

Student Loans and Labor Supply Incentives

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Motivation

- Student loans have become a predominant part of household debt over the past two decades.
- Federal student loans are unique in that they are almost completely non-dischargeable in U.S. bankruptcy. Recent growth in Income Driven Repayment Plans (IDR).
- Important to understand the impact of unique features of student loans on labor supply incentives.

Key Takeaways

- **Student loans' unique features have nuanced effects in household labor supply incentives:**
- **Disciplinary Effect:**
 - Non-dischargeability of loans in personal bankruptcy mitigates household debt overhang. Households become residual claimant of their labor income.
 - Thus, households are incentivized to supply labor.
- **Setback Effect:**
 - IDR allows households to "pseudo-discharge" student debt for a fraction of their income.
 - Households anticipating enrolling in IDR no longer fully internalize benefits of supplying labor.
 - Thus, households are disincentivized to supply labor prior to their IDR enrollment.
- **Empirical and structural analysis of the disciplinary vs. setback effect:**
 - Empirical evidence using survey data shows disciplinary effect dominates (i.e., higher share of student loans incentivizes labor supply and mitigates debt overhang).
 - Calibrated model targeting share of households enrolling in IDR corroborates the disciplinary effect outweighs setback effect.
- **Policy Implications trade-off:**
 - Reforms making IDR terms more lenient (e.g., reducing share of income repayment or shortening of repayment period) exacerbate setback effect and disincentivize labor supply. Hence, undermining economic efficiency via lower labor supply.
 - Possibility of enrolling in IDR encourages higher student loan debt and thereby higher human capital acquisition. Hence, fostering economic efficiency via higher wages and hourly productivity.

Model and Predictions

- A household's life-time utility from consumption, and labor supply, $\{C_t, l_t\}$, is given by

$$\mathbb{E} \left[\int_0^{\infty} e^{-\delta t} u(C_t, l_t) dt \right]$$

- Different from risk-neutral corporations (thanks to diversification), a typical household is assumed to be risk-averse. For tractability, we assume logarithmic consumption preferences and quadratic cost of labor supply such that per-period utility is given by:

$$u(C, l) = \log C - \frac{\beta}{2} l^2$$

- Denote $K_t \geq 0$ as the hourly labor income per-period. The dynamics of K are given by the (controlled) geometric Brownian motion (GBM) process:

$$dK_t = K_t(\mu dt + \sigma dB_t)$$

- The total wages W_t are the product of hourly income and the number of hours: $W_t = l_t K_t$

- Initially, households have complete access to credit markets. Household savings S_t evolve according to:

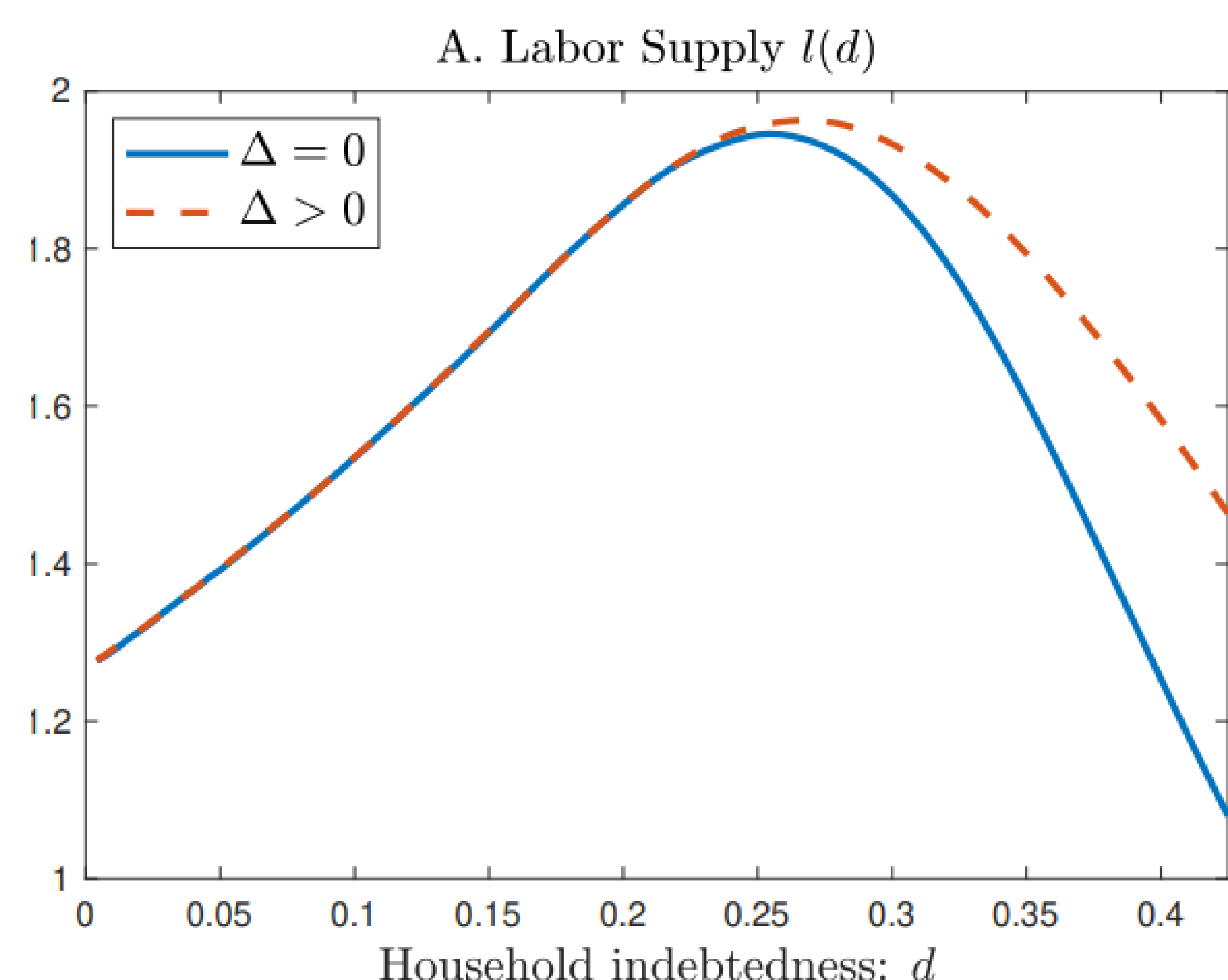
$$dS_t = (r(S_t)S_t - C_t + W_t)dt \text{ if } t \leq \tau_D, \\ S_t = 0 \text{ if } t > \tau_D,$$

- The household's total borrowing (i.e., negative savings) is the sum of student debt and non-student debt: $S^{SL} + S^{NS} < 0$.

- The proportion of household borrowing corresponding to student loans Δ remains constant. That is: $S_t^{SL} = \Delta S_t$ and $S_t^{NS} = (1 - \Delta)S_t$.

- Student loan borrowers start out in the standard repayment plan (SRP). While payments to non-student debt terminates after default (discharge), student debt requires continued repayments. The present value of garnished wage matches the outstanding value of student loans.

- An alternative: Income Driven Repayment (IDR) plan. Sets the monthly repayment as a proportion (15%) of borrowers' discretionary income; Forgives principal after 20-25 years



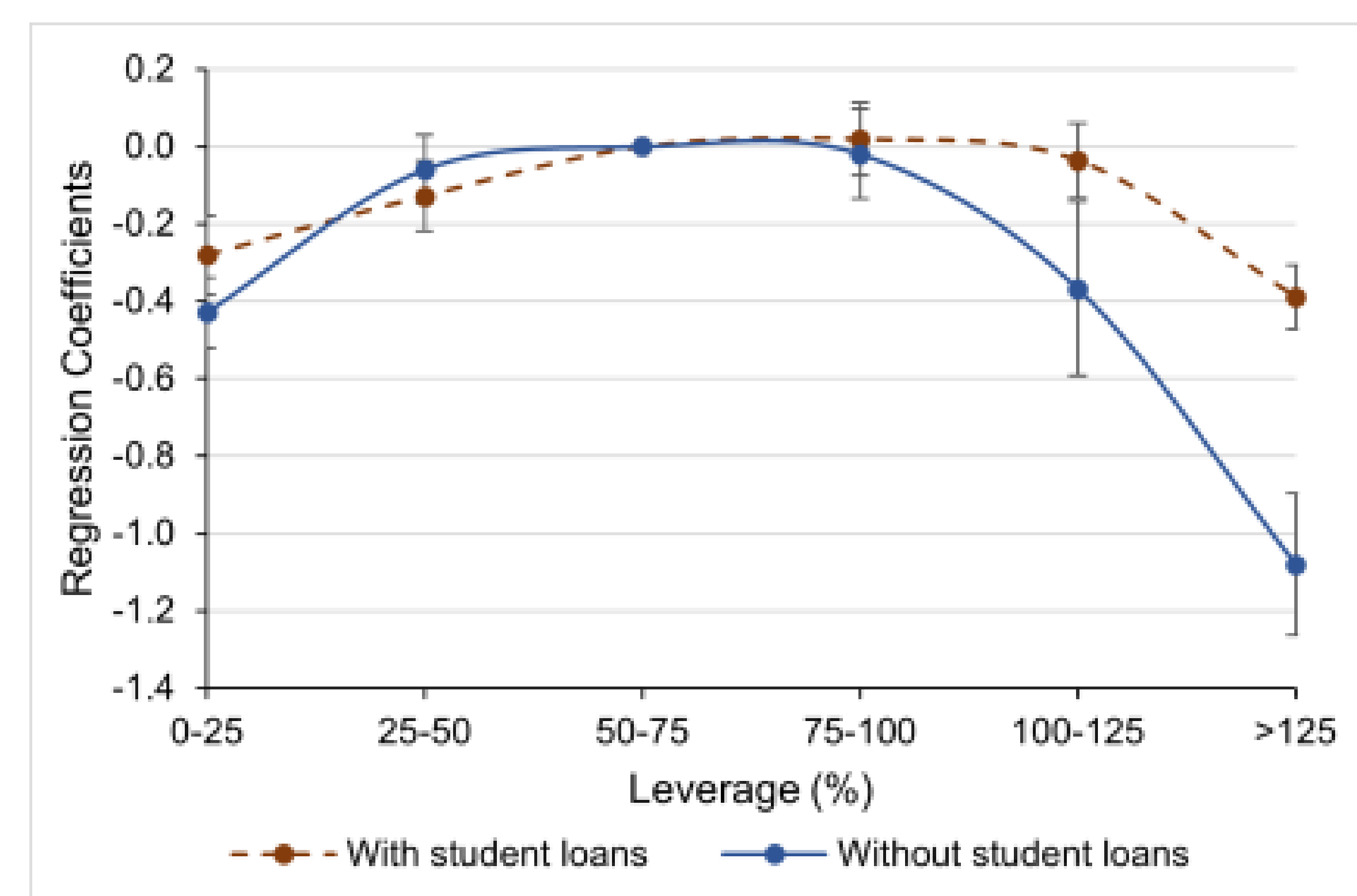
Data and Empirical Findings

- The 1997 National Longitudinal Survey of Youth (NLSY97) and the restricted-use NLSY Geocode files:

- Tracks 8,984 American youths who were between 12 and 16 years old in 1997, following their trajectories over time.
- Family background, education and employment history, job training information, household balanced sheet (mortgage, auto loan, credit debts, house and car value, savings, etc.), and geographical information.
- The amount of outstanding student debt when a respondent is 20, 25, 30, and 35 years old.
- Week-by-week records of a respondent's labor force status and associated job(s), the total number of hours the respondent works in each week at any job, and the hourly wage of the ongoing job during a survey interview.
- College-cohort grant share as instrument for student loan borrowing.

Dep. Var.	Labor supply						Difference
	With student loans			Without student loans			
	(1)	(2)	(3)	(4)	(5)	(6)	
$1_{Lev \in (0,25\%]}$	-0.285*** (0.064)	-0.274*** (0.064)	-0.281*** (0.063)	-0.408*** (0.053)	-0.382*** (0.054)	-0.429*** (0.055)	0.102 (0.084)
$1_{Lev \in (25,50\%]}$	-0.135** (0.054)	-0.129** (0.054)	-0.128** (0.054)	-0.042 (0.053)	-0.028 (0.053)	-0.059 (0.053)	-0.105 (0.076)
$1_{Lev \in (75,100\%]}$	0.039 (0.057)	0.022 (0.057)	0.020 (0.057)	-0.087 (0.068)	-0.057 (0.072)	-0.019 (0.071)	0.055 (0.091)
$1_{Lev \in (100,125\%]}$	-0.003 (0.058)	-0.012 (0.058)	-0.036 (0.059)	-0.460*** (0.133)	-0.417*** (0.136)	-0.368*** (0.136)	0.317** (0.142)
$1_{Lev > 125\%]}$	-0.341*** (0.048)	-0.347*** (0.049)	-0.389*** (0.050)	-1.111*** (0.110)	-1.059*** (0.110)	-1.080*** (0.112)	0.712*** (0.121)
Male			0.301*** (0.034)			0.535*** (0.046)	
White			0.118*** (0.040)			0.185*** (0.047)	
GraduateDegree			0.627*** (0.052)			0.734*** (0.062)	
MaritalStatus			-0.223*** (0.040)			-0.324*** (0.042)	
Age			-0.191 (0.133)			0.002 (0.158)	
Age ²			0.003 (0.002)			-0.001 (0.002)	
State × Year FE	NO	YES	YES	NO	YES	YES	
Observations	18,787	18,749	18,749	17,010	16,953	16,953	
R-squared	0.004	0.044	0.056	0.011	0.056	0.075	

(A) Regression coefficients



(B) Differences in regression coefficients

