

# The Effects of State Mandated Financial Education on College Financing Behaviors

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# Motivation

- Returns to college degrees are high and rising (Goldin and Katz, 2009; Oreopoulos and Petronijevic 2013).
- Federal government subsidizes student borrowing for postsecondary education.
- Identifying optimal aid package for postsecondary education is challenging.
  - ▶ Current policy rhetoric around *reducing* student loan debt by limiting public loans. SL Default
  - ▶ Evidence students actually under-invest due to credit constraints (Avery and Turner, 2012; Lochner and Moge-Naranjo, 2011 & 2015; Hoxby and Turner, 2015; Hoxby and Avery, 2014).

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## Do students have enough information to make borrowing decisions?

- First large financial decision young adults make.
- Most information about student loans online or focused on repayment (Fernandez. et. Al., 2015).
- Low financial literacy: 27% of 23-28 year olds correctly answer 3 questions on interest, inflation, and diversification (Lusardi and Mitchell, 2010).
- Lusardi (2016) reports statistics from NFCS:
  - ▶ 54% of student loan borrowers did not calculate their future monthly payments prior to choosing a loan.
  - ▶ 53% said they would make a change if they could make financial aid decisions again
    - ★ 11 percentage points higher for those with private loans.

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Federal Application for Student Aid (FAFSA) is a barrier for students:

- Dynarksi and Scott-Clayton (2006)
- Bettinger et Al. (2012)
- Castleman and Page (2016)
- 2.9 million undergraduate students do not apply for federal aid when they would have received Pell Grants (Kantrowitz, 2009)

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# A Policy Response

One potential response is personal finance coursework in high school:

- Required for all students prior to graduation (22 states).

Research Question: Can financial education requirements in high school change students' initial financial aid packages?

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# Other Policy Responses

- Campus-based interventions suggest some groups change student loan behavior when they get more information:
  - ▶ Barr et. Al. (2016), Castleman and Page (2016), Schmeiser et. Al. (2016), Stoddard et. Al. (2016)
- Behavioral economics literature finds that framing, debt-aversion, fixed costs of borrowing, and self-control all play a role.
  - ▶ Marx and Turner (2016), Field (2009), Marx and Turner (2015), Cadena and Keys (2013)

# Our Paper

- Use a difference-in-difference (DD) strategy to understand how students before and after the graduation requirement in states with and without personal finance course requirements change financial aid packages.
- Understand for whom financial education changes behavior?
- Use CPS data to show that personal finance education does not change college enrollment or institution choice.



# High School Financial Education

Previous research has studied the effect of state-mandated financial education in high school on a variety of outcomes.

**Knowledge:** Tennyson and Nguyen (2001)

**Savings:** Bernheim et. Al. (2001), Cole et. Al. (2013)

**Credit:** Cole et. Al (2013); Brown et. Al. (2016); Urban et. Al. (2014)

# High School Financial Education

What happens in high school financial education courses?

- Calculating and comparing interest rates
- Understanding credit scores
- Incurring long-term debt: mortgages, auto loans
- Using credit cards
- Examining how incomes may fluctuate
- Insuring against risk

# High School Financial Education

Some states directly teaching student loans in curricula.

- For example, in Texas, the State Board of Education requires that all students “understand the various methods available to pay for college and other postsecondary education and training.”
- Includes
  - ▶ understanding how to complete the FAFSA
  - ▶ researching and evaluating scholarship opportunities
  - ▶ comparing grant options, comparing private and federal student loans
  - ▶ evaluating work-study options
  - ▶ investigating any non-traditional methods of financing college or training

# Mechanisms

- Not sure if loan amounts should go up or down.
- Define other areas where financial education could change behavior:
  - ▶ Applying for aid
  - ▶ Obtaining grants or scholarship
  - ▶ Credit Card balances
  - ▶ Private vs. Public Loans
  - ▶ Stafford, subsidized/unsubsidized loans with lower interest rates than private.

## National Postsecondary Student Aid Study (NPSAS)

- Nationally representative study of students enrolled in higher education.
- Detailed data on financial aid extracted from institutional data.
- Paired with student survey data: demographics, high school degree, family background, credit card balances, and work.
- 2000, 2004, 2008, 2012 waves.
- Focus on 4-year public and private institutions.
- First semester freshmen only.
- 17, 18, and 19 year olds.

# Methods

- Compare students within the same treatment state that graduate the years before and after the requirement.
- Compare students in control states across years.
- Compare the difference within treatment states and the differences within control states.
- We cluster standard errors at the state level.

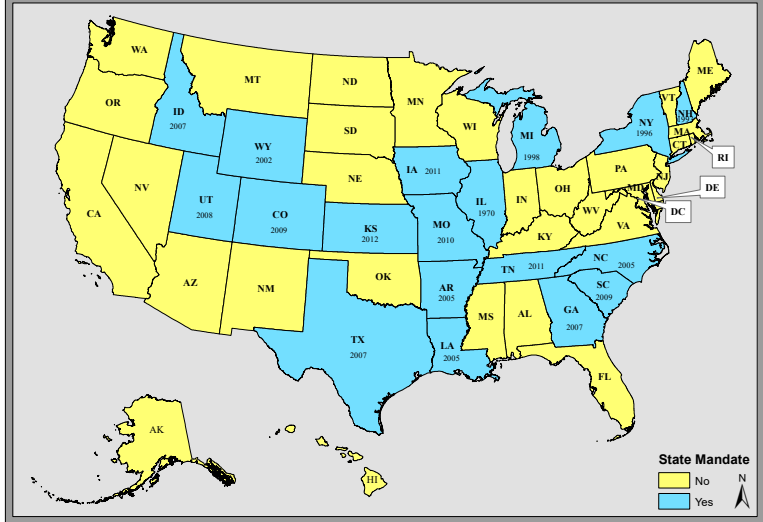
# Methods

$$Y_{i,s,t} = \alpha_0 + \alpha_1 \text{PF Required}_{i,s,t} + \beta \mathbf{X}_i + \delta_s + \gamma_t + \epsilon_{i,s,t} \quad (1)$$

- $Y_{i,s,t}$  Apply for aid, no loans at all, Stafford (sub, unsub), credit card use, working status.
- $\text{PF Required}_{i,s,t}$  state required personal finance prior to graduation for individual  $i$  in state  $s$  graduating in year  $y$
- $\mathbf{X}_i$  contain: male, race dummies, age dummies, dependent status, EFC, parent education
- $\delta_s$  are state fixed effects
- $\gamma_t$  are year fixed effects

# State-mandated Personal Finance Education in US High Schools

Date: 06/30/2017





# Predicting Personal Finance

|                            | PF                  |
|----------------------------|---------------------|
| Governor is Democrat       | 0.00125<br>(0.035)  |
| Unemployment rate          | -0.02940<br>(0.021) |
| Medicaid beneficiaries     | -0.00006<br>(0.000) |
| SSI recipients             | -0.00123<br>(0.002) |
| Gross State Product        | 0.00004<br>(0.001)  |
| Poverty Rate               | -0.00078<br>(0.007) |
| Population                 | 0.09944<br>(0.098)  |
| Food Stamp/SNAP Recipients | 0.00008<br>(0.000)  |
| N                          | 1,145               |

# Results

Financial Education increases applications for aid and federal aid taken.

|      | Applied<br>for Aid | Have<br>Stafford  | Sub<br>Stafford \$s | Unsub<br>Stafford \$s | Have<br>Grant     |
|------|--------------------|-------------------|---------------------|-----------------------|-------------------|
| PF   | 0.033*<br>(0.013)  | 0.053*<br>(0.022) | 106.25+<br>(61.95)  | 0.024<br>(76.92)      | 0.031+<br>(0.017) |
| N    | 25,354             | 25,354            | 25,354              | 25,354                | 25,354            |
| Mean | 0.92               | 0.558             | \$1,275             | \$1,007               | 0.748             |

# Results

Financial Education decreases private lending and decreases credit card balances.

|      | Private<br>Loan   | Private<br>Loan \$s | Have CC<br>Balance | Work while<br>Enrolled |
|------|-------------------|---------------------|--------------------|------------------------|
| PF   | -0.003<br>(0.007) | -151.99*<br>(65.83) | -0.021*<br>(0.008) | -0.014<br>(0.014)      |
| N    | 25,354            | 25,354              | 25,354             | 25,354                 |
| Mean | 0.114             | \$803               | 0.095              | 0.454                  |

# Results Across EFC

|                      | Applied<br>for Aid | Sub<br>Staff                 | Unsub<br>Staff      | Have<br>Grant      | Private<br>Loan               | CC<br>Bal          | Work                      |
|----------------------|--------------------|------------------------------|---------------------|--------------------|-------------------------------|--------------------|---------------------------|
| <u>EFC &lt; \$4K</u> |                    |                              |                     |                    |                               |                    |                           |
| PF                   | 0.021*<br>(0.009)  | <b>183.151+</b><br>(107.465) | 77.248<br>(98.965)  | 0.032**<br>(0.010) | 42.802<br>(72.076)            | -0.019<br>(0.015)  | <b>-0.046*</b><br>(0.022) |
| N                    | 9,400              | 9,400                        | 9,400               | 9,400              | 9,400                         | 9,400              | 9,400                     |
| Mean                 | 0.968              | 1,878                        | 922                 | 0.935              | 529                           | 0.125              | 0.479                     |
| <u>EFC &gt; \$4K</u> |                    |                              |                     |                    |                               |                    |                           |
| PF                   | 0.039*<br>(0.017)  | 29.242<br>(51.608)           | -41.603<br>(76.717) | 0.028<br>(0.027)   | <b>-272.740**</b><br>(86.435) | -0.021*<br>(0.008) | 0.011<br>(0.018)          |
| N                    | 16,307             | 16,307                       | 16,307              | 16,307             | 16,307                        | 16,307             | 16,307                    |
| Mean                 | 0.884              | 924                          | 1,053               | 0.640              | 958                           | 0.079              | 0.439                     |

# Effects Across Race

|                         | Applied<br>for Aid | Sub<br>Staff               | Unsub<br>Staff              | Have<br>Grant            | Private<br>Loan             | CC<br>Bal          | Work              |
|-------------------------|--------------------|----------------------------|-----------------------------|--------------------------|-----------------------------|--------------------|-------------------|
| <u>White</u>            |                    |                            |                             |                          |                             |                    |                   |
| PF                      | 0.034*<br>(0.015)  | 9.95<br>(63.75)            | -121.06<br>(76.55)          | 0.031<br>(0.026)         | <b>-230.70**</b><br>(68.35) | -0.022*<br>(0.010) | -0.014<br>(0.023) |
| N                       | 17,996             | 17,996                     | 17,996                      | 17,996                   | 17,996                      | 17,996             | 17,996            |
| Mean                    | 0.898              | 1,176                      | 983                         | 0.723                    | 898                         | 0.078              | 0.452             |
| <u>African American</u> |                    |                            |                             |                          |                             |                    |                   |
| PF                      | -0.001<br>(0.008)  | <b>261.21*</b><br>(127.30) | <b>452.14**</b><br>(161.98) | <b>-0.029</b><br>(0.023) | -51.36<br>(123.05)          | -0.010<br>(0.029)  | 0.008<br>(0.032)  |
| N                       | 2,859              | 2,859                      | 2,859                       | 2,859                    | 2,859                       | 2,859              | 2,859             |
| Mean                    | 0.986              | 2,009                      | 1,696                       | 0.875                    | 712                         | 0.130              | 0.388             |
| <u>Hispanic</u>         |                    |                            |                             |                          |                             |                    |                   |
| PF                      | 0.040*<br>(0.015)  | <b>301.55*</b><br>(127.38) | 151.18<br>(130.55)          | 0.037<br>(0.024)         | -162.78<br>(269.15)         | 0.031<br>(0.022)   | 0.038<br>(0.040)  |
| N                       | 2,524              | 2,524                      | 2,524                       | 2,524                    | 2,524                       | 2,524              | 2,524             |
| Mean                    | 0.959              | 1,461                      | 953                         | 0.822                    | 704                         | 0.131              | 0.465             |

Results are robust to:

- Controlling for family income instead of EFC, tuition with EFC, or SAT scores.
- Adding state linear time trends.
- Controlling for state unemployment rates or house prices.
- Accounting for other high school graduation policy changes:
  - ▶ Total math credits required.
  - ▶ Highest math level required.
  - ▶ Total credits required.
  - ▶ ACT/SAT required.
  - ▶ Common core.

# Pre-Trends

- DD requires that the trends in the treatment and control groups are parallel in the pre-period (and would have remained parallel in the absence of the policy).
- Create 2 variables = 1 if the student was 19 or 20 in a state where personal finance was required in his high school for those 18 and younger.
- Not precisely a “pre trend” since the course was not *required* until the mandate took place, but some schools within states piloted programs early.
  - ▶ This is because mandates generally take at least 3 years to be a requirement.

# Pre-Trends

|            | Applied<br>for Aid | Sub<br>Staff       | Unsub<br>Staff       | Have<br>Grant     | Private<br>Loan     | CC<br>Bal        | Work              |
|------------|--------------------|--------------------|----------------------|-------------------|---------------------|------------------|-------------------|
| $PF_{t+1}$ | 0.007<br>(0.017)   | 94.185<br>(74.955) | 7.912<br>(97.362)    | 0.076+<br>(0.044) | 45.020<br>(188.144) | 0.012<br>(0.022) | -0.014<br>(0.026) |
| $PF_{t+2}$ | -0.012<br>(0.016)  | 86.455<br>(58.394) | -102.685<br>(68.318) | -0.017<br>(0.035) | 43.349<br>(138.451) | 0.029<br>(0.020) | -0.003<br>(0.020) |
| N          | 12,822             | 12,822             | 12,822               | 12,822            | 12,822              | 12,822           | 12,822            |



# Choice of Institution

NPSAS Sample only includes college students.

- Are students exposed to financial education and more likely to:
  - ▶ Go to college.
  - ▶ Choose a college with a different tuition level.
  - ▶ Choose a different type of education.
  - ▶ Choose a more selective college.
  - ▶ Choose a different financing plan conditional on this initial choice.
  - ▶ Choose a different major.

# Choice of Institution

Personal Finance courses do not change choice of institution in NPSAS data.

|    | Private           | Tuition & Fees        | In State          | Four yr           |
|----|-------------------|-----------------------|-------------------|-------------------|
| PF | -0.002<br>(0.042) | -680.349<br>(669.963) | -0.020<br>(0.016) | -0.010<br>(0.051) |
| N  | 25,354            | 22,437                | 25,354            | 44,729            |

# Choice of Institution

Obtain data from the CPS

- 1995-2013
- Keep 18-20 year olds
- Determine if personal finance requirements in high school affected college attendance.

# Choice of Institution

|       | College           | Full Time         | Part Time         |
|-------|-------------------|-------------------|-------------------|
| PF    | -0.009<br>(0.017) | -0.008<br>(0.018) | -0.001<br>(0.005) |
| PF -1 | -0.006<br>(0.019) | -0.010<br>(0.021) | 0.004<br>(0.005)  |
| PF -2 | -0.000<br>(0.019) | -0.007<br>(0.020) | 0.007<br>(0.006)  |
| PF -3 | -0.001<br>(0.016) | -0.003<br>(0.018) | 0.001<br>(0.005)  |
| PF -4 | 0.001<br>(0.015)  | 0.009<br>(0.018)  | -0.008<br>(0.005) |
| PF -5 | 0.008<br>(0.017)  | 0.015<br>(0.018)  | -0.007<br>(0.005) |
| PF -6 | -0.018<br>(0.017) | -0.014<br>(0.018) | -0.004<br>(0.005) |
| PF -7 | -0.013<br>(0.017) | -0.011<br>(0.019) | -0.002<br>(0.004) |
| ...   |                   |                   |                   |
| N     | 510,933           | 510,933           | 510,933           |

# Conclusions

- High school financial education may change initial aid packages to result in more public loans, fewer private loans, less credit card balances, and more outside aid.
- Higher income families reduce private loans, while lower income families increase public borrowing (but reduce working).
- Fin ed may reduce barriers to financial aid (e.g., applying on time).
- Full picture needs to be studied in order to understand how more information can change borrowers' decisions.

# Conclusions

- Policy responses to student loan decisions need to consider pre-college interventions vs. current solutions centered around repayment.
- Other policies are costly (i.e., individualized counseling).
- ...or are not necessarily externally valid (i.e., RCTs on one college campus at a time).

# Descriptive Statistics

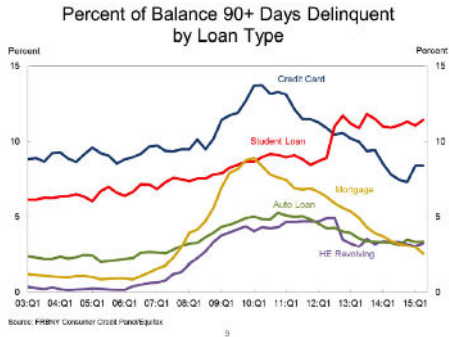
|                           | No PF            | PF               | Both             |
|---------------------------|------------------|------------------|------------------|
| Applied for Aid           | 0.907<br>(0.291) | 0.934<br>(0.248) | 0.915<br>(0.279) |
| Stafford Loan             | 0.540<br>(0.498) | 0.599<br>(0.490) | 0.558<br>(0.497) |
| Subsidized Stafford \$s   | 1,195<br>(1,488) | 1,464<br>(1,598) | 1,275<br>(1,526) |
| Unsubsidized Stafford \$s | 912<br>(1,601)   | 1,232<br>(1,839) | 1,007<br>(1,681) |
| Have Grant                | 0.865<br>(0.342) | 0.664<br>(0.472) | 0.748<br>(0.434) |
| Private Loan              | 0.111<br>(0.314) | 0.120<br>(0.325) | 0.114<br>(0.317) |
| Private Loan \$s          | 782<br>(3,034)   | 852<br>(3,133)   | 803<br>(3,064)   |
| Have CC Balance           | 0.096<br>(0.295) | 0.094<br>(0.292) | 0.095<br>(0.294) |
| Work while Enrolled       | 0.468<br>(0.499) | 0.420<br>(0.494) | 0.454<br>(0.498) |

# Descriptive Statistics

|                  | No PF            | PF               | Both             |
|------------------|------------------|------------------|------------------|
| Male             | 0.442<br>(0.497) | 0.441<br>(0.497) | 0.442<br>(0.497) |
| White            | 0.732<br>(0.443) | 0.657<br>(0.475) | 0.710<br>(0.454) |
| Black            | 0.097<br>(0.296) | 0.150<br>(0.357) | 0.113<br>(0.316) |
| Hispanic         | 0.091<br>(0.288) | 0.120<br>(0.325) | 0.100<br>(0.299) |
| Age 19           | 0.364<br>(0.481) | 0.319<br>(0.466) | 0.351<br>(0.477) |
| Dependent        | 0.974<br>(0.160) | 0.971<br>(0.169) | 0.973<br>(0.163) |
| EFC (000s)       | 14.7<br>(18.7)   | 14.6<br>(19.4)   | 14.7<br>(18.9)   |
| Parent HS Grad   | 0.182<br>(0.386) | 0.184<br>(0.388) | 0.182<br>(0.386) |
| Parent Some Coll | 0.204<br>(0.403) | 0.222<br>(0.416) | 0.209<br>(0.407) |



# Motivation



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# Descriptive Statistics

|                       | No PF              | PF                 | Both               |
|-----------------------|--------------------|--------------------|--------------------|
| Only Loans in Aid Pkg | 0.0802<br>(0.2716) | 0.0561<br>(0.2302) | 0.0725<br>(0.2594) |
| Private loan          | 0.0807<br>(0.2724) | 0.0785<br>(0.2689) | 0.0800<br>(0.2713) |
| Private loan \$s      | 519<br>(2,424)     | 510<br>(2,404)     | 516<br>(2,418)     |
| Have CC Balance       | 0.1129<br>(0.3165) | 0.1108<br>(0.3139) | 0.1122<br>(0.3157) |
| Work while Enrolled   | 0.5640<br>(0.4959) | 0.5377<br>(0.4986) | 0.5556<br>(0.4969) |

▶ Go Back

# Policy Heterogeneity

## **Rigorous, 11**

AR (2005), CO (2009), GA (2007), ID (2007), IA (2011), MO (2010), NC (2005), SC (2009), TN (2011), TX (2007), UT (2008)

## **Pre-2000 Mandates, 4 states**

IL (1970), MI (1998), NH (1993), NY (1996)

## **Less Rigorous, 4**

NE (2011), NM (2003), SD (2006), WY (2002)

## **Excluded, 8**

AZ (various), CT (various), KS (2012), LA (2005), NJ (2011)  
OR (2013), VA (2008), WV (various)

## **Controls, 23 states**

AL, AK, CA, DE, FL, HI, IN, KY, ME, MD, MA, MN, MS, MT, NV, ND,  
OH, OK, PA, RI, VT, WA, WI

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