



# ETPedia

The educational guide to  
Exchange Traded Products (ETPs)



ETF Securities believes investors should always understand and fully appreciate the risks involved in their investments. In light of this, we have produced the following guide which aims to provide investors with an unbiased reference to Exchange Traded Products.

The guide seeks to educate investors on the basics of Exchange Traded Products, covering everything from product types to the outlook for the industry as a whole. We hope you find this guide of value and interest.

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# 01 Introduction to ETPs

Since the first Exchange Traded Product (ETP) launched in 1993, the industry has undergone tremendous growth. There is now more than US\$2 trillion invested in over 4,500 ETPs worldwide<sup>1</sup>.

Originally, ETPs combined the cost-efficient, benchmark replication strategy of equity index funds with the listed, intra-day tradability of shares. As the market has matured, ETPs have expanded to cover exposure to an increasing number of asset classes. Now, along with providing equity benchmark replication, ETPs also offer investors the ability to diversify their portfolio by providing exposure to assets previously difficult to access.

## Active and passive investment

Broadly speaking, there are two investment methodologies for a fund manager: active and passive.

Active fund management	Passive fund management
The active fund manager makes investments in selected assets (whether stocks, bonds, commodities, etc.) with the goal of beating the market (usually a benchmark, like the FTSE 100).	A passively managed fund or investment does not seek to beat the market. Instead, the passive investor tries to replicate the benchmark performance as accurately as possible.  The majority of ETPs are passive investments, since their aim is to track a benchmark or asset.

It might be questioned why someone would choose passive over active investment. Settling for achieving, rather than exceeding, the market return may be seen as defeatist. After all, the idea of consistent, market-beating returns that transform a small initial investment into great wealth is always alluring.

However, no matter how attractive the claims of active management, the performance above of the benchmark is not guaranteed. Many investors choose a passive investment strategy because, historically, a large number of active investors have failed to consistently beat the market. Instead of uncritically relying on the claims of active investment, investors should consider the historical performance of active versus passive investment.

For further information on active and passive investments see page 56.

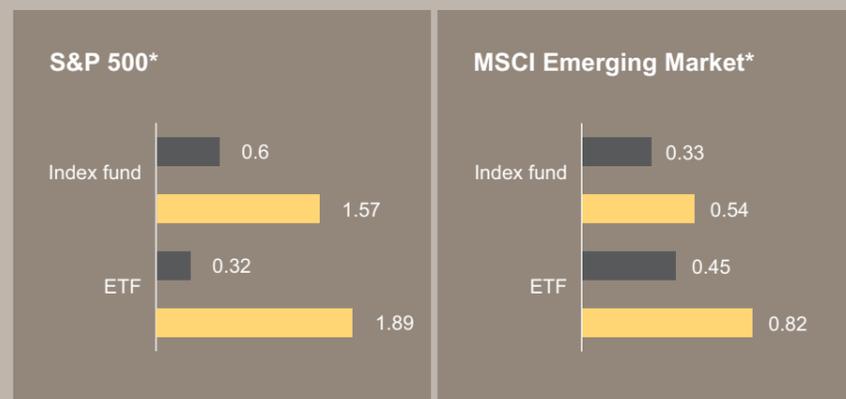
<sup>1</sup> BlackRock, ETP Landscape: Industry Highlights (January 2013).

## Case study 01 : Traditional Index Funds

The success of traditional passively managed index funds has been, in part, due to their low cost and the inconsistent returns of many actively managed funds. However, traditional index funds may have a number of shortcomings: minimum investment amounts, early redemption charges, and lack of intra-day trading.

Like traditional index funds, ETPs track benchmarks. However, ETPs also offer intra-day pricing and trading with no minimum investment amounts or early redemption charges. In addition, ETPs compete with traditional index funds on cost and performance<sup>2</sup>.

### ETP vs. traditional index funds



■ Expense ratio (%)  
 ■ Average return (%)

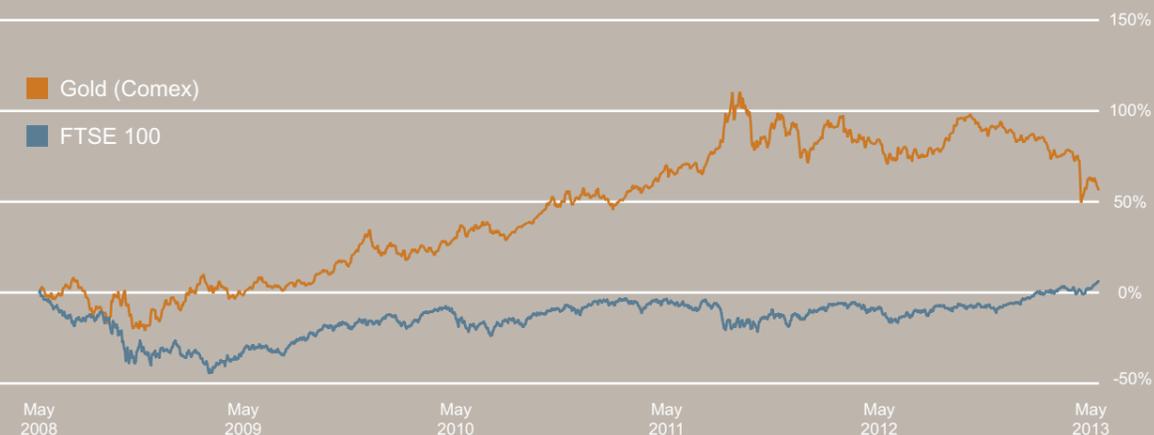
\*3-year load-adjusted annualised return, simple average (31 December 2010).  
 Source: McKinsey & Company, The Second Act Begins for ETFs (August 2011).

## Case study 02 : Commodity Access - Gold

Historically, it was difficult for investors to gain access to gold because they needed to have the resources to store bullion or the expertise to gain exposure through futures. Investors can now access the gold market via ETPs that trade as easily as shares and without having to take physical delivery of the metal. Worldwide, there is now over US\$125 billion invested in gold through ETPs<sup>3</sup>.

Access to gold and other commodities is valuable because commodities have historically had low correlation to the broader economic environment. Gold, for example, is often used by investors as a hedge in high volatility conditions to help protect them from risk. Over the last 5 years, gold has returned 56% compared to 6% for the FTSE 100<sup>4</sup>.

### A comparison of gold and FTSE 100 performance



Source: Bloomberg (May 2008 - May 2013).

<sup>2</sup>McKinsey & Company, The Second Act Begins for ETFs (August 2011).

<sup>3</sup>Financial Times (12 April 2013)

<sup>4</sup>ETF Securities (May 2013)

The popularity of ETPs seems set to continue. Despite a trebling of the amount invested in ETPs over the last decade, the European industry is still underdeveloped in comparison to the American marketplace, where ETPs account for 20% of all passive investment, compared to only 8.7% in Europe<sup>5</sup>.

### US/Europe passive investment breakdown from 2008 to 2012

	2008	2009	2010	2011	30.06.2012
US passive	13.1%	15.4%	18.0%	19.2%	20.1%
Europe passive	6.5%	7.7%	8.4%	8.5%	8.7%

Source: Vanguard, Evolution of ETFs (November 2012).

As awareness of and familiarity with ETPs improves, retail use of the product is also set to grow. ETP usage in Europe remains dominated by institutional investors compared to the US market. Retail investors and their advisers hold only 15% of ETP assets in continental Europe and 10% in the United Kingdom, while in the US these groups hold 50% of all ETP assets. If growth follows the same trajectory as in the US, we expect to see considerable expansion in ETP use among retail investors.

### Worldwide ETP usage

	Institutional	Adviser	Retail
US	50%	45%	5%
Canada	37%	34%	28%
UK	90%	9%	1%
Continental Europe	85%	10%	5%
Asia	90%	9%	1%
Australia	10%	30%	60%

Source: Vanguard, Evolution of ETFs (November 2012).

While the growth of the ETP industry has resulted in rapid innovation, the pace of change has also given rise to confusion. Concerns have been raised that not all investors fully understand the different product types and associated risks. In addition, there has been increased media and regulatory scrutiny on the universe of products grouped under the 'ETP' moniker.

For this reason, investor education is paramount. 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 Exchange Traded Products.

<sup>5</sup>Vanguard, Evolution of ETFs (November 2012).

## What is an ETP?

An Exchange Traded Product (ETP) is a financial instrument traded on a stock exchange whereby typically the aim 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
Listed on a stock exchange	Shows exactly how your investment is performing
Trade like shares	Buying and selling as easily as shares any time the market is open
Liquid asset	Liquidity provided by authorised participants and market makers
Tracks an underlying	Aims to provide the same return as underlying benchmark or asset
Passive investment	Cost-effective way of gaining exposure to a benchmark or asset as management fees are generally lower

In Europe, ETPs are typically divided into three categories:

- Exchange Traded Funds (ETFs)
- Exchange Traded Commodities (ETCs)
- Exchange Traded Notes (ETNs)

ETP		
ETF	ETC	ETN
Provides access to, among others: <ul style="list-style-type: none"> <li>• equity indices</li> <li>• commodity indices</li> <li>• fixed income</li> <li>• money markets</li> <li>• private equity indices</li> <li>• fund of hedge funds indices</li> </ul>	Provides access to, among others: <ul style="list-style-type: none"> <li>• individual commodities (e.g., gold, oil, agriculture, industrial metals, etc.)</li> <li>• commodity baskets</li> <li>• currencies</li> </ul>	Provides access to an asset or benchmark using an uncollateralised debt security

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.

## Why use an ETP?

### 01 Simple

ETPs are listed and trade in a similar way as shares through the same brokers and platforms

### 02 Accessible

ETPs can be bought and sold whenever the stock exchange is open as prices are quoted throughout the day

### 03 Diversified

ETPs can provide access to an entire index, or alternative asset classes (such as commodities), with a single trade

### 04 Cost-effective

ETPs provide a cost-effective way to gain diversification through a benchmark or exposure to assets previously difficult to access

### 05 Transparent

Unlike other investment vehicles, ETP constituents are published on a daily basis - this transparency makes it easier for the investor to see exactly what they own

### 06 Flexible

ETPs can be used to achieve numerous investment strategies

## The types of ETP

### Exchange Traded Funds (ETFs)

An Exchange Traded Fund is an investment fund that trades on a stock exchange as a single security. It is designed to track an underlying benchmark. ETFs are open-ended, which means ETF shares can be created as necessary to meet demand. Since the first ETF launched in 1993, the range and variety of ETFs have drastically increased. Some examples of the types of exposure ETFs can now provide are outlined below.

### Exchange Traded Funds (ETFs) - 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		Property
	Mortgage backed	Commodities	
	Emerging markets	Diversified indices	

In the European Union, most ETFs are governed by laws regulating collective investment schemes, known as UCITS<sup>6</sup>. UCITS provide 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.

<sup>6</sup> Undertakings for Collective Investment in Transferable Securities (UCITS).

## Exchange Traded Commodities (ETCs)

Exchange Traded Commodities are debt securities that pay no interest. They are designed to give exposure to an individual commodity or a basket of commodities.

### Exchange Traded Commodities (ETCs) - examples of asset types

Precious metals	Energy	Agriculture	Industrial metals	Diversified
Gold	Brent Crude	Grains	Aluminium	All commodities
Silver	West Texas Intermediate	Cocoa	Copper	Ex-agriculture
Platinum	Carbon	Coffee	Lead	Ex-energy
Palladium	Natural gas	Corn	Nickel	
	Refined products	Cotton	Tin	
Livestock		Soybeans	Zinc	
Lean hogs		Sugar		
Live cattle		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.

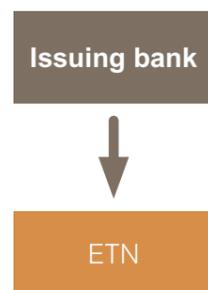
## Exchange Traded Notes (ETNs)

Like ETCs, ETNs are non-interest bearing debt securities that are designed to track the return of an underlying benchmark or asset. However, while ETCs are issued by SPVs with segregated assets, ETNs are generally issued by banks, hold no assets and are not collateralised. Although their yield references an underlying benchmark or asset, ETNs are similar to unsecured, listed bonds.

As such, ETNs are entirely reliant on the creditworthiness of the issuing entity. A change in that creditworthiness might negatively impact the value of the ETN, irrespective of the performance of the underlying benchmark or asset. In extreme circumstances, default by the issuer would leave the investor to claim as an unsecured creditor against the issuing entity.

The primary appeal of ETNs is that they guarantee exposure to a benchmark or an asset's return (minus fees) even when the underlying markets or sectors suffer from liquidity shortages. The return is guaranteed by the issuing entity and not reliant on the access (direct or via a derivative) to the underlying assets.

It should be noted that since ETNs hold no assets and are generally not collateralised, they operate very differently to ETFs and ETCs. As such, much of what is said about ETPs in this guide only applies to ETFs and ETCs and not ETNs.



### ETPs at a glance

	ETF	ETC	ETN
Security type	Collective investment vehicle	Debt security	Debt security
Governed by UCITS	Yes	No	No
Commodity access	Limited <sup>7</sup>	Yes	Yes
Issuer credit risk	Limited	Limited	Yes
Eligible by UCITS	Yes	Yes	Yes

<sup>7</sup> 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.

## Short and leveraged ETPs

An investor can gain both short and leveraged exposure to a variety of different asset classes through tactical use of short and leveraged ETPs.

Unlike traditional short and leveraged positions in shares, these positions do not involve borrowing but use derivatives to deliver their returns. Furthermore, because ETPs are usually structured as shares or debt securities, losses cannot exceed the initial amount invested.

### Long position

**A position that profits if an asset's value rises.**

For example, an investor buys a company's shares. If the shares rise in value, they can be sold for profit.

### Short position

**A position that profits if an asset's value falls.**

For example, an investor borrows shares from a broker to sell, which eventually must be returned. If the shares fall in value after being sold, the investor can buy them back, in order to return them, for less than the amount received from their sale.

### Leveraged position

**A position that uses financial instruments or borrowing money to increase the potential return of an investment. Both short and long positions can be leveraged.**

For example, an investor invests £500 in a company's shares: £250 from their own account and £250 borrowed interest-free from a broker.

If those shares increase by 20%, the investor has £600. Returning the borrowed £250 leaves the investor with £350: a gain of £100. Investing only with the investor's own money would have yielded only £50 (a gain of 20% from £250 to £300).

If those shares decrease by 20%, the investor has £400. Returning the borrowed £250 leaves the investor with £150: a loss of £100. Investing only with the investor's own money would have yielded a loss of £50.

## Compounding and volatility

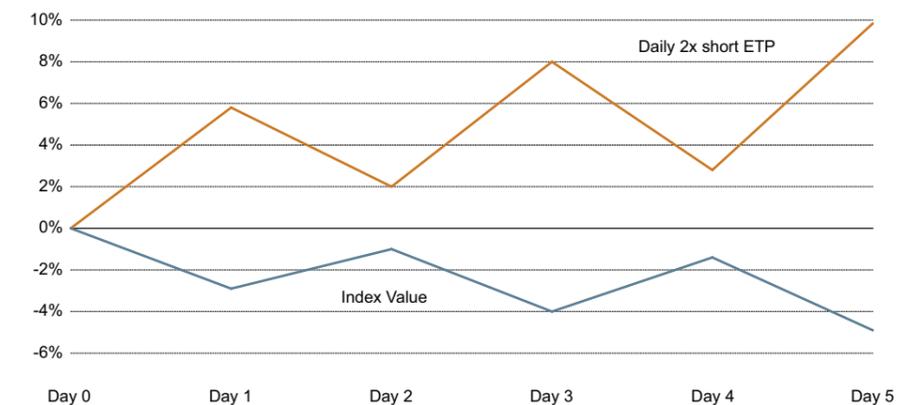
Short and leveraged ETPs generate their offered return for a stated period (e.g. daily or monthly) only. If you hold short and leveraged ETPs for longer periods, compounding and volatility can distort the expected return. This is most noticeable in a volatile market.

To illustrate this, the example to the right shows £100 invested in a daily 2x (leveraged) short ETP tracking a volatile index. After 5 days the index has declined 5%, so the investor might expect the value of the ETP to have increased by 10%. However, let's consider the performance of the ETP and the underlying index for each stated period. We are using a daily compounding ETP in this example so we will consider the value of the ETP and the index at the end of each day.

## Short and leveraged compounding - a numerical example

Day	Index value	Daily variation	2x short ETP value (GBP)
0	100		100
1	97.10	-2.9%	105.80
2	98.94	1.9%	101.78
3	95.98	-3.0%	107.89
4	98.47	2.6%	102.28
5	95.00	-3.5%	109.48
Performance	-5.00%		9.48%

Source: ETF Securities, hypothetical example.



Source: ETF Securities, hypothetical example.

By the end of day 1 the index value has declined by 2.9% to 97.10. The 2x short factor is applied to the daily index movement to give the corresponding value of the ETP. In this example the 2x daily short ETP will increase in value by 5.8% to 105.80 ( $2 \times 2.9\% = 5.8\%$ ). During day 2 the index value increases by 1.9%, rising from 97.10 to 98.94, and the ETP value declines by 3.8% ( $2 \times 1.9\% = 3.8\%$ ), falling from 105.80 to 101.78. The 2x short factor is applied for the index movements of each day, and then re-applied for the movements of the next day and so on – an example of a compounding ETP. By the end of day 5 the value of the ETP has increased by 9.48%, even though the index has declined by 5%. The 5 day performance of the index should not be multiplied by -2 as a means of estimating the 2x short ETP return. Due to the potential for volatility of any exposure, short and / or leveraged ETPs should be actively monitored.

## Currency ETPs

Currency risk is the risk that the value of an investment, denominated in a currency other than an investor's home currency, might be affected by the exchange rate between the two currencies. Investors often neglect the impact of currency risk on their investments. However, it is important to note that currency risk may have a significant effect on the value an investment. Practically, any investment abroad will be affected by currency movements: from buying a Spanish retirement home to owning shares in a US-listed company.

Even investments in an investor's home market can be subject to currency fluctuations if those assets are denominated in foreign currencies (such as commodities which are usually priced in US dollars). Investors often worry whether the value of their investments will fall but rarely consider the impact of a rise or fall in the value of their currency.

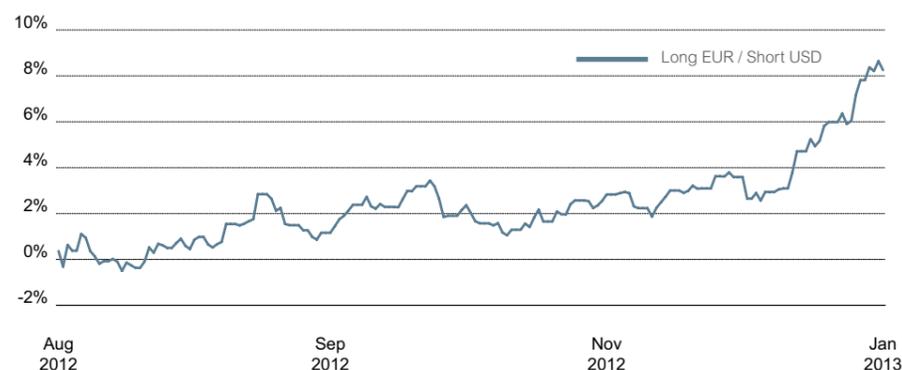
### Currency impact on equity returns

Currency fluctuations can negate the gains from an underlying asset. As on the right, from July 2012 to January 2013, a European investor in US equities would have made about 9.41%. But over the same time frame, the euro appreciated 9.86% against the dollar. The currency impact completely offset the equity gains resulting in a small loss for the investment overall.

	US equities (MSCI US)	Local USD returns	EUR/USD	Currency returns (unhedged)	Total return
31 Jul 2012	3343		1.2304		
31 Aug	3419	2.25%	1.2579	-2.21%	0.04%
28 Sep	3505	2.48%	1.2860	-2.21%	0.27%
31 Oct	3440	-1.87%	1.2960	-0.77%	-2.65%
30 Nov	3459	0.55%	1.2986	-0.20%	0.35%
31 Dec	3489	0.86%	1.3193	-1.58%	-0.72%
31 Jan 2013	3673	5.14%	1.3579	-2.88%	2.26%
<b>Total</b>		<b>9.41%</b>		<b>-9.86%</b>	<b>-0.45%</b>

Source: Bloomberg, MSCI USD (July 2012 - January 2013).

### Currency ETPs as an asset class: EUR/USD returns from August 2012 to January 2013



Source: ETF Securities (August 2012 - January 2013).

Currency ETPs can help protect against currency depreciation. In the case on the right, a currency ETP could have helped protect an investor against currency depreciation. A short US Dollar / long Euro ETP would have allowed the investor to preserve their gains from the original investment. From the end of July to the end of January, such an ETP would have generated 9.14%.

## Currency as a return generator

Currency ETPs can also be used as an asset class to generate return. As an investment, currency can provide:

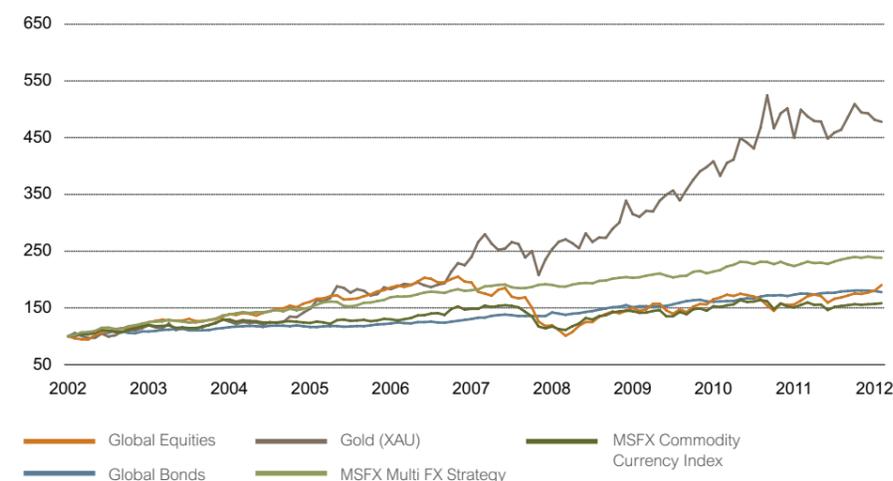
- Diversification:** Currencies often exhibit low or even negative correlation to traditional asset classes. For instance, over the 10 year period to December 2012, GBP / USD had a 0.40 correlation with Global Equities and a 0.08 correlation with Global Bonds. Likewise, USD / JPY had a 0.27 correlation with the equities and -0.32 with bonds. Obviously these correlations will vary dependent upon the time horizon studied. However, in general adding currency to a portfolio of traditional assets may offer diversification benefits from a correlation standpoint<sup>8</sup>.
- Macroeconomic factors:** Currencies can be used to profit from macro-economic circumstances. In recent years, central bank intervention has had a strong impact on currency movements.
- Low volatility:** The majority of developed currency pairs have historically lower volatility than equities<sup>8</sup>.
- Passive investment:** Passive currency investments, whether diversified over a number of currencies, trading style or both, can be a useful means to reduce the risk of currency investment as well as generate returns. Over the past decade, a typical multi-currency strategy has outperformed equities, bonds and diversified commodities<sup>9</sup>.

## Annual volatility for main developed currency pairs vs. equities

Asset class	Volatility
<b>Currencies</b>	
EUR/USD	11.04%
GBP/USD	9.88%
AUD/USD	14.76%
<b>Equity indices</b>	
FTSE 100	20.49%
S&P 500	21.69%
MSCI EM	21.22%
Euro STOXX 50	25.62%

Source: Bloomberg, Annual volatility of daily returns (May 2008 - May 2013).

## A comparison of indices over a 10 year period



Source: Bloomberg, Daily data (2002 - 2012).

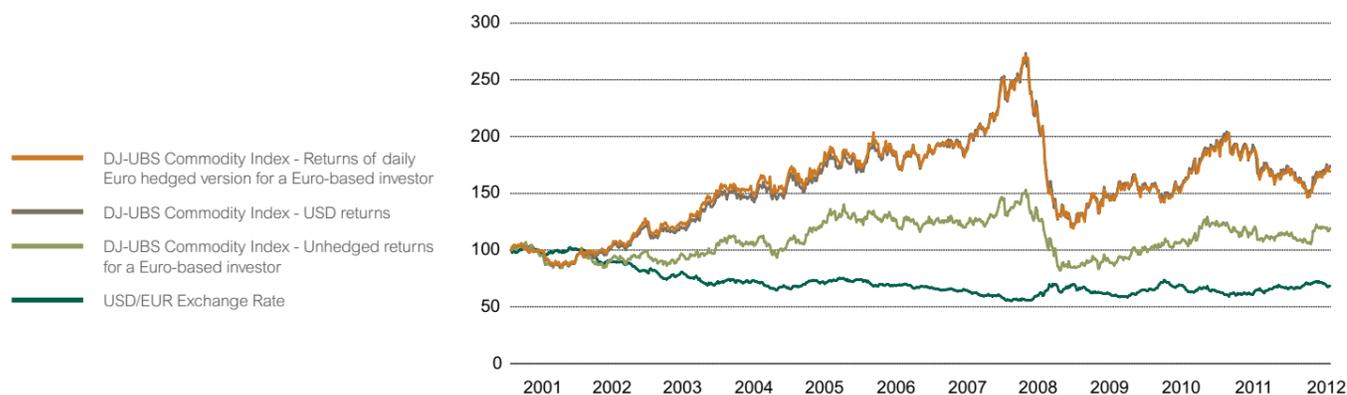
<sup>8</sup> ETF Securities (June 2013).

<sup>9</sup> Correlation statistics are based upon monthly observations where the MSCI World Index is used as a proxy for global equities and the Barcap Bonds Composite Global Index is used as a proxy for global bonds.

## Currency hedged ETPs

As we have seen, currency movements can impact returns on investments priced in currencies other than an investor's home currency. A good example of this is an investment in commodities, most of which are priced in US dollars. This means that non-US investors are affected by the movements of their local currencies against the US dollar. While this difference can be positive or negative, the US dollar's weakness against major currencies over the last 10 years has resulted in diminished profits for non-US investors.

### Currency hedged vs. unhedged commodity returns for a Euro-based investor



Source: Bloomberg, Daily data, (2001 - 2012).

### The DJ-UBS Commodity Index

The DJ-UBS Commodity Index is a benchmark which tracks 22 commodity futures, weighting each to account for economic significance and market liquidity. The main index is denominated in USD.

A currency hedge can be used to mitigate the effect of currency fluctuations. Historically, such strategies required significant expertise and infrastructure to execute and constantly ensure the currency hedge corresponds precisely with the commodity exposure, meaning they could only be implemented by institutional investors.

However, a currency hedged ETP not only provides exposure to the underlying asset but also includes a built-in currency hedge to mitigate the currency impact. This allows investors to focus on assessing the underlying asset based on its fundamentals without having to worry about the currency risk.



There are a number of ways that an ETP can implement a currency hedge. The easiest is to track an index which itself incorporates a currency hedge. For instance, the DJ-UBS family of commodity indices provide a number of currency hedged versions, calculated by applying a daily currency hedge to the main index. Therefore, an ETP tracking one of these currency hedged indices will be more likely to generate a return close to the main DJ-UBS index in the investor's local currency. Other index providers, such as MSCI, S&P and FTSE also produce currency hedged versions of their indices.

Although currency hedged ETPs make it simple to reduce the currency liability of a commodity investment, investors still need to consider how often the currency risk is hedged. Usually, this will be either on a daily or monthly basis. The more frequent the hedging, the more closely the ETP correlates with the price movement of the underlying benchmark. Over the last 7 years, the tracking difference between the euro daily hedged version of the DJ-UBS and the main USD-denominated index was far smaller than the monthly hedged alternative (particularly during the turbulent currency conditions of November 2008).

For more information on trading difference, please read the 'Tracking error and tracking difference' section on page 46.

### Tracking difference of daily vs. monthly hedged commodity indices



Source: Bloomberg, Daily data (2005-2012).

## ETPs and other vehicles

Investment vehicles come in a number of forms in the UK, of which ETPs are one. Understanding the differences between the vehicles will help an investor to determine which is the most suitable for their needs.

Exchange Traded Products (ETPs)	Investment Trust	Open-Ended Investment Company (OEIC)	Unit Trust
(including ETFs, ETCs, and ETNs)	<p>Public listed companies that raise money by selling a fixed number of shares to investors. This money is pooled to make investments. The trust is managed by a professional fund manager.</p> <p>Since they are listed on a stock exchange, they can be traded throughout the day, just like an ETP or listed company. Investment trusts are closed-ended: they have a fixed number of shares. The value of each share will change depending on supply and demand, as well as the underlying NAV. Therefore, the price of an investment trust can trade away from its NAV.</p>	<p>A company established to pool investors' money and make investments on their behalf. Like an investment trust, OEICs issue shares, but they differ in one important way.</p> <p>An OEIC is open-ended: shares can be created or redeemed according to demand. This means the value of each share is directly related to the NAV of the OEIC.</p>	<p>Very similar to an OEIC, a collective investment vehicle that pools money to make investments. A unit trust is also open-ended, and as such the value of each unit will be directly related to the NAV of the trust.</p> <p>The main difference between unit trusts and OEICs is that a unit trust is constituted as a trust and not as a company. Thus, instead of issuing shares, the trust issues units instead.</p>

## Comparing ETPs with Investment Trusts, Open-Ended Investment Companies (OEIC) and Unit Trusts

	ETP	Investment Trust	OEIC (non-exchange traded)	Unit Trust
Legal structure	Issues equity or debt security	Issues equity	Issues equity	Trust
Open or closed-ended	Open	Closed	Open	Open
Pricing	Remains very close to NAV through arbitrage	Indirectly linked to NAV, driven by demand	Directly linked to NAV	Directly linked to NAV
Bid / ask spread	Bid / ask spread applies	Bid / ask spread applies	No bid / ask spread; single price	Bid / ask spread applies
Trading	During market hours at quoted prices	During market hours at quoted prices	At most, once a day	At most, once a day
Access	On-exchange, through brokers	On-exchange, through brokers	Directly with fund manager	Directly with fund manager
Investment method	Passive (small number of active)	Active (small number of passive)	Active or passive	Active or passive

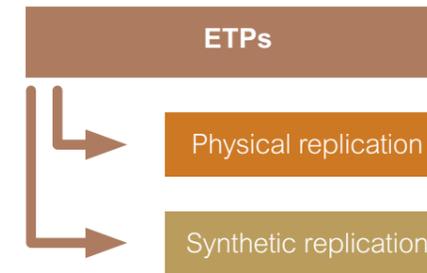
## 02 ETP structure

For an investor to make an informed investment decision, it is important to understand and consider the different investment vehicles available in the market. In this chapter we look to educate investors on the structures currently used within the Exchange Traded universe.

### Replication methods

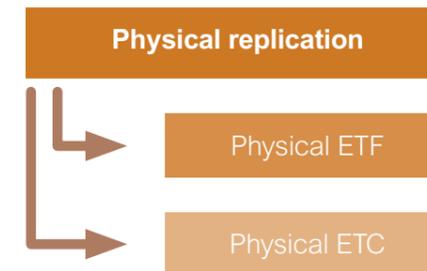
As a passive investment, ETPs replicate the return of an underlying benchmark or asset. ETPs can be structured in two ways to achieve this: physically or synthetically.

When considering an investment in an ETP, the structure is an important consideration. A product's structure impacts its risks, its costs and how accurately it tracks its underlying.



### Physical replication

Physical replication is where the ETP buys the underlying assets it is designed to track. Physical replication differs slightly between products that track a benchmark (usually ETFs) or a commodity (usually ETCs).



### Physical ETFs

A physically replicating ETF either owns all, or a sample, of the assets that comprise the underlying benchmark. These types of ETF are known as, respectively, 'full replication' and 'sampling replication'.

#### Full replication

All the underlying assets are held in the same proportion as their weighting on the index being replicated.

This method is employed if the underlying assets are readily available, reasonably small in number and do not significantly alter (e.g. the 102 shares listed on the FTSE 100, reviewed quarterly).

#### Sampling replication

Instead of holding all assets that constitute an index, the product holds a sample of some of the index constituents.

This approach might be used if the benchmark contains a large number of assets which change frequently (e.g. the MSCI World Index, with more than 1,600 constituents, sometimes changing over 300 shares annually) or if some constituents suffer from low liquidity.

A key benefit of full replication is that, since the product holds the same assets as the index, it should track the index very accurately. However, the disadvantage is the potential for high transaction costs if the index changes a large number of its constituents frequently.

With sampling replication, transaction costs are kept lower. However, because the ETP's holdings are not the same as those that comprise the index, the product's return may not correspond exactly to the index's return.

With physical replication, counterparty risk can be introduced if the product engages in securities lending.

### Securities lending

Where the owner of an asset lends it to a borrower in return for a fee. The borrower may also be required to post collateral to protect its obligations under the loan.

While the fee from securities lending can reduce the cost of an ETP, it creates counterparty risk. That is, the loaned securities may be lost if the borrower defaults. In such an event, the product could be left holding assets unrelated to those on the index it is meant to track.

### Physical ETCs

Physical ETCs are backed by a specific quantity of that commodity. This is only possible if the asset can be easily stored for long periods. Consequently, physical replication is only possible for precious and industrial metals.

The value of a physical ETC comprises:



Physical ETCs are backed by the corresponding amount of bullion deposited in a vault (precious metals) or warehouse (industrial metals). This bullion is reserved for the product and segregated from the general stock of metal stored in that vault or warehouse. There are a number of organisations that oversee and standardise the trade of precious and industrial metals such as the London Bullion Market Association (LBMA), the London Platinum and Palladium Market (LPPM) and the London Metal Exchange (LME). These bodies ensure a standardised market for trading metals by ensuring metal quality and inspecting storage. Precious metals are stored in vaults located in London, Zurich or Singapore; industrial metals are stored in warehouses inspected by the London Metal Exchange.

The most significant benefit for investors of physically backed ETCs is that they provide exposure to commodity price movements, safe in the knowledge that each ETC is backed by an entitlement to high quality, securely stored, physical metal.

### Synthetic replication

Unlike physical replication, a synthetic ETP does not hold the underlying assets the product is designed to track. Instead, the ETP issuer enters into a swap agreement with a counterparty that contracts to provide the return of the underlying assets.

An ETP provider might choose to use a swap structure for a number of reasons:

- **Accuracy:** Because the return of a synthetic ETP is guaranteed by a counterparty, it can match the underlying asset return accurately.
- **Cost-effective:** A synthetic ETP has limited transaction costs relating to buying and selling the underlying assets.
- **Commodities:** Non-metal commodities can only be accessed synthetically because of the difficulties associated with storage.
- **Variety:** Synthetic ETP structures can offer products which could not be offered physically, including short and leveraged products, volatility indices and emerging market securities.

The most significant risk with synthetic ETPs is that of counterparty default, known as counterparty risk. If a counterparty defaults on its obligations under the swap, the ETP would not provide the return of the asset it is designed to track which could also expose investors to losses.

To minimise the impact of any default, most synthetic ETFs and ETCs are backed by collateral.

### Swap

An agreement where the parties swap the return of one investment for another; or, alternatively, one party pays a fee for the return of a particular investment.

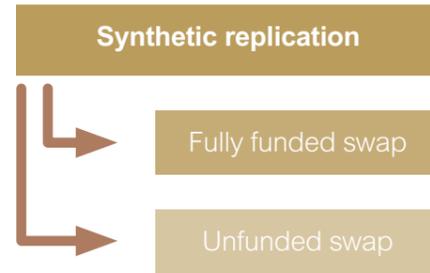
For example, an ETP may agree to pay a fee for the performance of the FTSE 100. If the FTSE rises by 1%, the counterparty will pay this to the ETP. If it falls by 1%, the ETP will pay the difference to the counterparty.

### Collateral

Generally, the asset(s) that a borrower offers as security for a debt.

In the context of ETPs, it usually refers to assets provided by swap providers to secure their payment obligations under a swap agreement.

Synthetic replication comes in two main forms, depending on the type of swap used: fully funded or unfunded.



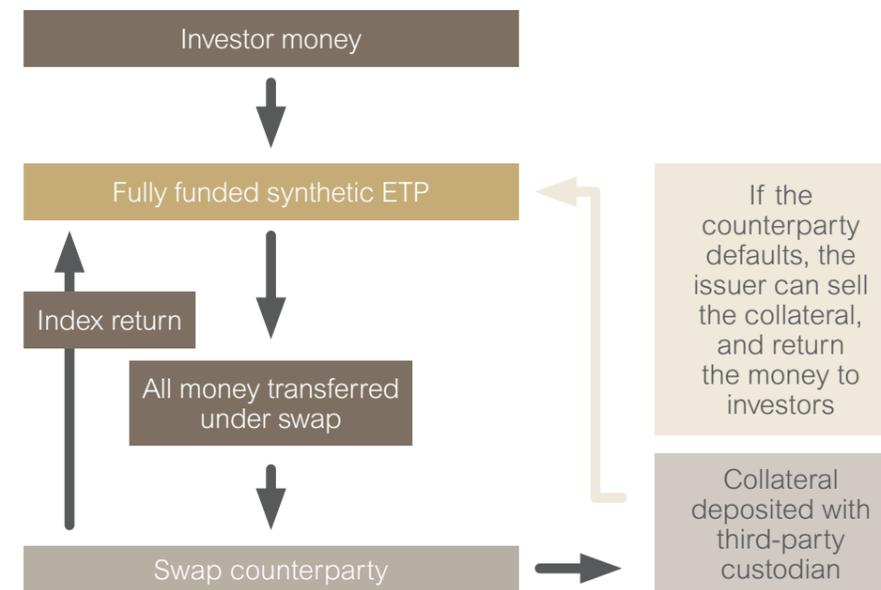
### Fully funded swap structure

In a fully funded swap, the money investors have paid to buy the ETP is transferred to the swap counterparty (hence, fully funded). In exchange, the counterparty will provide that amount of exposure to the underlying asset and deposit collateral equal to, or greater than, that amount with a third-party custodian. Under a fully funded swap, the title to the collateral may be owned by the counterparty or the ETP depending on how the ETP has been structured. Where the counterparty defaults in both cases, the ETP will have title to the collateral as well as be able to sell the collateral and return the proceeds to the investors.

UCITS require the collateral deposited by the swap counterparty to meet certain requirements in terms of asset type, liquidity and diversification for ETFs. Appropriate haircuts must also be applied to protect against the risk of price fluctuations. The level of haircut depends on the asset type, and laws of the jurisdiction in which the product is domiciled. The collateral is marked-to-market daily.

**Haircut**  
A percentage reduction to the market value of an asset used for collateral.  
Haircuts are imposed to provide a cushion to protect the ETP issuer in case the market value of the collateral falls.

### How a fully funded swap works



Below is an example of how a fully funded swap operates:

Fully funded swap	Day 1	Day 2		Day 3	
Index value	100	105		105	
Swap value	100	105		105	
		Before	After	Before	After
Collateral value	111	111	117	108	117
Explanation	Assuming an index level of 100, initial investment of 100, and the haircut applied is 10%. The counterparty must post 111 of collateral (100 / 90% = 111).	The index rises by 5. To maintain sufficient collateral after the haircut, the counterparty must deposit more collateral. The counterparty must deposit enough collateral to bring its value up to 117 (105 / 90% = 117).		Although the index value is unchanged, the value of the collateral has fallen. The counterparty must, again, deposit additional collateral.	

Source: ETF Securities, hypothetical example.

## Unfunded swap structure

### Repurchase agreement (Repo)

An agreement where one party agrees to sell an asset temporarily and repurchase it in the future.

### Reverse Repo

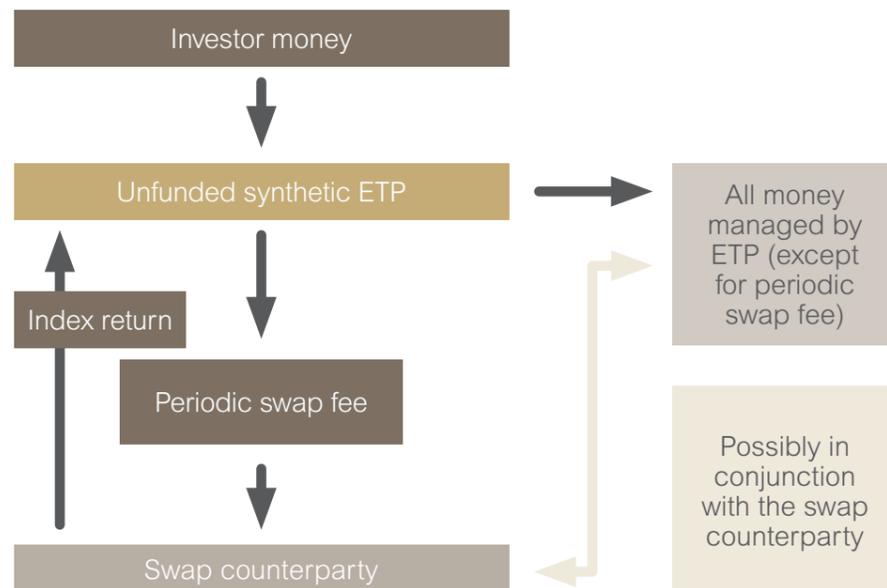
The same agreement, but from the perspective of the party purchasing the asset and selling it in the future.

In an unfunded swap, the money investors have paid to buy the ETP is not directly transferred to the swap counterparty. Instead, a proportion of the money is used to pay the swap fee. The rest of the money is managed by the ETP provider. How the money is managed differs between providers:

- **Reference basket:** Some providers use the money to buy a basket of assets, usually from the swap counterparty, unrelated to the assets being tracked. The basket's return is then exchanged for the return of the assets the ETP is designed to track.
- **Repurchase agreement:** Some providers invest the money with the swap counterparty in a reverse repo to generate a return.

However investors' money is managed, any counterparty exposure will usually be collateralised in an ETF or ETC.

### How an unfunded swap works



## UCITS and ETPs

UCITS, the 'Undertakings for Collective Investment in Transferable Securities', are a set of European directives that impose a common framework for regulating collective investment schemes throughout the European Union. UCITS have been embraced by ETP providers because it allows easy and cost-effective distribution throughout the fragmented European market via registration in an EU country.

UCITS require specific diversification criteria and therefore, only ETFs can be UCITS compliant.

### The benefits of UCITS for investors

#### Liquidity

In times of market disruption, a UCITS ETF may begin to trade away from its NAV, perhaps because there are no market makers willing to quote prices. Where an ETF is trading significantly away from its NAV on exchange, investors who are named on the Register of Shareholders for the ETF should be able to redeem their shares directly with the ETF. If an investor purchased the shares via a broker, they will need to request that the broker redeems directly on behalf of the investor.

#### Segregated assets

The assets of a UCITS fund must be entrusted to an independent custodian for safekeeping, segregated from the assets of that custodian and the company that issued the ETF. These assets cannot be used to discharge the liabilities of either the custodian or the fund issuer.

This means that the fund's assets could not be seized to pay creditors of the fund issuer were it to default.

#### Diversification

To be UCITS compliant, the index an ETF tracks must be sufficiently diversified. No individual security can exceed 20% of a fund's NAV. This figure can be increased to 35% under certain market circumstances.

#### Collateral

If an ETF uses derivatives, such as swaps, UCITS requires an ETF to limit the amount of its exposure to a single counterparty. The amount exposed through a derivative contract must not exceed 5% or 10% of NAV, depending on the type of counterparty.

Furthermore, the UCITS regulations oblige the fund to reduce its exposure to any counterparties in case such counterparties default on their obligations under the derivative contracts. One way of doing this is to post collateral. This collateral should meet minimum criteria. For example, the collateral must be valued on at least a daily basis and assets that exhibit high price volatility should not be accepted unless suitably conservative haircuts have been applied.

#### Disclosure

UCITS ETFs must publish a number of documents to inform investors about the nature of the product, such as (i) the prospectus; (ii) the Key Investor Information Document (KIID); and (iii) annual and semi-annual reports.

The prospectus must set out information such as a description of the index being tracked, the method of tracking and a description of the factors that contribute to the ETF's performance. The amount of information required in the prospectus will vary according to the type of ETF.

Since prospectuses can be extremely long and dense documents, the KIID is a plain and concise summary of the important facts about the ETF. Usually, it is limited to two A4 pages in length. However, it should be noted that the KIID will inevitably omit certain information and investors should always read the full prospectus.

Finally, the annual and semi-annual reports will provide details of the investments and performance. It will include commentary from the fund issuer about developments over the financial year.

## UCITS, ETCs and ETNs

ETCs and ETNs are not issued as shares in funds but as debt securities. As such, they are not collective investment schemes for the purpose of the UCITS directive, and are therefore not governed by the UCITS regulations. However, while they are not UCITS compliant, they may be UCITS eligible. This means that they are investments which, while not themselves compliant with UCITS, are capable of being an eligible investment for another UCITS fund.

## 03 ETP risks

Hopefully now you have some idea of the benefits on offer from using ETPs. But as with all investments, there are risks. It is important to distinguish what risks any individual ETP is subject to before making an investment.

### General ETP risks

#### Market risk

ETPs replicate the price movements of their underlying benchmark or asset so their performance is affected by the volatility of their underlying markets.

#### Tracking difference

The structure and cost of an ETP means it may not track its underlying exactly.

#### Tax

As with the majority of investments, ETPs will usually incur some form of taxation. Each investor should obtain independent tax advice.

#### Costs

All ETPs incur costs, whether internal costs (related to the product) or external costs (incurred in trading the product).

#### Currency

Any investment involving a non-local currency will be affected by exchange rate fluctuations (unless the product incorporates a currency hedge).

### Physical Exchange Traded Funds (ETFs) risks

#### Securities lending

Physical ETFs that engage in securities lending can help reduce the cost of the product. However, securities lending introduces counterparty risk.

#### Sampling

Physical ETFs that engage in sampling replication may reduce transaction costs but may not track its underlying as accurately as synthetic or fully replicated physical ETFs.

### Synthetic Exchange Traded Products (ETPs) risks

#### Counterparty risk

Synthetic ETPs rely on swaps to track their underlying exposure. If the counterparty defaults, it is likely that the return will not be provided by the counterparty. Synthetic ETFs and ETCs are collateralised to minimise the impact of this possibility.

### Exchange Traded Notes (ETNs) risks

#### Credit risk

ETNs are affected by the credit rating of their issuer because they have no segregated assets and are not usually collateralised.

	Physical ETFs	Synthetic ETFs	Physical ETCs	Synthetic ETCs	ETNs
Market risk	•	•	•	•	•
Tracking difference	•	•	•	•	•
Tax	•	•	•	•	•
Costs	•	•	•	•	•
Currency	•	•	•	•	•
Securities lending	(•)				
Sampling	(•)				
Counterparty risk	(•)*	•		•	•
Credit risk					•

\*If engages in securities lending.  
( ) = if engages in.

## 04 ETPs and taxation

Many potential investors have questions regarding the tax status of ETPs. However, given that each individual's tax status will be different, it is only possible to give general information about potential tax liabilities arising from ETPs.

The brief points opposite are correct as of going to print (June 2013) and relate to UK investors only. ETF Securities strongly suggests that potential investors seek specialist independent investment and tax advice before investing.

### Stamp Duty

UK Stamp Duty is charged at a rate of 0.5% on electronic share purchases as well as some OEIC and unit trusts.

UK Stamp Duty is not payable on the majority of ETPs when they are bought on-exchange and are not domiciled in the UK.

### UK reporting fund status

Many ETPs are domiciled in jurisdictions such as Jersey, Dublin or Luxembourg. As such, they are often treated as offshore funds for UK tax purposes. This is significant because, unless an offshore fund has UK reporting fund status for the entire period that the investor holds it, any gain on that fund will be taxed as income instead of capital gains. This could subject the investor to significantly higher levels of taxation. Therefore, if the ETP is domiciled in an offshore jurisdiction, an investor should check if the product has UK reporting fund status.

### Tax wrapper

An account which confers tax advantages on the gains made on assets held within them. Examples in the UK include Individual Saving Accounts (ISAs) and Self Invested Pension Plans (SIPPs).

Most ETPs are eligible for ISAs and SIPPs. Notable exceptions are ETCs where physical redemption by all investors, not just Authorised Participants (APs), is possible and are accordingly not eligible for ISAs (but are for SIPPs).

### Remittance

If you are a UK resident but not domiciled in the UK, it is possible to elect to be taxed on the remittance basis, as opposed to the arising basis.

Since ETPs are domiciled in offshore jurisdictions, under a remittance taxation basis, they would be exempt from UK taxes unless that income or gain is remitted to the UK.

## 05 Trading and pricing

Investors often judge ETP liquidity by the volumes traded on-exchange. In fact, there are 2 sources of ETP liquidity:

### 1. The amount traded on-exchange

### 2. The liquidity of the underlying asset

This is because ETPs can be created in exchange for the underlying assets or with cash. Therefore, ETPs are able to source liquidity from the underlying assets being tracked. Unlike a share, pricing is not determined by the supply and demand of a fixed number of units because ETP securities can be created to meet demand. Instead, ETPs are priced by reference to the underlying asset. Arbitrage will ensure ETPs track their underlying closely.

An understanding of how ETPs are created and redeemed, and the role of arbitrageurs, will help investors fully appreciate the mechanics of ETP pricing and how best to trade them.

## Creation and redemption

Investors in Exchange Traded Products purchase and sell securities on the stock exchange. This is referred to as the secondary market. There is also a primary market, where APs are able to deal directly with the issuer of the ETP. A closer look at this process is detailed below for informational purposes. However, all of the interactions retail investors have with ETPs will take place only on the secondary market via the stock exchange.

### Authorised Participant (AP)

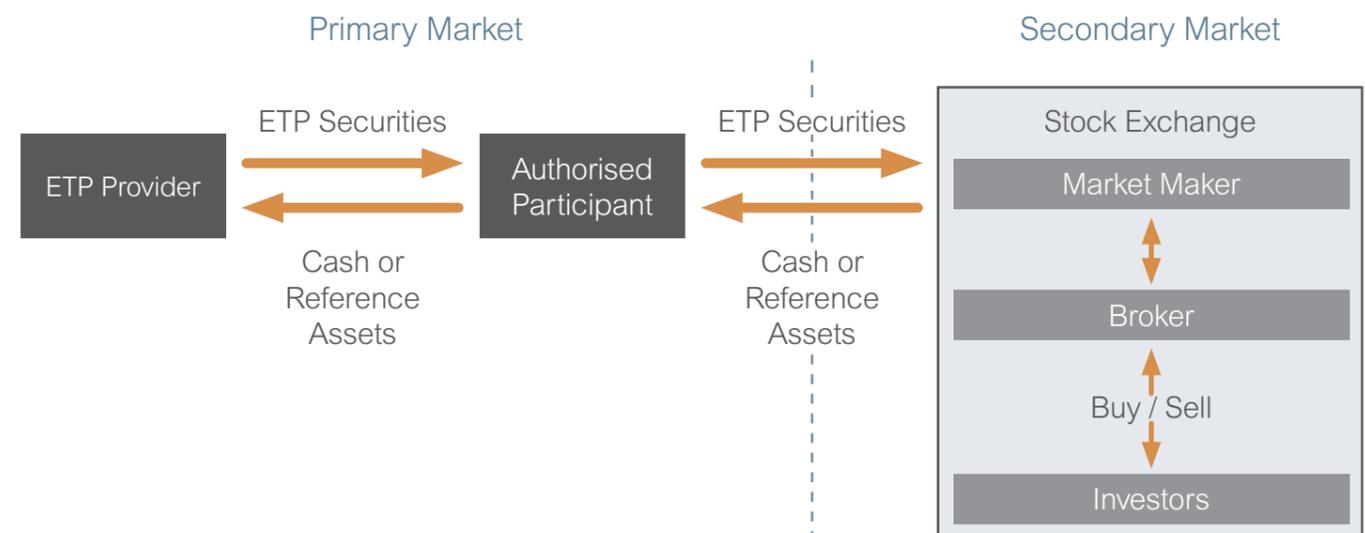
APs are financial institutions that source the underlying assets or cash needed to create the ETP. Only APs can create or redeem ETPs. They are typically investment banks or specialist market makers.

### Creation

When an AP wishes to purchase (i.e. 'create') securities from the ETP provider, it will typically deliver the underlying reference assets (or the cash equivalent) to the ETP provider. In return, the AP will receive the ETP securities from the ETP provider. These transactions typically occur in large batches (e.g., 50,000 securities). Once the AP has received the securities, it can sell them to intermediaries and investors via the stock exchange.

### The creation process

1. The AP submits an application to the ETP provider to purchase (i.e. 'create') securities.
2. The AP then delivers the underlying reference asset or the cash equivalent to the ETP provider (e.g. if the ETP is tracking the FTSE 100 index, the AP will deliver the FTSE 100 shares according to their weighting in the index or the cash value of such shares).
3. In exchange, the ETP provider transfers the same value in ETP securities to the AP.
4. The AP then sells the ETP securities to intermediaries and investors via the stock exchange.



### The redemption process

1. The AP submits an application to the ETP provider to return (i.e. 'redeem') securities.
2. The ETP provider then delivers the underlying reference asset or the cash equivalent to the AP.
3. In exchange, the ETP provider cancels the same value in ETP securities.

### NAV or Net Asset Value

Generally, NAV refers to the value of an entity's assets minus its liabilities.

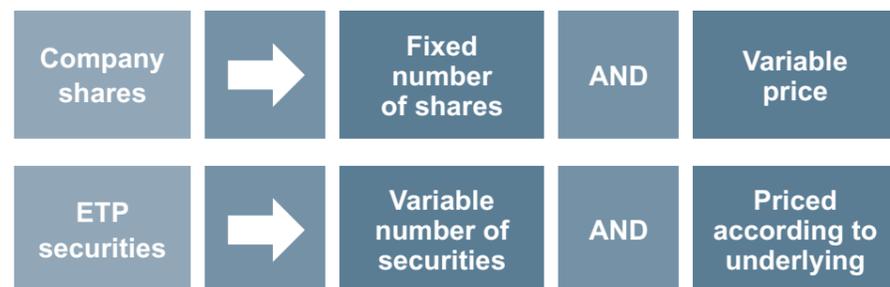
In the context of ETFs, NAV is calculated as the value of assets held by the ETF (whether equities bonds, swaps, cash, etc.) minus its liabilities (management fee, swap fee, etc.). ETCs are valued according to their price, as securities are issued as debt securities and not as shares. That price is calculated by reference to a formula that references the underlying asset. The price of an ETC is sometimes referred to as its NAV for convenience purposes.

### Redemption

The redemption process is the opposite of the creation process. When investors sell securities in an ETP, the AP will either hold them as 'inventory' or will redeem them with the ETP provider. If the AP decides to redeem the securities, it will submit a redemption request to the ETP provider, who will then return either the underlying reference asset or cash in return for the securities, which will then be cancelled.

### Pricing and NAV

ETPs can be created and redeemed according to demand, which means the number of ETP units issued is variable. This is unlike company shares. Companies issue a fixed number of shares (unless a corporate event takes place to issue additional shares) that trade at a variable price determined by supply and demand. This is important because the purpose of an ETP is to track an underlying benchmark or asset. If the price of an ETP fluctuated depending on supply and demand, it would no longer track its underlying accurately.



In theory, the price of an ETP should be determined by its net asset value (NAV) divided by the number of securities. The NAV will fluctuate depending on the price movements of the underlying assets which, in turn, will alter the price of each ETP security.



Physical ETCs do not have a NAV. Instead, a physical ETC's price is determined by the metal entitlement multiplied by the spot price of that metal. The spot price will fluctuate depending on the supply and demand for the underlying metal.



### Arbitrage

If supply and demand for an ETP causes it to trade away from its NAV value, an arbitrage opportunity arises.

#### If ETP price > underlying assets

The AP can buy the underlying assets and exchange them for ETP securities. These securities can then be sold to intermediaries and investors. Since the ETP securities are worth more than the underlying assets, the AP profits.

#### If ETP price < underlying assets

The AP can buy ETP securities and exchange them for the underlying assets. These assets can then be sold to intermediaries and investors. Since the underlying assets are worth more than the ETP securities, the AP profits.

With ETPs, the creation / redemption process allows arbitrage to take place. The AP can continue the arbitrage until there is no price difference between the ETP and the underlying assets, hence the process of arbitrage will no longer be profitable. This ensures that ETPs will only trade away from its NAV for short periods.

### Arbitrage

The purchase and sale of an asset to exploit a price difference.

For example, bread costs £2 in London but £1 in Manchester. It costs 50p to transport the bread from Manchester to London. There is an opportunity to buy bread in Manchester and sell it in London for a profit.

### The arbitrage process

Imagine a physical FTSE 100 ETP trades for £20 and the underlying assets that constitute the ETP are worth £25. The AP can buy the ETP on exchange and redeem it for the underlying shares. By selling them, the AP makes a profit of £5. As it buys the ETP and sells the underlying assets, it reduces the price difference between them. Eventually, the prices converge and the arbitrage will no longer be profitable. Through this process, the AP has returned the ETP to its NAV.

## Liquidity

Since ETPs can take advantage of the liquidity of its underlying assets, large transactions can be executed without significant impact on costs. For example, average daily volume of all LSE-listed ETPs that track the FTSE 100 is approximately £50 million. Looking at this metric alone, an investor might conclude liquidity in these products is limited. However, the liquidity available to FTSE 100 ETPs is actually much larger, since average daily volume of FTSE 100 shares is over £3.75 billion. ETP volume represents only 1.3% of the underlying asset volume.

Therefore, investors thinking about an investment in ETPs should consider underlying asset liquidity as a more accurate measure of an ETP's liquidity and not just on-exchange volumes.

### ETP liquidity explained

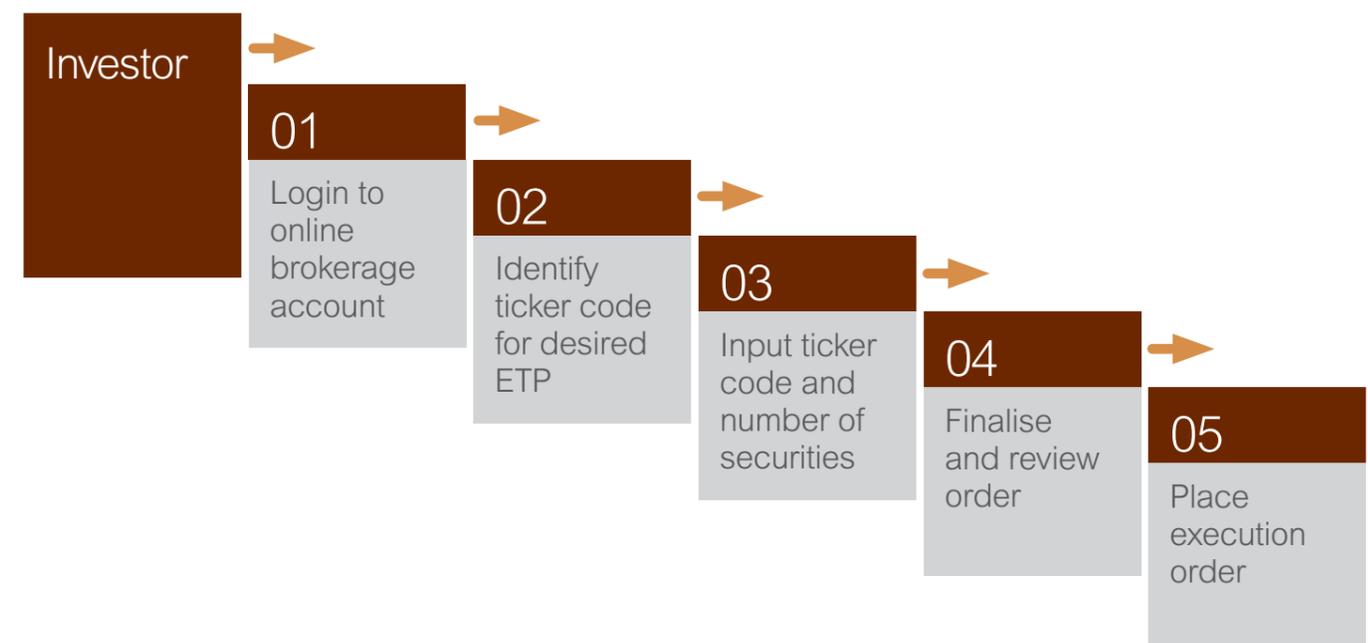
	FTSE 100 ETPs	FTSE 100 shares	ETP volume as % of underlying
Daily volume (£)	49,317,790	3,782,304,887	1.3%

Source: Bloomberg, daily average volume, month ending (March 2013).

## Understanding order types

ETPs can be bought and sold on-exchange in the same way as shares in companies. They can be traded through an online platform or through a broker. This means with a few clicks of a mouse, an investor can add commodity diversification with an ETC or gain exposure to an entire benchmark with an ETF in a single transaction.

## Buying an ETP



## Execution slippage

Because ETPs are traded on-exchange, investors can be exposed to execution slippage. This is the difference between the best price an asset could be traded at and the actual price achieved.

A stock exchange uses an order book to record the best bid and ask price for all market makers quoting a particular security. In the hypothetical order book below, the 'Ask' column shows the prices at which an ETP security can be purchased. The 'Size' is the number of securities available in the market, and the 'Order' is the number of market makers selling securities at each ask price. To illustrate this concept we introduce a hypothetical order book below. Imagine an investor wants to buy 3,000 ETP securities:

### A hypothetical order book

Ask (£)	Size	Order	Total
10.83	2,000	1	2,000
15.50	180	1	2,180
16.30	100	1	2,280
17.25	120	1	2,400
20	160	1	2,560
21.10	1,000	1	3,560

Source: ETF Securities, hypothetical example.

An investor's order is filled by purchasing the cheapest securities first and progressing onto the more expensive securities. If the investor in this example wants to fill the order for 3,000 securities of the ETP immediately, he will first purchase the 2,000 securities available in the market at the lowest ask price of £10.83. The rest of the order is filled by purchasing the 180 securities available at the next best ask price of 15.50 before progressing onto the more expensive securities. The process continues until the entire order of 3,000 securities is filled. Note that, despite there being 1,000 securities of the ETP available at £21.10, only 440 securities need to be purchased at this price.

The average price of each ETP security is the sum of each ask price multiplied by the number of securities purchased at that price and divided by the total order size (3,000). As explained in the table, left, the total order of 3,000 securities would be executed at an average price of £13.54, compared to a best price of £10.83. The investor has paid a significant premium for the asset, reducing the prospective gain. This is called execution slippage.

Potential investors can protect themselves against execution slippage by using different order types.

### Calculating the average price of an ETP security

Ask (£)		Shares purchased	=	Order cost (£)
10.83	x	2,000	=	21,660
15.50	x	180	=	2,790
16.30	x	100	=	1,630
17.25	x	120	=	2,070
20	x	160	=	3,200
21.10	x	440	=	9,284
<b>Total</b>				<b>40,634</b>

<b>Total order cost (£)</b>	40,634
<b>Total order size</b>	3,000
<b>Average price (£)</b>	$40,634 \div 3,000 = 13.54$

## Order types

There are four key order types:

- Market order
- Limit order
- Stop loss
- Stop limit order

Market order	Pros	Cons	Often used when...
Trade immediately at best market price	Immediate	No guaranteed price and risk of execution slippage	It is more important to make the trade quickly than achieve a specific price

Market orders are immediately executed, but suffer from execution slippage. A market order is illustrated in the example opposite.

Limit order	Pros	Cons	Often used when...
Trade only at a specified price or better	Transact only at a particular price the investor is comfortable with	If that price is not reached, there will be no transaction	The aim is to execute a trade at a particular price

If an investor seeks to execute at a specific price, a limit order is often be used. Limit orders are cancelled after a set time, usually at the end of the day, but can be specified to last for a longer period. Limit orders can be amended or cancelled provided they have not already been executed. Other order types include:

Stop loss order	Pros	Cons	Often used when...
Execute as market order once designated stop price is achieved	More likely to transact than limit order, when transacting close to specified price	Slight risk of execution slippage (price may change after order is triggered)	The aim is to protect a profit or limit a loss

Stop limit order	Pros	Cons	Often used when...
Trigger a limit order once designated stop price is achieved (i.e. set both a stop and limit price)	Maximum execution protection to achieve desired price	Price must reach two set limits before there is a transaction	The aim is to protect a profit or limit a loss and speed is not a big priority

## 06 Costs and performance

Cost is one of the most important factors to take into consideration when making an investment. While performance is difficult to predict, costs are not.

Unfortunately, ETP costs are not always clear. The most widely reported cost figure, the total expense ratio (TER), is often incomplete and can neglect a number of internal and external expenses, including transactions costs, swap spreads and bid / ask spreads on exchange.

In this guide, we attempt to outline the most common components that contribute to an ETP's total ownership cost, dividing them between internal costs (related to the product) and external costs (incurred in trading the product).

### Internal costs

There are three factors that contribute to the internal costs of an ETP:

- the total expense ratio (TER)
- any rebalancing costs
- any swap spread

#### Total expense ratio (TER)

The total expense ratio is the annual cost of managing the product, expressed as a percentage. The costs included within the TER can vary among providers, but usually incorporate:

Management expense ratio

Administrative costs

Index licence fee

Storage costs (for physical ETCs)

### Rebalancing costs

The cost incurred by physical ETFs when they buy and sell securities.

When the underlying index changes its constituents, the ETF must do likewise. Transaction costs depend on how many and often the index constituents change: the greater the number and frequency, the more expensive the rebalancing costs.

### Swap spread

The fee paid by the synthetic ETP provider to the swap counterparties for the swaps agreements.

The swap fee is a matter of negotiation between the provider and the counterparty, considering commercial factors such as the cost of the counterparty hedging its swap exposure, the cost of collateral, its credit rating and its own profit margin. Generally, more illiquid or exotic exposures have more expensive swap spreads.

Sometimes the swap spread is incorporated into the TER of ETPs.

### Market Maker (MM)

MMs are firms that provide liquidity to the market by quoting bid / ask prices. Their profit comes from buying an asset at a lower price than which it is sold or, vice versa, selling an asset at a higher price than which it is bought. The MM wants to hold the asset for as little time as possible, ideally buying and selling simultaneously.

For example, for ETP 1, a MM may quote an ask price of £100 and a bid price of £99. If you sell your shares of ETP 1 at £99, the MM can go on to sell them to another buyer at £100, making a £1 profit.

### Creation / redemption fee

The fee the ETP provider charges to create or redeem shares.

### Market maker spread

MMs do not attempt to profit from changes in an asset's price; what most investors consider investment exposure is actually risk to the MM. Instead, they attempt to buy and sell simultaneously. This is not always possible, therefore the MM will hedge against the price fluctuation of an asset. The cost of doing so is the market maker spread passed on to the investor.

### Underlying spread

The cost of buying the underlying assets, which also have bid / ask spreads, needed to create the physically backed ETP. This cost is greater for illiquid assets than liquid ones.

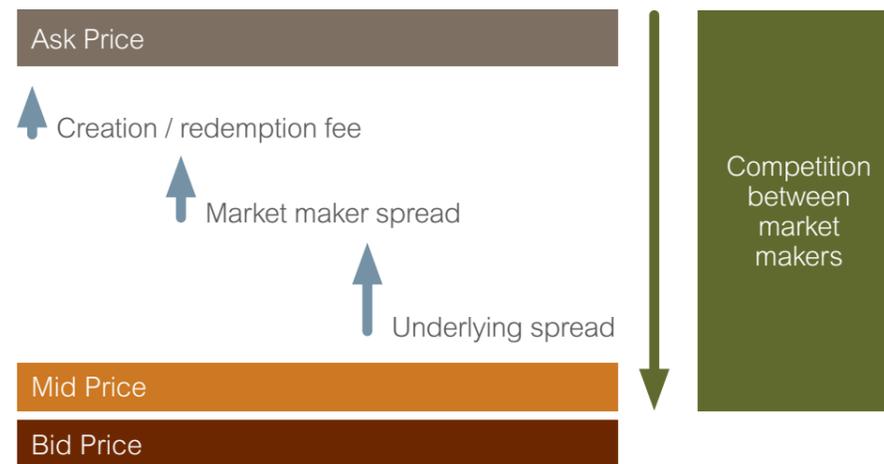
## External costs

### Bid / ask spread

As with trading any asset on-exchange, there is a spread of prices at which an ETP can be bought or sold.

Bid	Ask	Bid / ask spread
The price at which a buyer is willing to buy an asset.	The price at which a seller is willing to sell an asset.	The difference between the bid and ask price.

Bid / ask prices are quoted by market makers (MMs), who ensure there is always a price at which an asset can be bought and sold. MMs compete for customers by trying to offer the most competitive prices. For an ETP, the costs that MMs consider are the creation / redemption fee, the market maker spread and the underlying spread.



If any of these 3 costs rise, the MM will widen the bid / ask spread to try to make a profit.

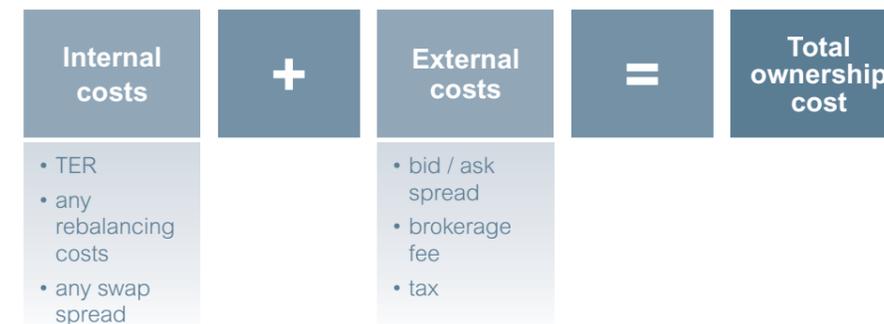
Typically, the more MMs offering bid / ask spreads on an ETP, the tighter the bid / ask spread. ETPs with more MMs will generally trade at a price closer to that of the underlying asset they are designed to track. This, in turn, means the investor pays less money to buy the product and receives more money on its sale.

### Brokerage fee

Cost paid by the investor to a broker to buy or sell an ETP.

### Tax

Different ETPs will incur different taxes, depending on the product itself, the jurisdiction it is domiciled in and the circumstances of the individual investor. Investors are advised to contact tax experts in their own jurisdiction to clarify what charges will apply.



## Beyond TER

A product's TER is only one aspect of a product's total ownership cost. Unfortunately, to think of TER as 'total' would be misleading: a lower TER does not necessarily guarantee the cheapest investment.

In the following simplified example, ETP 1 has a cheaper TER by 15 basis points. However, when all the costs of ownership are considered it becomes 9 basis points more expensive. Investors should resist the impulse to judge an ETP by TER alone and adopt a more holistic view about ETP costs.

	TER (bps)	Swap spread (bps)	Securities lending (bps)	Bid / ask spread (bps)	Total cost (bps)
ETP 1	25	15	-5	10	45
ETP 2	40	5	-15	6	36

Source: ETF Securities, hypothetical example.

### Tracking error

The volatility of the difference of the returns between a product and its benchmark.

Tracking error is calculated as the standard deviation of a product's returns against its benchmark. It shows how consistent the ETP has been in replicating its benchmark.

### Tracking difference

The difference between a product's return and that of its benchmark over a specific time period.

Tracking difference is calculated by accessing the difference between the return of a benchmark and the return of the ETP designed to track it. It shows the magnitude of underperformance. There will always be an element of tracking difference because of fees.

Tracking difference is usually negative, meaning that the ETP underperforms its benchmark. However, sampling replication and revenue from securities lending can both cause physically backed ETFs to have a positive tracking difference, in which case the ETF has outperformed its benchmark.

## Tracking

Both internal cost and replication method can affect how the product tracks the underlying. Even if the product tracked its underlying perfectly, it would still underperform its benchmark by the internal cost (see page 43).

The two most common methods of defining how well an ETP tracks its benchmark are tracking error and tracking difference.

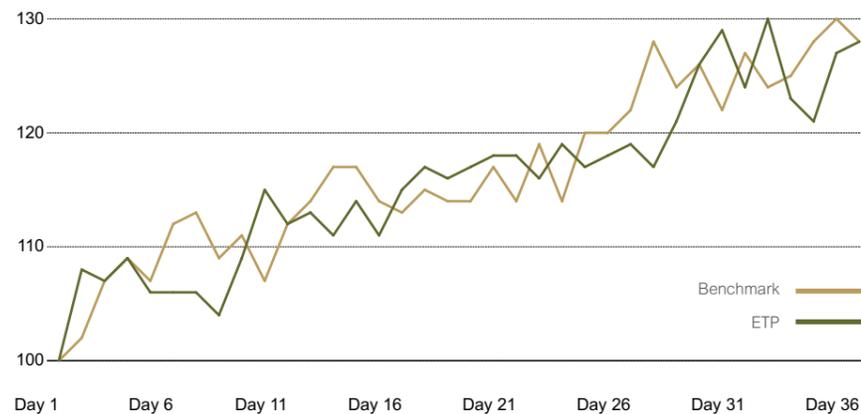
### Tracking error and tracking difference

In the hypothetical example below, the volatility of the difference of the returns between the benchmark and the product is the cause of tracking error. However, if measured between day 1 and day 36 there is no tracking difference since both the benchmark and the product returned the same amount over 36 days. Nevertheless, if we were going to measure returns across a different time frame, such as over 20 days rather than 36, there would have been tracking difference.

Tracking difference tends to vary over time and is therefore sensitive to the time horizon that is selected. As such, tracking error does not necessarily impact the magnitude of tracking difference over a given time period.

While tracking difference is easily calculable, tracking error is much more complex because there are numerous methodologies that providers use to calculate tracking error.

### ETP tracking error calculation



Source: ETF Securities, hypothetical example.

Tracking error inconsistency can arise from:

- frequency of data used (daily, weekly, monthly)
- time period (one year, three years, five years)
- issues around rounding
- issues posed by holidays

Currently, there is no standardised methodology to calculate tracking error, which means the figures supplied by ETP providers may not be a like-for-like comparison.

### Causes of tracking error and tracking difference

Cost is one of the largest sources of tracking error and tracking difference. Given that the total holding cost comprises both fixed elements (TER) and variable elements (bid / ask spreads) such costs can contribute to the absolute difference between a product and its benchmark's return (tracking difference), as well as the volatility of that difference (tracking error). However, there are a number of causes of tracking error and tracking difference that are not covered by costs.

Cost factors that impact tracking	Non-cost factors that impact tracking
TER	Dividend reinvestment
Rebalancing costs	Withholding taxes
Swap spread	Sampling
Tax	Securities lending

#### Dividend reinvestment

For physical ETPs tracking equity benchmarks, the difference in the dividend reinvestment assumptions of the benchmark and the product can impact tracking.

Some indices assume immediate reinvestment of dividend proceeds on the ex-dividend date but a product must wait to receive the dividend before it can re-invest. During this period, there will therefore be a difference between the performance of the ETP and its benchmark.

### Withholding taxes

Taxes applied on dividend or interest payments generated by an investment in an underlying index can impact tracking.

While these taxes are factored in the index calculation, they may not apply to all investors. Please consult an independent financial adviser in order to determine how tax implications will affect your investment.

### Sampling

Physically replicated ETPs that use sampling techniques to replicate their benchmark usually have greater tracking error and difference compared to fully replicating or synthetic ETPs because their constituents do not exactly match those of the benchmark.

### Securities lending

Revenue from securities lending can reduce the cost of an ETP and in some cases completely offset the product's internal costs.

For a full explanation of securities lending please see page 24.

### How well do ETPs perform?

	FTSE 100	Dax 30	S&P 500	MSCI Emerging Markets	Gold (physical)
Tracking error	0.06%	0.04%	0.04%	0.57%	0.00% <sup>10</sup>
Tracking difference	0.46%	0.23%	0.02%	0.95%	0.40%

Source: Morningstar, On the Right Track: Measuring Tracking Efficiency in ETFs (February 2013); ETF Securities (February 2013)

The table shows tracking accuracy varies between asset classes. Investors should adjust their expectations according to the underlying assets. For example, a 1% tracking difference would be poor in developed country equity ETFs but might be acceptable in an emerging markets product.

### Tracking error or tracking difference?

Investors often ask which is more important: tracking error or tracking difference? The answer depends on the purpose of the investment. For return generating investments, tracking difference is a more useful metric because these investors want to maximise return while minimising cost. Tracking error may be more appropriate to consider if the investment is for hedging purposes since tracking precision will be more important than the overall return. Long-term investors may be more concerned with tracking difference whereas investors seeking to profit from short-term fluctuations may want to focus on tracking error.

<sup>10</sup> The annualised tracking error for a physical gold ETC was 0.00024% from July 2010 to September 2012.

## Understanding indices

There are two main types of equity indices.

### Total return index (TR)

An index in which any cash distributions from the underlying assets are reinvested.

For instance, the FTSE 100 total return index (Bloomberg code: TUKXG).

There are also total return indices for bonds and commodities, which are calculated in a slightly different way.

See page 53 for an example of a total return commodities index.

### Price return index (PR)

An index which only tracks the price movements of the underlying assets and does not reinvest cash distributions.

For instance, the FTSE 100 price return index (Bloomberg code: UKX).

FTSE 100 total return index (TR) vs. FTSE 100 price return index (PR) from July 2010 to April 2013



Source: Bloomberg (July 2010 - April 2013).

This distinction is important because whenever cash dividends are made, PR indices will fall but TR indices will not be affected by the distributions. For instance, if a number of FTSE 100 companies pay out dividends on a particular day, UKX would drop as a result of the dividends, but TUKXG would not be affected by the dividends. As such, TUKXG has outperformed UKX by over 11% over the last 3 years<sup>11</sup>. Since news media almost exclusively quote PR indices, this can cause some confusion among investors who have invested in an ETP that tracks a TR index. Thus, potential investors should be aware of which version of an index (TR or PR) a particular ETP tracks.

<sup>11</sup> Bloomberg (April 2013).

### Futures (contracts)

An agreement where one party will buy and the other party will sell an asset at a future date at a predetermined price.

Futures contracts are standardised in that they will stipulate an amount and quality of the asset which is the subject of the contract. For instance, 5,000 bushels at #1 soft red winter grade are the set requirements for wheat futures on the New York Mercantile Exchange. This makes establishing a liquid market easy because buyers and sellers know exactly what they are getting.

Futures contracts have varying maturities (when the commodity is to be delivered), ranging from 1 month to 3+ years.

## Futures, contango and backwardation

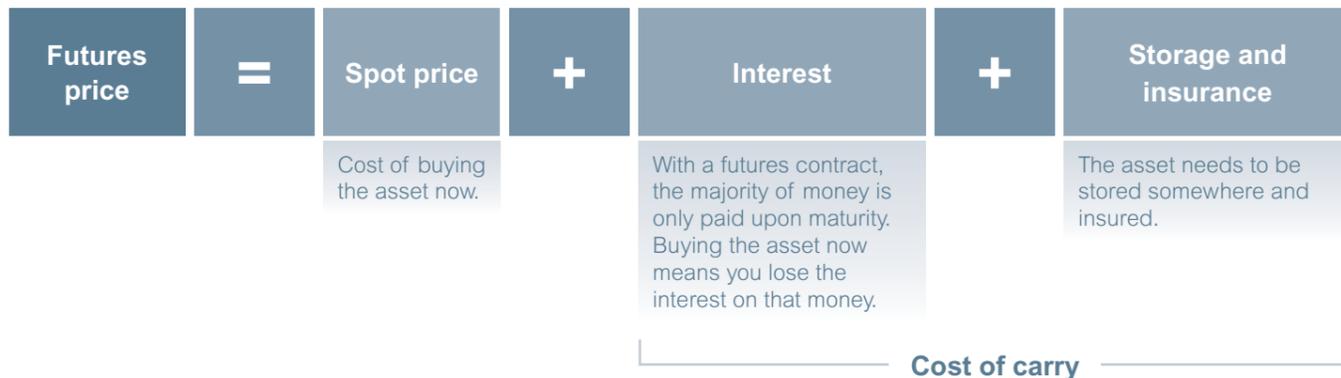
One of the biggest asset classes that ETPs make available to a wider audience of investors is commodities. However, most non-metal commodities cannot be traded physically because they are difficult and expensive to store. For example, agriculture and livestock are perishable and oil is explosive. Therefore, investors seeking commodity exposure, without wanting to deal with the physical asset itself, have historically used futures contracts. Indeed, when media outlets quote commodity prices, they are quoting front month futures prices (the futures contract that matures closest to the current date).

As such, ETCs tracking non-metal commodities usually track futures indices. However, there are certain costs inherent in futures that investors should be aware of when purchasing an ETP that tracks their performance, especially in relation to the impact of contango and backwardation.

### Futures

The price of a futures contract is based on the spot price of the underlying asset and additional costs of carry which are explained below. Instead of buying the futures contract, the investor could buy the commodity and store it for the length of the future. For example, an investor who wants to receive 1,000 barrels of oil in 3 months time can buy the appropriate futures now or buy 1,000 barrels of oil and store it for 3 months.

However, buying the commodity immediately for use in the future incurs extra costs: interest, storage and insurance. These are known as the costs of carry.



### Futures indices

Unlike futures contracts, which expire, futures indices are constructed to simulate a continuous exposure to a commodity future of a particular maturity.

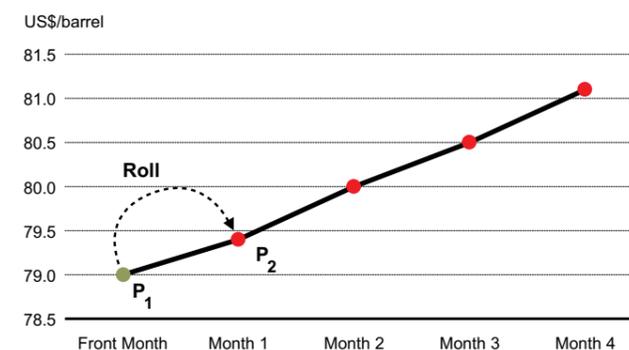
#### Roll yield

Futures contracts are generally closed out of just before the term of the contract expires and new longer dated contracts are entered into in order to avoid taking actual delivery of the commodity in question (a process known as 'rolling'). This ensures that continuous exposure to the commodity is maintained.

The contracts being purchased may be more expensive than the contracts being sold which would cause an investor in commodity futures to make an additional loss. This market trend is known as 'contango' and the price difference is commonly referred to as 'roll yield'. As the roll yield is incorporated into the calculation of the value of the Index, it will have a negative impact on the value of the Index.

For example, imagine an investor holds 100 front month oil futures that are nearing expiry, so the futures need to be rolled. According to the graph on the right, they can be sold for US\$79, yielding US\$7900. This money is then invested in futures that expire a month later (M2 futures), which cost US\$79.4. The US\$7900 will only be sufficient to buy 99 M2 oil futures. Thus, the investor has lost 1% of his investment due to the cost of rolling.

Oil futures curve in contango

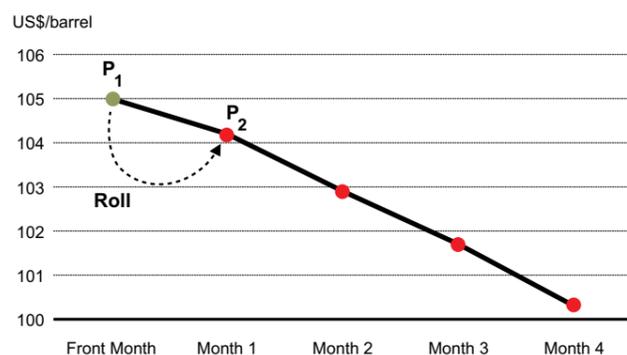


Source: ETF Securities, Bloomberg (as of 30 July 2010).



Alternatively, the contracts being purchased may be cheaper than the ones being sold which would result in an additional gain, known as 'backwardation'. Rolling futures when the market is in backwardation results in a profit to an investor. This is because the current futures contract can be sold for a higher price than it costs to buy the new futures contract.

### Oil futures curve in backwardation



Source: ETF Securities, Bloomberg (as of 30 July 2010).



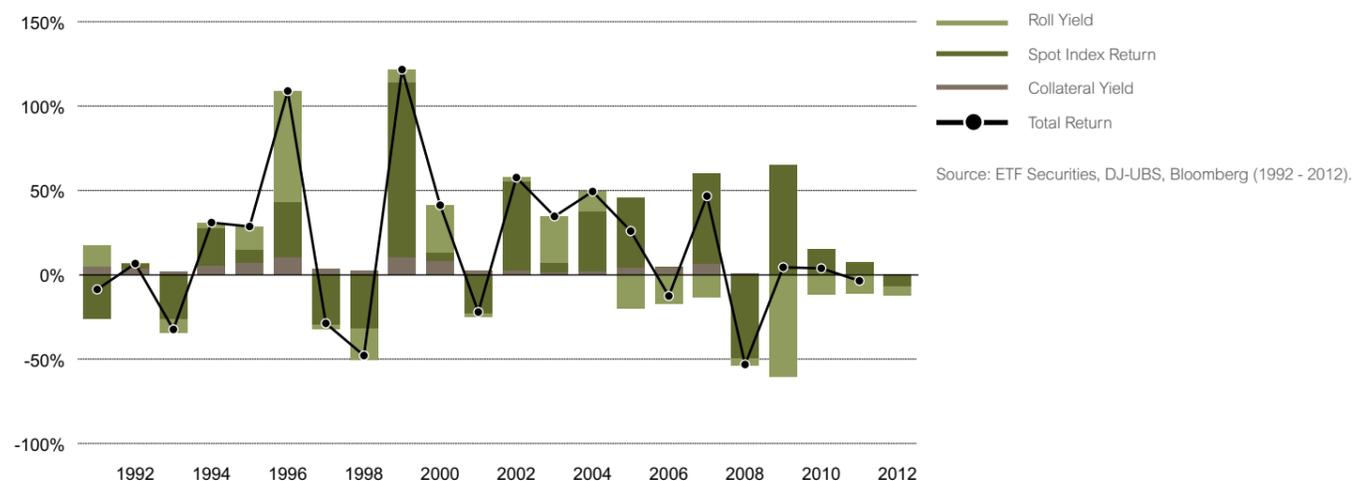
### Collateral yield

With a futures contract, the majority of cash due to be paid on delivery of a commodity does not change hands immediately. In contrast, futures indices presume that the entire contract value is paid up-front. However, this would mean a futures index investor would lose the interest on cash that could have been earned by using futures contracts. As such, the index calculation includes a collateral yield to more accurately simulate a rolling futures exposure.

Thus, a futures index can be said to be composed of three elements: the spot index return, the roll yield and the collateral yield. A commodities index that incorporates all three elements is known as a total return index.



### Composition of returns - DJ-UBS crude oil annual return, from 1991 to 2012



Note that some ETPs track price return indices. These are indices which omit the collateral yield component.



### The impact of contango and backwardation

Since non-metal ETCs track futures indices, the return of an ETC will similarly be composed of these three elements - spot return, roll yield and collateral yield. As can be seen from the graph on page 53, the roll yield is the largest reason why a commodity ETC will not match the spot return. The roll yield, in turn, depends on whether the futures market is in contango or backwardation. The magnitude of the impact of these market traits on ETC returns should not be underestimated. For instance, in 2009, although the spot price of crude oil increased over 50%, contango negated almost all the gains.

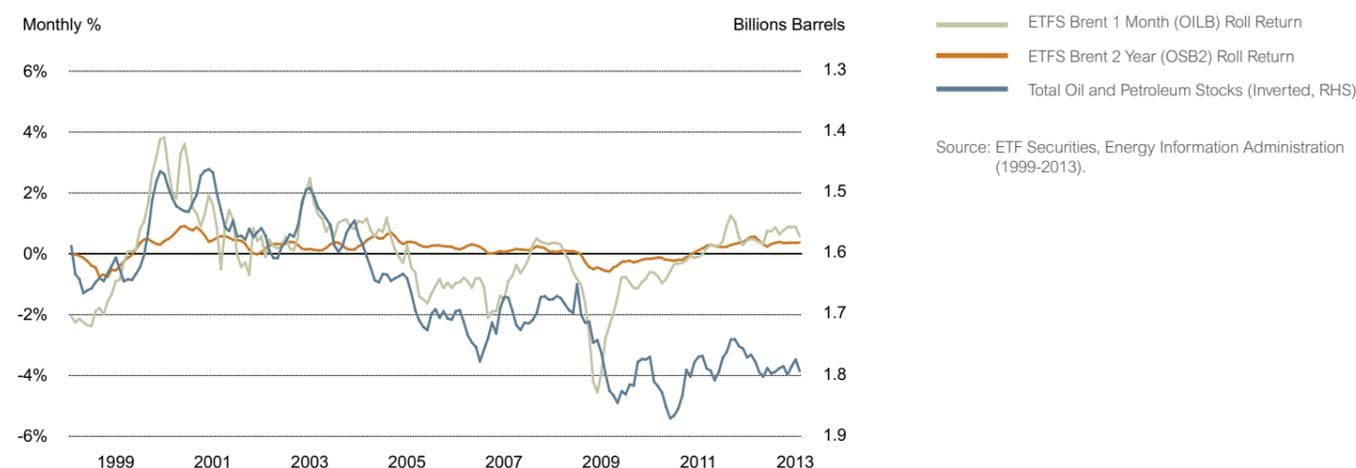
ETCs can track futures indices that simulate exposure to both short dated and long dated futures contracts. One way to mitigate the effects of contango and backwardation in the short-term is to invest in these longer dated contracts. ETCs tracking short dated futures indices need to roll futures contracts more frequently than ETCs tracking long dated futures, giving the investor more exposure to short-term price movements and the slope of the futures curve. The price of longer dated futures tends to be driven more by structural supply / demand considerations. In the graph opposite we can see that the roll return is closer to 0 for the ETP tracking the longer dated futures index. ETPs tracking shorter dated futures indices can have much more variability in roll returns.

Short-term drivers	Long-term drivers
Immediate supply / demand concerns, affected by: <ul style="list-style-type: none"> <li>• natural disasters</li> <li>• infrastructure</li> <li>• current inventories</li> </ul>	Structural supply / demand concerns, affected by: <ul style="list-style-type: none"> <li>• emerging markets demand</li> <li>• remaining resources</li> </ul>

An investor can seek to limit and, in certain cases, benefit from the impact of contango and backwardation. To minimise the occasions in which a futures contract needs to be rolled over, and possibly track the spot price more closely, an ETP can track a longer dated futures contract. It is worth noting that, if the futures curve is in backwardation, an ETC investor with a long position can benefit from a positive roll yield. There are ETCs which track indices that dynamically adjust the maturity of the futures contract in order to optimise the roll yield. However, the effect of these strategies is uncertain given the scarcity of data available to assess their performance.

### Contango / backwardation of Brent 1mth & 2yr vs. US Oil Inventories

(Rolling 3 month average returns, Mar 1998 - May 2011)



Source: ETF Securities, Energy Information Administration (1999-2013).

Ultimately, investors need to consider their investment aims. If an investor is seeking to profit from temporary supply / demand imbalances, then an ETP that tracks a short dated futures index may be considered to achieve the investment aim. If an investor is attempting to benefit from structural discrepancies, a longer dated ETP may be worth considering further.

## 07 Active and passive investments

When considering an investment fund, there are two main strategies an investor will consider - active management and passive management. Here we look into the factors an investor should consider when making a choice between actively and passively managed funds.

### The performance of active investment funds

An active manager's aim is to generate returns in excess of a specified benchmark. Any manager can experience periods of underperformance when their investment strategy disappoints. However, active investment proponents would argue that managers can outperform their benchmark over extended periods.

The table below compiles data on actively managed funds available to UK investors, focusing on a few broad investment categories: UK, global, and emerging market equities as well as sterling, euro and dollar-denominated bonds. It then compares their performance over 5, 10 and 15 years against the benchmark specified in the fund's own prospectus.

#### The performance of active investment funds vs. their benchmarks

Equity funds	UK	Global	Emerging markets
15 years	73 / -0.22	93 / -1.55	79 / 2.47
10 years	74 / -0.18	84 / -0.95	89 / -1.99
5 years	77 / -0.54	86 / -1.47	86 / -1.78
Each cell shows: funds that started the given period but either underperformed or dropped out of the sample (%) / return difference compared to benchmark for the median surviving fund (%)			
Fixed income funds	GBP diversified	EUR diversified	USD diversified
15 years	90 / -0.63	100 / -1.21	100 / -1.20
10 years	94 / -0.97	100 / -0.98	98 / -0.85
5 years	90 / -0.75	94 / -0.82	92 / -1.31

Source: Vanguard, The case for index fund investing for UK investors (October 2012).

## The cost of active funds

The majority of active funds are unable to consistently outperform their benchmark, making passive funds an attractive alternative. This can be demonstrated through a simple example: imagine £10,000 is invested in both an active fund and an ETP, neither of which generate any return. The active fund charges 2% where the ETP charges only 0.5%. The table below shows how much money would remain over various periods:

	1 year	3 years	5 years	10 years	20 years
Active fund (2% charge)	£9,800	£9,411.92	£9,039.21	£8,170.73	£6,676.08
ETP (0.5% charge)	£9,950	£9,850.75	£9,752.49	£9,511.10	£9,046.10

Source: ETF Securities, hypothetical example.

Over a 20 year time frame, the actively managed fund has cost almost £2,500 more than the ETP. This is an extreme example but the savings are significant even over shorter periods.

The table below shows the average total expense ratios for both actively managed funds and ETPs covering the same asset classes. On average, ETPs charge lower fees compared with actively managed funds. As of March 2013, on average, UK investors paid 90 basis points more for an actively managed UK equity fund than an ETP. The difference becomes even more pronounced when looking at niche asset classes. Emerging market equity funds are, on average, 110 basis points more expensive than a corresponding ETP. The data shows, therefore, that ETPs are generally cheaper than actively managed funds.

Sector	Active	ETP
UK equity	1.23%	0.33%
Global equity	1.18%	0.45%
Emerging markets equity	1.74%	0.64%
GBP diversified bonds	0.68%	0.20%
EUR diversified bonds	0.94%	0.21%
USD diversified bonds	0.92%	0.23%

Source: ETF Securities (March 2013).

## The risks of passive investment

Passive management has its own risks.

### Index distortion

Investing in a passive index fund offers the benefit of owning a broad range of assets. However, owning an index does not always guarantee diversification: indices can become particularly concentrated in one sector. In July 2007, the height of the pre-crisis boom, financial services constituted 24.5% of the FTSE 100. Over the next 2 years, financial services shrank to 12.5% of the FTSE, losing £30 billion in market capitalisation and contributing to a 48% decline in the FTSE for that period.

A diligent active manager may have been able to mitigate their losses by reducing their financial services exposure in a way that a passive investor could not. However, many index methodologies will cap sector and single company exposures to mitigate this risk.

### Tracking inaccuracy

ETPs attempt to replicate indices as closely as possible but they are not perfect. In practice, there will usually be tracking difference between the benchmark and the product. Although for most liquid markets, these differences are limited: e.g., since 2010, the average tracking difference for FTSE 100 ETPs was only 0.46% (see page 48). However, tracking difference can be much more significant for individual ETPs, especially in less liquid market segments. An ETP that significantly underperforms its benchmark may return less than an active fund.

### Combining active and passive investments

ETPs should be used as building blocks in an investment portfolio. Ultimately, investors can benefit by combining active and passive investments in a single portfolio. Incorporating passive funds into the core of a portfolio will help to minimise the overall costs and volatility of a portfolio. Additional positions, known as satellites, harness the ability of active funds to incorporate forward looking projections and possibly outperform the market. This core / satellite method of portfolio construction is a flexible approach to investing designed to provide the best of both active and passive strategies.

## 08 The future of ETPs

Although there were earlier prototypes, the origin of the ETP industry is commonly cited as the listing of the SPDR S&P 500 (SPY) on the NYSE on 22 January 1993.

Europe followed suit with the listing of the Euro STOXX 50 on the Frankfurt Stock Exchange in 2001.

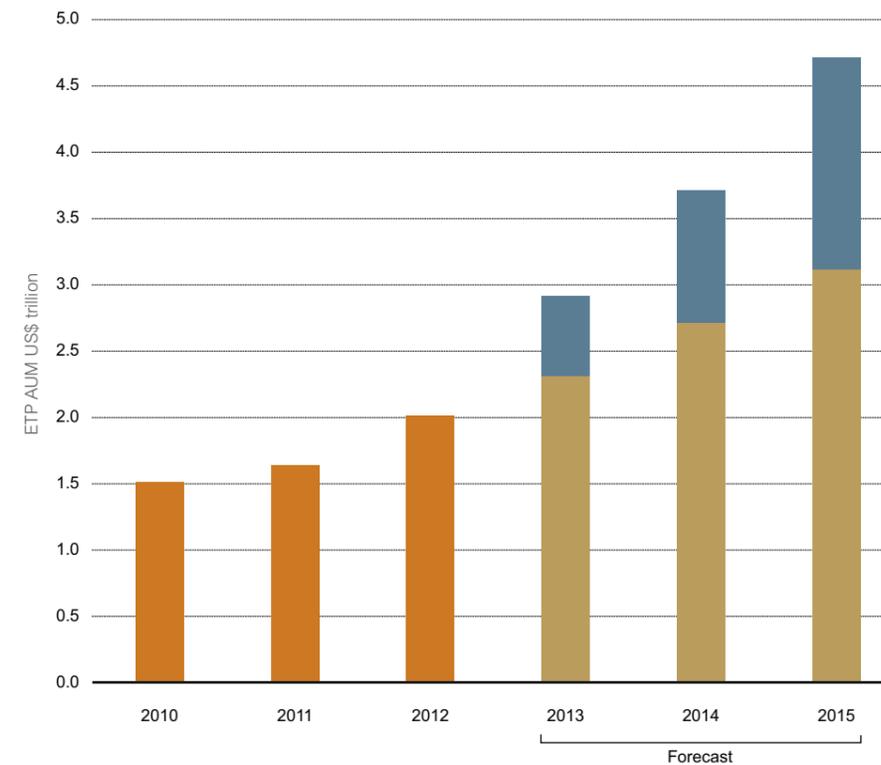
Since then, the industry has developed. SPY now has around US\$155 billion<sup>12</sup> in assets under management and the industry as a whole has exceeded US\$2 trillion.<sup>13</sup>

### ETP growth

The size of the ETP market has continued to grow, as providers drive product innovation. In the beginning, ETPs were restricted to long-only equity products but have now expanded to cover various exotic sectors. Emerging market, fixed income and commodity ETPs are now commonplace; short and leveraged, volatility and currency-hedged ETPs are also being used by many investors.

Below, consultants at McKinsey & Company<sup>14</sup> predict strong global ETP growth to endure through to 2015:

#### ETP growth - forecast



Source: McKinsey & Company, The Second Act Begins for ETFs (August 2011); ETF Securities (June 2013).

■ High case ■ Low case ■ Actual AUM

<sup>12</sup> Bloomberg (August 2013).

<sup>13</sup> BlackRock ETP Landscape: Industry Highlights (January 2013).

<sup>14</sup> McKinsey & Company, The Second Act Begins for ETFs (August 2011).

Although it is difficult to make predictions about an industry undergoing so much innovation, some positive future development might include:

**Specific strategy ETPs:** A growth in ETPs that replicate a particular investment technique. For instance, a merger arbitrage ETP, that seeks to exploit the price spreads of companies being taken over.

**Index experimentation:** Given ETPs track indices, it is natural that the growth in ETPs accompanies a growth in the variety of indices. As ETP issuers seek to differentiate their products, index providers will generate more varied indices for ETPs to track.

**Regulation:** The Retail Distribution Review in the UK may be only the start of various pieces of legislation that may impact the growth of ETPs. By banning commissions and forcing advisers to evaluate the entire marketplace of investments, RDR is likely to expand the ETP market, especially among retail consumers.

Ultimately, it might be said that the real success of ETPs has been to democratise investment. They have provided retail investors with access to assets and, increasingly, to strategies that used to be solely available to institutional investors such as investment banks and hedge funds. If ETP providers keep innovating, we anticipate that the industry will continue to expand the opportunities available to ordinary investors.

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For more information please contact ETFS UK at +44 (0)20 7448 4330 or [info@etfsecurities.com](mailto:info@etfsecurities.com).



**ETF Securities (UK) Limited**

3 Lombard Street  
London EC3V 9AA  
United Kingdom

**T** +44 (0)20 7448 4330  
**E** [info@etfsecurities.com](mailto:info@etfsecurities.com)  
**W** [etfsecurities.com](http://etfsecurities.com)

