



Student Loan Market Place

Total Cost of Borrowing Definition

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1 Overview

The Student Loan Market Place is a tool that uses automated underwriting technology to retrieve loan prices from multiple lenders based on the applicant's credit profile. It allows students and their families to obtain and compare real loan products to help fund the student's cost of attendance.

The Student Loan Market Place mainstreams the entire process of college funding from the creation of the application to the acceptance of the loan offer. It eliminates the tedious process of multiple applications, dealing with multiple vendors, and comparing separate products. Instead, it showcases the possible options in one convenient place. Through this web-based application, prospective consumers and lenders can easily complete a variety of functions. The Student Loan Market Place allows users to create loan applications, gather pertinent consumer information, rate lenders, and view loan products. It also makes use of Web 2.0 concepts to allow users to interact with industry experts and each other to gain more insight into the lending process. The Market Place consists of a Student, Aid Administrator, Guarantors, and Lender components. Each component walks the user through the necessary steps and gives him or her insight into the status of the loan process.

1.1 Intended Audience

This document is meant for use by individuals working in the Lender organization who will be involved or have oversight of the installation and usage of the Student Loan Market Place. In addition, this document can be used as a document to aid the instruction of business analysts and rule writers.

2 Total Cost of Borrowing

The Total Cost of Borrowing is an important calculation. Total Cost is one of the characteristics upon which a consumer will select a loan product. Until now, each lender was able to determine which fees will be included (or not) in the calculation. However, in order to provide the consumer with a fair analysis of all the offers presented, we must define the equation for calculating the total cost.

Basic rules to apply:

1. We will not include any fee or benefit in the total cost calculation that is dependant upon the consumer achieving certain conditions we cannot validate within the Market place application. The benefit may be described to the consumer, but it is not included in the interest or total cost calculations. The test is whether the condition can be validated.

Examples:

- Interest Rate Reduction for On-Time Payments (Benefit)
- Automated Clearing House or Direct Debit (Benefit)
- Loan Forgiveness (Benefit)
- Principal Rebate

2. Benefits related to flexible payment options will be included in the total cost for the appropriate product.

Examples:

- Full Deferment, Interest Only payment options

3. Fees: For calculation of total cost of a loan, fees will be separated into two categories upfront fees and non-upfront fees. The upfront fees will include origination fee and insurance fee. These up front fees are usually flat percentages taken out of the loan (i.e. the fee amount is subtracted from loan check).

The non-upfront fees include repayment fees and disbursement fees. The disbursement fee is added to the principal at disbursement. The repayment fee is added to principal at repayment. The non-upfront fees are eligible for capitalization.

Examples:

- A \$10,000 loan with no deferment with a 1 % origination fee and a 3 % repayment fee would look as follows.
Amount of Disbursement = \$9,900
Amount due at Repayment = \$10,300

2.1 How will we calculate the Total Cost of Borrowing

In general, the Total Cost will be sum of the Loan Amount plus (Total Fees and Interest) minus Total Benefits.

where the following is true:

Loan Amount is the amount of money offered to student

Total Fees is total amount of fees charged to the consumer

Total Interest is total interest of the loan which is based off the principal at repayment (This may include capitalized fees)

Total Benefits is total value of the reduction in fees plus other

Overture will use the following equations to calculate the Total Cost of Borrowing

If the Repayment Type is Immediate Repay

Monthly Payment

$$MonthlyPayment = \left[k + \frac{k}{\left((1+k)^n \right)^{-1}} \right] \times P$$

where the following is true:

P = initial principal = (Loan Amount + Disbursement fee + Repayment fee)

k = annual interest rate paid divided by 12

n = term of the loan (in months)

Total Cost

$$TotalCost = (MonthlyPayment \times n) + UpfrontFees - TotalBenefits$$

If the Repayment Type is Interest Only Loan

Monthly interest Payment during deferment

$$\text{MonthlyInterestPayment} = P \times k$$

where the following is true:

P = initial principal = (Loan Amount + Disbursement fee + Repayment fee)

k = annual interest rate paid divided by 12

n = term of the loan (in months)

Total Cost

$$\text{MonthlyPayment} = \left[k + \frac{k}{(1+k)^n - 1} \right] \times P$$

$$\text{TotalCost} = (\text{MonthlyPayment} \times n) + (\text{MonthlyInterestPayment} \times (D + G)) + \text{Upfront fees} - \text{Total Benefits}$$

where the following is true:

D = deferment period (in months)

G = grace period (in months)

If the Repayment Type is Deferment**Capitalization of Interest****At Repayment**

$$\begin{aligned} \text{New Loan balance after deferment} \\ = P \times [(k \times D) + 1] \end{aligned}$$

$$\begin{aligned} \text{Total Capitalized interest} \\ = P \times (k \times D) \end{aligned}$$

where the following is true:

P = initial principal

k = annual interest rate paid divided by 12

D = deferment period (in months)

For other Compounding Intervals

New Loan balance after deferment

$$= P \times \left(1 + \frac{r}{m}\right)^{m \times t}$$

Total Capitalized interest

$$= \left[\left(1 + \frac{r}{m}\right)^{m \times t} - 1 \right] \times P$$

where the following is true:

r = annual interest rate paid

m = number of times per period (typically months) the interest is compounded

t = term of the loan (in years)

Sample values for m

Compounding rate Period	Number of compounding periods per year
Annual	1
Semiannual	2
Quarterly	4
Monthly	12
Weekly	52

Total Cost

$$\text{MonthlyPayment} = \left[k + \frac{k}{((1+k)^n)^{-1}} \right] \times NP$$

$$\text{TotalCost} = (\text{MonthlyPayment} \times n) + \text{Upfrontfees} - \text{TotalBenefits}$$

where the following is true:

NP = New Loan balance after deferment

k = annual interest rate paid divided by 12

n = term of the loan (in months)

3 Estimated Annual Percentage Rate (APR)

The estimated APR of the product in question will be displayed to the consumer. This estimated rate takes into account principal, interest rate and structure, fees and other costs of the loan, and length of repayment. As stated in the Total Cost section, only the non-conditional Consumer Benefits will be included in estimated APR calculation. Since the consumer will rely on the APR when comparing one loan product to another; it is important that the estimates are repeatable and standardized.

3.1.1 How will we calculate the APR

In order to create a comparable standard APR between lenders, we must define the parameters for the calculation of APR. These parameters include monthly payment, loan term, grace period, length of deferment, repayment option, monthly payment during deferment.

We will be using the internal rate of return (IRR) to calculate the APR. We have built three java functions that will calculate the APR using the Newton-Raphson technique to calculate the IRR. Each function represents the calculation based on the various payment streams (i.e. the Interest only deferment, Standard Deferment and No deferment). Each lender will be responsible for testing and using functions to ensure the accuracy of the estimated APR.

Examples of java functions:

APR for Immediate Repay

This function makes use of the following parameters:

Monthly payment defines the payments within the cash flow

Term determines the total number of monthly payments within the cash flow stream

Initial Principal is the initial value of the cash flow

Guess is the number closest to the rate value (default value of 0)

APR for Interest Only

This function makes use of the following parameters:

Interest only Monthly Payment defines the interest only payments within the cash flow

Interest only Term determines the total number of interest only payments within the cash flow stream

Monthly payment defines the payments within the cash flow

Term determines the total number of monthly payments within the cash flow stream

Initial Principal is the initial value of the cash flow

Guess is the number closest to the rate value (default value of 0)

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APR for Full Deferment

This function makes use of the following parameters:

Deferment Term determines the total number of deferred payments within the cash flow stream

Monthly payment defines the payments within the cash flow

Term determines the total number of monthly payments within the cash flow stream

Initial Principal is the initial value of the cash flow

Guess is the number closest to the rate value (default value of 0)