Xtrackers' guide to Synthetic Replication

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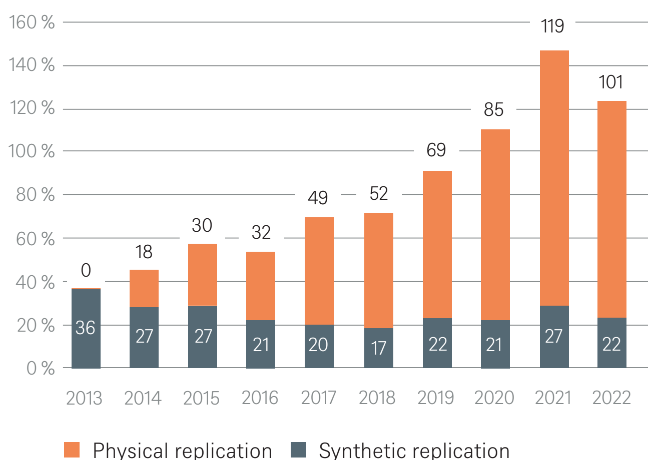
Introduction

Previously perceived by investors as a more challenging structure to comprehend, synthetic replication ETFs (also called indirect replication or swap-based ETFs) have seen a shift in investors' perception as investors have started to understand the benefits of such structures. At the same time, positive evolutions in terms of risk diversification, counterparty selection and swap standardisation have helped such developments. We will explore these aspects in more detail throughout this paper, reviewing the structure of synthetic replication ETFs, providing a balanced overview of the benefits and risks, and showcasing case studies where synthetic replication ETFs have carved their well-established spot within the ecosystem.

Synthetic replication ETFs in the market

The following chart illustrates ETF assets under management in the UCITS space along with the breakdown between synthetic replication and physical replication ETFs. In the nascent days, the Xtrackers platform was a 100% synthetic replication offering, which gradually transitioned over time to a predominantly (>80%) physical replication offering. More broadly, the overall UCITS ETF market is split into approximately 88% physical replication compared to 12% synthetic replication (source: DWS Investment GmbH, Trackinsight, as of 31/12/2022).

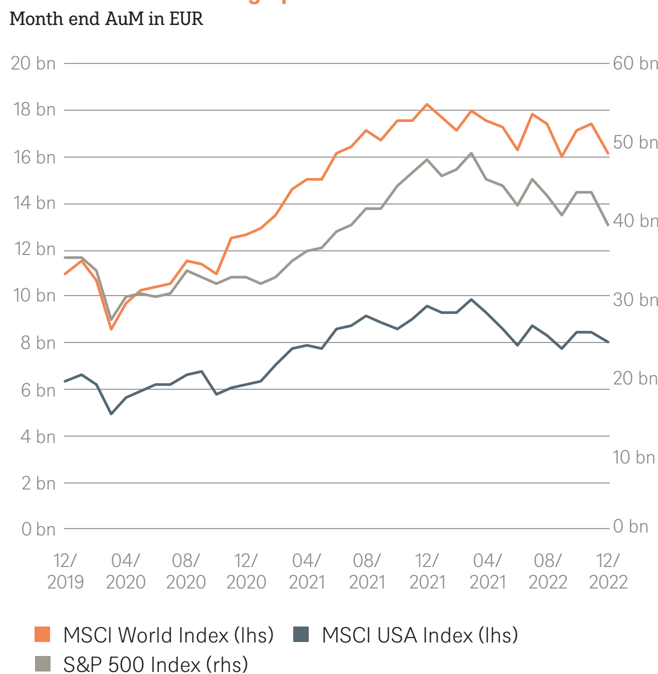
Chart 1: Xtrackers ETF historical replication split
In billion Euros



Source: DWS Investment GmbH, Trackinsight, as of 31/12/2022.

Although this shows an overall transition from synthetic replication to physical replication over time, synthetic replication for certain markets has grown more recently. This has been the case with US exposures and markets where outperformance can be achieved compared to physical equivalents, such as China and Emerging Market exposures. Especially assets in ETFs with the former exposures have been trending upwards since March 2020:

Chart 2: ETF AuM of UCITS ETFs using synthetic replication since Covid-19 trending upwards
Month end AuM in EUR



Source: DWS Investment GmbH, as of 31/12/2022. Period: 31/03/2020 to 31/12/2022.

Why synthetic replication ETFs? Comparing physical versus synthetic replication

It is important to explain the key differences between synthetic replication and physical replication ETFs and how they are constructed. Physical replication ETFs invest directly in the underlying securities of the index to track it, while synthetic replication ETFs have the same prime objective to track the underlying index but instead use derivatives to achieve this objective.

This leads to a structural difference which the following table illustrates:

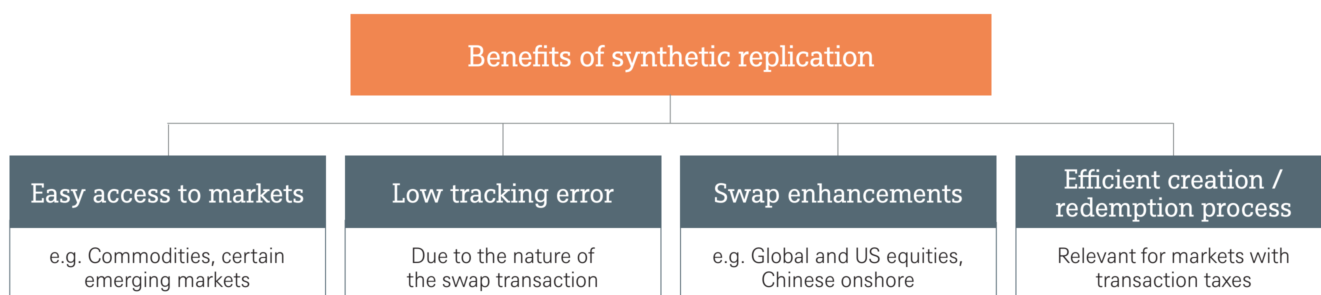
	Physical replication ETFs	Synthetic replication ETFs
Description	The ETF physically buys the underlying securities (or a sample of them) to replicate the performance of the underlying index	The ETF uses swap contracts to synthetically replicate the performance of the underlying index
Assets	Index constituents	The UCITS ETF buys a basket of assets and enters into a total return swap on such basket with the swap counterparty where the swap counterparty receives the performance of the basket in exchange for providing the performance of the index to the UCITS ETF. Such swaps may also be collateralised via EMIR Variation Margin
Exposures	Standard Equity and Fixed Income exposures, where there is no UCITS restriction or significant challenge to access the underlying	Various possible exposures, for example for simple and complex underlyings as well as commodities, which cannot be physically held by UCITS ETFs
Transparency of holdings	Yes	Yes
Derivatives usage	Yes, but limited in volume. For example, futures for efficient portfolio management or FX forwards for FX hedging	Yes, swap contracts for replication, usually for close to 100% of the ETF volume
Counterparty risk	Limited, may engage in securities lending with collateral to protect against borrower's default	Limited, with collateral to bring the net counterparty exposures to zero on a daily basis, as per EMIR (defined below)
Tracking Difference drivers	– Securities lending revenue – Withholding tax differentials between ETF and index assumptions – Portfolio sample optimisation (where applicable)	Swap spread, which can lead to outperformance or underperformance versus the underlying index depending on exposure
Tracking Error drivers	– Quality of portfolio replication – Level of portfolio sampling and optimisation – Treatment of corporate actions such as dividends – Potential cash drag	– Limited – Importance of swap resets driven by quality of portfolio management
Primary Market Creation/Redemption Mechanism	– Actual cost of execution – Order placement by all authorised participants	– Fixed cost of execution – Order placement by all authorised participants

Having looked at the high-level differences between the two replication methods, we can summarise the key benefits of synthetic replication as shown below:

For certain markets, physical replication is not possible due to UCITS restrictions or complexities with market accessibility. Synthetic replication ETFs can be used as a solution to gain exposure to such markets via a swap counterparty. This is especially favourable with more complex emerging and frontier markets underlyings. Additionally, synthetic replication plays a key role in the replication of commodity indices where a swap counterparty can trade a basket of commodity futures and provide performance based on the reference index to the ETF. Furthermore, in a case where an underlying index includes an extensive number of constituents, instead of a portfolio manager fully replicating the index by trading each individual line, a single total return swap transaction with a swap counterparty can be used to obtain the exposure with potential performance and cost benefits. Often swap counterparties will hedge synthetic replication ETFs at a broader portfolio level – instead of fund level - which allows for optimisation and efficiencies within trading books. Subsequently, cost benefits can be passed back via the swap enhancement to the ETF.

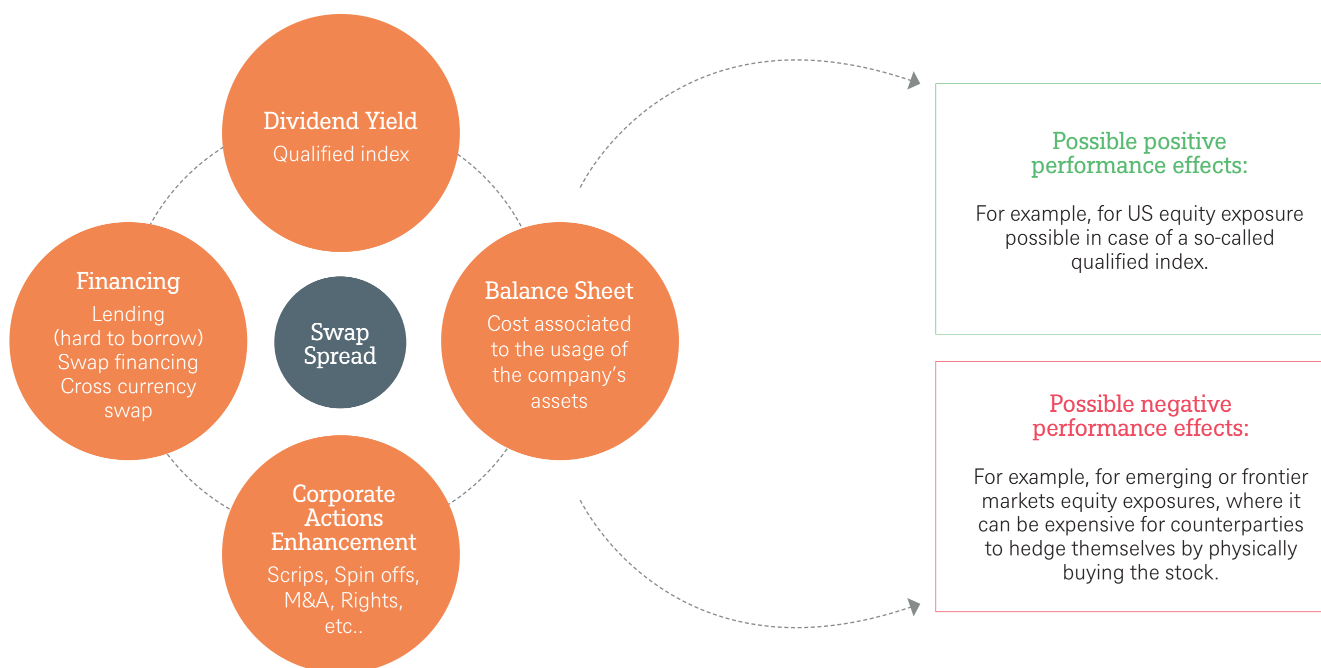
By nature, synthetic replication ETFs have a low tracking error as each swap counterparty commits, under the swap transaction, to deliver the reference index performance before replication costs or, where applicable, enhancements. Such replication cost or enhancement is characterised by a swap spread, a figure quoted in basis points by each swap counterparty and referencing the performance that will be provided below or above the reference index for the given term of the trade. A negative swap spread usually translates into an expected outperformance versus the reference index for such a swap, while a positive spread results in underperformance versus the reference index. The drivers behind such outperformance capabilities will be explored in more detail in the next section.

Synthetic replication ETFs also have advantages for markets where financial transaction taxes are associated with certain underlying securities of the reference index which can lead to lower primary market transaction costs for synthetic replication ETFs, offering benefits particularly for short term tactical allocations.



Synthetic replication ETFs:
The case for potential outperformance

In this section, we explore the various drivers of synthetic replication ETF performance. Some are a result of demand driven factors whereas others are structural. The following diagram highlights various performance drivers for synthetic replication ETF outperformance:



In the next section we explore the main drivers of swap enhancements with case studies. We use the Xtrackers S&P 500 Swap UCITS ETF and Xtrackers CSI 300 Swap UCITS ETF to demonstrate the impact on dividend yield and financing drivers, respectively.

Please also note that foreign withholding tax (WHT) and how foreign jurisdictions would qualify swap payments which refer to indices would affect any revenue. See annex 1 which explains in more detail e.g., corresponding US regulations.

Gross versus Net Total Return Indices

For the following ETFs, Xtrackers has the flexibility to trade swaps on either the gross or on the net total return index at the discretion of the investment manager, which will be in accordance with pricing terms and considerations of market conditions (subject to a yearly review).

1. Xtrackers S&P 500 Swap UCITS ETF
2. Xtrackers MSCI USA Swap UCITS ETF
3. Xtrackers MSCI World Swap UCITS ETF

For these products, the underlying benchmark is currently considered to be a qualified index according to section 871(m) of the US Internal Revenue Code ("US IRC"). This section looks at the dividend withholding tax assumptions for gross total return (GTR) and net total return (NTR) indices in respect of the US securities within the respective indices.

A GTR index assumes a dividend re-investment rate of 100% or, equally, a 0% withholding tax. This means as the dividend yield varies with equity spot or dividend adjustments, so does the performance of the swap on the GTR index. Where the swap counterparty is able to provide a performance, which is aligned to the methodology of the GTR index, dividend yield has no impact on the swap spread.

A NTR index assumes a dividend re-investment rate in the case of a US index of 70% or, equally, a 30% withholding tax for dividends on the US portion. This is referring to the standard tax rate for the US, which is only partially applicable when looking at an exposure like MSCI World. Where there is a discrepancy between the performance that can be achieved by the swap counterparty compared to the NTR index, the dividend yield has a direct impact on the swap spread at the time of pricing.

To make this more tangible, we will have a look at a case study in the next section for example purposes only.

Case studies on outperformance

Case study 1 on dividend yield impacts: Xtrackers S&P 500 Swap UCITS ETF

		Method used	Swap on NTR index	Swap on GTR index
A	Index dividend yield	assumption	2.00%	
B	Index WHT rate	assumption	30%	
C	Gross Total Return index performance	assumption	10.00%	
D	Net Total Return index performance	approximation	9.40% (= C - A * B)	
E	Swap enhancement	approximation	**0.60% (= A * B)**	**0.00% -**
F	TER	assumption	0.07%	
G	Expected ETF performance	approximation	9.93% (= D + E - F)	9.93% (= C + E - F)
H	Expected Tracking Difference vs. Net Total Return index	approximation	**0.53% (= G - D)**	**0.53% (= G - D)**

Source: DWS Investment GmbH, as of 31/03/2023. For illustrative purposes only. Past performance does not predict future returns.

Assuming the current 12-month dividend yield of the S&P 500 index is 2.00% (A) and a WHT of 30% (B), the swap enhancement on the NTR index may then be approximately 60 bps (E), as outlined above. In contrast to this a swap enhancement of around 0 bps may be expected for a swap on the GTR index (E). The exact swap enhancement varies with spot movement, dividend expectations and rebalance potential.

Furthermore, in some cases, the flexible and efficient collateral structure at Xtrackers allows the swap counterparty to derive a performance uplift, which can be passed back to the ETF via the swap enhancement. An example of this would be a case where the swap counterparty incurs financing costs for holding long positions on their balance sheet. If they can sell these securities to the ETF instead of bearing the financing costs, this can lead to a cost reduction on their end and thus an enhancement of the swap spread.

Taking this a step further, we translate this into performance numbers comparing how the NTR and GTR indices will behave. Using 10.00% as exemplary GTR index performance and the WHT as well as dividend yield from above, this results in 9.40% performance for the NTR index. We also take an exemplary TER of 0.07% for an ETF on either version, gross or net. The resulting ETF for either index will align, in this example at approximately 9.93%, representing the sum of index performance, swap enhancement and negative TER. Consequently, the tracking difference is expected to be identical at 53 bps, all else being equal.

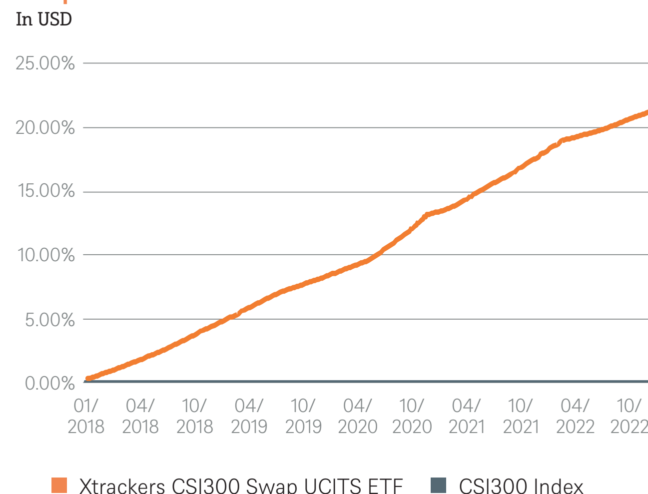
This example shows that the choice of GTR versus NTR index does not have an impact on ETF performance, providing the dividends materialise with the level which was expected. Only if the actual dividend yields are higher or lower than expected, either the GTR or NTR index will have an advantage over the other.

Case study 2 on supply-demand imbalance: Xtrackers CSI300 Swap UCITS ETF

As shown in the below chart, the Xtrackers CSI 300 Swap UCITS ETF consistently outperformed its underlying benchmark over a five-year period.

Chart 3: Relative performance of Xtrackers CSI300 Swap UCITS ETF vs. CSI300 Index

In USD



Source: DWS Investment GmbH, as of 31/12/2022. Period: 30/12/2017 to 31/12/2022. Past performance does not predict future returns.

The primary driver of the outperformance is the imbalance in the underlying China A-shares repo market. In this instance, repo refers to the associated value with lending a basket of China A-share securities to counterparties on the lending market.

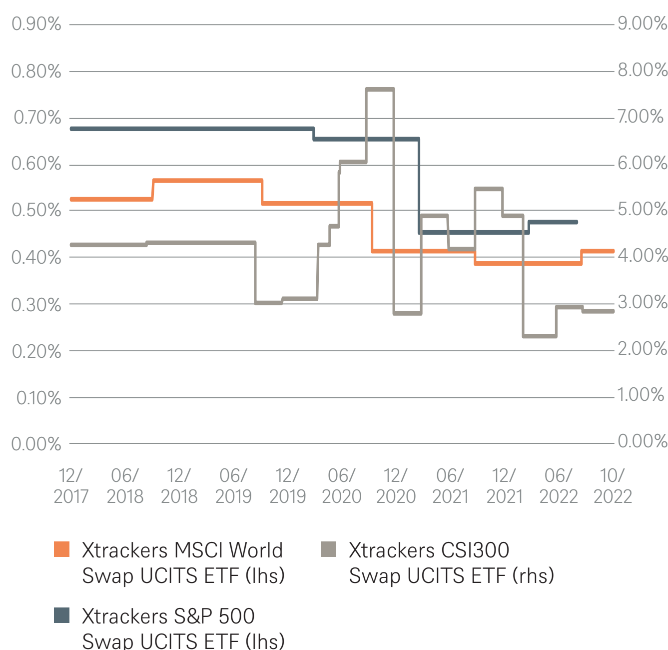
There is, at times, very high demand from prime brokers, and various market participants to borrow Chinese CSI 300 stocks. Where a swap counterparty is long the basket of securities to hedge the swap balance, they can lend these stocks out at a premium in the repo market. The value obtained from such lending can be passed back to the ETF via the swap enhancement. Although Xtrackers trade swaps on a termed basis with a fixed maturity, the repo curve can be volatile depending on sentiment, market and broker activity which consequently means the premium received for lending Chinese CSI 300 stocks can vary over time as demonstrated in Chart 3. The limited ability to borrow and short China local stocks has a material impact on the repo rate. During periods where appetite to short local stocks of the CSI 300 increases, these can cause an increase in the respective repo rate, driving more

negative swap spreads. Such more attractive spreads may or may not be partially materialised at ETF level in case the ETF swap contracts are rolled in this period.

In addition to this, swap counterparty book positioning can also play a crucial role for the outperformance swap enhancements. It is important for swap counterparties to be able to monetise the lending value of the securities which can be supported by a developed prime finance offering.

To put these case studies into context, the historical swap enhancements of selected Xtrackers synthetic replication ETFs are represented in the Chart 4 below:

Chart 4: Swap enhancements of selected Xtrackers ETFs based on leading swap spread



Source: DWS Investment GmbH, as of 31/12/2022. Period: 30/12/2017 to 31/12/2022. Past performance does not predict future returns.

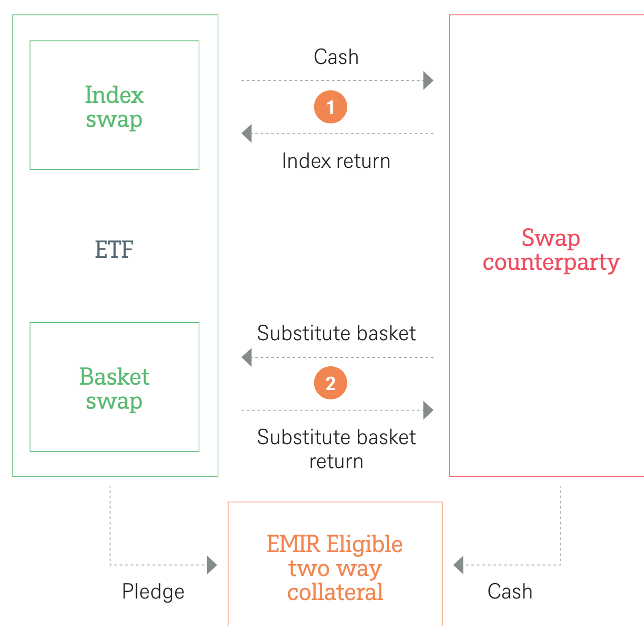
As examined within this section, there are various elements which can drive synthetic replication ETF outperformance. In the next section, further explanation will be provided on the overall structure of Xtrackers synthetic replication ETFs.

Xtrackers synthetic replication structure overview

Synthetic replication ETFs do not invest directly in the constituents of the underlying index. Instead, the exposure to the performance of the underlying index will be achieved by way of derivative transactions, more specifically total return swaps (TRS). ETFs may enter into one or several similar swap transactions with different terms and / or swap counterparties.

A total return swap is a bilateral derivative agreement in which each party agrees to exchange the total return performance of two underlying instruments between them. One party agrees to pay the total return performance of one underlying instrument, such as that of a basket of securities while the other party makes payments based on the total return of another underlying instrument, such as a reference index.

The total return swaps entered into by Xtrackers synthetic replication ETFs typically consist of two swaps: an index swap, swapping cash for reference index performance and a basket swap, swapping the total return performance of a substitute basket for cash. The mechanics of these two separate swaps create the overall structure as illustrated in the diagram:



When an authorised participant creates new ETF units by placing a creation order with the ETF on trade date, the Xtrackers portfolio manager will buy an index swap from an appointed swap counterparty (1). The settlement of the index swap and the ETF transactions will typically be aligned to ensure the ETF is neither long nor short cash. It is the index swap leg which provides the ETF's performance versus the reference index.

Since the ETF has purchased an index swap from a swap counterparty, the ETF will have exposure risk to that party. Therefore, to mitigate this risk the ETF will sell a total return swap, commonly referred to as the basket swap, to the swap counterparty equal or greater than the value of the index swap (2). The ETF will use the cash received from the swap counterparty to buy a basket of equity securities directly from the swap counterparty. The performance of these securities is passed back entirely to the swap counterparty under the basket swap.

The settlement of each swap is aligned to mitigate counterparty risk and exposure. Where the ETF purchases assets, ownership is transferred, and the securities are held in the ETF main custody account at the ETF's custodian.

Example box (For illustrative purposes only):
Let's consider an example, the authorised participant places an order to create 100mm USD of an ETF today for T+2 Settlement. The ETF portfolio manager will need to buy a corresponding index swap to the value of 100mm USD from the swap counterparty at the same time as the strike of the ETF NAV on the same day of order placement. Both the ETF and the Index swap will settle Trade Date plus two business days. The portfolio manager will then subsequently sell a total return basket swap to the same swap counterparty to the value of 100mm USD, or greater depending on the pre-agreed level of collateralisation for the ETF.

Physical versus synthetic replication ETF execution

While we touched earlier on the cash flow within the ETF after a creation or redemption, we want to also highlight the differences in execution for synthetic and physical replication ETFs.

For direct replication products, cash creation/redemption orders[1] are executed by the ETF portfolio manager trading the underlying stocks via, for example, an investment bank's programme trading desk (directed cash execution) and the actual cost of execution is passed on to the authorised participant. A similar mechanism is at work when the ETF trades with an authorised participant on a delivery versus payment in-kind basis where the ETF units are exchanged for the underlying securities directly with the authorised participant who has placed the primary market order.

In the case of synthetic replication ETFs, the mechanism works similarly. The portfolio manager receives cash creation or redemption orders from an authorised participant and trades an upsize or downsize to the prevalent index swap(s) with the swap counterparty(ies). Subsequently, the authorised participant receives the final price, which is reflective of the pre-agreed NAV strike minus or plus pre-agreed fixed costs when placing orders in the ETF. Such fixed costs are calculated in reference to the closing price of the index specified and passed onto the authorised participant.

Despite the differences in the creation and redemption mechanism for synthetic and physical replication ETFs, the fair value pricing model for a broker is in practice predominantly the same when pricing either a synthetic or a physical replication ETF.

ESG exposures via synthetic replication

As synthetic replication ETF offerings have evolved, this has led to the possibility of synthetic ESG exposures. For such exposures, Xtrackers utilises several tools to implement efficient replication in line with underlying index ESG methodologies.

Xtrackers ETFs require swap counterparties to apply ESG exclusion criteria to the substitute basket which are similar to those of the reference index. Using this screen, Xtrackers checks that the same exclusions are applied to the substitute basket on the MSCI World equivalent as are in the index universe. For example, if a synthetic replication ETF tracks an MSCI China A Inclusion Select ESG Screened index, the substitute basket would be screened to only include securities which are part of the MSCI World Select ESG Screened index.

All other processes remain the same as for non-ESG exposures.

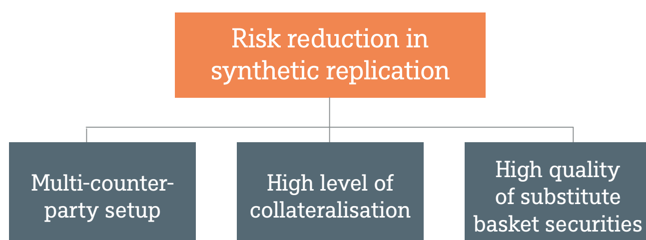
Risk mitigation

For synthetic replication ETFs different risks and accompanying risk mitigation processes exist. Both are summarised in the table below and are discussed in more detail later in the paper.

Type of risk	Description	Mitigation steps
Counterparty risk	Counterparties may default and be unable to deliver the agreed performance	Xtrackers has multiple steps in place such as a multi-counterparty model, high levels of collateralisation or a high quality of securities in the substitute basket to reduce counterparty risk
Concentration risk	Synthetic replication ETFs may be significantly exposed to a single swap counterparty	Xtrackers have set up a multi-counterparty model for the platform to diversify the counterparty risk. This limits cases of concentration risk for ETFs
Substitute basket risk	Value of the substitute basket may decline and may be insufficient in case of a default	The substitute basket is marked to market on a daily basis and the swap counterparty needs to reset the basket and index swaps to bring their valuation into line. In addition, EMIR Variation Margin will be required to be posted if the ETF is still exposed to the swap counterparty after such reset.
Roll risk	Swap enhancements may change when the index swap and basket swap are rolled	Xtrackers typically fix the swap contracts for longer periods of time to give investors more comfort regarding existing swap enhancements

Risk mitigation – How is counterparty risk mitigated?

In instances, investors have raised concerns with counterparty risk involved with synthetic replication. Discussed in more detail below are the measures in place, along with the multi-counterparty structure embedded into the Xtrackers synthetic platform which mitigate risk:



These will be explained in more detail in the following sections.

The multi-counterparty model

Over the years, the Xtrackers synthetic replication ETF platform has grown and evolved into a multi-counterparty model with open architecture. Even on a single ETF level, multiple counterparties can be assigned balances at the same time. The diversification of the swap balances across multiple counterparties allows Xtrackers ETFs to reduce concentration of counterparty risk.

Moving from a single counterparty to a multiple counterparty model led to extensive benefits. With the multi-counterparty structure, authorised participants can transact in the primary market directly with the platform, as opposed to placing reliance on the swap providers directly.

Additionally, the multi-counterparty model allows for more competitive pricing leading to best-in-class performance, swap balance diversification and a broad range of distinct counterparties. Importantly, it enables Xtrackers to trade with the most competitive brokers with the objective to achieving the best performance for the ETF.

Under the Xtrackers umbrella with its multi-counterparty structure, there are 10 appointed swap counterparties across three platforms:

- Bank of America
- BNP Paribas
- Deutsche Bank
- HSBC Bank
- Morgan Stanley
- Barclays Bank
- Citi
- Goldman Sachs
- J.P. Morgan
- Société Générale

This information is intended for informational purposes only and does not constitute investment advice, a recommendation, an offer or solicitation.

There is a formal committee for counterparty selection, consisting of various stakeholders within Xtrackers, which ensures full transparency and a consistent pricing process. Considerations take place across a range of factors such as but not limited to:

- The number of counterparties required per fund
- Daily liquidity requirements for creation and redemptions
- Creation and redemption costs
- The swap tenor for execution
- Cost of balance transfer from one counterparty to another

DWS also maintains a list of approved and monitored counterparties that Xtrackers ETFs can trade the index swap and basket swap with. Across platforms, DWS only works with major eligible counterparty investment banks which are subject to the most stringent regulatory regimes and prudential oversight. Credit checks are carried out on an ongoing basis and appropriate action is taken if ratings deteriorate outside of our risk tolerance. Additionally, DWS reviews all counterparties on an initial and annual basis paying particular attention to capital adequacy, asset quality, management (record, reputation, and succession planning), earnings, liquidity, and systemic vulnerability.

Substitute basket rules and risk mitigation

It is useful to remind the reader at this stage that a synthetic replication ETF holds the substitute basket as well as the swap contracts. Daily monitoring by the portfolio manager takes place to ensure the substitute basket adheres to the basket rules and risk mitigation procedures. Not only does the ETF have access to the substitute basket if the swap counterparty defaults, the swap contracts are collateralised with EMIR Variation Margin collateral following the introduction of EMIR regulations in 2017.

The substitute basket must adhere to strict rules to ensure a diversified and high-quality substitute basket. Equity ETFs only accept equity securities in the substitute basket whilst fixed income securities are only eligible for the substitute basket of Fixed Income ETFs. Commodity ETFs follow the same substitute basket rules as Equity ETFs on the Xtrackers platform.

There is full daily disclosure on the Xtrackers website for each ETF with the constituents of the respective substitute baskets.

[1] Note that, especially in the fixed income space, in-kind creations and redemptions also apply to physical replication ETFs but do not apply to synthetic replication ETFs.

EMIR Variation Margin and risk mitigation

Non-centrally cleared OTC derivatives came under the scope of European Market Infrastructure (EMIR) Variation Margin on 1 March 2017, meaning firms trading these instruments will have to comply with these Variation Margin rules. The total return swaps which the Xtrackers ETFs execute with various swap counterparties are in scope of these rules. The process for adherence to EMIR Variation Margin and risk mitigation is outlined in this section.

For OTC swap transactions entered on behalf of synthetic replication ETFs under EMIR, both parties are required to implement appropriate procedures and arrangements to measure, monitor and mitigate operational risk and counterparty credit risk. This includes the need to put in place timely, accurate and appropriately segregated exchange of collateral. EMIR regulations oblige both the ETF and the swap counterparties to transfer collateral, i.e. the Variation Margin, reflecting their respective exposures daily.

Explaining this in more detail, for all swap counterparties on the platform, it is a requirement to maintain zero net exposure resulting from the index swap and basket swap which is marked to market daily. This is implemented either via an adjustment of the posted Variation Margin or a reset of the index swap and basket swap.

Each party to the swap agreements will deliver cash or securities with a view to reduce the net exposure of the relevant ETF to each counterparty, and vice versa, to 0%. A minimum transfer amount of up to EUR 500,000 (or currency equivalent) applies.

How is a counterparty default managed?

Swap counterparty exposure is monitored daily, and additional collateral is requested as soon as the collateralisation levels fall below the required minimum levels. If a counterparty defaults, as defined in the Events of Default and Termination Events clause of the applicable ISDA Master Agreement, the ETF can realise the posted collateral and will liquidate the assets in the substitute basket related to that counterparty.

Regarding a swap counterparty default, we can take the example of three counterparties as part of a multi-counterparty structure. In the event of one of the swap counterparties defaulting, the swap contract of the defaulted counterparty will automatically terminate. The value of the swap is determined at the last closing valuation point according to the terms in the ISDA agreement.

As for the substitute basket, this remains held both legally and physically at the ETF's custodian. Any EMIR Variation Margin collateral owned or pledged to the ETF is used to offset any remaining counterparty exposure, taking the current value of the index swap replacement costs and the sale of the substitute basket into account.

Once the ETF has sold the securities within the substitute basket and realised any posted collateral, the Portfolio Management team will look into options of obtaining exposure to the index. These include, for example, increasing the share of other swap counterparties with existing exposure with the ETF or adding additional swap counterparties from those already onboarded. Alternatively, the ETF could be converted from a synthetic to a physical replication structure. As a last resort the option of terminating the ETF is also considered.

Summary

As explained throughout the paper, there are numerous benefits to both synthetic and physical replication ETFs and it is always important for investors to consider their investment options to best meet their investment objectives. As the marketplace continues to evolve and investors become more familiar with the structure and benefits of synthetic replication ETFs, we presently do not see any obstacle to the current growth trend in synthetic products for specific exposures.

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Glossary of terms

All-In Fee
Comprising the Fixed Fee and the Management Company Fee.

Authorised Participant
An institutional investor, market maker or broker entity authorised by Xtrackers for the purposes of directly creating and/or redeeming shares in an ETF with the Xtrackers.

Collateral
Securities posted as part of EMIR Variation Margin requirements.

EMIR
European Market Infrastructure Regulation is a regulation mandated by the EU, aiming to mitigate systemic counterparty and operational risk.

EMIR Variation Margin
The collateral to reflect the daily marking-to-market of a swap contract and can therefore vary over time.

Reference Index
The index of securities or other assets whose performance an ETF will aim to reflect, pursuant to its investment objective and in accordance with its investment policies.

Substitute basket
The basket of securities owned by the ETF.

Swap Counterparty
The entity with whom the swap agreement is entered into and who is responsible for paying the performance versus the reference index for the given term of the trade.

Total Return Swap (TRS)
A bilateral derivative agreement in which each party agrees to exchange the total performance (based on an underlying instrument) between them. One party agrees a set rate while the other party makes payments based on the total return of an underlying asset, in this instance represented by the performance of the index.

Tracking Difference
The difference between ETF performance and underlying index performance over a timeframe.

Tracking Error
The standard deviation of Tracking Differences over a timeframe. Typically, daily differences are used over a timeframe of one year.

Annex 1

As indicated before also foreign tax law and/or regulations could generally impact the return under an index swap. Please see as example the so called "Qualified Indices" under section 871(m) US IRC, which was enacted as part of the Hiring Incentives to Restore Employment (HIRE) Act.

Qualified Indices under section 871(m) US IRC

When gaining exposure to US equities via a total return swap it is important to consider eligibility of the underlying index under the 871(m) IRC. In general, under US legislation and regulation, some payments under derivatives are subject to a US withholding tax (WHT) if such pass-through payments would be qualified as so-called dividend equivalent payments. This means, unless the underlying index is classified as a qualified index, payments under the derivative will be subject to withholding tax at the same rate applied to physical US securities for the respective party writing the trade.

In order to benefit from the treatment as a qualified index certain requirements need to be fulfilled. Inter alia the following criteria need to be cumulatively met:

- The index must be based on a diverse basket of publicly traded securities which are widely used by numerous market participants.
- The index needs to reference 25 or more component securities.
- The index does not provide for a dividend yield that is greater than 1.5 times that of the S&P 500 Index for the prevailing year.
- The index does not contain any single stock representing more than 15% of the index's weighting.
- The index must be referenced by futures or options contracts with public calculation and index rebalance methodology.

Under section 871(m) US IRC, the performance of a synthetic replication ETFs is influenced by the ability of the swap-counterparty to provide a gross dividend versus the for example 70% net dividend into the net index from the index provider for US equities. The regulation permits swap counterparties to pass back dividends with a 0% WHT, i.e., gross dividends, versus the equivalent net total return index or physically replicating instruments that have different WHT treatment.

Key Risk Factors

- An investment in an Xtrackers ETF may not be suitable for all investors. Xtrackers UCITS ETFs are not capital protected, therefore investors should be prepared and able to sustain losses up to the total loss of the capital invested.
- Investors should be aware that DWS Investments UK Limited, any of its parents or any of its or its parents subsidiaries or affiliates may from time to time own interests in the funds which may represent a significant amount or proportion of the overall investor holdings in the Fund. Investors should consider what possible impact such holdings, or any disposal thereof, may have on them.
- Substantial fluctuations of the value of the investment are possible even over short periods of time.
- Investments in Xtrackers UCITS ETFs involve numerous risks including but not limited to general market risks relating to the relevant underlying index, credit risks on the provider of index swaps utilised in the Xtrackers UCITS ETFs, possible delays in repayment, market fluctuations, counterparty risk, foreign exchange rate risks, interest rate risks, inflationary risks, liquidity risks, loss of income and principal invested and legal and regulatory risks.
- Movements in exchange rates can impact the value of your investment. If the currency of your country of residence is different from the currency in which the underlying investments of the fund are made, the value of your investment may increase or decrease subject to movements in exchange rates.
- Shares in Xtrackers UCITS ETFs which are purchased on the secondary market cannot usually be sold directly back to the fund. Investors must purchase and redeem such shares on the secondary market with the assistance of an intermediary (e.g. a market maker or a stock broker) and may incur fees for doing so (as further described in the prospectus). In addition, investors may pay more than the current net asset value of a share in a Xtrackers UCITS ETF when buying shares on the secondary market, and may receive less than the current net asset value when selling such shares on the secondary market.

The value of an investment in Xtrackers ETFs may go down as well as up. Past performance does not predict future returns. For further information regarding risk factors, please refer to the risk factors section of the relevant prospectus and the Key Investor Information Document.

Disclaimer

Clarification on All-in Fee:
Direct replication funds – Investors should be aware that in addition to the All-In Fee, other factors may negatively impact the performance of their investment relative to the underlying index. Examples include: Brokerage and other transaction costs, Financial Transaction Taxes or Stamp Duties as well as potential differences in taxation of either capital gains or dividend assumed in the relevant underlying index, and actual taxation of either capital gains or dividends in the fund. Investors should also note that currency hedging costs are not included within the All-In Fee.

The precise impact of these costs cannot be estimated reliably in advance as it depends on a variety of non-static factors. Investors are encouraged to consult the audited annual and un-audited semi-annual reports for details.

Investors should note that the All-In Fee does not cover any OTC Swap Transaction Costs, which are embedded in the OTC Swap Transaction of the ETF. OTC Swap Transaction Costs are index replication costs incurred by the Swap Counterparty and may impact the performance of the ETF negatively relative to the underlying index. Index replication costs can be broken down into various categories depending on the nature of the underlying index (long, short or leveraged). A detailed description of each scenario is available in the Prospectus under the heading "Investment Objectives and Policies - Sub-Funds with an Indirect Investment Policy". Investors can access https://etf.dws.com/en-GB for information regarding the applicable scenario and an indication for the latest OTC Swap Transaction Costs.

For investors in EMEA excluding UK and CH:
This marketing communication is intended for professional clients only. Please read the fund prospectus and KID before making a final investment decision.

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This document does not constitute investment advice.

Complete information on the Funds/Sub-Funds can be found in the relevant current prospectus. Together with the relevant key information documents, these constitute the only binding sales documents for the Funds. Investors can obtain these documents, together with regulatory information, as well as the latest constitutional documents for the Funds/Sub-Funds from DWS Investment GmbH, Mainzer Landstraße 11-17, 60329 Frankfurt am Main and, in case of Luxembourg domiciled Sub-Funds, from DWS Investment S.A., 2, Boulevard Konrad Adenauer, L-1115 Luxembourg, in printed form free of charge, or available in respective languages from Germany: www.dws.de and www.etf.dws.com, Austria: https://funds.dws.com/at, Belgium: https://funds.dws.com/be/NL, France: https://funds.dws.com/fr-fr/, Luxembourg: www.dws.

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Forecasts are not a reliable indicator of future performance. Forecasts are based on assumptions, estimates, opinions and hypothetical performance analysis, therefore actual results may vary.

Past performance, actual or simulated, is not a reliable indication of future performance. The calculation of performance uses the BVI (Bundesverband Investment and Asset Management) methodology and therefore does not consider the Upfront Sales Charge.

Tax information can be found in the relevant prospectus.

The Funds described in this document track the performance of the indices included in their name.

The Index Sponsor is not liable for errors in its index and is not obliged to provide information of such errors.

– CSI 300 Index
– MSCI USA Index, MSCI World Index
– S&P 500 Index

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The registered office of Xtrackers (RCS No. B-119-899) and Xtrackers II (RCS No.: B-124-284), companies registered in Luxembourg, is at 49, Avenue J.F. Kennedy, L-1855 Luxembourg, Luxembourg.
The registered office of Xtrackers (IE) (Reg. No.: 393802), a company registered in Ireland, is at 78 Sir John Rogerson's Quay, Dublin 2, Ireland. DWS Investment GmbH acting through its branch offices where relevant.

As of: 28/04/2023.

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For investors in New Zealand:
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For investors in Singapore:
To be read in relation to the following unregistered funds:
– Xtrackers S&P 500 Swap UCITS ETF (5C - EUR Hedged)
– Xtrackers MSCI World Swap UCITS ETF
– Xtrackers MSCI USA Swap UCITS ETF

In Singapore, this document is issued by DWS Investments Singapore Limited. This document has not been reviewed by the Monetary Authority of Singapore.

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To be read in relation to the following registered funds:
– Xtrackers S&P 500 Swap UCITS ETF (1C, 7C - GBP Hedged, 1D)
– Xtrackers CSI300 Swap UCITS ETF

This document has not been reviewed by the Monetary Authority of Singapore.

The offer or invitation of the shares of the fund(s), which is the subject of this document, does not relate to a collective investment scheme which is authorised under section 286 of the Securities and Futures Act, Chapter 289 of Singapore (the "SFA") or recognised under section 287 of the SFA. The fund(s) is not authorised or recognised by the Monetary Authority of Singapore (the "MAS") and its shares are not allowed to be offered to the retail public. This document and any other document or material issued in connection with the offer or sale is not a prospectus as defined in the SFA. Accordingly, statutory liability under the SFA in relation to the content of prospectuses would not apply. You should consider carefully whether the investment is suitable for you.

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Where shares are subscribed or purchased under Section 305 by a relevant person which is:
(a) a corporation (which is not an accredited investor (as defined in Section 4A of the SFA)) the sole business of which is to hold investments and the entire share capital of which is owned by one or more individuals, each of whom is an accredited investor; or
(b) a trust (where the trustee is not an accredited investor) whose sole purpose is to hold investments and each beneficiary of the trust is an individual who is an accredited investor, securities (as defined in Section 239(1) of the SFA) of that corporation or the beneficiaries' rights and interest (howsoever described) in that trust shall not be transferred within six months after that corporation or that trust has acquired the shares pursuant to an offer made under Section 305 except:
(i) to an institutional investor or to a relevant person (as defined in Section 305(5) of the SFA), or to any person arising from an offer referred to in Section 275(1A) or Section 305A(3)(c)(ii) of the SFA;
(ii) where no consideration is or will be given for the transfer;
(iii) where the transfer is by operation of law;
(iv) as specified in Section 305A(5) of the SFA; or
(v) as specified in Regulation 36A of the Securities and Futures (Offers of Investments) (Collective Investment Schemes) Regulations 2005 of Singapore.

(3) to an institutional investor or to a relevant person defined in Section 305(5) of the SFA, or to any person arising from an offer referred to in Section 275(1A) or Section 305A(3) (i) (B) of the SFA; (4) where no consideration is or will be given for the transfer; (5) where the transfer is by operation of law; (6) as specified in Section 305A(5) of the SFA; (7) as specified in Regulation 36 of the Securities and Futures (Offers of Investments) (Collective Investment Schemes) Regulations 2005 of Singapore.

The index sponsors of the indices referred to herein make no warranty or representation whatsoever either as to the results obtained from use of the indices and/or the figures at which the said indices stand at any particular day or otherwise. These index sponsors shall not be liable to any person for any error in their indices and shall not be under any obligation to advise any person of any error therein.

For investors in Switzerland:
The collective investment schemes ("CIS")
– Xtrackers S&P 500 Swap UCITS ETF (1C, 1D)
– Xtrackers MSCI World Swap UCITS ETF (4C - EUR Hedged, 1C)
– Xtrackers MSCI USA Swap UCITS ETF (1C)
– Xtrackers CSI300 Swap UCITS ETF (1C)
have been authorised by the Swiss Financial Market Supervisory Authority (FINMA) for offering to non-qualified investors in Switzerland, pursuant to the Swiss Federal Act on Collective Investment Schemes of June 23, 2006 ("CISA") The Swiss Representative for this CIS is DWS CH AH, Hardstrasse 201, CH-8005 Zurich. The Swiss Paying Agent is Deutsche Bank (Suisse) SA, Place des Bergues 3, CH-1201 Geneva. The current sales prospectus, the articles of association, KID (Key Information Document) as well as the annual and semi-annual reports may upon request be obtained free of charge from the Swiss Representative as well as from www.etf.dws.com/en-ch/. In respect of the units offered in Switzerland, the place of performance is the registered

office of the Representative. The place of jurisdiction shall be at the registered office of the Representative or at the registered office or domicile of the investor.

For Qualified Investors (Art. 10 Para. 3 of the Swiss Federal Collective Investment Schemes Act (CISA)) only / For Professional Clients (Art 4 Para. 3 and 4 of the Financial Services Act (FinSA)) only.

The foreign collective investment scheme ("CIS")
– Xtrackers S&P 500 Swap UCITS ETF (5C - EUR Hedged, 7C - GBP Hedged)
– Xtrackers MSCI World Swap UCITS ETF (1D)
– Xtrackers MSCI USA Swap UCITS ETF (1D)
have appointed a Swiss Representative and a Swiss Paying Agent but have not been approved by the Swiss Financial Market Supervisory Authority (FINMA) for offering to non-qualified investors.

Accordingly, the offering of the units (the "Units") of this CIS in Switzerland will be exclusively made to qualified investors as defined in the Swiss Collective Investment Schemes Act of 23 June 2006, as amended ("CISA").

The Swiss Representative for this CIS is DWS CH AH, Hardstrasse 201, CH-8005 Zurich. The Swiss Paying Agent is Deutsche Bank (Suisse) SA, Place des Bergues 3, CH-1201 Geneva. The current sales prospectus, the articles of association, KID (Key Information Document) as well as the annual and semi-annual reports may upon request be obtained free of charge from the Swiss Representative as well as from www.etf.dws.com/en-ch/. In respect of the units offered in Switzerland, the place of performance is the registered office of the Representative. The place of jurisdiction shall be at the registered office of the Representative or at the registered office or domicile of the investor.

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Xtrackers, Xtrackers II and Xtrackers (IE) plc are undertakings for collective investment in transferable securities (UCITS) in accordance with the applicable laws and regulations and set up as open-ended investment companies with variable capital and segregated liability between their respective compartments.

Xtrackers and Xtrackers II are incorporated in the Grand Duchy of Luxembourg, are registered with the Luxembourg Trade and Companies' Register under number B-119.899 (Xtrackers) and B-124.284 (Xtrackers II) respectively and have their registered office at 49, avenue J.F. Kennedy, L-1855 Luxembourg. Xtrackers (IE) plc is incorporated in Ireland with registered number 393802 and has its registered office at 78 Sir John Rogerson's Quay, Dublin 2, Ireland.

DWS Investment S.A. acts as the management company of Xtrackers, Xtrackers II and Xtrackers (IE) plc.

This document is intended as marketing communication. The information contained in this document is provided for information purposes only. Any investment decision in relation to an Xtrackers ETF should be based solely on the latest version of the prospectus, the audited annual and, if more recent, un-audited semi-annual reports and the Key Investor Information Document (KIID), all of which are available in English upon request or on www.etf.dws.com.In the case of any inconsistency with the prospectus, the latest version of the prospectus shall prevail.

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This offer relates to securities not registered with the Securities Registry or the Registry of Foreign Securities of the Commission for the Financial Markets Commission, and therefore such shares are not subject to oversight by the latter;

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