Total Cost of Ownership: A framework for ETFs
Acknowledgements

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Very special thanks to iShares by BlackRock, UBS Global Asset Management, State Street.
The indexing landscape has changed. Investors have four options when considering how to implement index mandates: index mutual funds (IMF), Exchange Traded Funds (ETFs), derivatives or separate accounts. In this paper, we focus on ETFs and when and why it might potentially be more efficient from a cost perspective to use an ETF instead of an alternative wrapper. However, the foremost factor an investor should consider before using an ETF, is whether its exposure is in line with the target. Only then it would make sense to consider a cost comparison between IMFs and ETFs.

**Primary versus secondary market**

ETFs have both primary and secondary market trading. IMFs have no public secondary market and trade solely in the primary market. Exposure can be bought and sold at scale, intraday, within the secondary market, without holding any underlying securities.

**The evolution of the ETF market**

ETF assets have increased from c.$1trn in 2009 to above $4trn today. As AUM has increased, so too has the volume traded over exchanges, which has the direct impact of reducing transaction costs versus trading in the primary markets. Exposure can be bought and sold at scale, intraday, within the secondary market, without holding any underlying securities.

**This changing landscape requires a more holistic view of costs**

Traditionally, for IMFs, investors would consider the Annual Management Charge (AMC) and the Ongoing Charges Figure (OCF) to the Fund (AMC and admin and custody). Transaction costs are usually variable over time with the potential to cross with other investors on the day of trading. In order to protect the existing shareholders against the dilution effect resulting from creation and subscription activity, there are methodologies that can be applied to a fund. Examples are the Anti Dilution Levy (ADL) and Swing Pricing, both of which are typically fixed.

Costs for active funds tend to be quoted in AMC terms and transaction costs can be variable. Additional performance fees can also exist.

ETFs tend to quote a Total Expense Ratio (TER) which is the equivalent of the OCF for index mutual funds. The TER tends to be fixed for all investors and is transparent. The potential trade on exchange offers an

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1. Preface

1. With exception of “crossing” activity facilitated by asset manager that operates the fund. Crossing can take place on the unit level (netting of investor flows) or in the underlying markets within the organization/trading desk.
additional layer of liquidity which can result in significantly lower transaction costs. If there is no traded volume on exchange, securities will be traded in the primary market, a proxy for an index mutual fund.

**Cost differences across wrappers require a common framework**

The Total Cost of Ownership (TCO) framework allows for comparison between these different vehicles despite different charging structures. The TCO framework considers the costs to purchase, the cost to own, and the cost to sell an investment. It is a more rounded way of evaluating the most cost-efficient vehicle and a better reflection of true costs.
2. Objective

In this paper we show that the total cost of ownership (TCO) framework shows the potential role of ETFs in the portfolios of institutional clients. Especially in asset classes with high underlying transaction costs, the use of large liquid ETFs can help to reduce the TCO for our clients. The TCO framework explicitly incorporates the costs of entering and leaving a specific position. Trading costs of investment solutions have been part of Kempen’s due diligence and monitoring processes for many years. With this paper we hope to highlight the importance of using the TCO framework to facilitate implementation decisions. It is however noteworthy that the TCO framework is stylized and that benchmark differences, ESG considerations, presumed quality of portfolio management and other factors will impact the decision regarding the optimal implementation vehicle.

In order to show the importance of using the TCO framework when making an investment decision, we carry-out a two-fold analysis:

1. To demonstrate a worked example for Emerging Market Equities (EME), USD Emerging Market Debt (EMD) and £ Investment Grade Credit ETFs where the TCO is calculated for different holding periods of up to two years.

2. To compare the results in a. above with the corresponding TCO of IMFs.
3. TCO framework

TCO is made up of the cost to transact and the cost to hold. Both involve a number of additional considerations.

1. **Transaction Costs:**
   a. Average daily volumes.
   b. Bid / offer spreads.
   c. Premiums / discounts to NAV prices.
   d. Broker commissions.
   e. Methods of trading.

2. **Holding costs:**
   a. Fund fees.
   b. Performance.
   c. Tax.
   d. Securities lending.
   e. Unit lending.
   f. Options market.

### 3.1 Transaction costs

**a. Average daily volume (ADV)**

The ADV relates to the volume of units of an ETF that are traded on exchange. The larger the ETF, the greater the ADV tends to be. The recent growth in ETF AUM has also resulted in the growth of ETF ADV. This has a direct effect on the secondary market’s bid/offer spreads.

IMFs have no public secondary market and all trading is done in the primary market with the exception of “crossing” activity facilitated by the asset manager that operates the IMF. If an ETF has no, or little, secondary market trading, then securities will similarly be traded in the primary market. Transaction costs are generally higher on the primary market as actual underlying securities are bought and sold.

Figure 3.1 shows a comparison of transaction costs in primary and secondary markets for:

- iShares Core MSCI Emerging Markets ETF (IEMG);
- iShares MSCI Emerging Markets ETF (EEM); and
- iShares MSCI Emerging Markets UCITS² ETF (IEEM).

Figure 3.1 also shows the ADV for each. Another crucial point to consider here is the effect of the size of the investment on the trading costs. If the size of an investment for an ETF executed on exchange exceeds its ADV, this will cause the creation of the additional ETF shares on the primary market which will increase the trading costs. It is important to note that due to this characteristic, ETF trading centers mostly in large ETFs; i.e. with large ADV, to profit from secondary market liquidity.

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² Undertakings for Collective Investments in Transferable Securities are collective investment schemes (a type of investment product) which are established and authorised in one EU member state and designed for EU retail investors. Once authorised, UCITS can be sold cross border to EU retail investors in other EU member states using a registration process, but without a requirement for separate authorisation.
b. Bid / Offer Spreads
The higher the ADV of the ETF, the tighter the bid/offer spread is likely to be as there are more buyers and sellers in the secondary market. These costs are not fixed, but historical liquidity can give an indication of how tight or wide these are likely to be depending on the exposure.
ETF providers tend to quote bid/offer spreads using three month averages. These averages give a general indication of previous bid / offer spreads but are not a guarantee. Market moves can always impact these levels. Those same market moves would impact index mutual funds, unless those funds have fixed bid / offer spreads.
However, broker pricing for ETFs allows for live pricing at any point. Averages can be used as a guide and broker pricing can be used as a live estimate of where bid / offer spreads would be at a point in time.

c. Premiums / discounts to NAV prices
The actual value of an ETF is measured by its net asset value (NAV) at the end of each day, and by its intra-day NAV in the middle of the day; not only its “price”. As ETFs trade on exchange, unlike IMFs, they also have a current market price, which can differ from the NAV throughout the trading day. If the price of the ETF trades above its NAV, the ETF is said to be trading at a “premium”. The ETF is said to be trading at a “discount” when its current market price is below its NAV.
This phenomena mainly occurs because the ETF and its underlying securities are two distinct liquidity pools, albeit directly linked, as illustrated in Figure 1.1. For example, if there is a higher buying demand for an ETF than its underlying securities, the price of the ETF may rise faster than its underlying securities causing it to trade at a premium. Conversely, if the selling demand for the ETF is higher than its underlying securities, the ETF may then trade at a discount.

Another way premiums and discounts may arise is when the ETF and its underlying securities trade on exchanges that are in different time zones. The price of the ETF will reflect real-time changes in market sentiment whereas its NAV will be based on its price as the end of the previous trading day. When both exchanges are open at the same time, any significant deviation between the two will likely vanish.

Because ETFs quickly reflect changes in market sentiment, although NAVs may take longer to adjust, premiums and discounts are particularly apparent when financial markets become more volatile. Even though ETF prices and NAV are close and premiums / discounts tend to be short-lived, it is important to
use limit orders set close to NAV to mitigate the risk of buying at a large premium and selling at a large
discount.

d. Broker commissions
ETF transactions on the secondary market are typically brokered. Broker commissions need to be
factored into transactions costs for ETFs.

e. Methods of trading
As securities themselves, ETFs can be traded at different times of the day and with different trading
orders. Consideration should be given to what time of the day a trade is placed and whether the order
is consistent with the investor’s goals.

3.2 Holding Costs

1. Fund fees
ETF TERs have been reducing as the industry has become more competitive. TERs tend to be less
negotiable than the fees available on IMFs, as any reduction applies to all investors rather than a
singular negotiator. Comparing costs on a TER basis provides a more complete picture of fund fees.

2. Performance
From an indexing perspective we consider performance as the effective tracking of the fund’s quoted
benchmark. This is generally impacted by the benchmark choice and way the portfolio is managed (it
comes down to the replication strategy as well as the capabilities of the manager). These elements are
part of the extensive due diligence process of Kempen’s manager selection team.

It is important to define the type of ETF when considering performance. ETFs tend to be either physically
replicating or synthetically replicating.

- Physically replicating ETFs buy the underlying securities that constitute the benchmark,
aiming to replicate the benchmark by fully replicating it or optimising its replication.
- Synthetically replicating ETFs enter into a swap on the index that is being tracked. This
swap will be collateralised by a pool of assets which may or may not be the same as
the index being tracked.

For the purposes of this paper, the focus is on physically replicating ETFs.

It is also important to note that there can be additional costs due to the benchmark difference between
the index that the ETF tracks and the one the investor would like to use for a particular exposure. Before
doing a TCO analysis, the first step should really be to ensure that this benchmark difference is small
enough to be comfortable with.

3. Tax
Tax exempt investors do not pay tax on the gains made on investments. However, the withholding taxes
(WHT) on dividends from securities are incurred. The impact of tax should be considered on a case by
case basis.

4. Securities lending
ETFs operate a securities lending program in much the same way that IMFs do. Unlike IMFs ETFs can
themselves be lent out too, generally referred to as Unit Lending. Unit Lending offers investors the
potential to earn revenue from making their ETF units available for loan. However, even though lending
offers additional revenues, one should keep in mind that the activity is not free of (tail) risks.
5. **Unit Lending**

As a security in its own right, an ETF can be lent out to generate additional income. For example, the iShares iBoxx USD High Yield Corporate Bond ETF (HYG) had an average lending revenue of 84bps for the 12 months leading to 12/09/2017 with lendable availability of c$3bn. This ‘carry’ is a function of the ETF wrapper and is not an aspect of IMFs or segregated mandates which operate securities lending programs only on the securities within the funds themselves.

It is important to distinguish ‘traditional’ securities lending from Unit lending. Securities lending is a common facet with many mutual funds, and would occur in ETFs and IMFs alike. However, Unit lending is specific to the ETF wrapper and cannot be replicated with an IMF.

6. **Options market**

There are listed options on many ETFs in the market. These options allow investors to alter the financial pay off profile of the ETF, with puts and calls available for physical settlement.

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2 Data source: IHS Markit. Lending revenue is defined as the total lending income generated by all the ETF unit loans, divided by the average market value of all the ETF units available for lending during the 12 months leading to 12/09/2017. Figures provided do not include fees paid to lending agents. Additional lending supply may impact ETF Unit lending revenue.
4. IMF and ETF TCO comparison

4.1 Emerging Market Equities (EME)

IEMG offers a compelling case when considering costs on a TCO basis, with respect to the UBS Index Fund. Table 4.1 shows the TCO calculation, for different holding periods, for EME ETFs of iShares (IEMG), UBS (UB32 LN), SPDR (EMRG and SPEM) and UBS Life Global Emerging Markets Equity Tracker Fund (EME UBS IMF) (assuming no crossing).

<table>
<thead>
<tr>
<th></th>
<th>IEMG</th>
<th>EMRG</th>
<th>SPEM</th>
<th>UB32 LN</th>
<th>EME UBS IMF</th>
</tr>
</thead>
<tbody>
<tr>
<td>TER (bps)</td>
<td>14</td>
<td>42</td>
<td>11</td>
<td>45</td>
<td>13</td>
</tr>
<tr>
<td>ADV</td>
<td>$443m</td>
<td>$3m</td>
<td>$354</td>
<td>$6m</td>
<td>N/A</td>
</tr>
<tr>
<td>Bid / Offer spread (bps)</td>
<td>2</td>
<td>26</td>
<td>8</td>
<td>39</td>
<td>56</td>
</tr>
<tr>
<td>Securities Lending Revenue (bps)</td>
<td>12</td>
<td>N/A</td>
<td>3.6</td>
<td>1.5</td>
<td>6</td>
</tr>
<tr>
<td>Estimated broker commissions (bps)</td>
<td>4</td>
<td>4</td>
<td>4</td>
<td>4</td>
<td>N/A</td>
</tr>
<tr>
<td>Option Market</td>
<td>Yes</td>
<td>No</td>
<td>No</td>
<td>No</td>
<td>Yes</td>
</tr>
<tr>
<td>WHT (bps)</td>
<td>27</td>
<td>33</td>
<td>33</td>
<td>22</td>
<td>22</td>
</tr>
<tr>
<td>Approx. TCO (1 month)</td>
<td>7bps</td>
<td>34</td>
<td>14</td>
<td>47</td>
<td>57</td>
</tr>
<tr>
<td>Approx. TCO (3 months)</td>
<td>8</td>
<td>43</td>
<td>17</td>
<td>54</td>
<td>58</td>
</tr>
<tr>
<td>Approx. TCO (12 months)</td>
<td>13</td>
<td>83</td>
<td>30</td>
<td>86</td>
<td>63</td>
</tr>
<tr>
<td>Approx. TCO (24 months)</td>
<td>20</td>
<td>136</td>
<td>49</td>
<td>130</td>
<td>69</td>
</tr>
</tbody>
</table>

Table 4.1: Cumulative TCO calculation for IEMG, EMRG, UB32 LN and EME UBS IMF for different holding periods. Broker commission is estimated as 4bps; 2bps to buy and sell each. This estimation is based on Kempen’s brokers’ historical trading experience with various ETFs. All ETF data, except for estimated broker commissions, is as at April 2018.

TCO calculation has been performed in the following way throughout this paper:

\[
(\text{TER}_{\text{ETF}} - \text{securities lending revenue}_{\text{ETF}} + (\text{WHT}_{\text{ETF}} – \text{WHT}_{\text{IMF}})) / \text{number of years} + \text{Bid / Offer spread}_{\text{ETF}} + \text{Estimated broker commissions}.
\]

\[
(\text{TER}_{\text{IMF}} – \text{securities lending revenue}_{\text{IMF}}) / \text{number of years} + \text{Bid / Offer Spread}_{\text{IMF}};
\]

where WHT_{ETF} and WHT_{IMF} are the WHTs of the ETF and IMF under consideration; respectively.

Bid / Offer Spread (bps) – Estimated cost of purchase + Estimated cost of sale.

Avg. Daily Volume ($) - The average daily closing composite volume in millions of dollars during the month.

Spreads available in the secondary market, which for this analysis are taken from Bloomberg, are subject to change and are dependent on market conditions at the time of trading. WHT relates to the weighted average tax on the underlying dividends arising from securities within the fund.

The fee information of EME UBS IMF is based on internal Due Diligence Report. UBS securities lending revenue is as at 2015.
Figure 4.1: Estimated TCO per ownership period for IEMG, EMRG, UB32 LN and EME UBS index fund. Calculated linear interpolation values for different holding periods using the known co-ordinate points.

Figure 4.1 shows the results for an ownership period of two years. IEMG has a significantly lower TCO than the UBS index fund as well as other ETFs studied in this analysis. SPEM is the second best benefitting from higher liquidity as a US-domiciled fund. Since UB32 LN has its primary exchange in Switzerland, its London Stock Exchange listing tends to be a fair bit less liquid, which is reflected on its relatively higher bid / offer spread than IEMG. A similar situation is also apparent for EMRG. UB32 LN is more cost-efficient than EME UBS IMF only for the first few months, whereas EMRG has a higher TCO already from the beginning.

This example illustrates the impact of transaction costs and how this has an effect over different holding periods. The break-even, i.e. when the EME UBS IMF becomes cheaper than the ETFs is only after c. 96 years. Even if in a hypothetical situation where one crosses on the way in (as could be planned with UBS), it would still take c. 45 years to break even with the ETF (as it is impossible to guarantee a similar cross on the way out). Given that the break-even is reached after such a long period of time, one can conclude that for the case of EMES, it would be substantially more cost-efficient to invest in ETFs as the default approach to gaining exposure to indexed EMES, instead of an index fund.

Should the trading size exceed the ADV of the ETF under consideration, one would then pay the weighted average of the secondary market trading costs and the primary trading costs. In practice, many investors choose to trade in blocks to take advantage of the secondary market liquidity should their trade size exceed the ADV of the ETF. Therefore, even under the circumstance of the trading size exceeding the ADV, the ETFs would still be the more cost efficient option.

We note that the implications of this analysis could be applied to actively managed funds. It is worth considering what level of active management performance (net of fees) would be required to offset the transaction costs of investment versus simply holding an indexed ETF in this way, let alone generate actual alpha (net of fees and transaction costs).

It is important to note that IEMG track the Emerging Markets IMI benchmark. This benchmark includes an allocation to small cap EM equities, but aims to be sector and geographically neutral versus the parent

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4 Applicable to currently approved UBS product.
MSCI EM benchmark. In 2015 and 2016, these changes resulted in a c.1% deviation, plus and minus, between the two benchmarks.

**When an IMF is more cost efficient**

For index investing, in many cases an index mutual fund will remain the most cost-effective option for large institutional mandates. The management fees for index mutual tend to be more negotiable than those of ETFs, although the transactions costs tend to either be fixed, single swinging or dual priced. In general, for long term holding periods, the transaction cost benefits that may arise through using ETFs can be washed away if the equivalent IMF has lower management costs but higher transaction costs. These dynamics can be broken down into three areas:

1. ETF has a lower TER and lower transaction costs than IMF. Always select ETF.
2. ETF has lower transaction costs but higher management costs than IMF. Consider holding period.
3. ETF has equivalent transactions costs (little or no secondary market trading for example) and higher management than IMF. Always select IMF.

As an example, the iShares Core MSCI World UCITS ETF (SWDA) is not a compelling option versus the UBS Life World Equity Tracker Fund (DME UBS IMF) that we have available to otherwise invest in.

<table>
<thead>
<tr>
<th></th>
<th>SWDA</th>
<th>DME UBS IMF</th>
</tr>
</thead>
<tbody>
<tr>
<td>TER (bps)</td>
<td>20</td>
<td>2.5</td>
</tr>
<tr>
<td>ADV</td>
<td>$47m</td>
<td>N/A</td>
</tr>
<tr>
<td>Bid / Offer spread (bps)</td>
<td>10</td>
<td>21</td>
</tr>
<tr>
<td>Securities Lending Revenue (bps)</td>
<td>2</td>
<td>1</td>
</tr>
<tr>
<td>Estimated broker commissions (bps)</td>
<td>4</td>
<td>N/A</td>
</tr>
<tr>
<td>Option Market</td>
<td>No</td>
<td>N/A</td>
</tr>
<tr>
<td>WHT (bps)</td>
<td>28</td>
<td>6</td>
</tr>
<tr>
<td>Approx. TCO (1 month)</td>
<td>17bps</td>
<td>21</td>
</tr>
<tr>
<td>Approx. TCO (3 months)</td>
<td>24</td>
<td>21</td>
</tr>
<tr>
<td>Approx. TCO (12 months)</td>
<td>54</td>
<td>23</td>
</tr>
<tr>
<td>Approx. TCO (24 months)</td>
<td>94</td>
<td>24</td>
</tr>
</tbody>
</table>

*Table 4.2: Cumulative TCO calculation for IEMG and EME UBS IMF for different holding periods. Broker commission is estimated as 4bps; 2bps to buy and sell each. This estimation is based on Kempen’s brokers’ historical trading experience with various ETFs. All ETF data, except for estimated broker commissions, is as at April 2018.*

*Bid / Offer Spread (bps) - Estimated cost of purchase + Estimated cost of sale.*

*Avg. Daily Volume ($) - The average daily closing composite volume in millions of dollars during the month.*

*All ETF data provided by Bloomberg & BlackRock. Spreads available in the secondary market are subject to change and are dependent on market conditions at the time of trading. WHT relates to the weighted average tax on the underlying dividends arising from securities within the fund.*
Figure 4.2: Estimated TCO per ownership period for SWDA and DME UBS IMF. Calculated linear interpolation values for different holding periods using the known co-ordinate points.

Figure 4.2 shows that already after only 3 months SWDA is more expensive than DME UBS IMF resulting mainly from its relatively very high TER and WHT. These cost elements overpower the relatively low bid / offer spread.

The example of SWDA illustrates that conducting a TCO analysis on each index mandate can highlight opportunities for fiduciary managers to add value to client portfolios.

In each of the three scenarios outlined above, a TCO framework can provide additional insight to either confirm or identify the right indexing wrapper for each mandate.

4.2 USD Emerging Market Debt

On the fixed-income side, non-traditional participants are now increasingly turning to ETFs. This is predominantly due to three reasons:

1. Since the financial crisis in 2008, the introduction of regulation such as Basel III and Dodd-Frank have impacted fixed income markets significantly. The amount of assets that can be held on bank balance sheets has reduced and as such the inventories held by dealers has decreased (see below).

2. Given the OTC nature of bond trading and the heterogeneity of fixed income securities (vs equities), the market has become increasingly fragmented and illiquid, making it much more challenging for fixed income managers to trade cash bonds in the secondary market.

3. This is exaggerated in periods of market stress. Dealers are less willing to provide balance sheet and warehouse risk and as such, portfolio managers are not able to move risk around as easily resulting in less liquid markets.

Figure 4.3 shows the change in inventories and market fragmentation for the time period covering the financial crisis of 2008 until 2016.
Figure 4.3: Source of primary dealer inventory: Federal Reserve Bank of New York until 27 March 2017; Corporate and Miscellaneous bonds. After March 2013, MarketAxess, Bloomberg showing inventory in IG corporates, HY corporates, RMBS, CMBS, commercial paper. Source of US IG credit assets: Barclays, data as 30/09/2016.

As shown on Figure 3.1, ETFs provide investors with primary market and secondary market liquidity on exchange. Secondary market trading in ETFs can mean investors can access credit across the spectrum at lower trading costs and potentially higher volumes, when compared to primary markets.

Table 4.3 shows the TCO calculation, for different holding periods, for iShares J.P. Morgan USD Emerging Market Bond UCITS² ETF (EMB), SPDR BofA Merrill Lynch 0-5 Year EM USD Govt Bond UCITS² ETF (EMH5), UBS ETF Barclays USD Emerging Markets Sovereign UCITS² ETF (SBEM LN) and the IMF Legal and General USD Emerging Markets Government Bond index fund (LGIM EMD IMF).
<table>
<thead>
<tr>
<th></th>
<th>EMB</th>
<th>EMH5</th>
<th>SBEM LN</th>
<th>EMD LGIM IMF</th>
</tr>
</thead>
<tbody>
<tr>
<td>TER (bps)</td>
<td>40</td>
<td>42</td>
<td>42</td>
<td>12</td>
</tr>
<tr>
<td>ADV</td>
<td>$179m</td>
<td>$9m</td>
<td>$8m</td>
<td>N/A</td>
</tr>
<tr>
<td>Bid / Offer spread (bps)</td>
<td>8</td>
<td>89</td>
<td>48</td>
<td>90^5</td>
</tr>
<tr>
<td>Securities Lending Revenue (bps)</td>
<td>N/A</td>
<td>N/A</td>
<td>N/A</td>
<td>N/A</td>
</tr>
<tr>
<td>Estimated broker commissions (bps)</td>
<td>4</td>
<td>4</td>
<td>4</td>
<td>N/A</td>
</tr>
<tr>
<td>Option Market</td>
<td>Yes</td>
<td>No</td>
<td>No</td>
<td>N/A</td>
</tr>
<tr>
<td>WHT (bps)</td>
<td>N/A</td>
<td>0.3</td>
<td>N/A</td>
<td>N/A</td>
</tr>
<tr>
<td>Approx. TCO (1 month)</td>
<td>15bps</td>
<td>97</td>
<td>56</td>
<td>91</td>
</tr>
<tr>
<td>Approx. TCO (3 months)</td>
<td>22</td>
<td>104</td>
<td>63</td>
<td>93</td>
</tr>
<tr>
<td>Approx. TCO (12 months)</td>
<td>52</td>
<td>135</td>
<td>94</td>
<td>102</td>
</tr>
<tr>
<td>Approx. TCO (24 months)</td>
<td>92</td>
<td>178</td>
<td>136</td>
<td>114</td>
</tr>
<tr>
<td>Approx. TCO (36 months)</td>
<td>132</td>
<td>220</td>
<td>178</td>
<td>126</td>
</tr>
</tbody>
</table>

Table 4.3: Cumulative TCO calculation for EMB, EMH5, SBEM LN and EMD LGIM IMF for different holding periods. Broker commission is estimated as 4bps; 2bps to buy and sell each. This estimation is based on Kempen’s brokers’ trading experience with various ETFs. All data is as at April 2018.

**Bid / Offer Spread (bps)** - Estimated cost of purchase + Estimated cost of sale.

**Avg. Daily Volume ($M)** - The average daily closing composite volume in millions of dollars during the month.

**Spreads available in the secondary market**, which for this analysis are taken from Bloomberg, are subject to change and are dependent on market conditions at the time of trading. WHT relates to the weighted average tax on the underlying dividends arising from securities within the fund.

*The fee information of EMD LGIM IMF is based on internal Due Diligence Report.*

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^5 Please note that the current trading costs are more favourable than the previous estimates for EMD LGIM IMF. LGIM now applies a 56bps spread which lowers the funds’ TCO.
Figure 4.4 shows that for a holding period of c. 3 years, EMB would be a more cost efficient option than EMD LGIM IMF. Even though the transaction costs, i.e. bid / offer spread, of EMB is much lower than the index fund, its relatively higher TER eats up this advantage. Therefore, EMB would be more suitable for a shorter investment horizon of max 3 years. This may be for tactical allocation purposes and to use in a transition phase to maintain the required EMD exposure. SBEM LN, on the other hand, is more cost-efficient than EMD LGIM IMF only for c. 1 year but is still more expensive than EMB. EMH5 has the highest TCO of all the options studied in this analysis due to its very high bid / offer spread, therefore, would not be a suitable choice.

Unit lending, as it is defined within section 3.2, has the potential to improve the TCO dynamics for EMB, and for other ETFs where there is appetite to take units on loan. Given that achievable unit lending revenues can vary significantly we have omitted this from our TCO calculation as set out above, but view this as an interesting additional source of revenue.

Furthermore, one should also take into account that fixed income ETFs almost always trade at a premium to NAV, which would result in additional costs. This is because the ETF NAV is valued at bid side of underlying assets but the ETF itself trades closer to mid-point of the bid / offer spread of the underlying assets, as a result of which, there is always going to be a natural premium to NAV. As a general rule, one can take half the bid / offer spread of the underlying assets and, all things being equal, that would be a descent proxy to the premium. Importantly, where one may pay the premium to NAV to initially enter a long position in the ETF, one should receive it back upon deciding to sell the position, all things being equal.
### 4.3 £ Investment Grade Credit

Table 4.4 compares the TCO results for iShares Core Sterling Corporate Bond UCITS2 ETF (SLXX), SPDR Barclays Sterling Corporate Bond UCITS2 ETF (UKCO) and two active funds for £ Investment Grade Credit: 1) LGIM Active Corporate Bond All Stocks Fund (IGC LGIM AMF) and 2) Standard Life Investments Ethical Corporate Bond Fund (IGC SL AMF).

<table>
<thead>
<tr>
<th></th>
<th>SLXX</th>
<th>UKCO</th>
<th>IGC LGIM AMF</th>
<th>IGC SL AMF</th>
</tr>
</thead>
<tbody>
<tr>
<td>TER (bps)</td>
<td>20</td>
<td>20</td>
<td>20</td>
<td>34</td>
</tr>
<tr>
<td>ADV</td>
<td>$7m</td>
<td>$3m</td>
<td>N/A</td>
<td>N/A</td>
</tr>
<tr>
<td>Bid / Offer spread (bps)</td>
<td>26</td>
<td>38</td>
<td>70</td>
<td>64</td>
</tr>
<tr>
<td>Securities Lending Revenue (bps)</td>
<td>1</td>
<td>N/A</td>
<td>N/A</td>
<td>N/A</td>
</tr>
<tr>
<td>Estimated broker commissions (bps)</td>
<td>4</td>
<td>4</td>
<td>N/A</td>
<td>N/A</td>
</tr>
<tr>
<td>Option Market</td>
<td>No</td>
<td>No</td>
<td>N/A</td>
<td>N/A</td>
</tr>
<tr>
<td>WHT (bps)</td>
<td>N/A</td>
<td>2.2</td>
<td>N/A</td>
<td>N/A</td>
</tr>
<tr>
<td>Approx. TCO (1 month)</td>
<td>32bps</td>
<td>44</td>
<td>72</td>
<td>67</td>
</tr>
<tr>
<td>Approx. TCO (3 months)</td>
<td>35</td>
<td>48</td>
<td>75</td>
<td>73</td>
</tr>
<tr>
<td>Approx. TCO (12 months)</td>
<td>49</td>
<td>64</td>
<td>90</td>
<td>98</td>
</tr>
<tr>
<td>Approx. TCO (24 months)</td>
<td>68</td>
<td>86</td>
<td>110</td>
<td>132</td>
</tr>
</tbody>
</table>

**Table 4.4**: Cumulative TCO calculation for SLXX, UKCO, IGC LGIM AMF and IGC SL AMF for different holding periods. Broker commission is estimated as 4bps; 2bps to buy and sell each. This estimation is based on Kempen’s brokers’ trading experience with various ETFs. All data is as at 15/01/2018.

*Bid / Offer Spread (bps) - Estimated cost of purchase + Estimated cost of sale.*

*Avg. Daily Volume ($M) - The average daily closing composite volume in millions of dollars during the month.*

*Spreads available in the secondary market, which for this analysis are taken from Bloomberg, are subject to change and are dependent on market conditions at the time of trading. WHT relates to the weighted average tax on the underlying dividends arising from securities within the fund.*
As Figure 4.5 shows, SLXX is by far the most cost efficient option in comparison to AMFs. This results mainly from its relatively very low bid / offer spread. Even if it traded at a premium to its NAV (our brokers have so far experienced NAV + 7bps on one occasion; on another at a discount to NAV, NAV – 6bps), the break-even would be more than 50 years. Therefore, provided that investing in the AMFs cannot be justified by the extra alpha that they deliver, SLXX would be the most cost efficient option for the IGC exposure. UKCO has the same TER as SLXX but a much higher bid / offer spread, leading to higher TCOs. It becomes more cost-efficient than IGC SL AMC, after the first year resulting from its lower TER, however it has still a materially higher TCO than SLXX and would therefore not be a suitable alternative, unless its bid / offer spread reduces.

However, one should take here the benchmark differences into account, since the SLXX’ benchmark covers a more liquid subset of the market than the AAC benchmark. Another point to note here is that IGC SL AMF might be the more suitable option for particular clients due to its ethical considerations.
5. Conclusions

Based on the results of our analysis presented in this paper, we draw two important conclusions:

1. Both for strategic and tactical investment implementation decisions, investors should compare costs in the framework of TCO. The TCO captures extra costs that are missed by the TER such as bid/offer spread and gains from security lending. These costs are an inevitable part of running any type of investment fund and should be considered by investors. Looking solely at the TER is misleading because the product with the cheapest TER is not necessarily the cheapest product you can buy.

   The TCO is a helpful tool to decide on the implementation vehicle. Kempen evaluates funds (including ETFs) on a large range of characteristics including costs of entering and selling. The TCO framework can help to take TCO efficient decisions regarding the implementation of allocation decisions. A good example of this is the relatively low costs associated to implement sterling investment grade credit, by accessing Sterling IGC with a total transaction cost of 9bps, versus c40bps using the traditional route of a pooled fund, via SLXX. The TCO framework can be extended to different investment vehicles such as futures and other derivatives. As we show in this analysis, it can also be used to capture both the securities and unit lending impact in the form of better fund performance and net return to investors. Securities lending returns typically vary by asset class and upon the underlying demand for securities.

   This fits in well with Kempen’s cost transparency policy where we advise trustees to understand all sources of costs (size, investment strategy, etc.) and investigate what is already available to compare and contrast. Using the TCO approach can improve cost transparency and help investors make better decisions.

2. Our results presented in this paper show that for the asset classes EME, IGC and EMD, ETFs offer significant cost efficiency with respect to index mutual funds studied here. This applies both in the strategic and tactical space for EME and IGC and for EMB more in the tactical space, without trading off return and risk. Hence, our clients can achieve material cost savings.

   We recommend to consider ETFs by default for indexed portfolio construction of these asset classes, recognizing that other factors such as hidden market impact and benchmark differences can play a role when selecting a fund for a client.
6. Appendix 1: ETF Trading Landscape

How can fiduciary managers access ETFs?

Figure 6.1 depicts the infrastructure of ETF trading landscape.

**Figure 6.1**: Infrastructure of ETF trading landscape: secondary and primary markets.
7. Appendix 2: Benchmark of IEMG

It is important to note that the benchmark of IEMG is MSCI EM IMI. Below is an analysis as at March 2017 showing how this IMI benchmark compares to the parent benchmark of MSCI EM. The IMI benchmark has a methodology which is intended to be both sector and geographically neutral when compared to the MSCI EM parent index, but also includes a maximum of 10% exposure to smaller caps. The smaller cap component allows investors to harvest the small cap premia in Emerging Markets.

Figure 3.2: Analysis comparing MSCI EM IMI index with the parent MSCI EM index. All of this data is at March 2017. Source iShares by BlackRock.
Strategically speaking, there is little risk difference between holding exposure to these two indices.
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Before joining Kempen’s UK team in 2016, Miss Beyhan worked as a Fiduciary Manager for Kempen’s Dutch clients advising on strategic asset allocation. She then also created, used and maintained models to calculate the expected risk and return of potential investment strategies, monitor and project funding levels, attribute risk and return, hedge liabilities and create proxy liability cashflows.

She started her career as an investment consultant within Aon Hewitt Amsterdam’s investment strategy team, advising clients on asset allocation, liability hedging solutions and introducing new asset classes. Miss Beyhan earned a PhD in quantum chemistry from VU University Amsterdam and a MSc degree in theoretical physics from Groningen University in the Netherlands.
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Prior to joining KCM in 2014, he worked for Hymans Robertson and Punter Southall where he focused on building those businesses across investment, actuarial, and consultancy business streams.

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