

# The Impact of Financial Aid Incentives on Educational Outcomes: Evidence from Two Experiments

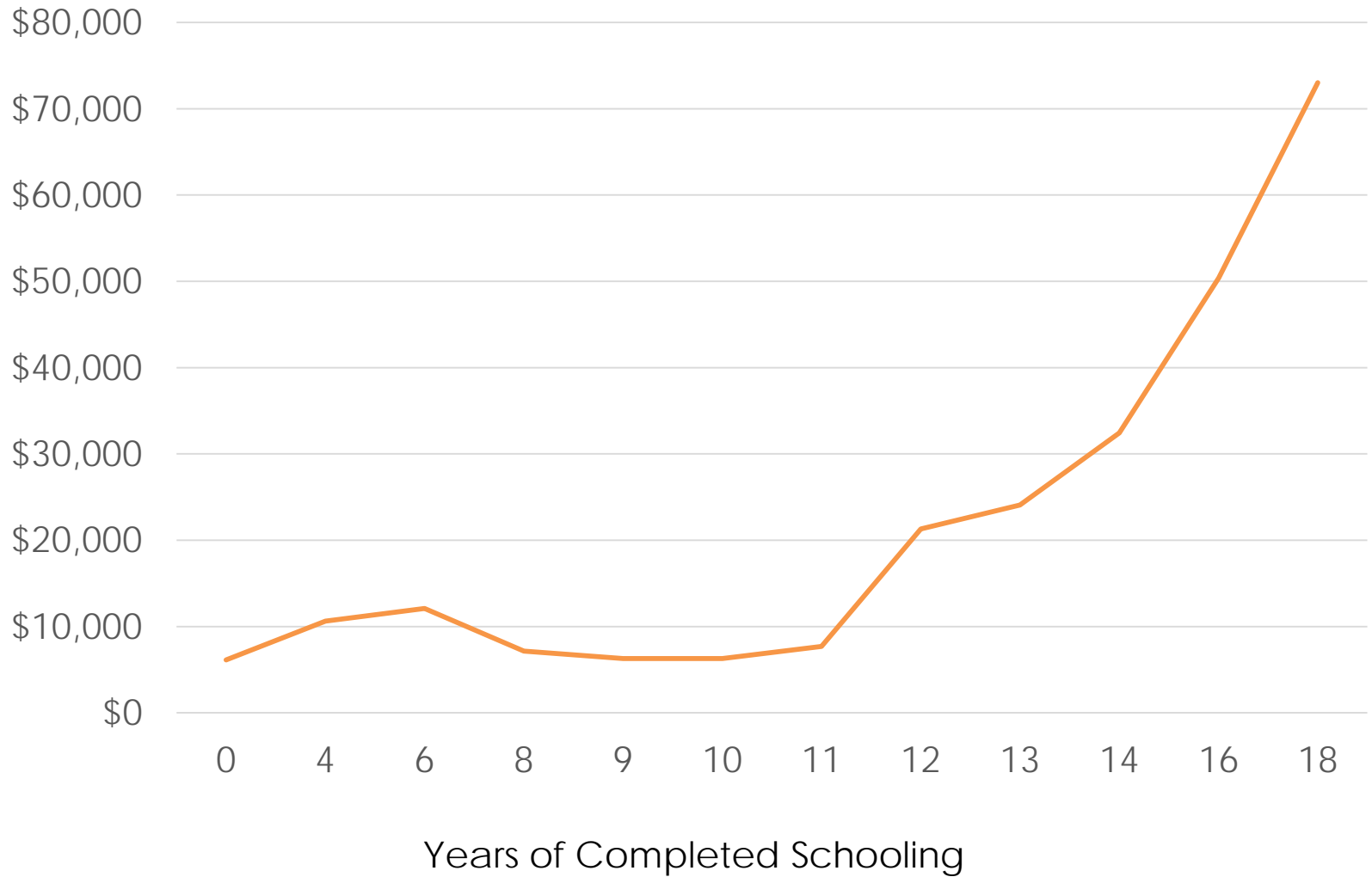
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October 2019

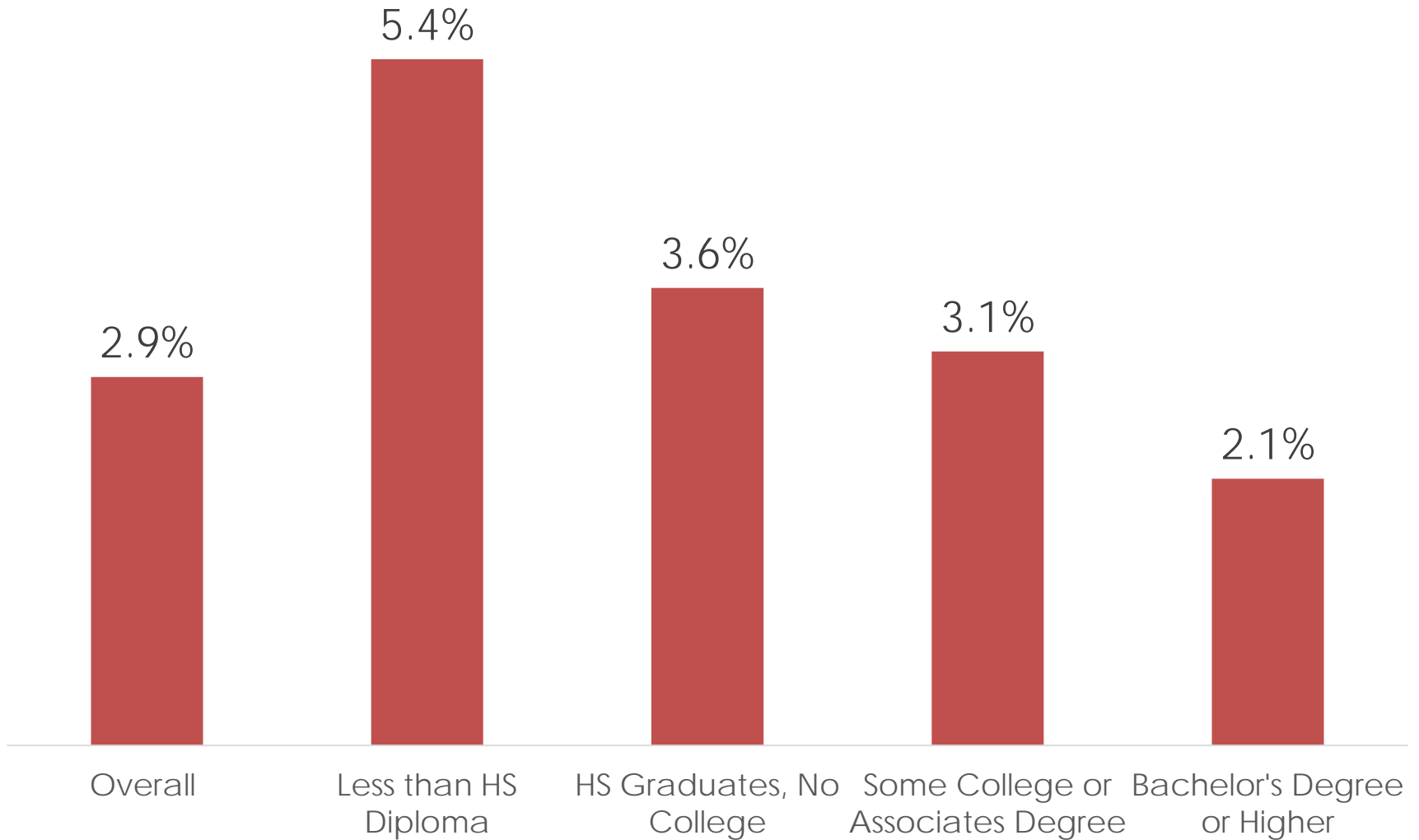
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# Average Annual Earnings by Years of Completed Schooling



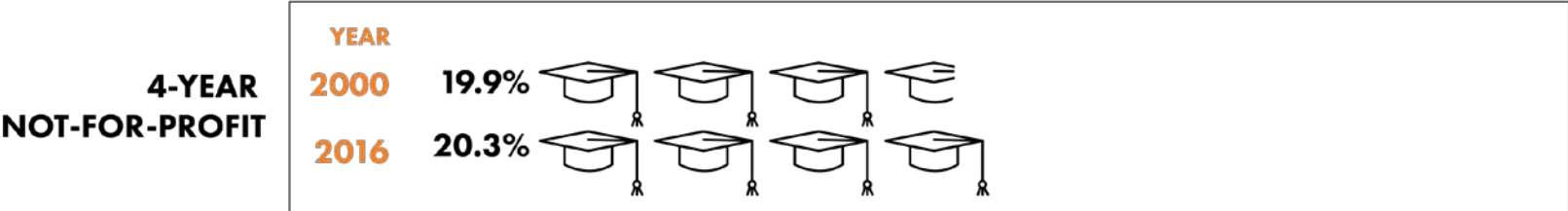
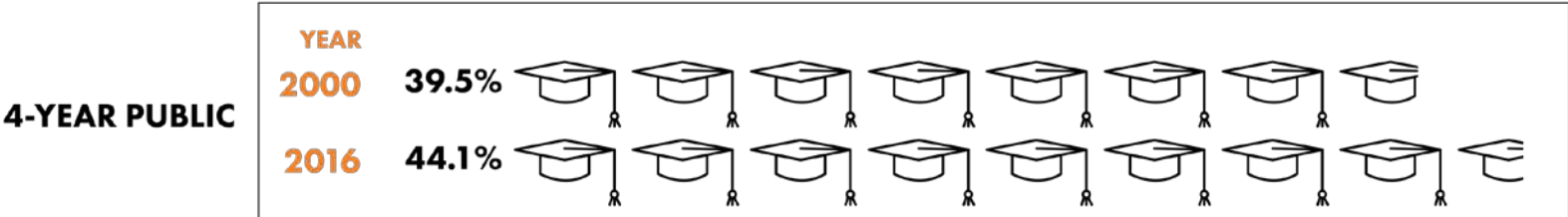
# Unemployment Rate by Educational Attainment August 2019



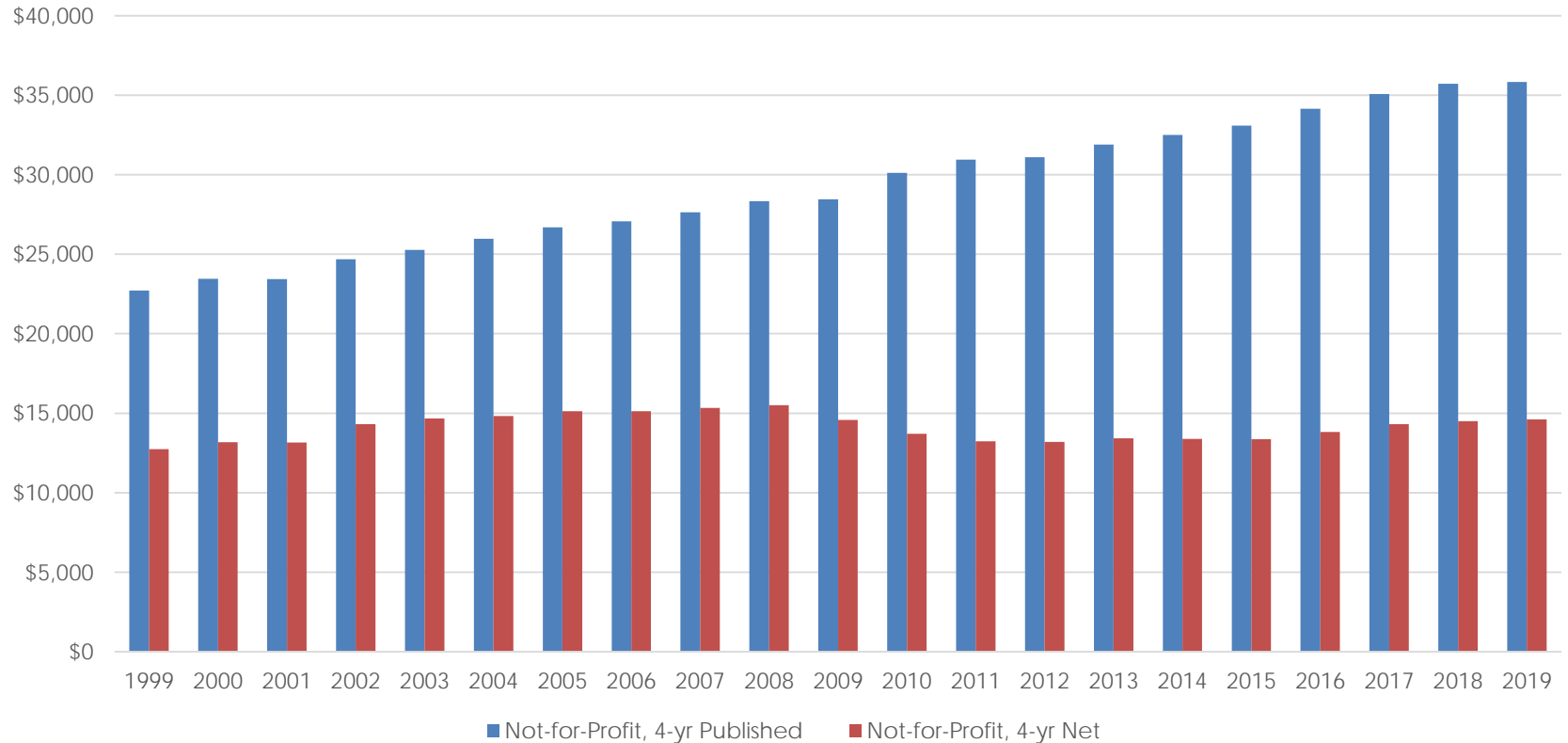
# Other Benefits to Education

- Better Employment, Benefits (Levin et al., 2007)
- Improved Health Outcomes (Cutler and Lleras-Muney, 2006)(Grossman, 2005)
- Societal Outcomes
  - Crime (Levin et al., 2007)
  - Voting (Dee, 2003)
  - Free Speech (Dee, 2003)
  - Taxes (Levin, 2005)
  - Spillovers to other workers (Moretti, 2012)

# Student Population by Type of Institution and Over Time

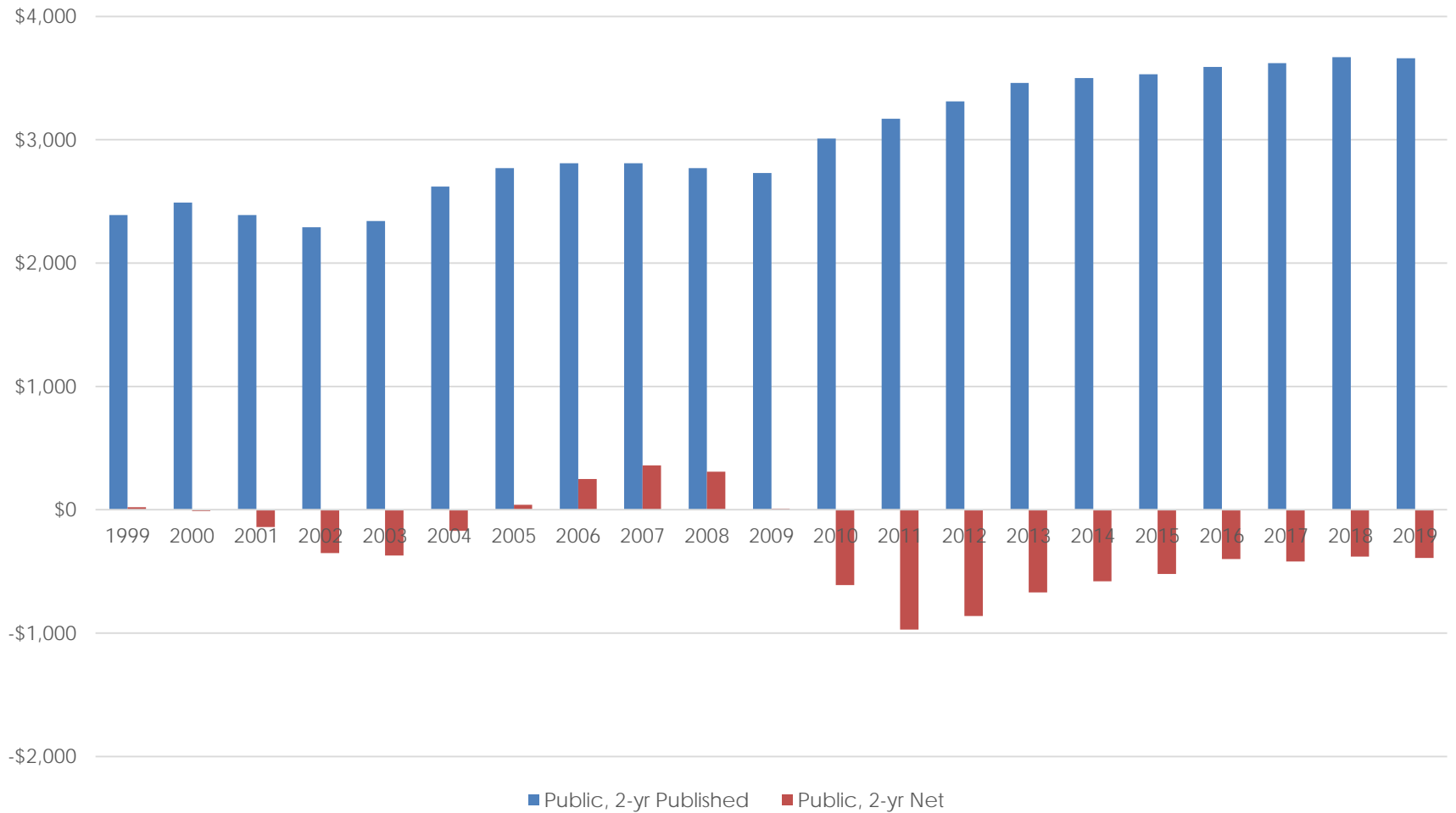


# Sticker prices are up ... Actual prices much less so



## Not-for-Profit 4-year universities

## ... the difference is even greater at public 2-year institutions



## Degree Attainment within 6 Years for 2003-04 Beginning Post-secondary Students, by Type of First College

Highest Degree Attained	All	Public Two-year	Public Four-year	Private not-for- profit
Bachelor's	30.7	11.6	59.5	60.4
Associate's	9.3	14.4	3.8	4.9
Certificate	9.4	8.5	1.6	2.8
No degree, still enrolled	15.0	19.6	12.9	11.1
No degree, not enrolled	35.5	46.0	22.2	20.9



## Degree Attainment by Goal in First Year by Type of First College Attended

Highest Degree Attained	Initial Degree Goal	Outcome for those who wanted BA	Outcome for those who wanted Associate's	Outcome for those who wanted Some College
Two-year College Students				
Some College	14.8	68.1	77.4	94.1
Associate's	26.8	15.2	20.4	4.1
Bachelor's	58.4	16.7	2.22	1.8
Four-year College Students				
Some college	4.4	34.3	64.8	60.3
Associate's	6.6	3.5	20.2	2.5
Bachelor's	89.0	62.2	15.0	37.2

# Why the high rate of non-completion?

- Complicated lives
- Academic preparation
- Ineffective curriculum
- Lack of adequate institutional support
- Cost (both direct & indirect)/Financial aid



# Findings

- Performance-based scholarships increase quantity and quality of time spent on educational activities, esp. for those who are plausibly less time constrained and those likely to be myopic/have high discount rates.
- Some evidence the impacts come from the incentive structure of the scholarship rather than simply the additional income.
- Mixed evidence of unintended consequences.
- Combined suggest post-secondary students can, and do, respond to monetary incentives.
- Biggest impacts *may* be from those most able to respond or less forward looking.

# Theoretical Framework

- Grades/attainment depend on ability, effort, and random noise.
- Effort is costly.
- PBS increases the pay-off to effort. Therefore expect:
  - Smaller effect on effort for high “ability” students
  - Smaller effect on effort for low “ability” students
  - Smaller change in effort for students facing higher marginal cost of effort/more time constrained.
  - Smaller change in effort for those who are more “forward looking.”

# Literature on education incentives: somewhat mixed, and often small impacts

- K-12 level
  - Jackson (2010s) finds that an AP incentive program in TX increased test scores, college matriculation, and persistence.
  - Angrist and Lavy (2009) get similar results from a program in Israel incentivizing HS exit exam completion.
  - Fryer (2012) finds no impacts from incentivizing educational “outcomes,” but suggestive evidence from incentivizing “inputs” to education.
- Postsecondary level
  - Angrist, Lang, and Oreopoulos (2009) no impacts of GPA incentives for men, sizable impacts for women.
  - Angrist, Oreopoulos, and Williams (2012) small impacts of grade incentives on grades at a Canadian commuter college campus.
  - Barrow, Richburg-Hayes, Rouse and Brock (2014) found an impact on enrollment and total credits earned with some evidence of increased academic performance and effort.

# Outline for the Rest of the Talk

- I. Description of the MDRC PBS experiments
- II. Description of the Barrow/Rouse time use survey
- III. Descriptive statistics from the data
- IV. Analysis
- V. Discussion and conclusion

# The MDRC PBS Demonstration

- Started in 2008

- Six Sites:

New York City (Hostos & BMCC)

Ohio

New Mexico

California

Arizona

Florida

# Characteristics of BMCC and Hostos (2007)

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	BMCC	Hostos
Total enrollment	18,462	4,416
Full-time students	63.0%	65.2%
Female	59.7%	71.4%
Black, non-Hispanic	33.7%	28.3%
White, non-Hispanic	13.8%	2.5%
Hispanic	31.2%	55%
Under age 25	66.0%	58.4%
In-state tuition & fees	\$3,068	\$3,105

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Source: Richburg-Hayes, Sommo, and Wellback, "Promoting Full-time Attendance Among Adults in Community College," May 2011, and IPEDS.



# The New York City Performance-based Scholarship

\$200 After registration (i.e., had paid tuition)

With continued enrollment mid-semester (had attended at least once in the first 3 weeks and at least once in the 4<sup>th</sup> or 5<sup>th</sup> weeks of the semester)

+ \$450

+ \$650

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\$1,300

With grade of “C” or better (or Pass in Dev Ed) in at least 6 credits or equated credits)

1<sup>st</sup> semester total

+ \$2,600

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Could be repeated a 2<sup>nd</sup> semester

**\$2,600**

**Total**

# Design of New York City Experiment

Students randomly assigned to one of three groups:

PBS Scholarship of up to \$1,300 each semester for two semesters (\$2,600 max)

PBS Scholarship plus a PBS scholarship of up to \$1,300 for one consecutive summer term (\$3,900 max)

Control group: Regular financial aid package for which individual qualified

# Design of CA Experiment (Fall 2009 Cohort)

Type	Total Amount	Performance-Based?	Duration	Fall 2009		Spring 2010	Fall 2010		Spring 2011
				Initial	Final		Initial	Final	
1	\$1,000	No	1 term	\$1000					
2	\$1,000	Yes	1 term	\$500	\$500				
3	\$1,000	Yes	1 year	\$250	\$250	\$500			
4	\$2,000	Yes	1 year	\$500	\$500	\$1000			
5	\$2,000	Yes	2 years	\$250	\$250	\$500	\$250	\$250	\$500
6	\$4,000	Yes	2 years	\$500	\$500	\$1000	\$500	\$500	\$1000

Must complete 6 or more credits with at least a “C” average to earn the PBS scholarship.

# MDRC Performance-based Scholarship Eligible Populations

## New York City

- Age 22-35;
- Lives away from parents;
- Requires developmental education;
- Enrolled in 6+ credit or contact hours at intake;
- Pell eligible.

## California

- Age 16-19;
- Attend a Cash for College workshop in eligible region
- Below Cal Grant income thresholds;
- Must be HS senior at time of workshop;
- Must have completed FAFSA and Cal Grant applications.

# Barrow & Rouse Time-use Surveys

- Web-based Survey;
- Key Question: Do students randomly assigned to receive a PBS spend more time in activities that would improve their academic outcomes (e.g., attending class, studying) and less time in activities that would detract from their academics (e.g., working, socializing with friends)?

# Barrow & Rouse Time-use Surveys

- 25 minute survey
- Incentive payments = \$30 for first survey
  - \$20 with survey invitation
  - \$10 upon survey completion
- Subsequent surveys increased total incentive by \$5

# Barrow & Rouse Time-use Surveys

- “In the LAST SEVEN DAYS,…”
  - Employment
  - Enrollment
  - Social life
- 24-hour time diary (DRM)
- Motivation, learning strategies, efficacy
  - MSLQ learning strategies
  - Academic self-efficacy
  - Internal/External motivation

# Time Use Categories

BLS ATUS categories	Barrow Rouse Time Use Survey
(All) Educational activities	Attending class; participating in online classes; studying/homework/special projects for school; preparing for test/mid-terms/finals; meeting with instructor, teaching assistant, counselor; registering/other administrative issues related to school.
Working and work-related activities	Work
Personal care sleep, eating and drinking, performing household tasks, and caring for others.	Household production
Leisure, commuting, and extracurricular activities	Leisure and other activities



# Do incentives motivate students for the wrong reason?

- Internal vs. external
- Does offering external rewards undermine internal (intrinsic) motivation?

# Types of Motivation

- External motivation (mean of):
  - *If I attend class regularly, it's because I want to get a good grade.*
  - *If I raise my hand in class, it's because I want to receive a good participation grade.*
- Internal motivation (mean of):
  - *If I turn in a class assignment on time, it's because it makes me happy to be on time.*
  - *If I attend class often, it's because I enjoy learning.*

# MSLQ: Motivated Strategies for Learning Questionnaire

- During class time, I often miss important points because I'm thinking of other things. (reversed)
- When I become confused about something I'm reading, I go back and try to figure it out.
- I ask myself questions to make sure I understand the material I have been studying.
- I often find that I have been reading for a class but don't know what it was all about. (reversed)
- When studying, I try to determine which concepts I do not understand well.

# Academic Self-Efficacy

- I'm certain I can master the skills taught in this class this year.
- I'm certain I can figure out how to do the most difficult class work.
- I can do almost all the work in this class if I don't give up.
- Even if the work is hard, I can learn it.
- I can do even the hardest work in this class if I try.

# Total (Baseline) Sample Size by Site

	NYC	CA					
	PBS	Non-PBS (\$1000)	PBS				
	\$1,300/ term		\$ 500/term		\$1000/term		
Cohort	2 terms	1 term	2 terms	4 terms	1 term	2 terms	4 terms
Fall 2008	368						
Spring 2009	514						
Fall 2009	619	483	484	447	468	468	460
Fall 2010		653	637	679	611	633	637
<b>Total</b>	<b>1,501</b>	<b>1,136</b>	<b>1,121</b>	<b>1,126</b>	<b>1,079</b>	<b>1,101</b>	<b>1,097</b>

## (Selected) Baseline Characteristics of PBS Participants and First-year NPSAS Students (Percentage)

	New York		California	
	PBS	NPSAS 2-yr Public colleges	PBS	NPSAS All institutions
Age (in years)	26.5	27.0	17.6	18.4
Female (%)	69.1	52.1	59.9	53.5
Hispanic (%)	44.3	21.6	63.2	15.4
Black (%)	37.2	18.8	3.9	12.3
Has any children (%)	47.8	46.9		
Highest degree completed = AA, CT+	15.1	19.3		
First person in family to attend college (%)	32.9	47.0	54.8	28.7
Non-English spoken at home	54.6	19.6	63.0	12.0
Sample size	1,501	250,997	6,660	2,660,060

## Randomization of Program and Control Groups

	NYC		CA	
	Program Group	Control Group	Program Group	Control Group
Age (in years)	26.5	26.6	17.6	17.6
Female (%)	69.8	68.4	60.6	59.7
Hispanic (%)	44.4	44.3	63.1	63.2
Black (%)	36.2	38.2	3.3	4.1
No child < 6 years old (%)	69.2	65.5		
Attended at most 11 <sup>th</sup> grade or lower (%)	29.5	31.8		
First person in family to attend college (%)	34.5	31.3	56.4	54.8
Number of observations	1321-1501		6541-6660	

# Question #1:

*Do these scholarships change behavior?*



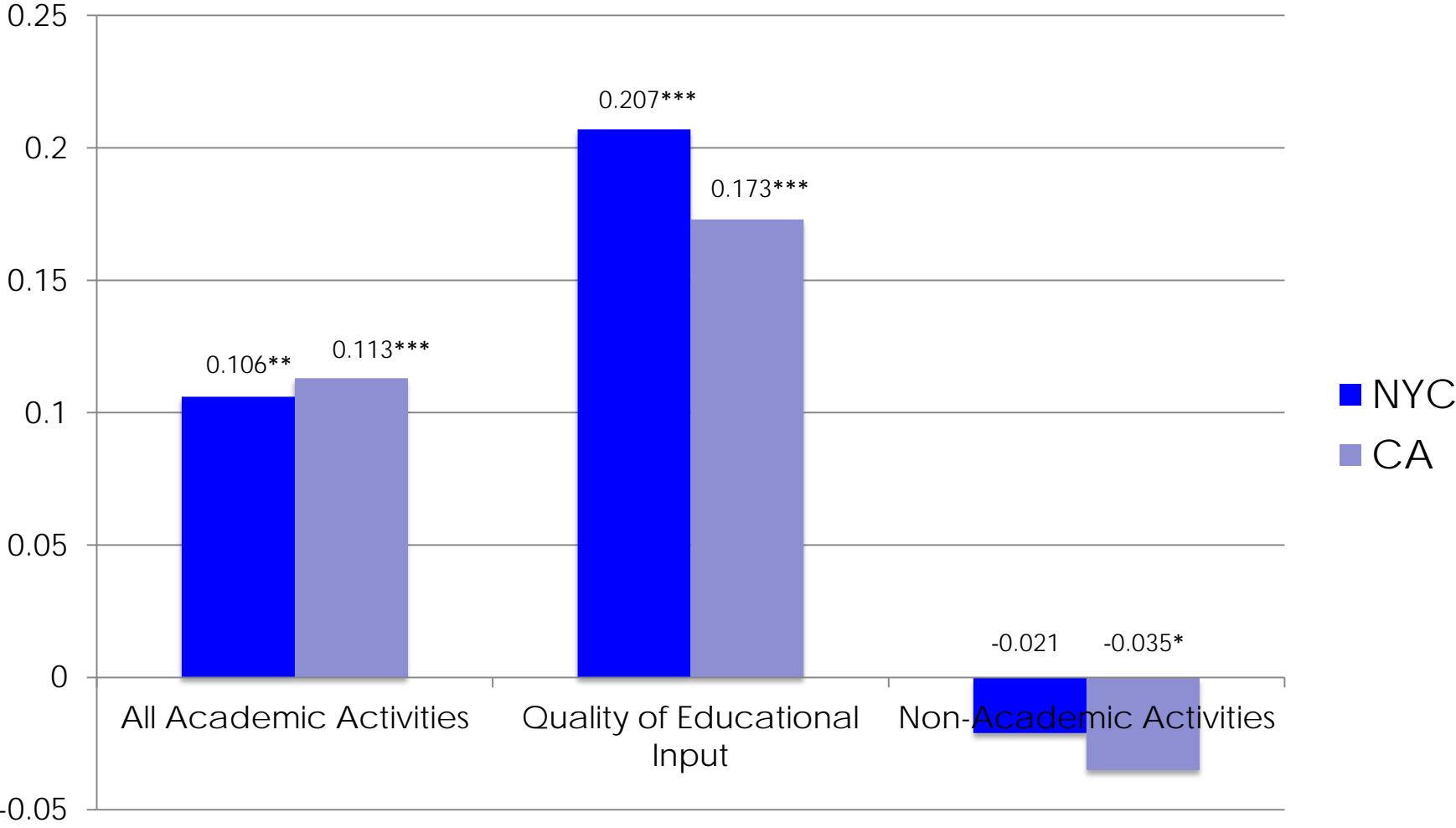
# Did Students in NYC and CA Spend More Time on Academic Activities?

	NYC		CA	
	Control Mean	PBS Impact	Control Mean	PBS Impact
Ever-attended post-secondary	0.922	-0.012 (0.023)	0.831	0.052*** (0.015)
All educational activities	4.504	0.470 (0.314)	4.757	0.277 (0.174)
Hours/day spent studying in last 7 days	2.843	0.217 (0.204)	2.936	0.139 (0.098)
Prepared for last class attended	0.810	0.026 (0.032)	0.736	0.073*** (0.018)
Attended all/most classes in last 7 days	0.778	0.062* (0.032)	0.776	0.067*** (0.017)
Academic Self-Efficacy	0.000	0.189** (0.078)	0.000	0.121*** (0.041)
MSLQ Index	0.000	0.225*** (0.078)	0.000	0.224*** (0.042)

# Did Students in NYC and CA Spend Less Time on “Other” Activities?

	NYC		CA	
	Control Mean	PBS Impact	Control Mean	PBS Impact
Hours Worked in Last 24 Hours	2.496	0.096 (0.299)	0.750	0.026 (0.089)
Hours Worked in Past 7 Days	14.953	0.671 (1.414)	4.928	-0.216 (0.399)
Household production in Last 24 Hours	11.887	0.118 (0.352)	11.721	0.168 (0.147)
Leisure and other Activities in Last 24 Hours	5.080	-0.689** (0.302)	6.765	-0.482*** (0.160)
Times Out in Past 7 Days	0.761	-0.014 (0.084)	2.077	-0.124** (0.059)

# Overall Impacts of PBS on Behavior



## Question #3:

*Are there “unintended”  
consequences?*

## Potential “Unintended” Consequences in NYC and CA

	NYC		CA	
	Control Mean	PBS Impact	Control Mean	PBS Impact
Strongly agree/agree take challenging classes	0.451	0.024 (0.041)	0.385	0.058*** (0.021)
Ever felt had to cheat (yes/no)	0.176	-0.027 (0.030)	0.349	-0.106*** (0.019)
External motivation	0.000	0.031 (0.088)	0.000	0.077* (0.044)
Internal motivation	0.000	0.195** (0.076)	0.000	0.019 (0.045)
Ever asked for a regrade (yes/no)	0.262	-0.018 (0.036)	0.197	0.006 (0.017)
Very satisfied or satisfied with life	0.494	0.070* (0.041)	0.624	0.010 (0.020)

## Question #4:

*Does the size of the incentive matter?*

# Does the size of the incentive matter?

Evidence from CA PBS Demonstration in the First Semester

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	\$500/T	\$1000/T	p-value \$500/T=\$1000/T
	(1)	(2)	(4)
Ever-enrolled	0.072*** (0.021)	0.039** (0.018)	0.188
Currently enrolled	0.071*** (0.023)	0.049*** (0.020)	0.430
All Academic Activities	0.120*** (0.036)	0.108*** (0.033)	0.772
Quality of Educational Input	0.191*** (0.048)	0.160*** (0.043)	0.597
Non-Academic Activities	-0.026 (0.025)	-0.041* (0.022)	0.630
Unintended Consequences	-0.055** (0.026)	-0.044* (0.022)	0.731

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## Question #5:

*Was it the money or the incentive structure?*



# Is it the Money or the Incentive?

Evidence from CA PBS Demonstration

	\$1000/T	Non-PBS	p-value Non-PBS=\$1000/T
	(2)	(3)	(5)
Ever-enrolled	0.039** (0.018)	0.004 (0.030)	0.295
Currently enrolled	0.049*** (0.020)	0.028 (0.032)	0.554
All Academic Activities	0.108*** (0.033)	0.039 (0.056)	0.260
Quality of Educational Input	0.160*** (0.043)	0.034 (0.075)	0.125
Non-Academic Activities	-0.041* (0.022)	-0.023 (0.034)	0.632
Unintended Consequences	-0.044* (0.022)	-0.087** (0.037)	0.288

## Question #6:

*Who is most impacted by the incentive?*

## Impacts by Parental Status in NYC

	PBS	PBS x No Child < 6	p-value of difference
All Academic Activities	0.038 (0.080)	0.086 (0.105)	0.410
Quality of Educational Input	0.250** (0.117)	-0.091 (0.144)	0.528
Non-Academic Activities	-0.046 (0.049)	0.047 (0.062)	0.451
Unintended Consequences	-0.121** (0.052)	0.070 (0.068)	0.301

# Impacts by Educational Attainment in NYC

	PBS	PBS x $\leq 11$ years Education	p-value of difference
All Academic Activities	0.054 (0.064)	0.200* (0.109)	0.065
Quality of Educational Input	0.093 (0.084)	0.349** (0.152)	0.022
Non-Academic Activities	0.007 (0.037)	-0.107* (0.065)	0.101
Unintended Consequences	-0.033** (0.042)	-0.091 (0.071)	0.205

# In sum...

- Performance-based scholarships appear to increase quantity and quality of time spent on educational activities.
- However, the estimated impacts have been mostly modest in the literature.
- It appears that the size of the scholarship does not matter which is a puzzle.
- To the extent there are impacts, there is some evidence that they likely come from the incentive structure of the scholarship rather than the additional income.
- There is only some evidence of unintended consequences like choosing easier classes, cheating, or grade-grubbing, or taking few classes to meet GPA requirement.
- Together these results suggest performance-based scholarships can be a useful tool as their small impacts are nonetheless cost effective but that we need a much better understanding of how students respond to incentives.

Thank you.

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