# Leverage in Volatility-Controlled Indices:
## The How and Why

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## Introduction

Volatility-controlled indices (VCIs), also known as risk control indices, are commonly used as index account options within index-linked annuities. The goal of the indices is to provide exposure to an underlying equity asset or multi-asset combination while realizing a volatility level close to a target.[1]

## How Does a VCI Seek to Achieve a Target Volatility Level?

The first thing about VCIs that comes to mind, for most, is the usage of the theoretical cash component in high volatility environments—but that is only half the story. On the flip side, how is the index designed to operate in periods of low volatility?

To answer that, we will review the two basic concepts that these indices employ, and when.

[1] For a deeper dive into volatility-controlled indices, please see Pollock, Sara, "Demystifying Volatility-Controlled Indices," S&P Dow Jones Indices LLC, March 2022.

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## Market Volatility > Index Target Volatility

As indicated above, a VCI typically consists of an equity component and theoretical cash component or is an index of indices. When market volatility spikes, a VCI will allocate (or, in the context of indices, weight index components) away from the underlying index component and toward a risk dampening asset class, commonly a theoretical cash component.[2] S&P DJI's risk control index offerings include a variety of frameworks that use a theoretical cash component or a liquid bond index.

In this case, the VCI will allocate less than 100% to the underlying index, and therefore will not be leveraged. Allocation in a VCI refers to the weight attributed to each asset class, most commonly an equity component and a theoretical cash component.

The lower volatility asset class *dampens* the overall VCI's volatility level, allowing the index to more closely realize a target volatility when market volatility is high.

## Market Volatility < Index Target Volatility

On the other hand, when market volatility is below the target, the VCI can allocate more than 100% to the underlying equity or multi-asset index in an effort to increase volatility. A weighting of more than 100% to an underlying index component is referred to as leverage.

Leverage allows a VCI to *increase* volatility and more closely realize the target when market volatility is low.

# Applying Leverage: An Example

To illustrate how leverage within a VCI could affect index performance, we will use the S&P 500® Dynamic Intraday TCA Index[3] as an example. Please note that this outcome is not guaranteed but is included for general illustrative purposes only.

If general equity volatility is low, for the S&P 500 Dynamic Intraday TCA Index to more closely achieve its volatility target of 15%, it can allocate up to a maximum of 250% to the underlying S&P 500. This maximum is called the leverage cap.

If the S&P 500 posts results of 1%, at the leverage cap and under normal market conditions, the S&P 500 Dynamic Intraday TCA Index performance could be 2.5 times this, or 2.5%.

[2] The theoretical cash component can be represented by a number of possible instruments, such as Secured Overnight Financing Rate (SOFR), an SOFR spread, three-month U.S. Treasury bills and/or other fixed income instruments.

[3] For more information on the S&P 500 Dynamic Intraday TCA Index, please see here: [Insert link to methodology]. TCA stands for Transaction Cost Adjustment.



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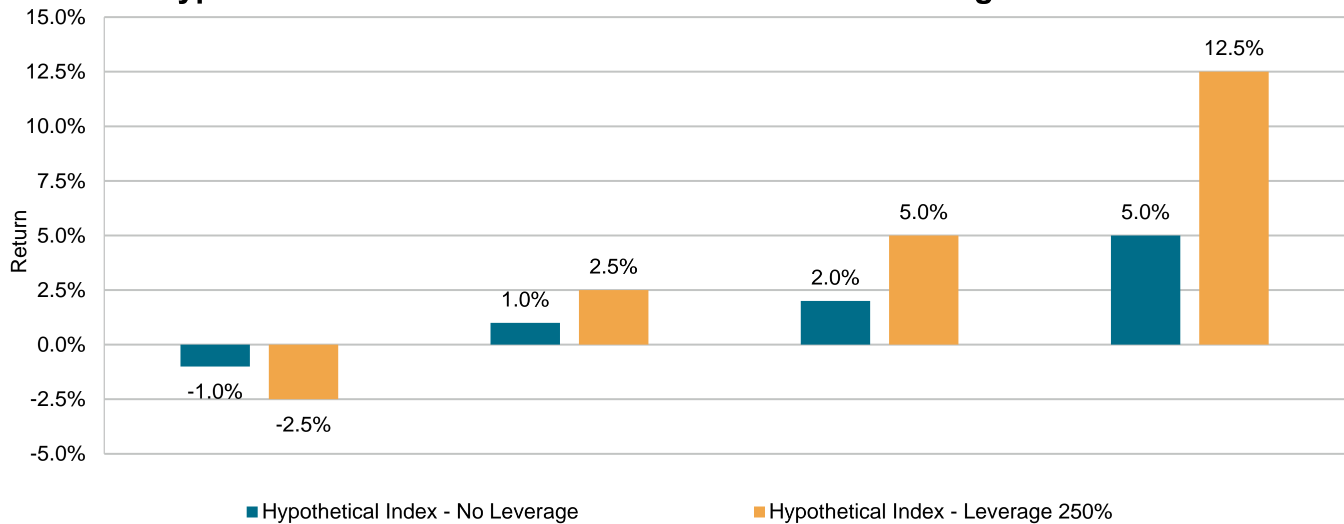
Similarly, if the S&P 500 posts results of 2%, under normal market conditions the risk control index could post 2.5 times that performance at 5%.

The relationship applies when markets are trending down as well. If the S&P 500 posts results of -1%, at its leverage cap, the S&P 500 Dynamic Intraday TCA Index could post results of -2.5%.

For a visual example, we can look at a hypothetical VCI with leverage of 250% versus an unlevered index (see Exhibit 1).

**Exhibit 1: Hypothetical Index Returns – With and without Leverage**




Source: S&P Dow Jones Indices LLC. Data as of Aug. 9, 2024. All data is hypothetical. Past performance is no guarantee of future results. Chart is provided for illustrative purposes.

# Effects of Leverage in Different Market Environments

As noted in the previous example, leverage magnifies returns, both on the upside and the downside.

In other words, leverage in an upward trending market should yield performance results higher than an unlevered index, and leverage in a downward trending market should yield performance results lower than an unlevered index.



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**Exhibit 2: Effects of Leverage in Different Market Environments**

| Market Environment | Higher Volatility Relative to Target | Lower Volatility Relative to Target |
|---|---|---|
| **Up Market** | The VCI is partially allocated to cash. | The VCI is at least 100% allocated to the underlying index, so is using leverage. |
| | It will participate in some but not all of the upside. | It may participate in more than the underlying index's upside. |
| | The VCI is generally expected to underperform the underlying index | The VCI is generally expected to outperform the underlying index |
| **Down Market** | The VCI is partially allocated to cash. | The VCI is at least 100% allocated to the underlying index, so is using leverage. |
| | The volatility control overlay should provide some downside protection | It may participate in more than the underlying index's downside. |
| | The VCI is generally expected to outperform the underlying index. | The VCI is generally expected to underperform the underlying index |

Source: S&P Dow Jones Indices LLC. Table is provided for illustrative purposes.

# Conclusion

A VCI needs two tools to realize a target volatility most effectively:

- **Low Risk Asset Class:** The ability to allocate to a theoretical cash component when market volatility is above the target dampens realized volatility and brings the risk control index closer to target.
- **Leverage:** The ability to use leverage to allocate more to an underlying index when market volatility is low should increase the overall index's realized volatility closer to the target.

Since markets are in constant flux, these two tools provide VCIs with the ability to execute their mandates potentially more accurately.

To learn more about S&P DJI's risk control indices, please visit the Insurance Resource Center.



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