

Some Comments on Access Effects of Higher Education Subsidies

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ASSET Round Table

Alain Trannoy talked about two models of higher education finance. A third model is US Higher Education

There are both public (state) and private providers,

Variation in public university tuition, extreme price discrimination (by ability, income, minority status, athletic ability etc.) at private universities

Approximately 40% of the US college-aged population is enrolled (FTE basis) in four-year colleges

Public colleges enroll about 70% of this.

US Higher Education is under increasing scrutiny

Increasing gap in earnings between college and non-college graduates

Persistently increasing costs of higher education

Tuition and fees have risen at an annual rate twice the rate of inflation over the past three decades. (Source: BLS)

Student debt has more than tripled over the past decade

Fiscal pressures are leading to reduced expenditures on state universities

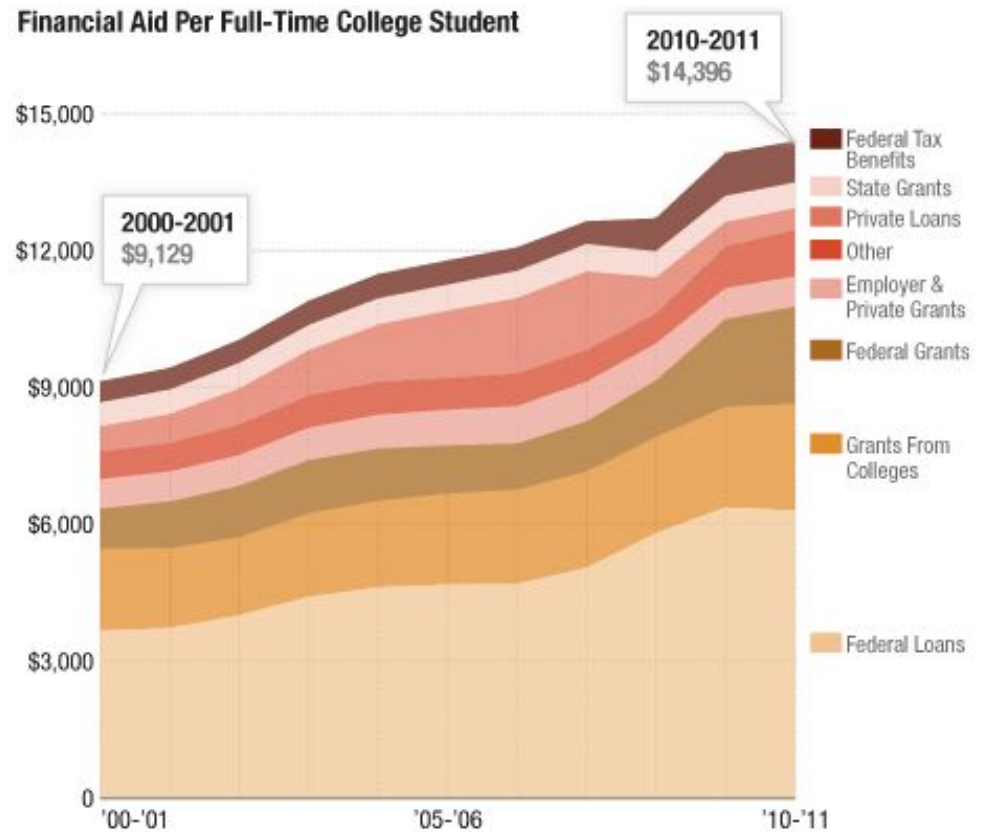
Access became a major policy concern

Higher education is among the most highly subsidized goods in the U.S. economy.

During 2010-11 school year, Federal Student Aid provided \$144 billion in aid to about 15 million students.

State aid was approximately \$80 billion (about \$8000 per student) in 2010.

The federal government and state governments use different approaches to subsidize higher education.



State Government Subsidies

- ❑ **Public universities receive direct subsidies** from their states, provide access to higher education at subsidized rates to state resident students.
- ❑ Public schools have much less discretion than private schools in setting tuition and financial aid policies.
- ❑ The average in-state tuition in 2007-08 was \$6,200, and the average out-of-state tuition was \$15,100 for full-time undergraduates enrolled in public 4-year institutions.

Federal Aid (grants, subsidized loans, work+study, ...)

- ❑ Direct aid to students via aid policies administered by colleges.
- ❑ Federal aid, therefore, can benefit students at both public and private universities, while state subsidies are primarily targeted at in-state students that attend public colleges.
- ❑ Amount of federal aid *(simplified)*
 - ❑ $\max\{\text{tuition} - \text{expected family contribution}, \text{max.aid}\}$

Federal Subsidies and Aid

- There is broad agreement that government should ensure affordable access to quality higher education
 - The functioning of the current aid/subsidy system is not well understood
- Amount of federal aid
 - $\max\{\text{tuition} - \text{expected family contribution}, \text{max.aid}\}$



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Policy Issues (cont.)

- ❑ **A Central Policy Question:** Can state and federal aid policies be designed to aid students without bidding up college tuitions and costs?

Efficacy of changes in government funding and aid depends on responses of different competing providers.

- ❑ Hence, investigation of government aid policies requires equilibrium analysis.

A New Model of the US Market for Higher Education, addresses a number of unresolved issues in the literature

- A General Equilibrium Analysis of State and Private Colleges and Access to Higher Education in the U.S. *JPubE*, forthcoming, with Dennis Epple (Carnegie Mellon), Richard Romano (U Florida), Holger Sieg (U Penn)
- Market Power and Price Discrimination in the U.S. Market for Higher Education *NBER Working Paper w23360*, with Dennis Epple, Richard Romano, Holger Sieg, and Melanie Zaber (RAND corporation)
- (untitled paper) in progress, with Dennis Epple, Richard Romano

A New Model of the US Market for Higher Education

Student utility increases in achievement: function of own ability, and school quality

Decreases in spending on education

School quality increases in peer quality and instructional expenditures

Private schools maximize quality

State schools maximize achievement/earnings of state-resident students

We derive associated admission, tuition, and financial aid policies, obtain some predictions about equilibrium

Build a quantitative model, solve market equilibrium, great fit to data!

Quality Issues

- Lower public school tuition improves access
 - to lower income students
 - but also lower ability students (MB=MC)
- Dilute quality (peer effects, signaling value, teaching standards)
- Those who can afford look for alternatives (private colleges, study abroad, invest in additional education)

Capacity Issues

- Some sort of rationing e.g., admission/enrollment or graduation standards necessary
- Results in quality hierarchy & sorting by ability– Even within a given university (honors program or some specialization with higher standards)
 - Family income can be a complement to inherent ability when meeting standards (sorting by ability -> sorting by income)
- Labor market outcomes differ between grads of good vs not-as-good university.

Cost of “Free” College Education

- to taxpayers
 - There is an efficient amount of college educated, depends on ability distribution as well as labor market conditions, $MB=MC$
- to students, conservative estimate of non-tuition costs to be over USD10,000 for the average student
- opportunity costs of staying off the labor market through college years

Graduation

- Free education may weaken incentives to graduate
- Especially for those whose job opportunities are not as good (lower ability/SES).

Conclusion

- Some factors that work towards equity/equality of opportunity, some against
- No clear universal answer. Understanding net effect requires getting into further details.

Policy Change

- Increase the max on federal aid such that TOTAL cost (tuition+nontuition) at public colleges approaches 0
- Total enrollment increases by about 29%

		PUBLIC COLLEGES		PRIVATE COLLEGES	
		Baseline	Policy	Baseline	Policy
Enrollment		28.50%	38.80%	11.50%	12.70%
Quality of Education		3.41	3.22	4.34	4.42
	<i>Peer Q</i>	2.89	2.82	3.42	3.44
	<i>Expenditure</i>	8.78	6.95	17	18.31
	<i>Admission Threshold</i>	2.57	2.46		
Average TOTAL Cost to Student		15.85	0.4	31.8	28.1
Average Aid		1.41	2.11	6.6	6.57
	<i>Conditional</i>	4.7	12.3	5.4	12.7
Fraction Receiving Aid		0.3	0.4	0.54	0.52

Total University Enrollment

Baseline Equilibrium and Policy Change

BASELINE EQUILIBRIUM												
		Lowest		ABILITY								Highest
		1	2	3	4	5	6	7	8	9	10	
INCOME	Highest	10	0	0	0	0.439	0.960	0.966	0.967	0.982	0.993	0.997
		9	0	0	0	0.375	0.912	0.921	0.922	0.937	0.959	0.986
		8	0	0	0	0.348	0.832	0.839	0.842	0.866	0.911	0.978
		7	0	0	0	0.285	0.688	0.696	0.700	0.721	0.792	0.947
		6	0	0	0	0.209	0.470	0.518	0.518	0.529	0.561	0.838
		5	0	0	0	0.235	0.529	0.544	0.541	0.543	0.542	0.741
		4	0	0	0	0.219	0.541	0.550	0.549	0.547	0.555	0.629
		3	0	0	0	0.074	0.182	0.193	0.188	0.187	0.195	0.287
		2	0	0	0	0.003	0.008	0.008	0.009	0.008	0.010	0.040
		Lowest	1	0	0	0	0	0	0	0	0	0
INCREASED FINANCIAL AID												
		Lowest		ABILITY								Highest
		1	2	3	4	5	6	7	8	9	10	
INCOME	Highest	10	0	0	0.48	0.89	0.89	0.91	0.92	0.92	0.98	1.00
		9	0	0	0.38	0.78	0.78	0.80	0.80	0.80	0.89	0.97
		8	0	0	0.29	0.61	0.62	0.63	0.64	0.63	0.80	0.96
		7	0	0	0.17	0.41	0.41	0.41	0.42	0.42	0.84	0.99
		6	0	0	0.09	0.20	0.19	0.25	0.27	0.27	0.71	0.97
		5	0	0	0.12	0.25	0.25	0.37	0.40	0.40	0.54	0.93
		4	0	0	0.24	0.52	0.53	0.60	0.62	0.62	0.62	0.85
		3	0	0	0.38	0.83	0.83	0.83	0.83	0.83	0.83	0.88
		2	0	0	0.42	0.96	0.96	0.96	0.96	0.96	0.96	0.97
		Lowest	1	0	0	0.25	0.62	0.64	0.64	0.66	0.70	0.74

Change in Public and Private Universities Enrollment in response to Policy

CHANGE IN PUBLIC ENROLLMENT												
		Lowest		ABILITY								Highest
		1	2	3	4	5	6	7	8	9	10	
INCOME	Highest	10	0	0	0.48	0.45	-0.07	-0.06	-0.05	0.38	0.01	-0.04
		9	0	0	0.38	0.40	-0.13	-0.12	-0.12	0.07	-0.04	-0.04
		8	0	0	0.29	0.26	-0.21	-0.21	-0.21	-0.08	-0.11	-0.04
		7	0	0	0.17	0.12	-0.28	-0.28	-0.28	-0.23	-0.36	-0.11
		6	0	0	0.09	-0.01	-0.28	-0.26	-0.25	-0.25	-0.36	-0.16
		5	0	0	0.12	0.02	-0.28	-0.18	-0.14	-0.15	-0.22	-0.26
		4	0	0	0.24	0.30	-0.02	0.05	0.07	0.08	0.05	-0.18
		3	0	0	0.38	0.76	0.65	0.64	0.65	0.65	0.64	0.38
		2	0	0	0.42	0.96	0.96	0.96	0.95	0.96	0.95	0.85
	Lowest	1	0	0	0.25	0.62	0.64	0.64	0.66	0.70	0.74	0.70
CHANGE IN PRIVATE ENROLLMENT												
		Lowest		ABILITY								Highest
		1	2	3	4	5	6	7	8	9	10	
INCOME	Highest	10	0	0	0	0	0	0	0	-0.45	-0.02	0.03
		9	0	0	0	0	0	0	0	-0.21	-0.02	0.03
		8	0	0	0	0	0	0	0	-0.16	0.00	0.03
		7	0	0	0	0	0	0	0	-0.08	0.40	0.15
		6	0	0	0	0	0	0	0	-0.01	0.51	0.29
		5	0	0	0	0	0	0	0	0.00	0.21	0.44
		4	0	0	0	0	0	0	0	0.00	0.01	0.40
		3	0	0	0	0	0	0	0	0.00	0.00	0.21
		2	0	0	0	0	0	0	0	0.00	0.00	0.08
	Lowest	1	0	0	0	0	0	0	0.00	0.00	0.05	

Cost of “Free” University Education

			Baseline	Policy
Max Aid			6	15.5
Enrollment			40%	51.50%
Taxes	State		3.90%	5.37%
	Federal		1.05%	5.52%