A Simple Framework for Structured Products
This guide breaks down a subset of fast-growing but complex assets.

Executive Summary
After a decade of near-zero interest rates smothering debt yields, a global pandemic that halted global supply chains, and a reopening that spurred red-hot inflation, investors would be forgiven for wanting to take some uncertainty off the table. Enter structured products: jack of all trades, master of none.

Structured products combine several different elements of other financial securities. What they all have in common is that they’re a form of debt, issued by a bank or financial intermediary. The money an investor receives is linked to the performance of one or more underlying assets, like stocks, commodities, or currencies. Like Frankenstein’s monster, these parts are sewn into a note and reanimated with flashy payoff profiles borrowed from exotic exchange-traded options strategies.

Exhibit 1 Payoff Chart of a Dual Digital Option

Their popularity is newfound, but structured products have been around for decades. They last came into vogue in the 1990s, when interest rates were falling, and investors were hunting for higher yields. Early versions of structured products were often esoteric, and providers often snuck steep fees and surprise charges. Over the years, technological innovations and a softening regulatory posture have increased access to structured products. That said, in many essential respects, these tigers have not changed their stripes.
The use cases for structured products are as diverse as the instruments themselves. Structured products can hedge against specific risks—such as interest-rate or currency fluctuations—or address more general objectives like ensuring income or enhancing returns. Although they often promise to dampen market risk, structured products carry unique risks.

- Combining elements of several financial instruments makes structured products tricky to monitor across changing market environments.
- Structured products are bespoke, so they are often tough to resell.
- Relative to exchange-traded options, these instruments have long time horizons, effectively locking up investors’ capital until maturity.
- Banks are the main providers of structured products, exposing investors to significant counterparty risks.
- The cost structure of these instruments is opaque. The vast majority are exorbitantly expensive.

To help investors wade through the complex swamp of products and profiles, Morningstar has created a framework to help investors contextualize structured products’ continued momentum and classify these assets relative to the rest of their portfolios.

**Key Takeaways**

- Despite clear drawbacks, structured products have grown dramatically since Morningstar last examined the asset class in 2020. Rising interest rates have not dented enthusiasm; instead, it has rotated from products with yield enhancements toward those offering some form of a hedge.
- In 2022, in recognition of rising interest, Morningstar inked a partnership with Luma Financial Technologies to bring a structured products dataset to Morningstar clients.
- Atop Luma’s dataset, within this paper we have built a bucketing approach by which to parse the array of features that are most commonly found in structured products: income, principal protection, optionality, and return structuring.
- Most third-party categorization systems capture the first three groups in some form or fashion, but they fall short of identifying structured products where the returns are reshaped.
- We find that among the structured products that currently live in Luma’s dataset, principal protection is the most popular characteristic, with more than 80% of structured products offering some sort of downside hedge.
- In keeping with their a la carte approach, structured products track many different types of underlying assets: single stocks, baskets of stocks, indexes, baskets of indexes, and even some bonds and commodities.
- To help investors gauge the positioning of their structured products relative to Morningstar’s outlook, we have linked our Morningstar Ratings for stocks to structured products within Luma’s database that track a single stock under our coverage. We have run this analysis both at issuance and over time, allowing us to measure how structured products are positioned relative to our estimates of the underlying stocks’ fair values.
- We have found that most structured products that were live and active as of February 2023 offered excessive downside protection relative to our outlook at issuance. Put another way, we believe that
most stocks tracked by a structured product are undervalued, which renders downside protection irrelevant for long-term-focused investors.

Encouragingly though, we also determined that most structured products that feature adverse optionality—meaning an embedded option that favors the issuer rather than the investor—are unlikely to be exercised should the stocks they track converge with our fair value estimate over the life of the note. However, we only have access to products that are active and currently traded within Luma’s database, so we can’t ascertain how much survivorship bias contributes to this relationship.

So, What Gives?
Structured products have a key advantage, though: flexibility. Issuers can tailor them to meet specific investor needs or behavioral preferences. For example, investors looking to protect against market downturns can invest in structured products that provide a guaranteed minimum return. In contrast, investors looking to juice their returns can invest in products that provide amplified exposure to a market index or sector.

This flexibility has made structured products compelling for retail investors daunted by the ongoing maintenance required to hedge with exchange-traded options. Indeed, most outstanding notes are owned by moms and pops. However, structured products have also gained traction with institutional investors such as pension funds and insurance companies. Years of low yields on fixed-income products have left these institutions scrounging for other sources of return without forgoing principal protection. Banks, which struggled throughout the 2010s to diversify their sources of revenue after the global financial crisis, were only too happy to provide them.

Exhibit 2 Bulge Bracket Banks Are the Largest Issuers of Structured Products in North America

<table>
<thead>
<tr>
<th>Firm</th>
<th>Number of Products</th>
</tr>
</thead>
<tbody>
<tr>
<td>JPMorgan</td>
<td></td>
</tr>
<tr>
<td>BMO</td>
<td></td>
</tr>
<tr>
<td>Morgan Stanley</td>
<td></td>
</tr>
<tr>
<td>Goldman Sachs</td>
<td></td>
</tr>
<tr>
<td>Citigroup</td>
<td></td>
</tr>
</tbody>
</table>

Blooming Where Planted

There are several reasons for the structured product renaissance. Initially, they gained traction because financial conditions were ripe. Like the 1990s, the 2010s brought low interest rates that made it difficult for investors to earn sufficient income from traditional investments such as bonds and savings accounts. Structured products offered a higher yield than bonds. Crucially, they allowed investors to keep some stock exposure, which performed better than bonds throughout the decade.

Rates have risen steadily since March 2022, though, and as of March 2023, a two-year T-bill yielded more than 5% annualized. Despite that, demand for structured products has shown no sign of abating. Why is that? Increased market volatility led to greater demand for a different flavor of structured products—ones that protect investors on the downside. Structured products can be tweaked to provide different levels of protection, from capital guarantees to partial protection against market downturns.

The two most common approaches are the barrier approach and the buffer approach. A barrier note protects an investor against losses until a certain limit is breached. If the underlying security breaches that limit, an investor loses the entire amount. Meanwhile, a buffer note protects an investor down to a certain limit, but that limit is supported even if the underlying security breaches that price level. For instance, if that downside level is 10% and the underlying stock loses 11%, a barrier note would lose 11%, and a buffer note would lose 1%.

Exhibit 3 Principal Protection Features Are Increasing in Popularity

Two secular tailwinds supported the favorable market environment. New technology-enabled investment platforms like Luma have made it easier for advisors to buy structured products for clients. Many online vendors now offer structured products alongside traditional investment products, making
them more accessible to a wider range of investors. These websites feature slick user interfaces that make it easier to break down structured products’ complex payoff profiles.

Second, the regulatory environment has tilted in favor of structured products. Regulators have increased issuer transparency by requiring greater disclosure and implementing suitability requirements. These enhancements have bolstered confidence in the asset class and ultimately driven further adoption. In some jurisdictions, regulators have taken it a step further by relaxing rules around marketing and distribution, making it easier for financial institutions to offer structured products to retail investors.

**More Thorn Than Rose**

Despite a track record of modest improvements and rapidly growing popularity, structured products can have several flaws that render them unapproachable. One of the primary concerns is complexity. Structured products offer a litany of features, many of which have inscrutable names even to sophisticated investors.

![Exhibit 4: Outside of Finance, Common Terms to Classify Structured Products Are Anything But](image)

Even if all these terms made sense, it’s unlikely that most investors would be able to juggle all the different ways that they interact when combined. The use of derivative-like payoff profiles in structured products can make them highly sensitive to changes in market conditions, including interest rates, volatility, and credit spreads. These types of products can carry a lot of leverage, which can amplify potential gains but also increase the risks of losses. It takes a great deal of expertise and resources to keep tabs on how these attributes morph in different market conditions. This is partly why exchange-traded options markets were closed to retail investors for decades.
Another problem is product opaqueness. Some fees are reported as a separate line item, typically classified as "underwriting fees." Issuers pay underwriting fees to the brokers that sell the instruments to investors. Other markups are baked into the product itself. The dollar value of these charges can only be backed out by calculating the difference between the par value of the instrument—the price an investor pays—and the expected value of its underlying components. Studies conducted by Morningstar and others place the value of these fees at roughly 2.9% of the instrument's par value.1,2

This type of compensation model is quite popular in the insurance industry, especially with hybrid financial products like variable annuities, which could explain the labeling of commission fees as underwriting fees. The parallels don’t stop there. Both structured products and insurance feed off a well-known quirk in behavioral finance.

The prospect theory, pioneered by behavioral economists Daniel Kahneman and Amos Tversky, states that investors dislike losses much more than they like gains.3 Investors are willing to forgo extra profits if it means they can eliminate or reduce the risk of losing money. In the insurance industry, this means that policyholders are much more likely to choose a policy with a high monthly premium and a low annual deductible, even for adverse events that aren’t likely to happen. Financially, this is irrational: Policyholders pay more at the end of each year in premiums than they would if they hit the higher deductible on a normally distributed basis. But on a behavioral economics level, this feels rational for policyholders because it reduces their chances of unexpectedly incurring a loss.

Structured products prey on a similar desire for stability in a different context. Instead of insuring against a house fire or a clumsy teenage driver, structured products offer security from adverse market conditions. Investors can shield themselves against shortfall risk by locking in a high income payout or mitigate a sequence of return risk by creating a buffer against depreciation. But investors are probably over-insured against this outcome.

**Bucketing the Baskets**

Structured products are described based on the features that they offer, using terms so arcane and abstract that they might as well be fished from the back of a securities textbook. Terms like "cliquet," "snowball," and "dual directional" are difficult to decipher on their own, let alone when you find them in combination, as in "Capped Dual Directional Weighted Basket Buffer Note." Labels that dense don’t effectively convey what the product is designed to do and may even be misinterpreted by sophisticated investors.

To create a shorthand, we’ve bucketed the most popular features of structured products into four objectives: principal protection, income, return structuring, and optionality. The objectives are nonexclusive, meaning a structured product may offer principal protection and optionality, for example.

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That's because structured products often cherry-pick features from different groups for maximum reach. But by grouping these notes in this way, we can provide more explicit definitions for which goal each product is attempting to address. This will help investors better understand how their products are helping—or hurting—them.

**Exhibit 5** Principal Protection Is the Most Popular of All 4 Objectives

<table>
<thead>
<tr>
<th>Type</th>
<th>Number of Products</th>
</tr>
</thead>
<tbody>
<tr>
<td>Principal Protection</td>
<td><img src="chart.png" alt="Bar Chart" /></td>
</tr>
<tr>
<td>Return Structure</td>
<td><img src="chart.png" alt="Bar Chart" /></td>
</tr>
<tr>
<td>Optionality</td>
<td><img src="chart.png" alt="Bar Chart" /></td>
</tr>
<tr>
<td>Income</td>
<td><img src="chart.png" alt="Bar Chart" /></td>
</tr>
</tbody>
</table>


Structured products with principal protection features are designed to protect the investor's initial investment, either partially or fully. This bucket encompasses barrier notes, buffer notes, and minimum return products, among others. These products are particularly attractive to risk-averse investors, as they offer a level of downside protection.

The income bucket captures structured products designed to amplify or reshape the income delivered to investors. This includes products with fixed interest, contingent interest, or coupon memory. These notes are commonly used by investors seeking higher income from their investments, while still having some exposure to other assets like stocks or market indexes.

Structured products with optionality adopt the payoff profiles of derivatives in some way. This includes products that are capped, have digital returns, or lookback windows. Unlike exchange-traded call and put options, which always give investors more choices, in some cases the optionality embedded in structured products can actually work against investors. Take "autocallable" and "issuer callable" notes, for instance. These are products where the issuer receives a call option instead of the investment's owner. The issuer can exercise the option if it so chooses, and in those cases, the contract would be terminated.
Finally, structured products with return structuring aim to either transform the performance profile of the underlying asset or combine the performance of multiple assets. Many of these features artificially reduce volatility by changing how frequently returns are calculated. One feature unique to structured products is the "worst of" basket, where investors earn the return of the security that underperforms the most relative to a preselected bunch over the life of the product. This is a feature not commonly found in other financial instruments because it puts investors at a disadvantage in many market contexts, although it can spare investors some pain on the margin if there’s an embedded call option in their note.

Exhibit 6 How Features Are Shared by Structured Products
Single-Purpose Vehicles Are Rare.

Other Options for Optionality

Structured products have carved out a niche in the investment management industry by offering all four features under one contract. But they’re far from the only type of investment that can multitask, so we’ve developed a framework for considering the supplemental features that structured products bring to a portfolio, and whether or not other investments could offer similar touches at a lower price point.
### Exhibit 7 Investment Options: Features Across All 4 Categories

Annuities and bonds have 20-year life spans, while structured products and options are between 1.0 and 1.5 years.

<table>
<thead>
<tr>
<th>Instrument</th>
<th>Example</th>
<th>Income (Nominal Yield)</th>
<th>Principal Protection</th>
<th>Optionality</th>
<th>Return Structuring</th>
<th>Return of Capital</th>
</tr>
</thead>
<tbody>
<tr>
<td>Structured Products</td>
<td>Citigroup Issuer Callable Contingent Interest Worst Of Barrier Note</td>
<td>10.0%</td>
<td>Partial</td>
<td>Issuer Only</td>
<td>Worst Of</td>
<td>At expiration or termination</td>
</tr>
<tr>
<td>Fixed Annuities</td>
<td>20-Year Period Certain SPIA</td>
<td>7.0%</td>
<td>Full</td>
<td>None</td>
<td>None</td>
<td>Distributed annually</td>
</tr>
<tr>
<td>Multi-Asset Income Funds</td>
<td>BlackRock Multi-Asset Income</td>
<td>5.2%</td>
<td>None</td>
<td>None</td>
<td>Weighted Basket</td>
<td>At liquidation</td>
</tr>
<tr>
<td>Treasury Bonds</td>
<td>20-Year T-Bond Feb. 15, 2043</td>
<td>3.9%</td>
<td>Full</td>
<td>None</td>
<td>None</td>
<td>At expiration</td>
</tr>
<tr>
<td>Convertible Bond Funds</td>
<td>Virtus Convertible</td>
<td>1.5%</td>
<td>None</td>
<td>Asset Manager Only</td>
<td>Weighted Basket</td>
<td>At liquidation</td>
</tr>
<tr>
<td>Options-Writing</td>
<td>JPMorgan Hedged Equity</td>
<td>1.0%</td>
<td>Partial</td>
<td>Issuer &amp; Asset Manager Only</td>
<td>Weighted Basket</td>
<td>At expiration</td>
</tr>
<tr>
<td>Exchange-Traded</td>
<td>1-Yr OTM S&amp;P 500 Put Feb. 16, 2024</td>
<td>0.0%</td>
<td>Full</td>
<td>Full</td>
<td>None</td>
<td>None</td>
</tr>
</tbody>
</table>

It’s important to note that while none of the offerings matches the Citigroup note’s nominal yield of at least 10%, it’s unlikely that the structured note itself will live up to that stated interest rate. That’s because the embedded call option makes it doubtful that the note will survive all the way to maturity, unless the worst performer of the Russell 2000, S&P 500, and Nasdaq-100 indexes meets Citigroup’s condition that the laggard’s return does not exceed the note’s principal value. Calling away the structured product prior to maturity reduces an investor’s effective yield over the life of the instrument. None of the other investment options listed here would force the investor to accept full prepayment of a security’s principal before maturity.

A note on what each of the following alternative strategies to structured products entails:

1. **Fixed Annuities**: Buy a SPIA, or single-premium immediate annuity, which is a type of fixed annuity.
   
   These contracts guarantee fixed payments until the investor dies. To achieve such lofty payout ratios, insurers distribute a certain portion of the initial lump sum every month. If the policyholder dies before the principal runs out, any remaining principal belongs to the issuer. But, if a policyholder outlives their principal, the insurer still guarantees their income, and the insurer eats the loss.

2. **Multi-Asset Income Funds**: Buy and hold a mutual fund with a mandate to invest for income. These strategies court more risk than annuities. Principal is not guaranteed, yields are not stable, and these strategies are sometimes forced to forgo higher expected return opportunities in favor of securities that pay out a higher proportion of their returns as income. That said, they are typically cheaper than annuities and allow investors to retain control of their assets.
3. Treasury Bonds: Buy and hold a 20-year bond. Unlike a SPIA, this strategy comes with reinvestment risk if the investor outlives the 20-year holding period. On the other hand, the note returns your principal once it expires, and it’s effectively guaranteed. (An impending debt-ceiling showdown notwithstanding.)

4. Convertible Bonds: Convertible bonds are still considered an esoteric investment. But like structured products, they offer a stock-bond hybrid performance profile and some embedded optionality to boot. That’s because the bond gives investors the option to convert the debt into a slice of common stock. Now, these bonds are typically issued by firms already laden with debt, which invites a significant amount of credit risk. So, we recommend investing in a diversified mutual fund like Virtus Convertible ANNPX to diffuse idiosyncratic credit risk.

5. Options-Writing Strategies: These mutual funds systematize the strategy that many structured product providers offer, but at a bigger scale. In the case of JPMorgan Hedged Equity JHEQX, lead portfolio manager Hamilton Reiner sells call options on the S&P 500 — just like a callable structured note. He redeploy the revenue he earns from writing those options into purchases of put options that protect the fund up to a 20% drawdown, like a buffer note.

6. Exchange-Traded Options: Finally, investors can reconstruct some of the payoff profiles of structured products with exchange-traded options. Purchasing put options protects against losses in their portfolios. The only problem is that most exchange-traded options have maturity dates shorter than a structured product, which means frequent tinkering is required to maintain the desired exposures.

Link to Build
Even in a simplified form, structured products can carry many bells and whistles. These features can make it challenging to understand how the instrument is supposed to perform relative to the underlying asset. Like a complicated sports bet, it can sometimes be easy to get caught up in the parlays and lose sight of whether you are betting on a team to win or lose.

Morningstar benefits from a deep library of qualitative and quantitative equity research ratings that assign valuations to more than 1,500 stocks across the globe. Through a partnership with Luma, a structured-products database, we can match up individual structured products with the companies whose performances they track. We can then match the structured products to the Morningstar Ratings on those stocks. This lets us showcase investment strategies where the structured product’s features align with our valuation outlook.
Before we go any further, it's important to note that our assessment of a stock's alignment with a given structured product does not confer any sort of rating or endorsement of the structured product itself. Rather, this tool can be used in the research phase to identify structured products with profit potential inconsistent with our outlook. This could happen either by eliminating potential future upside on a name that we expect may still have room to run or by failing to shield against losses in cases where depreciation is likely.

There are a few basic features common to structured products that we've highlighted here. According to our research, more than 80% of the structured products in Luma's database feature some type of downside-protection element. Most of these downside-protection features work like insurance, which means investors are covered up to a certain amount. If a stock's price falls below that amount, the investor absorbs some or all of the losses. We call the price at which an investor starts to lose money—that is, the price at which an investor’s downside cushion runs out—the trigger price.

We can compare that trigger price to Morningstar's estimate of the stock's fair value and make some determinations about the investor's coverage. Let's take a simple example of a structured product that's issued when a stock is trading at $15. The note features a trigger price of $10, and our fair value estimate is $12. When our fair value estimate is between the trigger price and the issue price (in this case, greater than $10 but less than $15), we can say that the amount of downside protection offered by the note is appropriate. Our expectation is that the stock should converge to its fair value at $12—somewhere above the price at which the downside protection runs out but below the price when the
note was issued. In that case, the downside protection element of the note would kick in and investors would be hedged against losses on that stock, and they would save $3.

### Exhibit 9 A Hypothetical Structured Product Where Morningstar's Fair Value Estimate Falls Within Barrier Range

![Graph showing the performance of a structured product based on Morningstar's fair value estimate.](source: Author's calculations. Data as of Feb. 28, 2023.)

Let's say our estimate of the stock's fair value is $8—below the trigger price. If that's the case and our forecasts are correct, the note may be at risk of breaching its downside protection level. When the downside protection level is breached (in our case if the stock price falls below $10), then the owner of the note is on the hook for any additional losses. If the stock converges to our fair value estimate, an investor would lose at least $2. They could also lose more than that. Depending on the type of note, an investor may also have to eat all of the losses from the issue price to the trigger price, too—a full $7, meaning the value of their hedge was worthless.

### Exhibit 10 A Hypothetical Structured Product Where Morningstar's Fair Value Estimate Falls Below Barrier Range

![Graph showing the performance of a structured product based on Morningstar's fair value estimate.](source: Author's calculations. Data as of Feb. 28, 2023.)
There's a third scenario available to us as well: What happens if our fair value estimate is above the issue price? Let's say that we believe the stock is currently undervalued at $15 and likely to appreciate to $20 in the long run. In that case, a downside buffer may be an excessive precaution to take. For a long-term investor, a hedge may not be necessary at all.

Exhibit 11 A Hypothetical Structured Product Where Morningstar’s Fair Value Estimate Falls Above Barrier Range

So, where do most structured products land? By using Luma’s database to run an analysis on notes that track stocks under analyst coverage and feature downside protection, we find that most common scenario is the last one. That is, for 46% of structured products, our fair value estimate was actually higher than the issue price when that note was issued. This pattern holds across time horizons but is more prevalent in years with sustained market drawdown, like 2020 (63%) and 2023 (76%). That makes intuitive sense. While issuers have latitude to set the issue price, issue prices are likely to be depressed if the structured notes are created at a time when the markets in general are in the red.

It’s true that downside protection, issued during turbulent markets, may be alluring to investors concerned about additional losses. In fact, 94% of the structured products in our database track a stock that’s lost value since it was issued, as of March 2023. That being said, the relationship to our fair value estimates indicate that this level of protection may be unnecessary for investors with a long-term outlook.

To optimize outcomes, the best time to purchase a note with downside protection is when prices are rich and close to fully valued. Financial advisors are well-positioned to help guide clients through these decisions: When is the right time to take risk off the table? When might a higher yield make sense, and what is an investor forgoing in order to get it?

Investors working with a good financial advisor shouldn’t need fancy hedges to absorb market volatility, assuming their asset allocation profile is aligned with their capacity to take risks. But these products’
"structured" parts incentivize commission-based advisors to sell. This can create a reliance on "flavor of the month" securities that are easiest to push when the markets have already priced in most of the downside. Indeed, Morningstar research has shown that commission-based financial advice creates suboptimal financial outcomes. During rocky markets in particular, the price for structured products is too low for an investor to get any other benefit besides peace of mind.

Oftentimes, there's another hidden price to be paid for this peace of mind. It comes in the form of a call option. Now, investors usually like call options, and for a good reason as they provide the flexibility to participate in the upside of an investment. But that's only true for the person that owns the option. For many structured products, the investor does not own the call option. Instead, it's owned by the issuer. The issuer can exercise the call option and terminate the contract—sometimes at will, other times during prespecified windows. When that call option is exercised, the investor must sell the note back to the entity that issued it and forgo any future returns.

While that may sound unappealing, selling a call option isn't always a bad trade. If the investor has already realized a large gain on the underlying security or thinks that it is likely to lose value in the future, there may be no need to participate in potential upside. There may be other features, like a higher income payout, embedded in the structured product that make it compelling enough to act as a counterparty.

In fact, over half of structured products with an embedded call option were issued with a strike price above Morningstar's estimate of the company's fair value on the day that note was issued. That means that, like most downside protection features, the call options are less likely to get used during the life of the structured product unless the stock moves away from our estimate of its fair value or our forecasts were subsequently revised upward. In this case, that's a good thing; investors are less likely to get their structured products called away from them.

Importantly, this assessment ignores a crucial principle for markets: survivorship bias. If there was a significant contingent of structured products with a strike price above Morningstar's estimate of fair value, they may have already appreciated past the strike price, and their issuers have already called them away. Luma's data partnership with Morningstar only covers active securities, so this remains an area for further research and study.
Research Methodology for Valuing Companies

Overview
At the heart of our valuation system is a detailed projection of a company’s future cash flows, resulting from our analysts’ research. Analysts create custom industry and company assumptions to feed income statement, balance sheet, and capital investment assumptions into our globally standardized, proprietary discounted cash flow, or DCF, modeling templates. We use scenario analysis, in-depth competitive advantage analysis, and a variety of other analytical tools to augment this process. We think analyzing valuation through discounted cash flows presents a better lens for viewing cyclical companies, high-growth firms, businesses with finite lives (mines, for example), or companies expected to generate negative earnings over the next few years. That said, we don’t dismiss multiples altogether but rather use them as supporting cross-checks for our DCF-based fair value estimates. We also acknowledge that DCF models offer their own challenges (including a potential proliferation of estimated inputs and the possibility that the method may miss short-term market-price movements), but we believe these negatives are mitigated by deep analysis and our long-term approach.

Morningstar’s Equity Research Group (“we,” “our”) believes that a company’s intrinsic worth results from the future cash flows it can generate. The Morningstar Rating for stocks identifies stocks trading at a discount or premium to their intrinsic worth — or fair value estimate in Morningstar terminology. Five-star stocks sell for the biggest risk-adjusted discount to their fair values, whereas 1-star stocks trade at premiums to their intrinsic worth.

Four key components drive the Morningstar rating:

- our assessment of the firm’s economic moat.
- our estimate of the stock’s fair value.
- our uncertainty around that fair value estimate.
- the current market price.

This process ultimately culminates in our single-point star rating.

Economic Moat
The Morningstar Economic Moat Rating is a structural feature that Morningstar believes positions a firm to earn durable excess profits over a long period of time, with excess profits defined as returns on invested capital above our estimate of a firm’s cost of capital. The economic moat rating is not an indicator of the investment performance of the investment highlighted in this report. Narrow-moat companies are those that Morningstar believes are more likely than not to achieve normalized excess returns for at least the next 10 years. Wide-moat companies are those that Morningstar believes will earn excess returns for 10 years, with excess returns more likely than not to remain for at least 20 years. Firms without a moat, including those that have a substantial threat of value destruction-related risks related to environmental, social, and governance; industry disruption; financial health; or other idiosyncratic issues, are more susceptible to competition. Morningstar has identified five sources of economic moats: intangible assets, switching costs, network effect, cost advantage, and efficient scale.

Fair Value Estimate
Each stock’s fair value is estimated by using a proprietary discounted cash flow model, which assumes that the stock’s value is equal to the total of the free cash flows of the company is expected to generate in the future, discounted back to the present at the rate commensurate with the riskiness of the cash flows. As with any DCF model, the ending value is highly sensitive to Morningstar’s projections of future growth.

Fair Value Uncertainty
The Morningstar Uncertainty Rating represents the analysts’ ability to bound the estimated value of the shares in a company around the fair value estimate, based on the characteristics of the business underlying the stock, including operating and financial leverage, sales sensitivity to the overall economy, product concentration, pricing power, exposure to material ESG risks, and other company-specific factors. Based on these factors, analysts classify the stock into one of several uncertainty levels: Low, Medium, High, Very High, or Extreme. Our recommended margin of safety — the discount to fair value demanded before we’d recommend buying or selling the stock — widens as our uncertainty of the estimated value of the equity increases.

Market Price
The market prices used in this analysis and noted in the report come from exchanges on which the stock is listed, which we believe is a reliable source.
Morningstar Rating for Stocks

The Morningstar Rating for Stocks is a forward-looking, analyst-driven measure of a stock's current price relative to the analyst's estimate of what the shares are worth. Stock star ratings indicate whether a stock, in the equity analyst's educated opinion, is cheap, expensive, or fairly priced. To rate a stock, analysts estimate what they think it is worth (its “fair value”), using a detailed, long-term cash flow forecast for the company. A stock's star rating depends on whether its current market price is above or below the fair value estimate. Those stocks trading at large discounts to their fair values receive the highest ratings (4 or 5 stars). Stocks trading at large premiums to their fair values receive lower ratings (1 or 2 stars). A 3-star rating means the current stock price is close to the analyst's fair value estimate.

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