

Advisor information presented at November 2, 2021 Negotiated Rulemaking

1. Interest capitalization example

Note: This document was prepared by Dr. Rajeev Darolia, Advisor for economic and higher education policy analysis and data, for the 2021 Affordability and Student Loans Committee Meetings as part of the 2021-22 US Department of Education Negotiated Rulemaking for Higher Education. Please forgive any errors in analyses produced in an expeditious manner.

Terms defined

- Interest capitalization: when unpaid interest is added to the principal amount of a loan
- Some common reasons for unpaid interest
 - Periods of non-payment (e.g., deferment or forbearance, depending on type of loan)
 - Payment being less than amount of interest accrued on an IDR plan
- Some examples of things that can lead to interest capitalization (currently)
 - Following periods of deferment on an unsubsidized loan and/or forbearance on any types of loans
 - Following the grace period on an unsubsidized loan
 - Voluntarily exit from the Revised Pay as You Earn, Pay as You Earn (PAYE) or Income-Based Repayment (IBR) plans
 - Fail to annually update income for some of the income-driven plans
 - If repaying loans under the PAYE or IBR plans and no longer qualify to make payments based on income
- In some plans, unpaid interest is currently subsidized by ED for some time and, for some plans and types of loans, for the entire period of repayment

Example capitalization chart

Treatment of Interest with Deferment/Forbearance	Loan Amount	Capitalized Interest	Outstanding Principal	Monthly Payment	Number of Payments	Total Repaid
Interest is paid	\$30,000	\$0	\$30,000	\$333	120	\$41,767
Interest is capitalized at the end	\$30,000	\$1,800	\$31,800	\$353	120	\$42,365
Interest is capitalized quarterly and at the end	\$30,000	\$1,841	\$31,841	\$354	120	\$42,420

Source: Table 1, Economic Hardship Deferment Request, US Department of Education

Assumptions: \$30,000 unsubsidized loan, 6% interest rate, deferment or forbearance for 12 months at beginning of repayment

Quarterly capitalization and at the end leads to a higher monthly payment and total amount repaid than does just capitalization at the end.

Fictional borrower example (Charlotte), without interest capitalization

Period (Month)	Income	Income Protection	Discretionary Income	Income Assessment	Payment	Principal (beginning of period)	Interest Rate	Interest Due	Principal Paid	Unpaid Interest	Principal (end of period)
	[A]	[B]	[C] = [A] - [B]	[D]	[E] = [C] X [D]	[F] = [K] _{t-1}	[G]	[H] = [F] X [G]	[I] = MAX([E]-[H],0)	[J] = MAX([H]-[E],0)	[K] = [F] - [I]
0											28000
1	2000	1610	390	0.1	39	28000	0.003108	87	0	48	28000
2	2000	1610	390	0.1	39	28000	0.003108	87	0	48	28000
3	2000	1610	390	0.1	39	28000	0.003108	87	0	48	28000
4	2000	1610	390	0.1	39	28000	0.003108	87	0	48	28000
5	2000	1610	390	0.1	39	28000	0.003108	87	0	48	28000
6	2000	1610	390	0.1	39	28000	0.003108	87	0	48	28000
7	2000	1610	390	0.1	39	28000	0.003108	87	0	48	28000
8	2000	1610	390	0.1	39	28000	0.003108	87	0	48	28000
9	2000	1610	390	0.1	39	28000	0.003108	87	0	48	28000
10	2000	1610	390	0.1	39	28000	0.003108	87	0	48	28000
11	2000	1610	390	0.1	39	28000	0.003108	87	0	48	28000
12	2000	1610	390	0.1	39	28000	0.003108	87	0	48	28000

Assumptions: Household size = 1; Interest rate = 3.73%; Income protection = 150% Poverty Line. CAVEATS: Estimates are approximations for illustrative purposes about individual repayment scenarios; Scenarios are in the spirit of IBR plans but does not explicitly model all aspects of current IBR policies.

Fictional borrower example (Charlotte), with monthly interest capitalization

Period (Month)	Income	Income Protection	Discretionary Income	Income Assessment	Payment	Principal (beginning of period)	Interest Rate	Interest Due	Principal Paid	Unpaid Interest	Principal (end of period)
	[A]	[B]	[C] = [A] - [B]	[D]	[E] = [C] X [D]	[F] = [K] _{t-1}	[G]	[H] = [F] X [G]	[I] = MAX([E]-[H],0)	[J] = MAX([H]-[E],0)	[K] = [F] - [I] + [J]
0											28000
1	2000	1610	390	0.1	39	28000	0.003108	87.0	0	48.0	28048
2	2000	1610	390	0.1	39	28048	0.003108	87.2	0	48.2	28096
3	2000	1610	390	0.1	39	28096	0.003108	87.3	0	48.3	28145
4	2000	1610	390	0.1	39	28145	0.003108	87.5	0	48.5	28193
5	2000	1610	390	0.1	39	28193	0.003108	87.6	0	48.6	28242
6	2000	1610	390	0.1	39	28242	0.003108	87.8	0	48.8	28290
7	2000	1610	390	0.1	39	28290	0.003108	87.9	0	48.9	28339
8	2000	1610	390	0.1	39	28339	0.003108	88.1	0	49.1	28388
9	2000	1610	390	0.1	39	28388	0.003108	88.2	0	49.2	28438
10	2000	1610	390	0.1	39	28438	0.003108	88.4	0	49.4	28487
11	2000	1610	390	0.1	39	28487	0.003108	88.5	0	49.5	28537
12	2000	1610	390	0.1	39	28537	0.003108	88.7	0	49.7	28586

Assumptions: Household size = 1; Interest rate = 3.73%; Income protection = 150% Poverty Line. Estimates are approximations for illustrative purposes about individual repayment scenarios; Scenarios are in the spirit of IBR plans but does not explicitly model all aspects of current IBR policies.

Fictional borrower example (Charlotte), with interest capitalization at periods 6 and 12

Period (Month)	Income	Income Protection	Discretionary Income	Income Assessment	Payment	Principal (beginning of period)	Interest Rate	Interest Due	Principal Paid	Unpaid Interest	Principal (end of period)
	[A]	[B]	[C] = [A] - [B]	[D]	[E] = [C] X [D]	[F] = [K] _{t-1}	[G]	[H] = [F] X [G]	[I] = MAX([E]-[H],0)	[J] = MAX([H]-[E],0)	[K]
0											28000
1	2000	1610	390	0.1	39	28000	0.003108	87.0	0	48.0	28000
2	2000	1610	390	0.1	39	28000	0.003108	87.0	0	48.0	28000
3	2000	1610	390	0.1	39	28000	0.003108	87.0	0	48.0	28000
4	2000	1610	390	0.1	39	28000	0.003108	87.0	0	48.0	28000
5	2000	1610	390	0.1	39	28000	0.003108	87.0	0	48.0	28000
6	2000	1610	390	0.1	39	28000	0.003108	87.0	0	48.0	28288
7	2000	1610	390	0.1	39	28288	0.003108	87.9	0	48.9	28288
8	2000	1610	390	0.1	39	28288	0.003108	87.9	0	48.9	28288
9	2000	1610	390	0.1	39	28288	0.003108	87.9	0	48.9	28288
10	2000	1610	390	0.1	39	28288	0.003108	87.9	0	48.9	28288
11	2000	1610	390	0.1	39	28288	0.003108	87.9	0	48.9	28288
12	2000	1610	390	0.1	39	28288	0.003108	87.9	0	48.9	28582

Assumptions: Household size = 1; Interest rate = 3.73%; Income protection = 150% Poverty Line. Estimates are approximations for illustrative purposes about individual repayment scenarios; Scenarios are in the spirit of IBR plans but does not explicitly model all aspects of current IBR policies.

Fictional borrower example (Charlotte), with interest capitalization at period 12

Period (Month)	Income	Income Protection	Discretionary Income	Income Assessment	Payment	Principal (beginning of period)	Interest Rate	Interest Due	Principal Paid	Unpaid Interest	Principal (end of period)
	[A]	[B]	[C] = [A] - [B]	[D]	[E] = [C] X [D]	[F] = [K] _{t-1}	[G]	[H] = [F] X [G]	[I] = MAX([E]-[H],0)	[J] = MAX([H]-[E],0)	[K]
0											28000
1	2000	1610	390	0.1	39	28000	0.003108	87.0	0	48.0	28000
2	2000	1610	390	0.1	39	28000	0.003108	87.0	0	48.0	28000
3	2000	1610	390	0.1	39	28000	0.003108	87.0	0	48.0	28000
4	2000	1610	390	0.1	39	28000	0.003108	87.0	0	48.0	28000
5	2000	1610	390	0.1	39	28000	0.003108	87.0	0	48.0	28000
6	2000	1610	390	0.1	39	28000	0.003108	87.0	0	48.0	28000
7	2000	1610	390	0.1	39	28000	0.003108	87.0	0	48.0	28000
8	2000	1610	390	0.1	39	28000	0.003108	87.0	0	48.0	28000
9	2000	1610	390	0.1	39	28000	0.003108	87.0	0	48.0	28000
10	2000	1610	390	0.1	39	28000	0.003108	87.0	0	48.0	28000
11	2000	1610	390	0.1	39	28000	0.003108	87.0	0	48.0	28000
12	2000	1610	390	0.1	39	28000	0.003108	87.0	0	48.0	28576

Assumptions: Household size = 1; Interest rate = 3.73%; Income protection = 150% Poverty Line. Estimates are approximations for illustrative purposes about individual repayment scenarios; Scenarios are in the spirit of IBR plans but does not explicitly model all aspects of current IBR policies.

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