# Distribution of Returns to a College Income Share Agreement: Evidence from Administrative Data

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**Abstract**

This paper examines the financial implications of a college Income Share Agreement (ISA) program, focusing on institutional returns and participant payment burdens relative to federal PLUS loans. An ISA provides college funding in exchange for a fixed percentage of a student's future income over a specified period. Using administrative data from 1,857 undergraduate ISA contracts issued between 2016 and 2022 at a large public U.S. university, the analysis compares actual ISA payments to counterfactual PLUS loan obligations. Results show that ISA payments are typically lower than PLUS loan payments for graduates with low or moderate earnings, and higher for those with strong labor market outcomes. Total ISA payments are similar to, though slightly lower than those expected from a PLUS loan suggesting the ISA program is sustainable. Regression analysis indicate that major-specific average salary and individual academic performance are significant predictors of the net cost of an ISA. The findings suggest that well-designed ISA contracts may benefit students who have exhausted their direct federal student loans.

**JEL Codes:** I23, I22, G51
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# 1 Introduction

Two competing explanations have been proposed to account for the limited adoption of Income Share Agreements (ISAs) in higher education finance. The prevailing academic theory is that ISA markets unravel due to high levels of adverse selection as students are unwilling to accept an ISA contract at the income share rate necessary for the program to remain solvent (Herbst and Hendren, 2024). The alternative view holds that ISA programs charge income share rates that are too high, leading vulnerable students to repay far more than they would have under traditional student loans (Warren, Porter and Pressley, 2019). These perspectives offer opposing predictions—either that adverse selection is too strong to support a sustainable ISA program, or too weak to weak to constrain pricing behavior. Although case studies and anecdotal evidence has been cited in support of each claim, these claims cannot both be true in the aggregate.

Prior studies have emphasized theoretical market failures as barriers to viable ISA markets in higher education finance (Rey and Verheyden, 2011; Gary-Bobo and Trannoy, 2015; Herbst and Hendren, 2024). Others have focused on behavioral and framing effects that may distort student perceptions of risk and value in income-contingent repayment arrangements (Evans, Boatman and Soliz, 2019; Abraham et al., 2020; Balakrishnan et al., 2024). Concerns about fairness and potential disparate impacts have also been raised, particularly in light of evidence that income-contingent repayment structures can amplify inequalities when program terms vary by expected income, which correlates with race, gender, and field of study (Zaber and Steiner, 2021).[1] In contrast to this prior work, which relies on stylized models or hypothetical choices, this paper uses administrative data to directly observe ex post repayment patterns under an ISA program implemented at scale. By comparing these outcomes to those implied by federal loan benchmarks, the analysis offers new insights into the sustainability of a higher education ISA program.

In 2016, Purdue University—a large public research university in Indiana—launched the first ISA program at a major U.S. university since Yale's Tuition Postponement Option in

[1] Pollack and Sullivan (2022) show that ISA contract terms across 51 education providers do not appear to disadvantage Black or Hispanic students and they find no gender differences in contract terms.

the 1970s.[2] The program, branded as *Back a Boiler*, was only offered to full-time domestic undergraduates who had exhausted their direct federal student loan capacity (typically at $31,000 of borrowing).[3] Students received funds in exchange for a fixed share of their future income, consistent with the original proposal by Milton Friedman, who framed ISAs as a form of human capital equity rather than debt (Friedman, 1955). Contracts included some protections including a six-month post-graduation grace period, an income floor ($20,000/year) below which repayment was not required, and a cap on total repayments.

ISA Contracts were defined by three adjustable parameters—the income share rate, term length, and payment cap—and varied over time by major and class standing. These design choices aimed to reduce informational asymmetries and limit cross-subsidization across heterogeneous participants. The parameters were adjusted for new cohorts by major in response to changes in projected post-graduation earnings. Program details and changes to the rates, terms, and cap are described in Section 2.

Anecdotal accounts have illustrated the variable experiences of students participating in income share agreements. Early media coverage highlighted individual stories of students who benefited from income-contingent repayment, particularly those with modest earnings early in their careers (The Economist, 2018; Quintana, 2019). In response, concern was expressed that high-earning participants could face repayment obligations exceeding those of even the "most burdensome, predatory, and costly private student loans," (Warren, Porter and Pressley, 2019). Subsequent media coverage revealed diverging participant experiences, with some students reporting financial relief and others expressing frustration as incomes rose and repayment obligations exceeded expectations (Douglis, 2022; Herron, 2022). These conflicting narratives reflect underlying uncertainty about the nature and severity of adverse selection in ISA markets.

[2]From 1971 until 1978, Yale University ran the Tuition Postponement Option (TPO) where nearly 3,300 students agreed to pay back 4 percent of their earnings for every $10,000 borrowed and payment obligations ending after 35 years. Students were placed into cohorts and once a cohort repaid their balance, remaining cohort members were released from financial obligation. However, problems emerged when a number of participants bought out of the agreement soon after graduation by paying 150% of the funding amount plus interest, leaving the remaining cohort members responsible for the balance. Yale ended its program prematurely and accepted final payments in 1999 (Ladine, 2001).

[3]Undergraduates who are dependent students have an aggregate limit of $31,000 in direct federal student loans with no more than $23,000 of this amount in subsidized loans. Independent students and dependent students whose parents are unable to obtain a PLUS loan have an aggregate limit of $57,500.

In contrast to these anecdotal accounts, this paper empirically evaluates ISA participant outcomes by comparing actual ISA payments to counterfactual student loan payments based on the federal Parent PLUS loan program. As described in Section 4, the monthly loan payments are simulated to match the funding amount and term length of each ISA contract, incorporating the PLUS loan interest rate and origination fee at that time. Two repayment scenarios are considered: one in which loan payments follow the standard repayment schedule and another in which payments are paused in months when no ISA payment is made.

The administrative data underlying the analysis are described in Section 3. The dataset includes 1,073 unique students who signed 1,857 ISA contracts between 2016 and 2022, totaling over $20.8 million in funding.[4] Student-level information includes demographics, academic performance, major-specific labor market average earnings, individual post-graduation salaries, and ISA contract payments. These data enable longitudinal tracking of repayment behavior and allow for comparisons across socioeconomic and academic subgroups.

The empirical analysis shows that most participants have, so far, repaid less under the ISA than they would have under an equivalent PLUS loan, particularly those with weaker academic profiles and to some extent those in lower-earning majors. Students with higher than expected earnings often paid more under the ISA structure, consistent with the ISA design which provides downside protection in exchange for higher payments from those with higher salaries.

This paper is the first to empirically examine the realized repayment outcomes of ISA participants at a traditional U.S. university. The analysis provides new evidence by identifying which students benefit most and least from participating in an income share agreement. The findings clarify how ISAs redistribute risk and cost relative to federal student loans and inform ongoing debates about the design, regulation, and equity implications of alternative student finance models.

[4]The Purdue University ISA program stopped issuing new ISA contracts (officially a program "pause") in 2022 when the service provider, Vemo Education, disbanded in response to a Consumer Financial Protection Bureau consent order (Consumer Finantial Protection Bureau, 2021) requiring ISA contracts to comply with private education loans regulations and subsequent a Department of Education announcement requiring higher education institutions to treat ISAs as private education loans (U.S. Department of Education, 2022). For a more detailed description of Vemo Education's decision to shut down and Purdue University's decision to pause their ISA program see Yoder (2022).

## 2 ISA Program Design

The design of Purdue University's *Back a Boiler* Income Share Agreement (ISA) program was developed in response to the shortcomings of earlier income-contingent financing efforts, such as Yale's cohort-based repayment model (Edelman, 2021). Rather than pooling repayment obligations across a group, Purdue adopted a contract-specific approach structured around three adjustable components: the income share rate, the term length, and the payment cap. This design enabled administrators to tailor repayment conditions based on academic major and class standing.

The payment cap—the maximum payment obligation for a contract—was set at 2.5 times the funding amount for contracts issued between 2016 and the summer of 2019. Once an ISA participant hits the payment cap, no additional payments are required, even if they have paid less than the funding amount. In 2019, the payment cap was reduced to 2.31 times the funding amount as part of a recalibration of income share rates and term lengths by major. The payment cap provides upside protection to ensure that no participant faces excessively high cumulative payment, regardless of post-graduation income.[5]

The income share rate and term length for each major were set to roughly equalize average payments across majors. Program administrators used American Community Survey (ACS) data to estimate average post-graduation earnings by major. These projections informed the sorting of roughly 175 undergraduate majors into eight contract groups. The term length ranged from 88 months for the highest earning contract group to 116 months for the lowest-earning contract group. Within contract group, the income share rate also varied by time to expected graduation in three categories (seniors with less than one year until expected graduation, juniors with between one and two years, and sophomores with more than two years remaining). For seniors, the income share rates initially ranged from 2.57 to 4.52 percent per $10,000 by contract group. Over time, program administrators moved some majors from one group to another and also reduced the income share rate for most contract

[5]For comparison, the cumulative payments for a 10-year PLUS loan at 7.60% for a college senior with a 4.3% origination fee that are scheduled to begin after the 6-month grace period would total about 1.7 times the borrowed amount.

groups. At the time of the program pause in 2022, the income share rates ranged from 2.32 to 4.01 percent per $10,000 for seniors. Reflecting the additional time to graduation as well as a lower probability that the student would graduate in the specified major, the income share rates for each contract group were higher for juniors (2.43 to 4.27 in 2022) and higher still for sophomores (2.95 to 4.58 in 2022).

Monthly payments were calculated as a fixed percentage of earned income, where the income share rate is simply scaled by the funding amount. Payments continue until either the end of the term length or the participant reaches the payment cap. Participants are asked to inform program administrators of any wage change and are also required to submit annual earned income documentation. After the annual income verification, an adjustment is made to the next monthly bill to account for over or under payment. Participants who fail to submit the annual earnings information have their next year's monthly bills increased by 10 percent until income is verified either voluntarily by the student or by requesting this information from the U.S. Internal Revenue Service.[6]

## 3 Data

The analysis uses administrative data from Purdue's *Back a Boiler* ISA program, encompassing all contracts issued between 2016 and 2022. The data are the universe of undergraduates who participated in the ISA program, enabling a comprehensive evaluation of participant characteristics, contract terms, and repayment outcomes. The sample consists of 1,073 unique students who collectively signed 1,857 ISA contracts and received $20.8 million in funding. These data are recorded at the contract level and include detailed demographic, socioeconomic, academic, and labor market variables in addition to payment records.

Of the 1,073 students in the sample, 533 (50%) signed only one ISA contract, while the remaining 540 (50%) signed multiple contracts across different academic periods. Of the 1,857 contract, 92% were for the fall and/or spring semesters of an academic year.

[6] A the time they sign the ISA contract, participants provide the university with a completed IRS Form 4506-T authorizing the university to obtain their future tax return information including any Form W-2s and Form 1099-MISCs.

The remaining 8% were for a summer term. The maximum number of contracts signed by any individual was six, allowing for repeated funding access as students progressed toward degree completion. This longitudinal structure enables us to track how students engage with the program over time and how cumulative repayment obligations accrue across multiple contracts. Among all ISA participants, 946 (88%) graduated from the university between 2017 and 2024, 30 (3%) appear to still be making progress towards graduation, and 97 (9%) either dropped out or transferred to another institution.

Table 1 reports summary statistics at the contract level. The average income share rate was 3.70% per $10,000 funded.[7] The average funding amount per contract was $11,246, with a maximum of $34,000.

Figure 1 shows the distribution of two ISA characteristics. Panel A presents the distribution of contract funding amounts, which is right-skewed. The funding amount for 75% of contracts lies between $5,000 and $17,000. Panel B displays the number of months from contract origination to the onset of repayment obligations, with mass points at 15, 27, and 39 months after origination, consistent with expected graduation timelines and the 6-month post-graduation grace period. These distributions reflect considerable heterogeneity in student financial need and academic paths.

Returning to Table 1, the ISA participants are 52% female and 67% White, with 11% identifying as Hispanic, 9% as Black, and 7% as Asian. This is a higher share of underrepresented minority students than the university's overall domestic student population which during this time period was 73% White, 6% Hispanic, 3% Black, and 11% Asian. Roughly 27% of ISA participants were administratively defined as first-generation college attendees, and a small share (3.4%) reported being a non-native English speaker. Academically, ISA participants have lower SAT scores than domestic students at the university. The average SAT math score in the sample is 621 (vs 643 overall) and the average SAT verbal score is 619 (vs 630 overall). Average cumulative and first-year GPAs for ISA participants are about 0.13 points lower than for the overall domestic student population.

[7] Three senior computer science students in 2019 each entered into an ISA contract with an income share rate of just 1.73 rather than the 2.32 rate that other senior computer science students were offered that year. It is not clear why these students were given better terms.

The student's home zip code is matched to census data to define the urban, suburban, and rural indicators as well as the median family income variable. Approximately 60% of students responded to the author's survey which provides information about parent income, parent education, individual preferences, as well as labor market data (Mumford, 2022). This survey data is combined with the university's first destination survey to observe starting salary for 83% of ISA participants with 10% reporting going directly to graduate school. The inflation-adjusted average starting salary for ISA participants of $58,949 is similar to the average over major average salaries calculated from the full population of students who responded to the university first destination survey.

# 4 Empirical Methods

To assess whether ISA contracts imposed a greater or lesser financial burden on students relative to traditional student loans, I construct a counterfactual benchmark modeled on the federal Parent PLUS loan program. This benchmark enables a comparison between the actual ISA payments and simulated loan payments that match each student's ISA contract features, including funding amount and repayment duration.

The administrative dataset contains payment records for all ISA contracts through 2024, including information on repayment amounts, deferrals, and the number of months remaining until contract completion. This high-resolution panel allows us to quantify the total amount repaid and to characterize variation across students and contract types.

## 4.1 Constructing the Hypothetical PLUS Loan Benchmark

For each ISA contract, we simulate a hypothetical federal Parent PLUS loan with the principal equal to the ISA funding amount, a term equal to the ISA term length (ranging from 88 to 116 months rather than the 120 months that is typical for a PLUS loan), and interest rates set to the historical PLUS rate applicable at the time the contract was signed.[8] All

[8]This was a period of relatively low interest rates. The PLUS loan interest rates by origination year are: 6.31% (2017), 7.00% (2018), 7.60% (2019), 7.08% (2020), 5.30% (2021), and 6.28% (2022). All PLUS loans in this period also included a 4.3% origination fee. The interest rate subsequently increased. For PLUS loans disbursed in the 2025 academic year, the interest rate is 9.08%.

simulated loans include a six-month post-graduation grace period during which no payments are made, but interest accrues starting one month after origination.

Monthly payments for contract $i$ are calculated using the standard amortization formula:

$$\text{Payment}_i = (1.043 \times F_i)\,(1+r)^{m_i}\left(\frac{r(1+r)^{t_i}}{(1+r)^{t_i}-1}\right) \tag{1}$$

where $F_i$ is the ISA funding amount, $r$ is the PLUS loan interest rate divided by 12 to convert it into a monthly interest rate, $m_i$ is the number of months between contract origination and the start of repayment (graduation plus six months), and $t_i$ is the contract term length in months. Using the ISA term length aligns the counterfactual PLUS loan as closely as possible to the ISA.

Paying off a student loan early saves the borrower the interest that would have accumulated during the repayment period. In contrast, there is no financial incentive to pay off these ISA contracts early. However, 14 ISA participants paid off their ISA contract early by repaying the payment cap (either 2.50 or 2.31 times the funding amount) and exited the ISA contract soon after their graduation. From a time-value perspective, it would have been better to delay their ISA payments even if the participant expected with high likelihood to eventually hit the payment cap in the future. So, for these students the hypothetical PLUS loan is also assumed to be completely paid off early.

Figure 2 presents the distribution of loan principal and monthly payment for the hypothetical PLUS loan. Panels A and B show the loan principal at the time repayment begins by contract and by student, respectively. The average balance is \$13,672 per contract and \$23,637 per student. Note that on average, the principal for the hypothetical PLUS loan at the time repayment begins is higher than the average ISA funding amount because the PLUS loan imposes an origination fee and because interest accumulates while the student is in school. Panels C and D of Figure 2 display the distribution of monthly payment amount again by contract and by student, respectively. The average monthly payment per contract is \$185 and the average monthly payment by student is \$320.

The cumulative payments for each ISA contract is compared to two versions of this

hypothetical loan benchmark. The first version assumes the borrower makes every monthly payment as scheduled with no delays or deferments. This overstates hypothetical PLUS loan payments as student loan deferments are allowed for unemployment, continuing education, and military service. The second version assumes the borrower pays nothing in any month in which no ISA payment was made. This introduces deferments into the loan benchmark, but in a way that likely understates hypothetical PLUS loan payments as the ISA allows for forgiveness or deferment in situations not covered by a student loan.

Figure 3 illustrates the distribution of cumulative ISA payments through 2024 (in panel A), cumulative hypothetical PLUS loan payments as scheduled (in panel B), and cumulative hypothetical PLUS loan payments with deferments (in panel C). Panel A shows that most ISA participants had repaid between $5,000 and $20,000 by 2024, with a long right tail extending beyond $30,000. Panel B shows the cumulative payments assuming full, on-time repayment. These amounts are typically higher, reflecting front-loaded repayment obligations as compared to the income-contingency of the ISA. Panel C presents cumulative loan payments assuming the same timing of payments as with the ISA participants. This benchmark reduces repayment totals relative to panel B, though most students still appear to pay less under the ISA structure. This suggests that the income-contingent features of ISAs provide tangible relief, especially for students with delayed labor market entry or volatile early-career earnings.

### 4.2 ISA over PLUS Regression Model

To better understand the heterogeneity in net payments across students, we use the observed ISA payments minus the hypothetical PLUS loan payments as the dependent variable in a simple linear regression model that relates the ISA over PLUS loan payments to individual contract and student characteristics. Specifically, the model explains variation in the difference between payments under an ISA and those under the counterfactual PLUS loan:

$$(ISA - PLUS)_{isc} = \alpha + \beta_1 \, rate_{isc} + \beta_2 \, funding_{isc} + \mathbf{X}'_{sc}\boldsymbol{\gamma} + \lambda_c + \varepsilon_{isc}, \tag{2}$$

where $(ISA - PLUS)_{isc}$ denotes the difference in 2024 cumulative payments between the ISA and the hypothetical PLUS loan for contract $i$ entered into by student $s$ in origination cohort $c$. Positive values indicate that the ISA is more expensive than the PLUS loan, while negative values indicate savings under the ISA. The vector $\mathbf{X}_{sc}$ includes a rich set of student-level covariates including gender, race and ethnicity, first-generation status, academic performance, major-level earnings expectations (mean and standard deviation), graduation status, and realized starting salary. The income share rate, $rate_{isc}$ is expected to be positively correlated with ISA over PLUS after controlling for the average salary for the student's major. There is no clear expectation for how ISA funding amount, $funding_{isc}$ will be correlated with ISA over PLUS, though students who need higher levels of funding may be negatively selected on unobservables. Cohort fixed effects, $\lambda_c$, account for time-varying institutional or macroeconomic conditions.

An additional regression model is also considered where the dependent variable is ISA over PLUS divided by the funding amount:

$$\left(\frac{ISA - PLUS}{funding}\right)_{isc} = \alpha + \beta\, rate_{isc} + \mathbf{X}'_{sc}\boldsymbol{\gamma} + \lambda_c + \varepsilon_{isc}, \tag{3}$$

This change to the dependent variable allows us to interpret the coefficient estimates in fractions of the funding amount rather than dollars.

# 5 Results

## 5.1 Aggregate Payments

Tables 2 and 3 report cumulative repayment amounts in 2022 and in 2024 for the ISA and both version of the hypothetical PLUS loan by origination cohort and graduation cohort, respectively. These data highlight the overall similarity between the cumulative ISA payments and the hypothetical PLUS loan payments. The scheduled loan payments are always higher because, by assumption, every borrower makes the payments with no deferment an d no default. The data also highlight the distinct temporal patterns inherent in ISA and

PLUS loan repayment structures. Specifically, ISA payments start lower and increase over time as participant earnings rise, while PLUS loan payments are typically amortized on a fixed schedule, remaining flat overtime regardless of borrower income.

This difference is evident when comparing the ISA payments observed in 2022 and 2024 to those of the hypothetical PLUS loan. Across each origination cohort in Table 2, the percentage change in ISA payments is always higher than the percentage change in the scheduled loan payments. This growth pattern is even clearer when aggregating across all cohorts. Total ISA payments rose from \$3.0 million in 2022 to \$7.5 million in 2024, a 150% increase. During the same period, total scheduled PLUS payments grew from \$4.5 million to \$9.6 million (a 115% increase). This convergence of ISA and loan payments over time reflects the earnings-contingent structure where ISA payments are more back-loaded than those of traditional student loans.

These repayment trajectories underscore an important dynamic: ISA repayment burdens are relatively light on average in the early post-graduation years, offering liquidity to lower-earning borrowers. Over time, as incomes rise, so too do ISA payments—potentially outpacing student loan payments. This dynamic serves as a foundation for the distributional and subgroup analyses that follow, where we assess how this payment structure differentially impacts borrowers across earnings distributions, fields of study, and demographic subgroups.

### 5.2 Payment Heterogenity

Figure 4 presents histograms of the distribution of the cumulative difference between ISA payments and hypothetical PLUS loan payments—referred to as "ISA over PLUS"—across contracts and students, under two repayment scenarios. Panel A shows this distribution based on scheduled payments, while Panel B adjusts PLUS loan payments to account for deferments during periods when no ISA payment is made. Panels C and D replicate the first two panels but present the data at the student level rather than at the contract level, capturing the distribution of total excess payments across individuals rather than financial instruments. Across all panels, the mode of the distribution lies near zero and the median lies below zero, indicating that for most borrowers, cumulative ISA payments are less than

what they would have paid under a PLUS loan. However, there is substantial variation, with a long right tail indicating that high-earning students repay considerably more under ISAs, particularly when deferments are not considered. This heterogeneity underscores the regressivity concern often raised in critiques of ISAs: students with high earnings may repay far more than they would under a traditional student loan. The comparison between panels also highlights the impact of deferments in mitigating this excess burden for lower earners. In Panels B and D, where PLUS loan payments are set to zero when there is no ISA payment, the mass of the distribution shifts to the right.

Tables 4 and 5 summarize demographic, academic, and labor market characteristics of ISA participants whose cumulative payments fell below or above the two loan comparison benchmarks. Contracts where ISA payments and hypothetical PLUS loan payments are both zero are excluded. In Table 4, which compares cumulative ISA payments to scheduled Parent PLUS loan payments, 73.8% of students repaid less under their ISA contracts. These students had lower cumulative GPAs (3.04 vs. 3.15), SAT Math scores (618 vs. 627), and real starting salaries ($55,568 vs. $67,228), on average, relative to peers who paid more under the ISA. They were also more likely to identify as Hispanic (12% vs. 6%) and less likely to be white (65% vs. 72%). Students in this group were more often in-state residents (48% vs. 42%) and came from lower median family income neighborhoods ($96,236 vs. $101,477).

By contrast, the 26.2% of students whose ISA payments exceeded the scheduled loan benchmark tended to have stronger academic preparation and more favorable labor market outcomes. This group also had higher average major-specific salaries ($64,903 vs. $59,218). These differences align with the income-contingent design of the ISA: participants who experience stronger financial returns contribute more over time.

When accounting for deferred loan payments (Table 5), the margin narrows: 58.2% of students paid less under ISAs, while 41.8% paid more. Nonetheless, the same core patterns persist. Students paying more under the ISA had higher GPAs, stronger SAT scores, higher major-specific average salaries, and higher real starting salaries ($62,937 vs. $55,352).

The distribution of repayment outcomes by race and ethnicity offers no evidence that the ISA program systematically disadvantages minority students. Black students are equally

represented among those who repaid more or less under both loan comparison benchmarks, and these differences are statistically insignificant. Hispanic students, by contrast, appear to disproportionately benefit from the ISA structure: they comprise 12% of participants who paid less under the scheduled benchmark, compared to only 6% of those who paid more. A similar pattern holds under the deferment-adjusted comparison (11% vs. 7%). No significant differences are observed for Asian students. These patterns suggest that the income-contingent design of ISAs may provide greater financial protection to students from historically underrepresented groups, who are over-represented among those with lower earnings early in their careers. In contrast, White students are more prevalent among those who repaid more under ISAs, consistent with their higher average academic performance and labor market outcomes in the sample.

These results demonstrate that repayment outcomes under the ISA are systematically associated with academic ability and labor market success. Students with weaker earnings profiles and lower academic metrics generally paid less under the ISA, while those with stronger profiles repaid more. This redistribution of repayment burden reflects the intended structure of the ISA program.

### 5.3 ISA over PLUS Regression Analysis

Table 6 presents estimates of how the financial cost of the ISA relative to the hypothetical PLUS loan depends on contract terms and individual student characteristics. The dependent variable in all columns is the difference in cumulative payments between the actual ISA contract and the hypothetical PLUS loan, where positive values indicate that the student has paid more to the ISA than would have been expected under the hypothetical PLUS loan. Columns (1) and (2) show results based on the PLUS loan payments as scheduled while columns (3) and (4) incorporate observed ISA deferment periods into the hypothetical PLUS loan payments.

Higher income share rates are positively and significantly associated with greater ISA over PLUS payments, implying that ISA contracts with lower income shares yield more favorable outcomes for ISA participants, controlling for the average salary of the student's

major. Conversely, greater ISA funding amounts are correlated with lower ISA over PLUS payments, likely the result of negative selection on unobserved factors.

Several student characteristics are associated with ISA over PLUS payments. Female students appear to pay significantly more when deferments are considered (columns 3 and 4). There is some evidence that Hispanic students make lower ISA over PLUS payments than White students, though there is no significant evidence of differences for Black or Asian students. Students from majors with higher average earnings make higher ISA payments holding the income share rate constant, while greater within-major salary dispersion is associated with lower ISA payments, likely reflecting increased income risk under income-contingent repayment.

Columns (2) and (4) include controls for real starting salary and an indicator for graduating from the university. This decreases the number of observation, but the results are broadly consistent. A higher starting salary, even after controlling for the average salary of the student's major, is associated with higher ISA payments relative to the PLUS loan counterfactual.

An issue with the interpretation of Table 6 is that it presents averages, in dollars, without regard to the funding amount. Table 7 presents similar estimates where the dependent variable is the ISA over PLUS divided by the funding amount. This helps with the interpretation by putting all the estimates in terms of the funding amount. Consider the estimates in column (2) where the mean of the dependent variable implies that on average students would have paid 11 percent of their funding amount more with a PLUS loan than with their ISA. A 1 point increase in the income share rate, holding the student's salary constant, is associated with a 12 percent of the funding amount increase in ISA payment, effectively wiping out the entire ISA financial advantage over the PLUS loan.

For both Tables 6 and 7, the observations are ISA contracts, so standard errors are clustered by student. Students who have paid off their entire ISA contract by paying the payment cap soon after graduation are excluded from the regressions. All specifications also control for the student's grade level (senior, junior, or sophomore) or time to graduation that was used administratively to set the ISA contract terms.

A notable design feature of the ISA program is the use of major-specific contract terms, in which the income share rate and term length vary by field of study. This approach reflects an effort to tailor repayment expectations to differences in anticipated labor market outcomes. For instance, students in computer science (where the major average salary is about $100,000) were offered a relatively low income share rate and term length, consistent with the high average salaries in that field. By contrast, history majors were assigned higher income share rates and longer term lengths to accommodate lower expected earnings. While this differentiated pricing strategy was intended to align payments with earning potential, it also raised equity concerns. Critics argued that it might lead students in lower-paying fields to face heavier ISA payment burdens.

Figure 5 plots ISA over PLUS as scheduled (in Panel A) and with deferments (in Panel B) by major average starting salary. The size of each point represents the number of contracts entered into by students in that major. The colors represent the eight contract groups where majors that were assigned to different groups over time are assigned the color of the group where they were assigned for the longest period. Panel A shows a slight positive overall slope which indicates that students in higher-earning majors have so far made larger ISA payments, relative to the PLUS loan counterfactual, than students in lower-earning majors.

Panel B of Figure 5 indicates that cumulative payment amounts were relatively consistent across major groups when benchmarked against the PLUS loan with deferments. This suggests that missing payments (deferments and defaults) are more common for students in lower-earning majors. Overall, this figure implies that the program design fairly effectively equalized payments across majors by contract group, resulting in only a slight systematic disadvantage for students in higher-paying majors.

## 6 Conclusion

This paper provides new evidence on the realized repayment outcomes of a large-scale university Income Share Agreement (ISA) program. The ISA payment records are compared to simulated repayment obligations under a hypothetical Parent PLUS loan to quantify how

much students repaid under the ISA structure relative to a traditional student loan. The findings suggest that low-earning ISA participants received meaningful financial relief. At the same time, students with higher post-graduation incomes—often those with stronger academic profiles and higher expected earnings—paid more under the ISA than they would have under a traditional student loan.

These findings underscore the income-contingent and redistributive properties of ISA contracts. The Purdue ISA program was designed to shift repayment burdens toward those who experienced stronger labor market outcomes, while reducing the payment obligations for lower-earning participants. Repayment amounts varied systematically with ex ante academic and demographic characteristics as well as ex post income realizations. There is also evidence that students graduating in majors with higher earnings variance, who likely faced greater income risk, made lower ISA payments relative to the PLUS loan counterfactual than those with less income risk. The ISA required lower payments during periods of lower earnings offering greater liquidity when it was most needed.

From a policy perspective, these findings speak to ongoing debates around alternative financing models in higher education. First, the data offer little support for the view that ISAs are inherently predatory. While some students paid more under ISA contracts, these higher payments were concentrated among those with the highest earnings, individuals for whom traditional loan obligations would have been most affordable. In contrast, students at the lower end of the earnings distribution were insulated from large repayment burdens and often paid substantially less than they would have under a fixed loan. There is no evidence that minority students paid more under an ISA contract. For the institution, an important benefit of the ISA program is an increase in the graduation rate for ISA participants (Mumford, 2022). Focusing only on students who have exhausted their direct federal borrowing targets the ISA towards students who are most as risk of dropping out. Even a small increase in completion is very valuable to higher education institutions, given the finding that other common institutional practices aimed at helping students graduate appear to have little impact on completion rates (Denning et al., 2022).

The findings in this paper suggest that ISA contracts can be designed to balance financial

sustainability with equitable treatment of participants. This ISA program's use of differentiated pricing based on projected earnings of the student's major, combined with an income floor and a payment caps, limited adverse selection. It is not yet clear if the ISA program will break even, but the current findings suggest that the program has a financial return that is on track to be roughly similar to that of a PLUS loan. If the federal regulatory uncertainty were resolved, this evidence suggests that an income share agreement is a very inexpensive (perhaps even money making) use of university funds to provide students with the financial ability to graduate.

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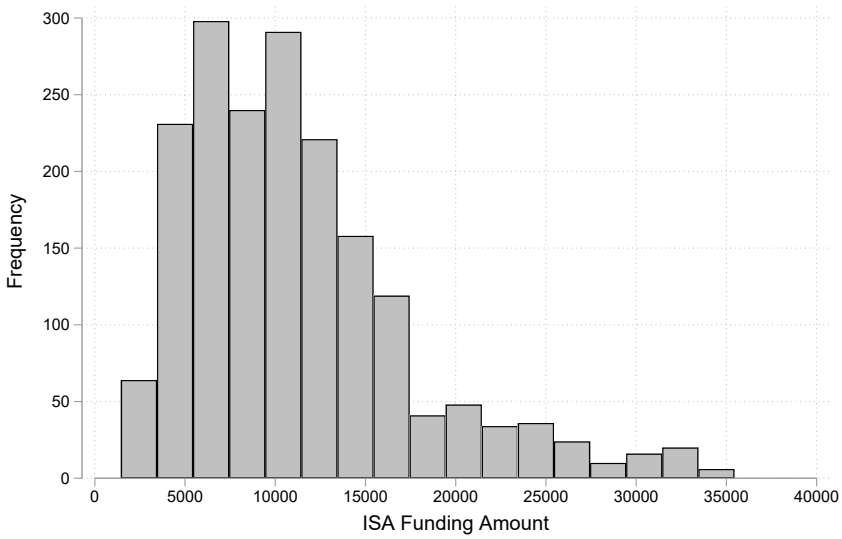
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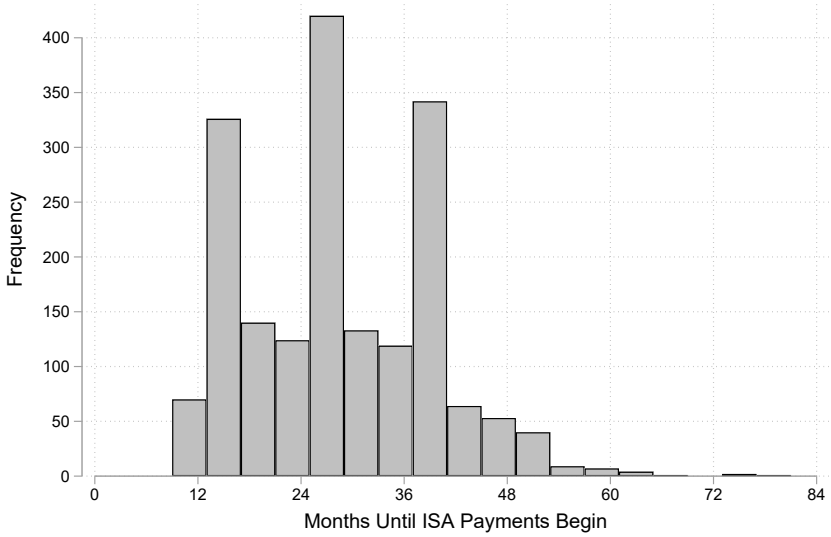
# Figures and Tables

Figure 1: Income Share Agreement Characteristics

A. ISA Contract Funding Amount

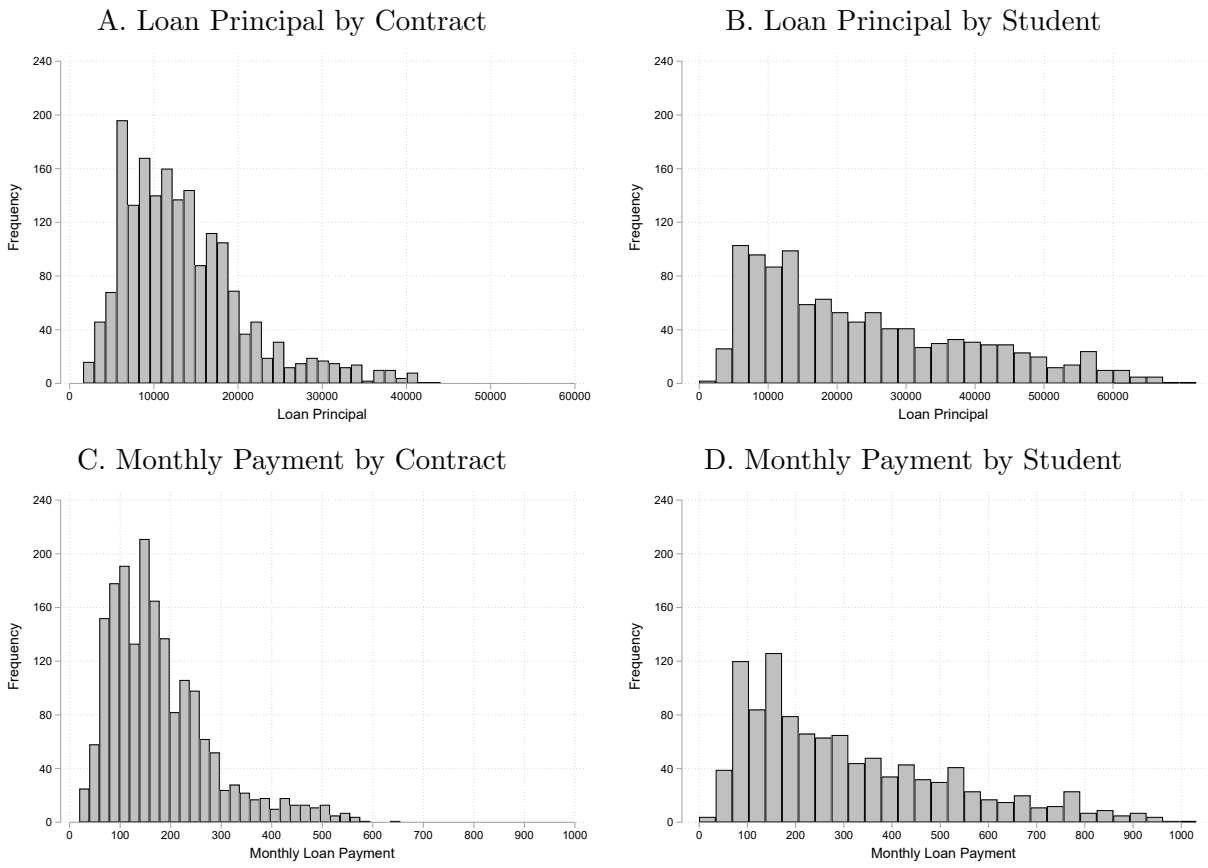



B. Months from Origination to ISA Payments Beginning



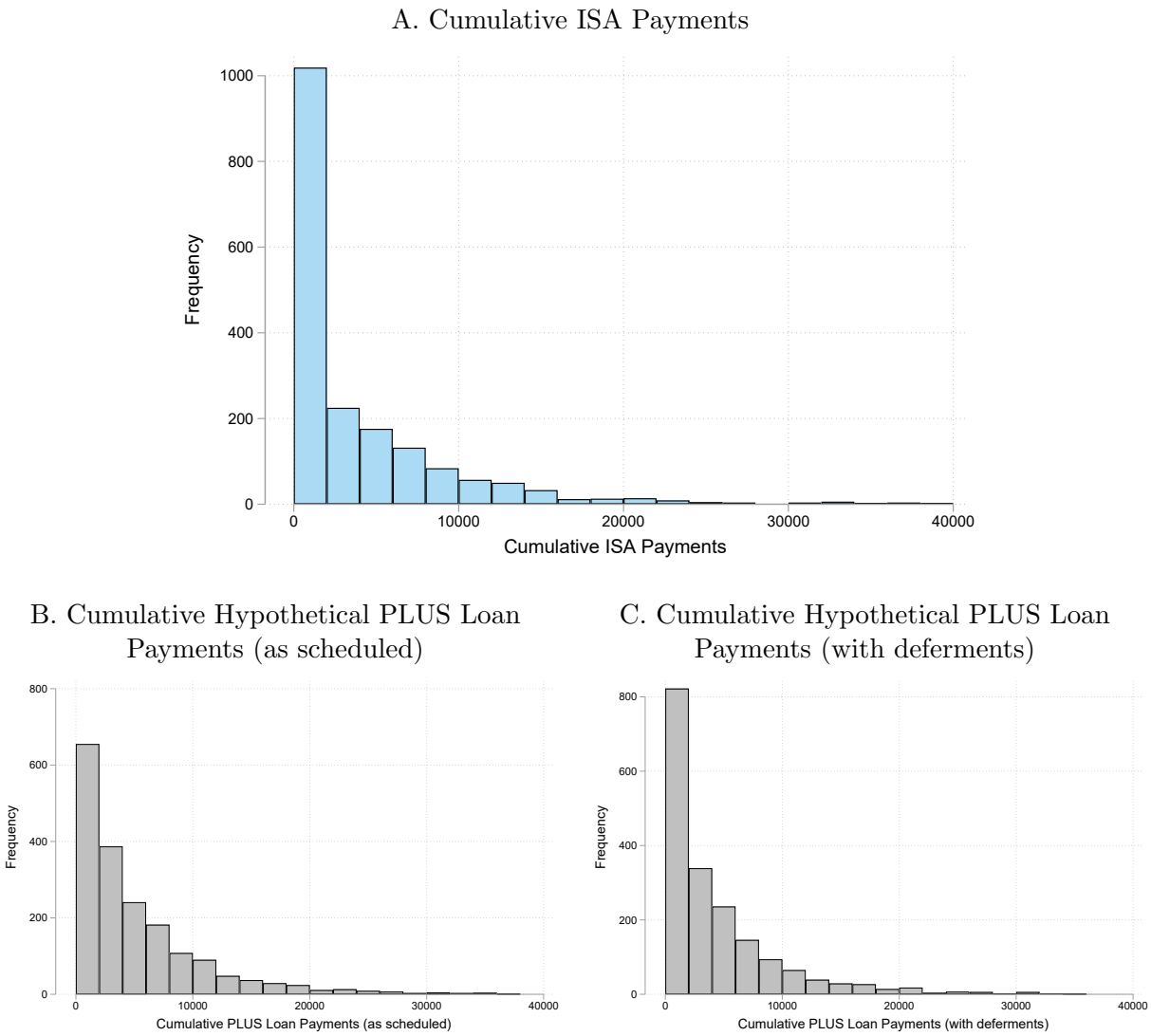

The distribution of ISA funding amount by contract is reported in Panel A. The distribution of months from the ISA origination until ISA payments begin are reported in Panel B.

Figure 2: Hypothetical PLUS Loan Characteristics



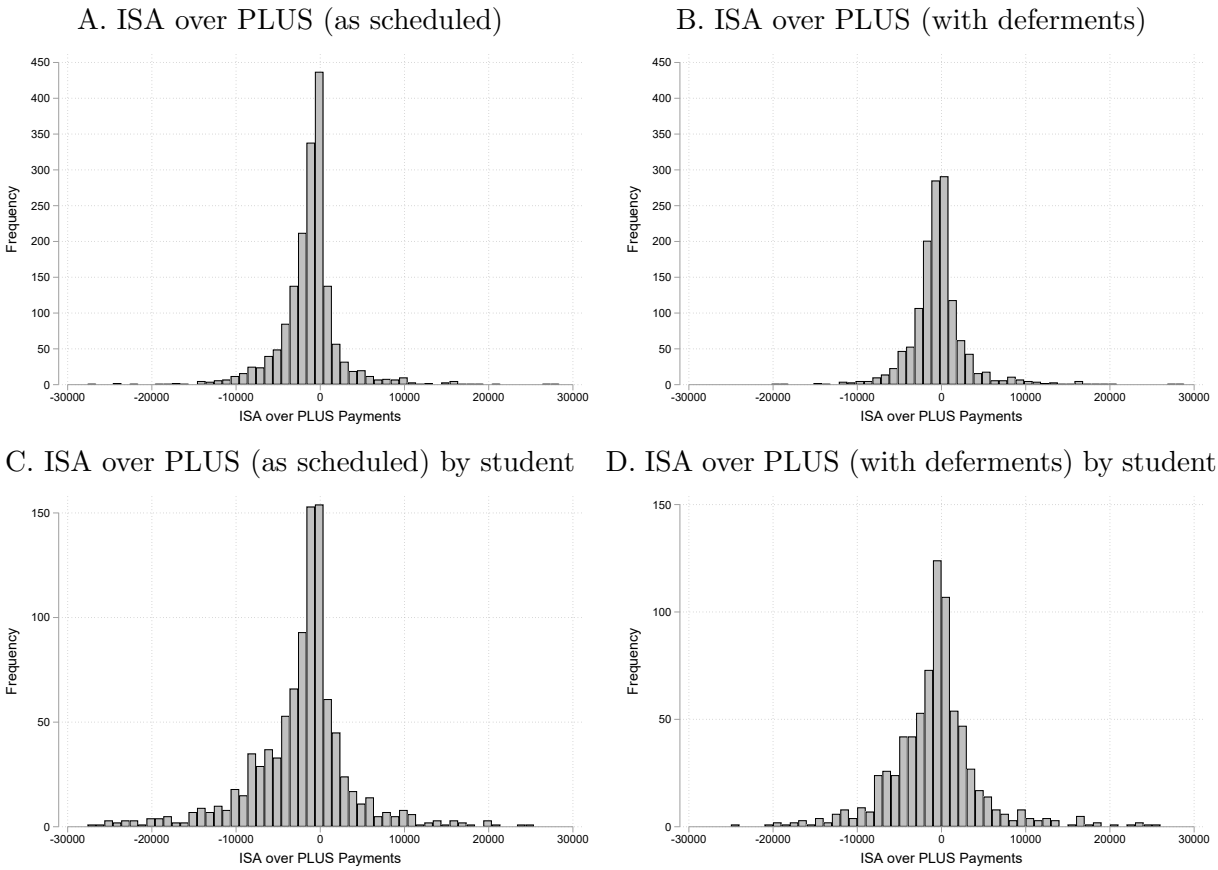

The distribution of hypothetical PLUS loan principal at the time repayment begins is reported by contract in Panel A and by Student in Panel B. The hypothetical PLUS loan monthly payment amount, as given by Equation (1), is reported by contract in Panel C and by student in Panel D.

Figure 3: Cumulative ISA Payments and Hypothetical PLUS Loan Payments, 2024



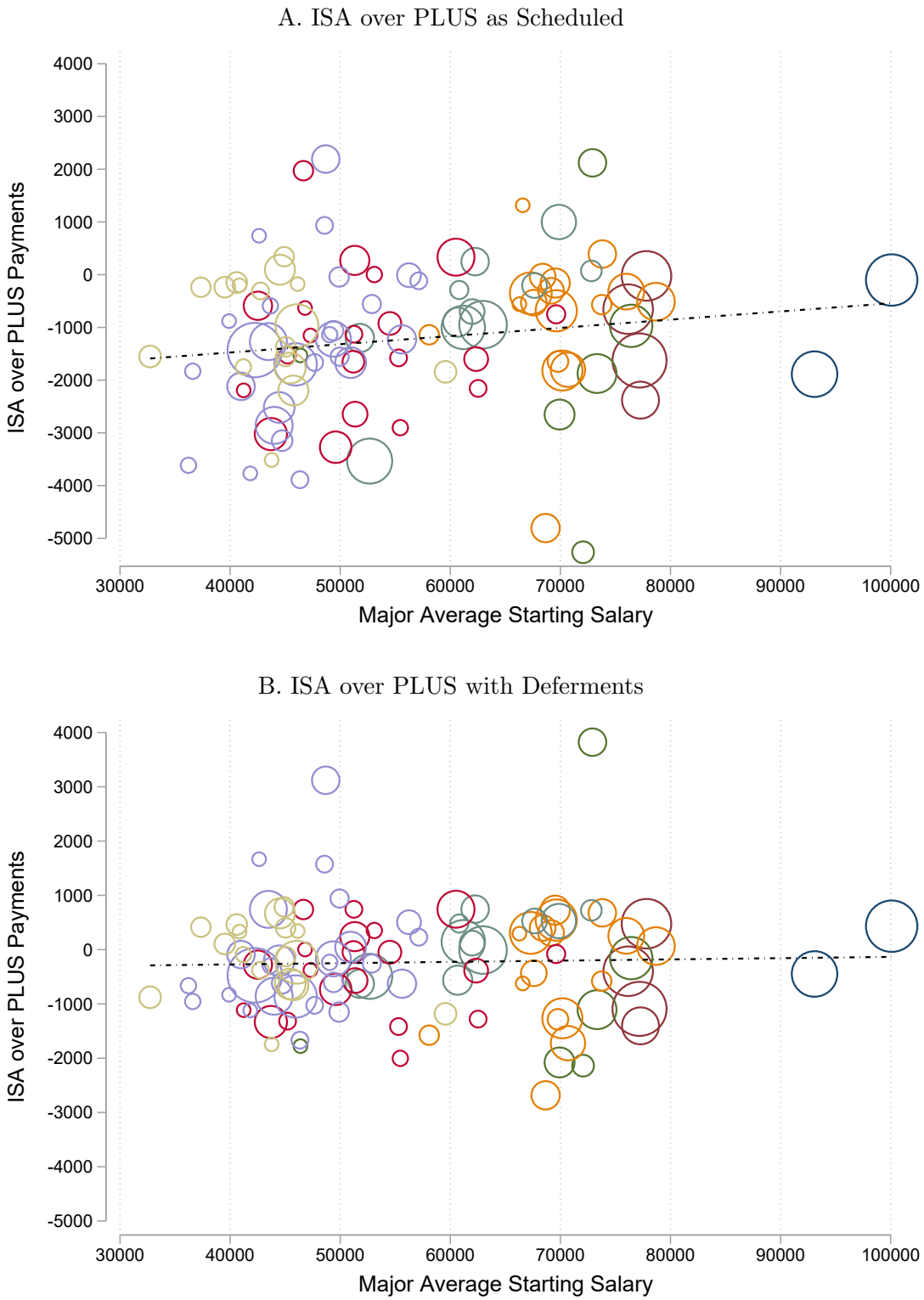

Panel A shows the distribution of cumulative ISA payments received as of 2024. Panel B shows the cumulative payments for the hypothetical PLUS loan where all monthly payment are made as scheduled as given by Equation (1). Panel C presents an alternative version of the cumulative payments for the hypothetical PLUS loan with the same monthly payments as given by Equation 1 but where the assumption is that no PLUS loan payment is made in any months without an ISA payment.

Figure 4: Cumulative ISA Payments minus PLUS Loan Payments




ISA over PLUS is the realized cumulative ISA payments through 2024 minus the cumulative hypothetical PLUS loan payments as given by Equation (1). The distribution of ISA over PLUS as scheduled is reported by contract in Panel A and by student in Panel C. The other two panels present the distribution of ISA over PLUS where the hypothetical PLUS loan payments are set to zero in any month where no ISA payment is made. Panel B presents ISA over PLUS with deferments by contract and Panel D presents ISA over PLUS with deferments by student. In all four panels, observations are excluded if the cumulative hypothetical PLUS loan payments is zero.

Figure 5: ISA over PLUS Loan Payments as Scheduled by Major Average Salary




Average realized cumulative ISA payments minus the cumulative hypothetical PLUS loan payments for each major are plotted by major average salary. Panel A uses the "as scheduled" definition for the hypothetical PLUS loan payments. Panel B uses the "with deferments" definition for the hypothetical PLUS loan payments. The size of each marker represents the number of contracts. The color of each marker represents the ISA contract group.

Table 1: Descriptive Statistics

| | Mean | SD | Min | Max | Obs |
|---|---|---|---|---|---|
| ISA Rate per 10,000 | 3.70 | 0.67 | 1.73 | 5.42 | 1,857 |
| Term Length | 102 | 9 | 88 | 116 | 1,857 |
| Payment Cap | 2.40 | 0.09 | 2.31 | 2.50 | 1,857 |
| Funding Amount | 11,246 | 6,219 | 1,446 | 34,000 | 1,857 |
| | | | | | |
| Female | 0.519 | 0.500 | 0 | 1 | 1,857 |
| White | 0.668 | 0.471 | 0 | 1 | 1,857 |
| Black | 0.088 | 0.284 | 0 | 1 | 1,857 |
| Hispanic | 0.107 | 0.309 | 0 | 1 | 1,857 |
| Asian | 0.066 | 0.248 | 0 | 1 | 1,857 |
| In-State Student | 0.462 | 0.499 | 0 | 1 | 1,857 |
| Home Urban | 0.116 | 0.321 | 0 | 1 | 1,829 |
| Home Suburban | 0.712 | 0.453 | 0 | 1 | 1,829 |
| Home Rural | 0.172 | 0.377 | 0 | 1 | 1,829 |
| First-Generation Student | 0.269 | 0.444 | 0 | 1 | 1,857 |
| Mother College Grad | 0.432 | 0.496 | 0 | 1 | 1,114 |
| Father College Grad | 0.341 | 0.474 | 0 | 1 | 1,102 |
| Non-Native English | 0.034 | 0.182 | 0 | 1 | 1,817 |
| Transfer Student | 0.093 | 0.291 | 0 | 1 | 1,817 |
| | | | | | |
| SAT Math | 621 | 85 | 360 | 800 | 1,771 |
| SAT Verbal | 619 | 88 | 390 | 800 | 1,770 |
| Cumulative GPA | 3.07 | 0.45 | 0.50 | 4.00 | 1,857 |
| First-Year GPA | 3.08 | 0.52 | 0.50 | 4.00 | 1,857 |
| | | | | | |
| Median Family Income | 97,708 | 38,789 | 12,228 | 244,602 | 1,806 |
| Parent Income | 125,902 | 71,153 | 5,430 | 377,650 | 1,072 |
| Major Average Salary | 60,802 | 16,324 | 30,000 | 100,833 | 1,856 |
| Major StDev Salary | 15,811 | 5,446 | 3,308 | 33,802 | 1,854 |
| Real Starting Salary | 58,949 | 20,777 | 17,695 | 135,208 | 1,540 |

The sample consists of ISA contracts entered into by students between 2017 and 2022. SAT scores, home zip code, and real starting salary are not observed for all students. Survey responses to questions about parent education and parent income are observed for the 60% of student who responded to a survey as described in Mumford (2022).

Table 2: ISA and Hypothetical PLUS Loan Payments by Origination Cohort

| | Origination Cohort | | | | | | |
|---|---|---|---|---|---|---|---|
| | 2017 | 2018 | 2019 | 2020 | 2021 | 2022 | Total |
| Participants | 153 | 313 | 326 | 415 | 401 | 249 | 1,857 |
| ISA Funding | 2,097,114 | 3,806,154 | 3,903,241 | 4,402,518 | 3,804,774 | 2,870,455 | 20,884,256 |
| | | | | | | | |
| ISA Payments 2022 | 1,023,612 | 992,941 | 592,381 | 324,602 | 69,337 | 484 | 3,003,356 |
| Scheduled Loan Payments 2022 | 1,294,509 | 1,563,944 | 968,728 | 520,196 | 111,916 | 4,377 | 4,463,670 |
| Loan with Deferments 2022 | 1,018,220 | 924,818 | 517,786 | 249,039 | 33,524 | | 2,743,388 |
| | | | | | | | |
| ISA Payments 2024 | 1,775,910 | 2,041,209 | 1,576,063 | 1,313,935 | 624,588 | 174,072 | 7,505,777 |
| Scheduled Loan Payments 2024 | 1,873,324 | 2,624,651 | 2,098,929 | 1,777,545 | 885,147 | 349,596 | 9,609,192 |
| Loan with Deferments 2024 | 1,770,173 | 2,170,112 | 1,731,260 | 1,375,063 | 601,588 | 224,131 | 7,872,328 |

ISA funding, payments, and two versions of the hypothetical PLUS loan payments are reported for each origination cohort in both 2022 and 2024. ISA Payments are the actual payments received. Scheduled Loan Payments is the total amount calculated using Equation 1. Loan with Deferments sets the hypothetical loan payment to zero if the participant does not make an ISA payment.

Table 3: ISA and Hypothetical PLUS Loan Payments by Graduation Cohort

| | Graduation Cohort | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|
| | 2017 | 2018 | 2019 | 2020 | 2021 | 2022 | 2023 | 2024 | Total |
| Participants | 46 | 147 | 183 | 318 | 346 | 345 | 201 | 73 | 1,659 |
| ISA Funding | 676,500 | 1,912,420 | 2,477,315 | 3,753,020 | 3,857,273 | 3,592,649 | 2,149,934 | 675,919 | 19,095,030 |
| | | | | | | | | | |
| ISA Payments 2022 | 416,617 | 839,559 | 709,121 | 713,590 | 242,668 | 12,184 | 331 | | 2,934,071 |
| Scheduled Loan Payments 2022 | 515,370 | 1,127,676 | 1,099,131 | 1,081,293 | 343,363 | 26,477 | | | 4,193,309 |
| Loan with Deferments 2022 | 423,649 | 792,756 | 746,619 | 590,300 | 127,433 | 6,370 | | | 2,687,127 |
| | | | | | | | | | |
| ISA Payments 2024 | 633,911 | 1,530,266 | 1,402,351 | 1,730,932 | 1,362,627 | 515,151 | 111,833 | 10,891 | 7,297,962 |
| Scheduled Loan Payments 2024 | 648,639 | 1,652,678 | 1,809,682 | 2,258,963 | 1,636,428 | 945,366 | 184,846 | 1,578 | 9,138,180 |
| Loan with Deferments 2024 | 650,470 | 1,446,025 | 1,592,957 | 1,890,296 | 1,286,527 | 635,205 | 87,783 | | 7,589,262 |

ISA funding, payments, and two versions of the hypothetical PLUS loan payments are reported for each graduation cohort for those participants who graduated. ISA Payments are the actual payments received through 2024. Scheduled Loan Payments is the total amount calculated using Equation 1 through 2024. Loan with Deferments sets the hypothetical loan payment to zero if the participant does not make an ISA payment.

Table 4: ISA Payments Below PLUS and Above PLUS as Scheduled

| | Below | Above | Test |
|---|---|---|---|
| N | 1,298 (73.8%) | 461 (26.2%) | |
| ISA over PLUS | -2,539 | 2,573 | <0.001 |
| ISA Rate per 10,000 | 3.71 | 3.65 | 0.080 |
| Term Length | 103 | 101 | <0.001 |
| Payment Cap | 2.39 | 2.42 | <0.001 |
| ISA Funding | 11,188 | 11,798 | 0.074 |
| | | | |
| Female | 0.53 | 0.50 | 0.239 |
| White | 0.65 | 0.72 | 0.012 |
| Black | 0.09 | 0.09 | 0.978 |
| Hispanic | 0.12 | 0.06 | <0.001 |
| Asian | 0.06 | 0.07 | 0.805 |
| In-State Student | 0.48 | 0.42 | 0.027 |
| Home Urban | 0.11 | 0.11 | 0.842 |
| Home Suburban | 0.71 | 0.73 | 0.314 |
| Home Rural | 0.18 | 0.16 | 0.174 |
| First-Generation Student | 0.27 | 0.27 | 0.999 |
| Mother College Grad | 0.45 | 0.39 | 0.106 |
| Father College Grad | 0.35 | 0.32 | 0.333 |
| Non-Native English | 0.04 | 0.02 | 0.059 |
| Transfer Student | 0.10 | 0.07 | 0.024 |
| | | | |
| SAT Math | 618 | 627 | 0.056 |
| SAT Verbal | 617 | 622 | 0.245 |
| Cumulative GPA | 3.04 | 3.15 | <0.001 |
| First-Year GPA | 3.05 | 3.13 | 0.006 |
| | | | |
| Median Family Income | 96,236 | 101,477 | 0.013 |
| Parent Income | 123,506 | 129,893 | 0.195 |
| Major Average Salary | 59,218 | 64,903 | <0.001 |
| Major StDev Salary | 15,779 | 15,687 | 0.752 |
| Real Starting Salary | 55,568 | 67,228 | <0.001 |

The first column (Below) reports mean values for ISA participants who have made ISA payments that are less than hypothetical PLUS loan payments as scheduled as of 2024. The second column (Above) reports the mean values for ISA participants who have ISA payments that are more than then the hypothetical PLUS loan payments as scheduled as of 2024.

Table 5: ISA Payments Below PLUS and Above PLUS with Deferments

| | Below | Above | Test |
|---|---|---|---|
| N | 838 (58.3%) | 599 (41.7%) | |
| ISA over PLUS | -2,120 | 2,309 | <0.001 |
| ISA Rate per 10,000 | 3.62 | 3.67 | 0.115 |
| Term Length | 102 | 101 | 0.217 |
| Payment Cap | 2.41 | 2.41 | 0.975 |
| ISA Funding | 11,730 | 11,277 | 0.192 |
| | | | |
| Female | 0.48 | 0.54 | 0.036 |
| White | 0.67 | 0.74 | 0.003 |
| Black | 0.08 | 0.06 | 0.206 |
| Hispanic | 0.11 | 0.07 | 0.017 |
| Asian | 0.07 | 0.06 | 0.608 |
| In-State Student | 0.47 | 0.45 | 0.414 |
| Home Urban | 0.09 | 0.10 | 0.396 |
| Home Suburban | 0.72 | 0.72 | 0.799 |
| Home Rural | 0.19 | 0.17 | 0.351 |
| First-Generation Student | 0.26 | 0.26 | 0.801 |
| Mother College Grad | 0.45 | 0.40 | 0.125 |
| Father College Grad | 0.32 | 0.37 | 0.180 |
| Non-Native English | 0.04 | 0.02 | 0.225 |
| Transfer Student | 0.10 | 0.07 | 0.017 |
| | | | |
| SAT Math | 620 | 630 | 0.035 |
| SAT Verbal | 615 | 628 | 0.009 |
| Cumulative GPA | 3.02 | 3.18 | <0.001 |
| First-Year GPA | 3.01 | 3.14 | <0.001 |
| | | | |
| Median Family Income | 97,125 | 100,679 | 0.088 |
| Parent Income | 126,089 | 130,625 | 0.352 |
| Major Average Salary | 61,424 | 64,034 | 0.003 |
| Major StDev Salary | 15,755 | 15,690 | 0.823 |
| Real Starting Salary | 55,133 | 63,231 | <0.001 |

The first column (Below) reports the variable averages for ISA participants who have made ISA payments that are less than hypothetical PLUS loan payments with deferments as of 2024. The second column (Above) reports the variable averages for ISA participants who have ISA payments that are more than then the hypothetical PLUS loan payments with deferements as of 2024.

Table 6: Heterogeneity in ISA over PLUS

| | ISA over PLUS Payments | | | |
|---|---|---|---|---|
| | as Scheduled | | with Deferments | |
| | (1) | (2) | (3) | (4) |
| Income Share Rate per 10,000 | 1037.85*** | 1605.83*** | 734.79*** | 1099.08*** |
| | (326.74) | (376.85) | (274.82) | (318.89) |
| Funding Amount (1,000s) | -112.39*** | -102.81*** | -58.03*** | -45.68* |
| | (25.03) | (27.19) | (21.62) | (23.88) |
| Female | 281.65 | 242.29 | 541.27** | 617.45** |
| | (248.31) | (285.30) | (219.99) | (257.52) |
| Black | 231.41 | -89.45 | -5.50 | -126.04 |
| | (352.63) | (380.06) | (276.70) | (302.04) |
| Hispanic | -468.50 | -589.28 | -480.43* | -743.74** |
| | (309.20) | (383.28) | (250.42) | (317.31) |
| Asian | -151.43 | -328.22 | -289.51 | -282.80 |
| | (480.27) | (565.14) | (444.29) | (497.72) |
| First-Generation Student | -45.74 | -35.58 | -194.63 | -97.84 |
| | (227.67) | (252.98) | (181.60) | (199.07) |
| Cumulative GPA | 22.29 | 163.67 | 483.71*** | 560.53** |
| | (207.55) | (272.16) | (165.86) | (224.02) |
| Major Average Salary (1,000s) | 72.61*** | 64.52*** | 39.18*** | 32.74*** |
| | (11.70) | (14.12) | (9.86) | (12.08) |
| Major StDev Salary (1,000s) | -70.61*** | -73.59*** | -15.88 | -29.68 |
| | (20.95) | (25.20) | (16.56) | (20.44) |
| Real Starting Salary (1,000s) | | 34.05*** | | 29.50*** |
| | | (7.11) | | (5.63) |
| Graduated | | 293.28 | | 33.99 |
| | | (422.36) | | (250.28) |
| Observations | 1,833 | 1,520 | 1,833 | 1,520 |
| $R^2$ | 0.10 | 0.12 | 0.06 | 0.10 |
| Dependent Variable Mean | -1272.93 | -1214.47 | -337.86 | -262.74 |
| Origination Year Fixed Effects | X | X | X | X |
| Level FE (Senior, Junior, Sophomore) | X | X | X | X |

The dependent variable is the ISA cumulative payments minus the hypothetical PLUS loan cumulative payments. For columns (1) and (2), the hypothetical PLUS loan payments are as scheduled. Columns (3) and (4) use the PLUS loan payment version with deferments. Students who paid off their ISA early are excluded from the regression. Columns (2) and (4) use only the subset of contracts where the student has graduated and has a reported starting salary. Standard errors are clustered by student. * $p < 0.10$, ** $p < 0.05$, *** $p < 0.01$.

Table 7: Heterogeneity in ISA over PLUS divided by Funding Amount

| | ISA over PLUS / Funding Amount | | | |
|---|---|---|---|---|
| | as Scheduled | | with Deferments | |
| | (1) | (2) | (3) | (4) |
| Income Share Rate per 10,000 | 0.081*** | 0.118*** | 0.061** | 0.082*** |
| | (0.028) | (0.033) | (0.024) | (0.028) |
| Female | 0.011 | 0.008 | 0.044** | 0.051** |
| | (0.020) | (0.023) | (0.017) | (0.020) |
| Black | 0.015 | -0.005 | 0.002 | -0.007 |
| | (0.031) | (0.034) | (0.023) | (0.026) |
| Hispanic | -0.046* | -0.044 | -0.043** | -0.061** |
| | (0.026) | (0.030) | (0.020) | (0.025) |
| Asian | -0.023 | -0.038 | -0.023 | -0.027 |
| | (0.036) | (0.043) | (0.031) | (0.035) |
| First-Generation Student | 0.005 | 0.004 | -0.014 | -0.007 |
| | (0.019) | (0.020) | (0.015) | (0.016) |
| Cumulative GPA | 0.016 | 0.024 | 0.052*** | 0.057*** |
| | (0.017) | (0.021) | (0.013) | (0.017) |
| Major Average Salary (1,000s) | 0.006*** | 0.005*** | 0.003*** | 0.003*** |
| | (0.001) | (0.001) | (0.001) | (0.001) |
| Major StDev Salary (1,000s) | -0.006*** | -0.006*** | -0.001 | -0.002 |
| | (0.002) | (0.002) | (0.001) | (0.002) |
| Real Starting Salary (1,000s) | | 0.002*** | | 0.002*** |
| | | (0.001) | | (0.000) |
| Graduated | | 0.053 | | 0.021 |
| | | (0.037) | | (0.024) |
| Observations | 1,833 | 1,520 | 1,833 | 1,520 |
| $R^2$ | 0.079 | 0.109 | 0.060 | 0.113 |
| Dependent Variable Mean | -0.113 | -0.107 | -0.024 | -0.017 |
| Origination Year Fixed Effects | X | X | X | X |
| Level FE (Senior, Junior, Sophomore) | X | X | X | X |

The dependent variable is the quantity ISA cumulative payments minus the hypothetical PLUS loan cumulative payments divided by the ISA funding amount. For columns (1) and (2), the hypothetical PLUS loan payments are as scheduled. Columns (3) and (4) use the PLUS loan payment version with deferments. Students who paid off their ISA early are excluded from the regression. Columns (2) and (4) use only the subset of contracts where the student has graduated and has a reported starting salary. Standard errors are clustered by student. * $p < 0.10$, ** $p < 0.05$, *** $p < 0.01$.