Credit Supply and the Rise in College Tuition: Evidence from the Expansion in Federal Student Aid Programs

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Introduction

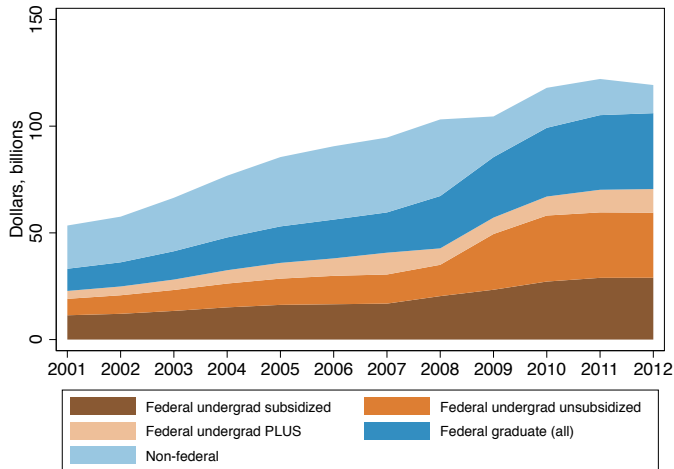- Study the link between the rise in student borrowing and college tuition

Non-mortgage related household debt balances
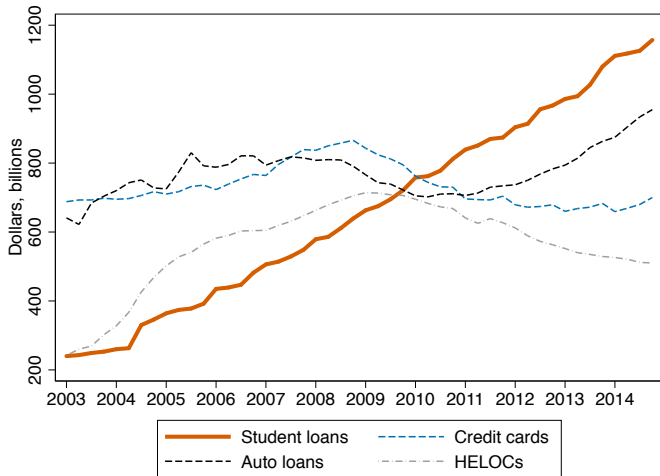
- At $1.2 trillion, student debt outstanding now the largest form of non-mortgage household liability (FRBNY CCP/Equifax)

Aggregate student loan originations

- Student loan originations rose from $53 to $120 billion between 2001-12; >90% under federal loan programs (College Board)

Undergraduate sticker tuition and federal per-student originations
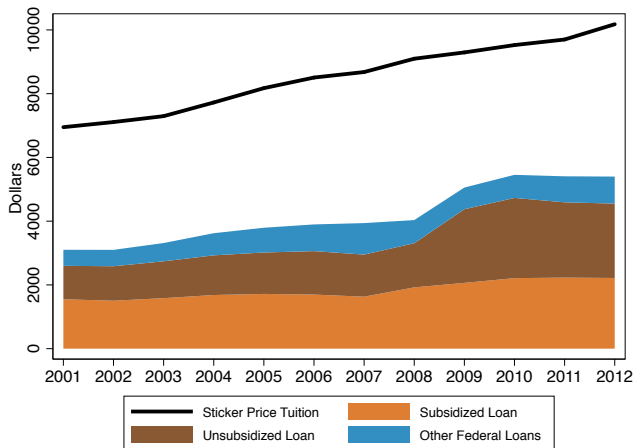
- Sticker tuition grew 46% in real terms from $6,950 to $10,200 in 2012 dollars (IPEDS/Title IV)

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- Study the link between the rise in student borrowing and college tuition

- Does more financial aid lead to higher tuition?
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- This paper's contribution is to test the loan supply channel (Bennett hypothesis)
  - Other studies have looked at this question (Pell grants) with other methods
  - This paper relies on a quasi-natural experiment: large expansion in federal aid maximums between 2005-10

Changes in Federal Aid Policies

- Focus on subsidized & unsubsidized federal loans (or "Staffords" pre-2010) that account for 82% of all federal student loans in 2012-2013

- Yearly federal loan and grant maximums

	Sub. and Unsub. Loans				Additional Unsubsidized Loans				Pell Grants
Year	Y1	Y2	Y3/Y4	Grad	Y1-Y4(D)	Y1/Y2(I)	Y3/Y4(I)	Grad	Y1-Y4
2001	2625	3500	5500	8500	0	4000	5000	10000	3350
2002	2625	3500	5500	8500	0	4000	5000	10000	3750
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2008	3500	4500	5500	8500	0	4000	5000	12000	4310
2009	3500	4500	5500	8500	2000	6000	7000	12000	4731
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- Higher Education Reconciliation 2006 Act increased subsidized loan limits from $2625 to $3500 for freshman, and from $3500 to $4500 for sophomores

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- Ensuring Continued Access to Student Loans 2008 Act: increased additional unsubsidized loan limits by $2000 for all students

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- Higher Education Opportunity 2008 Act and the ED appropriations: raised Pell Grant in 2002-03 and 2008-11

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Per-student Subsidized and Unsubsidized Federal Student Loan Amounts
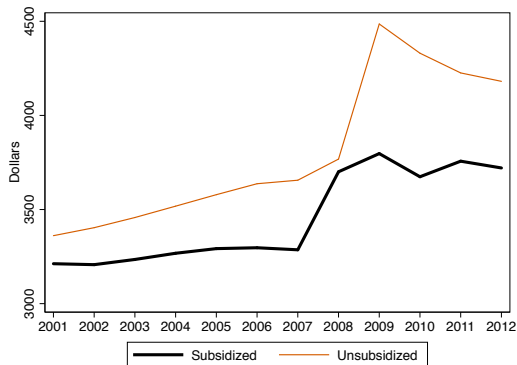
- Subsidized and unsubsidized per-student loan amounts jump at respective policy changes (Title IV, IPEDS)

Federal loan programs and tuition: economic priors (1/2)

- Economic rationale for a government loan to a student: education is an intangible investment that is hard to fund

- Equilibrium pricing effects with many constrained students:
  1. Students pay the (borrowing) constrained amount rather than their "willingness to pay"
  2. Greater access to credit boosts demand
  3. Higher tuition and margins unless perfect competition and ability to expand capacity

Note: Higher ability to pay of lower-income students affects other students as well because of increased shadow value of college seats

Federal loan programs and tuition: economic priors (2/2)

- To what extent would colleges respond to increased demand?

- Access to some university may already be rationed (selective privates); some universities are unable or unwilling to raise tuition (e.g. publics require state legislative or executive authorization)

- For profit privates are most likely to accommodate demand with price increases
  - Brian Mueller, CEO Apollo ED Group, 2007Q2 earnings call: "[...] rationale for the price increase at Axia had to do with Title IV loan limit increases. We raised it to a level we thought was acceptable in the short run [...] it definitely was done under the guise of what the student can afford to borrow [...]"

Statistical identification

- How to achieve identification from an aggregate loan supply increase?
    - Student aid available to all universities but eligibility and participation differs
    - Use ex-ante student aid exposures to sort institutions before changes in maximums

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- Construct college i change in program caps:

Loans: $\underbrace{\text{LoanExp}_i}_{\text{\% students at max for sub or unsub}} \times \$\Delta\text{LoanCap}_t$

Pell Grants: $\underbrace{\text{PellExp}_i}_{\text{\% students awarded any amount}} \times \$\Delta\text{PellGrantCap}_t$

Baseline regression results

|	(1) $\Delta PellGrants_{it}$	(2) $\Delta SubLoans_{it}$	(3) $\Delta UnsubLoans_{it}$	(4) $\Delta StickerTuition_{it}$
PellGrantExp$_i \times \Delta$PGCap$_t$	1.152***	-0.428***	-0.459***	0.374**
	[0.09]	[0.09]	[0.12]	[0.15]
SubLoanExp$_i \times \Delta$SLCap$_t$	0.057	0.705***	0.153	0.579***
	[0.07]	[0.12]	[0.14]	[0.17]
UnsubLoanExp$_i \times \Delta$USLCap$_t$	-0.039***	0.038	0.565***	0.167***
	[0.01]	[0.02]	[0.05]	[0.04]
Inst&Year FE?	Yes	Yes	Yes	Yes
Adj R^2	0.44	0.08	0.21	0.38
N Obs	10060	9790	9750	10570

- High elasticities wr/t own cap/exposure interactions (1)-(3); substitution effects with Pell Grants (2)-(3);

- Large pass-through effects of caps on tuition (4); e.g. a $1 subsidized cap increase $\rightarrow$ 60 cents tuition increase

Robustness checks (1/2)

- Account for other characteristics (interacted with policy changes):
    - sector (for-profit), program type (4-year), difference in average EFC, tuition levels, selectivity, other funding (federal, state, endowments)

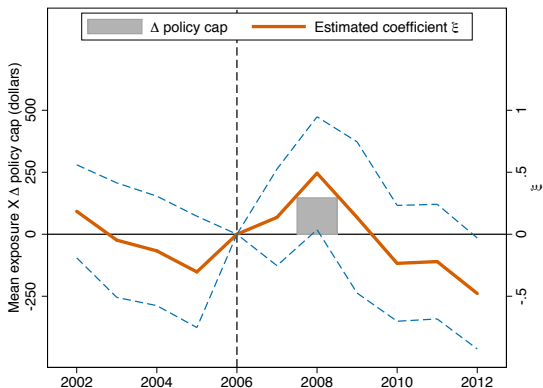   - Subsidized loan result pass these tests; unsubsidized and Pell not consistently

Robustness checks (2/2)

- Placebo/parallel trends test: relative differences (ξ) of more-and-less-exposed institutions in years when no policy change takes place

- **Subsidized loan exposure:** ΔSubsidized loans
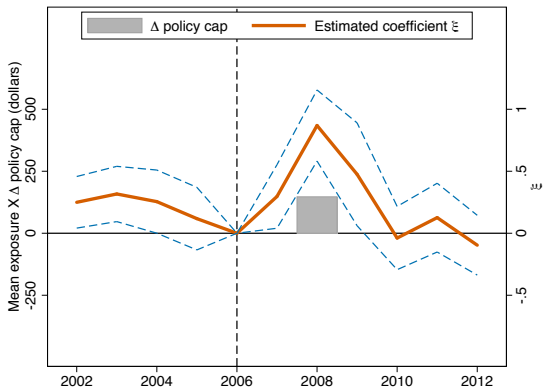
Robustness checks (2/2)

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- **Subsidized loan exposure:** ΔSticker tuition

Robustness checks (2/2)

- Placebo/parallel trends test: relative differences (ξ) of more-and-less-exposed institutions in years when no policy change takes place

- Subsidized loans pass the placebo test (abnormal loan and tuition increases only in 2008)

- Unclear that unsubsidized loans pass test for tuition; Pell Grants do not pass the placebo test for tuition (smoothness of Pell Grant increases; measurement issue of unsubsidized exposure)

Additional results

- Study effects for institutional grants, "net tuition" and enrollments

- Split samples: Loan effect most pronounced at expensive (sub & unsub) as well as private & less-than-4y programs (sub)

- For-profits under-represented in NPSAS:
  - Stock market responses of for-profits on days when aid legislation passes
  - Unusual tuition increase of for-profits in years of policy changes vs others

- Pre-policy trends:
  - Drop fixed effects and study 2002-07 institution changes in terms of 2002 reliance on aid

  - More aid dependence associated with higher enrollments, future aid growth and tuition

Conclusions

- Study response of college tuition to the federal student aid expansion

- Abnormal tuition increases for institutions where students are most responsive to changes in aid caps:
  - Loans (esp. subsidized) but results not robust for Pell Grants

- Benefit incidence/public policy:
  - In the short run, higher loan caps can be costly to students because of aggregate demand effects
  - In the long run, benefits may result in the form of higher capacity and improved education quality