

Autocallables: Dialing into the Details

A Differentiated Way of Delivering Derivatives Income

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At a Glance:

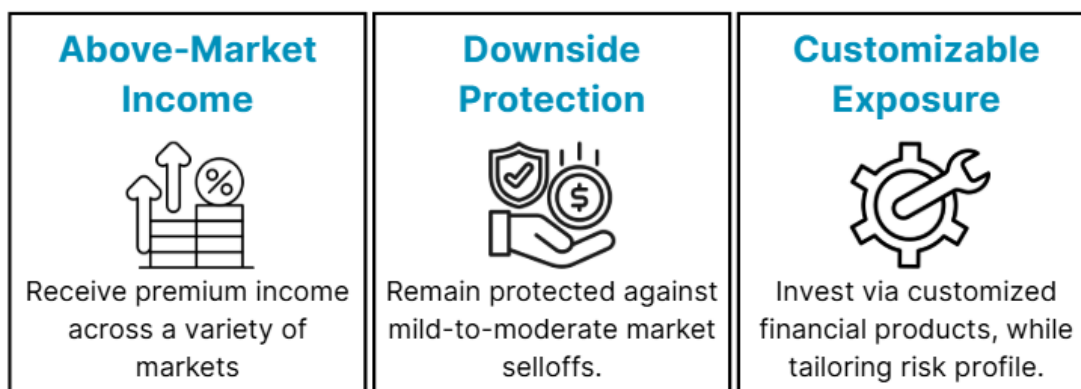
- Autocallables, combining features of bonds + equities, may offer enhanced income and customizable outcomes.
- A diversified and resilient index, such as the Nasdaq-100®, may help support both principal protection and income generation.
- The emergence of autocallable ETFs have broadened practical applications for autocallables in portfolios.

With a new era of innovation in indexing, previously unprecedented figures have now become attainable in derivatives income.

Over the past decade, significant advances have been made in generating systematic income from derivatives in global equity markets through the ETF wrapper. Intense competition among market makers, fintech firms, and asset managers has driven innovation and broadened access to derivatives income products, growing the options ETF market more than 100x during this period (See “Appendix A”). What started with simple covered call option overlays has grown into a comprehensive suite of offerings, each product strategically designed to *enhance and stabilize* income generation beyond its predecessor.

The latest wave of income products features the “autocallable” structure, a highly custom financial product that has existed in various forms for over at least two decades. Once exclusively reserved for institutional and ultra-high net worth (UHNW) investors, this structure has now been democratized to allow main street investors to participate in the high-income generating abilities of autocallables.

Figure 1: Key Benefits of Autocallables



Source: Nasdaq Index Insights.

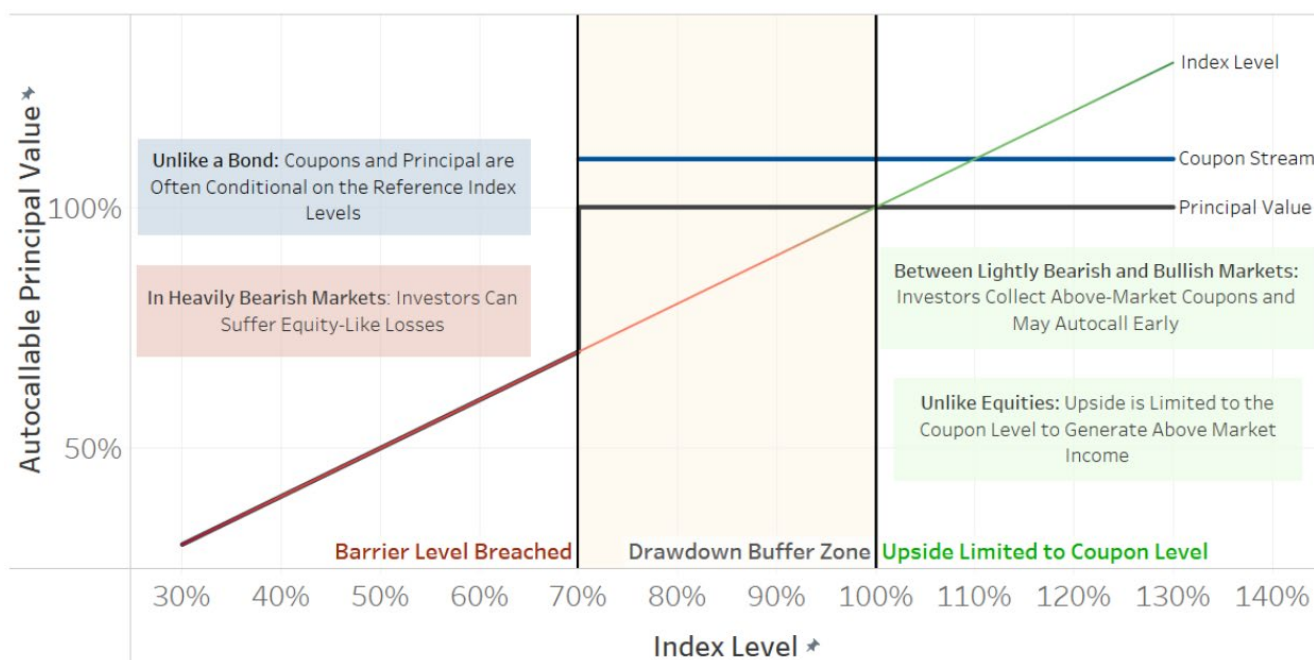
This paper will dive into the mechanics of autocallables, the investable products available, and how autocallables can be implemented in a client's portfolio. Additionally, this paper will explore what makes the Nasdaq-100® a highly effective index to use in an autocallable structure.

What exactly is an Autocallable?

An autocallable is an enhanced-income product issued in the form of a note that is designed to redeem early if an underlying asset (such as an index, ETF, stock, or basket) meets a pre-set performance condition on scheduled dates. If the condition is met, the note automatically redeems ("autocalls"), usually returning principal plus a coupon (or accrued coupons). If the condition is not met, the note continues to the next observation date—and ultimately to maturity if it never autocalls.

Autocallables are built to pay investors higher income than traditional bonds in exchange for taking risks that are often conditional on an equity index's performance:

Figure 2: Typical Autocallable Payoff Profile



Source: Nasdaq Index Insights. Autocallable principal value stated as a percentage of initial index value. All terms stated and scenarios laid out are purely hypothetical, illustrative, and are not reflective of real market events. See "Appendix B" for variations on downside protection.

As a result, autocallables tend to be most attractive when an investor expects markets to be *range-bound*, as that is the market scenario when autocallables typically *outperform both bonds and equities*. Bonds tend to preserve principal during bear markets, equities thrive in bull markets, while autocallables can usually deliver higher income than both in sideways markets.

How Autocallables Work

To enable the income-generating ability of these products, autocallables are comprised of several integrated components that function cohesively. These components – grouped by "underlying components"

and “structure components” – come together to influence the coupon level and return outcomes an investor can receive:

Figure 3: Typical Autocallable Components



The **Underlying Asset** (“underlying”) is what serves as the basis for the autocallable’s performance.

Underlying Components

Component Name	Component Definition	Impact on Coupon
Volatility	The measurement of price fluctuation.	Higher volatility raises coupon rates, while a target volatility strategy can stabilize coupons. ↑
Dividends/Decrements	Dividends: Payments made to investors in an underlying. Decrements: “Synthetic dividends” engineered into an underlying.	Since the dividend/decrement is forfeited by the investor, a larger dividend/ decrement raises coupon rates. ↑
“Worst-of”	A popular option involving holding multiple assets and receiving the worst performing of the basket.	Having a greater number of assets or having less correlated assets raises coupon rates. ↑



The **Structure** defines the payout profile that is being purchased linking to the underlying.

Structure Components

Component Name	Component Definition	Impact on Coupon
Tenor	The maturity date of a product, often between 1 and 5 years.	A longer tenor will typically lead to slightly lower coupon rates. ↓
Observation Periods	The intervals at which a coupon payment or early redemption (autocall) event may occur, typically on a monthly, quarterly, semiannual, or annual basis.	More observation periods will typically lead to slightly lower coupon rates. ↓
Autocall Trigger	The level at which the product will autocall on an observation date (typically when the underlying is at-or-above its initial value [100%]).	Moving the autocall trigger level higher will reduce the odds of early autocall, and therefore can lead to slightly higher coupon rates. ↑
Non-Call Period	An optional feature that prevents an autocall from happening for a portion of observation dates.	More non-call periods decrease reinvestment risk, but increases principal risk, resulting in a mixed impact on coupon. ↔
Downside Protection at Maturity	The style and degree of downside protection in a product, ranging between fixed (buffer) and conditional (barrier) downside protection across a variety of thresholds.	Fixed downside protection and lower thresholds will lower coupon rates, while conditional downside protection and higher thresholds will increase coupon rates. ↑
Coupon Barrier	An optional, but common feature that conditions the coupon payment based on the underlying being above a certain level (example: if the underlying level is above 70% of the initial value on an observation date).	Higher coupon barriers decrease the odds of receiving a coupon, therefore increasing coupon rates. ↑
Coupon Memory	When a coupon barrier is present, a coupon memory feature can be added to pay out any previously missed out coupons when the underlying is above a coupon barrier on a later observation date.	Coupon memory will lead to lower coupon rates. ↓

Source: Nasdaq Index Insights. See “Appendix B” for variations on downside protection.

With the breadth of features that can be present inside of an autocallable structure, there are two key points to take note of:

- 1) Each feature balances coupon value with downside protection and coupon redeemability; a higher coupon suggests the market anticipates either greater downside risk or reduced odds of earning the coupon.
- 2) Autocallables exist as a vehicle of risk customization. The investor can *choose* where they want to add risk to enhance income potential, be it less downside protection, a less redeemable coupon trigger, or a higher volatility underlying.

When engaging with an autocallable product, market participants can use the above table as a checklist to determine the list of features present in a product being sold.

Understanding the Payoffs

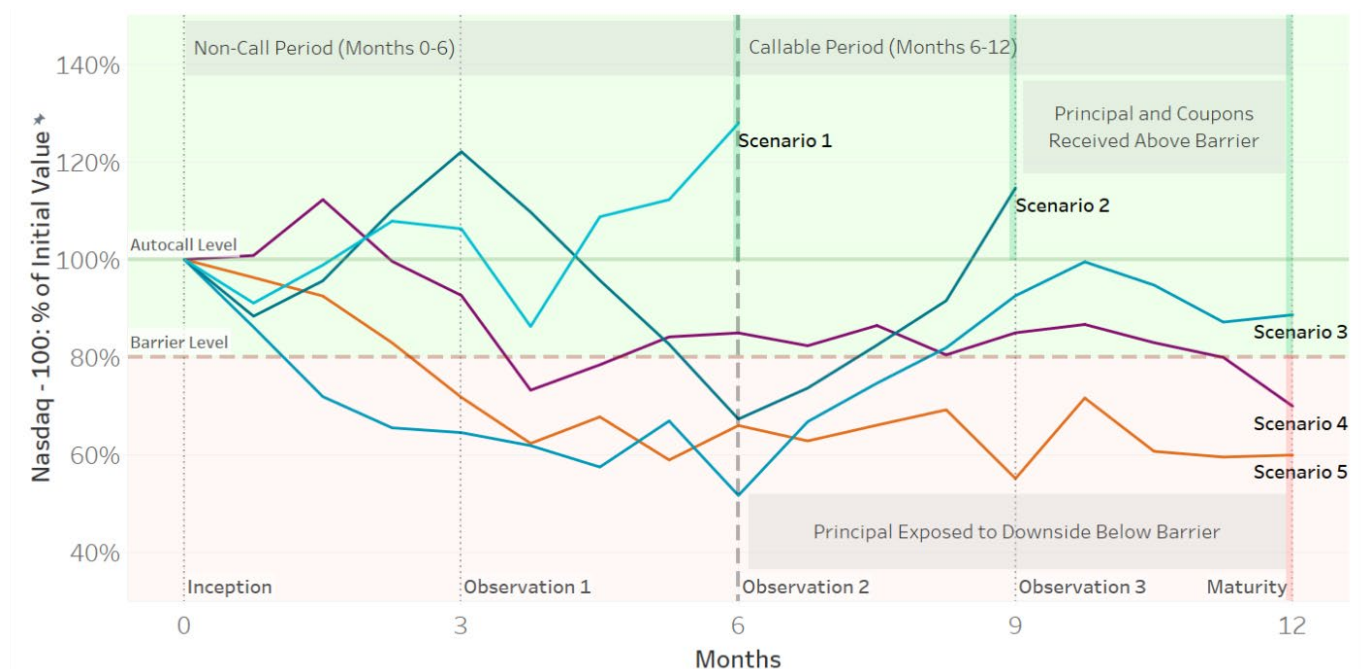
Putting the features together, below is a hypothetical simulation of 5 different scenarios of a hypothetical autocallable product:

Figure 4: Examining Hypothetical Product Outcomes

Terms of the Hypothetical Autocallable Product:

Underlying Asset	Tenor	Observation Periods	Autocall Trigger	Non-Call Period	Downside Barrier	Coupon Barrier	Coupon Memory	Coupon
Nasdaq-100	12 months	Quarterly	100% of initial value	6 months	80% of initial value	80% of initial value	Yes	10% per annum

Outlining 5 Hypothetical Scenarios on a Quarterly Observation with the Above Terms:



Scenario Guide:

Inception Non-Call	Scenario 1 Bullish	Scenario 2 Mildly Bearish to Bullish	Scenario 3 Bearish to Mildly Bearish	Scenario 4 Bearish	Scenario 5 Very Bearish
Observation 1 Non-Call	Coupon 1 Received	Coupon 1 Received	Coupon 1 Withheld	Coupon 1 Received	Coupon 1 Withheld
Observation 2 Auto-Callable	Called: Principal and Coupon 2 Received	Coupon 2 Withheld	Coupon 2 Withheld	Coupon 2 Received	Coupon 2 Withheld
Observation 3 Auto-Callable		Called: Principal and Coupons 2 and 3 Received	Coupons 1, 2, and 3 Received	Coupon 3 Received	Coupon 3 Withheld
Observation 4 Maturity			Matured: Principal and Coupon 4 Received	Matured: Principal at Risk and Coupon 4 Withheld	Matured: Principal at Risk and Coupon 4 Withheld
Outcome	5% Income in 6 Months 100% Principal Returned	7.5% Income in 9 Months 100% Principal Returned	10% Income in 12 Months 100% Principal Returned	7.5% Income in 12 Months 70% Principal Returned	No Income 60% Principal Returned

Source: Nasdaq Index Insights. All terms stated and scenarios laid out are purely hypothetical, illustrative, and are not reflective of real market events. See "Appendix B" for variations on downside protection.

While these scenarios are not exhaustive and are only representative of a single autocallable product, they present the diversity of outcomes that can occur and reinforce the types of markets in which they perform best – modestly bearish to bullish markets.

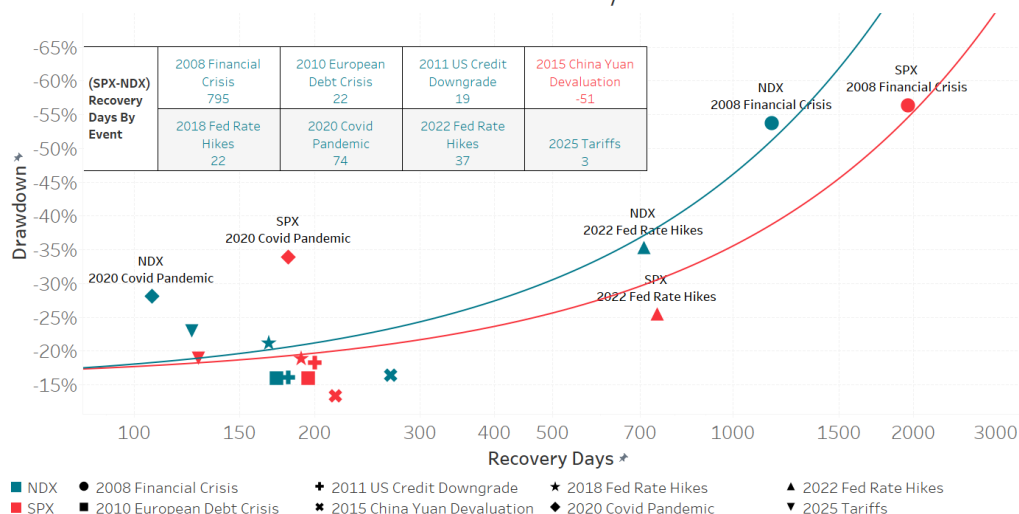
What Makes an Effective Underlying?

Considering the range of possible outcomes associated with an autocallable, it is essential to choose an underlying asset that demonstrates resilience. Typically, this involves choosing a broad market index to minimize single-stock risk; the two most common US large-cap equity indexes are the Nasdaq-100® (NDX®) and the S&P 500 (SPX).

Due to the non-linear returns of autocallables (capped upside, equity-like downside), traditional volatility measures like standard deviation only partially describe the underlying asset's risk. It is therefore essential to assess the drawdown and subsequent recovery of the underlying to effectively evaluate its resiliency. The chart below examines how drawdown percentage relates to recovery time in both indexes during the last eight market stress events, each marked by either an SPX or NDX drop of over 15%.

Figure 5: NDX vs SPX Drawdown Recovery Analysis

NDX® Recovers Faster Than SPX in the Most Recent 7/8 Stress Events



Source: Nasdaq Index Insights, Factset. Price Return Indexes used in calculation. X-Axis (Turnover Ratio) uses a Logarithmic (Log-10) Scale. Data between 1/1/2007 and 12/31/2025. Trend lines represent a linear regression of the relationship between drawdown magnitude and days to recovery. Drawdowns occurring from local highs. See “Appendix C” for full regression statistics.

In the last 8 US stress events, NDX recovered to its prior peak ~25% faster on average than SPX, outpacing it in 7 of the past 8 drawdowns.ⁱ Even during prolonged bear market environments like the 2022 inflation scare / rapid rate-hike cycle where NDX lagged SPX by ~10%, NDX exhibited a quicker rebound. The rapid recovery theoretically shortens the time an autocallable stays below coupon or principal barriers, potentially boosting the likelihood of preserving principal and coupons.

The Rise of the “Easy Button” - Autocallable ETFs

For several decades, the autocallable product traded in “note format” – packaged inside of a bond. This structure enabled securitization of previously inaccessible OTC derivative strategies, while also providing transparency and clear contractual payoff obligations. However, this format still required high minimum capital allocation, had low-to-no liquidity, and exhibited credit risk from the bond component (see “Appendix D” for autocallable risk factors).

Thanks to the relentless innovation within the ETF industry, the autocallable ETF finally emerged in the past year – taking the autocallable structure and packaging it inside of an ETF instead of a bond. Doing so has made the following improvements to the structure:

Ease of purchase

- Investors can acquire shares at any point during market hours, frequently with smaller capital allocations. Additionally, model portfolio managers can more readily incorporate these as a component within their strategies.

No issuer credit risk

- Since there is no bond, there is no risk of issuer default given that funds will be held by an independent custodian/trustee.

Laddered exposure to multiple autocallables at once

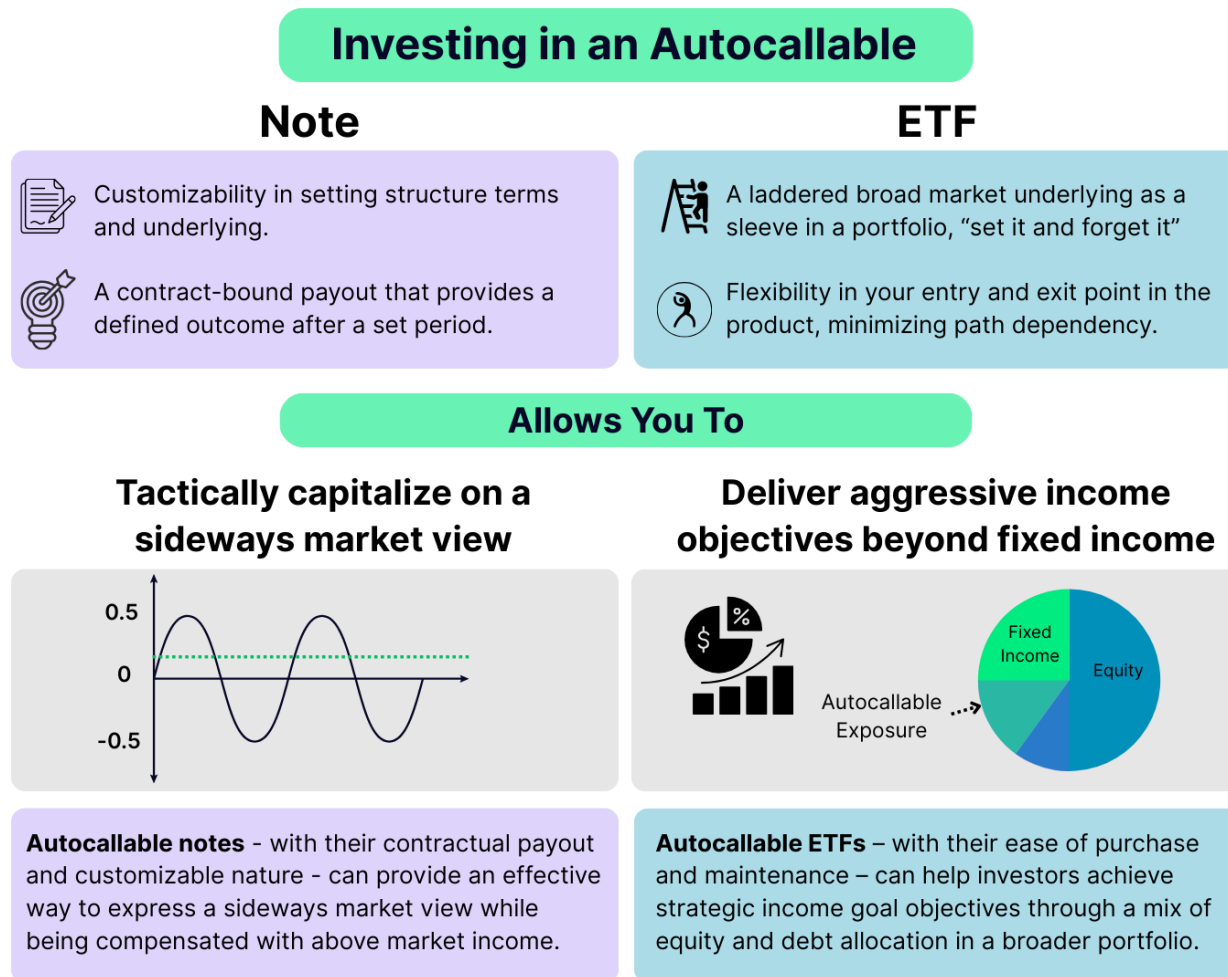
- The diversification enabled by this can often reduce tail risk, smooth coupon distribution rates, and simplify principal reinvestment.

These distinctions have allowed Asset Managers to launch autocallable ETFs that have generated high levels of adoption, not solely as a result of cannibalizing the autocallable Note business but by growing the “autocallable pie”, so to speak.

Where Autocallables Fit in an Investor’s Portfolio

As previously mentioned, autocallable ETFs have not replaced autocallable notes, but instead complement them by offering new ways to expand portfolio use cases. This raises the question: when is it appropriate to choose a Note versus an ETF? Broadly speaking, notes provide customizability in the structure, while ETFs provide customizability in the holding of that structure.

Figure 6: Using an Autocallable Note versus ETF



Source: Nasdaq Index Insights. All terms stated and scenarios laid out are purely hypothetical, illustrative, and are not reflective of real market events.

Conclusion

Autocallables have emerged as a compelling solution for investors seeking to enhance portfolio outcomes beyond the traditional scope of fixed income and equity markets. Their hybrid nature – blending characteristics of both stocks and bonds – positions autocallables as versatile instruments capable of delivering meaningful income and capturing value across a range of market environments. By providing defined outcomes and adaptability in terms of structure and market exposure, autocallables enable investors to better align their portfolios with their financial goals. As investor needs continue to evolve, autocallables may play a critical role by delivering both opportunity and resilience in an ever-changing market landscape.

To learn more about the Nasdaq-100® (NDX®), check out the following resources:

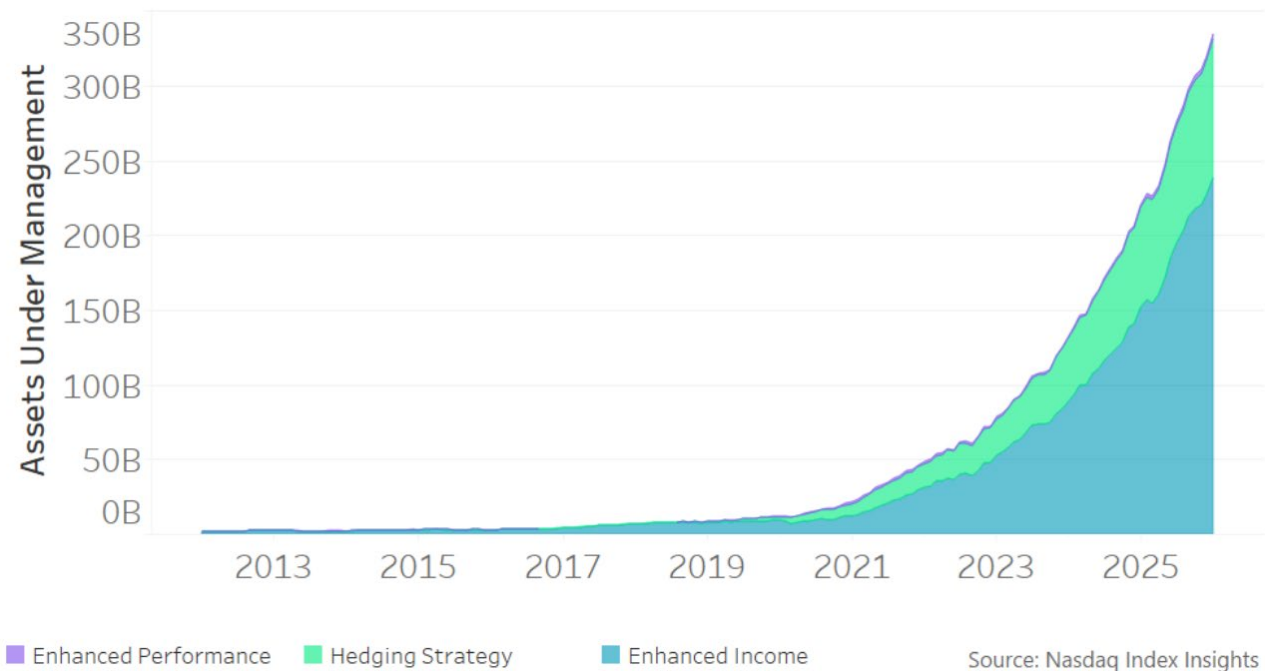
[Home Page](#) | [One Pager](#) | [Product Guide](#) | [Benchmark of the 21st century](#) | [Index Methodology](#) | [Index Data](#)

For weekly updates on the Nasdaq-100, sign up for the “Nasdaq-100 Weekly” email newsletter [here](#).

Appendix A: Growth in Options ETF

The chart below displays the AUM growth experienced by Options ETFs over the past ~14 years.

Figure 7: AUM Growth in Global Options ETFs



Date (Year-End)	2013	2014	2015	2016	2017	2018	2019	2020	2021	2022	2023	2024	2025
ETF AUM (\$billions)	2.19	3.04	2.99	4.00	6.89	7.81	11.86	20.50	46.30	72.31	125.56	206.28	320.13

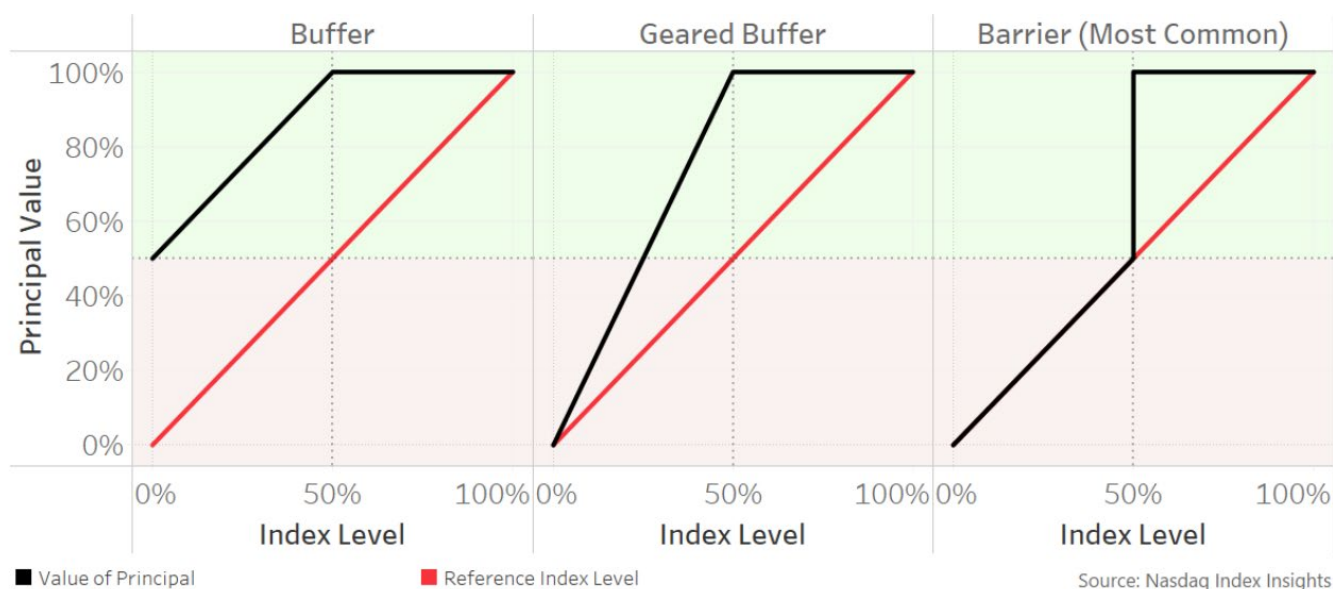
Source: Nasdaq Index Insights. Data between 1/31/2012 and 12/31/2025. Assets under management stated in billions of dollars.

During this period, enhanced income ETFs (such as covered call ETFs and the aforementioned autocallable ETFs) have led in AUM, with hedging strategy ETFs (such as buffer ETFs) having also seen sharp growth in the past 5 years. Enhanced performance currently exists as a more niche market, with potential to grow in the future.

Appendix B: Variations in Downside Protection

When discussing autocallable products, the conversation around downside protection is typically centered around having a “downside barrier” on the downside. While this is typically the most popular form of downside protection presented, it is not the *only* downside protection available in an autocallable. The chart below shows the 3 types of downside protection an investor can receive:

Figure 8: Variations in Downside Protection



Source: Nasdaq Index Insights. All terms stated and scenarios laid out are purely hypothetical, illustrative, and are not reflective of real market events.

- Buffered protection, popular in its namesake “Buffer ETFs”, provide principal protection up until a threshold, and then 1x downside to a reference asset (underlying) after that. Among the three types of downside protection presented, this is the sole form that offers principal protection should the underlying asset decline to zero.
 - If a product with a 50% buffer loses 75% of its value upon maturity, an investor would lose 25%.
- Barrier protection, on the other hand, only provides conditional protection up until a threshold. If the threshold (“barrier”) is breached, an investor is exposed to the *full downside* of the underlying asset.
 - If a product with a 50% barrier loses 75% of its value upon maturity, an investor would lose all 75%.
- Geared buffer protection (also known as a “leveraged buffer”) combines elements of buffers and barriers. Although it doesn't create a “cliff” like a barrier, investors can still lose their entire capital if the underlying asset falls to zero. This type of protection offers a buffer; however, any losses beyond this buffer are leveraged, which means an investor risks full capital loss as the asset approaches zero.
 - If a product with a 50% geared buffer loses 75% of its value upon maturity, an investor would lose 50%.
 - This is because a 50% geared buffer would create a 200% leverage of all downside exposure beyond the buffer in this instance to reach a full capital loss at zero.

Interestingly, barriers are the most popular form of downside protection in an autocallable despite providing the least protection of the three forms. This is because autocallable investors are typically seeking to maximize income, and products with barriers offer greater coupons all else equal. Based upon this, geared buffers provide the next highest coupon, with regular buffers following.

Appendix C: Regression Statistics for NDX vs SPX Drawdown Recovery Analysis

A linear trend model was estimated for Minimum Drawdown given Recovery Days, modeled separately by index using the formula:

Index $\times$ (Recovery Days + intercept)

This formula is based on 16 observations with 4 model degrees of freedom, 12 residual degrees of freedom, a Sum of Squared Error (SSE) of 0.0515, Mean Squared Error (MSE) of 0.0043, R-Squared (R^2) of 0.8009, standard error of 0.0655, and an overall model p-value of 0.0002. The Analysis of Variance (ANOVA) for the Index factor yielded an F-statistic of 1.7338 with 2 degrees of freedom (DF), a Sum of Squared Error (SSE) of 0.0149, Mean Squared Error (MSE) of 0.0074, and a p-value of 0.2180.

For the S&P 500 (SPX) individual trend line with 6 degrees of freedom (DF) and a p-value of 0.0035, the Recovery Days coefficient was -0.0001987 with a standard error (SE) of 0.0000427, a t-value of -4.6534 , and a p-value of 0.0035, and the intercept was -0.1567 with a standard error (SE) of 0.0323, a t-value of -4.8449 , and a p-value of 0.0029.

For the Nasdaq-100 (NDX) individual trend line with 6 degrees of freedom (DF) and a p-value of 0.0019, the Recovery Days coefficient was -0.0003127 with a standard error (SE) of 0.0000595, a t-value of -5.2517 , and a p-value of 0.0019, and the intercept was -0.1490 with a standard error (SE) of 0.0301, a t-value of -4.9583 , and a p-value of 0.0026.

Appendix D: Key Risk Factors of Autocallables

Below is a list of key risk factors to be considered when purchasing an Autocallable. Please note that this list is not exhaustive, and is reflective of information as of the publication date of this paper:

- **Market Risk:** Returns depend on the performance of the underlying index, stock, or basket. Sustained declines can prevent coupon payments and result in capital loss.
- **Reinvestment Risk:** Early redemption can force reinvestment, sometimes at lower yields and in less favorable market conditions.
- **Liquidity Risk:** Autocallable exposures are not designed for frequent trading. During periods of stress, bid – ask spreads may widen and exit prices may be materially unfavorable.
- **Path Dependency:** Outcomes depend on the trajectory of the underlying, not just its initial and final level. Interim drawdowns may suppress coupons, while interim rallies may lead to autocall events. Two identical final index levels can produce very different investor outcomes.
- **Model Risk:** Pricing and expected outcomes rely on quantitative models that are often proprietary to a hedging counterparty. Assumptions (volatility, correlation, liquidity) may break down in stressed markets.

Structured Note-Format Risks:

- **Issuer Credit Risk:** Structured notes are typically issued as unsecured obligations of the issuing bank. If the issuer defaults, investors may recover less than contractual payoffs regardless of underlying performance. Credit risk is independent of market risk.
- **Secondary Market Risk:** Early exit from a structured note (designed to be held till maturity) results in lower prices reflective of issuer credit spreads and hedging costs. Secondary prices may diverge materially from contractual maturity outcomes.

ETF-Format Risks:

- **Tracking Error:** Performance may deviate from expected autocallable payoffs and theoretical option models, with no contractual obligation to provide a specific payout. Tracking error typically increases during volatile or illiquid conditions.

Autocallables embed layered risks across market performance, volatility, path dependency, and structure; structured notes emphasize contractual certainty and issuer credit risk, while ETFs trade defined outcomes for liquidity, transparency, and strategy flexibility.

i “Based on Nasdaq analysis of historical price return index data from 1/1/2007–12/31/2025, using the methodology described in Appendix C.”

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