Evaluating the Costs and Benefits of a Federal Risk-Sharing Program

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Abstract

This paper builds on recent work examining the justification and potential unintended consequences of implementing a federal risk-sharing program. I provide a statistical justification for greater accountability in the student loan system by showing that observable student characteristics explain at most 50% of the variation in an institution's cohort default rates. I also provide evidence on how unintended consequences such as increased tuition and student displacement vary with the harshness of a risk-sharing penalty.

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JEL codes: I22, I23, I28

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Introduction

Three out of every five former students are not making any progress paying down the principal balance of their student loans three years after they left school. This has led to a push at both the state and federal levels to introduce a greater degree of institutional accountability into the federal financial aid system. At the current time, most institutions have little to no direct financial incentive to care about their students' ability to repay loans. Even the indirect financial incentives, based on reputational concerns, rely on the assumption that students are keenly aware of the expected return (and the variance of those returns) for each of their postsecondary options. One class of proposals, known as risk-sharing, has garnered bipartisan support, although a consensus has not yet formed around the details of how best to implement such a system.

At its most basic level, risk-sharing would tie a monetary penalty to the future financial outcomes of students who received federal student loans. For example, a school could be charged a penalty of 10% of the total loan balance among former students who default on their loans within three years of entering the labor force. The logic of such a system is fairly straightforward: under the current system institutions benefit greatly from the availability of federal loans but shoulder none of the burden when students fail, risk-sharing would alter that dynamic. The purpose of this chapter is to lay out the rationale (both intuitively and statistically) for a risk-sharing model and to examine some of the costs and pitfalls the higher education landscape could face as a result, filling in gaps from prior work.

This chapter is organized as follows: I will first provide an overview of the current accountability system, both at the federal and state levels and a summary of the research associated with each. I will then present a detailed description of how a risk-sharing model could be designed and implemented, along with the goals such a system would hope to accomplish. Next, I illustrate a statistical justification for risk-sharing using tools familiar to many education policy researchers from the Value Added literature. Finally, I provide an updated (this is important due to a large data quality error from the Department of Edu-

cation which was recently corrected) and deeper look at the potential costs of risk-sharing including the relationship between the size of the penalty and potential tuition increases as well as the possibility of some institutions shutting down or leaving the Title IV system.

Accountability and Title IV Funding

State-Level: Performance Based Funding

One method of institutional accountability imposed on public schools is known as Performance Based Funding (PBF). As of this writing, 37 states have either implemented, or are transitioning into, some form of PBF.[1] The typical PBF model places some proportion of an institution's share of state appropriations at risk, contingent on passing thresholds related to a variety of performance metrics. The most commonly utilized metrics are graduation and retention rates, but some states opt for benchmarks around more detailed measures such as the number of Science Technology Engineering and Math (STEM) graduates, external funding, or metrics for at-risk student populations (e.g. Pell Grant).

The states of Ohio and Tennessee currently have the most punitive/rewarding PBF systems, in which nearly all state funding is allocated on the basis of various metrics (see Ward and Ost (2017) for a recent evaluation of these states' programs). There is mixed evidence (spanning negative, zero, and positive results) on the relative impact of PBF policies on student outcomes in general, although a substantial barrier to precise evaluations is that each state implements their policies in different ways. For a more detailed look at the research surrounding state-level PBF and evaluations of various programs, see the excellent recent work by Shin (2010), Sanford and Hunter (2011), Hillman et al. (2014).As one concern of a risk-sharing system is that institutions might credit-rate their students, it is useful to look

[1] http://www.ncsl.org/research/education/performance-funding.aspx

to the PBF literature to see if similar behavior occurs. Kelchen and Stedrak (2016) study the institutional responses, and most notably find evidence that institutions may respond to some PBF policies by enrolling fewer students with Pell grants.

While the various PBF systems are certainly designed with the intention of improving student outcomes, one drawback is that the metrics utilized are typically easy to "game" by institutions. It is not difficult to imagine a cash-strapped institution responding by reducing graduation standards on the margin, as these are much easier to target relative to addressing the root causes of noncompletion. This is one key argument in favor of proposed risk-sharing systems; students' financial success seems intuitively difficult to game unless you have actually implemented a reform which helps students.

Federal Policies: Gainful Employment

In 2015, the Obama administration implemented what have come to be known as Gainful Employment (GE) regulations. This aim of GE was to create an accountability system which linked penalties to the financial outcomes of students who received federal financial aid. GE penalties are assessed at the program level rather than at the institutional level, and only apply to programs which are deemed to be primarily vocational. In this way, the GE regulations apply disproportionately to the for-profit sector, with relatively few non-profit programs falling under this distinction.

GE utilizes two metrics, with each program needing to "pass" at least one of them twice in a three year span in order for their students to retain eligibility for federally-funded student loans: 1) Student loan payments must be less than 12% of annual income, and 2) Student loan payments must be less than 30% of discretionary income (150% of the federal poverty line). Although these regulations were initially delayed by legal battles, the first round of data were released in early 2017, showing an overall failure rate of roughly 9%. There was

considerable variation across sectors, however, with no programs at public institutions failing and more than 20% of programs at for-profit 4-year schools falling below the bar.[2] The future of GE is currently unclear, as of this writing the Trump administration has not indicated whether they will enforce or alter the existing rules (since penalties do not kick in until an institutions fails twice, no penalties have been assessed yet).

Relative to state-based PBF policies, there are both positive and negative aspects of GE regulations. On the plus side, the metrics used are difficult to game/manipulate, and are targeted at an important outcome. However, the specific threshold between passing and failing is arbitrary, yet carries blunt penalties for those who fall just above them. Moreover, the fact that GE applies disproportionately to for-profit schools is at least in part due to political targeting.

Federal Policies: Cohort Default Rates

The most broad accountability program currently associated with Title IV funding is centered around three-year Cohort Default Rates (CDR). This metric measures the proportion of an institution's students who default on their loans within three years of leaving school. Institutions which have a three-year CDR greater than 30% for three consecutive years, or above 40% in a single year, lose access to the federal student loan system for a subsequent three year period. Unlike GE regulations, these thresholds apply to every institution which receives Title IV funds.

Although the metric in this case appears to be closely tied to students' financial health, there are several issues which limit the incentive effects produced by this program. First, relatively few schools have default rates close to the critical thresholds (Kelchen, 2015). Since the penalty is dichotomous (e.g. either keep or lose Title IV funding), the vast ma-

[2]See https://kelchenoneducation.wordpress.com/2017/01/10/highlights-from-the-gainful-employment-data-release/ for a detailed breakdown of the first year of data.

jority of institutions with default rates far away from the thresholds face no incentive effect whatsoever. Second, CDR are not immune from institutional manipulation. Default, in this context, is defined as having made no payments on the loan for 270 consecutive days (even a $1 payment resets the clock). Combined with the ability to nudge students into programs such as forbearance/deferment or income-based repayment, its not clear how much incentive power these thresholds have even among the institutions close to the bar. However, there is a clear negative impact on student access (particularly among Pell grant recipients) for those schools which do lose access to the federal loan program (Darolia, 2013; Cellini et al., 2016).

Designing a Risk-Sharing System

This section lays out a variety of theoretical and practical considerations that policymakers should consider when deciding whether and how to design a risk-sharing system.

The Metric

As discussed above, cohort default rates are problematic in an accountability context for several reasons:they can be manipulated, they represent only a worst-case scenario rather than a more nuanced look at the health of a given loan, and when used in the context of a threshold will likely fail to incentivize a majority of institutions. A slightly different metric, which I favor, is known as the repayment rate. It represents the proportion of students who are making progress on the principal balance of their student loans, and is thus a much better indicator of whether an institution's former students are prospering in the labor market. Furthermore, it would be very costly for a school to manipulate their repayment

rate, as they would need to pay off all of the interest on a student's loan.

Additionally, rather than using an institutions repayment rate, policymakers could use the number of dollars which are in repayment/nonrepayment as the key metric. This is an attractive metric as it produces a much more accurate picture of the true financial state of an institution's former students (a student with $5,000 in loans they are not paying down is much different than one with $50,000).

The Penalty

We have so far discussed both dichotomous (via CDR) and continuous (via PBF) penalty types. While both have relative strengths, I generally favor a continuous penalty, such as a percentage (more on the magnitude below) of an institution's student loan balances which are not being repaid three years after a student leaves school. A dichotomous penalty, such as losing access to Title IV funding, is a blunt policy tool which will treat otherwise similar schools (those on either side of the penalty threshold) very differently. While the severe nature of a dichotomous penalty may create greater incentive effects because of the crippling effect a loss of student loans can have on an institution's survival, these effects are only felt by institutions near the cutoff.

There are also many intermediate ways to structure a risk-sharing penalty. For instance, there could be a graduated penalty based on various thresholds: x% if nonrepayment rate<20%, (x+5)% if nonrepayment rate>=20% and nonrepayment rate <40%, etc. This would have the benefit of punishing the worst offenders at a more rate than relatively well-performing schools. The drawbacks, however, would come in the form of added complexity and more attempts from institutions to appeal their repayment rates. Appeals of calculated CDR's for schools near the cutoff are already a common practice in today's system due to the dire consequences of falling below the penalty threshold, such appeals place an

administrative cost on both the Department of Education and the institutions.

Another way to construct the penalty structure would be to tie an institution's penalty in some way to the type of students they enroll. This could be done by defining peer groups (e.g. based on the Carnegie Classification System or some other similar metric) and penalizing a school based on their distance from the average member of their peer group. Similarly, an institution's penalty could be risk-adjusted in a regression framework based on their students actual outcomes relative to what would be predicted based on a set of observable demographic characteristics. These types of systems have the considerable advantage of recognizing that pre-college differences between students play an important role in future success, and would avoid under or over-penalizing schools for factors beyond their control. Moreover, by utilizing relative rather than absolute penalties, the government would also effectively control for business cycle fluctuations.

The counterargument to the type of risk-adjusting described above is that the gains to assigning a more "accurate" penalty would be outweighed by the added complexity of the system and intense lobbying from institutions over inclusion in an advantageous peer group or which characteristics to include in the regression model. The magnitude of the tradeoff between efficacy and efficiency is an important open question in the institutional accountability literature in general and with regard to risk-sharing in particular.

XXX show penalty figures

What Risk-Sharing Incentivizes

A risk-sharing system generally incentivizes any reform which reduces the amount of student debt or increases subsequent earnings. Although not an exhaustive list, in general this can be broken down into three dimensions: time to degree, graduation rates, and future job quality.

Time to Degree

Only 44% of students who eventually graduate earn a Bachelor's degree within four years, and 24% take more than six years.[3] This can be improved through investments in academic advising, as many students (particularly first generation college students) find it difficult to navigate the often sprawling academic bureaucracy. Temple University recently created Fly in 4,[4] an attempt to improve on-time graduation by targeting both advising and also attempting to provide relief to students who work while enrolled in school, a key determinant of both time to degree and subsequent graduation (Ehrenberg and Sherman, 1987; Hotz et al., 2002; Hakkinen, 2006).

Sometimes the length of time to get a degree is mechanically under the university's control. For instance, a two-year degree historically required 60 credits (4 semesters of 15 credit hours). However, a majority of Associate's Degree programs require at least 65 or 66[5] credits to obtain a degree, two full classes above the norm of 60. Many of these programs require more than 70 credits. This growth in required classes has been seen even in general education programs, where it is difficult to argue that the extra courses serve a crucial role in students' future careers. Depending on the state and specific program, this could be due accreditation regulations or institution-level bureaucracy. Longer programs increase the likelihood of student default both because of larger student loans taken out and a lower probability of graduation.

Graduation Rates

Roughly 60% of first-time full-time students graduate with a four-year degree within 6 years of first enrolling. The numbers for part-time students and those returning to school later in

[3] http://nces.ed.gov/pubsearch/pubsinfo.asp?pubid=2011236

[4] https://www.insidehighered.com/news/2016/02/01/temple-u-offers-grant-exchange-students-agreeing-work-less-study-more

[5] See Johnson et al. (2012).

life are much worse. Among the leading determinants of default on student loans is not how much money was borrowed, but whether a degree was earned (Gross et al., 2009). Default rates are twice as high among individuals with less than $5,000 in debt compared to those with greater than $100,000 in student loans (Lee, 2013). Put another way, it is preferable to be a 22 year old college graduate with $30,000 in debt (the national average) rather than a 22 year old with no degree, but only $5,000 in debt. For these reasons, institutions would be strongly incentivized under a risk-sharing system to invest in programs which increase retention and graduation rates. A model example of such efforts would be Georgia State University.[6]

Importantly, reforms do not always need to involve new spending, but can rather involve reallocating some expenditures without adding to an institution's budget. Webber and Ehrenberg (2010) and Webber (2012) both find that the mix of different types of expenditures (student services, instructional, etc.) is an important determinant of persistence and graduation, and that some institutions may be able to shift around internal spending and improve student outcomes on the margin. Griffith and Rask (2016) further find that the mix of expenditures has an impact on students' future labor market outcomes.

Future Labor Market Outcomes

A college degree has become almost a de facto requirement for most middle class and higher jobs. While the average return is high, not all colleges provide the same level of labor market success (Hoekstra, 2009). In a wide variety of fields, a key to securing a good job after graduating is having a high quality internship in a student's junior or senior year. But for most faculty members, building a relationship with local/regional employers is time consuming and requires a different skill set than all other academic tasks. If an institution's

[6] https://www.theatlantic.com/education/archive/2013/09/georgia-state-improved-its-graduation-rate-by-22-points-in-10-years/279909/

current students are unable to find gainful employment (and subsequently unable to repay their loans), investments in internships and career counseling would be among the types of policies incentivized under a risk-sharing program.

Additionally, there are large differences in earnings across majors, even after accounting for observable and unobservable characteristics (Webber, 2014). For example, the median graduate with and degree in economics earns roughly $1 million more over their lifetime than the median college graduate with a management degree.[7] There are many students whose education does not pay off until very late in life or ever (Webber, 2016). Yet students and parents, in particular more vulnerable students and parents, often do not have the facts necessary to make arguably the most important financial decisions in life: 1) which school to attend and 2) what major to select. Providing labor market and student loan outcomes, in an easy to understand format, at the institution and program level would enable students to make informed decisions and could drastically lower the number of future loan defaults.

Similar Students, Different Outcomes

Figure 1 plots the distribution of repayment rates using data from the most recent College Scorecard. The large dispersion in outcomes is certainly not due entirely, or even mostly to factors under the institution's control. It is likely the case that student-specific factors are the biggest driver of the wide range of outcomes. Figure 2 plots the per-student average student loan balance which is not being repaid (no progress on the principal balance) three years after graduating, arranged by percentile (a horizontal distribution would indicate equality across schools). As with Figure 1, this distribution may not be causal in the sense that student outcomes are netted out, but it is indicative that there is a truly massive range of outcomes across institutions.

[7] http://www.doug-webber.com/expected_all.pdf

It is important to point out that risk-sharing policies such as the one described in this manuscript do not assume that institutions have total, or even a majority, of control over their students outcomes. A proposed penalty of 5-10% implies that schools are responsible for 5-10% of their students' negative outcomes. To some, even this might seem large, but also note that universities like to take a great deal of credit for the wage gains that a college degree affords students.

Although it is not possible to In order to provide some statistical evidence that institutional factors are responsible for at least some of the variation in student outcomes, I borrow tools from the K-12 literature on Value Added Models (VAM) typical used to measure the dispersion in teachers' value added quality.

I estimate four variants of Equation 1

$$y_{it} = X_{it}\beta + \gamma_i + \varepsilon_{it} \tag{1}$$

Where y represents the three year cohort default rate[8] of institution i for cohort t. X is a vector of control variables which includes the shares of students of each race, gender, over age 25, Pell grant status, and each of ten family income categories. γ_i represents the object of interest, a measure of the institution-specific effect on student outcomes net of the variables contained in X. Table 1 presents 4 separate estimates of the standard deviation of the estimated γ_i distribution. First, Equation 1 is estimated via a simple fixed effects estimator without including any covariates in the X matrix. This specification simply summarizes the average differences in cohort default rates across institutions. Second, Equation 1 is estimated including the the control variables listed above in the X matrix.

Third, Equation 1 is estimated via the random effects estimator (without covariates). The advantage of random effects in this case is that fixed effects might overstate the magnitude of dispersion due purely to sampling variation (even if each fixed effect is assumed to be

[8]Cohort default rates are used instead of repayment rates because there are only two years of repayment rate data relative to 20 years for default rates.

identical, we would expect to see different estimates because of sampling error).

Finally, Equation 1 is estimated via the Empirical Bayes estimator, the typical estimator utilized in the recent VAM literature. In addition to addressing dispersion due to sampling variation, the Empirical Bayes estimator also accounts for the sample size over which estimates are computed. Smaller sample sizes are more likely to produce outlier estimates of the mean, thus this estimator "shrinks" the distribution toward the overall mean based on the sample size and the relative within and between institution variances.

The fact that there is so little change in the spread of the distribution between columns 1 and 2 is quite surprising. While I did not control for student test scores in these models because they are typically only reported at the medium and highly selective publics and privates, I was still able to control for a wide variety of demographic and socioeconomic background characteristics. Even the most conservative estimate from column 4 is still 75% of the raw standard deviation from column 1. If I limit the sample to those schools for which I do observe test scores (and include the 25th and 75 percentiles for both math and reading), column 4 only drops to 50% of the dispersion from the first column.

I don't view these results as suggesting that institutions are responsible for 50% of their students' student loan outcomes, there are two many important student level characteristics which I am not able to include to make such a precise statement. However, I do view this as strong evidence that they are responsible for at least 5-10%, to pick a very conservative range. Thus, I see risk-sharing penalties within this range to be justified.

Unintended Consequences: Tuition Increases

One potential worry about a risk-sharing program is that instead of focusing efforts on improving students' outcomes, institutions would instead simply pass the costs of the penalty onto students in the form of higher tuition. This possibility was first explored in Webber

(2017), which modeled the effect of several risk-sharing structures on tuition by assuming institutions followed a model of monopolistic competition to set prices. This method effectively assumes a worst-case scenario in terms of the institutional response to risk-sharing, providing an upper bound on this particular unintended consequence.

I produce new tuition response estimates in this chapter for two reasons. First, Webber (2017) only calculated the tuition response for a single penalty rate, 20%. Second, a significant data error was uncovered in the Department of Education's repayment rate data after the publication of Webber (2017). The corrected data have significantly lower repayment rates, indicating that the 20% penalty studied would have a much greater effect than originally estimated (since the penalties would be considerably larger). Below, I produce a range of estimates for penalties ranging from 1% to 20% for each institutional category.

I follow Webber (2017) and estimate the following model for each of ten institution types (Public Research, Private Research, Public Masters, Private Masters, Public 4-year, Private 4-year, Public 2-year, Private 2-year, For-profit 4-year, and For-profit 2-year).

$$C_{it} = \alpha_0 + X_{it}\beta + \sum_j \gamma_j Y_{ijt} + (1/2)\sum_k \sum_j \delta_{jk} Y_{ijt} Y_{ikt} + \mu_i + \varepsilon_{it} \tag{2}$$

C represents the total cost expended by institution i at time t. X is a vector of control variables (the average instructor's salary, interactions between instructor salary and each output variable, and year fixed effects), Y represents the total value of outputs j and k (where j and k both index undergraduate enrollment, graduate enrollment, and a measure of external research output), μ_i denotes institution fixed effects, and ε_{it} is the usual error term. The above formulation effectively forms a quadratic in each output, as well as interactions between each output pair. Output categories were excluded from samples where all, or nearly all, institutions had no positive values of the output (e.g. research or graduate enrollment for community colleges). The data come from the Integrated Postsecondary Education Data System (IPEDS) and the College Scorecard.

I construct an approximation to the slope of each institution's marginal cost curve by

taking the second derivative of the cost function with respect to undergraduate enrollment. I use a standard profit maximization result which relates price (tuition) to marginal cost to produce an estimate of the tuition elasticity of demand for each of the ten institutional types.[9]

In order to assess the response of the institution to a risk-sharing program, I then shift the marginal cost curve up according to the following equation:

$$MC_{new} = \hat{MC} + riskpenalty \times (1 - \%repayment) \times \%loan \times averageloan \qquad (3)$$

where $\hat{MC}$ is the estimated marginal cost curve derived from Equation (2), riskpenalty is the fraction of unpaid loan balances costs the institution is asked to pay for, %repayment is the fraction of students who have made some progress in paying down their principal loan balance over the past 6 months, %loan is the share of each institution's students who receive student loans, and averageloan is the average dollar value of the loans held by students with a loan. I obtain the new predicted enrollment by calculating the intersection of the new marginal cost curve and the original marginal revenue curve, and then adjust in the following manner. Assume original enrollment is 1,000 in excess of the original profit maximizing enrollment, and original enrollment is 1,050 in excess of the new profit maximizing enrollment, then my model would anticipate an enrollment decline of 50 students. The new tuition level is calculated in a similar manner.

Figures 3-12 plot the average predicted tuition increase for each institutional type across a range of penalties. It should be noted that nonprofit schools, particularly public institutions, are unlikely to see tuition increases in the range shown in the figures as they are not attempting to maximize profits and there are often legislative caps on tuition increases at state schools. That said, these numbers can be taken as a measure of how schools might respond across all available mechanisms, for instance by cutting spending on students by the amount shown rather than increasing tuition. Furthermore, these represent the worst-case

[9] $\frac{P}{MC} = \frac{\eta}{1+\eta}$ where η is the elasticity of demand.

scenario where no student outcomes are improved.

On a purely subjective basis, I view the results for a penalty in the 10-20% range as being too big of a risk from a public policy standpoint. My preference would be to begin with a 5% penalty, and potentially increase it to no more than 10% over a period of years so long as there is not a large negative shock to the higher education market attributable to risk-sharing.

Unintended Consequences: School Closure/Leaving Title IV

One potential unintended consequence which has not been previously studied in a risk-sharing context is student displacement. Institutions with high penalties may either be forced to close out of financial necessity, or might decide to leave the Title IV system and forgo access to federally backed loans. While there may certainly be small institutions which could be considered a net social negative based on their student outcomes, the typically-stated goals of risk-sharing proponents involve providing incentives for schools to do better rather than forcing poor-performing institutions to close. Policymakers should be keenly aware of this consequence when deciding on how high a penalty to set. Even relatively poor-performing schools often produces some good outcomes for students, and the unexpected closure of an institution can be very disruptive to the lives and educations of many.

To examine the magnitude of the impact of risk-sharing on school closures, I use the framework described above to determine an institution's profit-maximizing number of students. For institutions whose optimal number of students is determined to be zero (or negative) based on the estimated parameters described above, I count the current enrollment at the school to be the number of students displaced.

Table 2 presents estimates of this procedure for penalties of both 5% and 20% in the top and bottom panels respectively. For the 5% penalty, there are zero (or effectively zero) predicted school closures within most institutional types. In aggregate only about 10,000 would be expected to have attended a school which would be forced to close due to risk-sharing. With a baseline level of more than 20 million students currently attending some postsecondary institution, this group of students is attending schools with incredibly poor job prospects and most would likely be better off attending a different institution.

The second panel of Table 2, however, predicts a much more dire impact of risk-sharing. Nearly 1% of the national entire student body would potentially be displaced, amounting to more than 10 percent of the population attending for-profit schools. This would be a negative shock that I don't believe could be easily absorbed by the higher education system, and underscores the need to start risk-sharing penalties out low, at most 5%, or risk serious consequences.

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Figure 1

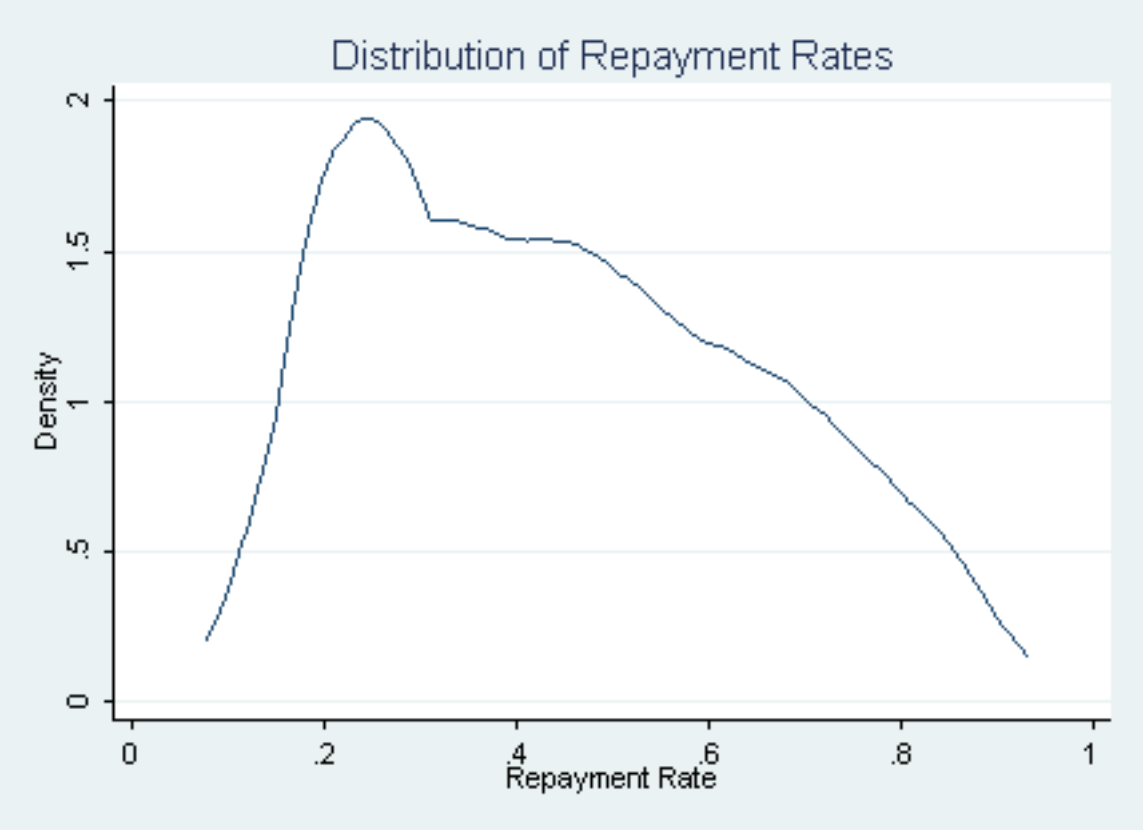
Distribution of Repayment Rates
Density
0
.5
1
1.5
2
0
.2
.4
.6
.8
1
Repayment Rate

Figure 2

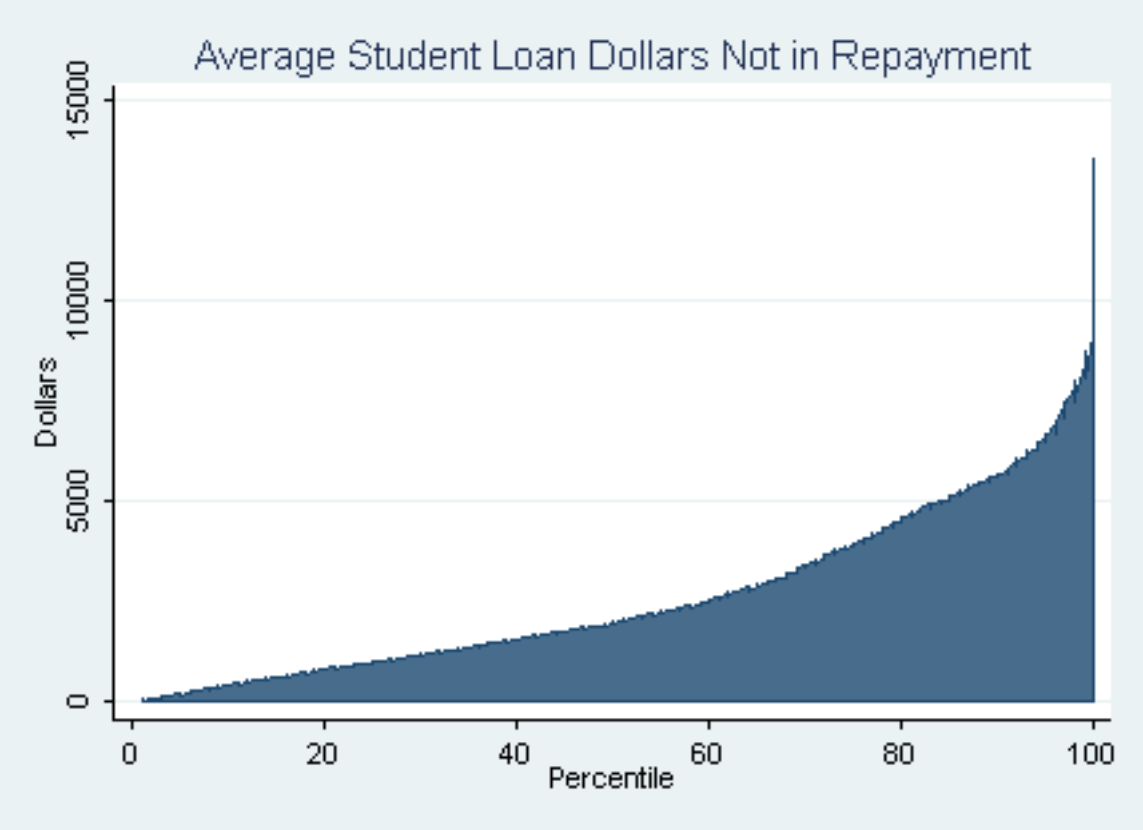
Average Student Loan Dollars Not in Repayment
Dollars
0
5000
10000
15000
0
20
40
60
80
100
Percentile

Figure 3: Predicted Impact of Risk-Sharing: Public PhD

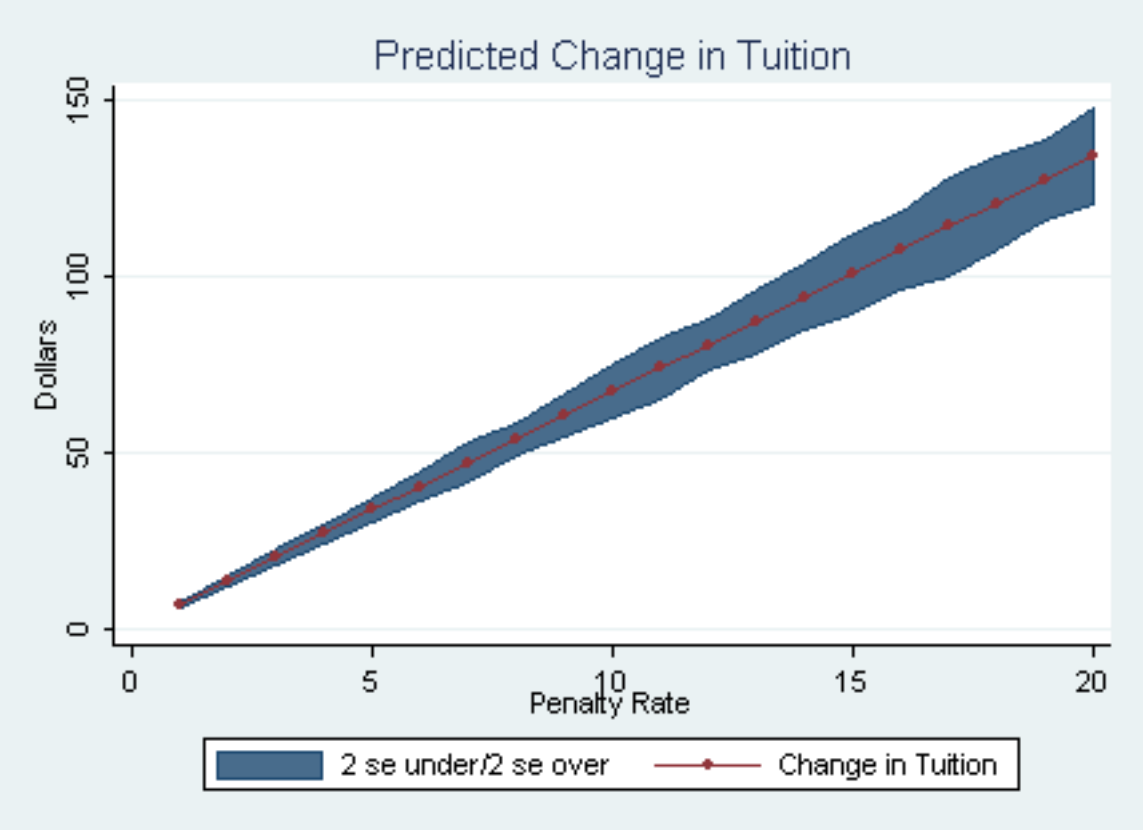

Figure 4: Predicted Impact of Risk-Sharing: Private PhD

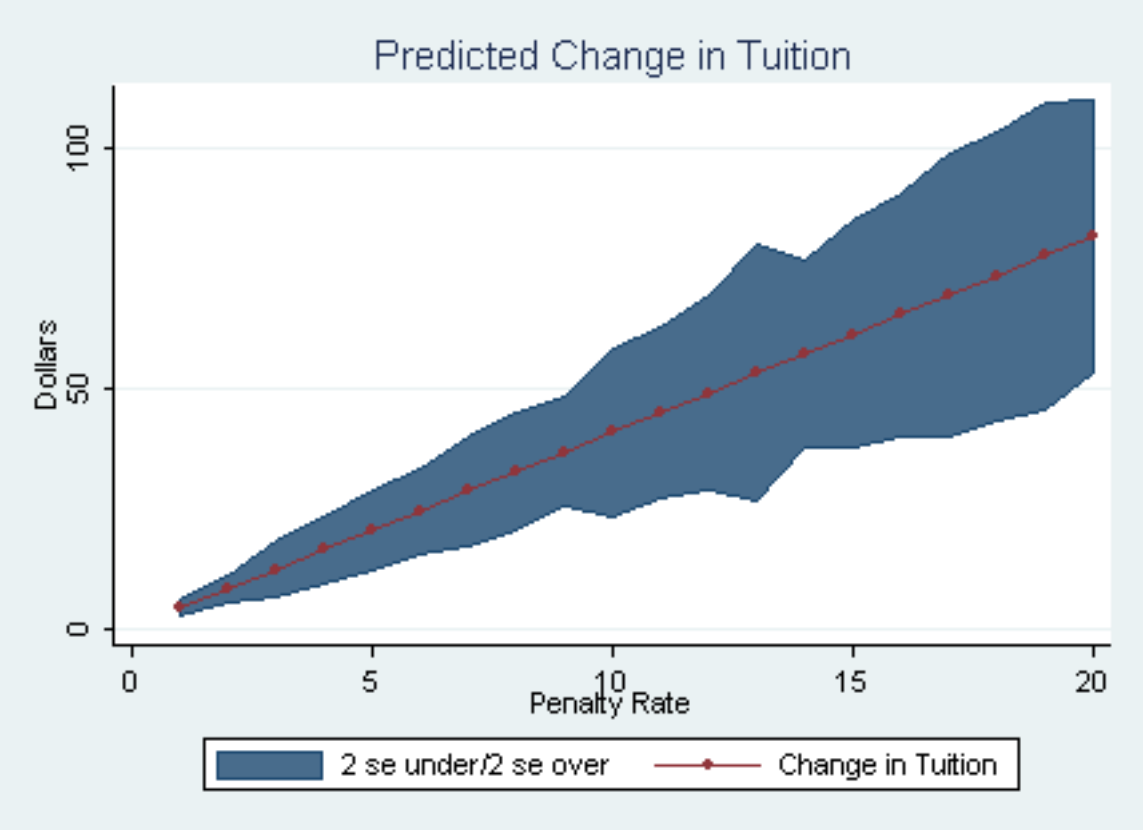

Figure 5: Predicted Impact of Risk-Sharing: Public Masters

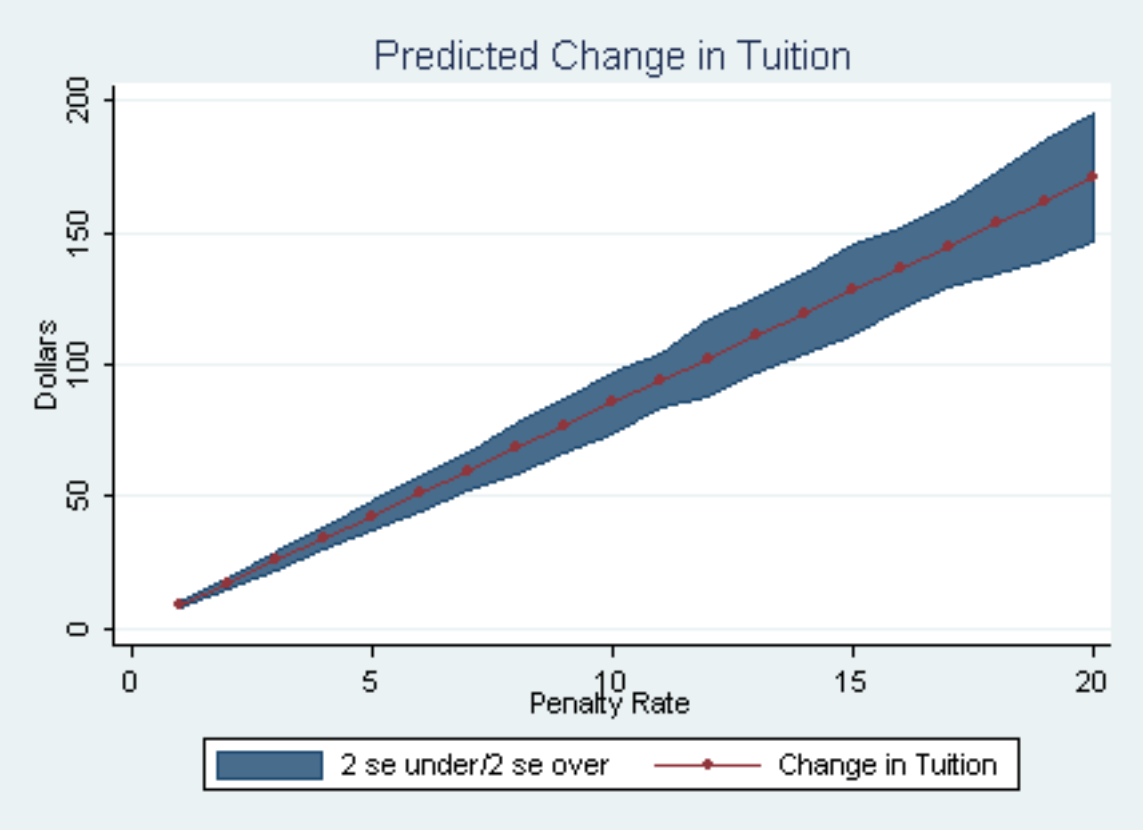

Figure 6: Predicted Impact of Risk-Sharing: Private Masters

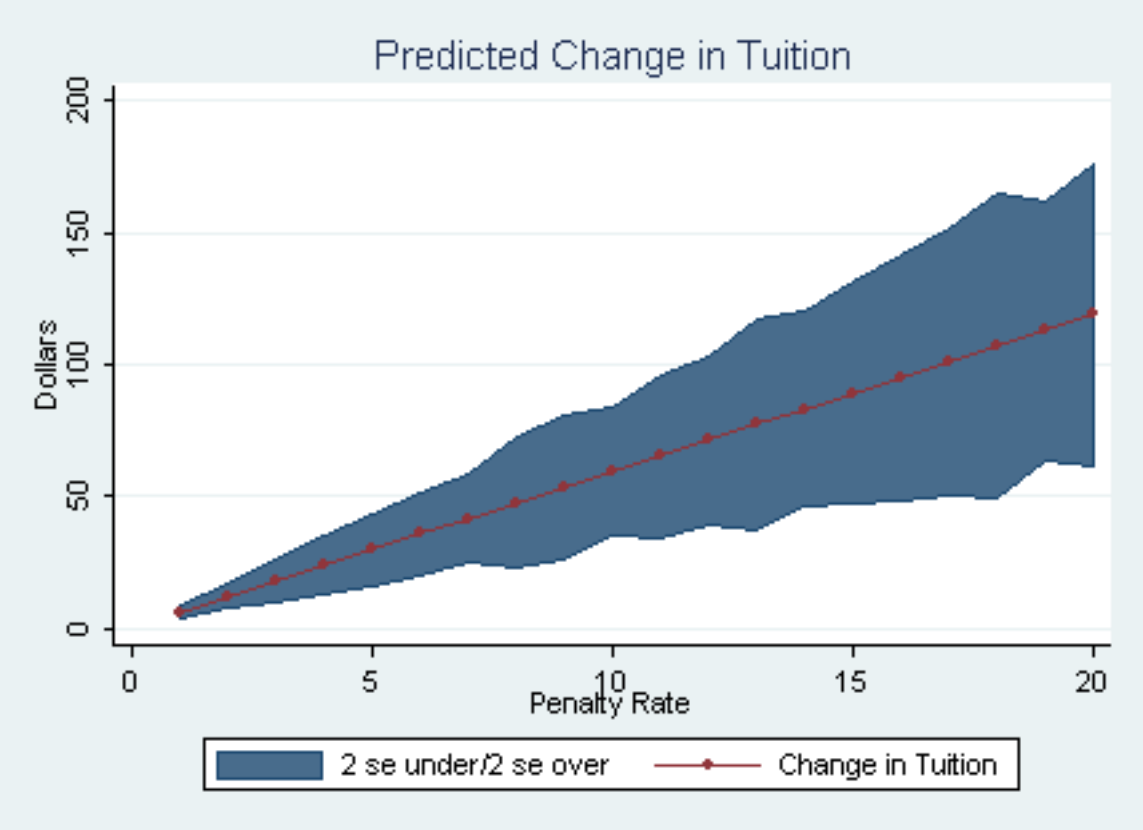

Figure 7: Predicted Impact of Risk-Sharing: Public Bachelors

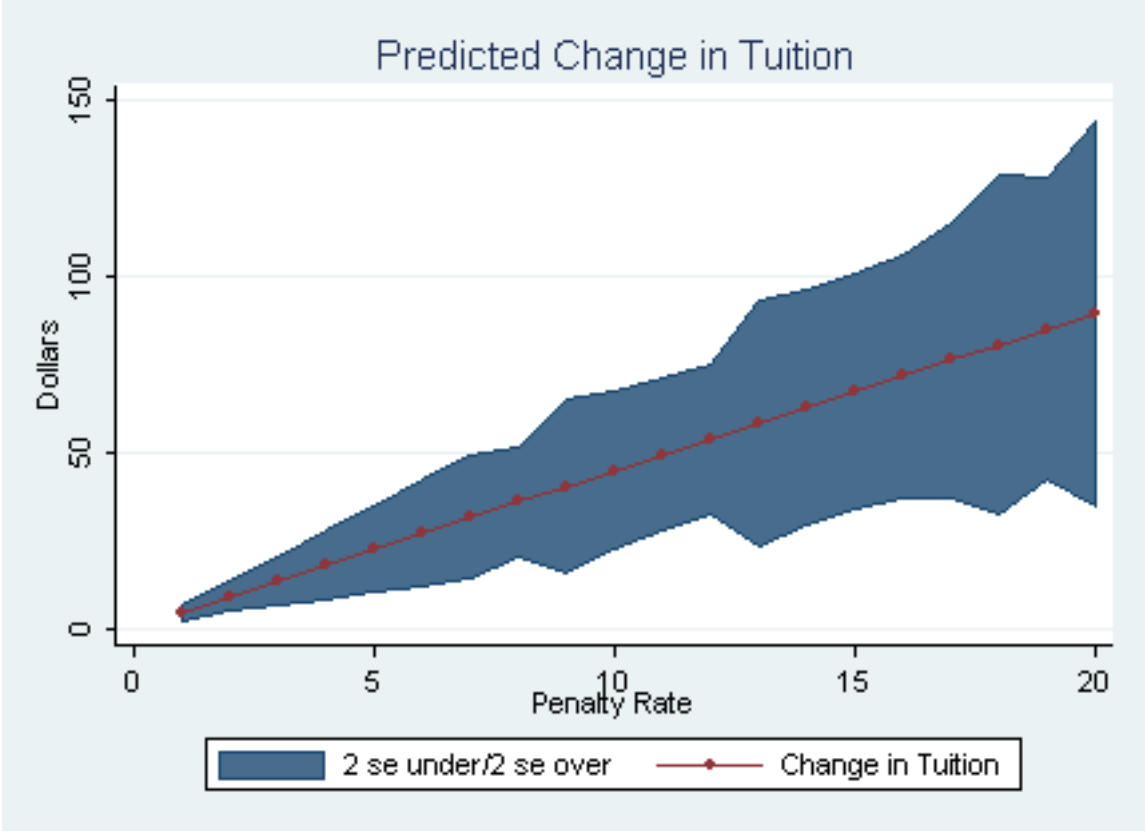

Figure 8: Predicted Impact of Risk-Sharing: Private Bachelors

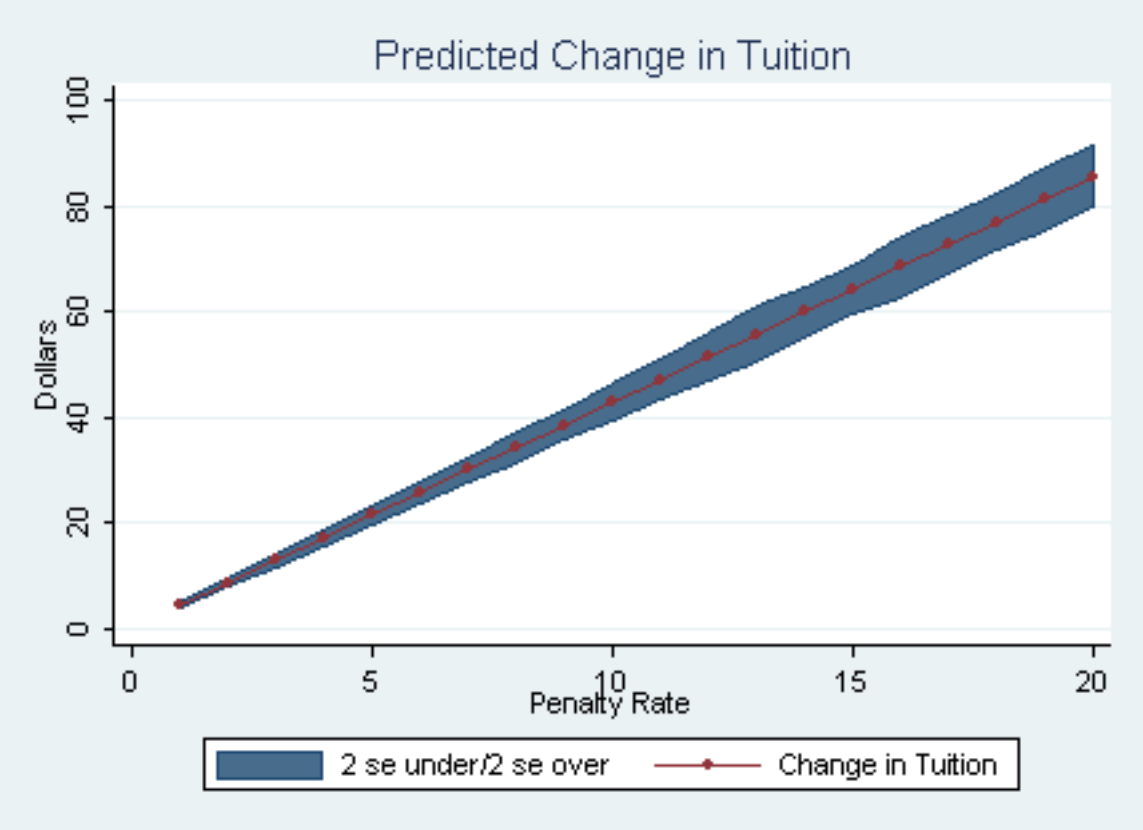

Figure 9: Predicted Impact of Risk-Sharing: Public 2-Year

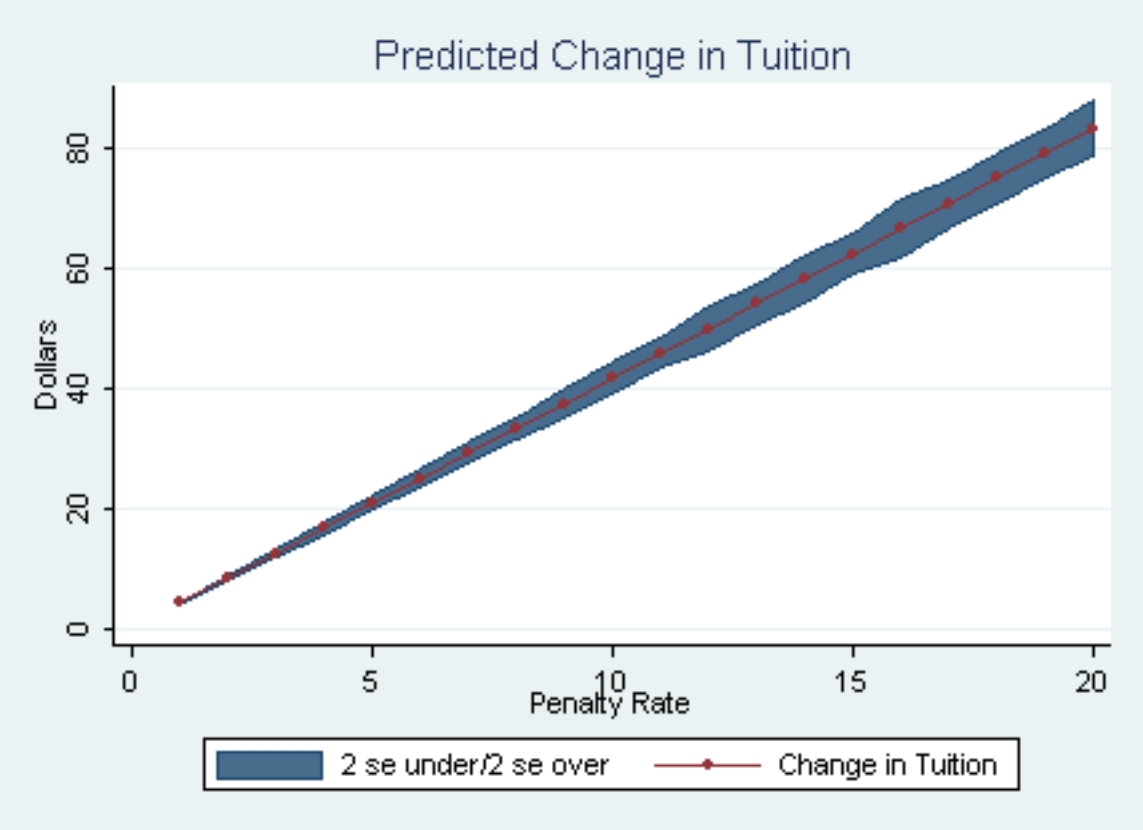

Figure 10: Predicted Impact of Risk-Sharing: Private 2-Year

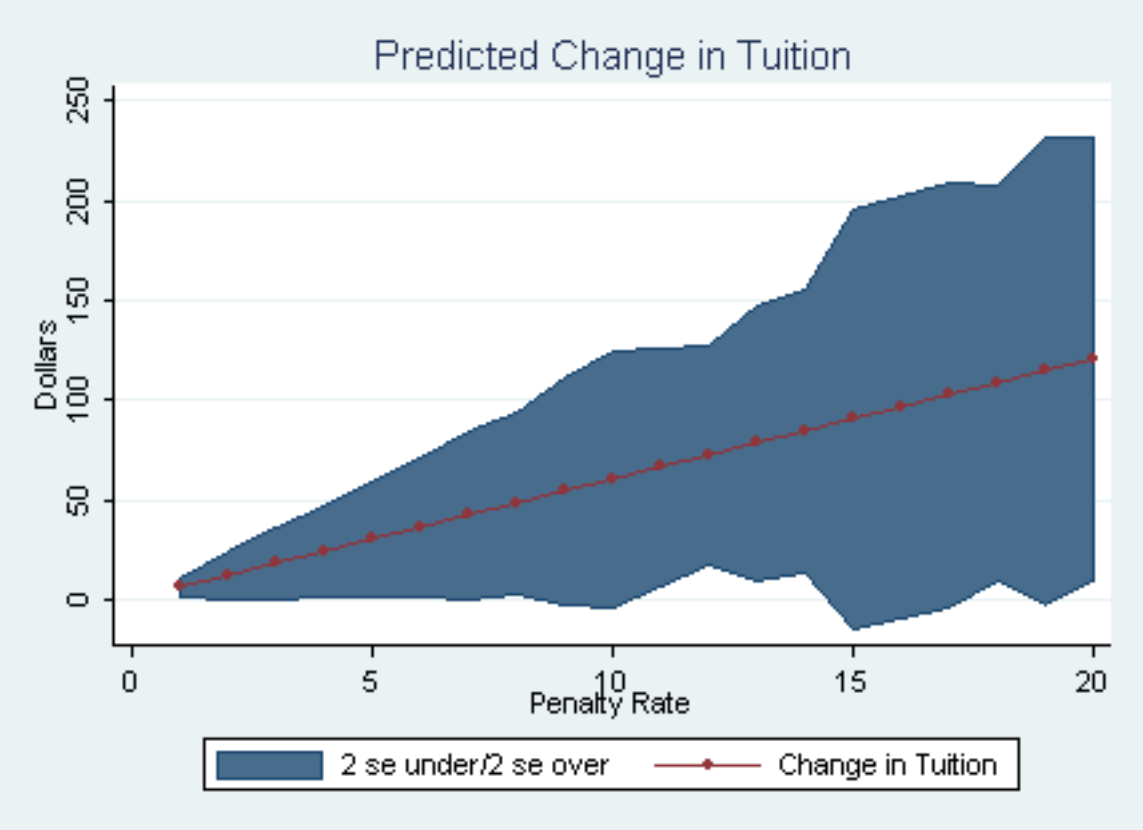

Figure 11: Predicted Impact of Risk-Sharing: For-Profit 4-Year

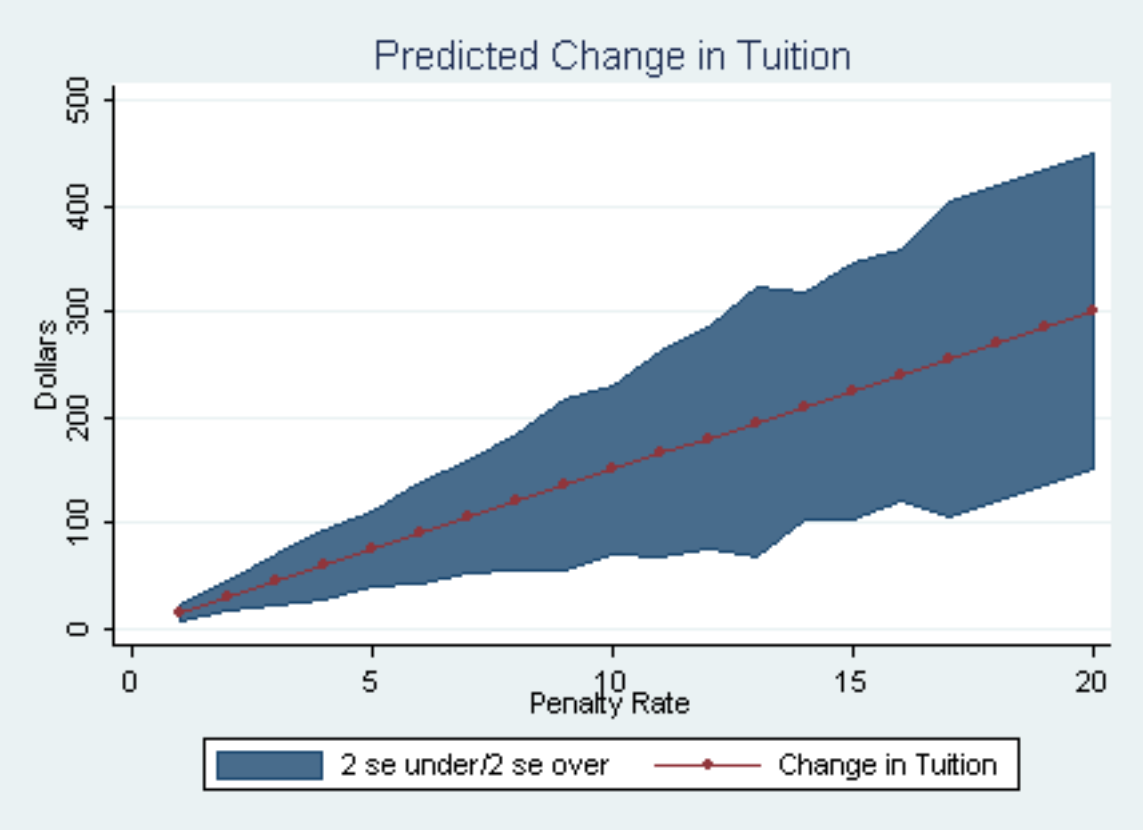

Figure 12: Predicted Impact of Risk-Sharing: For-Profit 2-Year

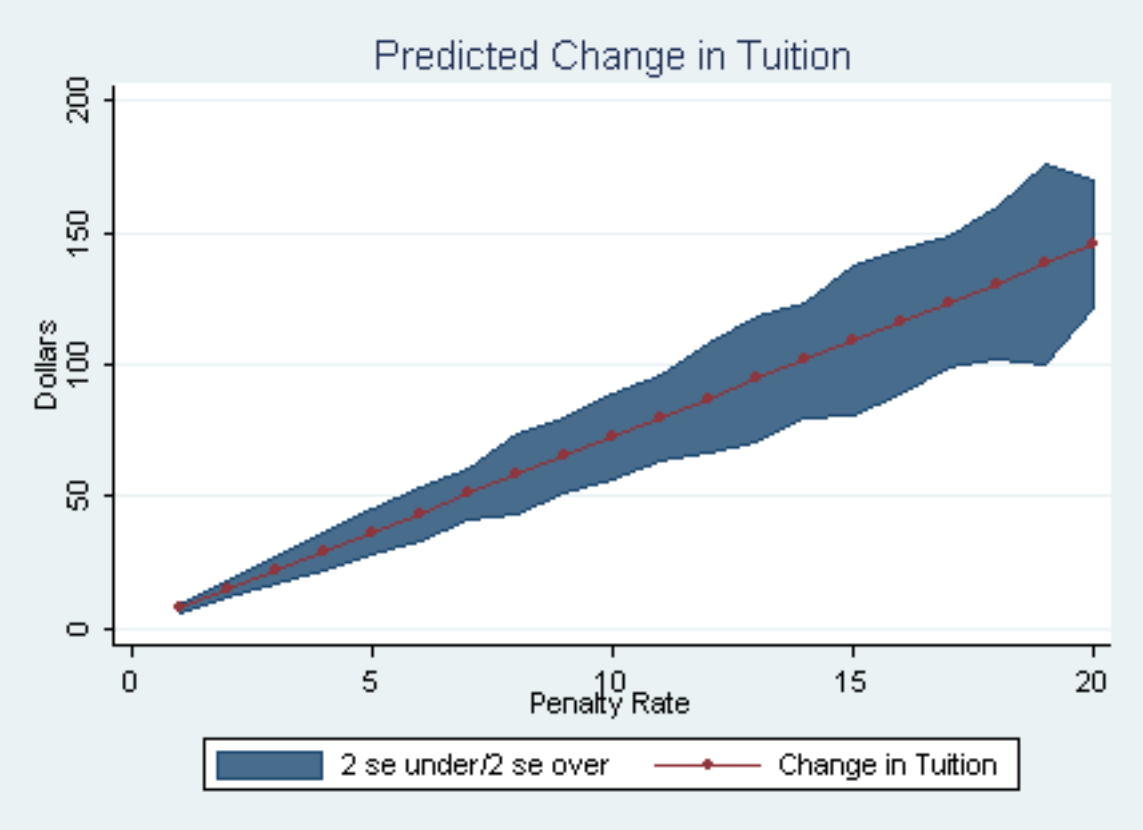

Table 1
Distribution of Institution-Specific Effects

Estimator	FE	FE	RE	EB
σ_γ	.048	.047	.040	.037
Controls	No	Yes	No	Yes
Schools	3,773	3,773	3,773	3,773
Total Observations	28,916	28,916	28,916	28,916

Table 2: Potential School Closures Due to Risk-Sharing

	Public PhD	Private PhD	Public Masters	Private Masters	Public 4-yr	Private 4-yr	Public 2-yr	Private 2-yr	For-Profit 4-yr	For-profit 2-yr
Penalty=.05										
Students Displaced	0	0	0	0	0	2	0	428	1883	7939
	(0)	(0)	(0)	(0)	(0)	(4)	(0)	(414)	(17284)	(1715)
Penalty=.05										
Students Displaced	0	0	0	3	0	2743	0	4702	130469	37894
	(0)	(0)	(0)	(21)	(0)	(919)	(0)	(3276)	(81408)	(5069)