Today

- Cost of college the college premium
- Student debt
- Price of textbooks

American Higher Education in Transition

Ehrenberg, Ronald G.. "American Higher Education in Transition." Journal of Economic Perspectives 26 no. 1 (Winter 2012), 193-216.

What have the trends been?

Many observers have been pointing to a tuition spiral or college bubble, what do the numbers say?

- Undergraduate tuition real increases 1982-2012
  - Private: 3.5%
  - Public: 5.1%
  - 2-year: 3.5%

What have the trends been?

However, many people do not pay the full cost of tuition but get some scholarship or grant money:

- Net tuition cost paid by the average student 1990-2012:
  - Public: 4.1%
  - Private: 3.4%
  - 2-year: saw a decline (number unreported)
  - Compare to inflation of 2.7%

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What have the trends been?

Where does the money go?

- Private universities are spending a significant amount of tuition on financial aid, the average tuition discount rate was 42% in 2008
  - (up from 26.7% in 1990)
- Full-time faculty share has declined
  - 80% in 1970 to 51.3% in 2007
- Full-time but not tenure track share has increased
  - 18.6% in 1975 to 37.2% in 2007

What have the trends been?

Where does the money go?

- State subsidies have fallen 19% from 1987-2010
  - $7,993 to $6,454
- Even controlling for the great recession
- Net tuition revenue plus state appropriation per student
  - roughly equal in real terms between 2010 and 1987

What have the trends been?

Where does the money go?

- Share of expenditures on faculty salaries and benefits
  - Declined over the period
- Expenditures per student have risen
- Share of expenditures for student services, academic support, and institutional support has risen

Changes in Higher Ed.

Is it important to have tenure-track faculty?

- Tenure protects professors who research controversial ideas or who provide expert testimony
- Tenure promotes mentoring of junior faculty
  - tenured faculty do not need to worry about competition from mentees for jobs
- Tenure acts as a winner-take all tournament that increases work effort

Changes in Higher Ed.

Is it important to have tenure-track faculty?

- Tenure serves as a substitute for salary when attracting faculty
  - at least in economics departments
- As faculty specialize they reduce outside options for employment
  - job security from tenure becomes needed to incentivize this potentially valuable specialization

Changes in Higher Ed.

Is it important to have tenure-track faculty?

- Rising non-tenured and part-time faculty shares are correlated with falling first year persistence and graduation rates
  - Controlling for many institutional characteristics
- Two year institutions that expose students to more part-time faculty
  - reduced transfer's to 4-year schools
  - reduce completion rates of 2-year degrees
- At Ohio public 4-year institutions students taking freshmen courses that are more likely to be taught by non-tenure track or part-time lecturers
  - Become more likely to drop out after their first year

Changes in Higher Ed.

Is it important to have tenure-track faculty?

- Some studies have found that students in some fields respond to adjuncts positively by taking more courses in that field
- Adjuncts may represent a cost in student graduation rates, but they also cost $10,000 less on average
- Non-tenure track faculty are supposed to be able to focus on teaching
  - Face heavy course-loads and may have a limited ability to work one on one with students
  - Reduces the amount of time they can spend staying on the cutting edge
  - Not everyone can be a star teacher
  - Lower salary and benefits may reduce the 'efficiency wage' effect

Changes in Higher Ed.

Is it important to have tenure-track faculty?

- Top institutions granting Ph.d.s have access to the best labor
  - This mitigates the negative effects of non-tenure track faculty
- Concentrating the negative effects on lower ranked institutions
  - Crowding out by top institutions makes their search for top teaching talent difficult

Changes in Higher Ed.

Table 4

Annual Average Percentage Real Changes in Expenditures per Full-Time Equivalent Student: FY1987–2008

	N	*Instruction*	*Student services*	*Academic support*	*Research*	*Public service*	*Institutional support*	*Operations and maintenance*	*Auxiliary*
Public doctoral	151	0.87	1.64	1.39	2.89	2.13	1.35	0.79	0.46
Private doctoral	103	1.87	3.13	2.87	2.35	2.83	2.60	1.05	1.42
Public master's	227	0.72	1.82	1.49	2.80	2.81	1.27	0.70	0.06
Private master's	327	1.55	2.66	2.13	2.18	0.75	1.57	–0.33	0.11
Private bachelor's	461	1.70	3.05	2.17	2.95	1.26	1.76	–0.23	0.52
Public 2-year	739	0.67	1.57	1.14	0.06	1.00	1.42	0.76	0.42
All public	1,192	0.75	1.66	1.22	2.74	1.69	1.39	0.77	0.37
All private	891	1.67	2.94	2.22	2.39	1.40	1.79	–0.12	0.49
All	2,083	1.07	2.16	1.62	2.63	1.66	1.57	0.51	0.40

Source: Author's calculations from Integrated Postsecondary Education Data System (IPEDS) data as cleaned by the Delta Cost Project (⟨http://www.deltacostproject.org⟩). Public bachelor's institutions are excluded from this table because of the relatively small number of them that reported data in both years. *Note:* Institutions classified as "master's" typically offer undergraduate and master's degrees; and those classified as "doctoral" typically offer a wide range of undergraduate and graduate degrees including doctoral degrees.

Changes in Higher Ed.

What about that money being spent on things besides faculty?

- Research:
  - Changes in federal grant requirements have made it harder to recover indirect costs of research
  - Grants are now more likely to require matching funds
  - Start-up costs for new STEM researchers is higher and harder to recover from later grants
- Share of total cost of research paid by institution has risen from 12% in 1976 to >20% in 2008

Changes in Higher Ed.

What about that money being spent on things besides faculty?

- Student services
  - admissions and registrar activity
  - student activities, cultural events, newspapers, intramural, clubs, tutoring
- Growth rate of this category is double growth in instructional spending

Changes in Higher Ed.

What about that money being spent on things besides faculty?

- These services have a positive impact on first-year persistence and graduation
- At lower ranked institutions serving less advantaged students
  - re-allocating money from instruction to these activities would lead to higher graduation rates
- Re-allocating from instruction to student services had a limited effect when the graduation rate was already above average

Changes in Higher Ed.

What about that money being spent on things besides faculty?

- Academic support services
  - libraries, museums, and computing
  - Libraries costs have been rising by 2% more than inflation
  - New technology is not adopted by Universities to cut costs

Changes in Higher Ed.

What about that money being spent on things besides faculty?

- Institutional support services
  - legal, accounting, auditing, HR, alumni affaris, public relations, etc
  - Government mandated reporting increases costs
    - Universities must higher whole departments to report on human/animal subject research, hazardous materials, conflict of interest
  - Facilities and maintenance is also a serious issue
  - Reports that Cornell plans to cut admin expenses by 5% of operating budget

Theory of Higher Education

Hoxby, Caroline. "How the Changing Market Structure of U.S. Higher Education Explains College Tuition." NBER Working paper no. 6323 (December 1997).

Theory of Higher Education

First some theories you may be familiar with:

- Note: we have been focused on rising costs since 1980, but costs have been going up since WW2
- Baumol: higher education is a non-traded service that does not get as much of a productivity gain from new technology as other goods
  - Its price should rise faster than inflation, rising not with the average good, but directly with the wages of its inputs
- Ehrneberg & Murphy: Net tuition accounts for some of change

Theory of Higher Education

First some theories you may be familiar with:

- Clotfleter: Rising demand for high skilled workers and inelastic supply of college graduates
  - Supply was likely elastic due to excess capacity in the 80s, also only explains recent trend
- Bennett: Federal govt. acts as 3rd party payer, market participants don't pay, so won't hold down costs
  - Problem share of 3rd party payments is small (increasing recently, but not enough to account for long trend)

Theory of Higher Education

Digging in deeper on the last two:

- These explanations rely on market imperfections to explain data
  - Barriers to entry that prevent supply of college graduates from rising
- Bennett argument relies on induced demand: i.e. consumers cannot tell what colleges are cost effective
  - This means they just take the colleges word for it
  - Because of subsidies students don't have an incentive to become informed, and colleges can raise tuition
- Some other commentators suggest colleges are collusive

Theory of Higher Education

Hoxby (1997) tells a different story:

- Argues that higher education has become more competitive not less
  - Market imperfections have diminished
- Argues that, counter-intuitively, more competition has led to higher prices

Theory of Higher Education

Hoxby (1997) tells a different story:

- Story hinges on transition from many local autarkies
  - To a geographically integrated market
- Two things happen simultaneously:
  - Colleges loose monopoly power
  - Colleges loose monopsony power
- Think of colleges as choosing quality of education rather than quantity

Theory of Higher Education

When the college looses monopoly power:

- It looses rents
- It increases quality and value

Theory of Higher Education

When the college looses monopsony power:

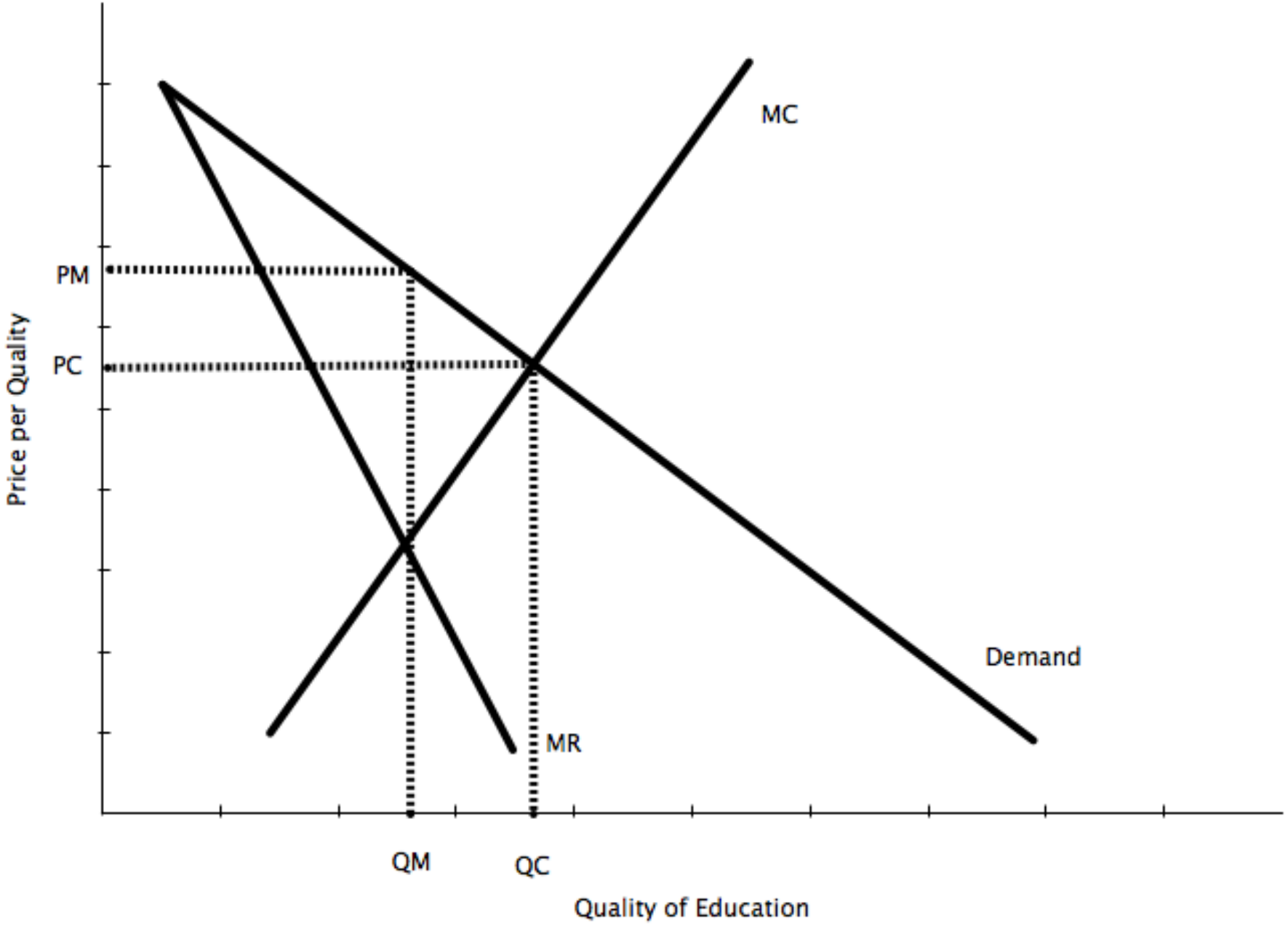
- Must pay higher wages to its inputs–like faculty but also capital
- Students are an input (your ability alters how much you can get out of college)
  - Higher ability students can get higher 'wages' i.e. more scholarship money
- All investments in quality (not just high ability students) payoff better in the larger market
  - Remember loss of monopoly power
- Higher average quality of education results in a higher price being able to be charged
  - value does not fall

Theory of Higher Education

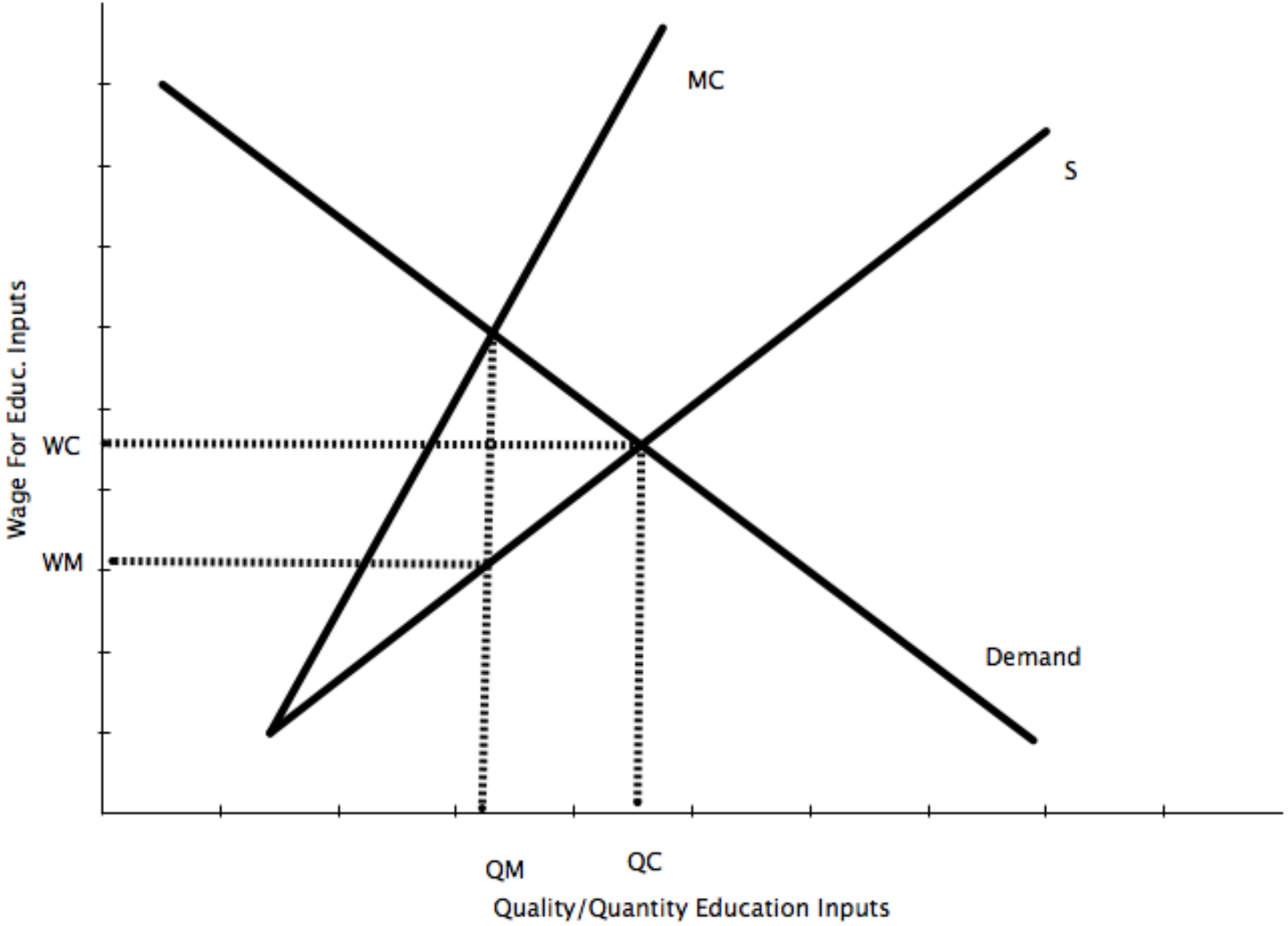
When the college looses monopsony power:

- In each autarky colleges were vertically differentiated
  - But not all quality levels may have been provided
- In the integrated market students are able to match their ability to college quality
- Within college diversity falls, between college diversity rises
  - Vertical differentiation increases
- Tuitions and scholarships will increase in variance

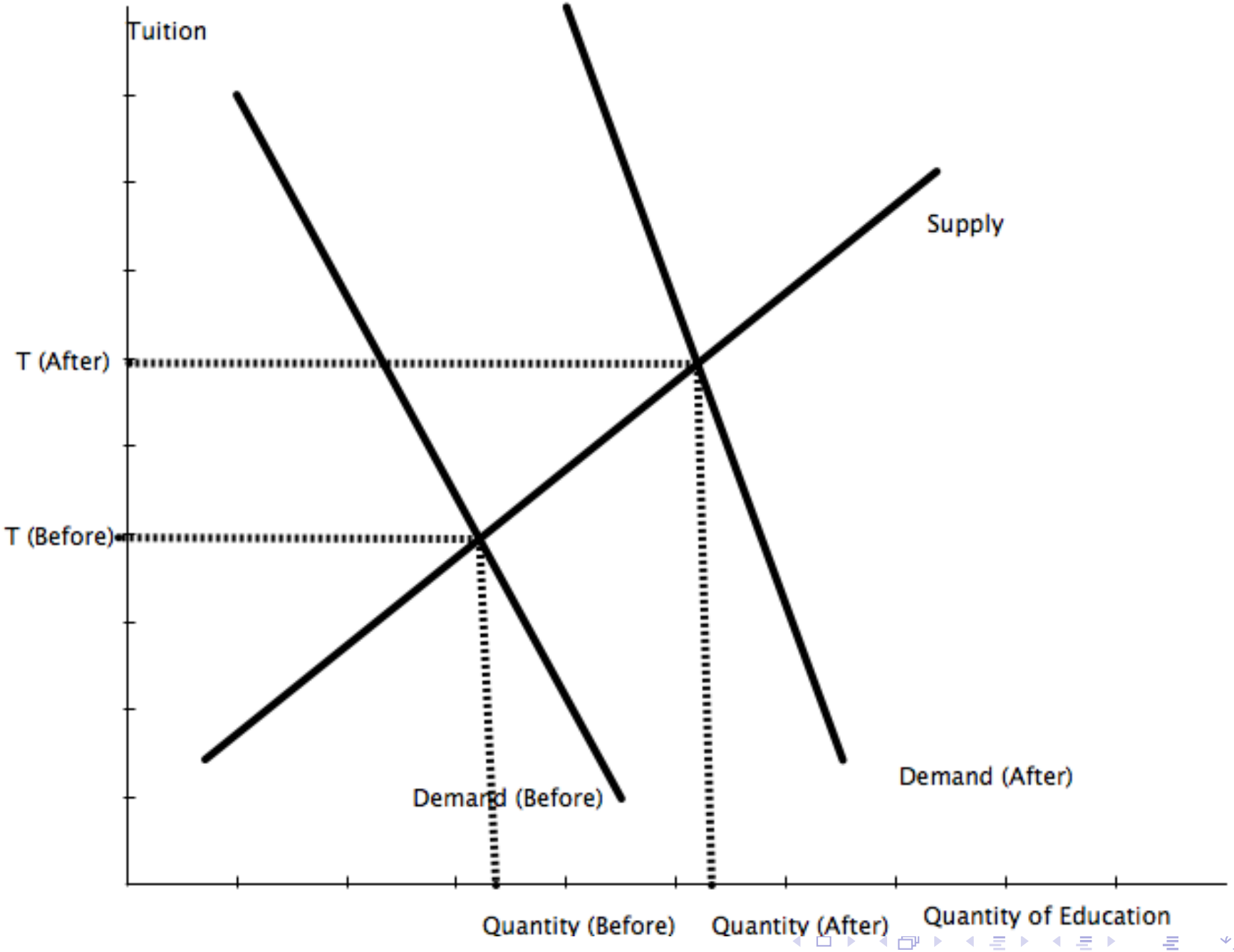
Theory of Higher Education



Theory of Higher Education



Theory of Higher Education



Theory of Higher Education

Hoxby finds that the data agree with all of the predictions of her theory:

- Within college variance in incoming SAT scores fell while between college variance rose
- Increases in tuition track the basic predictions of our graphical model
- Decreases in market concentration and in-state/out-of state student ratios are associated with
  - Higher tuition in private colleges and an increase in the variability of tuitions
  - Higher tuitions in public colleges
- Scholarships to all students have risen
  - And the most selective colleges have raised their subsidies to students more

Student Debt

Avery, Christopher and Sarah Turner. "Student Loans: Do College Students Borrow Too Much–Or Not Enough?" Journal of Economic Perspectives 26 no. 1 (Winter 2012), 165-192.

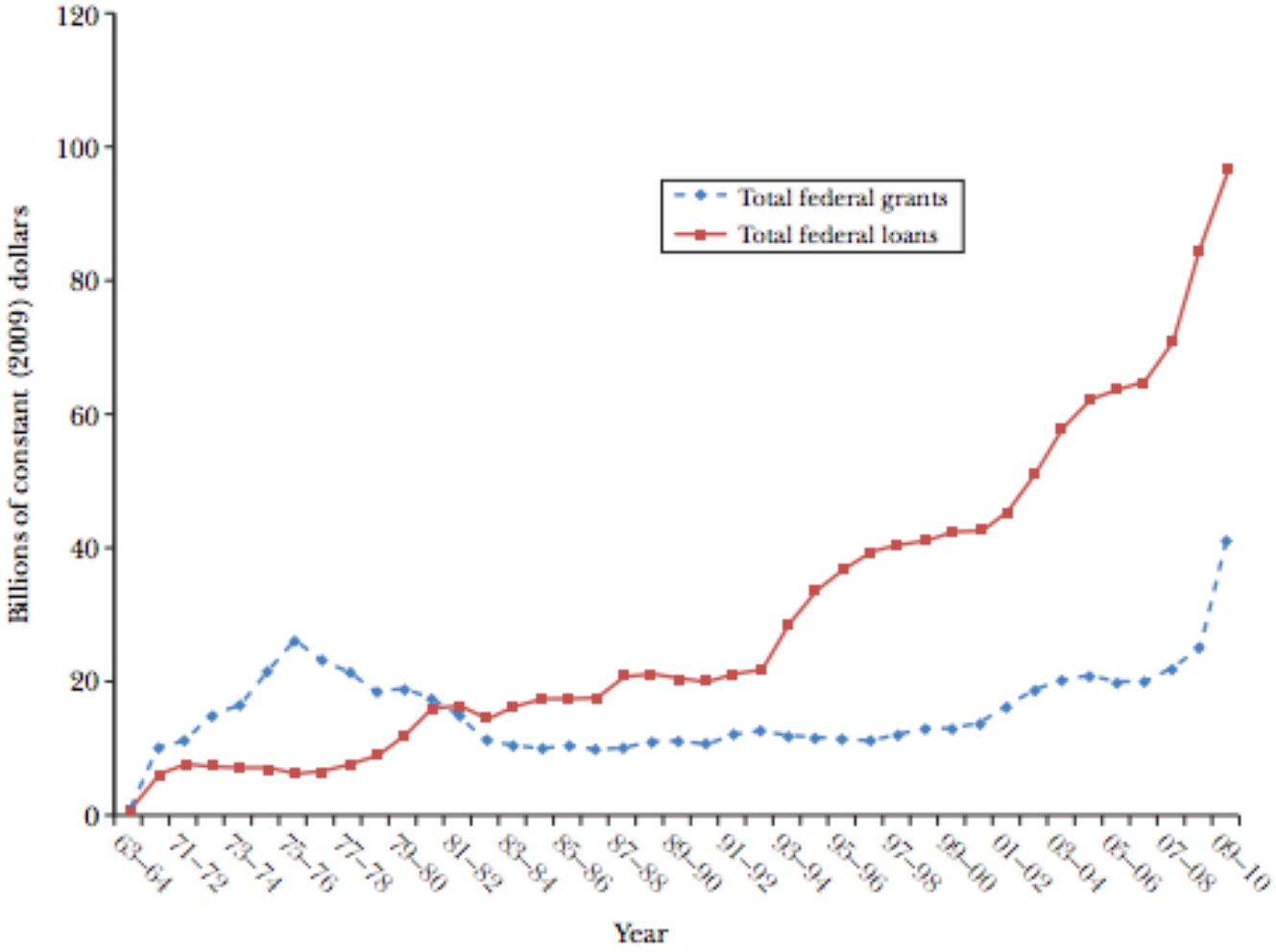
Student Debt

The trend:

- Student Load Debt Clock

Student Debt

Figure 1
Trends in Federal Grant and Loan Aid



Source: College Board, *Trends in Student Aid*, 2010.

Student Debt

Is this a bubble?

- A bubble would mean that the value of educations is not high enough to justify the debt
  - The asset is the human capital you get from college
  - It has a market value in the future, and you can borrow against this value
    - If the value is high your can borrow more
  - In a bubble people would be borrowing more than the value

Student Debt

While debt has increased so has the college wage premium:

- The college wage premium to high school wage premium has doubled over last 3 decades
- Great recession has not done much to mitigate this:
  - In 2011 unemployment among those with college degrees was 4.4%
  - In the same year without a college degree unemployment was 8.5%
  - With some college the rate was 7.6%

Student Debt

Enrollment rates and loan rates are rising from 1980 to 2009:

- Enrollment: 10.5 million to 17.6 million
- Federal Loans: 2.3 million to 10.9 million

Student Debt

Student loans are a pretty significant innovation in the economy:

- In the past it was not possible to invest in human capital in the traditional sense
- Physical capital can easily be collateralized by the actual asset
- Human capital is more difficult to collateralize
  - Difficult to know market value of a student prior to entry to labor market
  - Difficult to know effort level of student in school will be as high as investor would want
  - Student can also make choices in labor market that investor would disagree with

Student Debt

Student loans are a pretty significant innovation in the economy:

- Federal government chooses to ignore these issues in order to subsidize investment in human capital
  - Additionally to overcome lack of willingness on the part of state governments
- Private lending uses asset-backed securitization to pool the risk from multiple student loans
- Both have probably been a positive thing from the perspective of human capital market inefficiency

Student Debt

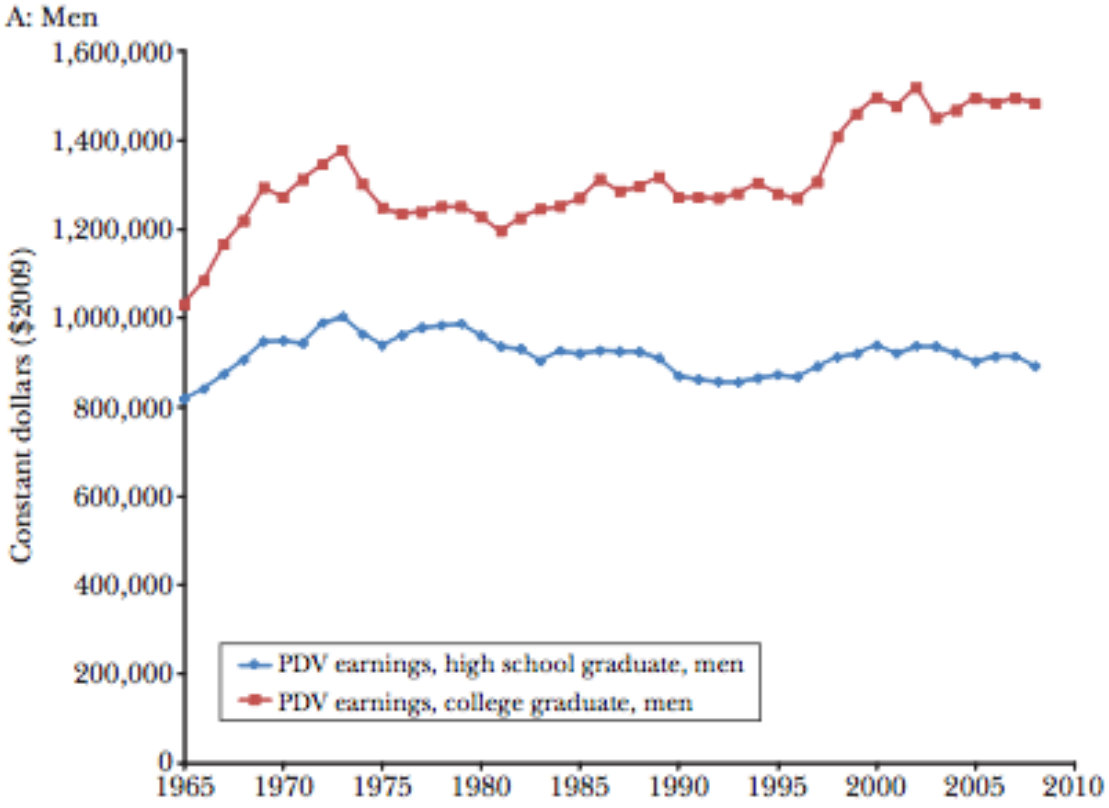
Students may borrow too much:

- College wage premiums may be driven by selection
  - High ability students that would do well in the labor market self-select to attend college
  - College may still be needed as a signal mechanism
- College wage premiums are generally given as averages
  - The premium is likely to be highly heterogenous across students, colleges, and careers
  - Students may not be able to forecast their premium accurately
- It is also possible students are not borrowing enough

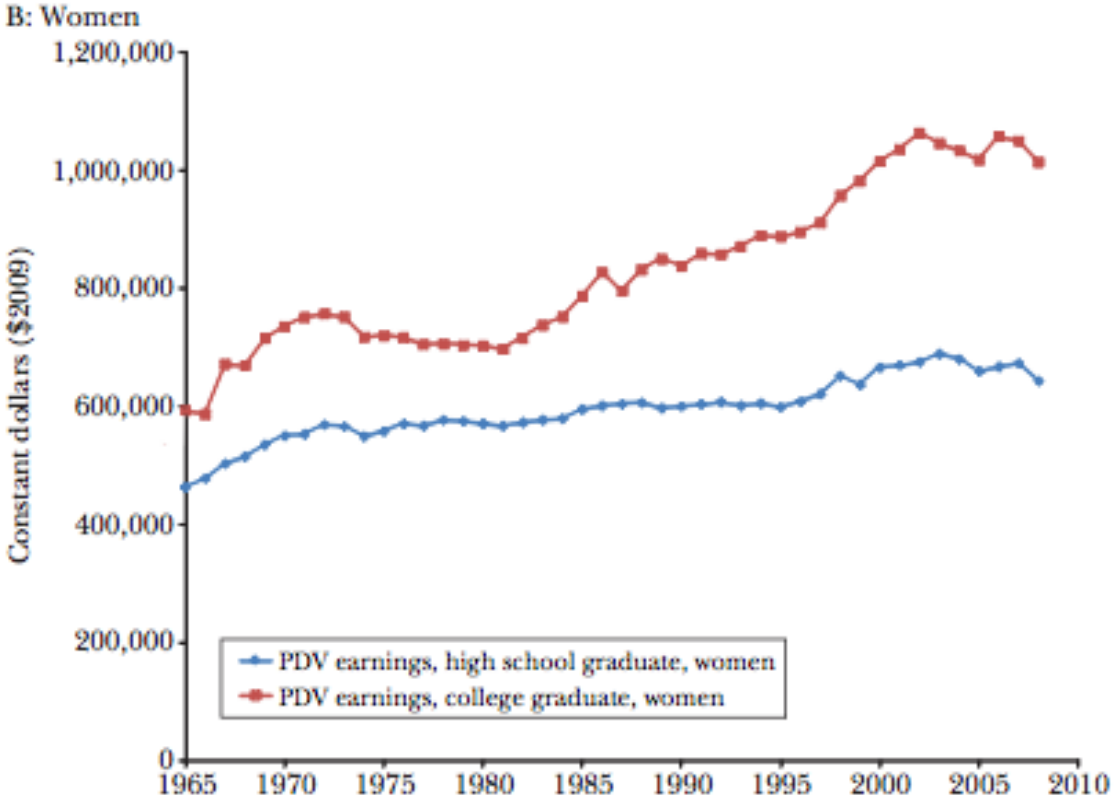
Student Debt

Figure 2

Trends in the Present Discounted Value (PDV) of High School and College Earnings Net of Tuition



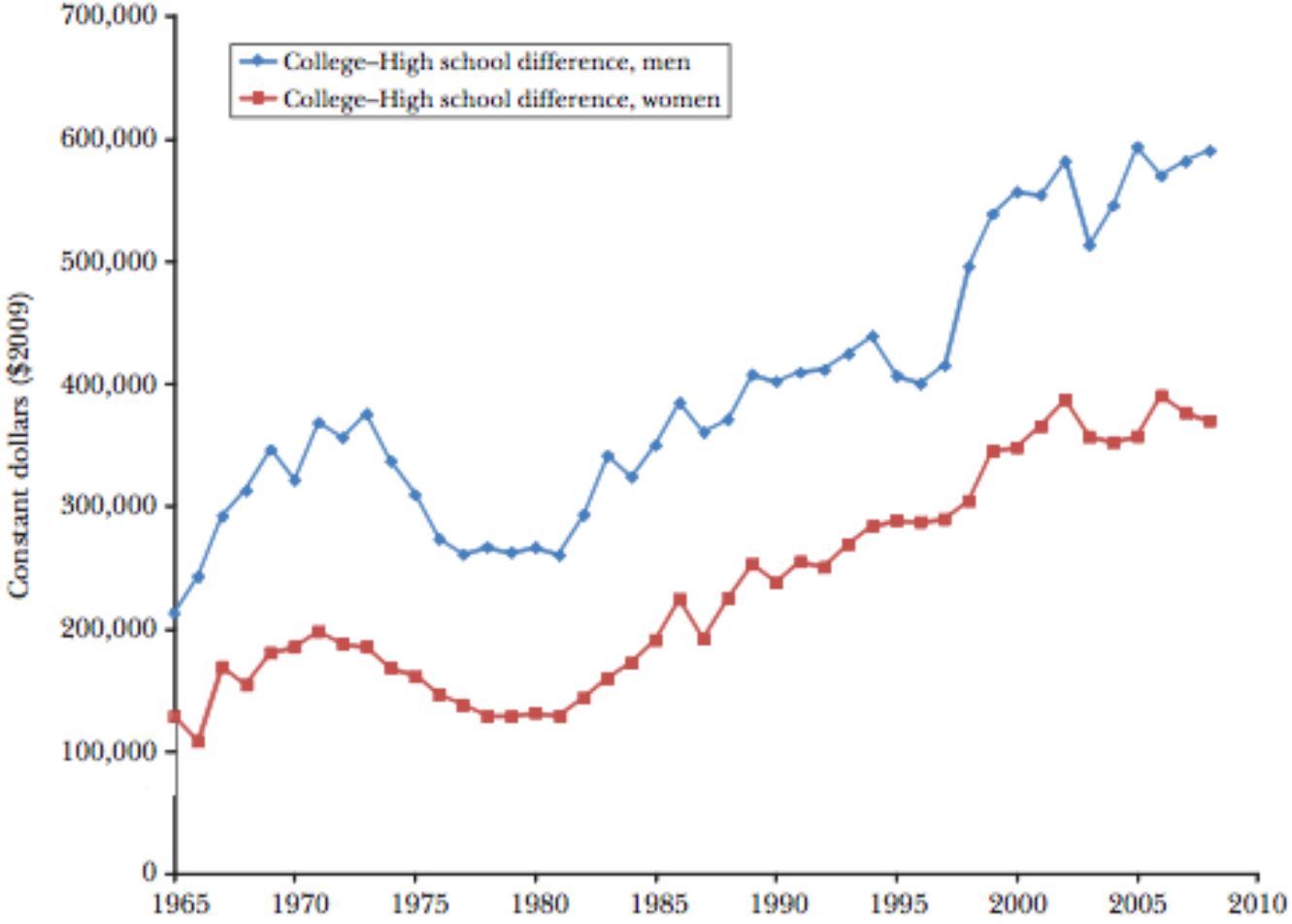
Student Debt



Student Debt

Figure 3

Present Discounted Value of College Degree Net of Tuition, 1965–2010



Student Debt

It seems that with these kinds of lifetime earnings differences a college degree is worth it:

- Value of Ohio State
- Borrowing to get one could be worth it if you face liquidity constraints or desire to smooth consumption
- Borrowing is even worth it on average just to get that premium
- Interest rate when article was written for unsubsidized loans was 6.8%
- Estimating cost of me attending Ohio State to be $160,000
- Median salary of college graduate is ~$45,000
- Loan estimates

Student Debt

Heterogeneity across students throws a wrench into this nice story:

- In particular it many expect to be able to complete college in ~4 years
  - But they fail to do so

Student Debt

Table 2

Expected Degree Completion, Realized Degree Completion, and Borrowing

	Expected attainment			
	No degree	*Certificate*	*AA*	*BA*
Distribution by expected attainment	3.6%	4.0%	13.0%	79.4%
Realized attainment				
No degree	66.2%	51.9%	62.0%	38.0%
Certificate	7.0%	31.9%	9.1%	2.1%
AA	4.9%	5.5%	21.5%	7.5%
BA	21.9%	10.8%	7.3%	52.4%
Percentage with student loans				
No degree	35.6%	37.0%	39.2%	51.3%
Certificate	22.0%	29.8%	47.9%	43.8%
AA	54.6%	35.1%	54.7%	55.6%
BA	66.3%	42.8%	65.4%	63.7%
Average student loans (unconditional)				
No degree	$4,475	$4,128	$4,222	$7,413
Certificate	$1,618	$2,788	$4,794	$5,113
AA	$7,651	$3,565	$8,544	$9,564
BA	$22,183	$9,658	$16,645	$15,562
Average student loans among borrowers				
No degree	$12,571	$11,160	$10,758	$14,457
Certificate	$7,367	$9,361	$10,008	$11,666
AA	$14,006	$10,149	$15,609	$17,194
BA	$33,480	$22,582	$25,465	$24,437

Student Debt

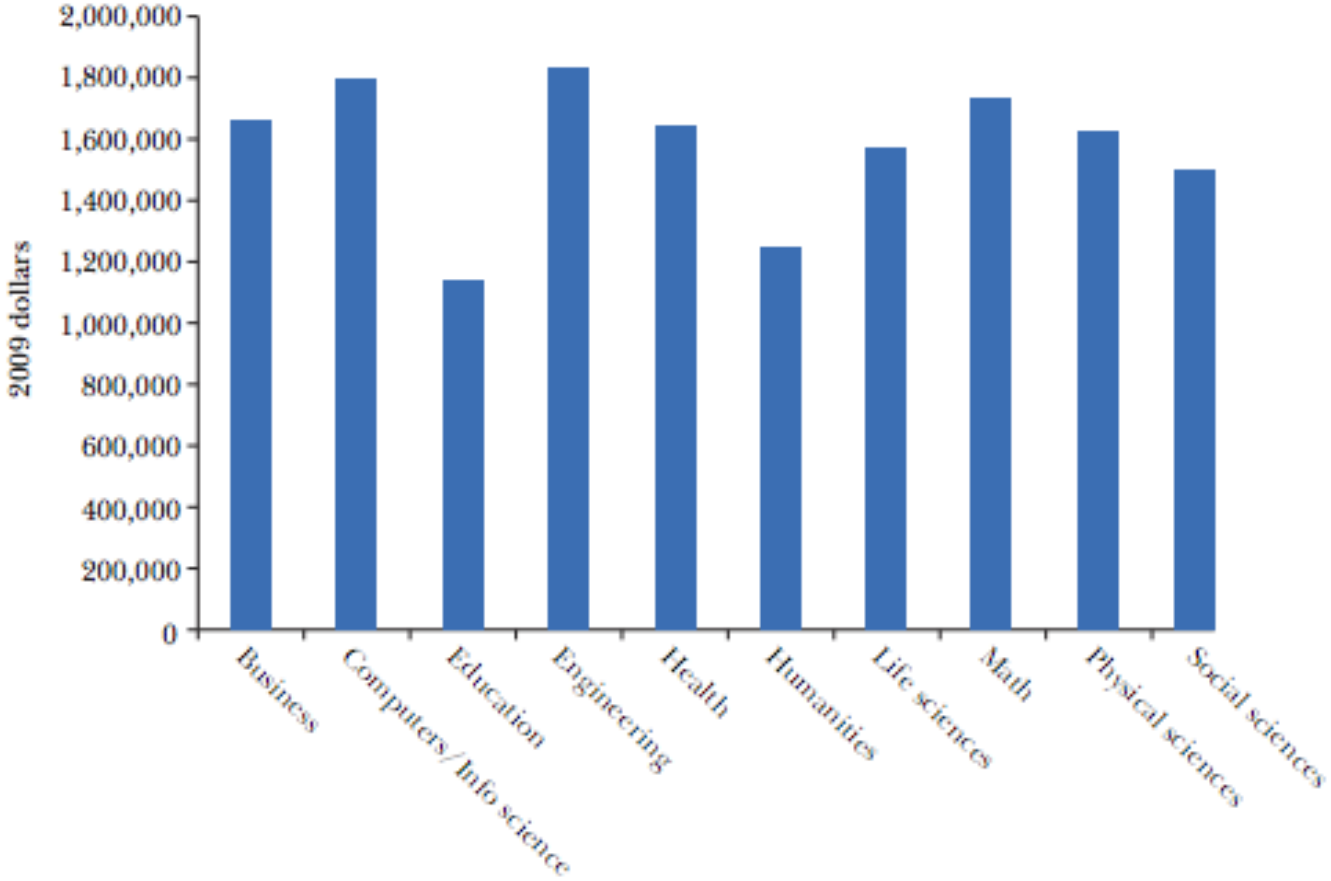
Major has a big effect on earnings potential:

- The average lifetime earnings of a high school graduate is $780,000
- Comparing that to the lower earning degrees shows the premium being eroded significantly

Student Debt

Figure 4

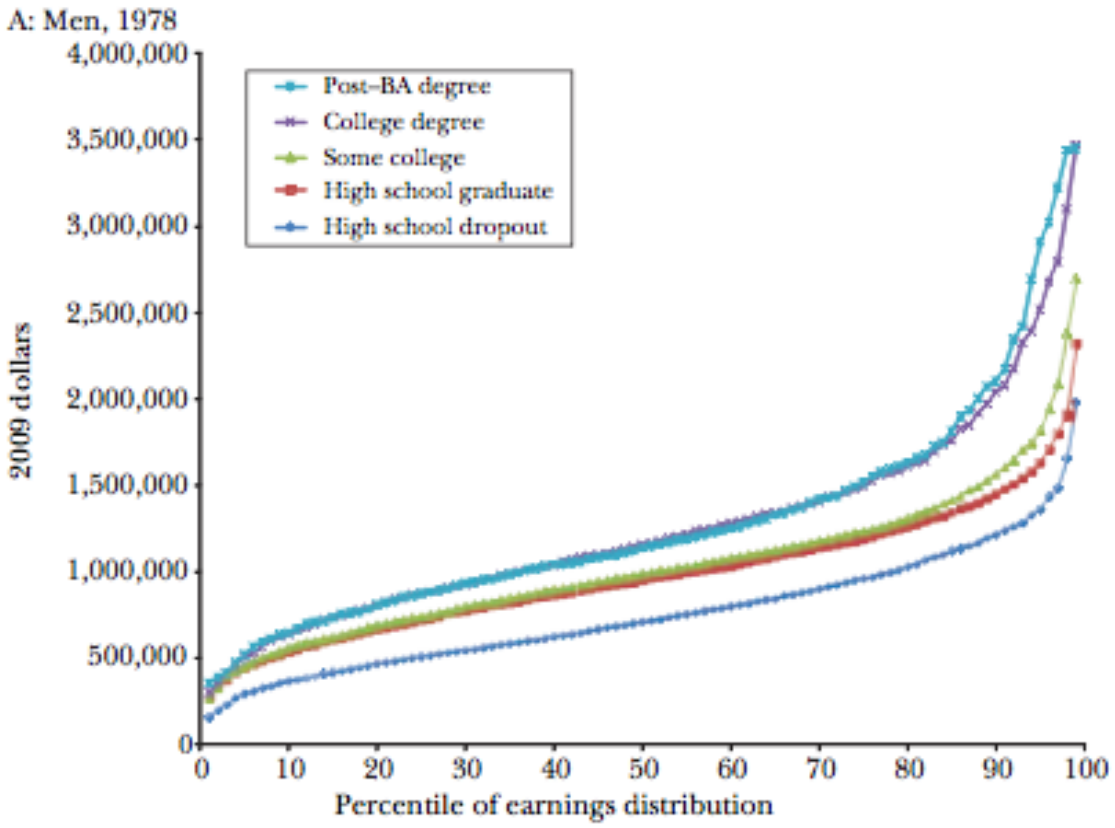
Expected Lifetime Earnings by Undergraduate Major, 2008



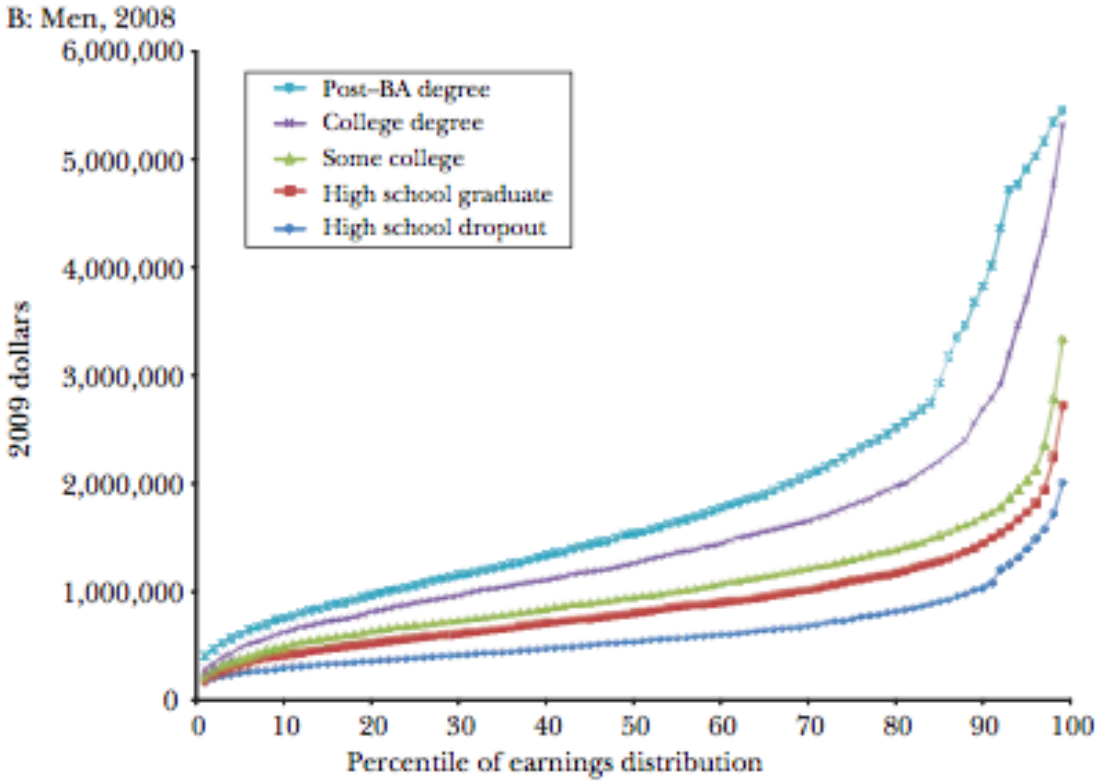
Student Debt

- A significant portion of the gains to college degrees may be accruing to those who go on to get professional or graduate degrees or certificates.
- Variance in general has risen

Student Debt



Student Debt



Student Debt

Percentile of high school wage distribution		*1978*			*2008*		
		$\rho = 1$	$\rho = .75$	$\rho = 0$	$\rho = 1$	$\rho = .75$	$\rho = 0$
Expected net returns (Coll-HS)							
Women							
	10	134,813	249,411	335,759	203,784	355,945	669,552
	25	167,899	239,871	254,250	305,930	399,938	604,639
	50	221,041	221,041	154,125	439,393	439,393	500,514
	75	273,940	185,138	28,132	644,108	486,238	391,902
	90	296,916	109,356	–136,452	886,685	510,096	216,762
	95	322,090	28,849	–261,567	1,108,659	454,099	81,008
	99	292,183	–195,673	–546,937	2,327,401	459,908	–108,517
Men							
	10	235,318	470,272	770,070	277,920	493,595	968,544
	25	298,880	414,859	626,742	408,338	553,783	874,169
	50	361,800	361,800	427,885	607,035	607,035	725,050
	75	410,767	255,779	176,674	896,534	670,763	518,658
	90	599,569	151,586	-76,355	1,326,780	703,732	230,408
	95	813,152	80,473	–221,434	1,941,625	475,151	–134,834
	99	1,116,979	–426,564	–840,546	3,024,145	271,733	–745,734

Source: Authors.

Student Debt

The mean monthly loan payment to income ratio for borrowers who have begun repaying loans after 6 years is 10.5%

- This is considered manageable by loan industry standards
- Those graduating from private schools are not faring as well with almost 3 times the default rate

Making College Free

- Making college free will undoubtedly increase the quantity of education while lowering the price paid by students/workers
  - Demand curves slope downward afterall
- There is an important fairness concern
  - Boils down to the idea that some people currently pay far more for education than others
  - If college becomes free and there are persistant differences in peoples willingness to pay for college
    - Then those who tend to pay more already benefit more (simply arithmetic)
  - Who pays more? People who have more resources
    - The wealthy

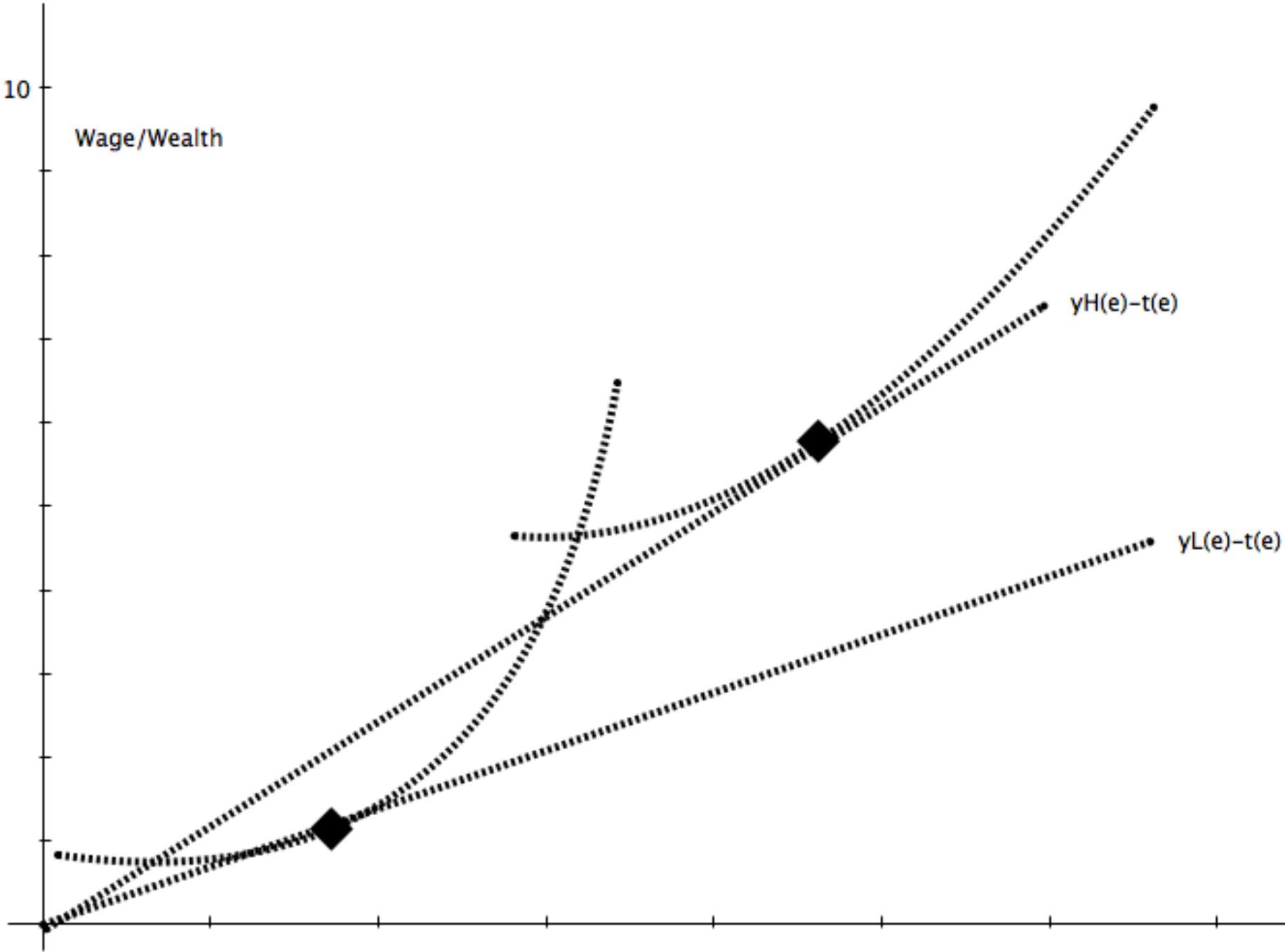
Making College Free

- Suppose people come in two types
  - High ability, and low ability
- Types may represent:
  - something innate about people
  - Or human capital accumulation prior to the education decision

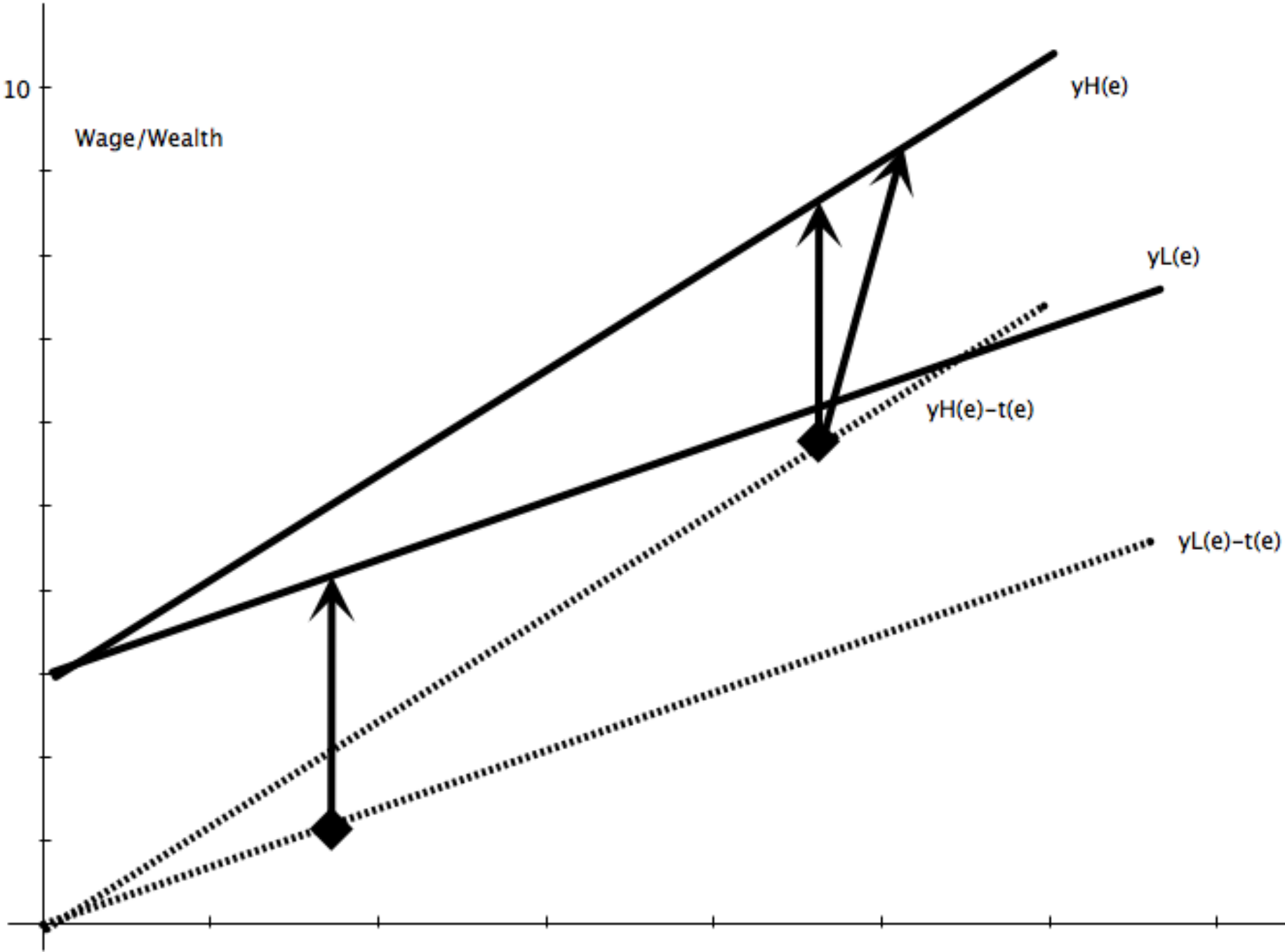
Making College Free

- High types:
  - Cost of education $c^h(e)$
  - Education is productive (raises their MPL) according to $y^h(e)$
  - Utility of wealth $u(w - c^h(e)$
- Similar for low types
  - But $y^l(e) < y^h(e)$ point-wise
  - And $c^l(e) > c^h(e)$ point-wise
- Tuition is the same for both types: $t(e)$
- Under these conditions and some technical conditions on the function forms there is a truthful equilibrium where
  - high types buy more education and get higher wages the low types

Making College Free



Making College Free



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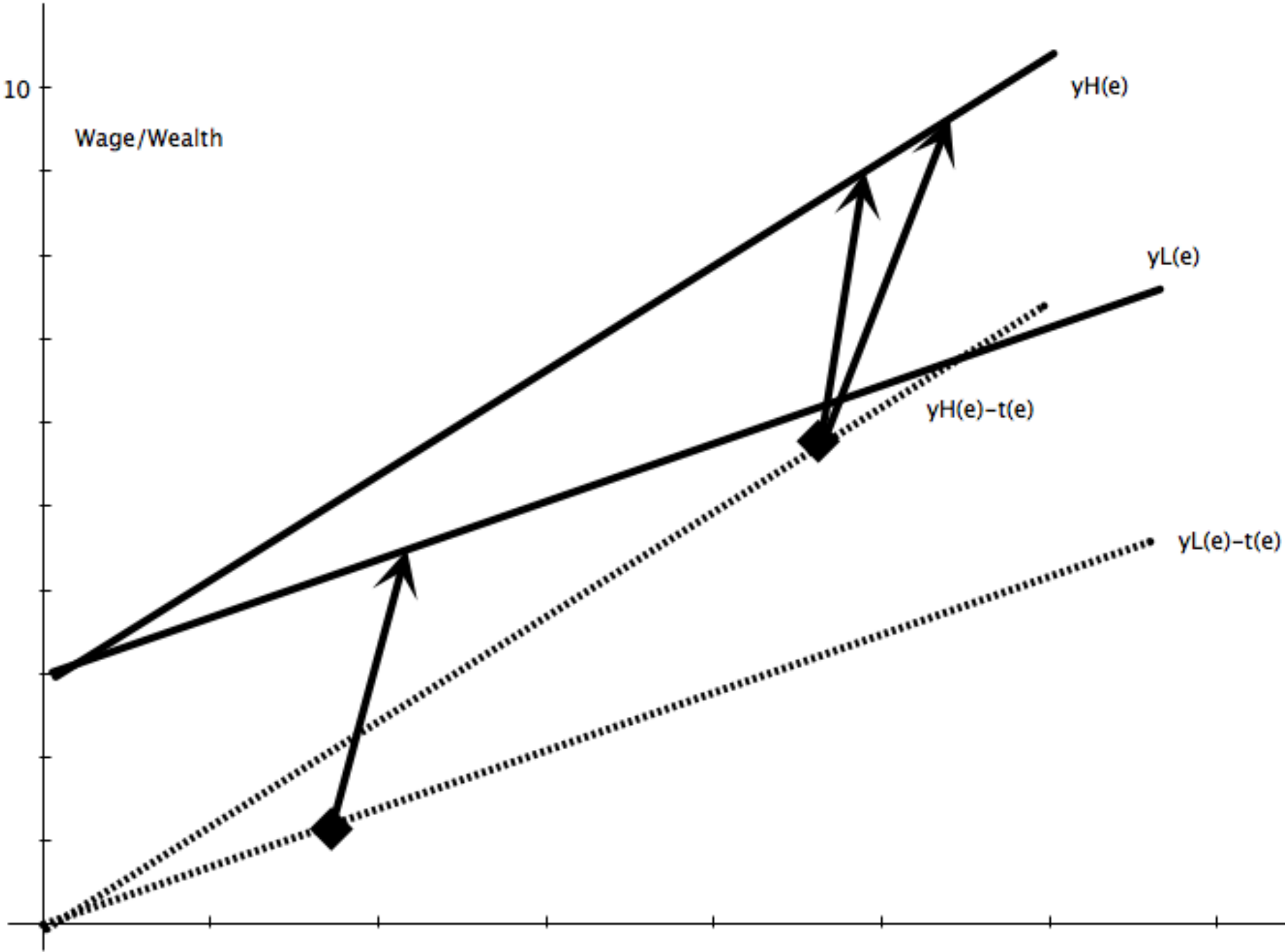

Making College Free

- The key is the income expansion paths (engel curves) for education/wealth bundles
  - If one of the types has a different expansion path then they benefit more than the other type
- There is reason to think that this may be the case since people with more income tend to spend more on education
  - This could be due to the signaling equilibrium illustrated above
  - Signaling is necessary but not sufficient for this effect
- Currently I am not aware of any attempts to estimate the income expansion paths and welfare effects of free college

Making College Free

- Free college will increase average education (increase average productivity)
  - At one point Clinton's plan was estimated to cost $500 billion dollars, that's a large tax increase
- May not get rid of wage inequality due to signaling
  - High ability workers may still try to differentiate themselves
- If income expansion paths differ for education then the policy may benefit the rich more than poor
  - Seems to be primary policy concern beyond total cost
  - Suggests that more targeted policies may be more helpful

Price of Textbooks

Textbooks are expensive, why?

- First a book has a monopoly on being that book
- Within a niche like an economics issues textbooks there are often few choices
  - I found about 6 that roughly matched, and looked at 3 in detail
- For my graduate classes there are usually 1 or 2 possible books, but demand is low and there are few resellers so they are more reasonably priced
- Undergraduate books must make their money on the first 5,000-10,000 copies sold and so may charge a higher price

Price of Textbooks

Textbooks are expensive, why?

- Books must be adopted by professors and professors may not fully internalize the cost of the book
- One might think that competition from used books would drive prices of new books down
  - A seller might start with a high price, and then drop the price over the lifetime of the book
- New books and used books erode in value as the time till a new edition gets smaller
  - Again we might think that prices should fall

Price of Textbooks

Textbooks are expensive, why?

- In the first period re-sellers drive the price up
  - re-sellers get a discounted price in effect because they will re-coup some of the expense
  - This hurts high valuation buyers who don't get to enjoy the discounted price

Price of Textbooks

Textbooks are expensive, why?

- In the second period if the number of high valuation buyers is low enough
  - The publisher will want to raise the price of the book in response to the increasing quantity of used books on the market
  - The publisher basically abandons the re-sellers and tries to sell only to the high valuation buyers