

Morningstar ETF Research

Synthetic ETFs Under the Microscope

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Ben Johnson, Director, European ETF Research

Hortense Bioy, CFA, Senior ETF Analyst

Gordon Rose, CIIA, ETF Analyst

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Executive Summary

- ▶ Exchange-traded products (ETPs) have recently been subjected to a greater level of scrutiny. The rapid growth in these various investment vehicles has been accompanied by an increasing level of complexity in both how they are structured and the underlying exposures they seek to achieve.
- ▶ In the wake of the global financial crisis, it is understandable why regulators might view such a rapidly expanding and innovative niche within the financial markets with caution.
- ▶ Exchange-traded funds (ETFs) using synthetic replication techniques have been at the epicenter of the most recent round of high profile warnings on the risks associated with ETPs.
- ▶ This structure contains some unique sources of risk. In assessing the risks associated with these structures it is important to address three key questions:
 1. What is the source of the risk?
 2. How are investors being protected against this risk?
 3. How are investors being compensated for assuming this risk?
- ▶ Investors in swap-based ETFs face the risk that the fund's swap counterparty will default on its obligation to provide the return of the fund's reference index.
- ▶ There are a variety of risk mitigants employed by providers of synthetic ETFs to protect them from this risk.
- ▶ In general, investors are compensated for assuming this risk in the form of lower holding costs relative to physical replication funds.
- ▶ As it pertains to the value of these funds' collateral or substitute baskets: the higher the level of these baskets' value relative to the funds' net asset value, the better.
- ▶ Cost aspects aside, the use of multiple swap providers seems to offer better protection to investors as it ensures diversification of counterparty risk.
- ▶ Great progress has since been made as it pertains to the transparency of providers' collateral and/or substitute baskets, mainly due to investor pressure on ETF providers. A handful of swap-based ETF providers are now disclosing snapshots of their substitute/collateral baskets on a daily basis on their websites and more providers have recently said that they will follow suit.
- ▶ ETF providers apply very different sets of criteria for the securities they accept into their structures, with some providers being more conservative than others.
- ▶ We have come to the conclusion that no ETF provider scores highly or badly on all aspects. We believe that as for everything, it's all about trade-offs. Providing extra protection to investors, more often than not, results in additional costs. This in turn is reflected in the performance of the ETF in the form of negative tracking difference between the return of the index and that of the fund. Ultimately, it's up to investors to decide the right balance between protection and return. And for that they need to do proper due-diligence. While the research burden lies with the investor, ETF providers can lighten it by being fully transparent about their practices and the various risks associated with them.

Introduction

Exchange-traded products (ETPs) have recently been subjected to a greater level of scrutiny. The rapid growth in these various investment vehicles has been accompanied by an increasing level of complexity in both how they are structured and the underlying exposures they seek to achieve.

In the wake of the global financial crisis, it is understandable why regulators might view such a rapidly expanding and innovative niche within the financial markets with caution. However, increased regulatory scrutiny could ultimately stifle the development of a product that is in many regards far safer, more transparent, and less costly than many competing investment vehicles. ETPs' low costs, generally stable and transparent portfolios and liquidity make them useful tools for a very wide spectrum of investors. But as with any investment vehicle, there are risks entailed in investing in ETPs, and it is vital that investors understand these risks.

Exchange-traded funds (ETFs) using synthetic replication techniques have been at the epicenter of the most recent round of high profile warnings on the risks associated with ETPs from the likes of the International Monetary Fund (IMF), Financial Stability Board (FSB), and Bank for International Settlements (BIS), amongst others. These funds' added layer of complexity vis-à-vis traditional physical replication funds has led to a good deal of confusion amongst those investors unfamiliar with the mechanics of swaps—which ultimately provide investors with the return of the reference index within synthetic ETFs. This structure contains some unique sources of risk. In assessing the risks associated with these structures it is important to address three key questions:

1. What is the source of the risk?
2. How are investors being protected against this risk?
3. How are investors being compensated for assuming this risk?

The chief source of risk (aside from investment risk) that investors face in synthetic ETFs is counterparty risk. Fund investors are relying on one or multiple swap counterparties to provide them with the performance of the fund's reference index. Should a swap counterparty default, fund shareholders face the risk of permanent capital impairment.

Each of these funds has built-in protections against counterparty default. First and foremost, a large majority of European synthetic ETFs are Undertakings for Collective Invest-

ment in Transferable Securities (UCITS)¹ and as such can never have more than 10% exposure to a swap counterparty. In practice, as you will see in the provider profiles, most providers hold assets or collateral in amounts that are either near, equal to, or greater than their fund's net asset values. Some providers engage multiple swap counterparties in order to diversify their funds' exposure. These are just a handful of the most important safeguards that have been put in place to protect investors in synthetic ETFs from counterparty risk.

Lastly, it is important that investors are compensated for assuming this additional form of risk. In general, synthetic ETFs have shown that they offer some compensation in the form of lower total holding costs. Holding costs represent a combination of the ETF's total expense ratio (TER) and tracking performance against their benchmark. Generally speaking, swap-based ETFs have proven to have lower TERs and superior tracking relative to physical products—especially in those instances where the underlying asset class is smaller and/or less liquid (e.g. emerging market equities).

The aim of this report is to illuminate the key risks, risk mitigants, and rewards associated with synthetic replication ETFs. After closely examining the practices of each of Europe's largest providers of swap-based ETFs, we have produced a general list of best practices for investors to use as a guide in assessing these various providers' practices. We also provide a detailed explanation of the mechanics of the two basic swap models used by providers of synthetic ETFs in Europe: funded swaps and un-funded swaps. Additionally, we have produced comprehensive profiles of each of the providers of swap-based ETFs in Europe. Here, we closely examine the most crucial aspects of these providers' product structures: the identity of the swap counterparty(ies), the fund holdings/collateral baskets, swap reset policies, disclosure levels, securities lending policies, and swap costs.

Please note that the information we have provided in these profiles was supplied to us directly by the relevant providers. As such, we cannot guarantee that it is complete, accurate, or timely.

¹ UCITS (Undertakings for Collective Investment in Transferable Securities) is a set of European Union Directives that aim to allow investment schemes to operate freely throughout the EU on the basis of a single authorisation from one member state. All UCITS ETFs are subject to the same requirements and constraints.

The Un-funded Swap Model

The un-funded swap model was the first method to be used in Europe to synthetically track the performance of an index. Under this structure, the ETF uses cash from investors to buy and hold a basket of securities from a swap counterparty (often the investment bank of the provider's parent). The swap counterparty then commits to deliver the reference index's performance (less swap fees where applicable) in exchange for the performance of the securities held by the fund.

The basket of securities bought by the fund is often referred to as the 'fund holdings' or 'substitute basket' and often does not include the constituents of the index the ETF is tracking but can have high correlation with the index. This basket however must comply with UCITS regulations on asset type, liquidity and often also complies with UCITS on diversification, although it is not obliged to. It usually consists of liquid equities and bonds that the investment bank acting as the swap counterparty may have within its inventory. The securities are held by the ETF in a segregated account at a custodian, where they are regularly monitored and verified.

It is important to note that at all times the fund remains the owner of these assets and has direct access to them. This means that if the swap counterparty defaults, in theory,

the ETF provider should be able to liquidate the assets swiftly should this option be chosen.

Some providers may engage multiple swap counterparties in an effort to minimise exposure to any one swap counterparty.

Counterparty risk is measured as the difference between the net asset value (NAV) of the ETF and the value of the substitute basket (in other words, the swap mark-to-market).

To mitigate this risk, UCITS regulations stipulate that exposure to the swap counterparty may not exceed 10% of the fund's NAV (note that some swap counterparties will see their UCITS limits reduced to 5%). This means that the daily NAV of the substitute basket should amount to at least 90% of the ETF's NAV.

The swap is marked-to-market on a daily basis and is reset whenever the counterparty exposure approaches the UCITS limit (or a lower limit set at the discretion of the ETF provider). In this case, the fund will ask the counterparty to pay the swap mark-to-market, which the fund will use to buy additional securities for the substitute basket.

Figure 1.1: Simplified Un-funded Swap ETF Structure

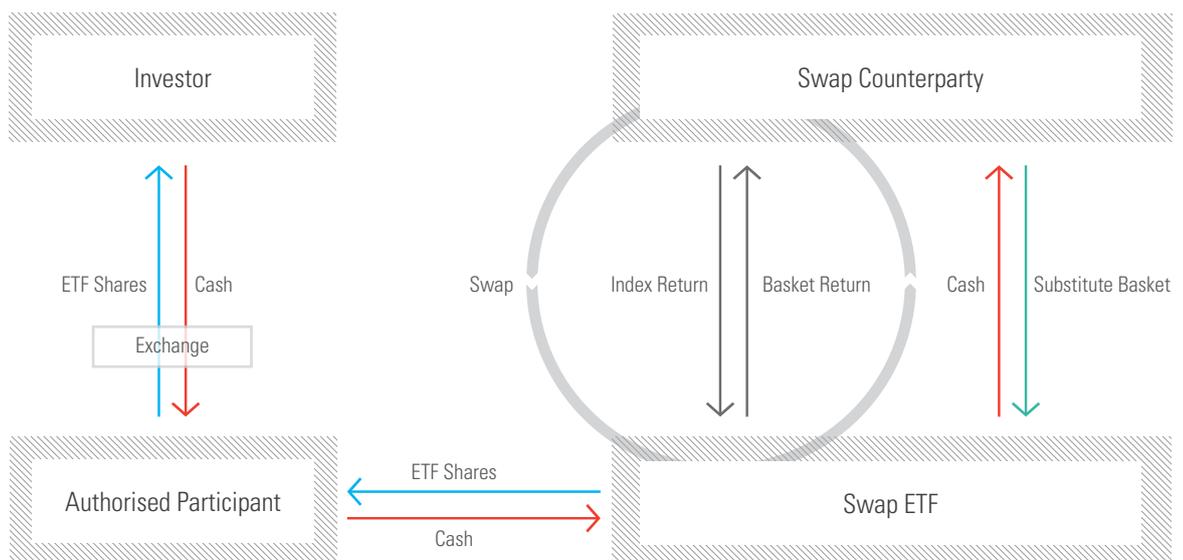


Figure 1.2: Example of daily counterparty exposure of a swap-based ETF

| Day ¹ | Index | Sub. Basket Value | Swap Value ² | ETF NAV ³ | Counterparty Exposure ⁴ | |
|-------------------------|-------|-------------------|-------------------------|----------------------|------------------------------------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Day 1 | 100 | 100 | 0 | 100 | 0/100=0% | Initial investment of 100, starting level of the index 100, swap value is 0. |
| Day 2 | 105 | 100 | 5 | 105 | 5/105=4.76% | The index rises whereas the basket remains flat: swap value is 5. |
| Day 3 | 110 | 108 | 2 | 110 | 2/110=1.82% | Both the index and the basket rise: swap value is 2. |
| Day 4: Before Resetting | 115 | 103 | 12 | 115 | 12/115=10.43% | Under UCITS III, counterparty exposure is limited to a maximum of +/- 10%, so the swap is reset. Resetting to zero ⁵ involves a payment of 12 from the swap counterparty to the ETF (reinvestment in the substitute basket) |
| Day 4: After Resetting | 115 | 115 | 0 | 115 | 0/115=0% | |
| Day 5: Before Resetting | 102 | 113 | -11 | 102 | -11/102= - 10.78% | The swap value falls below -10%, so the swap is reset ⁶ . Resetting involves a payment of 11 from the ETF to the counterparty (securities from the substitute basket are sold) |
| Day 5: After Resetting | 102 | 102 | 0 | 102 | 0/102=0% | |

¹ End of business day. No Intraday reset; ² Swap Value = Index Value – Substitute Basket Value; ³ ETF NAV = Substitute Basket Value + Swap Value;

⁴ Counterparty Exposure = Swap Value/ETF NAV; ⁵ Not all ETF provider reset swaps to zero; ⁶ Not all ETF providers reset swaps based on the fund owing the swap counterparty money

In practice, swap reset policies vary greatly from one ETF provider to another and from one ETF to another. Some providers reset swaps more frequently than others, depending on their own internal thresholds. Some apply much stricter reset triggers than the 10% UCITS rule, thus minimising the level of counterparty risk faced by fund shareholders at any given point in time. Also, some ETFs reset their swaps daily, either as a result of daily creation/redemption activity or simply because the provider has made it its policy. Finally, swaps are not necessarily reset to zero. Some providers opt to reset their swaps to a level that still represents a net exposure to their funds' swap counterparty, but sits comfortably within the UCITS-mandated 10% maximum. Some providers also do not reset the swaps based on the fund owing the swap counterparty money.

The Funded Swap Model

The funded swap model was introduced in Europe in early 2009. Under this structure, the ETF doesn't use the investor's cash to build a substitute basket—as is the case in those ETFs using un-funded swaps. Instead, the fund transfers investors' cash to a single swap counterparty (or multiple swap counterparties) in exchange for the index performance (less swap fees). The counterparty then posts collateral assets in a segregated account with a third party custodian. The account can be opened 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.

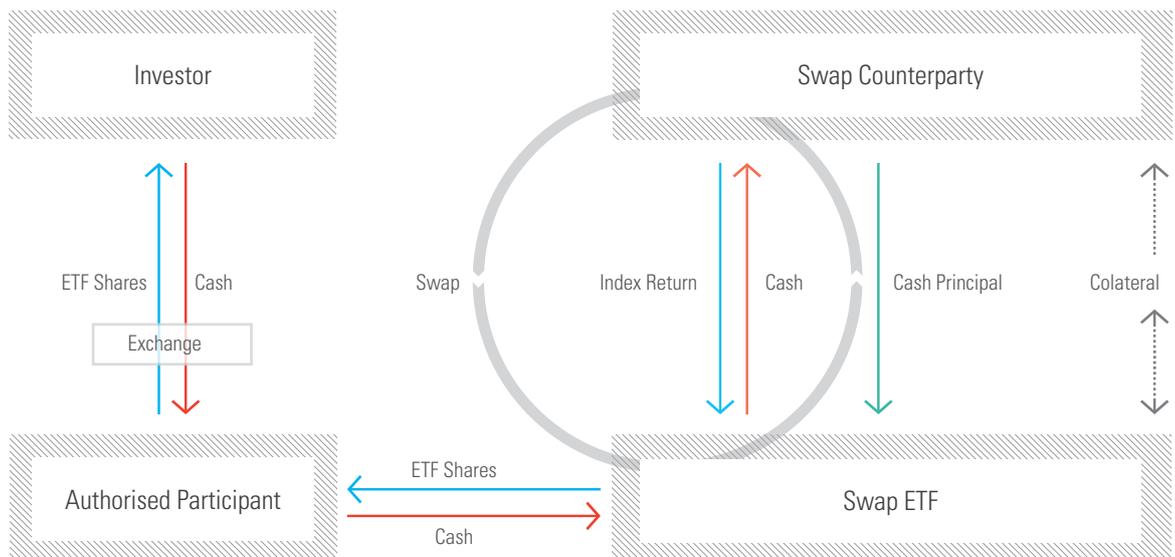
With a transfer of title, the collateral is treated as the property of the fund. This means that if the swap counterparty defaults, in theory, the ETF provider should be able to gain access to the assets without prior approval and dispose of them. Under a pledge structure, the fund would have to claim ownership of the collateral assets before it can sell them.

The posted collateral basket is usually composed of securities that come from the swap counterparty's inventory (typically OECD country equities, bonds, cash and funds) and is diversified in accordance with UCITS requirements. The collateral, which is of equal or greater value than the net asset value of

the ETF on any given day, is monitored on a daily basis. Whenever the exposure of the ETF to the swap counterparty becomes positive, the ETF provider requests that the swap counterparty deliver additional collateral. This is to ensure that the level of collateralisation is maintained and the net counterparty risk exposure remains zero, or negative.

Swaps can be over-collateralised depending on the assets posted as collateral and the regulation in the country where the fund is domiciled. In Luxembourg for example, the CSSF considers on an indicative basis that "an adjustment of approximately 20% is appropriate for shares which are comprised in a main index". It's then up to the fund provider's board of directors and custodian to determine the appropriate haircuts. In Ireland, since 1 July 2011 with the implementation of UCITS IV, the Central Bank stipulates that "where the collateral issuer is not rated A-1 or equivalent, conservative haircuts must be applied." It's then up to the fund provider's board of directors to set any haircuts.

Figure 1.3: Simplified Funded Swap ETF Structure



Provider Profiles

Amundi ETF

- ▶ Amundi, jointly-owned by Crédit Agricole (75%) and Société Générale (25%), rolled out its first swap-based ETFs in June 2008.
- ▶ Amundi's synthetic ETFs use the un-funded swap model. Under this model, each ETF buys and holds a basket of securities and simultaneously enters into a swap agreement with a counterparty that commits to pay the index performance (adjusted for the swap spread) in exchange for the performance of the fund holdings.
- ▶ All Amundi's synthetic ETFs are domiciled in France.

Swap Counterparty

- ▶ Each Amundi ETF enters into a swap agreements with a single counterparty. Société Générale Corporate and Investment Bank (SG CIB) is the only swap provider for the firm's fixed-income ETFs. SG CIB's long term credit is rated Aa2 by Moody's, A+ by S&P, and A+ by Fitch.
- ▶ Crédit Agricole Corporate and Investment Bank (CA CIB) (Aa1, A+, AA-) is used as swap counterparty for all the other asset classes represented in the Amundi ETF range.
- ▶ These banks were selected by Amundi following an auction process which is implemented once every 5 years.
- ▶ The swap exposure is monitored daily by Amundi's risk department.

Fund Holdings/Substitute Basket

- ▶ For equity ETFs, Amundi invests in shares of constituents of the MSCI Europe Index.
- ▶ Fixed income and commodity ETFs hold investment grade government, covered and corporate bonds (in EUR and USD) and US treasury bills.
- ▶ The correlation between the substitute baskets and the underlying indices is not taken into consideration.
- ▶ The substitute basket is held in a ring-fenced account at third party collateral agents, CACEIS Bank and BNY Mellon, and monitored daily by Amundi's asset managers.

Swap Reset Policy

- ▶ Amundi resets swaps whenever (i) the marked-to-market value of the swap reaches -10% or +10% of the fund's NAV or (ii) there is a creation/redemption or (iii) there is a significant change in the basket of securities (for example, the fund manager can decide to substitute some dividend paying stocks in order to avoid tax) or (iv) every quarter.
- ▶ All Amundi ETFs see their swaps reset to zero except

the equity ETFs whose swaps are reset to an average of 5% of the funds' net asset value, which results in a permanent net exposure to the counterparty.

Disclosure

- ▶ Amundi currently discloses the fund holdings of its swap-based ETFs upon request only but the company plans to publish this information on its website in the near future.

Securities Lending

- ▶ Amundi's swap-based ETFs do not engage in securities lending.

Swap Costs

- ▶ The swap counterparty charges swap spreads to Amundi ETFs (on average: zero basis point per annum for equity ETFs, 5 basis points per annum for fixed income ETFs, and 30 basis points per annum for commodity ETFs).
- ▶ These costs are reflected in the tracking difference. It is added or deducted to/from the index return delivered to the investor by the swap counterparty.
- ▶ Swaps are renegotiated every 5 years.

ComStage ETF

- ▶ ComStage, the ETF brand of Commerzbank, launched its first synthetic ETFs in August 2008.
- ▶ ComStage ETFs employ the un-funded swap model. Each ETF buys a basket of securities from Commerzbank and simultaneously enters into a swap agreement with the bank which commits to pay the index performance (adjusted for the swap fees) in exchange for the performance of the fund holdings.
- ▶ ComStage ETF collateralises its swaps.
- ▶ ComStage ETFs are domiciled in Luxembourg.

Swap Counterparty

- ▶ ComStage ETF uses only one swap counterparty, Commerzbank AG. Its long term credit is rated A2 by Moody's, A by S&P and A+ by Fitch.
- ▶ No bidding process is currently implemented when shopping for swaps. Independent price checks are performed.

Fund Holdings/Substitute Basket and Collateral

- ▶ ComStage ETFs intend to hold only European blue chips stocks (usually constituents of the EURO STOXX 50 or DAX 30 indices) in their substitute baskets.

- ▶ Correlation between the fund holdings and the underlying indices is not taken into consideration.
- ▶ Substitute baskets are held in segregated accounts at the custodian BNP Paribas Securities Services and monitored daily by ComStage's management company, Commerz Derivatives Funds Solutions SA (a Commerz bank's subsidiary), as well as the custodian.
- ▶ In addition to the substitute basket, the swap counterparty is requested to post collateral equivalent to 105% of the swap value. This helps to minimise counterparty exposure.
- ▶ The collateral, which consists of government bonds from Germany, the UK and/or France, is held by Commerz bank in a segregated account at Clearstream Banking, Luxemburg in a pledged account.

Swap Reset Policy

- ▶ ComStage ETF resets swaps three to four times per year and whenever there is a creation/redemption.

Disclosure

- ▶ ComStage ETF discloses the fund holdings and the swap value in terms of a percentage of the fund's NAV on its websites ("ETF Cash, Swap and Basket quotes" and "Swap Basis Portfolio" updated monthly to download [here](#)).
- ▶ The composition of the swap collateral is currently published only on the firm's German website ("Swap Sicherheiten" to download [here](#)). It will soon be published on the English language website as well.

Securities Lending

- ▶ ComStage ETF may lend out up to 100% of the securities held by its ETFs. As this practice introduces additional counterparty risk, the provider requires the borrowers of the securities to post collateral equivalent to 100% of the loan value.

Swap Costs

- ▶ Commerzbank charges ComStage ETFs varying swap costs which depend on the reference index being replicated.

Credit Suisse ETF

- ▶ Credit Suisse launched its first swap-based ETFs in August 2010.
- ▶ The Credit Suisse ETFs use the un-funded swap model. Each ETF buys a basket of securities from Credit Suisse and simultaneously enters into a swap agreement to

receive the index performance (net of fees) in exchange for the performance of the fund holdings.

- ▶ Credit Suisse ETFs are domiciled in Ireland.

Swap Counterparty

- ▶ Each Credit Suisse ETF enters into a swap agreement with a single counterparty, Credit Suisse Securities (Europe) Limited (CCSEL), a fully-owned subsidiary of Credit Suisse AG. Its long term credit is rated Aa1 by Moody's, A+ by S&P, and AA- by Fitch.

Fund Holdings/Substitute Basket

- ▶ CS ETFs intend to only hold high quality, liquid "blue-chip" European equities.
- ▶ Correlation between the substitute baskets and the underlying indices is not taken into consideration.
- ▶ The holdings are monitored daily by the asset manager, and are subject to periodic review by risk and reputation committees within Credit Suisse.
- ▶ Substitute baskets are held in segregated accounts at Credit Suisse's custodian, BNY Mellon Trust Company (Ireland) Ltd.

Swap Reset Policy

- ▶ Credit Suisse resets the swaps to zero at the end of each business day, so the counterparty risk that investors are exposed to is restricted to just that day's relative movements in the index and substitute basket.
- ▶ With the daily swap reset resulting in 100% of the mark-to-market exposures paid back into the ETF in the form of cash (which is then reinvested in further substitute basket assets), counterparty exposure is reduced to zero at the end of each business day.

Disclosure

- ▶ Credit Suisse publishes fund holdings every business day on its website (www.csetf.com).

Securities Lending

- ▶ Credit Suisse's synthetic ETFs don't currently engage in securities lending.

Swap Costs

- ▶ Credit Suisse currently charges no swap fees to CS ETFs. Through the swaps, the bank will typically pay 100% of the index performance with no "spread". The swaps are periodically reviewed by the Board of the fund management company.

db X-trackers

- ▶ db X-trackers, the ETF provider of Deutsche Bank, launched its first swap-based ETF in January 2007.
- ▶ db X-trackers employs two different synthetic replication strategies within its ETF range: the un-funded swap model and the funded swap model.
- ▶ The un-funded swap structure is used for all db X-trackers fixed income ETFs as well as for EURO STOXX 50, DAX, CAC 40 long and short and Shari'ah compliant ETFs. Under this model, the ETF buys a basket of securities from Deutsche Bank and simultaneously enters into a swap agreement to receive the index performance (net of fees) in exchange for the performance of the fund holdings.
- ▶ The funded swap model is used for all remaining equity ETFs, as well as currency, commodity and alternative ETFs. The ETF enters into a funded swap with Deutsche Bank to receive the index return. The fund transfers cash from investors to Deutsche Bank which in turn posts collateral in a segregated account in the name of Deutsche Bank and pledged in favor of the fund.
- ▶ All db X-trackers' swap-based ETFs are domiciled in Luxembourg.

Swap Counterparty

- ▶ db X-trackers ETFs contract swap agreements with a single swap counterparty, Deutsche Bank AG (Aa3, A+, AA).
- ▶ In the case of a downgrade of Deutsche Bank AG's credit rating, other swap counterparties will be considered as a replacement.

Fund holdings/Substitute Basket and Collateral

- ▶ Substitute baskets for db X-trackers fixed income and money market ETFs consist of sovereign and investment grade corporate and covered bonds. The aim is to have a high correlation between the substitute basket and the relevant underlying index.
- ▶ For all equity, currency, commodity and alternative ETFs, db X-trackers accepts a mix of sovereign and investment grade bonds and highly liquid blue chip stocks from OECD countries, including European, US and Japanese equities.
- ▶ In the funded swap model, haircuts are applied to the securities posted by Deutsche Bank as collateral: 7.5%-20% for equities, 10% for corporate bonds and 0% for government bonds. This results in over-collateralisation

of the funds. Whenever the mark-to-market value of the equity collateral falls below 107.5% of the fund's NAV, additional collateral will be requested of Deutsche Bank. This ensures that collateral levels are maintained between 107.5% and 120% of the funds' NAV at the end of each business day and therefore that net counterparty exposure remains negative.

- ▶ For equity ETFs cross-listed in Hong Kong, db X-trackers operates a collateral pool structure (most of which offer exposure to Asian securities). Under this structure, each fund has a share of the pledged collateral pool allocated on a pro-rata basis (based on asset size).
- ▶ Substitute/collateral baskets and collateral pools are held in ring-fenced accounts at the funds' custodian, State Street Bank Luxembourg or the funds' collateral manager, Bank of New York Mellon Luxembourg and reviewed daily by State Street Global Advisors (SSgA).
- ▶ In the case of an enforcement event—which could be any of a number of a wide range of actual and/or potential default or termination events on the part of Deutsche Bank—those db X-trackers ETFs using funded swaps will be entitled by Luxembourg law at that time to enforce the pledge and sell the collateral assets without giving prior notice to Deutsche Bank.

Swap Reset Policy

- ▶ db X-trackers ETFs using the un-funded swap structure see their swaps reset to zero whenever (i) there is a creation/redemption at the fund level and/or (ii) the counterparty exposure reaches 5% of the fund's NAV. So each fund has a maximum counterparty exposure of 5% at the end of any trading day. The reset can be done on a daily basis.
- ▶ For those db X-trackers ETFs employing the funded swap model, collateral can be adjusted on a daily basis to ensure over-collateralisation of the swap.

Disclosure

- ▶ db X-trackers discloses extensive details about substitute and collateral baskets on a daily basis on its website (www.etf.db.com). Published information includes net swap exposure as a percentage of NAV, substitute basket/collateral composition by security type, country, sector, currency, exchange listing and, for bonds, credit rating.

Securities Lending

- ▶ db X-trackers ETFs don't engage in securities lending.

Swap Costs

- ▶ Deutsche Bank provides swaps to most db X-trackers' ETFs with zero spread. However, in the case of some emerging markets equity and short equity ETFs a portion of the costs (slippage fees and borrowing costs) incurred as part of the index replication may be partially passed on by Deutsche Bank to the ETF under the swap agreement. These numbers are published in the audited annual reports.

EasyETF

- ▶ Synthetic replication was first used by EasyETF, BNP Paribas's ETF line-up, in 2005.
- ▶ EasyETF employs the un-funded swap model. Each EasyETF ETF buys a basket of securities and simultaneously enters into a swap agreement with a counterparty that commits to pay the index performance (adjusted for the swap fees) in exchange for the performance of the fund holdings.
- ▶ EasyETF ETFs are domiciled in either France or Luxembourg.

Swap Counterparty

- ▶ EasyETF ETFs enter into swap agreements with either a single or multiple counterparties.
- ▶ EasyETF follows the best execution principle defined by the European Markets in Financial Instruments Directive (MiFID) with the implementation of a bidding process. The list of eligible counterparties is only comprised of banks, including BNP Paribas, that have a minimum short-term ratings of P1 (Moody's) / A1 (S&P). BNP Paribas long term credit is rated Aa2 by Moody's, AA by S&P and AA- by Fitch.
- ▶ The full counterparty list is periodically reviewed by BNP Paribas's Global Counterparty Committee and Credit Risk team.
- ▶ EasyETF can split exposure amongst multiple counterparties in order to diversify credit risk.
- ▶ The level of exposure to each counterparty is determined by various factors including the competitiveness of its price offering, credit rating and quality of service.
- ▶ Counterparty risk is monitored daily by BNP Paribas Investment Partners' risk control department.

Fund Holdings/Substitute Basket

- ▶ EasyETF invests in Eurozone large capitalisation stocks for its equity ETFs and 3-month AAA treasury bills

(in EUR or USD) for fixed income and commodity ETFs.

- ▶ When constituting the substitute baskets, EasyETF prioritises the liquidity of the securities over their correlation with the reference index.
- ▶ The funds' holdings are held in segregated accounts at EasyETF's custodian, BNP Paribas Security Services.

Swap Reset Policy

- ▶ EasyETF resets swaps to zero (i) before a single counterparty exposure reaches 10% of the fund's NAV or (ii) when there is a large creation/redemption
- ▶ Equity and fixed income ETFs see their swaps reset quarterly. Those for commodity ETFs are reset monthly.
- ▶ In some instances, EasyETF will collateralise its swaps with AAA sovereign securities to further reduce counterparty risk. This choice is made based on the quality of the counterparty and the maturity of the swap.

Disclosure

- ▶ EasyETF discloses the fund holdings and the name of the swap counterparty(ies) of its swap-based ETFs upon request only.

Securities lending

- ▶ EasyETF synthetic ETFs currently don't engage in securities lending.

Swap costs

- ▶ EasyETF charges swap fees to authorised participants and market makers at the moment of creation/redemption. These costs vary from one underlying index to another.
- ▶ Swaps are renegotiated every 6 to 12 months but can also be terminated at any time without warning using the early termination clause.

ETF Securities

- ▶ ETF Securities launched its first UCITS-compliant synthetic ETFs in September 2008.
- ▶ ETF Securities is the only provider in Europe that may use both un-funded and funded swaps at the same time for the funds listed on its ETF Exchange platform (ETFX).
- ▶ The ETFX un-funded model is slightly different from the generic un-funded model described in this report in that the investor's cash is invested in a basket of securities by way of a repurchase agreement (repo) and any remaining cash is invested in money market funds in order

- ▶ to satisfy any margin calls from these swap providers.
- ▶ Under the funded model, investors' cash is transferred to the swap counterparty in exchange for the index performance (adjusted for the swap spread). The swap counterparty posts collateral in the name of the fund.
- ▶ All ETFX funds are domiciled in Ireland.

Swap Counterparty

- ▶ Each ETF on the ETF Exchange platform (ETFX) generally contracts with multiple swap providers. These counterparties are primarily selected according to their creditworthiness (minimum S&P rating of A-2 or equivalent as per UCITS guidelines) and currently include Bank of America Merrill Lynch (A2, A, A+), Citigroup (A3, A, A+), Barclays Capital (A1, A+, AA-) and Rabobank International (Aaa, AAA, AA+).
- ▶ The minimum number of swap providers for each ETF is one. As a result, at any given time, a fund may have exposure to a single counterparty while another may have exposure to two, three or all four counterparties. The funds' level of exposure to any given swap counterparty varies according to the amount that the bank transacts with the fund.
- ▶ While Citigroup and Bank of America Merrill Lynch provide un-funded swaps, Barclays and Rabobank swaps are fully-funded.
- ▶ As required by UCITS rules, risk exposure to each counterparty will not exceed 10% of the fund's assets where the counterparty is a credit institution, otherwise an exposure limit of 5% applies, Citigroup is the only counterparty under the 5% limit and 10% applies to the remaining counterparties.

Fund Holdings/Substitute Basket and Collateral

- ▶ ETF Securities accepts a list of securities as collateral, to which haircuts are applied: 5% for equities that belong to major benchmarks such as S&P 500 and EURO STOXX 50; and 10% for other stocks from developed market indices like the Nasdaq, STOXX 600 and TOPIX. This results in over-collateralisation.
- ▶ Other eligible collateral includes AAA Government or Treasury money market funds, sovereign fixed income (G10 and other European government bonds with minimum AA-rating), Supranational bonds, US agencies backed by the US government. All bonds are subject to haircuts ranging from 0-2% depending on the maturity and issuer in question.

- ▶ Unlike the other swap providers on ETFX, Rabobank doesn't transfer securities but instead transfers cash equating to 102% of the swap value. This cash received as collateral is then invested in AAA money market funds.
- ▶ ETF Securities does not intend to maintain a specific degree of correlation between the substitute basket and the fund's benchmark.
- ▶ Collateral is held by the fund's custodian, the Bank of New York Mellon (BONY), in a ring-fenced segregated account. It is also marked-to-market daily by BONY. The counterparty exposure is monitored daily by the investment manager, ETFX Investment Management LLP.

Swap reset policy

- ▶ Un-funded swaps are reset monthly and not according to exposures. Instead, margin calls are implemented typically whenever counterparty exposure reaches between 1 and 2.5% of the fund's position with the bank. This works both ways, i.e. the bank may also call collateral back should they be 1-2.5% exposed to the fund.
- ▶ Fully-funded swaps reset daily.

Disclosure

- ▶ ETF Securities publishes collateral holdings on a daily basis along with collateralisation levels on its [website](#).

Securities Lending

- ▶ ETF Securities does not engage in securities lending.

Swap Costs

- ▶ The swap costs vary depending on the underlying index.

iShares

- ▶ The Dublin-domiciled synthetic ETFs launched by iShares in September 2010 use the funded swap structure.
- ▶ Each of these funds enters into a funded swap with multiple counterparties to receive the index return (adjusted for the swap fees). The fund transfers cash from investors to the banks who in turn post collateral in the name of the fund.

Swap Counterparty

- ▶ iShares uses multiple swap counterparties for each of its swap-based ETFs. Only banks with a credit rating of A or higher are considered to provide swaps. Additional

counterparty monitoring is performed by BlackRock Risk & Quantitative Analysis group.

- ▶ Current counterparties include UBS (Aa3, A+, A+), Credit Suisse (Aa1, A+, AA-), and RBS (A2, A+, AA-).
- ▶ New/existing providers may be added/removed subject to the suitability of swap arrangements agreed with the provider.

Collateral

- ▶ The securities which can be used as collateral for the swap include G10 government bonds and developed market equities, to which margins are applied: 20% for equity collateral, up to 3% for bond collateral and 0% for cash collateral. These margins result in over-collateralisation.
- ▶ Collateral is held in a ring-fenced account at a third party collateral agent, Bank of New York Mellon (BONY). The fund has full legal title of the collateral assets and the swap counterparties have no recourse over the assets posted.
- ▶ Bank of New York Mellon monitors the collateral value and counterparty exposure daily to ensure that positions remain fully collateralised. This means that the fund can be collateralised up to 120% of NAV (assuming equity collateral) at the end of each business day.
- ▶ Whenever the value of the collateral posted falls below this level, additional collateral will be requested to ensure that over-collateralisation is maintained.
- ▶ Correlation between the collateral basket and the underlying index is not taken into consideration.

Swap Reset Policy

- ▶ Swaps are reset monthly but collateral is adjusted on a daily basis to ensure over-collateralisation of the swap.

Disclosure

- ▶ iShares publishes the composition of its swap-based funds' collateral holdings along with sector aggregate exposures on a daily basis on its website (www.ishares.com/global) where it also discloses counterparty names, total counterparty exposure levels, total collateral levels and swap costs.

Securities Lending

- ▶ iShares' Dublin-domiciled swap-based ETFs do not engage in securities lending.

Swap Costs

- ▶ Each swap counterparty charges a swap spread, which is added to or deducted from the index return delivered to the investor. This swap spread is calculated via a pricing algorithm based on the swap spreads quoted by the swap counterparties supporting the ETF and benchmarked to standard market swap quotes.
- ▶ A fee is charged for units created/redeemed in the primary market. The fee level is specific to the exposure being obtained.
- ▶ Swap fees are renegotiated each month when swaps are reset.

Lyxor ETF

- ▶ Lyxor was the earliest adopter of synthetic replication in Europe. The fully-owned subsidiary of Société Générale CIB rolled out its first swap-based ETFs in 2001.
- ▶ Lyxor ETFs use the un-funded swap model. Each ETF buys a basket of securities from Société Générale and simultaneously enters into a swap agreement with the bank which commits to pay the index performance (net of fees) in exchange for the performance of the fund holdings.
- ▶ Lyxor ETFs are domiciled either in France or in Luxembourg.

Swap Counterparty

- ▶ Each Lyxor ETF enters into swap agreements with a single counterparty, Société Générale. Its long term credit is rated Aa2 by Moody's, A+ by S&P and A+ by Fitch.
- ▶ Following the best execution principle defined by the European Markets in Financial Instruments Directive (MiFID), Lyxor challenges Société Générale's swap prices by putting the bank in competition with other swap providers. If another swap provider offers better pricing, Société Générale will structure the fund's swap agreement on a back-to-back basis. This means that all swap transactions are guaranteed by Société Générale. The counterparty risk therefore lies directly with Société Générale.
- ▶ Société Générale uses a range of swap counterparties consisting of around ten or more global investment banks with a minimum credit rating of "A" from S&P and a stable 5-year CDS volatility.

Fund Holdings/Substitute Basket

- ▶ For equity and commodity ETFs, Lyxor buys stocks from

OECD countries. The majority of Lyxor's funds are eligible for the PEA (the French Equity Savings Plan) and therefore hold a minimum of 75% in European stocks.

- ▶ Fixed income ETFs invest in European government and corporate bonds.
- ▶ Lyxor's equity and commodity ETFs also invest up to 10% in a fund that holds UK equities via a repo (the fund lends out up to 100% of its cash and receives UK equities as collateral). This diversified equity fund helps to reduce counterparty risk exposure.
- ▶ The funds' holdings, which are monitored by Lyxor's asset manager, are held in segregated accounts at Lyxor's custodian, Société Générale Security Services.

Swap Reset Policy

- ▶ Lyxor resets swaps whenever (i) the counterparty exposure gets close to 10% of the fund's NAV or (ii) there is a creation/redemption. The company has no regular predetermined resets with specific thresholds across its ETF range whether they are equity, fixed income or commodity funds.
- ▶ The swaps are usually not reset to zero. But the value of the swaps is partially offset by the UK equities held by the diversified equity fund, resulting in limited counterparty risk exposure.

Disclosure

- ▶ Lyxor discloses month-end fund holdings and daily swap exposures on its websites (www.lyxoretf.com).

Securities Lending

- ▶ Lyxor ETFs do not engage in securities lending.

Swap Costs

- ▶ Swap counterparty Société Générale charges swap spreads to Lyxor ETFs. These costs vary from asset class to asset class.
- ▶ Swaps are usually renegotiated once a year but their prices are monitored on a quarterly basis.

RBS Market Access ETFs

- ▶ RBS Market Access ETFs employ a synthetic replication strategy. The first ETF was launched in May 2006.
- ▶ RBS Market Access ETFs currently utilise an un-funded swap model. Each ETF buys a basket of securities

from The Royal Bank of Scotland and simultaneously enters into a swap agreement with the bank which commits to pay the index performance (net of swap fees) in exchange for the performance of the substitute basket.

- ▶ RBS Market Access ETFs are sub-funds of the RBS Market Access SICAV which is domiciled in Luxembourg.

Swap Counterparty

- ▶ Currently the sole swap counterparty for RBS Market Access ETFs is The Royal Bank of Scotland N.V. Its long term credit is rated A2 by Moody's, A+ by S&P, and AA- by Fitch.
- ▶ There is no bidding process in selecting the swap counterparty for each new ETF but the selection of swap counterparties is re-assessed periodically on the basis of commercial criteria and legal & regulatory requirements.
- ▶ Counterparty exposures are monitored daily by RBS Luxembourg S.A., the management company.

Fund Holdings/Substitute Basket

- ▶ RBS Market Access ETFs hold highly liquid large cap securities listed on recognised regulated markets. Typically this means stocks from Western European countries, the US and Canada.
- ▶ The substitute baskets are held in ring-fenced segregated accounts by the custodian, RBC Dexia Investor Services Bank.
- ▶ The funds don't target a specific degree of correlation between their holdings and reference indices.

Swap Reset Policy

- ▶ Swaps are reset to zero every time (i) the counterparty exposure exceeds 7% of the fund's NAV (5% in the case of leveraged long and short ETFs), (ii) there is a creation/redemption and (iii) at a minimum of once per month.

Disclosure

- ▶ Currently, RBS Market Access discloses fund holdings and swap fees upon request only. However the company is in the process of implementing more regular dissemination of this information through its website which will be executed shortly.

Securities Lending

- ▶ RBS Market Access ETFs don't engage in securities lending.

Swap Costs

- ▶ The swap fees for the RBS Market Access ETFs range from zero to 40 basis points per annum depending on the underlying index being replicated. The median swap fee is 10 basis points per annum. Swap costs are reviewed regularly.

Source

- ▶ Source is an ETP platform created by a group of investment banks, including Bank of America Merrill Lynch, Goldman Sachs, J.P. Morgan, Morgan Stanley and Nomura. Its first synthetic ETFs were launched in April 2009.
- ▶ For most of its equity and alternative products, Source uses the un-funded swap model. Each ETF typically buys multiple baskets of securities from multiple banks who act as swap counterparties. Through the swap agreements, each bank commits to pay the index performance (adjusted for the swap fees) in exchange for the performance of the basket they delivered.
- ▶ Source's synthetic ETFs are domiciled in Ireland.

Swap Counterparty

- ▶ Source generally contracts with multiple swap counterparties. These counterparties are chosen from a list of six eligible banks including Bank of America Merrill Lynch (A2, A, A+), Goldman Sachs (A1, A, A+), Morgan Stanley (A2, A, A), JPMorgan (Aa1, AA-, AA-), Nomura (Baa2, BBB+, BBB) and Credit Suisse (Aa1, A+, AA). This list is actively monitored and reviewed periodically.
- ▶ There isn't a minimum number of swap counterparties for each ETF. As a result, at any given time, a fund may have exposure to a single counterparty while another may have exposure to all six counterparties. The level of exposure to any given swap counterparty varies according to the amount that the bank transacts with the fund and the swap mark-to-market.
- ▶ Counterparty exposures are monitored daily by Assenagon Asset Management S.A, the investment manager of Source ETFs and the Source Credit Committee.

Fund Holdings/Substitute Basket

- ▶ Source equity and alternative ETFs' substitute baskets consist of a wide range of listed equities. Exempted securities are securities issued by an entity of the same financial group or stock or securities of other

authorised participants.

- ▶ Source strives to achieve the highest correlation possible between the assets held by the fund and the fund's benchmark index.
- ▶ The funds' holdings are monitored by Assenagon Asset Management S.A. and the Source Credit Committee. They are held through Northern Trust, in segregated accounts by sub-custodians, e.g. BNP Paribas, Deutsche Bank, Euroclear Bank.

Swap Reset Policy

- ▶ Swaps are reset to zero every time (i) a swap counterparty executes a creation or redemption, (ii) the aggregate counterparty exposure reaches 4.5% of the fund's NAV and (iii) at a minimum of once per month.

Disclosure

- ▶ Source publishes the fund holdings daily on its website (www.source.info, after signing in) where it also discloses sector aggregate exposure, country aggregate exposure and average swap levels.

Securities Lending

- ▶ Source's equity and alternative ETFs currently do not engage in securities lending.

Swap Costs

- ▶ The swap costs for Source's ETFs depend on the specific product; however many funds do not incur any swap fees at all.

UBS ETF

- ▶ UBS, which introduced its first UCITS-compliant synthetic ETFs in July 2010, currently uses the funded swap model.
- ▶ Each UBS ETF passes cash received from investors to UBS AG in exchange for the index performance (adjusted for the swap fees). UBS AG in turn posts collateral in the name of the fund.
- ▶ All UBS UCITS-compliant synthetic ETFs are domiciled in Ireland.

Swap Counterparty

- ▶ Each UBS ETF enters into a swap agreement with a single counterparty, UBS AG. Its long term credit ratings are Aa3 by Moody's, A+ by S&P and A+ by Fitch. No bidding process is implemented.

Collateral

- ▶ The only securities accepted as collateral are G10 government bonds, to which a 5% margin is applied. Collateral is held via transfer of title, in a segregated account with the fund's custodian, State Street Bank.
- ▶ The counterparty exposure is monitored daily by the collateral manager, Lantern, the portfolio manager and the custodian.
- ▶ Collateral is maintained at a level of 105% of the fund's prevailing net asset value at the end of each business day. Typically, this means that when the market-to-market value of the collateral falls below this level, additional collateral will be requested from the swap counterparty.

Swap reset policy

- ▶ Swaps are reset on a quarterly basis but collateral is adjusted on a daily basis to ensure over-collateralisation of the swap.

Disclosure

- ▶ UBS currently discloses collateral composition for its swap-based ETFs upon request only, but it plans to publish this information daily on its website in the near future.

Securities Lending

- ▶ UBS ETFs currently don't engage in securities lending.

Swap Costs

- ▶ UBS swap-based ETFs publish the total drag vs. the index (p.a.) which includes all costs including swap fees.

XACT ETF

- ▶ XACT, a fully-owned subsidiary of Handelsbanken, introduced its first synthetic ETFs in September 2010. It employs the funded swap model.
- ▶ Each XACT ETF passes cash received from investors to Handelsbanken in exchange for the index performance (adjusted for the swap fees). In turn, Handelsbanken posts collateral in a pooled account.
- ▶ All XACT UCITS-compliant synthetic ETFs are domiciled in Luxembourg.

Swap Counterparty

- ▶ Each XACT ETF currently enters into a swap agreement with a single counterparty, Handelsbanken. Its long term credit is rated Aa2 by Moody's, AA- by S&P and AA- by Fitch. No bidding process is implemented.

Collateral

- ▶ The only securities used as collateral for equity and commodity ETFs are stocks belonging to main global indices, to which a 20% haircut is applied. For fixed income ETFs, XACT accepts government and covered bonds, to which haircuts ranging from 0.5% to 7.5% are applied. These haircuts, which are applied in accordance with the relevant Luxembourg regulations, result in over-collateralisation.
- ▶ XACT has two collateral pools in place. All equity and commodity ETFs share one pool; while all fixed income ETFs share the other. The assets are allocated to each ETF pro-rata (based on their respective NAV) with a transfer of title in place. The allocation specifies which stock or bond belongs to which sub-fund. Each pool is held in a segregated account with third party custodian, Brown Brothers Harriman.
- ▶ The collateral is monitored by the risk manager of the fund (an independent unit within Handelsbanken) and to some extent by the central administrator and custodian (BBH).
- ▶ Whenever the value of the posted collateral (less haircuts and taking into account any risk add-ons on derivatives held by the fund) falls below the fund's prevailing net asset value, additional collateral will be requested from the swap counterparty. Typically, this means that for an equity ETF, new collateral will be posted when the value of the previously posted collateral falls below 125% of the net asset value of the fund. This is to ensure that counterparty risk exposure remains negative at the end of each business day.

Swap Reset Policy

- ▶ All swaps have a maturity of less than a year but collateral is adjusted on a daily basis to ensure over-collateralisation is maintained.

Disclosure

- ▶ XACT publishes the composition and level of collateral for its swap-based ETFs on a daily basis on its [website](#).

Securities Lending

- ▶ XACT ETFs do not engage in securities lending.

Swap Costs

- ▶ The swap costs for XACT ETFs depend on the underlying exposure.

Recommended Best Practices and Conclusions

Over the past decade, synthetic ETF structures have evolved rapidly, and have arguably increased in complexity. In this section, we will discuss the main differences between the approaches adopted by the various providers of swap-based ETFs and aim to determine what the best practices are from the investor's standpoint, i.e. what practices offer the best safeguards for the investor as it pertains to collateral management, structure and transparency.

When assessing investor protections in swap-based ETFs, several factors should be taken into consideration. We will look at first the level of counterparty exposure and then the quality of substitute/collateral baskets.

Counterparty Exposure: Less is More

As previously explained, the counterparty risk exposure of a UCITS-compliant ETF is limited to a maximum of 10% of the fund's net asset value (NAV). Said differently, the value of swap-based ETFs' substitute/collateral baskets should always exceed 90% of the ETF's net asset value on any given day. The basket of securities is marked-to-market on a daily basis by the risk department of the provider's parent bank or an independent custodian to ensure that its value doesn't fall under the regulatory limit.

In practice, counterparty exposures vary greatly from provider to provider, depending on the swap structure they use and the margin of safety they choose to offer investors on top of regulatory requirements. In the un-funded swap structure, counterparty exposure tends to be maintained between zero and 10% of the fund's NAV, so the value of the substitute baskets can range between 90% and 100% of the fund's NAV. In the funded swap structure, counterparty exposure is usually negative due to overcollateralisation (the level of over-collateralisation can reach 125% of the fund's NAV when only equities are posted as collateral). In terms of best practices, it is safe to say that the higher the value of the substitute basket and the higher the level of collateralisation as a percentage of the fund's NAV, the more protection is provided to investors in the event of a swap counterparty's default.

For ETFs using the un-funded swap structure, there is another factor worth paying attention to: the frequency of the swap reset. Swaps are usually reset when (i) the exposure to a counterparty reaches the trigger point set by

the ETF provider, (ii) whenever there is a subscription or redemption at the fund level, and/or (iii) on a regular basis. As resetting a swap to zero eliminates (temporarily) counterparty exposure, the more frequent the reset, the better from an investor's perspective.

ETFs that see their swaps reset daily offer the highest protection because counterparty risk is reduced to zero at the end of each business day. Every night, the ETF receives cash equivalent to the mark-to-market difference between the index and the substitute basket. The cash is then reinvested in additional assets and the substitute basket is brought back to 100% of the fund's NAV. So in this case, the counterparty risk that investors are exposed to is restricted to just that day's movements in the index and substitute basket.

That said most providers that employ the unfunded swap model don't reset swaps on a daily basis, mainly for cost reasons. They may wait until the counterparty exposure reaches the trigger point they have set internally (between 0 and 10%). In this case, the lower the trigger point, the more frequent the swap is reset and the better it is for investors. For example, a trigger point of 5% limits the counterparty risk exposure to a maximum of 5%, ensuring that the substitute basket covers 95% of the ETF's market value at any given day.

In the funded swap model, the reset policy doesn't matter much as swap resets only allow the swap counterparty(ies) to be paid. Providers using this structure typically overcollateralise swap exposures by up to 125% depending on the assets posted as collateral by the swap counterparty. While some require that the level of collateral is readjusted on daily basis, others will only request additional securities when the value of the collateral basket falls below a certain level. Both approaches ensure that over-collateralisation of the fund is maintained at all times and that counterparty exposure remains zero to negative. As mentioned earlier, the higher the level of collateralisation the better. Daily readjustments of the collateral in order to maintain initial margins is also preferred over waiting for the collateral value to reach the minimum levels of over-collateralisation limit stipulated by the provider.

When assessing investor protection in swap-based ETFs, the level of counterparty risk is not the only factor that should

be taken into consideration. As mentioned previously, the quality of the substitute/collateral baskets also comes into play.

Substitute/Collateral Baskets: Keep an Eye Out for Quality and Liquidity

The composition of the substitute/collateral baskets becomes a crucial consideration in the event of a counterparty's default. While all complying with UCITS regulations on diversification and asset type, swap-based ETF providers apply very different sets of criteria for the securities they accept into their structures, with some providers being more conservative than others. The main differences lie in the type, size, liquidity, region and credit quality of the securities transferred for the benefit of the fund. For example, some providers of equity ETFs will accept only G10 government bonds, while others only allow equities. Also, some will accept only Eurozone large cap securities, while others will take a wide range of OECD country securities.

Ultimately, the key question investors want to ask themselves is: Will the assets in the substitute/collateral baskets be hard to sell in the event of a counterparty default?

To answer this question, there are two main factors to look at: liquidity and market access. The baskets should consist of highly liquid blue chip equities and/or investment grade bonds, and preferably those traded in or near the same time zone as the market where the ETF is traded. It is worth noting that in the event of a counterparty default, baskets made up of assets listed in different time zones might not be easily liquidated in a timely manner. For example, the full sale of a basket containing Japanese stocks may be delayed until the next day due to the lack of overlap between normal European and Asian trading hours.

Another factor to take into consideration as it pertains to the liquidation of the basket of assets is how quickly the decision of selling these assets can be made. In theory, this is mainly dependent on the legal framework that applies to the fund. For both structures (un-funded and funded swaps), the enforcement of collateral policy within the UCITS framework is down to the individual regulator in the country where the fund is domiciled and the collateral held.

The swap agreement adopted by the ETF could also play a role in the event that the swap counterparty goes under and no replacement swap provider is found. In an un-funded

swap structure, the fund already owns the assets so in theory the ETF provider should be able to liquidate them swiftly. The funded swap structure, however, seems less straightforward because the collateral posted by the counterparty can either have legal title transferred to the fund or be pledged for the benefit of the fund. With a transfer of title, the collateral is treated as the property of the fund. This means that in a default scenario, in theory, the ETF provider should also be able to gain access to the assets without prior approval and dispose of them in the best interest of investors.

Under a pledge structure, the fund would have to claim ownership of the collateral assets before it can sell them. Enforcing the pledge could take some time and lead to a delay in liquidating the fund if the counterparty's bankruptcy administrator decides to freeze the assets. This scenario played out in the case of some of Lehman Brother's pledge contracts. Yet many others, including some securities lending arrangements, allowed investors to access pledged collateral from Lehman straight away and liquidate it without the administrator intervening. We believe this precedent should serve to underscore the fact that not all pledge agreements are created equal. As it pertains specifically to our field of study, db X-trackers is presently the only large provider to use funded-swaps with a pledge agreement. It is important to note that the firm has an arrangement with its custodian and collateral manager under Luxembourg law that entitles its funds to appropriate collateral assets and liquidate them without prior notice to the counterparty or any other third parties. This degree of enforceability should serve to lessen some investors' concerns over db X-tracker's specific pledge structure.

Single versus Multiple Counterparties: Diversifying Counterparty Risk

Since the multiple swap counterparty model was introduced in Europe in 2009, there has been a heated debate about what's better for investors: a single counterparty (usually the parent bank of the ETF provider) or multiple counterparties? Cost aspects aside, the use of multiple swap providers seems to offer better protection to investors as it ensures diversification of counterparty risk. It can serve to diminish the risk associated with the default of any one of the fund's swap providers. Also, should any one counterparty fail on its promise to deliver the index return, it will probably be easier to secure a replacement.

Transparency: The More the Better

Until the end of 2010, the level of transparency in synthetic ETFs had much left to be desired. Information about the composition of substitute/collateral baskets was only provided in annual and/or semi-annual reports or upon request. But great progress has since been made on this front, mainly due to investor pressure on ETF providers. A handful of swap-based ETF providers are now disclosing snapshots of their substitute/collateral baskets on a daily basis on their websites and more providers have recently said that they will follow suit. We view this initiative as a sign of goodwill. While investors will in many cases not be able to make sense of the composition of these baskets, regular disclosure by all swap-based ETF providers will help build the trust of the investor community and allow for greater scrutiny of the assets backing these funds. This in turn will ensure that these baskets are consistently comprised of high-quality, liquid securities.

That said, we think there is still room for improvement on the transparency front. When conducting our research, we discovered that there were various levels of disclosure, some ETF providers updating information on substitute/collateral baskets more frequently than others, and some providing more detail than others.

Because the make-up of substitute/collateral baskets can change daily (as swap counterparties recycle their inventories) we think that online disclosure should be provided on a daily basis too. Daily updates are all the more relevant in times of high market volatility and in the wake of events like the Lehman bankruptcy or the recent earthquake in Japan. All investors—whether retail or institutional—should be able to monitor the evolution of the securities held by their ETFs or pledged as collateral, since after all, these assets are what they actually own in the case of a counterparty default.

The best practice would also be not to limit online daily disclosure to the composition of substitute/collateral baskets and the name of the swap counterparties. Additional key information such as the net swap exposure as a percentage of the fund's NAV as well as the breakdown of the baskets by security type, country, sector, currency, and for bonds, credit rating, will undoubtedly help investors make sense of the composition of these baskets at a glance. The next step could also be to make this information available through third-party information providers.

This would make it even more easily accessible to retail investors.

Also, we would welcome greater transparency on swap costs. Because these costs are typically not included in the ETF's annual total expense ratio (TER), investors may find it hard to correctly assess the total cost of owning a particular ETF. And again, swap fees vary greatly from provider to provider and from fund to fund. Some charge no fees at all—those that use their parent bank as swap counterparty can easily do so. But others—typically those that use third parties to provide the swaps—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 (from securities lending and tax optimisation) and the costs of collateral.

Conclusion

In this report, we have outlined the various structures used in synthetic ETFs to help investors understand their nuances and hopefully make them more easily comparable. We have also highlighted what we believe the best practices are as it pertains to collateral management, structure and transparency in swap-based ETFs.

We have come to the conclusion that no ETF provider scores highly or badly on all aspects. We believe that as for everything, it's all about trade-offs. Providing extra protection to investors, more often than not, results in additional costs. This in turn is reflected in the performance of the ETF in the form of negative tracking difference between the return of the index and that of the fund. Ultimately, it's up to investors to find the right balance between protection and return. Only they can decide what level of risk/return they feel comfortable with. And for that they need to do proper due-diligence. While the research burden lies with the investor, ETF providers can lighten it by being fully transparent about their practices and the various risks associated with them. While so far the industry has done a fairly good job at self-regulating, we believe that more can be done. There is a real need for common industry standards. Whether a push towards harmonisation of best practices ultimately comes from within the industry itself or is handed down from regulators remains to be seen.

Comparison of Synthetic Structures

| ETF providers | Swap model | Swap counterparty(ies) | Frequency of swap resets | Substitute/Collateral Basket Minimum (% of fund's NAV) ¹ | Substitute Basket/Collateral | Exposure + collateral monitoring | Custodian | Securities lending ² |
|-----------------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------------------------------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|------------------------------------------------------------------------------------------------------------------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------|----------------------------------------------------------------------------|-----------------------------------------------------------------------------------------------------------------------|---------------------------------|
| Amundi | Un-funded swaps | Single counterparty: Société Générale for fixed income ETFs and Crédit Agricole for all other asset classes | Swaps are reset when (i) the swap value reaches +/-10% or (ii) there is a creation/redemption or (iii) quarterly. All swaps are reset to zero except those for equity ETFs (reset to 5%) | 90% | MSCI Europe Index universe for equity ETFs Investment grade, covered and corporate bonds and US treasury bills for fixed income and commodityETFs | Amundi's risk department | CACEIS Bank and BONY | No |
| ComStage | Un-funded swaps with swap collateralisation | Single counterparty: Commerzbank | Swaps are reset at least three to four times per year and when there is a creation/redemption. Swaps are 105% over-collateralised | 100.5% | European large cap equities, usually from the EURO STOXX 50 or DAX 30 indices | Commerz Derivatives Funds Solutions SA and BNP Paribas Securities Services | Substitute baskets are held at BNP Paribas Securities Services. Collateral is held at Clearstream Banking, Luxembourg | Yes |
| Credit Suisse | Un-funded swaps | Single counterparty: Credit Suisse | Swaps are reset daily to zero | 100% | European Large cap equities | Asset manager and risk and reputation committees within Credit Suisse. | BNY Mellon Trust Company (Ireland) | No |
| db X-trackers | Un-funded swaps for fixed income, CAC40 (long/short), EURO STOXX 50, DAX and Shariah ETFs. Funded swaps for other equity, commodity, currency and alternative ETFs | Single counterparty: Deutsche Bank | Unfunded swaps are reset to zero when (i) the swap value reaches 5% or (ii) there is a creation/redemption. In the funded swap model the collateral is adjusted daily to maintain overcollateralisation | 95% for unfunded swaps 107.5% for funded swaps (equity collateral) 100% for funded swaps (bond collateral) | Sovereign and investment grade bonds and covered bonds for fixed income ETFs Sovereign and investment grade bonds and OECD country equities for the remaining ETFs | State Street Global Advisors (SSGA) | State Street Bank Luxembourg | No |
| EasyETF | Un-funded swaps | Single/multiple counterparty(ies), including BNP Paribas | Swaps are reset to zero (i) before the swap value reaches 10% and (ii) when there is a creation/redemption. Swaps for equity and fixed income ETFs are reset quarterly. Swaps for commodity ETFs are reset monthly | 90% | Eurozone large cap stocks for equity ETFs 3 month US T-bills (USD or EUR) for fixed income and commodity ETFs | BNP Paribas Investment Partners' risk control department | BNP Paribas Securities Services | No |
| ETF Securities | Funded swaps and un-funded model with repo agreements | Multiple counterparties: Citibank, Bank of America-Merrill Lynch, Rabobank and Barclays Capital | Unfunded swaps are reset monthly. Margin calls are implemented when counterparty exposure reaches between 1 and 2.5% | 105% for equity collateral 100% for bond collateral | Developed market equities and various types of bonds | BONY and ETFX Investment Management LLP | BONY | No |
| iShares | Funded swaps | Multiple counterparties: UBS, Credit Suisse, RBS | Swaps are reset monthly but the collateral is adjusted daily to maintain overcollateralisation | 120% for equity collateral 100% for cash and bond collateral | G10 government bonds and developed market equities | BONY | BONY | No |
| Lyxor | Un-funded swaps | Single counterparty: Société Générale | Swaps are reset when (i) the counterparty exposure gets close to 10% or (ii) there is a creation/redemption. There is no regular reset. Swaps are rarely reset to zero but for equity and commodity ETFs, counterparty risk is reduced by a repo fully collateralised with UK equity holdings | 90% | OECD country equities (predominantly European) for equity and commodities ETFs European government and corporate bonds for fixed income ETFs | Lyxor Asset Management | Société Générale Security Services | No |
| RBS | Un-funded swaps | Single counterparty: The Royal Bank of Scotland | Swaps are reset to zero when (i) the swap value exceeds 7% (5% in the case of leveraged long and short ETFs), (ii) there is a creation/redemption and (iii) at a minimum of once per month | 93% | Large cap equities from Western European countries, the US and Canada | RBS Luxembourg S.A. | RBC Dexia Investor Bank | No |

¹ At the end of business day; ² Securities lending at the fund level. To generate extra revenue for themselves, it is possible that the banks acting as swap counterparties engage in securities lending. If so, the bank, not the fund, will assume the counterparty risk associated with this activity.

Comparison of Synthetic Structures (cont.)

| ETF providers | Swap model | Swap counterparty(ies) | Frequency of swap resets | Substitute/Collateral Basket Minimum (% of fund's NAV) ¹ | Substitute Basket/Collateral | Exposure + collateral monitoring | Custodian | Securities lending ² |
|-----------------|-----------------|----------------------------------------------------------------------------------------------------------------------------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------|---------------------------------------------------------------------|-------------------------------------------------------------------------------------------------------|-------------------------------------------------------------|-------------------------------------------------------|---------------------------------|
| Source | Un-funded swaps | Multiple counterparties: Morgan Stanley, Goldman Sachs, JP Morgan, Nomura, Credit Suisse and Bank of America-Merrill Lynch | Swaps are reset to zero when (i) the aggregate counterparty exposure reaches 4.5%, (ii) there is a creation/redemption and (iii) at a minimum of once per month | 95.5% | Wide range of listed equities | Source Credit Committee | Sub-custodians: BNP Paribas, Deutsche Bank, Euroclear | No |
| UBS | Funded swaps | Single counterparty: UBS | Swaps are reset quarterly but the collateral is adjusted daily to maintain over-collateralisation | 105% | G10 government bonds | Lantern, Portfolio Manager and State Street Bank | State Street Bank | No |
| XACT ETF | Funded swaps | Single counterparty: Handelsbanken | Swaps are reset at least once a year but the collateral is adjusted daily to maintain over-collateralisation | 125% for equity collateral 100% for bond collateral | Stocks from main global indices for equity ETFs Government and covered bonds for fixed income ETFs | Handelsbanken's risk department, Brown Brothers Harriman | Brown Brothers Harriman | No |

¹ At the end of business day; ² Securities lending at the fund level. To generate extra revenue for themselves, it is possible that the banks acting as swap counterparties engage in securities lending. If so, the bank, not the fund, will assume the counterparty risk associated with this activity.

Contact

Ben Johnson, Director, European ETF Research
ben.johnson@morningstar.com

Hortense Bioy, CFA, Senior ETF Analyst
hortense.bioy@morningstar.com

Gordon Rose, CIAA, ETF Analyst
gordon.rose@morningstar.com

