



# Understanding index tracking methodologies



The goal of an index ETF is to track the performance of a specific benchmark index, after fees. Depending on the asset class, sector or geographic region the index tracks, the portfolio manager generally uses one of three index tracking methodologies: full replication, optimization or a synthetic portfolio.

## Full Replication

Full replication involves holding all of the securities that make up the underlying index, in their respective weights. This methodology is a transparent and easy to understand way to track the index. Since the ETF portfolio mirrors the index, the performance (before fees) should closely track the performance of the index. However, full replication can sometimes lead to higher trading costs, as the securities have to be adjusted every time the index is rebalanced or reconstituted.

While full replication is the purest way to track an index, it may not be the most efficient. For example, as the number of holdings within an index grows, it becomes less efficient or even impossible for the manager to replicate the index. Some holdings may be a very small portion of the index or, in the case of fixed income, there may not be sufficient availability or liquidity in certain bonds. In these cases, an alternative method of tracking the index needs to be employed.

## Optimization

Some indexes include thousands of constituents while other indexes, particularly ones that track fixed income, have securities that may not be easy to acquire. For ETFs tracking indexes in more complex or less liquid areas of the market, full replication might not be efficient, or even possible. In those cases, a portfolio optimization methodology is often employed.

### A CASE FOR OPTIMIZATION

A tightly held bond issue is one example of why full replication may not be possible. Let's consider a bond issue of Company A that is purchased entirely by a pension fund (or other large investor) to hold to maturity. Although that bond issue may be a part of an index, none of its bonds will be available for purchase.

The goal of an optimization approach is to replicate index returns by holding securities that provide the most representative sample of the index based on correlations, exposure and risks. This approach can result in potentially lower trading costs, as there are fewer securities to trade when the index is rebalanced or reconstituted, but can also lead to higher tracking error – the difference between the performance of the ETF compared with the performance of the index it tracks. Successful optimization relies upon the expertise of the portfolio manager in choosing the correct portfolio securities to replicate the index performance. If optimization is done well, returns should be very close to the index, before fees.

### Synthetic portfolio

A synthetic portfolio is designed to replicate the return of an index by using derivatives. Synthetic ETFs are common in asset classes that are difficult to replicate with other methodologies,

but can also be used for traditional, liquid benchmarks. Instead of holding the underlying index securities directly, derivatives such as swaps are used to track the underlying index. The ETF provider enters into a contract with a counterparty (usually a bank) and the counterparty promises that the swap will return the value of the benchmark index to the ETF, in exchange for a fixed return (usually tied to LIBOR or some other fixed income benchmark). This approach could offer exposure to the performance of illiquid, difficult to access markets at low cost and with low tracking error, however, it introduces counterparty risk, i.e. reliance on the derivative counterparty being able to honour its commitment and deliver the returns of that particular asset class.

Each methodology, full replication, optimization, and synthetic portfolio, has its benefits and potential limitations. Suitability and implementation of each methodology is determined by the portfolio manager and is essential in delivering an optimal outcome for investors.

#### WHAT IS A SWAP?

Swap refers to an exchange of one financial instrument for another between the parties concerned. The receiver agrees to pay the counterparty a set rate, and the counterparty agrees to pay the receiver the total return of a reference asset (e.g., an equities index or a basket of bonds).

#### WHAT IS LIBOR?

LIBOR, or London Interbank Offered Rate, is a benchmark rate that some of the world's leading banks charge each other for short-term loans. It serves as the first step to calculating interest rates on various loans throughout the world.

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