
<td>Pell: $4,823</td>
<td>Pell: $12,325</td>
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<tr>
<td></td>
<td>No Pell: $10,930</td>
<td>No Pell: $11,245</td>
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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
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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