

# The Effects of Financial Education on Student Loan Amounts

J. Michael Collins<sup>1</sup>, Christiana Stoddard<sup>2</sup>, and Carly Urban<sup>3</sup>  
Affiliation

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<sup>1</sup>Associate Professor of Public Affairs and Human Ecology, University of Wisconsin-Madison.

<sup>2</sup>Associate Professor of Economics, Montana State University.

<sup>3</sup>Assistant Professor of Economics, Montana State University.

## INTRODUCTION

Student loans now account for over \$1 trillion in debt in the United States, surpassing credit card debt as the second largest source of debt after mortgages. Without previous experience in the financial market beyond a checking or savings account, concern may arise that 18 year-olds make suboptimal student loan decisions due to limited information. One potential policy lever that could mitigate these information problems is providing or requiring high school courses in personal finance. While research regarding the effectiveness of state-mandated financial education in high school on credit behavior is mixed (Bernheim, Garrett, & Maki 2001; Brown, Grigsby, van der Klaauw, Wen, & Zafar 2016; Cole, Paulson, & Shastry 2013; Tennyson & Nguyen 2001), recent work suggests that when courses are rigorous, state-mandated financial education requirements can increase credit scores and reduce default rates (Urban, Schmeiser, Collins, & Brown 2014).

This paper extends this body of research by estimating the causal effect of financial education on several components of financial aid packages aim to finance higher education. The analysis contains three parts, drawing on cross-state comparisons, as well as administrative data that compare school districts within a state. These complementary analyses all help to display the landscape of personal finance courses and student financial aid.

The most closely related paper is aimed at determining the effect of financial education in high school on student loan amounts (Brown et al. 2016). The authors look at young adults aged 29-29 to determine if exposure to a financial education reform changes student loan debt and whether or not individuals obtain student loans. This analysis does not look at course requirements prior to graduation but instead focuses on any financial education reform. This could include a state that requires a course to be offered or requires that financial education be incorporated, in any way, in another existing curriculum. For example, interest rates could be covered for one day in social studies. With that said, They find that financial education reform increases student loan balances and the probability of ever taking out a student loan. Since their data cannot account for individual-level characteristics or other componenets of financial aid packages (i.e., non-loan aid), making us the first to determine the effects of financial education on the full picture of financial aid packages.

We contribute to another new but growing strand of literature that seeks to inform stu-

dent loan decisions after they are initially made. These studies often use information-based interventions to change borrowing behavior (Schmeiser, Stoddard, & Urban 2015).

First, we determine if states requiring financial education prior to graduation have different rates of borrowing and different amounts of student loan amounts for 2-year and 4-year college students. We use a difference-in-difference approach to estimate this using a panel of states from 2007 to 2015 and data from the Common Data Set (CDS), the Integrated Postsecondary Education Data System (IPEDS), the US Department of Education Pell Grant Files, and the Fiscal Operations Report and Application to Participate, compiled by College In Sight.<sup>4</sup>

Second, we use data from 2007-2015 recording the total amount of Free Application for Federal Student Aid (FAFSA) awards for all states to determine how financial education can incentivize students to fill out the FAFSA and potentially earn grants or subsidized loans.

Third, we use unique administrative data from the Montana University System (MUS), as Montana does not have a financial education course mandate. This allows us to examine how an individual student's exposure to financial education courses changes initial financial aid decisions. We track all high schools in the state over the period 2000 through 2014 to determine whether they ever offered personal finance courses and the years in which these courses were introduced. We match this with administrative records for all students attending any public university within the state using high school identifiers.

Results suggest that students from high schools offering personal finance were more likely to obtain scholarships and received larger scholarship amounts, relative to students from the same school before the personal finance course was offered and students from high schools not offering personal finance.

## MECHANISMS

We seek to identify the mechanisms through which financial education in high school may change student aid packages. Personal finance courses aimed to educate high school students typically focus on creating a budget, understanding risk, borrowing, calculating credit scores, saving, and looking at ways in which the macroeconomy can affect these calculations. While these topics vary across states, most of the underlying lessons as they would relate to student

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<sup>4</sup>We will commonly refer to this compilation as the IPEDS data.

loans do not.

First, we know that young adults lack basic knowledge on interest rates, inflation, and risk (Lusardi, Mitchell, & Curto 2010). As these skills are paramount in determining the proper student loan package, learning about interest rates may allow students to properly calibrate their expected future debt burden. Students with financial education may be better equipped to choose loans with the lowest interest rates and apply for more non-loan aid that is not required to be paid back.

Second, creating a budget is a skill taught in most personal finance curricula that could affect one's initial student loan choice. On average, the status quo bias may suggest that students take out the maximum offered, and continue to take out the same amount.<sup>5</sup> However, if a student creates a realistic budget, he will better understand how much he actually needs to borrow. This could either 1) result in taking out more if his intuition suggested that expenses that semester would be less than he calculated, preventing him from having to work more while in school or 2) result in taking out less than is offered by the subsidized and unsubsidized limits provided by the federal government. This could also result in students seeking out more non-loan aid.

Third, mortgages are often covered in many states' personal finance curricula. While not exactly the same, mortgage originations draw many parallels with student loan originations. This could help students to better understand interest rates, learn to finance and pay back long-term debt, and understand how missed payments affect credit scores. Learning about mortgages could make the investment component of attaining human capital more salient.

## DATA

This paper combines three datasets to determine the effect of financial education on student loan amounts. First, we use novel administrative data from the Montana University System (MUS), containing information on student's high transcripts, student loan amounts, and college performance. Second, we use state-level data on the number of FAFSA applications complicated combined with state-level financial education graduation requirements. Third, we obtain data from the Integrated Postsecondary Education Data System (IPEDS) for university-level data on student loan amounts.

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<sup>5</sup>We will show this formally with the MUS data in Section 5.

## FAFSA DATA

We begin with the most transparent way to study the effects of financial education on student aid packages: filling out the FAFSA. Dynarski and Scott-Clayton (2006) assert and demonstrate that filling out the FAFSA is complex. If students in states requiring personal finance prior to graduation are learning about borrowing, they may overcome hurdles to fill out the FAFSA. Some states are even going so far to teach about student loans and filling out the FAFSA within personal finance mandates. For example, NJ Senate Bill 990 is aimed to incorporate student loans in the mandatory curriculum.

We use within state variation in personal finance course requirements over time across all states, paired with data on FAFSA applications completed by state from 2007-2015. Using a difference-in-difference (DD) specification that includes state fixed effects, year fixed effects, and annual state population counts, we estimate the effect of personal finance course requirements on FAFSA completions. We are careful to cluster our standard errors at the state level to account for the level of analysis of the policy. We also run this by dependent and independent student, with the thought that perhaps students later in life are less likely to either 1) be in the same state they were in at age 18 when taking personal finance or 2) more likely to be older and perhaps not affected by a mandate that recently changed. We make the assumption that students, on average, fill out the FAFSA when they are 18 and applying for college.

Table 1 shows summary statistics of applications based on economics and personal finance (PF) graduation requirements. Table 2 reports the effects of PF education on FAFSA applications. In general, the results are noisy with large standard errors, but actually report a *decrease* in filling out the FAFSA. This could simply be a product of the noisy measure of filling out the FAFSA and the age at which individuals first take the course and graduate from high school. It could be that since we are identifying off of changes in state policy and many non-freshmen fill out the FAFSA, we are adding noise to our measures.

## IPEDS DATA

We next look at the IPEDS data to determine if personal finance course requirements affect aid packages on average at an institution within the state. Here, we look only at freshmen aid

packages, since they are most likely to be affected by the PF requirement. Our unit of observation is the institution, either 2 or 4 year (public or private). We omit for-profit schools since students can be located in any state. We again use a DD setup, where we compare institutions within a state that required PF prior to graduation after a given year and not before and those that always or never required PF. We include institution and year fixed effects, and we control for the size of the matriculating cohort. We cluster our standard errors at the state level.

Table 3 reports these results separately for institution type. First, we look at private four year institutions, where we see that PF education does not affect loan amounts. However, those attending that are exposed to the PF education are more likely to get federal grant dollars. This is as expected, as those who attend private schools are least likely to be affected by the education. They likely have some external sources to fund their education.

Second, we look at public four year institutions. For these schools, we see similar effects to private schools. However, when we restrict the sample to be all four year institutions for which over 80 percent of the students come from in state, we find that students are less likely to take out any financial aid.<sup>6</sup> These students are most likely to obtain federal grant dollars, of which the most common are Pell grants. This suggests that students in states requiring PF prior to graduation are most likely to make use of federal grant programs.

Third we turn to Looney and Yannellis (2015), who find that the highest student loan default rates are among community college students, roughly at 28 percent. We restrict our sample first to all two year schools (private or public but not for profit). These students appear to benefit the most from the PF education. They are most likely to take out federal grant dollars and take out more in loans in general. However, the overall decrease in the percent of students taking out any aid suggests that potentially more students are attending two year schools after taking PF. Perhaps this is due to the returns to education segments many PF courses contain.

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<sup>6</sup>Financial aid is defined as: Grants, loans, assistantships, scholarships, fellowships, tuition waivers, tuition discounts, veteran's benefits, employer aid (tuition reimbursement) and other monies (other than from relatives/friends) provided to students to meet expenses. This includes Title IV subsidized and unsubsidized loans made directly to students.

## MUS DATA

We obtain an additional dataset to explore local variation in personal finance course *offerings* to determine the intent-to-treat (ITT) effect of PF on aid packages using administrative panel data from the Montana University System (MUS). These data include students' high school information, demographic information, the Montana postsecondary campus attended, and the degree pursued. The MUS data are novel for the detailed individual-level college funding information provided. These data identify the source of funds (such as federal, institutional, state, or other), the type and amount of award (need-based, merit-based, athletic payments, work study, loans, etc.), and the fraction of tuition covered by the loans. Our data do not include any information on private loans; however, private student loans are only a small fraction (roughly 7%) of student debt at the undergraduate level (?). These data also include semester-by-semester enrollment, credits, major, GPA, courses taken, and retention. To our knowledge, we are among the first researchers to use administrative individual student loan data to examine the effects of financial education on borrowing and aid packages.

Our data span the years 2002 through 2014, or 36 semesters of data. For the purpose of this study, we limit our analysis to the two largest four-year campuses in the state of Montana: the University of Montana and Montana State University.<sup>7</sup> We also limit our analysis to in-state undergraduate students so we are able to identify their high school attended. We contact each school directly to determine whether or not they offered a standalone personal finance course and in what years. We confirm that students generally take these courses in their junior or senior year, and we match students based on their age to either having the education offered or not. We only include first semester freshmen's aid packages, as this is when we expect the effect to be largest.

We include in our analysis high school fixed effects, year fixed effects, and individual characteristics in all of our models such as minority, male, ACT scores, and Census block group characteristics. We are careful to cluster our standard errors at the high school level as this is where the policy variation stems from.

Table 4 reports the ITT results. We show this for the entire sample and then separately for subgroups. We find that for all students, the PF education had little effect on students.

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<sup>7</sup>This is because the two year schools and other (smaller) four year schools data appear to have many errors.

However, when we separate this by ability, using high and low GPAs (above and below a 3.0), we find that students of the highest ability were 3 percent less likely to get loans and had a lower fraction of their tuition covered by loans. This is coming largely from an increase in obtaining more non-loan aid. These high-ability students are now applying for more scholarships and grants and are less reliant on loans. It is likely that these students are most equipped to obtain scholarships. The low GPA students do not see any improvements based on the offer of the PF course.

Next, we separate the sample by above and below median income groups. In Montana, median income is \$45,000 and in our sample the average median income of students who attend college is roughly \$48,250. We split the sample by this higher measure to account for the fact that students from better areas are more likely to go to college. We note that the top of the income distribution (75th percentile) is \$53,000 and the bottom 25th percentile is \$38,000 for reference. Students from low income areas take out more in loans conditional on getting a loan when they are offered PF. This relates to roughly \$7 so this is small. However, the students from the high income areas actually reduce their loan coverage and obtain more scholarships and grants after PF is offered. These students are potentially going after scholarships they would not have in the absence of the education.

## CONCLUSIONS



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## TABLES AND FIGURES

Table 1  
*FAFSA Applications by Graduation Requirement Type*

	No Econ Grad Reqmt	Econ Grad Reqmt	All
FAFSA Apps	10,797.0*** (10,426.8)	20,279.4 (24,250.2)	16,513.6 (20,455.6)
Dependent Students	2,319.1*** (2,280.4)	4,632.2 (6,283.4)	3,713.5 (5,205.5)
Observations	139	211	350
	No PF Grad Reqmt	PF Grad Reqmt	All
FAFSA Apps	14,468.5** (20,670.1)	20,194.7 (19,611.7)	16,513.6 (20,455.6)
Dependent Students	3,326.4* (5,407.1)	4,410.4 (4,763.6)	3,713.5 (5,205.5)
Observations	225	125	350

Notes: Means reported with standard deviations in parentheses. \*, \*\*, \*\*\*, denote the two means are statistically different from each other at the 10, 5, and 1 percent levels, respectively. Dependent students represents the number of 18 year olds in the state in the given year.

Table 2  
*Personal Finance Graduation Requirements and FAFSA Applications*

	ln(dep apps) (1)	ln(ind apps) (2)	ln(apps) (3)
PF	-0.0814 (0.148)	-0.0879 (0.191)	-0.0736 (0.171)
N	350	350	350
$R^2$	0.106	0.123	0.199

Notes: Robust standard errors clustered at the state level in parentheses. \*  $p < 0.10$ , \*\*  $p < 0.05$ , \*\*\*  $p < 0.01$ . Models control for state and year fixed effects, as well as the number of 18 year-olds in each state and year. PF = 1 if the state required Personal Finance for graduation in the given year and zero otherwise.

Table 3  
*Personal Finance Graduation Requirements Affect Student Loan Amounts (IPEDS)*

	% Fin Aid (1)	% Fed grant (2)	ln(loans \$s) (3)	ln(\$ Fed grant) (4)	% State grant (5)	% inst grant (6)
<u>Private 4-year</u>						
PF	-0.715 (0.506)	0.685 (0.579)	-0.000135 (0.0144)	0.0273** (0.0111)	4.811*** (0.631)	-0.312 (0.791)
N	17018	16987	15761	16549	16987	16987
<u>Public 4-year</u>						
PF	-0.206 (0.602)	0.0973 (0.578)	0.00845 (0.0166)	0.0315*** (0.0112)	4.959*** (1.218)	-0.941 (0.962)
N	9001	8986	8770	8945	8986	8986
<u>4-year, Over 80% In State</u>						
PF	-1.414** (0.702)	-0.679 (0.685)	0.0121 (0.0206)	0.0378*** (0.0139)	4.950*** (1.543)	-1.220 (1.187)
N	6726	6718	6558	6702	6718	6718
<u>2-year, All</u>						
PF	-1.684*** (0.541)	0.637 (0.584)	0.0834*** (0.0214)	0.100*** (0.0143)	4.037*** (0.651)	-0.875* (0.503)
N	14125	14111	11628	13946	14111	14111
<u>2-year, Over 80% In State</u>						
PF	-2.451*** (0.570)	0.198 (0.610)	0.0899*** (0.0226)	0.102*** (0.0150)	4.485*** (0.697)	-1.299*** (0.496)
N	11961	11956	9754	11902	11956	11956

Notes: Robust standard errors clustered at the institution level in parentheses. \*  $p < 0.10$ , \*\*  $p < 0.05$ , \*\*\*  $p < 0.01$ . Models control for institution and year fixed effects, as well as the number of students enrolled in each school in the given year. PF = 1 if the institution was in a state requiring Personal Finance for graduation in the given school year and zero otherwise.

Table 4

*Personal Finance Course Offerings Affect Financial Packages (MUS)*

	(1)	(2)	(3)	(4)	(5)	(7)	(8)
	Get Loan	$\frac{\text{Loan}}{\text{Tuition}}$	Cond'l Loan Amt	Get Non-Loan	Non-loan Aid \$s	Cond'l Non- Loan Amt	Work Study
All	-0.012 (0.014)	-0.014 (0.013)	0.026 (0.026)	0.002 (0.011)	0.070+ (0.036)	0.045 (0.049)	0.004 (0.003)
Low GPA	0.007 (0.015)	-0.001 (0.014)	0.041 (0.032)	0.002 (0.011)	0.021 (0.035)	-0.033 (0.054)	0.001 (0.004)
High GPA	-0.032* (0.016)	-0.030* (0.014)	0.009 (0.033)	0.004 (0.011)	0.147* (0.059)	0.123+ (0.066)	0.007+ (0.004)
Low Inc	-0.007 (0.016)	-0.004 (0.016)	0.067* (0.026)	0.001 (0.013)	0.074 (0.046)	-0.015 (0.067)	0.000 (0.004)
High Inc	-0.016 (0.012)	-0.029** (0.010)	-0.027 (0.040)	0.009 (0.010)	0.099* (0.048)	0.123+ (0.067)	0.007 (0.005)
0-3 Banks	0.014 (0.030)	0.006 (0.028)	-0.011 (0.056)	0.021 (0.024)	0.128+ (0.072)	-0.123+ (0.073)	-0.004 (0.007)
4+ Banks	-0.017 (0.013)	-0.017 (0.012)	0.051* (0.026)	0.005 (0.010)	0.054 (0.037)	0.095 (0.065)	0.004 (0.004)
Mean	0.516	0.470	1.97	0.634	1.495	1.346	.0173
Students	24,229						

Notes: Robust standard errors clustered at the school level in parentheses. \*  $p < 0.10$ , \*\*  $p < 0.05$ , \*\*\*  $p < 0.01$ . Models control for high school and year fixed effects, as well as student characteristics. Estimates are coefficients on high schools offering Personal Finance in the given school year and zero otherwise.