PENN WHARTON
UNIVERSITY *of* PENNSYLVANIA

Budget Model

Income-Driven Repayment Plans: Modeling Take-up Rates

Summary: Federal student loan borrowers can currently choose between several repayment options. When estimating program costs, government agencies have considered several different behavioral repayment models. We find that the most financially savvy rule – where borrowers select the repayment option that minimizes the present value of their future repayments – best explains current borrower choices among repayment options that exist prior to the new Income-Driven Repayment Plan (IDR) "SAVE" plan to be implemented in July 2024.

Key Points

- In a previous analysis, PWBM considered three different optimizing goals for student borrowers selecting among repayment options: (i) borrowers choose the repayment option that minimizes the present value of future payments ("financially savvy"); (ii) borrowers minimize monthly payments ("liquidity constrained"); and, (iii) borrowers minimize total payments ("behavioral economics"). Each optimizing goal has been used by different government agencies to estimate the cost of introducing a new repayment option.

- Knowing the best rule is key to estimating the cost of President Biden's new IDR (the "SAVE" plan) that will be implemented in July 2024.

- We find that goal type (i) – students being financially savvy – best fits the current choices being made by students across pre-SAVE repayment options. In a companion brief, we estimate the cost of SAVE.

Introduction

According to the Department of Education (ED) 2023 Q2 data, the total amount of federally managed direct loans that are in repayment, deferment, and forbearance is about $1.2 trillion.[1]

Federal student loan borrowers can currently choose between several repayment options for which they are qualified. These options include fixed-length plans where repayments do not depend on a borrower's income after college. The options also include various Income-Driven Repayment (IDR) plans where repayment is related to a borrower's income after college. The loan volume being repaid in any existing IDR plan – which includes

Income-Contingent Repayment (ICR), Income-Based Repayment (IBR), Pay As You Earn (PAYE), and Revised Pay As You Earn (REPAYE) – stands at $512.5 billion. The current IDR take-up rate of IDR by total loan volume is about 42 percent, not including Federal Family Education Loan (FFEL) loan consolidation.[2]

Modeling Borrower Repayment Behavior

Modeling how students choose among repayment options ultimately impacts the cost of introducing a new repayment option. Government agencies have recently considered several different borrower behavioral repayment models:

(i) borrowers choose the repayment option that minimizes the present value of future payments ("financially savvy"), used by Department of Education (2023);

(ii) borrowers minimize monthly payments ("liquidity constrained"), used by GAO (2022); and,

(iii) borrowers minimize total payments ("behavioral economics"), used by GAO (2022).

We considered all three options in a previous brief to demonstrate the range of cost estimates produced across them.

The current brief addresses the following question: Which optimizing rule is most consistent with the current IDR take-up?

While we presented option (iii) in our previous analysis because it has been used by previous cost estimators, we note that this model goal is not consistent with the actual data among existing IDR plans. For brevity, the remainder of this brief focuses on the choice between model (i) and (ii).

The Most Accurate Prediction of Aggregate IDR Take-up

Table 1 reports the predicted current *aggregate IDR* take-up rate by model versus the actual aggregate IDR take-up rate of 42 percent by loan volume. The aggregate IDR take-up rate includes all loan volume being repaid in any of the four existing IDR plans discussed above. Notice that model (i), where borrowers minimize the present value of all future payments, produces a 44 percent take-up rate by loan volume, very close to the actual take-up rate of 42 percent. In contrast, model (ii) predicts a counterfactual large take-up rate of 75 percent.

Table 1. Actual current aggregate IDR take-up rate versus estimated current aggregate IDR take-up rate

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	Take-up rate by loan volume (%)
Actual	42
Estimated	
Rule i) Minimizing net present value of all future payments	44
Rule ii) Minimizing starting periodical payment	75

Notes: Actual take–up rate is calculated from ED 2023 Q2 data.

Of course, there may still be some borrowers who are not fully optimizing, resulting in a slightly lower take-up rate than model (i). However, the strong performance of model (i) suggests that many borrowers are making forward-looking financially savvy repayment decisions when they choose whether to enroll in an IDR plan.

Plan Level Differences in Predictions

For transparency, Table 2 provides more detail by actual IDR plan type.[3] As shown here, model (i) underpredicts the take-up of REPAYE and ICR relative to the data. Model (i) also overpredicts the take-up of PAYE and IBR. In our calculation, the PAYE and the new IBR plan are the two most favored options, as these two plans require the smallest mandatory share of discretionary income (10 percent) as repayment. These two plans also require the shortest amount of time required before balance forgiveness (20 years for both undergraduate and graduate students).

Table 2. Actual current IDR take-up rate v.s. Estimated current IDR take-up rate by plan options

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	Take-up rate by loan volume			
	PAYE and IBR (%)	**REPAYE (%)**	**ICR (%)**	**Total (%)**
Actual	23	16	3	**42**
Estimated				
Rule i) Minimizing net present value of all future payments	44	0	0	**44**
Rule ii) Minimizing starting periodical payment	75	0	0	**75**

Notes: Actual take–up rate is calculated from ED 2023 Q2 data.

The reason for plan-level differences between actual data and predicted take-up rates is that each of the four IDR plans varies in a range of characteristics that are not fully captured in the model (i). These characteristics include: when the plans were introduced, loan eligibility, plan stickiness, interest accrual subsidy strategy, ease of plan sign-up, and, how widely the IDR options are promoted. For example, there have been documented strategic cases where REPAYE was used early in repayment before switching to IBR after exhausting the 50 percent interest-accrual subsidy benefits of REPAYE. Some tax filing strategies, including spouses filing separately, also vary across specific plans.

Aggregate IDR Take-up Rate Matters More for Cost Estimation

For the purpose of estimating total (aggregate) costs associated with a new IDR plan like President Biden's SAVE plan however, the misallocation of existing IDR choices across plans does not have a large effect on the final cost estimate for SAVE. The reason is that even if a current borrower in the data, for example, incorrectly picks REPAYE instead of PAYE, the present value size of the error is typically not very large. Put differently, even if actual plan-level take-up rates appear to be inconsistent with model (i), the quantitative differences in IDR plan choice are small. The more important choice is whether participants have enrolled in *any* IDR plan relative to a fixed-length plan. As shown in Figure 1, that choice appears to be very consistent with model (i).

Appendix: Methodology

Compared to the previous brief, we improved our IDR cost estimating modeling in several ways. While the changes did not materially impact our estimated cost values, updates to methods are a regular part of the estimation process. Most of the updates include merging various data sets together.

We merged the PWBM MicroSimulation (Microsim) with The National Postsecondary Student Aid Study (NPSAS) 2018 data on federal student loan borrowing. Our previous analysis set student borrowers' income growth at a fixed rate per year and kept borrowers' family size fixed from The Beginning Postsecondary Students Longitudinal Study (BPS) 2012/2017 data. However, we now use PWBM's Microsim projection modules that include macroeconomic influence and shocks, historical family formation trends, and the wage premium effect from educational attainment, etc., which provide a more realistic future income and household size projection.

We merged federal student loan data from NPSAS18 to Microsim projection for future cohorts' income and family size evolving. We constructed a college student cohort federal student loan amount sample, indexed by student age, college type (four-year or two-year), dependency status, income group (10 groups in total), and undergraduate or graduate loans. Then, we matched this federal student loan amount sample to the Microsim population to get each borrower's future income trajectory and family size changing from the year 2022 to 2060.

Using each borrower's future income trajectory and family formation information in the future years, we calculated the monthly payment amount under 1) standard payment plan, 2) Income-Contingent Repayment plan (20% of discretionary income,[4] 25 years until forgiveness), 3) Income-Based Repayment plan (10% of discretionary income, 20 years until forgiveness),[5] 4) Pay As You Earn repayment plan (10percent of discretionary income, 20 years until forgiveness), and 5) Revised Pay As You Earn repayment plan (10 percent of discretionary income, 20 years for undergraduate loans until forgiveness, 25 years for graduate loans until forgiveness).

After calculating the future monthly payments for each repayment plan, we compared model (i) the present value of all future monthly payments using Treasury securities discount rates, starting from the year of the loan's disbursement with maturities that match the timing of the cash flows. We then compared with model (ii) the starting monthly payment amount. In implementing optimizing rules (i) and (ii) mentioned above, we assigned a repayment plan choice to each borrower. Finally, we summed up the loan amount, which would have been enrolled in one of the plans divided by the total loan amount, to get the aggregate IDR take-up rate, as well as the specific IDR plan take-up rate results shown in Table 1 and Table 2.

Written by Junlei Chen under the direction of Kent Smetters. Prepared for the website by Mariko Paulson.

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1. The current total federal loan debt outstanding is about $1.64 trillion. This number includes loans disbursed but are not in repayment as some borrowers still are enrolled in-school, in grace period, or in default. ↩

2. In a previous brief, we estimated an IDR take-up rate of around 33 percent in loan volume, because we incorporated FFEL loans (approximately $200 billion, and the program has ended July 1, 2010) into the denominator. The FFEL loans are eligible for newly proposed IDR if consolidated. This assumption also appeared be in line with administration assumptions at the time. ↩

3. PAYE and IBR are combined in Table 2 since the key characteristics of these two plans are very similar. See Appendix for payment calculation details for these plans. ↩

4. Discretionary income = AGI – 150% x Federal Poverty Guideline (FPG). The FPG is dependent on family size. ↵

5. There also exists another IBR plan for borrowers before July 1, 2014, which mandates 15 percent of discretionary income and 25 years until forgiveness. Here we mainly focus on the new IBR plan. ↵