Stable Value Crediting Rates

HOW THEY WORK, HOW THEY ARE CALCULATED

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Crediting rates are a key component of stable value investing. We address how a stable value crediting rate works and the role that the crediting rate plays in determining the overall blended yield of a multi-issuer stable value fund. Our focus is on the crediting rate for synthetic GICs (also known as security backed investment contracts), although much of what we cover also applies to participating separate account GICs as well. The discussion is less relevant to traditional GICs and non-participating separate account GICs, since these are typically fixed or floating rate fixed maturity contracts and are not addressed.

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INTRODUCTION

Stable value funds are often the most conservative investment option offered in a defined contribution plan. They are designed to preserve principal and generate steady rates of return, while allowing investors to make withdrawals at contract value (principal plus accrued income), regardless of market conditions.

Over the long run, stable value funds have delivered returns that are similar to the returns of intermediate-term bonds; yet the volatility of those returns has been equal to or less than that of money market funds. This favorable risk/return profile is one of the main reasons that stable value is such a popular choice among savings plan investors.

A crediting rate is the interest earned on the contract value (principal plus accrued income) expressed as an effective annual yield.

Stable value funds typically have durations of about three years, which helps explain their bond-like returns. But how do they maintain such low volatility? The answer can be found in the mechanics of the contract value accounting provided by benefit-responsive stable value contracts. Stable value funds are able to report smooth returns because stable value contracts permit participants to withdraw their assets at contract value and insulate investors from movements in asset prices resulting from changes in market interest rates and the pricing of credit risk. This smoothing effect is achieved through the crediting rate, which is calculated when the investment contract initially funds and then resets periodically thereafter, typically on a monthly or quarterly basis.

WHAT IS A CREDITING RATE?

A crediting rate is the interest rate earned on the stable value contract's value (its principal plus accrued income, also known as its book value) expressed as an effective annual yield. Principal preservation is furnished by a contractual minimum crediting rate of 0% and contractual provisions that require the contract issuer to make payments at contract value in the event that the stable value contract's underlying assets are depleted. The crediting rate also acts as a stabilizing mechanism by amortizing investment gains and losses so that investors are protected from short-term changes in market value.

HOW IS A CREDITING RATE CALCULATED?

The performance of a stable value contract's underlying assets ultimately determines the long-term rate of return of a synthetic GIC (or participating separate account GIC). The returns of the stable value contract's underlying assets are passed along to its investors via the crediting rate formula, which is a function of the contract value of the investment contract, the market value of the underlying asset portfolio, and the yield and duration of the underlying asset portfolio. The crediting rate is designed to converge the difference in the investment contract's value and the market value of its underlying collateral by amortizing those differences over time. The difference between contract

value and underlying market value is commonly represented as a market value to contract value ratio (MV/CV, also known as market value to book value ratio (MV/BV)). The crediting rate is periodically set at a rate that is equivalent to the portfolio yield, adjusted for the difference between market value and contract value (positive or negative) over the amortization period less the fees that financial institutions charge for the contract. In the current environment, fees are typically 0.14-0.15% of the investment contract's value. The amortization period is typically defined by the duration of the asset portfolio.

Compounding Crediting Rate Formula:

The most commonly used crediting rate formula in the stable value industry is as follows:

Gross Crediting Rate = (MV/CV)^(1/D)*(1+AYTM)-1;

where:

MV = market value

CV = contract value

D = duration

AYTM = annualized yield to maturity = (1+ YTM/2)^2-1

How the Crediting Rate Formula is Derived:

The contract value (CV) when compounded at the crediting rate (CR) for the duration of the portfolio (D) equals the market value of the portfolio (MV) when compounded at the portfolio's annualized yield to maturity (AYTM) for the same duration of the portfolio (D), assuming there are no changes in market rates or portfolio yield.

CV*(1+CR)^D = MV*(1+AYTM)^D

[CV*(1+CR)^D]^(1/D) = [MV*(1+AYTM)^D]^(1/D)

CV^(1/D)*(1+CR) = MV^(1/D)*(1+AYTM)

1+CR = (MV/CV)^(1/D)*(1+AYTM)

CR = (MV/CV)^(1/D)*(1+AYTM)-1

In short, the contract value must accrue the crediting rate for "D" years to converge to market value, assuming the market value portfolio continues to earn the annualized yield to maturity for the same period.

THE IMPACT OF COMPONENT VARIABLES

As noted above, a contract's crediting rate is determined by the crediting rate formula's component variables: the market value to contract value ratio, the yield of the underlying asset portfolio, and the duration of the underlying asset portfolio. It is important to understand how each of these variables impact the crediting rate.

Market Value to Contract Value Ratio

The relationship between the contract value and the market value of the underlying asset portfolio determines whether the crediting rate will be more or less than the yield of the underlying asset portfolio. Relative to the asset portfolio's yield, a market value "deficit" (MV<CV) decreases the yield credited to investors, and a market value "surplus" (MV>CV) increases the yield (see Figure 1). If market value and contract value are equal, the net crediting rate will be set equal to the yield of the underlying asset portfolio, less the contract fee.

Keeping all other variables constant, an increase in the MV/CV ratio will improve the crediting rate, while a decrease in the ratio will result in a lower crediting rate. This holds true whether market value is greater than or less than contract value.

FIGURE 1: THE IMPACT OF THE MARKET VALUE TO CONTRACT VALUE RATIO ON THE CREDITING RATE

If Market Value is LESS than Contract Value...

Market Value	$48,000,000
Contract Value	$50,000,000
MV/CV Ratio	96.0%
Duration	3.00 Yrs
Yield to Maturity	3.30%
Annualized Yield to Maturity	3.33%
Gross Crediting Rate	1.93%

...the contract value crediting rate will be less than the asset portfolio's yield, to allow the market value "deficit" to be made up over time.

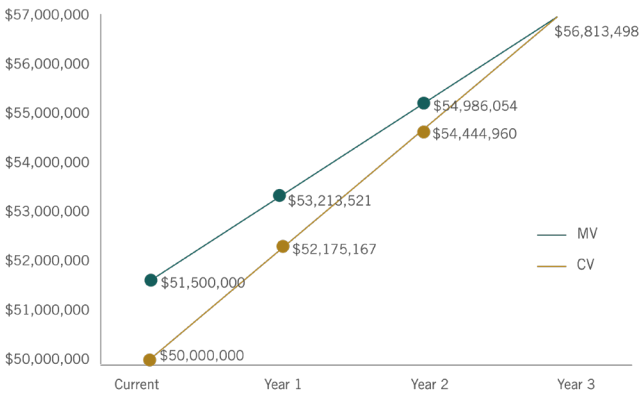
Contract Value Growth:
$50,000,000 $(1+1.93\%)^3$ = $52,952,386*

Market Value Growth:
$48,000,000 $(1+3.33\%)^3$ = $52,952,386*

If Market Value is GREATER than Contract Value...

Market Value	$51,500,000
Contract Value	$50,000,000
MV/CV Ratio	103.0%
Duration	3.00 Yrs
Yield to Maturity	3.30%
Annualized Yield to Maturity	3.33%
Gross Crediting Rate	4.35%

...the contract value crediting rate will be greater than the asset portfolio's yield, to allow the market value "surplus" to be recognized in the contract value over time.



Contract Value Growth:
$50,000,000 $(1+4.35\%)^3$ = $56,813,498*

Market Value Growth:
$51,500,000 $(1+3.33\%)^3$ = $56,813,498*

*using extended decimal places for AYTM and crediting rate

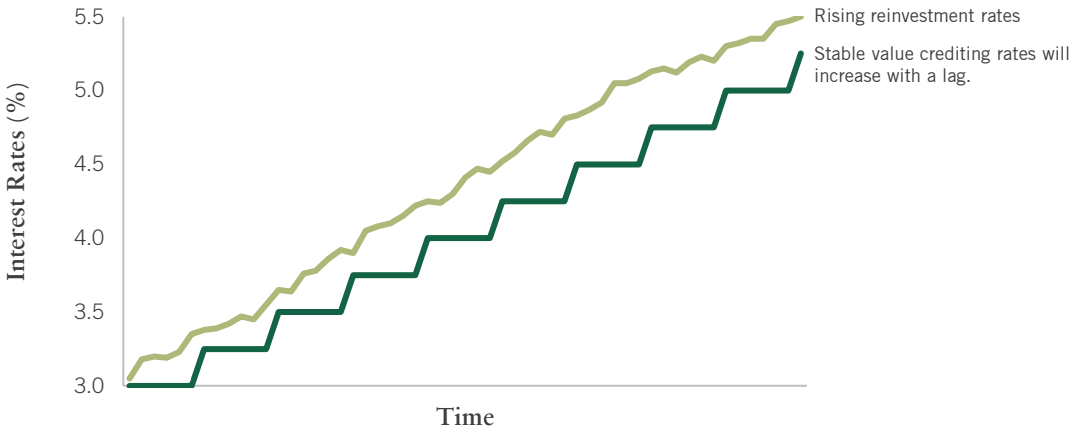
Annualized Yield to Maturity

The yield of the underlying asset portfolio is the portfolio's expected rate of return at a point in time, assuming bonds are held to maturity and cash flows are reinvested at the same rate. This is the expected earnings potential of the assets wrapped by the stable value contract. Holding all other variables constant, an increase in the yield of the underlying portfolio will increase the crediting rate. Conversely, a lower yield will decrease the crediting rate.

FIGURE 2: IMPACT OF INTEREST RATE ENVIRONMENTS ON THE CREDITING RATE

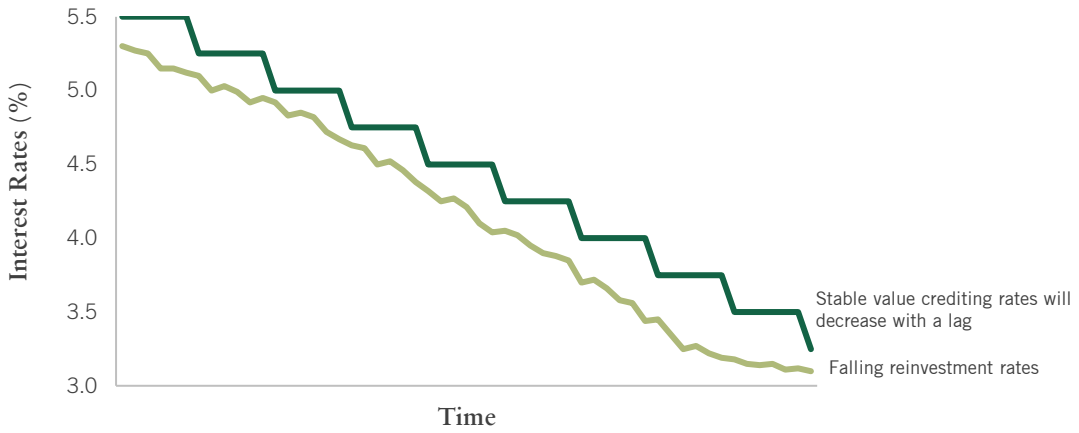
The Crediting Rate in a Rising Interest Rate Environment:

If reinvestment rates are higher when cash flows are reinvested, the crediting rate will increase (with a lag)



The Crediting Rate in a Falling Interest Rate Environment:

If reinvestment rates are lower when cash flows are reinvested, the crediting rate will decrease (with a lag)



Duration

Duration is a measure of interest rate risk, but in the crediting rate formula, the duration variable typically determines how quickly the difference between market value and contract value will be amortized. The shorter the duration of the underlying asset portfolio, the more quickly the difference will be amortized. As previously mentioned, stable value funds typically have durations of approximately three years.

Since duration sets the amortization period, its impact is slightly more complicated than that of the other component variables. When market value is less than contract value, a loss is being amortized, and a longer duration amortizes the loss over a longer period of time (assuming all other variables are held constant). An increase in duration therefore results in a higher crediting rate. When market value exceeds contract value and a gain is being amortized, a longer duration amortizes the gain over a longer period, decreasing the crediting rate. The opposite is true when duration is shortened, as shown in Figure 3.

FIGURE 3: IMPACT OF DURATION ON THE CREDITING RATE

Change in Portfolio Duration	Impact on Crediting Rate	
	MV < CV	MV > CV
Longer Duration	**Increases** the crediting rate	**Decreases** the crediting rate
Shorter Duration	**Decreases** the crediting rate	**Increases** the crediting rate

A Word About Management

Examining these "all else equal" scenarios illustrates the impact of changes in each of the crediting rate formulas' component variables. Yet in reality, stable value funds face a dynamic and constantly shifting market environment. Because each variable can have a significant impact on the crediting rate, it is important for a stable value manager to seek to limit the volatility of these factors in the underlying asset portfolio. Successfully managing the crediting rate inputs, while generating strong long-term risk-adjusted returns, is key to assuring that a stable value fund makes good on its name by providing a consistent rate of return.

The Impact of Cash Flows

Although not a component variable of the basic crediting rate formula, cash flows can also materially impact the crediting rate. Cash deposits to an investment contract when the market value is less than its contract value improve the MV/CV ratio at the margin, while cash deposits to an investment contract when the market value is greater than its contract value lowers the MV/CV ratio at the margin. Withdrawals from an investment contract when the market value is less than its contract value lowers the ratio at the margin, while withdrawals from an investment contract when the market value is greater than its contract value improves the MV/CV ratio at the margin (see Figure 4).

FIGURE 4: IMPACT OF CASH FLOWS ON THE CREDITING RATE

Cash Flow	Market to Contract Value Ratio	Immediate Typical Impact on Crediting Rate
Positive	MV/CV > 100	Negative
Positive	MV/CV < 100	Positive
Negative	MV/CV > 100	Positive
Negative	MV/CV < 100	Negative

The interest rate environment in which cash flows occur can also affect the crediting rate (see Figure 2). If current reinvestment rates are lower than the current portfolio yield, substantial cash inflows will negatively impact the yield and, thus, the crediting rate. However, if reinvestment rates are higher than the portfolio yield, cash inflows will improve the yield and crediting rate more quickly than if the portfolio relied upon the reinvestment of its internal cash flows alone. A stable value manager can usually control the duration impact of any significant cash flows. Therefore, cash flows typically affect the crediting rate through the MV/CV ratio and the portfolio yield as described earlier.

FROM THE CREDITING RATE TO THE INVESTOR'S DAILY YIELD

In stable value funds that invest in multiple security backed investment contracts, the overall blended yield of a stable value fund—the daily yield earned by investors—is primarily determined by the crediting rate formula, as it applies to each of the fund's contracts. Components of the daily yield include the weighted average crediting rate of the investment contracts (based on the contract value of the individual investment contracts) and the interest earned on cash held for liquidity purposes (as well as the crediting rates of any other insurance products owned in the fund, such as traditional GICs). Management and administrative fees reduce the yield earned by investors (see Figure 5). Like the crediting rate of an individual security backed investment contract, the yield on a stable value fund generally follows the direction of interest rates with a lag.

THE CREDITING RATE MECHANISM: A KEY COMPONENT FOR MAINTAINING STABLE YIELDS

Investment contracts and the use of a crediting rate are critical components for maintaining consistent, competitive yields in a stable value investment option. These contracts enable an investment manager to invest in a portfolio of assets (typically short- and intermediate-term fixed income securities), while insulating plan investors from volatility in the value of their investment. This ability to dampen volatility is a distinct feature of the stable value asset class and allows stable value funds to provide investors protection against loss of principal and attractive risk-adjusted returns that over the long-term have exceeded those of money market funds and have also kept pace with the long-term rate of inflation.

FIGURE 5: DAILY YIELD

The Components of Daily Yield

Weighted Average Crediting Rate of Individual Security Backed Investment Contracts	+	Yield on Cash Equivalents and other insurance products (i.e., traditional GICS)	-	Management and Administrative Fees	=	Stable Value Fund Net Daily Yield to Investors

Calculating the Daily Yield

Weighted Average Crediting Rate* % of Portfolio / Crediting Rate Contract 1 24% 5% Contract 2 24% 5% Contract 3 24% 5% Contract 4 24% 5%	+	Yield on Cash Equivalents and other insurance products (i.e., traditional GICS) % of Portfolio / Yield Cash/ Other 4% 4%	-	Management and Administrative Fees 0.40%	=	Stable Value Fund Net Daily Yield to Investors 4.56%

Example: Applying the Daily Yield to an Investor's Account

Investor balance beginning of day 1	**= $10,000.00**
Investor balance end of day 1 = $10,000 x (1+4.56%)^(1/365)	**= $10,001.22**
Assuming no change in crediting rate for 1 year, balance at the end of year 1	**= $10,456.00**

*Assumes use of four security backed investment contracts