



## Opportunity Unraveled:

### Private Information and the Missing Markets for Financing Human Capital

Executive Summary - September 2021

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Investing in college carries persistently high returns to both individuals and society, but also tremendous risks. Nearly half of all college enrollees fail to complete their degree. Among those who graduate, only 85% go on to find work. Even by age 40, over 15% of college graduates earn less than \$40,000 each year.

Our current student loan system amplifies these risks. Borrowers who fail to graduate, find a job, or earn a sufficiently high incomes are doubly impacted: not only are their incomes lower, but they're often faced with unaffordable levels of debt. Over half of student loan borrowers miss payments, and roughly one in five borrowers default during their first five

years of making payments.

Alternative financial products like equity contracts – in which collegegoers agree to pay a certain percentage of their future earnings – can mitigate these risks, yet college is typically financed through non-dischargeable, government-backed student loans. In this paper, we ask why financial products like equity contracts that reduce the risk to collegegoers seldom exist. Our core conclusion is that private markets for these contracts have unraveled due to adverse selection, and as a result there are large welfare gains to government subsidies that would help offer these types of financing alternatives to student debt.

### Methodology: Testing for Unraveling

We begin by establishing that collegegoers have significant amounts of information about their future life outcomes, such as their future earnings, beyond what could be known to potential financial companies offering alternatives to student debt. We use data from the Beginning Postsecondary Students study (BPS), a 2012 survey that asked over 20,000 first-year college students about a range of expectations for the future, including their likelihood of graduating, expected occupation, and expected salary, which we link to information on students' outcomes after college, such as whether they complete college and their earnings in young adulthood. We show that students are able to predict these future outcomes, even after controlling for a rich set of observable characteristics including student-level demographic and administrative college information that financiers might use to reduce the informational advantage held by collegegoers.

Why might this pose a problem for a private market that provides alternatives to student loans aimed at reducing risks to collegegoers? Suppose that a firm were to offer an equity contract that provides tuition assistance in exchange for a fraction of a student's future earnings. If students know more than the financier about their future earnings, then we would expect that students who anticipate earning *less* income will be *more* likely to opt into an equity plan that requires them to repay a certain fraction of their future earnings, while

those who expect to earn *more* will be *less* likely to opt for an equity plan. This phenomenon is known as **adverse selection** and represents a common concern across insurance markets.

To think about how adverse selection affects the market, we can define two curves. First, we define a collegegoer's **willing to accept (WTA)** to be the smallest valuation of their future earnings they'd accept in exchange for college funding today. In the presence of adverse selection, borrowers who expect to earn *less* will tend to be more open to accepting less money today in exchange for a fraction of their future earnings.

Second, we define the **average value (AV)** of the contract to the financier to be the average earnings of those who choose to take up the contract. In the presence of adverse selection, the average value will generally be lower than the average earnings in the population more broadly because those choosing the contract will be those with lower-than-average earnings.

In order for a to make a profit, financiers facing high levels of **adverse selection** may respond by offering less financing, in turn driving the collegegoers who expect the highest incomes to drop out of the market and further pushing down a given contract's **AV**. If collegegoers have enough knowledge about their future earnings, this cycle – called unraveling – can continue if no one is willing to accept a contract that would pay back the average value of those who would take it up. More formally, the market fully unravels when the

willingness to accept curve in the population lies everywhere above the average value curve.

### Results: Evidence of Unraveling

Using our data on students' expected and realized outcomes, we measure the threat of adverse selection by estimating the WTA and AV curves for four hypothetical contracts, all of which offer tuition support in exchange for post-college payments that depend on borrower outcomes:

**Earnings-equity contract:** Borrower pays a fixed percentage of post-college earnings

**Completion-contingent loan:** Borrower only pays if they graduate

**Employment-contingent loan:** Borrower only pays if they're employed after college

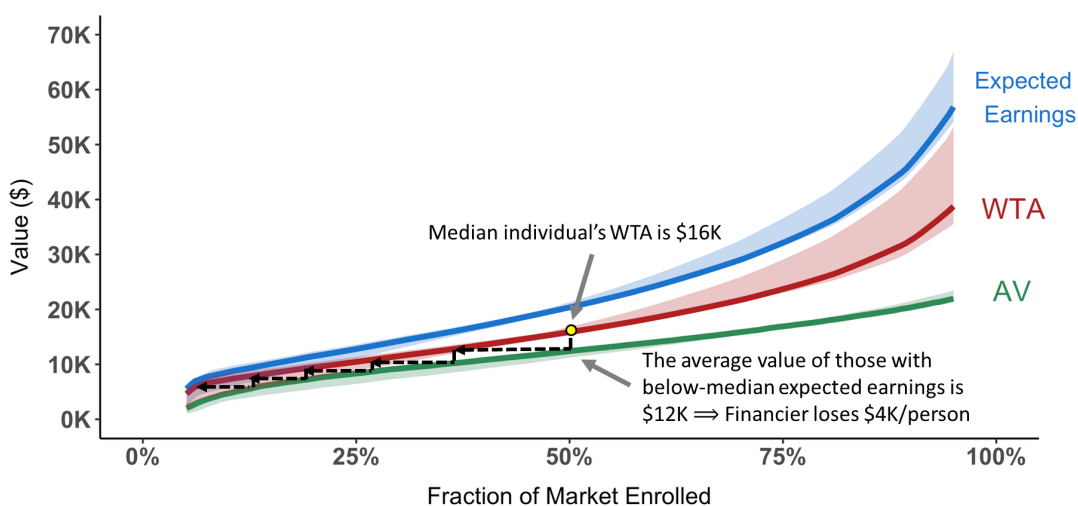
**Dischargeable loan:** Debt that's dischargeable in delinquency/default

Each of these potential contracts would offer collegegoers protection against the risk of going to college. But, our results suggest that each of these four markets have unraveled due to adverse selection.

Figure 1, shown below, plots our estimated WTA and AV curves for each market across different contract values and enrollment levels. In each case, the AV curve lies below the WTA curve. As shown by the blue line, the median collegegoer expects to earn roughly \$20,000 at age 26. If a financier were to offer a contract with a valuation attractive to the median collegegoer, the average earnings at age 26 of those who choose to take that contract would be just \$12,000, as shown by the AV plotted in green.

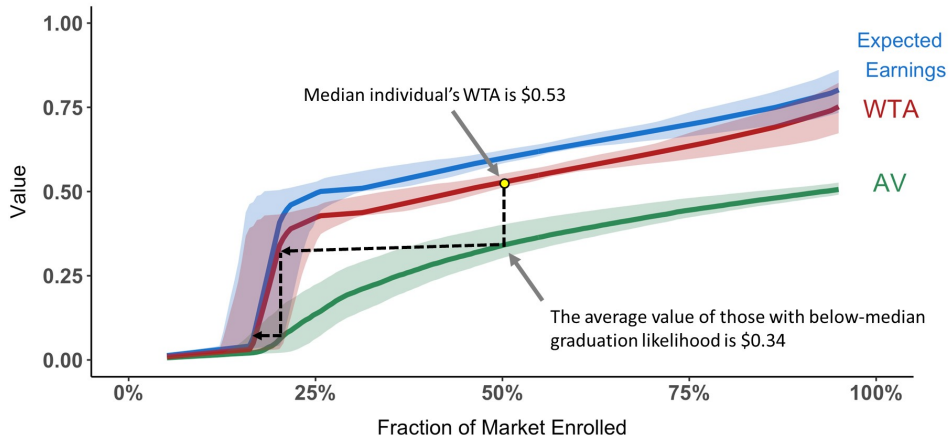
This means that a median individual expecting to earn \$20,000 would have to be willing to expect to pay back more than \$1.50 for every dollar of financing they obtain today to ensure the financier

**Figure 1: Unraveling of the Equity Market for College Financing**

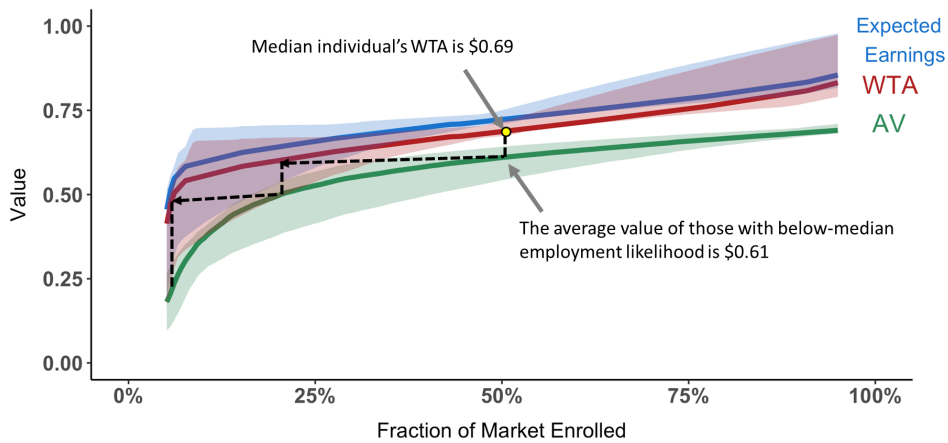


Source: U.S. Department of Education, National Center for Education Statistics, 2012/17 Beginning Postsecondary Students (BPS) study, authors' calculations (September 2021)

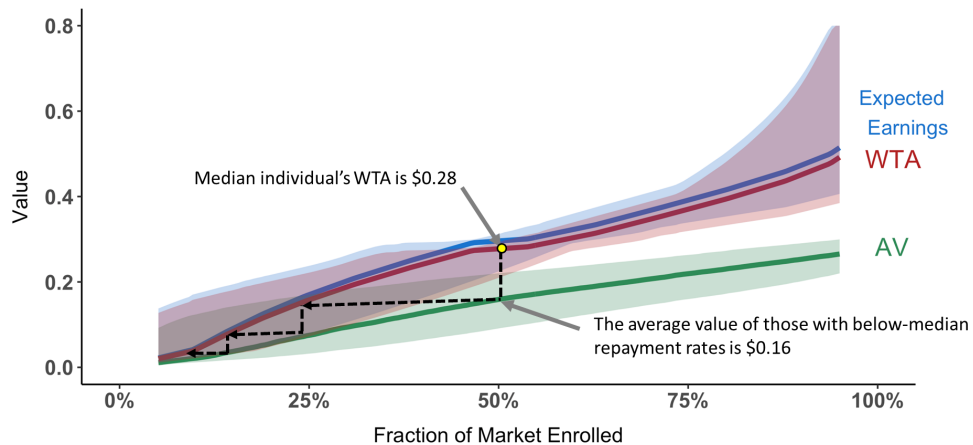
**Figure 2: Unraveling of the Completion-Contingent Loan Market**



**Figure 3: Unraveling of the Employment-Contingent Loan Market**



**Figure 4: Unraveling of the Dischargeable Debt Market**



Source: U.S. Department of Education, National Center for Education Statistics, 2012/17 Beginning Postsecondary Students (BPS) study, authors' calculations (September 2021)

breaks even. But, we estimate that individuals are not willing to accept these terms – they are willing to accept a minimum valuation of \$16,000 (i.e. be willing to expect to repay roughly \$1.20 for every \$1 of financing today).

The financier could lower their valuation to \$12,000 to reflect the expected earnings of those taking up their contract, but then the pool of people who would take up this contract would have even lower expected earnings. Because the green AV curve lies everywhere below the red WTA curve, this process continues as there is no valuation at which the financier can make a positive profit.

Figures 2-4, shown on the following page, show that these findings are not unique to the equity market. We estimate that the other three markets we explored also unravel due to adverse selection. Markets cannot profitably provide financing to collegegoers that would only need to be repaid if they graduated, if they found a job, or if they did not default on their current student loans. In summary, private markets cannot profitably provide financing to collegegoers in a way that helps mitigate the risks associated with going to college.

### Value of Government Intervention

What should we do in light of these results? A textbook example of a market failure that warrants government intervention is when adverse selection unravels a private market, especially one for a desirable social good like financing for higher education. The final step of our analysis is to evaluate the impact of government subsidies to help offer

students the option of outcome-contingent financing for college, despite their unprofitability in a private market.

A key concern one might have with expanding these types of contracts like equity contracts is that they could cause people to reduce their earnings in an effort to reduce their required repayment amounts. While higher tax rates can cause people to choose to reduce their earnings, our results suggest that the benefits from risk protection offered by equity contracts would significantly outweigh the additional costs from people choosing to reduce their earnings.

We arrive at this conclusion using estimates of the size of the earnings response to taxation taken from the existing literature. Even applying aggressive estimates of the size of this response, our baseline estimates suggest that every \$1 in spending to help open up an equity market for college financing would deliver a marginal value of public funds (MVPF) of \$1.86 in benefits to collegegoers. This MVPF, which is higher than that of many other tax and spending policies in the US, represents a conservative estimate because it excludes benefits resulting from the possibility that these subsidies increase the number of individuals who enroll in college in the first place, thereby boosting their future earnings and tax revenue.

We conclude, therefore, that there are significant welfare gains to be realized from using government subsidies to open up these missing markets and address the financial risks faced by collegegoers in the US.