

Short & Leveraged Exchanged Traded Products

A WisdomTree guide



WISDOMTREE®

At WisdomTree, we do things differently

Our investments provide investors with the potential for income, performance, diversification and more. We sponsor distinct exchange traded investments that span asset classes, strategies and countries around the world.

The WisdomTree family includes pioneering equity, fixed income, commodity, FX, and short and leveraged ETPs and UCITS ETFs. It is one of the most comprehensive, innovative ranges of specialist ETPs in the world—which enables investors to build and diversify their portfolios intelligently.

Our extensive Short & Leveraged platform offers a range of fully collateralised ETPs which are available in leverages between -1x +5x. Through these award-winning products, investors can access a broad range of Equities, Commodities, Fixed Income, Alternatives and Currency strategies, meaning they can magnify returns on a daily basis through positive or inverse leverage; take a hedging position efficiently; and access alternative or unique strategies.

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04 Short and leveraged ETPs

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01 Introduction

“Buy and hold” strategies have long been a core principle for value investing. Investors have been advised (and learned from experience) to look to the long term. Sophisticated investors, however, often complement their “buy and hold” strategies with short-term, tactical trading.

Sophisticated investors look to leveraged products to express views on the market direction and momentum and magnify their gains or to hedge their overall portfolio against temporary market dislocations. With tactical trading instruments, investors can implement high conviction views, increase short term returns, take advantage of market pricing anomalies and hedge risks in their portfolios.

Short and leveraged ETPs make these investment tactics available to sophisticated investors in a single trade on regulated exchanges. The first short and leveraged ETPs were introduced to the market in 2005. Since then, the segment has seen assets under management grow to US\$8.3bn in Europe and US\$77.9bn globally, across a range of asset classes¹.

This specialised branch of ETPs, like other investment products offering short and leveraged exposure, requires a certain level of expertise and due diligence. Media and regulatory coverage has highlighted a lack of understanding by many investors as to how short and leveraged ETPs work and the risks they entail.

The purpose of this guide is to provide an informative reference point for investors seeking to educate themselves about the opportunities and the risks presented by short and leveraged ETPs. With a full understanding of how the products work, investors will be able to use short and leveraged ETPs to their full potential.

02 What is an Exchanged Traded Product?

An Exchange Traded Product (ETP) is a financial instrument that provides exposure to a target benchmark or index while trading like an ordinary share on a stock exchange. ETPs have grown in popularity due to their ability to offer a cost-efficient solution to benchmark replication while maintaining intraday liquidity.

Initially focused in the equity market, ETPs have expanded to cover exposures across a broad range of asset classes and securities, offering investors a simple means of diversifying their portfolios.



Characteristics of ETPs

An ETP is a financial instrument traded on a stock exchange. Typically, the aim of an ETP is to provide the same return as a specified benchmark or asset (before fees). Although ETPs can take a number of forms, they share some common characteristics.

Characteristic	Benefit
Passive investment	Cost-effective and transparent way of gaining exposure to a benchmark or asset as management fees are generally lower than active and index mutual funds
Tracks an underlying	Aims to provide the same return as an underlying benchmark or asset, offering a diversified investment in a single transaction
Open-ended	Shares can be created as necessary to meet demand
Listed on exchange	Investment performance is accessible intraday through the provision of live prices
Trades like shares	As simple to buy and sell as shares are any time the market is open
Liquid asset	Liquid asset that is supported by pool of authorised participants and market makers ³

ETPs are designed to replicate the return of an underlying benchmark or asset, with the easy access and tradability of a share. Investors can benefit from the broad diversification of an equity benchmark, gaining exposure to hundreds or thousands of individual securities in a single transaction. Additionally, the wide range of asset classes covered by ETPs opens up more exotic investment areas which historically could only be accessed by institutional investors (such as individual commodities or emerging markets). ETPs generally do all this with a lower fee than actively managed funds and therefore compete with traditional index funds on cost.

IN EUROPE, ETPS ARE USUALLY DIVIDED INTO THREE CATEGORIES:

ETFs

Exchange Traded Funds

- + equity indices
- + commodity indices
- + fixed income
- + money markets
- + private equity indices
- + hedge funds indices

ETCs

Exchange Traded Commodities & Currencies

- + individual commodities (e.g., gold, oil, agriculture, industrial metals, etc.)
- + commodity baskets
- + currencies

ETNs

Exchange Traded Notes

- + generally issued by banks
- + usually entirely reliant on the creditworthiness of the issuing entity

The types of ETP

ETFs: Exchange Traded Funds

An ETF is an investment fund that trades on a stock exchange as a single security and is designed to track an underlying benchmark. Similar to mutual funds, ETFs are open-ended (meaning that shares can be created/redeemed to match demand) but ETF shares can be traded intra-day.

In the European Union, most ETFs are governed by laws regulating collective investment schemes, known as Undertakings for Collective Investment in Transferable Securities (UCITS). UCITS are recognised globally and are marketed throughout the world, providing a number of important safeguards for investors:

- + SEGREGATED ASSETS: to minimise risk to investors in the event of bankruptcy by the ETP provider.
- + INCREASED TRANSPARENCY: requires that certain information is made available to investors.
- + DIVERSIFICATION LIMITS: to protect investments becoming concentrated in a single asset.

These safeguards have contributed to the popularity of ETFs among both investors and providers.

EXAMPLES OF ASSET TYPES

Equity	Fixed income	Money market	Alternatives
Global	Government	EONIA	Private Equity
Sectors	Corporate	SONIA	Hedge Funds
Emerging Markets	Inflation-linked	Federal Reserve Funds	Volatility
Single Country	High yield	Diversified indices	Property
	Mortgage-backed		Commodities
	Emerging Markets		

ETCs: Exchange Traded Commodities

ETCs are debt securities that pay no interest and are designed to provide exposure to commodities (individual or baskets). They are not UCITS themselves, but the majority of ETCs are eligible for investment by UCITS

EXAMPLES OF ASSET TYPES

Agriculture	Industrial metals	Energy	Precious metals	Diversified
Grains	Aluminium	Brent crude oil	Gold	Commodity baskets
Cocoa	Copper	WTI crude oil	Silver	Ex-agriculture
Coffee	Lead	Carbon emissions allowances	Platinum	Ex-energy
Corn	Nickel	Natural gas	Palladium	
Cotton	Tin	Refined products		
Soybeans	Zinc			
Sugar				
Wheat				

Since UCITS mandate a minimum level of diversification for collective investment vehicles and restrict the asset types that can be held, product providers needed an alternative structure to provide investors access to individual commodities. In Europe, the solution was to use a debt security issued by a special purpose vehicle (SPV) with segregated assets:

- + **DEBT STRUCTURE:** means ETCs are subject to different regulatory treatment to ETFs and are not restricted by the UCITS diversification requirements. This allows them to offer investors exposure to a single or small number of commodities.
- + **SPV:** being issued by an SPV means the product's assets are segregated from the product provider and could not be used to discharge the product provider's liabilities if it were to go bankrupt.
- + **COLLATERALISED:** ETCs are often backed by either the physical asset or a derivative that gives exposure to an asset. Obligations under a derivative contract in an ETC are usually collateralised.

The ETC structure has also been used to offer investors access to currencies, whether as individual currency pairs (leveraged and unleveraged) or a currency basket.

ETNs: Exchange Traded Notes

ETNs operate differently from ETFs and ETCs, and are not UCITS compliant. Like ETCs, ETNs are non-interest bearing debt securities that are designed to track the return of an underlying benchmark or asset. However, ETNs are generally issued by banks rather than SPVs. They hold no assets, and are not usually collateralised. In this way, they are similar to unsecured, listed bonds—as they are entirely reliant on the creditworthiness of the issuing entity.

ETP Summary

	ETF	ETC	ETN
Security type	Collective investment vehicle	Debt security	Debt security
Governed by UCITS	Yes	No	No
Commodity access	Limited*	Yes	Yes
Issuer credit risk	Limited	Limited	Yes
Eligible by UCITS	Yes	Yes	Yes

*UCITS prohibits ETFs from holding physical commodities and requires a minimum level of diversification. This means that ETFs can only be used to access certain diversified commodity indices.





03 Short & leveraged positions

Using short and leveraged positions

Margin

Short Selling

Using short and leveraged positions

Short and long positions

A short position in a security, such as shares, means that the holder of the position will profit if the value of the security goes down. This is in contrast to a conventional long position, where an investor profits from a rise in the value of an asset. Short positions can be used to protect against, or profit from, declining asset prices.

Leveraged positions

A leveraged (or geared) position multiplies both the positive and negative returns of an investment. Both long and short positions can be leveraged. The potential returns and losses from a leveraged position will be greater than from the equivalent unleveraged position.

Leveraged positions can be used to achieve a certain level of exposure to the market for less upfront cash, using the surplus for alternative investments or for cash reserves. Alternatively, an investor may wish to pursue a more aggressive strategy and use leverage to gain increased exposure, expecting to gain additional profits.

PRESERVE CAPITAL

Leveraged positions require less cash to achieve a target level of exposure—leaving surplus for alternative investments, and reducing the upfront cash risked.

MAGNIFY EXPOSURE

With leveraged positions, investors can get additional exposure using the same cash as an unleveraged investment.

HEDGE MARKET RISK

Short positions can be used to offset potential losses/gains that may be incurred by a long position—providing more certainty about future prices, regardless of market conditions.

PROFIT FROM MARKET DECLINE

Short positions provide investors with a mechanism to profit when the market falls.

EMPLOY SOPHISTICATED TRADING STRATEGIES

For example, a long/short strategy that involves a long position on shares expected to rise in value and a short position on other shares expected to fall in value.

Margin

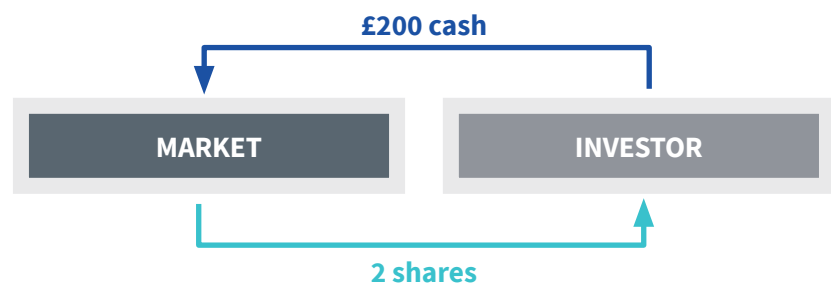
When investors borrow money to increase exposure to the preferred asset, they generally borrow from a broker or other financial intermediary.

The broker sets up an account (known as a margin account). The investor typically pays interest and is asked to keep a certain level of assets in the margin account to minimize credit risk. The investor can enter into contracts and bets, which provide a certain level of exposure to the price movements of an asset while maintaining a cash balance of just a fraction of that exposure.

As explained in more detail below, options, futures, contracts for difference (CFDs) and spread bets also make use of margin accounts to provide short and long exposure with leveraged returns.

Today's share price:

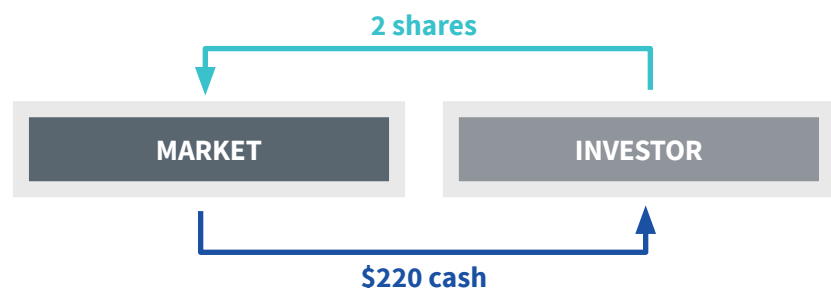
£100



The investor has £100 in the account, but buys £200 worth of shares—the extra £100 borrowed “on margin”.

Tomorrow's share price:

£110



The share price rises 10% to £110, so the investor can sell 2 shares for £220. This £20 profit (before borrowing costs) is a 20% return on the account balance of £100, whereas the investor would have only been able to buy 1 share (and make a 10% profit) without the margin account.

Short selling

A short sale involves borrowing securities and selling them on the market, with the expectation that the market price will decrease.

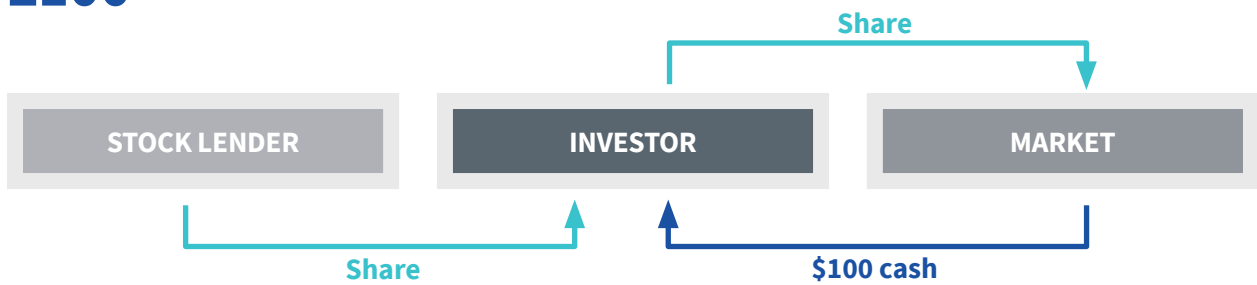
The fall in the market price enables the borrower to repurchase the securities for less than their initial sale price. The investor then returns them to the lender while retaining the proceeds from the short sale. Short selling usually requires a margin account with a broker, and an investor needs to maintain a certain level of assets in the account. There are usually financing costs for borrowing the securities. The cost of repurchasing the securities could rise significantly, so the investor's losses are potentially large.

INVESTING WITH LEVERAGE

Investors have used a wide range of methods to gain short and long exposure with leverage. A summary of some of the more traditional methods is provided below.

Today's share price:

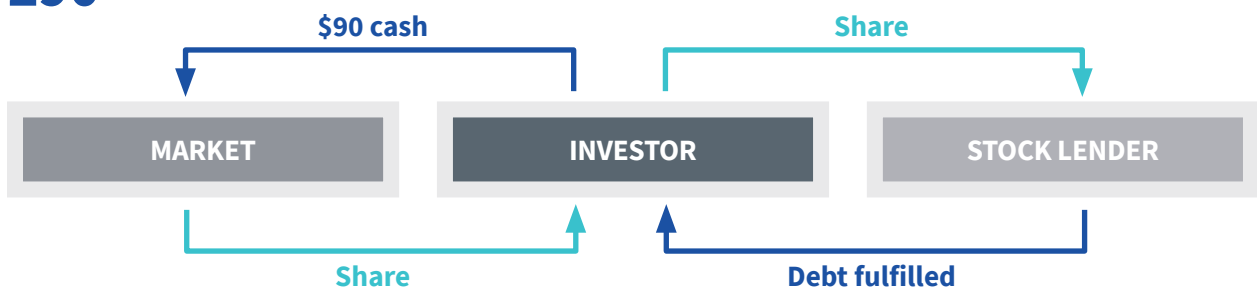
£100



Receives £100 and owes 1 share (plus borrowing costs).

Tommorrow's share price:

£90



Pays £90 and returns 1 share, making £10 profit (less borrowing costs).

Futures contracts

Investors can buy (a long position) or sell (a short position) futures contracts. The buyer is obliged to buy (and the seller is obliged to sell) an asset in the future at a price set now. The buyer or seller can profit in a similar way to the use of a call or put option as described above. However, the difference between the price of the asset set when the futures contract was negotiated and the price of the asset when it is settled can be significant. Futures traders will need to maintain a percentage of the contract's value in a margin account as collateral.

Contracts for difference (CFDs)

CFDs create a contract between two parties speculating on the movement of an asset price. If the asset falls in price, the seller receives cash from the buyer and vice versa. The asset price could move significantly, so the losses of either are potentially large (depending on the leverage factor and the size of the contract). CFDs are traded on margin with brokers so financing and commission costs are applicable.

Warrants, certificates and structured products

A number of financial institutions offer financial products that provide investors with short and leveraged exposure to a wide variety of assets. Often referred to as warrants, certificates or structured products, these instruments may be listed or unlisted. Their liquidity is often dependent on the financial institution that issued them and some products may be costly to sell prior to expiration. Finally, they are generally uncollateralised, exposing investors to the credit risk of the issuer.

Spread betting

A spread bet is a bet on the movement of an asset price. The seller of the spread bet is short and profits if the asset falls below the sell price, but must pay out if the asset price rises. Spread bets operate in a similar way to CFDs. The asset price could rise significantly, so the seller's losses are potentially large. The bet is placed with a spread betting provider (which acts as a market maker) and financing costs are built into the spread between the buy and sell price, though interest may also be charged.

Options

Options are contracts sold by one party (the option seller) to another party (the option buyer). The contract offers the buyer the right to buy (call) or sell (put) an underlying at an agreed-upon price (the strike price) during a certain period of time or on a specific date (exercise date). The key difference between options and futures is there is no obligation to buy or sell the underlying security when trading options. In other words, the right will only be exercised when there is a profit to be made.

Call options provide a long exposure, giving the holder the right to buy at certain price on a pre-agreed date in the future. The buyer of the call would want the price of the underlying to increase in order to profit from the difference in the pre-agreed price and the price of the underlying at the time.

Put options, on the other hand, provide a short exposure and give the option holder the right to sell at a certain price on a pre-agreed date in the future. Thus, the buyer of the put would want the price of the underlying to decrease.

Investors can gain short or leveraged exposure when buying options, because they are exposed to the full price of the underlying asset, but only initially pay for the cost of the contract (the option premium).

COLLATERAL

Generally, asset(s) that a borrower offers as security for a debt. In the context of ETPs, collateral usually refers to assets offered by swap providers to secure their payment obligations under a swap agreement.





04 Short & leveraged ETPs

What are short and leveraged ETPs?

Structure of short and leveraged ETPs

Why use short and leveraged ETPs?

Short and leveraged returns

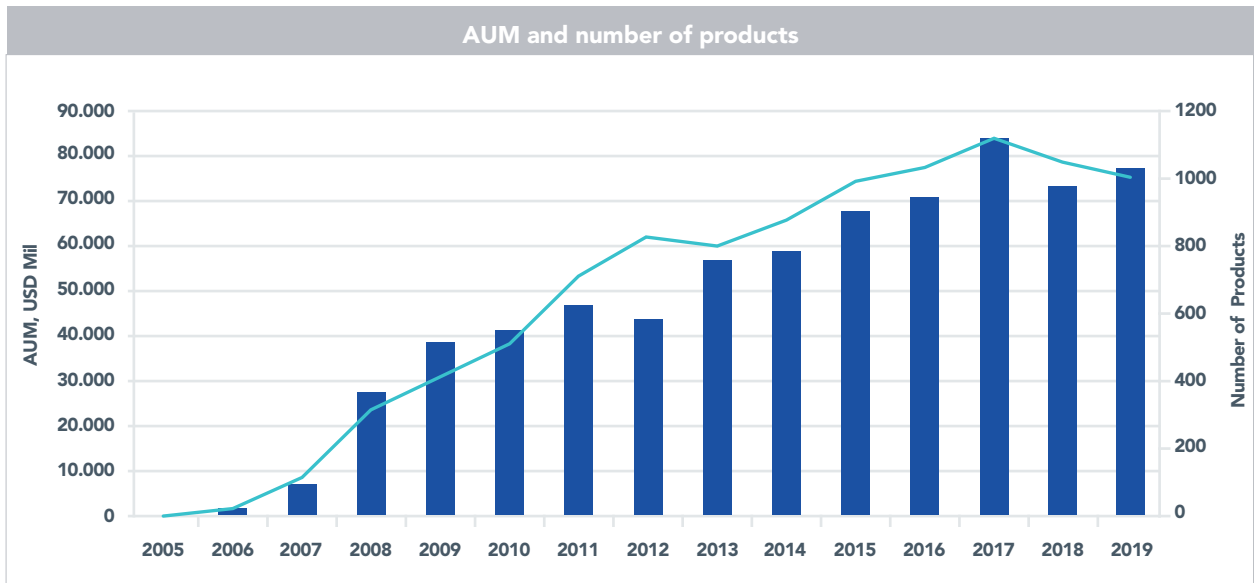
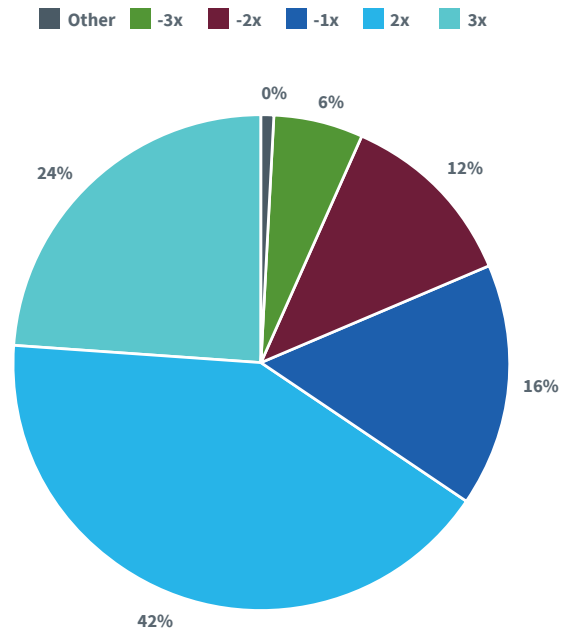
Short and leveraged ETPs and other vehicles

What are short and leveraged ETPs?

Short and leveraged ETPs comprise of leveraged long products (e.g. 2x, 3x or 5x), as well as non-leveraged and leveraged short products (e.g. -1x, -2x, -3x or 5x).

Short and leveraged ETPs allow investors to access short and leveraged returns via exchange traded, liquid, cost-efficient, collateralised financial products. Short and leveraged ETPs reference a wide variety of asset classes, including equities, fixed income, commodities and currencies.

The first short and leveraged ETPs were introduced to the market in 2005. Since then, the segment has seen assets under management grow to US\$9.8bn in Europe. Globally, as shown in the chart below, assets have surpassed US\$67bn, whilst the number of listings reached 1,204.²



	2005	2006	2007	2008	2009	2010	2011	2012	2013	2014	2015	2016	2017	2018	2019
AUM	88	1,576	6,193	27,381	38,957	41,477	46,733	43,799	57,143	58,989	67,853	70,492	84,227	74,226	77,952
Num. of ETPs	9	29	117	286	385	513	713	820	811	880	983	1,028	1,122	1,051	1,011

Source: WisdomTree, Bloomberg, as of 28 February 2019

Structure of short and leveraged ETPs

Like other ETPs, short and leveraged ETPs are passive investments that replicate the return of an underlying benchmark or asset.

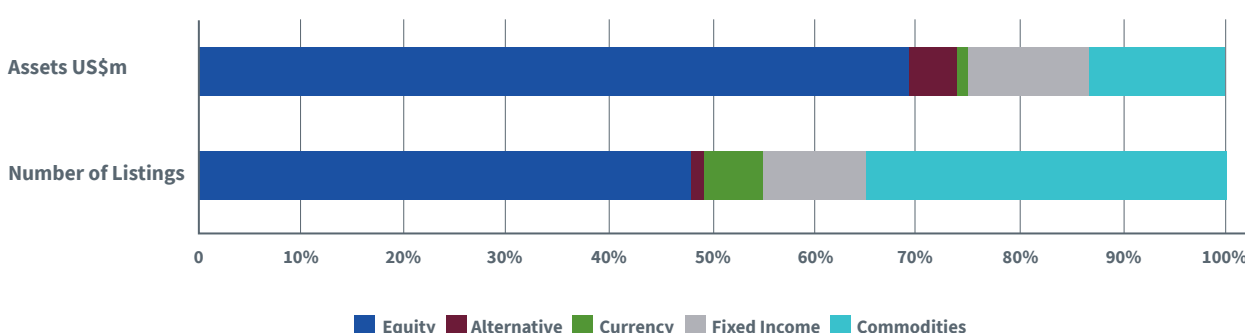
In Europe, short and leveraged ETPs generally achieve this replication by investing in total return swaps with financial counterparties. This type of exposure is often referred to as synthetic replication, since the ETP issuer does not directly hold the underlying assets the product is designed to track. Some short and leveraged ETPs in the United States use direct investment in futures, options and other derivatives. This is not particularly common in Europe.

Synthetic ETPs involve credit risk to the total return swap counterparty, which theoretically could default on its obligations under the swap. To minimise the impact of any default, synthetic ETPs in Europe are generally backed by collateral, which are assets that the swap counterparty provides as security for its obligations under the swap. ETPs typically have strict collateral policies in place. In the event that a swap counterparty defaults, the ETP provider should be able to sell the collateral and then pass on the proceeds of that sale to investors.

Short and leveraged ETPs do not require direct borrowing, options trading or the maintenance of margin accounts by investors. Furthermore, investors cannot lose more than the initial amount invested.

Synthetic replication

Synthetic ETPs do not hold underlying assets. Instead, the ETP issuer enters into a swap agreement with a counterparty. The counterparty provides the issuer with the return of the underlying, less the swap fee. To minimise credit exposure to the counterparty, most synthetic ETPs are backed by collateral.



	Number of Listings	Assets US\$m
Equity	579	48,587
Alternative	16	2,274
Currency	72	979
Fixed Income	109	7,747
Commodities	428	9,890

Source: ETFGI, ETP providers, as of January 2017.

Why use short and leveraged ETPs?

01 Simplicity

ETPs allow sophisticated investors to obtain short and leveraged exposure across a wide range of assets without the need for direct borrowing, the maintenance of margin accounts or options trading.

02 Accuracy

ETPs are open-ended in structure, with a creation and redemption process operated by independent market makers. The market makers can use the creation and redemption process to arbitrage any differences between the price of the ETP and the value of the underlying index or asset. This helps ensure that the price of ETPs generally track (with some variation known as tracking difference) the price of their underlying.

03 Accessibility

ETPs are traded and settled on regulated stock exchanges. They may be held in ordinary brokerage or custodial accounts. In this respect, they are like ordinary shares.

04 Transparency

ETPs track indices and other transparent underlyings. The pricing of these underlyings is publicly available information. The pricing and performance of the ETP may be verified independently.

05 Liquidity

ETPs are exchange traded, with multiple independent market makers responsible for liquidity in both the primary and secondary markets. This helps to ensure that ETPs have a robust level of liquidity that is not dependent on the willingness of any one counterparty (or the issuer) to provide liquidity.

Short and leveraged returns

Short and leveraged ETPs provide exposure to a multiple of the performance of a benchmark for a defined time period, usually on a daily basis.

As discussed in more detail below, it is very important that investors understand the time period (often referred to as “reset frequency”) for which the exposure applies. This time period will typically be stated in the name of the product and described in the product factsheet and prospectus.

For example, a daily “2x” leveraged exposure means that the product is designed to reflect twice the daily percentage change in the unleveraged index level (before fees). Short and leveraged ETPs can provide the relevant exposure in one of two ways:

- + by providing exposure equal to a multiple of the performance of a standard delta 1 index for a defined period. For a short and leveraged ETP using this method, the price of the ETP on any given trading day is calculated first by multiplying the daily percentage change in the level of the underlying delta 1 index by the relevant leverage factor, such as -1 or +2, and then applying that result to the ETP’s previous trading day’s closing price; or,
- + by tracking an index that itself is short or leveraged. For example, a leveraged ETP would track an index whose methodology includes the relevant leveraged return.

The price of short and leveraged ETPs will also be adjusted to reflect fees payable to the ETP issuer, the swap counterparties and the index providers.

Short and Leveraged ETPs and other vehicles

	ETP	Certificates/ Warrants	Options	Futures	CFDs	Spread betting
Very high leverage Over 5x leverage?	Generally up to 5x daily	Yes	Yes	Yes	Yes	Yes
Limited potential losses Limited to initial investment?	Yes	Yes	Yes (for option buyer)	No	No	No
Requires margin account	No	No	Yes	Yes	Yes	Yes
Multiple market makers/pricing Transparent, competition-based pricing on the same product?	Yes	No	Yes	Yes	No	No
Collateralised Intra-day exposure covered by pledged collateral?	Yes	No	No	No	No	No
Transparent trading Trading available continuously on regulated exchange?	Yes	No	Yes	Yes	No	No

05 Who should use Short & Leveraged ETPs?

Short and leveraged ETPs make sophisticated investment strategies easier to access, but they are not simple products. It is vital that investors understand the product attributes and all the associated risks before investing.

Short and leveraged products aim to provide their returns for a specific time period (usually daily). Due to the effects of compounding and leverage, the returns for short and leveraged ETPs held for longer than this period can differ from a similar leveraged benchmark. The returns of the underlying index should not be multiplied by the short/leverage factor as a means of estimating the ETP return over longer time periods.

Due to the effects of periodic resets and compounding, investors should actively monitor and manage their investments as regularly as the ETP resets. This generally means monitoring the investment on a daily basis. Short and leveraged ETPs are not suitable for passive investors employing a traditional buy and hold strategy.

Leveraged investments present additional considerations for investors. In particular, losses are multiplied as well as gains. It is crucial that investors are aware of these risks, and are able to tolerate substantial losses over a short period of time. It is also important to understand the implications of holding a short position (i.e. gains in the underlying benchmark will cause losses for an investor in a short ETP).

Investors should always consider their own investment situation and objectives before investing in any financial product.

UNDERSTAND THE PRODUCTS

The effect of leverage and compounding means that holding a 3x ETP for a period greater than the reset period (i.e., usually one day) is not the same as buying 3 times as much of the underlying benchmark and holding it for the same period.

BE ABLE TO TOLERATE SUBSTANTIAL SHORT-TERM LOSSES

Losses are amplified by leverage, and although losses are limited to the amount paid for the ETP, it is still possible to lose the whole initial investment.

ACTIVELY MONITOR AND MANAGE INVESTMENTS

Due to the effects of compounding, short and leveraged ETPs are not suitable for passive investors.

BE AWARE OF INVESTMENT SITUATION AND OBJECTIVES

Investors should consider the impact of holding a short and leveraged ETP based on their individual circumstances and objectives.

06 Resetting and compounding

Periodic resets

Compounding

The impact of compounding on returns over longer periods

Dealing with compounding

Stop loss resets





Periodic resets

Short and leveraged ETPs are generally designed to provide returns that are a multiple of the percentage change in the underlying benchmark for a particular time period, typically on a daily basis.

This periodic resetting means that a constant leverage factor is maintained for every investor over that period. So for an ETP that resets each day, investors, including new investors, can expect the published leverage factor to apply to returns for that day.

$$\left[\begin{array}{c} \text{Benchmark \%} \\ \text{change over period} \\ \text{(e.g., a day)} \end{array} \right] \times \left[\begin{array}{c} \text{Leverage} \\ \text{multiplier} \end{array} \right] = \left[\begin{array}{c} \text{Benchmark \% change in} \\ \text{that period (before fees)} \end{array} \right]$$

Over the specified period (which is typically a single day), the price of the ETP should change by the percentage movement in the benchmark, multiplied by the leverage factor (e.g. 2 or -1), before fees. At the end of the period, the base prices for the ETP and the benchmark are 'reset' and used as the starting point for the next period.

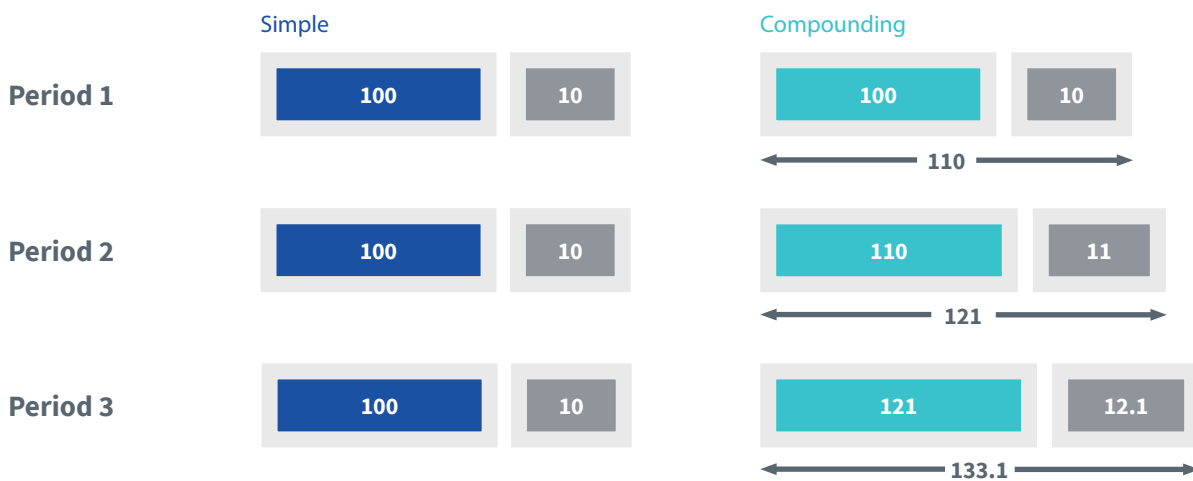
For example, let's examine a daily 2x leveraged ETP. At the start of the day, the ETP is priced at £20 and the benchmark index is priced at £200. Over the course of the day, the benchmark index rises to £206, which is a 3% rise. Applying the 2x leveraged factor, the ETP should increase in value by 6% to £21.20. Since it is a daily ETP, after one day the ETP is 'reset'. This means that the ETP and the benchmark index have a new start point. Any percentage change in the benchmark index is measured from the reset point (£206) and the leveraged returns are applied to the ETP's new starting value (£21.20).

	Index	2x daily ETP
Day 1 start	£200	£20
% change	+3%	+6%
Day 1 close	£206	£21.20
Day 2 start	£206	£21.20

However, the returns for short and leveraged ETPs held for longer than their reset periods are not as easy to explain, due to the effects of compounding.

Compounding

The principle of compounding is that the gains or losses from one period are added to the base from which the next period's returns are calculated. A common example of compounding is found in bank accounts that pay compound interest.



Period	Simple		Compounding	
	Base	Interest	Base	Interest
1	100	10	100	10
2	100	10	110	11
3	100	10	121	12.1
Total		30		33.1

With simple interest, the interest is the same each period, as the principal investment is always used as the base from which to calculate the returns. With compound interest, however, the gains from the interest are added to the base amount for the next period. Here, the base grows from 100 to 110, and then to 121, as the interest from the previous period is added on. As the base grows, the interest also gets larger in each subsequent period.

As a result of compounding, the return for any particular period will depend on both the percentage gain/loss for that period, plus any cumulative gain/loss on the initial investment. In contrast, without compounding it would be possible to calculate the payoff with just the percentage change for the period and the value of the initial investment.

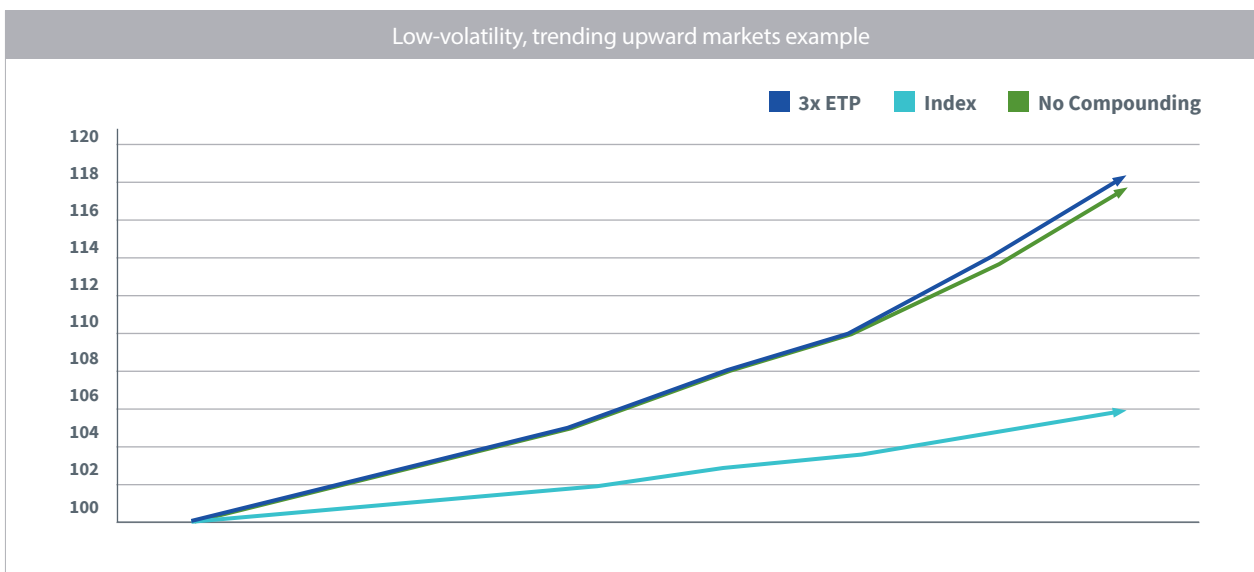
The impact of compounding on returns over longer periods

With short and leveraged ETPs, periodic resets cause a compounding effect. This means that the gains or losses from each period affect the base from which the next period's returns are calculated. Investors who hold short and leveraged ETPs for longer than their reset period will experience the effects of compounding.

Compounding can have positive or negative effects, depending on how the benchmark moves. Unlike the compound interest example, the market may fall as well as rise, so the compounding effect is dependent on the performance of the benchmark index between resets.

Low-volatility, trending upward markets

In general, if the market is stable and trending in favour of the investor, then compounding will increase the price of the ETP, (at least, relative to 'linear' non-compounded returns.) If the market continually moves in favour of the investor, the price of the ETP will rise. Subsequent gains will be applied to an increasingly growing value. This is a similar effect to the above example of a compounding interest bank account. Compounding may even help reduce losses when a market trends against the investor, provided that the market isn't volatile. This is because as the price of the ETP falls, subsequent losses are applied to a progressively smaller amount.



Day	Index	Daily change	3x daily change	3x ETP	No compounding
0	100	-	-	100	100
1	100.50	0.50%	1.50%	101.50	101.50
2	101.00	0.50%	1.50%	103.62	103.01
3	101.61	0.60%	1.80%	104.88	104.83
4	102.62	1.00%	3.00%	108.02	107.87
5	103.14	0.50%	1.50%	109.64	109.41
6	104.38	1.20%	3.60%	113.59	113.13
7	106.00	1.56%	4.67%	118.89	118.00
Total	6.00%			18.89%	18%

CALCULATION FOR THE 3X ETP:

$$\left[\text{Yesterday's 3x ETP Value} \right] \times \left[(1 + \text{Today's 3x daily change}) \right]$$

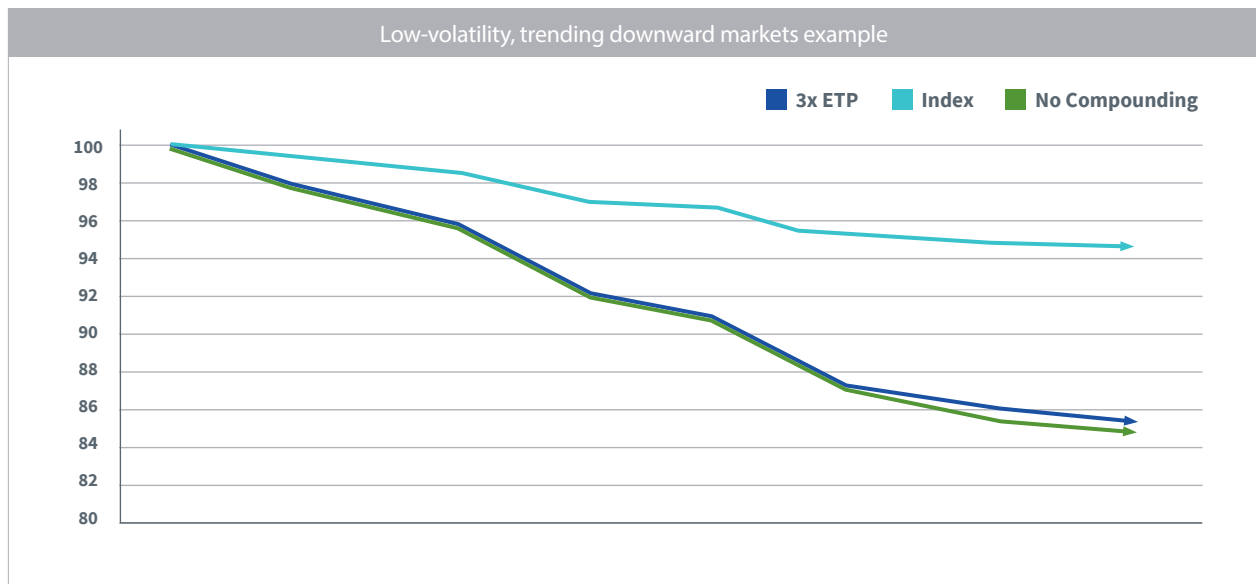
CALCULATION WITHOUT COMPOUNDING:

$$\left[\text{Yesterday's Value (no compounding)} \right] + \left[(\text{Today's Index Value} - \text{Yesterday's Index Value}) \right] \times \left[\text{x Leverage Factor (in this case, 3)} \right]$$

Low-volatility, trending downward markets

In the case of the benchmark index which rises each day, the effect of daily compounding is that the base value used to calculate the next day's returns increases every day—therefore, the continued gains are applied to a larger amount. In this example, the 3x ETP rises 18.89% after 7 days, more than 3 times the benchmark index's rise of 6% over the 7-day observation period.

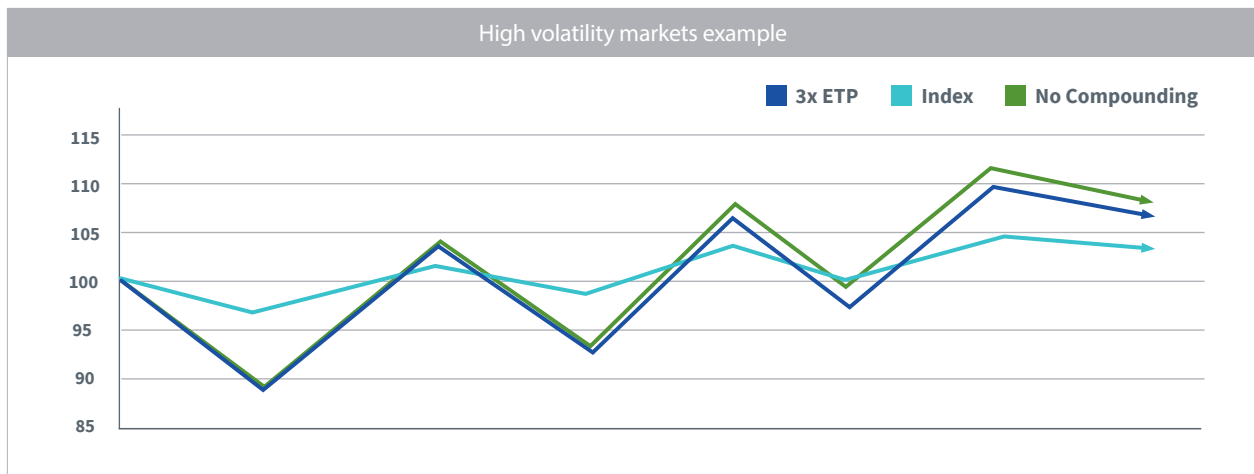
On day 6 there was a 1.2% gain on the benchmark index, so a 3.6% gain to be applied on the price of 3x ETP. This gain is applied to the previous day's closing price, 109.64, higher than at any earlier point in the example.



Day	Index	Daily change	3x ETP	No compounding
0	100.00	-	100.00	100.00
1	99.40	-0.60%	98.20	98.20
2	98.60	-0.80%	95.84	95.81
3	97.42	-1.20%	92.39	92.26
4	96.93	-0.50%	91.01	90.80
5	95.87	-1.10%	88.00	87.60
6	95.10	-0.80%	85.89	85.30
7	95.00	-0.11%	85.62	85.00
Total	-5.00%		-14.38%	-15.00%

Where the benchmark index falls each day, the base value decreases every day—therefore, the continued losses are applied to a smaller amount. In this example, the 3x ETP falls 14.38% after 7 days—less than 3 times the benchmark index's fall of 15%.

On day 7 there was a -0.11% loss on the benchmark index, so a -0.33% loss to be applied on the price of 3x ETP. This loss is applied to the previous day's closing price, 85.89, lower than at any earlier point in the example.



Day	Index	Daily change	3x ETP	No compounding
0	100.00	-	100.00	100.00
1	96.30	-3.70%	88.90	88.90
2	101.40	5.30%	103.02	104.20
3	97.96	-3.39%	92.54	93.88
4	102.66	4.80%	105.86	107.98
5	99.90	-2.69%	97.32	99.70
6	103.99	4.09%	109.27	111.97
7	103.00	-0.95%	106.15	109.00
Total	3.00%		6.15%	9.00%

High-volatility markets

In contrast, a volatile market that has daily gains and losses will generally result in the ETP underperforming in comparison with the benchmark's return multiplied by the leverage factor. If a rise in the ETP's value is followed by a loss, the loss is applied to a larger amount. And if the ETP loses value and then makes a gain, the gain is made on a smaller amount (often referred to as path dependency). Therefore, volatility is detrimental to investors holding short and leveraged ETPs for longer periods.

Here, each fall in the benchmark index is followed by a rise, and vice-versa. Therefore, gains are applied to a smaller base value, and losses are applied to a larger base value—clearly a negative effect on the returns for the investor. For example, day 2's gain is applied to the previous day's ETP price of 88.90, while day 3's loss is applied to the higher price of 103.04.

Crucially, it is not possible to estimate short and leveraged ETP returns beyond the product's reset period using only the benchmark's percentage change over that time. The size and direction of market movements will also impact the ETP's price, due to the effects of compounding.

Understanding Volatility

- + The size and direction of market movements will impact the ETP's price.
- + Compounding can improve or reduce short and leveraged ETP returns, depending on the volatility of the benchmark index.
- + Increased volatility (over periods longer than one day) can erode returns and in some cases decrease the ETP's return relative to the benchmark index multiplied by the leverage factor.

"PATH-DEPENDENCE"

The payoffs of path-dependent financial instruments depend not only on their final values, but also on the historical price movements of the underlying.

Because short and leveraged ETPs are designed to track the daily percent change (as opposed to the cumulative percent change) in the underlying index, the size and direction of market movements, as well as the order or sequence of these movements, will impact the ETP's price. Path-dependency therefore refers to the way the current and future value of an investor's holding is affected by historical performance since the day of investment.

Dealing with compounding

Investors primarily deal with the effects of compounding by monitoring and trading their positions daily. Investors may accept that compounding could work for or against them, and willingly take on the risk of holding a short and leveraged ETP for a longer period.

An investor might even consider that the market is going to move in one direction with low volatility and decide that compounding will be beneficial. It is important that any investor deciding to hold a short and leveraged ETP for extended periods fully understands that there may be a significant difference between the ETP performance and the benchmark performance multiplied by the leverage factor.

Rebalancing

Investors may wish to maintain exposure to the benchmark while also keeping the leverage factor close to the ETP's target multiple. This aim can be achieved through the process of 'rebalancing'. Rebalancing involves buying or selling the ETP securities to realign exposure to the underlying index.

For example, if the underlying index rises by 5% in a day then a daily 2x leveraged ETP will rise by 10%. This means that the ETP would be overexposed the next day, since any gains or losses will be applied to a larger base value. The rebalancing adjustment can be calculated with the following formula:

$$\left[\text{Initial Value} \right] \times \left[(1 + \text{Benchmark Return}) \right] - \left[\text{Current Value} \right]$$

In the example opposite, imagine that the ETP investment was initially valued at £100, and increased to £110 (a 10% rise, 2x the benchmark return of 5%). The adjustment required would be $\text{£}100 \times (1 + 0.05) - \text{£}110$, which equals -£5. Therefore, the investor would sell £5 of the ETP to rebalance.

This process can be performed at regular intervals that are appropriate relative to the ETP's reset period. For example, a daily ETP might be rebalanced every day, or every few days. An alternative strategy is to rebalance when the ETP's return deviates from the benchmark by a certain amount.

The decision of how often to rebalance is a compromise. Rebalancing more frequently will mean that the ETP is more likely to maintain the target leverage factor, but each trade incurs administrative and transactional costs.

Rebalancing—An example using a 3x daily leveraged ETP

	Day 1		Day 2		Day 3	
	Start	End	Start	End	Start	End
Index	250	245	245	248.68	248.68	243.70
Index change	-2%		1.5%		-2%	
ETP change	6%		-4.5%		6%	
Not rebalanced	100	106	106	101.23	101.23	107.30
Rebalanced ETP	100	106	98	93.59	99.47	105.44
Adjustment		-8		5.88		
Formula	Initial Value x (1 + Benchmark Return) - Current Value					
Explanation		The index falls by 2% on Day 1 so the -3x daily ETP rises by 6%. The initial value is 100 and the current value is 106. Using the formula, the adjustment is: $100 \times (1 - 0.02) - 106 = -8$		The index rises by 1.5% on Day 2 so the -3x daily ETP falls by 4.5%. The initial value is 98 and the current value is 93.59. Using the formula, the adjustment is: $98 \times (1 + 0.015) - 93.59 = 5.88$		

EXPLANATION

The rebalanced ETP ends on a value of 105.44, but has had a net adjustment out of 2.12 (-8 after Day 1, and +5.88 on Day 2). This adjustment is profit which must be added back in to calculate the total return from the rebalanced ETP ($105.44 + 2.12 = 107.56$).

Over the 3 day period, the index falls from 250 to 243.70, which is a 2.52% loss. -2.52% multiplied by the leverage factor (-3x) is 7.56%, which equals the return from the rebalanced ETP. However, the investment which is not rebalanced only gains 7.30%. This is because the non-rebalanced ETP becomes over or underexposed over time, due to the effects of compounding. In contrast, the rebalanced ETP is regularly adjusted to maintain a constant level of exposure to the benchmark.

It is important to note that this example does not include transaction costs. In practice it may be too expensive to rebalance on a daily basis due to these costs, while also requiring effort from the investor to calculate and perform each trade. However, investors may rebalance from time to time to prevent the ETP deviating too far from the expected leverage factor.

	Start	End	Total
Index	250	243.70	-2.52%
Not Rebalanced	100	107.30	7.30%
Rebalanced	100	107.56	7.56%

Stop loss resets

Using leverage magnifies returns, both on the upside and the downside. Adverse price movements can quickly and significantly reduce the value of a leveraged ETP. Depending on the leverage factor, intra-day movements can significantly impact the price of the ETP.

To mitigate this risk, some (but not all) short and leveraged ETPs often include a safety mechanism where the ETP will reset before the end of the current period (usually daily) if a certain threshold is met. For example, a daily 2x (double leveraged) ETP might have a safety reset trigger if the underlying benchmark falls by 25% (i.e. where a decline of 50% in the ETP price). Once this threshold is reached, the ETP resets and continues for the rest of the period using new base values.

Although ETPs can never lose more than the value of the initial investment, the stop loss or intraday reset is designed to slow the rate of loss during periods of extreme market movement. If the adverse price movements continue, then the investor will not suffer a loss to the same extent as if the reset had not occurred. This will also create a tapering effect on sustained losses. However, investors will also not fully benefit from a 'rebound' in the market, as any recovery gains will be applied to a smaller base value.

If the ETP is tracking a leveraged index, then the index may have the stop loss reset built in. Alternatively, the leveraged ETP itself may build the mechanism in to its pricing structure.

Intra-day reset—an example

Consider a daily -3x (triple short) ETP with an intra-day reset triggered by a 20% rise in the benchmark index.

Time	Close	10:00	11:00	12:00
Index Value	100	120	130	95
% from close	-	+20%	+30%	-5%
% change (-3x)	-	-60%	-90%	+15%
-3x ETP (no reset)	100	40	10	115
% from reset	-	-	+8.3%	-20.8%
% change (-3x)	-	-	-25%	+62.5%
-3x ETP (reset)	100	40	30	65
Explanation		The index rises 20%, causing a 60% fall in the -3x ETP and the intra-day reset is triggered—the new index start point is 120 and ETP value is 40.	The index rises to 30% from yesterday's close. This would have caused the -3x ETP to fall 90% from its start point without the reset. However, the index has risen 8.3% since the reset, so the ETP falls 25% from the (much lower) reset point.	The index changes direction and is now 5% down for the day. Without the reset, the -3x ETP would have been 15% up for the day. However, since index is down 20.8% from the reset point, there is a 62.5% rise in the -3x ETP—but this gain is from a smaller starting position.

EXPLANATION

The reset essentially sets a stop loss limit, setting the base value of the leveraged ETP to a lower level. After the reset, the ETP provides leveraged exposure to a new value, as if the market had closed and reopened at the time of the reset. Some products also remove the leverage factor for the remainder of the period following a stop loss reset.

Once the reset occurs, the leveraged ETP no longer provides its target exposure to the full daily change of the underlying benchmark. Stop loss resets are designed to protect investors, as shown in the example above, but they also reduce the benefits of any market rebound. As a result, the investor's losses may still be significant where an intra-period reset occurs.

All products are different and may be subject to different stop loss triggers or no triggers at all (although unlikely). As leverage levels increase, intra-period resets generally have a greater impact (i.e. the reset mechanism is triggered by smaller movements in the underlying benchmark).

01 Who should use short and leveraged ETPs?

Only sophisticated investors who monitor their portfolios frequently (if not daily) should invest in short and leveraged ETPs. As a result, they are not appropriate for buy and hold investors or for longterm asset allocation purposes. Investors should be familiar with the effects of leverage and daily compounding on returns.

02 How do short and leveraged ETPs differ from traditional delta 1 ETPs?

Short and leveraged ETPs seek to track the daily percent change (as opposed to the cumulative percent change) in the underlying index. The ETPs involve a daily reset, whereby the value of the index to which the leverage factor applies is adjusted at the close of each day. This daily reset creates a path dependency and magnifies the compounding effects discussed above. As a result, the difference between the cumulative percent change in the underlying index and the percent change of the value for the ETP during that same period can differ dramatically. This difference can have a significant impact on returns for short and leveraged ETPs.

03 How can an investor utilise short and leveraged ETPs?

An investor can use short and leveraged ETPs to trade tactically, choosing from a diverse range of assets. Investors can react quickly to daily changes in the markets and express bullish and bearish positions with products on the same underlyings. Finally, investors can use these ETPs to hedge short-term market and currency risk in their existing portfolios.

04 How can investors trade short and leveraged ETPs?

The ETPs are listed on a number of regulated exchanges, and investors can trade these products directly through their brokerage accounts. It is expected that investors seeking to trade these products will have the level of sophistication necessary to understand the risks associated with these ETPs, including the structural risks, the risks arising from path dependency and compounding and the risks associated with leverage.

05 Can an investor lose more than the initial investment with short and leveraged ETPs?

An investor holding short and leveraged cannot generally lose more than the initial amount invested. However, the entire amount of the invested capital is at risk. Furthermore, under certain conditions, an investor can lose a substantial amount (if not all) of that invested capital.

06 Will a 2x leveraged ETP always deliver exactly 2x the return of the underlying?

No. Because the 2x leveraged ETP is reset on a daily basis, the size and direction of market movements will impact returns if held for longer than a period of one day. If the market develops a trend (low volatility), compounding can benefit the investor. However, in highly volatile markets, returns should not be expected to be exactly 2x the performance of the underlying. For more information on resetting, compounding, volatility and path-dependency, see pages 25–37 of this guide.

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