

Addressing Under-Matching: Toward An Economic Rationale And A Case Study

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Here's the punch line:

- We argue that policies to support selective (often private) higher education and to reduce the phenomenon of under-matching for low-to-middle income students can be justified *on a hard core economic – or efficiency – basis* as well as the social equity arguments usually put forward.
- Now, how do we get there?

There are numerous factors complicating how a market works in regard to higher education, especially selective higher education.

- Various possible imperfections: public good dimensions, third party payer issues, investment and consumer aspects co-mingling, imperfect capital markets for loans, etc.
- Imperfect information is significant.

Issues Addressed -1 (Value)

- We calculate the return to selective (often expensive!) higher education based on the value-added approach put forward in the 2015 Brookings study by Rothwell and Kulkarni.
 - If the individual attends a selective institution, his or her earnings are presumably higher, but tuition typically is as well.
 - If these additional tuition dollars were instead invested in financial markets, and the individual attended some “base” or “normal” college, what is the annual inflation-adjusted rate of return on that financial investment that would give the individual the same lifetime stream of income?
 - This is then the rate of return or ROI for attending the selective institution.

Issues Addressed -2 (Under-Matching)

- Lessening under-matching increases the aggregate economic gains *for the system as a whole*.
 - With better matching, the economic pie gets larger.
- *Promoting the enrollment of high talent low-to-moderate income students at high value-added institutions promotes economic efficiency.*

Outlining The Argument– Value Proposition (theory)

- Value added in the Brookings study is the extent to which mid-career earnings for an institution's alumni exceed what those individuals are estimated to earn if they attended a hypothetical base (“normal”) institution.
- With additional information on the institution, we can move to the aforementioned approach to calculate an implicit rate of return on the investment when attending the selective – and likely more expensive, institution.

Outlining The Argument – Value Proposition (case study)

- We apply this framework for our own institution, Franklin & Marshall College to determine (inflation-adjusted) rates of return:
 - Class of 1991 earning median salary (\$98,200): 4.5 -5.1%.
 - With the higher tuition of today: 3.4 – 4.0%.
 - With such higher tuitions and earning 75% of the median: 2.6 – 3.2% .
- The inflation adjusted growth in the S&P500 has been 0.2% since 2000.
- With 50% financial aid the rate of return rises from 2.6 – 3.2% to 4.5 – 5.0% using current tuition.

Outlining The Argument –Under-Matching (theory)

- Building on work by Hoxby and Avery, and others, there are at least 25,000, and probably about 35,000, under-matched high school seniors each year.
- To address the efficiency issues with under-matching, we created a simple mathematical “narrative.”

- Suppose we have a set of institutions C_1, C_2, \dots, C_n with rates of value added r_1, r_2, \dots, r_n ordered so that

- $r_1 > r_2 > \dots > r_n > 0$

- Suppose we have a set of individuals whose earnings after graduating from a “base” or “normal” college would be

- $P_1 > P_2 > \dots > P_n > 0$

- We match each individual with an institution until all are used.
 - If individual i attends institution j , his or her earnings are $P_i (1 + r_j)$.
 - We calculate $P (1 + r)$ for each person/institution match and then add them.

- What is the matching pattern that maximizes this sum?
 - This maximum occurs where P_1 enrolls at C_1 , P_2 enrolls at C_2 , etc.
- This simplistic model could be elaborated in a number of ways, but we would arrive at the same conclusion. Match the most talented students with highest value-added producing institutions.
 - There is a clear and strong correlation between the most selective institutions and the highest value-added producing ones.
- Under-matching leads to the economic pie being smaller than it could be, and lessening under-matching it makes the pie bigger.

Outlining The Argument – Under-Matching (case study)

- We apply this framework to our own institution, Franklin & Marshall College.
- In the early 2000s, a series of studies indicated that:
 - Financial aid not based on need (so called “merit aid”) did not increase the average likelihood that recipients would enroll.
 - Recipients of financial aid based on need were significantly more likely to enroll than no-need students with comparable characteristics.
- The Fall 2011 incoming class was the first brought in with a 100% need-based aid platform.

- At about the same time, the College decided to begin to increase its financial aid expenditures (discount rate) as part of a renewed attempt to recruit and enroll excellent students from any socioeconomic background.
 - First-Year discount rate through 2008: 25-30%
 - 2009 and 2010: 33% 2011: 38% 2012 forward: 40%+
 - The student body has changed as a result.
 - 2006-2008: 7% Pell
 - 2011 forward: 17% + Pell
- F&M partnered with Posse, KIPP, Cristo Rey, College Match, National College Advising Corps, Achievement First, Noble Street, and many others in recruiting students.
 - *The information problem is mitigated by the use of these “information brokers.”*

What have the outcomes been?

- The average SAT score of incoming first-years was 1305 for the 2008 entering cohort; it has been in the 1300-1314 range each year since then.
- The six-year graduation rates for the Fall 2010 entering cohort:
 - Entire cohort: 86%
 - Need-based aid recipients: 85%
 - Pell: 85%
 - Average graduation GPA for each group in the 3.17-3.20 range.
- The 40-45% discount rates starting in 2012 are not yet represented above. Four-year graduation rates for the 2012 entering cohort :
 - Entire cohort: 79%
 - Need-based aid recipients: 80%
 - Pell 81%

- First-to-second year retention rates for the Fall 2014 entering cohort:
 - Entire cohort: 92%
 - Need-based aid recipients: 93%
 - Pell: 93%
- F&M has begun the process of tracking post-graduation outcomes. The six-month-out results for the Class of 2015:
 - 81% were employed
 - 18% pursuing further education

Summary

- We present a context for determining the return on investment for selective institutions. For the case study institution, it is 3.4-4.0% per year after adjusting for inflation.
- Under-matching as a social phenomenon has *both* efficiency and social equity costs, and lessening under-matching is then supported by efficiency and not just social equity arguments.
- Additional funding sources to promote enrollment at selective institutions, especially for low- to moderate-income students, is justified on efficiency as well as social equity grounds.

The full paper is available on line at:

<https://drive.google.com/file/d/0B59Xbewq25mwTk5nZ0hLV09DOEE/view?usp=sharing>

Questions and Discussion