How ETFs affect financial markets

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How ETFs affect financial markets

Welcome to the first in our series of papers on Lyxor’s positioning of the ETF market. In these papers we’ll try to give answers to the questions that matter most to investors as the market grows. Our position is supported by the key findings of academic studies from the ETF Research Academy (see p15) and of our own research.

Right now, we’re being asked whether ETFs:

- Are getting too big
- Increase correlations and harm diversification
- Add to volatility
- Make markets less efficient
- Increase market susceptibility to major drawdowns

Our findings show:

- The ETF footprint is still fairly small
- The impact of ETFs on the underlying markets is still relatively modest on equities and is even less obvious on bonds
- We find no evidence that the increase in the number of ETFs leads to an increase in volatility and a decrease in stock dispersion
- Introducing new ETFs can have positive effect on efficiency
- The longer the holding period of the ETF, the smaller its impact in accelerating market drawdowns

Lyxor’s ETF Positioning Papers
Where academia and investing meet
Q1: Are ETFs getting too big?

Equity ownership

Between 2000 and 2016, ETFs’ aggregate ownership share of three popular US equity indices—the S&P 500, the Russell 1000 and the Russell 2000—rose from around 1% to between 7-12% (Agarwal 2017). On average, it corresponds to a 0.4% increase per year over the period.

ETF Ownership Share of Underlying Index

As the table below shows, ETFs on a European underlying (listed in the US and Europe) represent around 4.4% of the European equity market, based on the weight of each country in the MSCI World and ACW indices. ETFs on a US underlying both listed in the US and in Europe represent 7.6% of the US equity market.

ETF ownership of the US & European equity market

<table>
<thead>
<tr>
<th>ETF Underlying</th>
<th>CAPI USD bn</th>
<th>% / WORLD</th>
<th>% / ACWI</th>
<th>All ETFs listed in Europe USD bn</th>
<th>%</th>
<th>All ETFs listed in the US USD bn</th>
<th>%</th>
<th>All ETFs</th>
</tr>
</thead>
<tbody>
<tr>
<td>EUROPE</td>
<td>10388</td>
<td>24%</td>
<td>21%</td>
<td>236</td>
<td>2.3%</td>
<td>216</td>
<td>2.1%</td>
<td>452</td>
</tr>
<tr>
<td>USA</td>
<td>25429</td>
<td>59%</td>
<td>52%</td>
<td>161</td>
<td>0.63%</td>
<td>1767</td>
<td>6.9%</td>
<td>1928</td>
</tr>
<tr>
<td>WORLD</td>
<td>43463</td>
<td>100%</td>
<td>88%</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>49244</td>
</tr>
<tr>
<td>ACWI</td>
<td>49244</td>
<td>113%</td>
<td>100%</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>5781</td>
</tr>
<tr>
<td>ACWI ex US</td>
<td>23816</td>
<td>55%</td>
<td>48%</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>282</td>
</tr>
<tr>
<td>EM</td>
<td>5781</td>
<td>13%</td>
<td>12%</td>
<td>58</td>
<td>1.01%</td>
<td>282</td>
<td>4.9%</td>
<td>341</td>
</tr>
</tbody>
</table>

Source: Lyxor ETF, Bloomberg, ETFGI as of end of August 2017
ETF share in secondary market trading

We can also calculate the ETF footprint on the secondary market (i.e. comparing the volume traded on the stock exchange on ETF vs the volume on stocks). Looking at the data on the EUROSTOXX 50 in Europe, we found that ETFs on the EUROSTOXX 50 represent 2% of the cumulative average daily volume traded. Even on the secondary market, the footprint is still rather small.

Eurozone ETF average daily volume relative to Eurostoxx 50 stocks

Source: Lyxor ETF Bloomberg data from 31/3/2010 to 30/8/17

Bond ownership

ETF Research Academy analysis suggests US-listed corporate bond ETFs’ represent only 2.6% of the underlying corporate bond market at the end of 2016.

% Ownership of Corporate Bond Investors in the US

Source: “A Study on the Bond ETFs and Corporate Bond Liquidity”, Syed Galib Sultan, Figure 1, ERA 2016

THE LYXOR VIEW

Our analysis, built on the support of our ETF Research Academy papers, suggests the ETF footprint is still fairly small, and so too is the current potential for ETFs to impact their underlying assets. ETFs on a European underlying (listed in the US and Europe) represent around 4.4% of the European equity market. ETFs on a US underlying both listed in the US and in Europe represent 7.6% of the US equity market.
Q2: Do ETFs increase correlations and harm diversification?

S. Malamud* from the ETF Research Academy introduced a new model last year to try to better understand the impact of ETFs in the underlying markets.

His Model extended the classical CAPM introduced in the 1960s by Sharpe and Lintner1. He shows that as a result of the existence of ETFs, aggregate levels of risk in the market has changed, but not necessarily increased, as a result of the existence of ETFs. In particular, there is, as he calls it, a “propagation channel” between ETFs and the underlying securities markets. This channel is directly related to the creation redemption mechanism.

Mr. Malamud warned of the dangers of empirical analysis of ETF returns, given serious endogeneity problems. Studying causal relationships or correlations between ETFs and their underlyings does not address what we know about the feedback loop. For example, an ETF’s liquidity is related to the liquidity of the basket of securities in which it invests. But in turn, the liquidity of the underlying basket is almost certainly influenced by the existence of the ETF. He also demonstrated that the newly created ETFs has an impact on reducing volatility and the co-movement of returns.

His model is a solution to solve these endogeneity issues, and it allows Mr. Malamud to conclude that ETFs don’t automatically cause higher volatility and do not automatically increase the tendency of stock prices to move in sync. The next figure for example plots the volatility of basic securities and new ETFs. We observe that volatilities first decrease with the number of ETFs.

Volatility of basic securities and new ETFs

![Volatility graph]

Source: Malamud, ETF Research Academy 2016*

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* Semyon Malamud, Professor of Finance, Ecole Polytechnique Fédérale de Lausanne and Swiss Finance Institute in a research paper entitled an equilibrium model for ETF liquidity included in the ERA (ETF Research Academy) 2016 selection.
The introduction of new ETFs can even reduce co-movement of stocks through a demand substitution effect. For him, introducing better-built ETFs (index weights and underlying market liquidity) may reduce both the volatility and co-movement in the returns and may improve the liquidity of the underlying securities.

Long term dispersion in Europe

Dispersion can be influenced by multiple factors other than index related instruments.

European dispersion vs European ETF market AuM

0 decrease in dispersion was observed during the strongest ETF growth period 2011-2017

THE LYXOR VIEW

A parallel can be drawn between the growth of ETFs and passive management and the decrease of return dispersion in the underlying markets over the last 20 years. We don’t subscribe to the view that one definitely caused the other. During the analysis period, we saw a global trend of less economic and market volatilities which was a key factor in narrowing the range of returns but we also found that there were still some sharp spikes, when returns did vary more widely, in crisis periods. A number of other index based tools (futures & derivatives) or systematic strategies and algorithmic trading may also have contributed to the decrease in dispersion.
Q3: Do ETFs make markets more volatile?

Equities

Whether the actions of more, or less, informed ETF traders can affect index volatility of the underlying index is a familiar debate. It’s similar to the one that accompanied futures’ introduction to the financial markets. Most of the literature since then has in fact demonstrated the opposite i.e. that the opportunity to trade futures brings stability to the market of the underlying equity (IMF Working paper 1998).

An ETF Research Academy paper written by Russ Wermers and Jinming Xue of the University of Maryland (“The role of ETFs in intraday price discovery”) studied the relationship between price movements in the largest ETF tracking the S&P 500 index and the price movements in the underlying index. The authors used a statistical method that was first tested on futures in 2003 to calculate the proportion of trading in the underlying stock market resulting from informed ETF traders.

The paper concluded that the effect noise trading in the ETF has on index volatility is relatively short-lived. Only ETF trading by informed investors has an impact on the volatility of the cash index. In other words, ETF traded by informed traders have a greater impact on financial markets and they do play a role in price discovery instead of adding noise or instability in the market over the long run.

Bonds

Does ETF ownership of bonds increase non-fundamental volatility and make the markets noisier? Anna Agapova* tried to address the issue of whether bonds’ inclusion in an ETF leads to price distortion and elevated levels of volatility. The question was already studied for stocks but never for bonds. This is the first study to look at the effect of ETFs on their constituent bonds in terms of the volatility of the bonds’ prices.

The key findings were:
- The percentage of bond issues held by ETFs is small: ETF ownership of US-listed corporate bonds was around 2.6% of the underlying corporate bond market value at the end of 2016
- ETF ownership of bonds is associated with more liquid and less volatile underlying bonds
- ETF inflows and outflows have a positive impact on the level and the volatility of bond returns. This impact is four times greater for high-yield bonds than for investment grade bonds
- Adding a bond to, or excluding it from, ETF portfolios does not affect return volatility. Yet inclusion into an ETF decreases returns.

* Anna Agapova & Austin Shelton Florida Atlantic University, Nikanov Volkov of Mercer University published in their latest research paper titled “Bond ETFs and Price Volatility of Underlying Securities (2017)”
Q4: Do ETFs make markets less efficient?

Studies show new ETFs can help make markets more efficient if they are built the right way. In fact as stated by Malamud (see note p6), adding new ETFs to those already in issue can reduce systemic risk. Therefore, the overall level of risk of the market does not depend on the number of ETFs in existence or the size of their assets under management. ETF issuers, via their design choices (index weight, primary market liquidity), can influence the overall riskiness of the market.

Index design choices (stock selection methodologies, weightings etc) can also influence ETF impact on market efficiency. Although market-cap indices increase the amount of macro-based information included in financial assets, ETFs on non-market cap weighted indices include a significant micro-based information part in the investment decision process and thus positively contribute to pricing efficiency.

Non-market cap weighted strategies like smart beta, objective-driven, thematic & specialised ETFs allocate between capital and risk and therefore actively participate in the price discovery mechanism in the same way stock pickers do. Using information like valuations to differentiate between potential holdings reintroduces a layer of micro-economic based information to the investment decision process.

Fundamental indices like the Rafi, based on financial account data rather than market prices, are a good example. These indices aim to benefit from the tendency for markets to revert to mean i.e. to return to their fundamental value. The graph below shows the mean reversion of the MSCI USA Index’s price toward its fundamental value over a period of 20 years. Fundamentals-based ETFs have a role to play in this process.

THE LYXOR VIEW

ETFs on non-market cap weighted indices include a significant micro-based information part in the investment decision process and thus positively contribute to pricing efficiency. Fundamental indices based on financial account data rather than market prices, are a good example. Sector or thematic ETFs are another example as they are based on indices selecting stocks on microeconomic criteria.

Source: Bloomberg from 1/1/97 to 13/9/2017
Sector or thematic ETFs are another example as they are based on indices selecting stocks on microeconomic criteria (% of revenues in a certain activity for example). Add the growth in this area to that of Smart Beta, and it's clear more and more people are looking for diversification and alternative sources of return to get more from their money in today’s low rate environment. Assets here are growing faster than the market overall. We expect this segment will be one of the main growth drivers of the ETF market in the future.

Source: Lyxor ETF, Bloomberg data from 1/1/2014 to 30/8/2017
Q5: Do ETFs make markets more susceptible to major drawdowns?

ETF holding period

We all know ETFs can be traded more flexibly than traditional mutual funds, but are they being bought for the longer-term as well? Data is hard to find on investor type; size, location and duration of ownership; and the products they use. We’ve tried to estimate the length of time people hold ETFs by analysing the activity ratio - the absolute sum of the creation plus redemption divided by the assets under management – on the primary market. The smaller the ratio, the smaller the impact ETFs have on the underlying market.

The declining trend on the graph below indicates that Lyxor ETF assets traded less, therefore the holding period is longer. If the average holding period of ETFs lengthens, it reduces the potential impact on the underlying markets. We can also reach the same conclusion when looking at the secondary market activity ratio for the overall European market (3 month average daily volume divided by 3 month average European ETF AuM) on the second graph below. The ratio declines as assets steadily increase, indicating that ETF holdings are more stable. This should provide some reassurance when their role in a major market drawdown is being considered.

**LYXOR ETF primary activity ratio**

Source: Lyxor ETF Research, Bloomberg from 1/1/2015 to 27/9/2017

**LYXOR ETF secondary market activity**

Source: Lyxor ETF Research, Bloomberg from 1/1/2016 to 27/9/2017

THE LYXOR VIEW

Our view is that the proportion of stable assets in ETFs should continue to grow. This should mitigate the impact of tactical ETF users on the underlying markets.
Impact of ETF on underlying markets compared to that of Mutual funds

**Theoretically**, the link between ETF creation and redemption and underlying market impact can be quantified. Vikas Agarwal’s 2017 paper* concluded:

- Higher ETF ownership of stocks leads to greater co-movement of liquidity
- But other categories of stock owners (like mutual funds) have a relatively similar impact

Based on the paper’s results we calculate that, for an annual increase in ETF ownership of 0.4%, the average commonality measure** will increase by 5% whereas an increase in the same proportion of mutual fund ownership will lead to an increase of 4% for mutual funds of the same measure***.

**Empirically**, we know investors are concerned by the possible impact of ETFs on the underlying markets, especially when they are under stress. Our analysis and experience tells us such periods are, so far at least, impossible to find in Europe. They can be found in the US, but the market is very different from its European counterpart. That said, it is worth digging a bit deeper.

For example, the US Muni market (which has no equivalent in Europe) endured a period of stress in May 2013 as the so-called “taper tantrum” took hold after Fed Chairman Bernanke first raised the possibility of tapering the central bank’s quantitative easing programme. We saw volatility spike and US municipal bonds suffer. Liquidity in the US dried up among underlying securities and market pricing proved difficult.

Our analysis shows ETFs and mutual funds participated almost equally in the sell-off, with the contribution of the former only marginally higher. Cumulative ETF outflows represented 5% of ETF AuM, while they represented 3.5% of active fund AuM. Given the size of ETF ownership in underlying securities, this illustrates the resilience of ETFs compared to mutual funds and tallies with the theoretical results we’ve already discussed.

The key question is whether these issues are likely to affect the European ETF market any time soon. In our view, the answer is no. We’ve said already that the markets are different, but there is more to it than that. It’s true the ETF market in Europe has doubled in the last 4 years, but it’s still four times smaller than in the US. There are also more checks and balances in place. There are other differences too, including the users of ETFs. In the US, usage is much more widespread among retail and hedge fund investors as well as institutions, we don’t see that in Europe yet.

However, there are more fundamental differences between the two markets. Providers in Europe have to publish the value of the fund on a daily basis and also publish an indication of the NAV throughout the day (the iNAV). Meanwhile, exchanges such as Euronext also have measures in place to prevent trading from drifting too far from fair value. When markets are stressed, the ETF is suspended if it is acting too far from the iNAV, which has not necessarily been the case historically in the US. Trading stops when the difference between the ETF price and its fair value goes beyond a certain exposure-dependent threshold, ranging from 0.10% for money market funds through to 3% for less liquid underlyings.

Some providers add specific risk rules that go even further to try to limit any ETF impact. This is something investors should be aware of when making their selections. Lyxor, for example, won’t allow any of its ETFs to be more than 2% of the free market float of the underlying pieces. And the volume of shares traded must not be more than 30% of the average daily trade volume of the underlying parts.

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*Paul Hanouna and Rabih Moussawi of Villanova University and Christof Stahel of the Division of Economic and Risk Analysis of the US Securities and Exchange Commission published in their latest research paper untitled “Do ETFs increase the commonality in liquidity of underlyings stocks?”.

**Definition of the commonality measure: it measures the relationship between the ownership of stocks by ETFs and an increase in the co-movement of liquidity for those stocks.

***Koch, Ruenzi and Starks (2016), "Commonality in Liquidity: A Demand-Side Explanation".
Conclusion: What it means for the future of ETFs

In conclusion, the ETF ownership ratio is small in both the equity and bond markets. It is a key determinant of the impact of ETFs on the underlying markets and therefore this data should be made more widely, and more regularly, available.

The growth of the ETF market is likely to be driven by ETFs in non-market capitalisation-weighted indices (sectors, themes and Smart Beta), which tend to be used by sophisticated investors. This should improve, rather than diminish, market efficiency.

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OUR FINDINGS:

1. **Footprint:**
The ETF footprint is still fairly small:
   - ETFs on European equities, listed both in the US and in Europe represent 4.4% of the European equity market
   - ETFs on US equities listed both in the US and in Europe represent 7.6% of the US equity market
   - US-listed corporate bond ETFs’ collective holdings represent only 2.6% of the underlying corporate bond market

2. **Diversification:**
From a theoretical & an empirical point of view, we find no evidence that the increase in the number of ETFs leads to an increase in volatility and a decrease in stock dispersion.

3. **Volatility**
Only ETF trading by informed investors has an impact on the volatility of the cash index. In other words, ETFs do play a role in price discovery and do not add noise or instability in the market over the long run. Even in the bond markets, evidence ETF ownership reduces, rather than increases, the price volatility of constituents in the corporate bond market should be reassuring.

4. **Efficiency**
New ETFs can help make markets more efficient if they are built the right way. Adding new ETFs to those already in issue can reduce systemic risk. Therefore, the overall level of risk of the market does not depend on the number of ETFs in existence or the size of their assets under management.

Introducing new ETFs can have positive impact on market efficiency depending on their index design. More sophisticated methodologies like smart beta actively participate in the price discovery mechanism in the same way stock pickers do

5. **Drawdowns**
The longer ETFs are held, the smaller their impact is in accelerating market drawdowns. ETFs are in fact no more responsible for any drying up of liquidity than mutual funds.

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Lyxor closely monitors these issues through its ETF Research, and will continue to encourage academic works on measuring the ETF impact on financial markets, through the ETF Research Academy a joint initiative with Paris Dauphine University.

Start the conversation at etfresearch@lyxor.com
Lyxor has been running ETFs since 2001, longer than any other European provider. Our pioneering spirit helped shape the market as you know it today. Over the last 15 years, we’ve become one of Europe’s largest¹, most liquid ETF managers². And we’ve built one of its most far-reaching ranges, which spans all asset classes, and includes some of the largest and most efficient ETFs³.

We now offer more than 220 ways to explore the markets. So, whether you’re seeking essential core index exposure, or reaching out for more tactical opportunities in specific sectors or markets, we have a product to match. Staying true to our pioneering heritage, We’ve been breaking new ground in smart beta since 2007 and now rank third for assets⁴.

We know choice alone isn’t enough. So wherever you roam, you can be sure our quality charter sets standards of management few other providers can match.

² Source: Lyxor International Asset Management. Data observed between December 2015 and December 2016.
³ Source: Lyxor International Asset Management. Data observed between January 2015 and December 2016
About the ETF Research Academy

A NEW FRAMEWORK FOR THE ETF INDUSTRY

ETF RESEARCH ACADEMY –
FOUNDED BY DAUPHINE & LYXOR

The ETF Research Academy was created in 2014 in the newly founded Paris-Dauphine House of Finance, with the support of Lyxor Asset Management, one of the world’s leading providers of ETFs. The Academy’s aim is to promote high-quality academic research on ETFs and strong links between academia and the ETF industry. The Academy’s objective is also to focus on key areas of interest for investors in ETFs and to develop an analytical framework covering ETFs and indexing.

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