Spotlight on Synthetic ETFs in Europe
A Review of Management Practices

Introduction
In Europe, 83% of assets in equity exchange-traded funds are held in funds following physical replication and only 17% is in synthetic ETFs. For fixed income, the split in favour of physical ETFs is more pronounced, with only 5% of assets in synthetic ETFs. However, in the past few years, there has been an increase in demand for European-domiciled US equity synthetic ETFs because of their tax advantages over their physical peers. This even led iShares, a stalwart advocate of physical replication, to launch its own swap-based S&P 500 ETF in 2020.

As synthetics again become a topic of conversation in Europe, this is the right time to provide investors with up-to-date knowledge to make informed choices. In 2011, Morningstar published a paper titled “Synthetic ETFs Under the Microscope,” where we drilled into the management practices of European providers of synthetic ETFs. This was followed in 2012 by a paper with a global scope.1 As there have been changes since then, the paper we publish now, focusing solely on European providers, is a necessary update to that first guide published a decade ago.

In this paper we set the background by describing how the split between physical and synthetic ETFs in Europe has evolved in the past decade, citing the causes for the fall in popularity of the synthetic structure and why investors are again expressing interest in it for exposure to mainstream US equity indexes. We explain how the two synthetic ETF structures used by ETF providers in Europe—unfunded and funded swaps—work and how swap counterparty risk is mitigated. We also include comprehensive due-diligence profiles for the main providers of synthetic equity and fixed-income ETFs in Europe, where we zero in on their fund management practices. These profiles provide answers to the key questions that investors considering synthetic ETFs should ask themselves.

Key Takeaways
► In the choice between unfunded and fully funded, almost all providers of synthetic ETFs use the unfunded swap structure.
► The use of multiple swap counterparties has become more common as a risk-mitigation measure of swap counterparty exposure.
► There remain substantial differences in the type of assets that providers accept as content of substitute/collateral baskets.
► Compared with a decade ago, there has been a major improvement in transparency. ETF providers now disclose the full contents of substitute/collateral baskets on their websites and typically update them daily.
► Transparency around swap costs remains an area that needs improvement.

The Physical/Synthetic ETF Split in Europe

The European ETF marketplace is characterised by the coexistence of two replication models: physical and synthetic. Physical ETFs replicate the performance of indexes by holding all or a selection of the securities included in those indexes. Synthetic ETFs are more complex instruments than their physical peers. This is because they do not receive the return from holding the stocks that make up the index, but instead deliver the performance of the index by negotiating total return swaps with a counterparty, typically an investment bank. In most cases, investors’ assets are used to purchase a basket of securities whose contents may or not be related to the index the ETF tracks, and whose return is passed on to the swap counterparty in exchange for that of the index.

The split in assets under management between physical and synthetic ETFs in Europe has experienced a massive shift in the past decade in favour of physical replication. In 2010, 46% of assets in equity ETFs and 35% of assets in fixed-income ETFs were held in synthetic funds. At the close of 2020, the market share had shrunk to 17% and 5%, respectively.

Exhibit 1 Market Share of Synthetic ETFs in Europe

The seeds for the decline in market share in synthetic ETFs were sown in 2011-12 when, in the wake of several reports on the perceived systemic risks of ETFs, European ETF providers engaged in open PR warfare over the virtues, and above all the risks, of the physical and synthetic replication structures. In particular, those in the physical replication camp were keen to highlight the issue of swap counterparty risk associated to the synthetic model—that is, the possibility that the party providing the swap fails to honour its obligation to deliver the performance of the index tracked by the ETF.

At the time, Morningstar maintained a neutral stance, not favouring one side over the other, acknowledging that both physical and synthetic replication models have pros and cons and calling for improvements on both sides while fulfilling our fundamental mission of arming investors with the knowledge to make their own informed choices.
Synthetic replication came out badly bruised from that period, and investors decisively shifted in favour of physical ETFs. This had a significant effect in the way some of the major ETF providers in Europe conducted their business. The three leading providers of synthetic ETFs back in the early days—Xtrackers, Lyxor, and Amundi—ditched their “swap only” status and adopted a mixed physical/synthetic ETF product lineup. Over the years, many ETFs that started off as synthetic funds have been converted to physical funds. Meanwhile, most new entrants to the European ETF marketplace have considered only physical replication.

Against this backdrop, the synthetic replication model for ETFs was mainly considered to track equity and bond indexes made up of illiquid securities or indexes for markets with barriers to foreign ownership. It must be noted, however, that derivatives, typically futures contracts, have remained widely used in exchange-traded commodities, or ETCs, throughout this period, as for most of these products physical replication is unfeasible.

Investors Are Going Back to Synthetics for US Equity Exposure

Overall, the synthetic ETF structure remains a minority option in Europe, but in the past few years there has been an increase in the usage of synthetic ETFs to gain access to popular US large-cap indexes such as the S&P 500 and MSCI USA Index. As Exhibit 2 shows, after years of decline and stagnation around 20%, the market share of the group of synthetic ETFs tracking the S&P 500 and the MSCI USA Index has increased to around 30% since 2017, supported both by inflows and capital appreciation. This is because synthetic ETFs tracking indexes with a “qualified status”—amongst them the S&P 500 and MSCI USA Index—benefit from a favourable regulatory regime (Section 871(m) of the US Internal Revenue Service Code) that allows for the total return of the index in swap contracts to be calculated free of withholding tax on dividends.

For some investors, the dividend tax-free status has made synthetic ETFs tracking these popular US equities indexes a more appealing proposition than the still dominant physical counterparts, which remain liable to pay the withholding tax. In the case of Irish-domiciled physical ETFs, the taxation treaty between Ireland and the United States allows for a halving of the tax rate to 15% from the standard rate of 30%.

In fact, renewed investor interest for the synthetic structure for US equity market exposure encapsulated in indexes with qualified status even led iShares, which spearheaded the campaign against synthetics in 2011-12, to launch its own swap-based S&P 500 ETF in September 2020.
Although circumscribed to a specific market exposure, this has put synthetic ETFs back on the table as a discussion topic. In the following sections we outline how synthetic ETFs work, as well as the risks that investors must consider, and provide due-diligence profiles for providers of synthetic ETFs that answer key questions on their management practices.

**Synthetic Replication Models**

There are two models currently used by European ETF providers to track an index synthetically: the unfunded swap model and the funded swap model. Of the two, the unfunded swap model is more common.

In the *unfunded swap model*, the ETF manager enters into a total return swap agreement with one or several counterparties (typically investment banks) to receive the performance of the index. Effectively, the portfolio manager uses cash from investors to buy a basket of securities—the substitute basket—from the swap counterparty, which commits to deliver the performance of the index (typically adjusted for a swap spread) in exchange for the performance of the securities held in the substitute basket.

The substitute basket must comply with UCITS regulations on asset type, liquidity, and diversification. The assets in the substitute basket always remain the property of the ETF, and they are held in a segregated account at a custodian where they are monitored and verified daily.
Counterparty risk in ETFs that employ the unfunded swap model is actively managed by the fund managers. Swaps are marked-to-market daily and must be reset whenever the counterparty exposure approaches the 10% UCITS limit. In practice, ETF providers that use the unfunded swap model typically apply tighter swap reset triggers than the UCITS rule of 10%, which results in lower counterparty risk. When a swap reset is triggered, the manager asks the counterparty or counterparties to pay the swap marked-to-market value by delivering additional securities to top up the substitute basket.

In the funded swap model, the ETF manager transfers investors’ cash to a swap counterparty in exchange for the index performance (adjusted for a swap spread) plus the principal at a future date. The swap counterparty posts collateral assets in a segregated account with a third-party custodian. The collateral account can be held either in the name of the fund (in the case of a transfer of title) or in the name of the counterparty and pledged in favour of the fund (in the case of a pledge arrangement). The collateral basket must comply with UCITS regulations on asset type, liquidity, and diversification. Typically, haircuts (or margins) are also applied to the assets posted as collateral to account for the risk of fluctuations in value and the fact that the fund does not hold the assets. This means that the market value of the collateral usually exceeds the NAV of the ETF.

As of this review, of all the ETF providers we have conducted due diligence on, UBS is the only one that uses this model, and in its case the legal title of the collateral basket is transferred. This means that the collateral is treated as the property of the fund, and so if the swap counterparty defaults, the ETF manager should have direct access to the assets. By contrast, under a pledge structure, the manager would have to claim the ownership of the collateral account first to gain access to its contents.
Net counterparty exposure is measured as the difference between the fund's NAV and collateral value (less haircuts or margins). Here also, under UCITS, the net counterparty risk exposure may not exceed 10% of the fund's NAV. If the collateral value falls below 90% of the fund's NAV or the discretionary level agreed with the swap counterparty, the manager requires the swap counterparty to post additional collateral.

Using Swaps Is Not Risk-Free
Synthetic replication may offer advantages in terms of tracking error over physical replication, but it exposes investors to swap counterparty risk. If the investment bank at the other end of the swap contract goes out of business, the ETF is left with the contents of the substitute basket, which typically are different from those of the index.

Faced with this situation, ETF providers have various courses of action, all of which come with risks that ETF shareholders must consider. A preferred option would be to negotiate a swap contract with a new counterparty. This process may be expedited by the fact that many providers of synthetic ETFs now routinely work with a pool of approved multiple swap counterparties rather than relying on a single entity. Still, until the new contract is in place, the returns of the ETF will be derived by the contents of the substitute basket, which typically differ from those of the index, investors would experience a temporary increase in tracking error.

Another possibility to deal with the default of a swap counterparty is for ETF providers to switch the replication method of the fund from synthetic to physical. Here again, investors will be exposed to temporary tracking error until the transition is completed. But also, investors can sustain capital losses. The contents of the substitute basket will need to be sold, and with the cash generated the ETF manager would buy the securities included in the index to replicate it physically. Investors run the risk of a loss if the realisable value of the substitute basket is below that of their holding in the ETF. Besides,
there will be trading costs to consider both to sell the contents of the substitute basket and to buy new securities to replicate the index physically.

ETF providers may also opt to close the ETF. In that case, they would liquidate the contents of the substitute basket and redeem shareholders. Here, investors face the risk of a capital shortfall if the value of the basket is below that of their holding in the ETF.

To minimise these risks, regulators and ETF providers themselves impose a set of restrictions around the value and composition of the substitute basket.

Under UCITS, the net swap counterparty risk exposure may not exceed 10% of the fund's NAV. Swap reset policies vary across providers, but nowadays, all the providers on which we conducted due diligence apply tighter reset triggers than the UCITS rule of 10%, which results in lower counterparty risk. In fact, some providers target zero swap counterparty exposure daily. From an investor's risk perspective, ETFs that reset swaps daily offer the highest protection, as the counterparty risk that investors are exposed to is restricted to just that day's movements in the index and substitute basket.

Some ETF providers further diversify risk by sharing out swap exposure for any given ETF between two or more counterparties. Compared with a decade ago, when most ETF providers used a single counterparty—typically, their own parent investment bank—the more common use of multiple swap counterparties is a welcome risk-mitigation development in the management of synthetic ETFs.

Regarding the composition of the substitute baskets, they must comply with UCITS regulations on diversification and asset type. The typical substitute basket is made up of large-cap equities of major developed-markets indexes and/or bonds from developed-markets issuers with an investment-grade credit rating. But ETF providers impose their own set of additional criteria for the securities they accept, and there can be substantial differences in the type, size, liquidity, region, and overall credit quality of the contents. This makes it imperative for investors to be able to gain easy and detailed insight into the contents of these baskets to assess risk. In this regard there have been major improvements compared with a decade ago when disclosure was patchy at best. Nowadays, the contents of these baskets for each ETF are disclosed in their entirety and typically updated daily on the providers' websites.

An area where there remains a need for transparency is that of swap costs. These costs are typically not included in the ETF’s ongoing charge, so investors may find it hard to correctly assess the total cost of owning a synthetic ETF. Though not always, swap counterparties can charge a spread, which will have an impact on the tracking difference of the fund. This swap spread depends on various factors: the cost for the swap provider to gain access to the reference index in order to hedge its exposure, any revenue generated (for example, from tax optimisation), and the costs of collateral.
**Key Questions Investors Should Consider**

In fully assessing whether a synthetic ETF is the right structure to gain exposure to any given market exposure, investors will have to consider several questions.

- Do I understand how swaps work?
- Does the provider use unfunded or fully funded swaps?
- Does the provider use single or multiple swap counterparties? If multiple, is the ETF swap exposure shared out between two or more or allocated to just one of the many? Does the provider disclose this information?
- How does the ETF provider choose swap counterparties? How do they monitor their creditworthiness?
- How often are swaps contracts negotiated for?
- Are there swap costs to bear? Does the provider disclose this information?
- How often is swap counterparty risk exposure reset?
- What assets are eligible to be part of a substitute/collateral basket?
- Does the ETF disclose the contents of the baskets? How often are they updated?
- What is the procedure to deal with the default of a swap counterparty?
- Will the assets in the substitute/collateral baskets be hard to sell in the event of a counterparty default?
- And ultimately, am I willing to accept the risk of temporary higher tracking error and potential capital losses in the event of a swap counterparty default for the potential benefits of smoother tracking associated with synthetic ETFs?

Investor’s attitudes to risk are not uniform. Even in possession of the answers to all these questions, some investors will decide that using synthetic ETFs is not for them, whereas others will have no issue using them. The important thing is to have the information to make that choice. In the following section we provide comprehensive due-diligence profiles for the main providers of synthetic ETFs in Europe—we include iShares here for the interest generated by its swap S&P 500—which specifically address many of these key questions and should help investors make that informed choice.
Provider Profiles

Amundi

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Source: Morningstar Direct. Data as of end January 2021

Swap model used
Unfunded.

Single/multiple counterparty
Single counterparty model. As of this review, BNP Paribas is the swap counterparty for all synthetic equity ETFs and Societe Generale for all synthetic fixed-income ETFs.

Selection criteria of swap counterparties
The credit analysis team at Amundi carries out due diligence on the selected swap counterparties on a mix of qualitative and quantitative criteria to ascertain their financial creditworthiness and market capabilities. This includes the assessment of their ability to provide and execute high-quality swap operations at competitive fees. The swap counterparty must be validated by Amundi's risk department.

Swap contract length
Swap contracts can be negotiated for variable periods depending on prevailing market conditions.

Selection criteria for assets in substitute basket
Consistency between the securities and the nature of the index (that is, equities for equity ETFs and bonds for fixed-income ETFs). High liquidity. Compliance with UCITS diversification rules.

Eligible assets for substitute basket
For equity ETFs: a) stocks making part of the ETF index; b) stocks of representative indexes such as MSCI Europe, Stoxx Europe 600, S&P 500, MSCI Japan and Nikkei 225. The aggregated weight of any given stock included in substitute baskets in the entire synthetic equity range cannot exceed 3 times its average daily volume. For fixed-income ETFs: a) government and corporate bonds from OECD countries with an investment-grade credit rating and a minimum size of EUR 500 million; b) bonds included in the ETF index. In the case of emerging-markets bonds ETFs, the substitute basket may include bonds included in the index even if they do not carry an investment-grade credit rating.

Exclusions
Stocks and bonds from the swap counterparties (BNP Paribas, Societe Generale) as well as from Credit Agricole and Amundi. CFDs and certificates or structure products (for example, ABS, CDO, CDS). Stocks and bonds from companies involved in the manufacturing of controversial weapons.

Securities lending allowed in substitute baskets
No.

Disclosure of contents of substitute baskets
Full daily disclosure for each ETF in the relevant product page on the Amundi website.

Swap reset policy
Daily.

Swap counterparty default mitigation measures
Depending on market conditions, Amundi will consider any of the following scenarios: a) keep the assets of substitute baskets and negotiate swap contracts with a new counterparty for its entire range of equity and/or fixed-income ETFs; b) sell the assets of the substitute baskets and switch to physical replication; c) sell the assets of the substitute baskets, liquidate the funds, and reimburse investors.

Disclosure of swap costs to investors
No disclosure.

Source: Morningstar Research
BNP Paribas

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Swap model used

Unfunded.

Single/multiple counterparty

Multiple swap counterparty model. As of this review, the group of eligible counterparties are Bank of America Merrill Lynch, Barclays, BNP Paribas, HSBC, JP Morgan, Morgan Stanley, and Societe Generale. For each synthetic ETF, the portfolio manager issues a call for tender with at least three counterparties. Depending on the fund's size, the portfolio managers can decide to negotiate the swap with one or more of the counterparties.

Selection criteria of swap counterparties

The BNP Paribas AM Risk Department carries out due diligence on the selected swap counterparties on a mix of qualitative and quantitative criteria to ascertain their financial creditworthiness and market capabilities. The global counterparty committee approves and removes counterparties from the authorised list. Counterparties must have a minimum credit rating of "A-/A3" or equivalent for OTC derivative counterparties. Information on the counterparty(ies) used for each ETF is disclosed in the annual report available on the BNPP EasyETF website.

Swap contract length

Swap maturities can vary from three months to up to two years, depending on market conditions at time of negotiation.

Selection criteria for assets in substitute basket

BNP Paribas favours liquidity over correlation with the reference benchmark. The securities in the substitute basket are subject to ESG screening criteria defined by BNPP AM’s sustainable investment sector policy and BNPP AM’s sustainability centre. Compliance with UCITS diversification rules.

Eligible assets for substitute basket

Primarily eurozone large-cap equities. When the fund’s currency is USD, they use stocks included in the MSCI World Index. None of BNP’s fixed-income ETFs are synthetic.

Exclusions

Securities that do not comply with BNPP AM’s sustainable investment policy as well as those assigned an ESG ranking decile of 10 (scale from 1 to 10) by BNPP AM’s sustainability centre.

Securities lending allowed in substitute baskets

No.

Disclosure of contents of substitute baskets

Full daily disclosure for each ETF in the relevant product page on the BNPP EasyETF website.

Swap reset policy

BNP offsets swap counterparty risk exposure by the use of cash collateral. BNP can reset swaps at any time, and they are always reset before reaching the mandatory UCITS 10% level. For most ETFs the swap is reset whenever there is a creation or redemption. Also they may ask for a reset when the cash ratio is above 10% or whenever they need to post collateral.

Swap counterparty default mitigation measures

Depending on market conditions, BNP Paribas will consider the following scenarios: a) keep the assets of substitute baskets and negotiate swap contracts with a new counterparty; b) sell the assets of the substitute baskets and switch to physical replication; c) sell the assets of the substitute baskets, liquidate the funds, and reimburse investors.

Disclosure of swap costs to investors

No disclosure.

Source: Morningstar Research
**Invesco**

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**Swap model used**

Unfunded.

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**Single/multiple counterparty**

Multiple counterparty model. As of this review, the counterparties are Goldman Sachs, JPMorgan, Morgan Stanley, and Societe Generale. Typically for each ETF the swap contract will be shared out between at least three counterparties. The breakdown of the exposure to each counterparty for each ETF is disclosed in the relevant product page on the Invesco website.

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**Selection criteria of swap counterparties**

The board of directors and the credit committee consider and approve swap providers. They assess the legal capacity, credit quality (minimum S&P’s A2 rating or equivalent) and operational capabilities of the candidates. They also consider each counterparty’s performance relative to peers and their ability to price swaps competitively over the medium term. Invesco claims that it sets a common price that is willing to pay for all swap transactions for a given exposure, and the counterparties are eligible to participate only if they agree with the price.

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**Swap contract length**

Typically one year, but subject to change depending on market conditions.

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**Selection criteria for assets in substitute basket**

Listed securities in a manner that ensures strong correlation with most equity benchmarks. Compliance with UCITS diversification rules. Single-stock concentration capped at 2% of the issuer's market capitalisation. Target weighted average daily trading volume below 50% to ensure liquidity.

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**Eligible assets for substitute basket**

Stocks from an approved list of developed country exchanges. These are Australia, Austria, Belgium, Canada, Denmark, Finland, Germany, Israel, Japan, Netherlands, Norway, Portugal, Singapore, Spain, Sweden, Switzerland, UK, and US. None of Invesco’s fixed-income ETFs are synthetic.

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**Exclusions**

Stocks of authorised participants, fund units, REITs, nonequity securities (for example, convertible bonds), controversial weapons companies. Securities for which Invesco anticipates a corporate action in the next 10-day period are also excluded.

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**Securities lending allowed in substitute baskets**

No.

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**Disclosure of contents of substitute baskets**

Full daily disclosure for each ETF in the relevant product page on the Invesco website.

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**Swap reset policy**

Invesco resets its swaps when a) the exposure to a single swap counterparty exceeds 4.5% of the swap notional; b) end-of-day exposure to a single counterparty exceeds EUR 400,000 or 0.20% of fund’s assets and EUR 100,000; c) when a creation or redemption occurs; and d) every 30 days if not otherwise reset.

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**Swap counterparty default mitigation measures**

In the event of a default, Invesco will terminate the swap transaction at the closing market prices on the day of default and sell the securities from the substitute basket. The proceeds from the sale would either be distributed to shareholders or used to purchase US Treasury securities as a near-term solution and negotiate a swap with a new counterparty. In the latter case and if another counterparty cannot be appointed, Invesco would consider switching the fund to physical replication or liquidate the ETF and redeem shareholders.

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**Disclosure of swap costs to investors**

Full disclosure of swap costs for each ETF on Invesco’s website.

Source: Morningstar Research
## Swap model used
Unfunded.

### Single/multiple counterparty
Multiple counterparty model. As of this review, BlackRock uses JPMorgan and Citi as the two swap counterparties for the iShares S&P 500 Swap ETF.

### Selection criteria of swap counterparties
BlackRock carries out due diligence on the selected swap counterparties on a mix of qualitative and quantitative criteria to ascertain their financial creditworthiness and market capabilities.

### Swap contract length
Standard one-year swap contract.

### Selection criteria for assets in substitute basket
BlackRock uses predefined criteria that ensure diversification, quality, and liquidity of the stocks in the substitute basket.

### Eligible assets for substitute basket
The list of eligible securities is made up of mid- and large-cap stocks that are part of the MSCI World Index. Single-stock capping is in place to ensure that none of the basket constituents represents more than 5% of the swap’s notional value.

### Exclusions
Bank stocks; no dividend-paying or corporate action names held over ex/record date.

### Securities lending allowed in substitute baskets
No.

### Disclosure of contents of substitute baskets
Full daily disclosure for the iShares S&P 500 Swap ETF on its product page on the iShares website.

### Swap reset policy
The swap is reset weekly, but the swap is marked-to-market daily and collateralised with variation margin. Ad-hoc resets can be triggered in volatile markets.

### Swap counterparty default mitigation measures
Depending on overall market conditions, iShares will consider the following scenarios: a) keep the assets of substitute baskets and negotiate swap contracts with a new counterparty; b) sell the assets of the substitute baskets and switch to physical replication; c) sell the assets of the substitute baskets, liquidate the funds, and reimburse investors.

### Disclosure of swap costs to investors
No disclosure.
Lyxor Spotlight on Synthetic ETFs | March 2021 | See Important Disclosures at the end of this report.

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Swap model used

**Unfunded.**

**Single/multiple counterparty**

For each ETF Lyxor engages in a competitive RFP with a group of eligible counterparties. As of this review, the counterparties are: Bank of America, Barclays, Goldman Sachs, Morgan Stanley, and Société Générale. The swap for any given ETF is negotiated with the winner of its RFP. The swap counterparty of each ETF is indicated on the relevant product page on Lyxor's website.

**Selection criteria of swap counterparties**

Swap counterparties are selected on their creditworthiness, measured as a function of qualitative and quantitative metrics relative to the wider pool of available counterparties. Selected counterparties must have a S&P credit rating of A- or above and five-year CDS spreads lower and less volatile than a calculated average measure for the wider group of available counterparties. Compliance with the minimum criteria is monitored weekly. The decision to terminate transactions with the swap counterparty is ultimately taken by Lyxor's CEO.

**Swap contract length**

Standard one-year swap contract.

**Selection criteria for assets in substitute basket**

Consistency between the securities and the nature of the index (that is, equities for equity ETFs and bonds for fixed-income ETFs). High liquidity. Compliance with UCITS diversification rules.

**Eligible assets for substitute basket**

For **equity ETFs**: a) stock from all sectors listed in main indexes such as MSCI Developed World, MSCI Emerging Markets World, MSCI Developed World Small Cap, STOXX Europe 600, MDAX, or FTSE 250 indexes; b) ADIs or GDIs issued by a company belonging to such indexes. For **fixed-income ETFs**: a) Sovereign bonds issued by eurozone countries, US, UK, Japan, and other major developed countries with an investment-grade credit rating and residual maturity of less than 30 years for US, German, UK, Japanese, and French bonds and of less than 20 years for the rest; b) corporate bonds with residual maturity of less than 12 years and minimum size of USD 250 million issued by companies with investment-grade ratings located in the eurozone, US, UK, Japan, and other major developed countries.

**Exclusions**

Société Générale stock and bonds.

**Securities lending allowed in substitute baskets**

No.

**Disclosure of contents of substitute baskets**

Full daily disclosure for each ETF in the relevant product page on the Lyxor website.

**Swap reset policy**

Daily.

**Swap counterparty default mitigation measures**

Lyxor would give first priority to selecting a new counterparty from the pool of approved counterparties and negotiate a new swap contract. Failing this, Lyxor would consider changing the replication method of the ETF to physical, and as a last resort it would liquidate the fund, sell the assets in the substitute basket, and redeem investors.

**Disclosure of swap costs to investors**

No disclosure.

Source: Morningstar Research
**UBS**

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**Swap model used**

UBS uses two swap models, the fully funded model, and a 95/5 combination of unfunded and fully funded in proportion of approximately 95%/5%, respectively. Information on the model used for each synthetic ETF is disclosed in the relevant product page on the UBS website.

**Single/multiple counterparty**

Single counterparty model. UBS AG is the only counterparty to UBS ETF swap agreements.

**Selection criteria of swap counterparties**

Creditworthiness of the swap counterparty is monitored on a quarterly basis by the board of directors. However, it can be done on an ad-hoc basis if circumstances require it.

**Swap contract length**

Standard one-year swap contract.

**Selection criteria for assets in substitute basket**

Compliance with UCITS diversification rules. Compliance with ESMA guidelines. For collateral baskets in funded swap contracts, only government bonds and cash allowed. For substitute baskets in unfunded swap contracts, liquid stocks from developed-markets companies.

**Eligible assets for substitute basket**

**Substitute baskets in unfunded swaps:** developed-markets equities. **Collateral basket for funded swaps:** Government bonds with a minimum credit rating of A issued by G10 countries (France, Germany, Belgium, the Netherlands, Sweden, Canada, US, and UK). Bonds issued by supranational organisations with a minimum credit ratings of AA. Cash. Assets can be held individually or inside investment funds that only own acceptable securities. None of UBS’ fixed-income ETFs are synthetic.

**Exclusions**

No stocks allowed in collateral baskets for funded swaps. No stocks other than from developed markets for substitute baskets in unfunded swap contracts.

**Securities lending allowed in substitute baskets**

No.

**Disclosure of contents of substitute baskets**

Full composition is available for download on a weekly basis for each ETF on the relevant product page on the UBS website.

**Swap reset policy**

Swaps are reset a minimum of every three months of when a predetermined exposure threshold is met or exceeded. In practice, swaps are frequently reset owing to subscription and redemption activity within the ETFs.

**Swap counterparty default mitigation measures**

The collateral basket is liquidated and the proceeds used to cover any shortfall in performance. A new swap counterparty would then be appointed by UBS to replace the previous agreement.

**Disclosure of swap costs to investors**

No disclosure.

Source: Morningstar Research
Xtrackers

<table>
<thead>
<tr>
<th>Xtrackers</th>
<th>Equity</th>
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<td>Synthetic</td>
<td>30</td>
<td>18.5</td>
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Source: Morningstar Direct. Data as of end January 2021

Swap model used
Unfunded.

Single/multiple counterparty
Multiple counterparty model. As of this review, the counterparties are Deutsche Bank, HSBC Bank, Societe Generale, Goldman Sachs, Morgan Stanley, Barclays, JPMorgan, BNP Paribas, Bank of America ML, and Citibank. The ETF portfolio management team selects between one or more swap counterparties depending on the prevailing market conditions and suitability for any given ETF. The breakdown of the exposure to each counterparty for each ETF is disclosed in the relevant product page on the Xtrackers website.

Selection criteria of swap counterparties
DWS has a counterparty risk management department responsible for assessing and controlling counterparty risk for all transactions undertaken. They review all counterparties on an initial and annual basis and pay attention to track record, reputation, succession planning, earnings, liquidity, and systematic vulnerability.

Swap contract length
Three-, six-, or 12-month contracts depending on market conditions.

Selection criteria for assets in substitute basket
UCITS eligibility and minimum ADV requirements to ensure liquidity. Eligible assets must not be subject to buying/selling tax or income payments within 10 days. Securities must be denominated in deliverable settlement currencies. There is no correlation requirement between the contents of the substitute basket and those of the ETF index.

Eligible assets for substitute basket
For equity ETFs: global developed-markets stocks from OECD countries. For fixed-income ETFs: sovereign and corporate bonds with an investment-grade credit rating issued by entities in developed markets.

Exclusions
Stocks and bonds that do not meet the basic eligibility criteria.

Securities lending allowed in substitute baskets
No.

Disclosure of contents of substitute baskets
Full daily disclosure for each ETF in the relevant product page on the Xtrackers website.

Swap reset policy
The notional of a swap agreement is reset when the notional is above 105% or below 95% of the fund value as well as after each creation and redemption.

Swap counterparty default mitigation measures
In the event of default, the swap automatically terminates and its value is determined at the last closing valuation point. The substitute basket is liquidated to cover swap replacement costs, and once the cash is received the portfolio managers would find a replacement counterparty, typically within the remaining pool of selected counterparties.

Disclosure of swap costs to investors
No disclosure.

Source: Morningstar Research
About Morningstar Manager Research

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