



ΤΜΗΜΑ: ΧΡΗΜΑΤΟΟΙΚΟΝΟΜΙΚΗΣ ΚΑΙ ΤΡΑΠΕΖΙΚΗΣ ΔΙΟΙΚΗΤΙΚΗΣ

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The Effect of ETFs on Financial Markets

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Περίληψη

Τα ETF (διαπραγματεύσιμα αμοιβαία κεφάλαια) είναι ένα από τα ταχύτερα αυξανόμενα χρηματοπιστωτικά προϊόντα στον κόσμο. Τα συνολικά περιουσιακά στοιχεία που επενδύθηκαν σε ETFs έχουν υπερδιπλασιαστεί μέσα στα τελευταία 15 χρόνια, αγγίζοντας τα 5,1 τρισεκατομμύρια δολάρια στο τέλος του 2021. Τα ETF έχουν ορισμένα οφέλη σε σχέση με τα άλλα επενδυτικά οχήματα. Μερικά από αυτά είναι η άμεση ρευστότητα και το φθινό κόστος συναλλαγής.

Εκτός από τη συνεχιζόμενη άνοδο των ETF, το Flash Crash το 2010 ώθησε τις ρυθμιστικές αρχές να διεξήγαγαν εκτεταμένους ελέγχους σχετικά με τον τρόπο με τον οποίο τα ETF επηρεάζουν τις χρηματοπιστωτικές αγορές. Αυτή η βιβλιογραφική ανασκόπηση παρέχει μια γενική περίληψη των πρόσφατων ακαδημαϊκών μελετών που εξετάζουν τον αντίκτυπο των ETF στη ρευστότητα των υποκείμενων τίτλων, στις τιμές, τη μεταβλητότητα και την εμπορευματοποίηση των τίτλων αυτών και γενικά στον τρόπο που επηρεάζουν την αγορά.

Λέξεις κλειδιά: διαπραγματεύσιμα αμοιβαία κεφάλαια ,αγορά, τιμές

Abstract

ETFs (exchange-traded funds) are one of the most rapidly increasing financial products in the world. Total assets invested in ETFs have more than doubled in 15 years, hitting \$5.1 trillion at the end of 2021. ETFs have several benefits over their nearest competitors, such as traditional index funds, including increased demand for passive investing, strong liquidity, and cheap transaction costs.

Aside from the continued rise of ETFs, the Flash Crash in 2010 prompted regulators to conduct extensive examinations into how ETFs affect the financial markets. This literature review gives a general summary of recent academic studies examining the impact of ETFs on underlying securities liquidity, price discovery, volatility, and comovement.

Keywords: exchange-traded funds, liquidity, price discovery, volatility, comovement

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1. Introduction

The availability of funds and their efficient management directly and to a large extent affect the economic development of a country. Within this framework, the role of the Stock Exchange is to bring together available funds and investment options. The suggested companies make investments with the funds they draw from the Stock Exchange, thus increasing employment, enhancing productivity and the wider economic growth of the country.

An important but unanswered question is the long-term stability of the relationship between stock market sizes and the sizes that measure economic activity, as well as the factors or conditions that affect it over time. Stock markets in the long term reflect the course of the economy and tend to discount economic events. In many countries the stock market has experienced significant growth especially with the advent of ETFs.

1.1 Problem Definition & Aim of Thesis

The main objective of this thesis can be summarized in the following hypothesis: Based on a through description and analysis of Exchange Traded Fund's and the relevant alternatives in the European market, we will evaluate if the swap-based Exchange Traded Fund is an attractive investment solution for institutional investors. The main problem will be sought solved by answering the following sub-questions:

- What is an Exchange Traded Fund?
- How does the market for Exchange Traded Fund's look like?
- What structural and regulatory issues are important?
- Why do institutional investors invest in the product?

- What qualities do ETF's possess compared to other index instruments?

The present Thesis aims to presents a new financial product, the Exchange traded funds. Through this Thesis will show the reasons why such a product was created initially in USA and later in other countries of Europe and Asia. Its characteristics as well as the advantages it presents over other investment options will be analyzed. The most important of the ETFs currently trading in the market will be presented, as well as their returns for the year 2020, in order to make clear the extent of the development of this product and the possibilities it provides to the potential investor. Finally, the ultimate goal of this thesis is to highlight any prospects for the creation, development and the effect of ETF in the Financial Markets.

1.2 Data & Methodology

The research for data for the writing of this Thesis was carried out mainly through the internet, due to the lack of Greek bibliography in the subject. However, important information for further reflection has been drawn from the Association of Greek Banks and news. As well as from the notes of the course Capital and Money markets of Mr. Anthropolos. We will concentrate in the research on exchange-traded funds (ETFs) that are listed in Several Countries around the world.

This research began with the construction of a complete list of all classic ETFs that were available. Thomson Financial Datastream was used to compile the ETF lists for us to see the effects on the market. The list has been compiled with the European market in mind. As a result, funds from Austria, Belgium, Bulgaria, the Channel Islands, Cyprus, the Czech Republic, Denmark, Estonia, Finland, France, Germany, Greece, Hungary, Iceland, Ireland, Italy, Kazakhstan, Latvia, Lithuania, Luxembourg, the Netherlands,

Norway, Poland, Portugal, Russia, Serbia, Slovakia, Slovenia, Spain, Sweden, Switzerland, Turkey, Ukraine, and the United Kingdom are included in the list in the 5th Chapter.

The list is then further narrowed to only include non-enhanced indexing funds, institutional funds, and insurance funds. Because there is such a big amount of data (over 5,000 funds), only a sampling of the entire list is considered. This is owing to the restricted time allotted for doing the research and the lack of manpower available to analyze fund-level data on a case-by-case basis.

As a result, only index funds issued by well-known providers are considered. Vanguard, State Street Global Advisors (SSgA), Pictet, and HSBC are the suppliers. Then we look for funds that solely track important benchmark indexes like the S&P 500, MSCI USA, MSCI Europe, MSCI Japan, MSCI World, and MSCI Emerging Market. The funds are then examined individually on the Morningstar website, the Financial Times website, and the websites of the companies that offer these funds to determine the fund's aim and investment policy. This is to look at the fund's nature as well as the clients it attracts. This list excludes any upgraded funds and institutional funds.

Meanwhile, ETF information is gathered from Thomson Financial Datastream. Only European-listed ETFs are included in the list. Because the overall data equal to 7,000 ETFs, only a sample of the entire list is used in the paper's study, like the index funds data. ETFs from major ETF providers such as iShares, Lyxor, and Street Tracks are used to create the sample.

We found the data for the return of the funds in our samples by looking up the price of the funds and the benchmark index they track in Thomson Financial Datastream. The funds' gross total return is then computed. The total return data was compiled over a ten-year period, from March 2011 to March 2021.

As previously stated, the funds in our samples were chosen from top fund providers. Vanguard, State Street Global Advisors (SSgA), Pictet, and HSBC are among the classic mutual fund providers. The ETFs are from iShares and Lyxor, respectively. We also included funds with numerous listings in the European stock market in our sample.

2. Definition and Categories of Exchange Traded Fund

2.1 Introduction

The philosophy of passive investment management began in 1971 in Wells Fargo with simple index funds and it was only in 1976, when John Bogle founded Vanguard Group, that the first index fund available to the public was founded. The growth of index funds was rapid in the 1970s and 1980s, flourishing in 1980 in the UK and Europe. Japan has also seen significant growth in index funds in recent years. The assets of the index funds amount to approximately 1 trillion dollars equivalent to 8% of the entire global industry. In India, the first index fund was promoted by unit trust in 1998. However, it was not only in the second half of 1988 that index funds made a dynamic entry into the market (Patton, 2015).

In Greece, the first Index Fund appeared in May 1996 by the Ionian Bank «Athens Index Funds of Internal Shareholders» based on the Athens stock exchange general index. The "Sigma Greek Index Fund of Domestic Shares" based on the FTSE/ASE-20 index in October 1997, which has not existed since May 2002 and finally the Barclays Index Fund based on the FTSE/ASE-20 in September 1997, following the merger of Barclays with HSBC, was renamed "HSBC Athens Index Fund domestic shares FTSE/ASE-20" (Diavatopoulos, Felton, & Wright, 2011).

2.2 First needs of Index Funds creation

Much of the success of the index can be attributed to a man, John Bogle, the founder of Vanguard Group. His dedication to indexing has benefited individual investors more than anyone else in the modern economy. He has done so much that many investors have called him *Saint Jack*. Professional researchers recognized the advantages of an indexed portfolio in the early 1930s, when mutual funds were only at their beginning. In 1933 A. Cowles published an investigation into the futility of using research on Wall Street to hit the stock market. He believed that the market was too dynamic to be understood by any man on Wall Street. The Cowles Commission Index recorded all the shares traded in the New York stock exchange since 1871, not just the Dow Jones (Chen, Kwong, & Shum, 2012).

In the 60's the Cowles index was redefined and re-established as the Standard & Poor's 500 index. A. Cowles wasn't the only one seeking more prudence on Wall Street. In the 50's, academic researchers began to search for "effective" stock portfolios and discovered that the most effective portfolio was that of the market itself. Adequate portfolios are groups of stocks that have the highest returns per level of risk. Markowitz, P.Samuelson, I.Fisher, and A.D.Roy (1952) conducted much of their first research on effective portfolios, and some of them even went so far as to win the Nobel Prize in Economics for their efforts. All the investigations seem to come to the same conclusion. There was no need to invest in any portfolio unless it was an indexed portfolio.

Over the next 20 years, extensive work is being done on the idea of creating index funds, but no Index Fund was created. Malkiel sought a mutual fund with no disposal commission, and with minimal management costs, which simply buys hundreds of shares, forming market averages and which is not exchanged. It was clear to Malkiel and others that the managers did not align with the market benchmarks (Ellis, 1975) pointed out the

inefficiency of active administrators in his article. Ellis reports that in the past decade 85% of all institutional investors who tried to "hit" the market achieved a worse return than the performance of the S&P 500 index.

Despite repeated calls from academics for a new Index Fund there were several reasons why the first Index Fund did not appear before the mid-70's. The first reason was that the idea of an indexed portfolio is simple, but managing it is a complex process. By their very nature, Index Funds have hundreds of securities, and the daily inflows and outflows of liquids in the portfolio make daily balancing a complex process. It goes without saying that computers must be at the heart of every ETF, but the available power of computers was prohibitively expensive until the mid-70's. So, the ETF's had to wait (Rubinstein, 2018).

A second reason that the ETF did not appear earlier was its prohibitive cost. Before 1976, Wall Street was in a stable supply value system, meaning that the managers of the ETF could not negotiate lower transaction costs with the brokers. The ETF makes many small trades and a high commission ratio would eliminate any advantage. After 1976, procurement costs were liberalized and the indices decreased considerably.

A third obstacle was distribution. For a long time of the 20th century, the ETF was distributed through the stockbrokers who were paid with a commission of 8% or more. The idea of paying a broker a large commission, just to buy an ETF, did not suit investors. The ETF without supply first appeared in the late 70s (Rubinstein, 2018).

The fourth reason why the ETFs did not exist before 1976 was the reluctance of the industry to accept the idea. The managements of the companies wanted to prove that their company could "hit" the market and saw the indexing as a personal "insult" to their intelligence. Moreover, the managers did not want to lose the high salaries and bonuses.

The low-cost ETF simply did not fit in with the business models that had been established in the companies.

2.3 The first Index Fund

The first attempt to model the stock market index was made in early 1971. Wells Fargo Bank constructed an indexed account of 6 million euro for the pension fund of the samsonite company. The strategy was to buy all the shares in the New York stock exchange in equal proportions, thus creating the first ETF. The idea sounded very good, but the application turned out to be a nightmare. In the effort to keep the portfolio balanced among all the shares, there were great difficulties and the costs of commissions were unbearable. A few years later the strategy was abandoned and the S&P 500 was adopted on behalf of Samsonite (Rubinstein, 2018).

The first strategy of the S&P 500 was created by the Batterymarch financial management. The company presented the idea at a seminar at Harvard Economics School in 1971, although it did not attract customers until 1974. Which company is going to risk its business model? It was not likely to be a company whose managers were comfortable with high management fees. What was needed was a new fund company with lower transaction management costs and direct distribution to the public.

In 1950 Princeton students had to write their thesis and John Bogle was no exception. Bogle hadn't given much credence to the idea of a growing capital industry until he read an article in fortune in December 1949. The article was called "Big Money in Boston" and highlighted the rapidly expanding and somewhat controversial industry. Over the next 18 months, Bogle researched the industry and wrote a study titled "The Economic Role of Investment Firms." A copy of this study was re-released under the title "J.Bogle on Investing, the First 50 year" (Fevurly, 2013).

In 1975 Bogle had the opportunity make his dreams come true. As chairman of the newly formed Vanguard Group, Bogle guided the company to low-cost investments. His company would become the first to offer low-cost ETF to the public. Vanguard could follow this strategy because of its unique structure. The company consists of shareholders who invest in its mutual funds and not a private profit-making investment group. Vanguard operates as a group, where low costs benefit all investors. This "mutual" fund company was a pioneering idea, and Vanguard is one of the companies that still operate in this way. The board of directors approved an ETF in May 1976 and created a detailed curriculum for the Securities and Exchange Commission (SEC).

The SEC approved the reciprocal and the first day it would go on the market was arranged for August 31, 1976. The only thing that was missing from equality was money. The fund needed an initial amount of money to start (Rubinstein, 2018).

2.4 The development of Index Funds

After the introduction of Vanguard's ETF, it took 7 years before the appearance of the second ETF. In 1984 Wells Fargo created the Stagecoach Corporate Stock Fund, which was linked to the S&P 500 index. Unfortunately, this capital had 1% management costs and for this reason it did not survive in the market. Since 1986 onwards, 9 more ETF'S were created by various companies, however, two ETF employ the international markets. One of the new chapters created in 1986 was the Vanguard Bond Market Fund. It was linked to the Lehman Brothers index. It was the first ETF dedicated exclusively to the bond market, and Bogle was confident that it would succeed. With a contribution of only 0.25% per annum, the Mutual Fund had a large cost advantage over the active bond funds that charged an average of 1% per year (Rubinstein, 2018).

Since its creation, the Vanguard Total Bond Market Index Fund has increased its capital to more than 11 billion. The expanded market capital was designed to complement the Vanguard 500 index. It was affiliated with the Wilshire 4500, an index consisting of small and mid-cap companies. But it was not in Vanguard's financial interest to invest in all 4500 shares. That's why the expanded market decided to invest it in 2000 shares from Wilshire's largest companies 4500 and in another 800 small and medium-sized companies based on a statistical sample. The result was to get for this fund a return identical to that of the Wilshire 4500, but at a very low cost (Patton, 2015).

The 90s

Vanguard increased the number of ETF in the family in the '90s. They added ETF which was aligned with the Russell 2000 small-Cap index, as well as with the Morgan Stanley Europe and Pacific Busin indices. The first competition came to the market in 1990. That year Fidelity created two ETF's, one based on the S&P 500 and the other on the Lehman Brothers index. So, by the end of 1990, there were 43 ETF's market from various companies. Most of them had little capital and Vanguard was undoubtedly the leader with 9 ETF and a capital of almost 9 billion. The average spending rate of the ETF for competitors was 0.5%, while for Vanguard it was 0.2% (Patton, 2015). The fact that the competitors were trying to emulate Vanguard was a triumph for J. Bogle and his team.

In the following years Vanguard added another 20 ETF's and by the end of the 90s they reached 29. These included a large collection of stocks, bonds, rebalanced and real estate investment mutual funds. Due to some good times for the shares of Large Cap of America, the popularity of the ETF's soared. The total number from 43 in 1990 reached 272 at the end of 1999. From 1997 to 1999, 40 new ETFs aligned themselves with the S&P. index (Rubinstein, 2018).

2.5 Definition of an Index Fund

An index fund is a type of mutual fund or exchange-traded fund (ETF) with a portfolio constructed to match or track the components of a financial market index, such as the Standard & Poor's 500 Index (S&P 500). An index mutual fund provides broad market exposure, low operating expenses, and low portfolio turnover. These funds follow their benchmark index regardless of the state of the markets (Grudzinski, 2012).

"Indexing" is a form of passive fund management. Instead of a fund portfolio manager actively stock picking and market timing—that is, choosing securities to invest in and strategizing when to buy and sell them—the fund manager builds a portfolio whose holdings mirror the securities of a particular index. The idea is that by mimicking the profile of the index—the stock market, or a broad segment of it—the fund will match its performance as well (Fevurly, 2013).

Portfolios of index funds only change substantially when their benchmark indexes change. If the fund is following a weighted index, its managers may periodically rebalance the percentage of different securities to reflect the weight of their presence in the benchmark. Weighting is a method that balances out the influence of any single holding in an index or a portfolio (Patton, 2015).

The main reasons that led to the creation of the ETF's are that their administrative expenses are significantly lower than those contained in active management portfolios due to the minimal movements of the shares that take place. They are therefore designed to enable the small or medium-sized investor to invest in the stock market, without the need for large capital. One invests in ETF when he believes that this stock market will have upward trends and therefore a good return. At the same time, he will want to avoid the stress of closely monitoring these shares or when someone does not have the knowledge to monitor the specific companies and shares.

The ETF is an investment approach that seeks to identify investment returns on a specific specialized equity or bond market index. The manager of the Mutual Fund tries to achieve these returns by buying and holding all the shares or a significant part (if there are many shares) contained in the index. It is in no way an attempt to use traditional money management or betting on individual shares or specific industrial sectors. Indexing is a passive investment approach, which emphasizes a broad portfolio diversification and a low trading capacity. What is a key word is its low cost?

An ETF should pay only minimal consultancy costs, while keeping the trading costs at a lower level, as is the case with the transaction costs and commissions. Therefore, from the above comes the conclusion that the ETF leaves the largest part of the profits to the investors, since the commissions are the minimum possible. Consequently, the ETF is managed on "autopilot". On the contrary, the managed income vehicles have expenditure ratios of 1% or higher, which means that in order to match the market's returns with the portfolio's returns after the commissions, the ETF must already have achieved these returns before the expenses (Patton, 2015).

2.6 Synthetic & Physical ETF

ETFs can be divided into two very important and distinct categories, physical ETFs, and synthetic ETFs. The former hold shares in their portfolios or invest in commodities, while synthetic ETFs use derivative financial products to achieve the return of an index or commodity. For example, a physical ETF investing in an index such as the S&P 500 would buy all its shares based on the index's weightings, whereas a synthetic ETF on the S&P 500 index would use Swaps with a third-party institution that would agree to yield

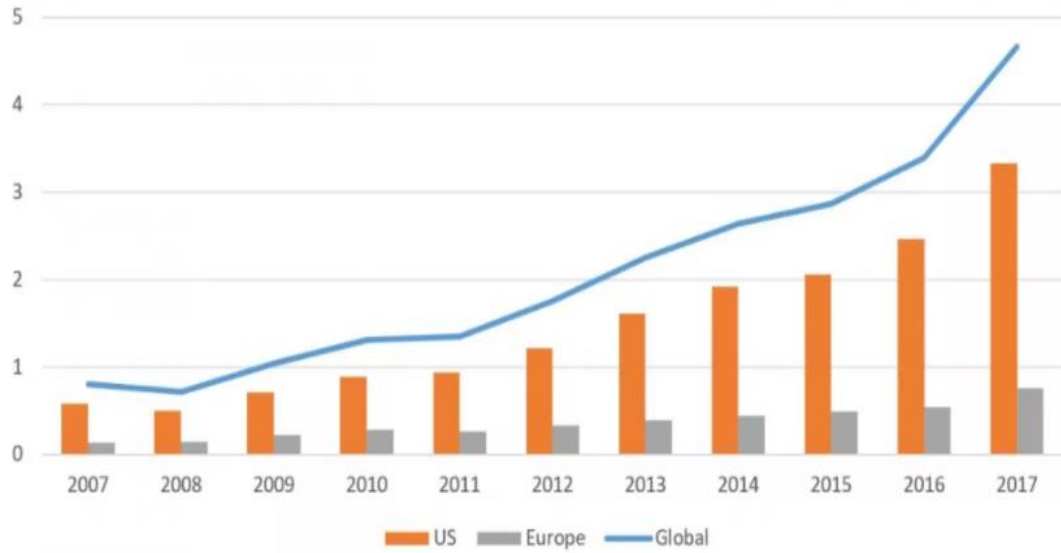
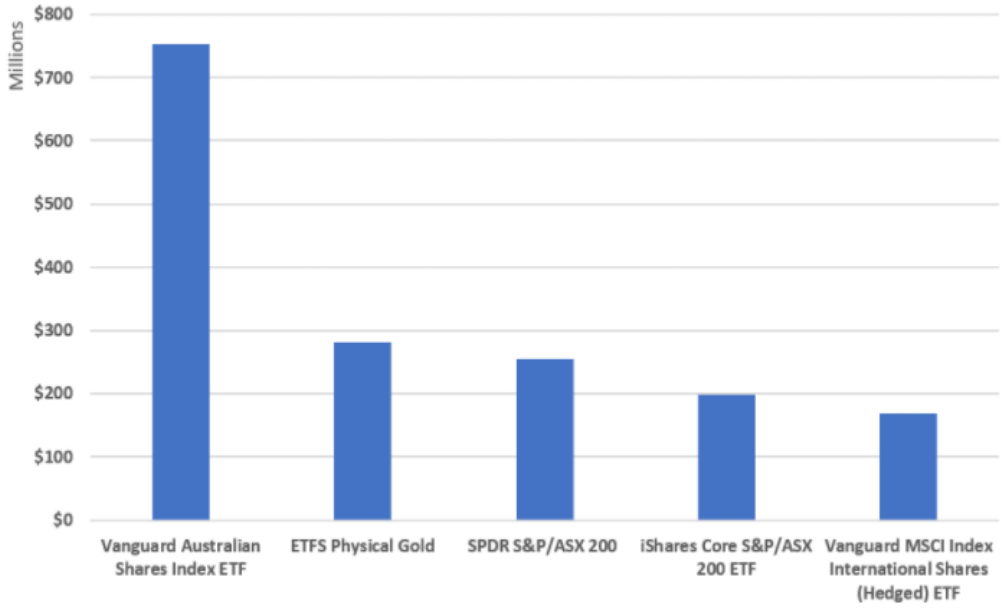
the performance of the index. In this way, the synthetic ETF achieves the performance of the index.

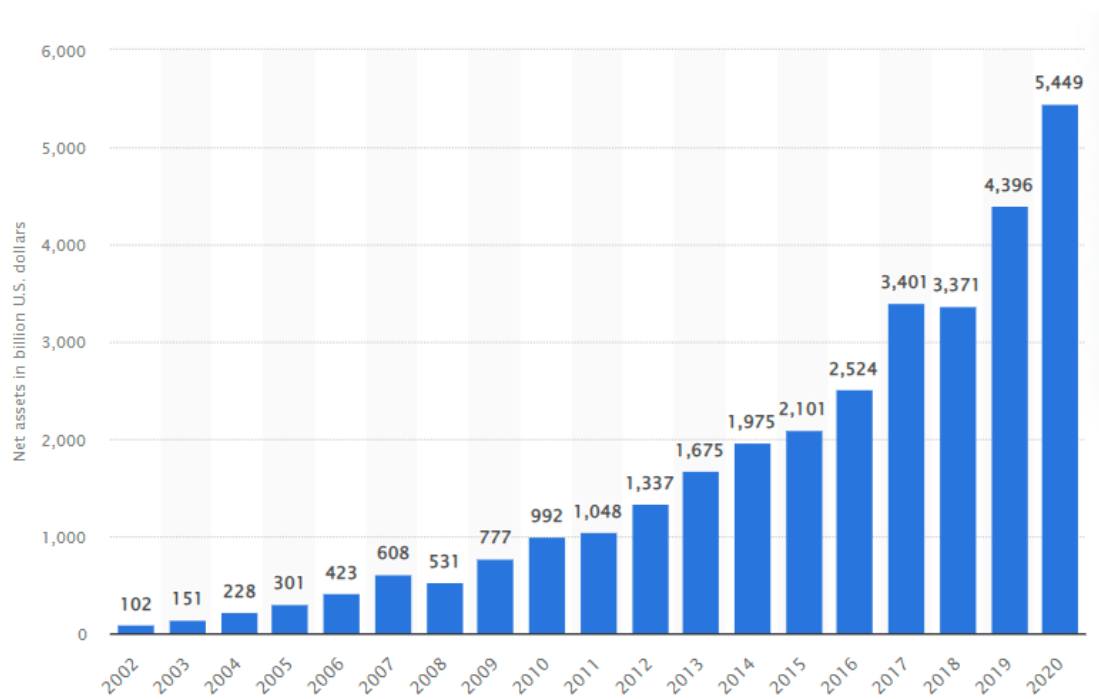
Understandably, having hundreds or even thousands of shares in an index increases the transaction costs and transactions on shares that an ETF must do, even if it has passive management. This is exacerbated if the index is reconstructed frequently. This is why many companies choose to reproduce indices using swaps. The more stocks that belong to an index, the more likely it is that the structure of a synthetic ETF will be preferred in order to reproduce its performance. Still, physical ETFs receive dividends throughout the year, but give them to investors once a quarter. These dividends received from the shares for the ETF are not reinvested, but are held as cash, until they are distributed to the unitholders (Svetina & Wasal, 2010) which undermines the accuracy of the reproduction of the index by physical ETFs.

In the case of ETFs in commodities, it is customary to reproduce their performance synthetically, as their storage and maintenance, depending on the commodity, is in most cases problematic. The exceptions are gold and copper. However, it is preferable for an ETF to make swaps to get the performance of these metals. In the US, an investor who buys gold bars and have a profit is subject to 28% taxation regardless of the amount of profit. For this reason, most investors choose to buy GOLD ETF rather than physically own it.

Due to the high popularity of ETFs in recent years there is fierce competition between ETF providers, as a result of which the latter are trying to find more efficient ways of reproducing the indices. Synthetic ETFs are most prevalent in Europe, where they account for 33% of the ETF market, but only 4% of the American ETF market. The trend in recent years is illustrated in the following graphs:

Australia's most popular ETFs in Q1 (\$m inflows)

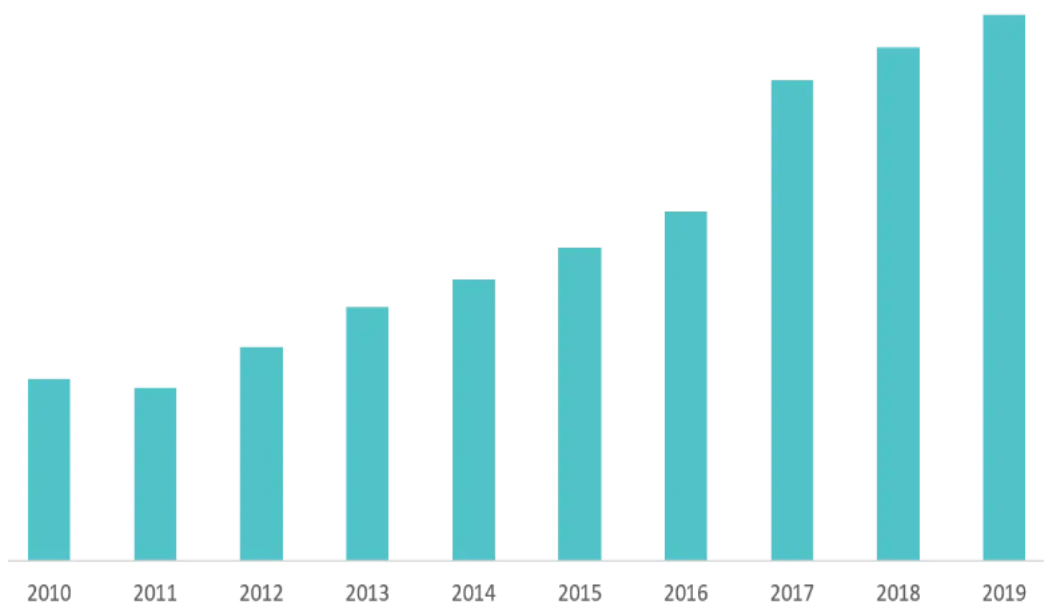




The explanation of this phenomenon has to do with the different legislative framework in Europe and the USA. The European legislative framework has more flexible regulations for issued ETFs and so there are more options for their publishers when it comes to copying their performance. Their structure allows the selection of investment items that are not related to the underlying elements of each index, which is intended to be reproduced. A similar legal framework exists in Asian markets (Ramaswamy, 2011).

On the contrary, the legal framework in the US is stricter and does not leave great opportunities for more complex structures without the complete reproduction of the index with possession of the shares that make up it. An ETF issued in the US must have the largest part of its data on investments related to the underlying index or commodity whose return it wishes to reproduce. The trend for European ETFs is shown in the chart below:

Value of Assets Managed by Exchange Traded Funds, Europe,
In billion USD, 2010-2019



2.7 Risks of Investing in ETFs

Although simulating an index an ETF can reduce and eliminate non-systematic risk through the diversification offered by investing in all stocks in an index, systematic risk remains. Investors are exposed to market risk if the index, which is reproduced, moves downwards. Here mutual funds prevail, as their active management enables them to take opposite positions in a bearish market by reducing losses or even creating profits for investors.

Although in most cases ETFs faithfully synthesize the indices or commodities that follow, there are cases where tracking errors occur. By tracking error, we mean the performance error generated between the ETF and the relevant index or commodity. The tracking error

can be zero, negative, but even positive and depends on factors such as market volatility, passive or active management, changes in the composition of indices, compound interest, the potential leverage of the ETF, its liquidity, the costs of managing an ETF, the time of its holding and others. The factors that affect the tracking error of an ETF, as well as its calculation, will be analyzed more extensively in the rest of the chapters.

The ETF market is relatively new compared to that of Mutual Funds. This means that for senior ETFs a potential investor can collect data and evaluate returns, risk and tracking error for 20+ years, but for the newer ETFs he does not have enough data to properly evaluate each ETF. In recent years, new ETFs have been created all the time and usually more complexly, on the contrary, Mutual Funds are left more or less the same in number and so investors have more information about their potential returns and management costs.

Synthetic ETFs achieve the returns of the following indices through Swaps. Although they have the advantage of reducing tracking error in this way compared to physical ETFs, they are exposed to Counterparty Risk, i.e., the risk that the counterparty will not fulfill its contractual obligations and not pay the amount owed on time. If the institution with which the Swap has been made goes bankrupt or finds itself in financial disfavor, then the Swap will not take place. To reduce this risk, the ETF must enter into collateralized agreements that bear some cost to the ETF.

Even physical ETFs, however, are exposed to this risk, as it is customary to lend their shares to make higher returns which means that there is always a risk that they will not be returned on time. Indeed, it is widely believed that the lending of shares creates the same level of risk for a physical ETF by carrying out Swaps on a synthetic ETF (Bioy & Rose, 2012), as the risk that the provision of the Swap will not be able to pay the issuer

the pre-agreed return is real, but the probability of large losses being written to the ETF is minimal due to the collateral.

Those investors who choose ETFs that invest in foreign equities should be aware that they are subject to foreign exchange risk and may lose money even if the underlying index or commodity in which they invest moves upwards (Anthropelos, Kupper, & Papapantoleon, 2018). Still, it is possible that an ETF is trading at different times than the underlying index it is reproducing. For example, Asian market ETFs are traded on the U.S. stock exchange. It has been observed that due to the time difference, volatility can have large fluctuations due to significant news effect, even if the index being reproduced is not at trading hours (Gutierrez, Martinez, & Tse, 2009).

ETFs trading does not stop even if the market whose performance is being reproduced remains closed, as in the case of Greece in the summer of 2015. Although ETFs investing in developed markets faithfully copy the indices, it has been observed that ETFs investing in growing markets show greater tracking errors and their liquidity is not so great, something that the potential investor should consider (Chen, Kwong, & Shum, 2012).

Finally, the widespread use of ETFs is likely to lead to increased volatility in the markets where the shares of the underlying index are traded. This phenomenon is greater in the shares of high-capitalization companies, as they are more involved in the reproduction of an index. The increased volatility mainly concerns the last minutes of stock trading, and this is because some forms of ETFs, and more specifically leveraged ETFs, must redefine their assets at the end of the day.

These transactions are knowledgeable in advance by several market participants, as the composition and objectives of ETFs are clearly certain, resulting in institutional investors taking the same positions just before the same positions and liquidating their positions after a while, locking in profits and increasing volatility at the end of the session (Bai et

al, 2012). As investment in ETFs increases, it will increasingly affect markets. It has been observed empirically, that the larger the beta of a stock, the more likely it is to be influenced by investments in ETFs whose portfolios also consist of that stock. Moreover, the higher the weighting of a stock in an index (and thus in an ETF that reproduces that index), the more it is affected by fluctuations in the trading volume of each ETF (Gutierrez, Martinez, & Tse, 2009).

3 The legal framework of ETF Worldwide

3.1 Legal Framework in the U.S.A.

In the U.S., there are two basic laws about investment companies, the Investment Company Act of 1933 and 1940, which describe how companies and formations dealing with investments operate, primarily mutual funds. The U.S. Securities and Exchange Commission SEC is responsible for the inclusion of each product in the respective legislative framework. Without going deep enough into these two laws, we will mention their features that are necessary for us to understand the differentiation and the logic of categorization for the financial products to which we refer.

The law of 1933 was a result of the great financial crisis of 1929. It regulates issues related to the listing of shares in the primary market as well as the way in which shares trade on the secondary market and mutual funds. Its main feature is that it recognizes to the investor the right to hold on the underlying elements of the investment. The first law of

1933 was not enough to restore confidence in the public, and so Congress passed in 1940 the corresponding law, also known as the 40 ACT. Its main objective was to regulate the operation of investment companies and schemes. Contrary to the previous law, it does not give a right of ownership (physical ownership) on the investment elements that make up the investment scheme (shares, commodities, currencies, etc.).

At the end of 2010, 90% of ETFs operated under the 1940 law while the remaining 10% under the 1930 law the following table shows the various investment products categorized according to the legal framework in which they fall.

Table 1 Legal categorization

<i>1940 ACT</i>	<i>1933 ACT</i>
<i>E.T.F.</i>	Exchange Traded Notes (ETN)
<i>Open End Funds</i>	Grantor Trusts
<i>Unit Investment Trusts (UIT)</i>	Limited Partnerships
	Exchange Traded Commodities (ETC)

From a legal point of view, the above separation is quite important and, in many cases, differentiates the risk or the investment purpose of the buyer of an ETF product, but its analysis requires a good knowledge of the two laws and goes beyond the purpose of the work. In everyday practice, although the above distinction is not made based on legal terminology, the purpose of each ETF is understood through its description except for the

ETN which is explicitly referred to as such products and secondly the Exchange Traded Commodities that include commodities and currencies.

The legislative basis for ETFs is 40 ACT and more specifically the articles mentioned in the Mutual Funds. But the structure and operation of ETFs does not correspond 100% to the 40 ACT, so some exceptions to the law are required. These exceptions are known as "Exemptions Relief" which is a series of requests from an ETF publisher to the SEC to exempt the ETF from some articles in the Investment Company Act 1940 that contradict their function. The reason is that there is not yet a complete adaptation of the legislation with these new financial products, while various additions and modifications are constantly being made to the existing legislation in order to minimize the requests for exemption. Each time an exemption is given does not mean that it is applied to each subsequent identical structure of an ETF, instead the competent committee decides separately for each scheme application.

Since 2008, the SEC has consulted rule 33-8901, which includes some very common and simple exceptions, making the process a little easier, but there has so far been no significant legislative development.

3.2 The European Legal Framework

Many of the ETFs were originally created for the United States market with the legislation there in mind. In the European Union the rules for such investment schemes are different and for this purpose a committee has been set up with powers to examine requests for ETFs trading on European markets. The legislation applicable in such cases has to do

with the UCITS Undertaking for Collective Investment in Transferable Securities legal framework, known in Greece as UCITS

3.3 The Greek Legal Framework

Exchange-traded Funds (ETFs) are Undertakings for Collective Investment in Transferable Securities as described in EU Directive 611/1985 as in force, according to the information document of the Athens Stock Exchange. Their assets constitute a total of assets and are managed by the managing company (MFMC) on behalf of the shareholders to whom it belongs indivisible. More specific issues related to the creation / acquisition and trading refer to decisions of the Hellenic Capital Market Commission and the STA (Securities Court System) regulation that are mentioned in detail elsewhere. In the Greek stock market, there is no division into ETFs as in the NYSE and all schemes are designed to copy the performance of a stock index.

4 Effects of ETF's in the market

4.1 Causes of the Rise of the ETF Market

The popularity of ETFs is summed up in the fact that they give investors the opportunity to have both the benefits of stocks, such as high liquidity, shorting, the listing of various types of orders in the stock market system, and the diversification that mutual funds give without having to buy many shares. Another important reason for the rise of ETFs worldwide is the tax benefits that this type of investment has. The passive management implied by the composition of an index implies that few sales are made and therefore investors are less burdened by capital taxes on profits (Grudzinski, 2012). This buy and

hold strategy means that the ETF will not sell the shares that have moved upwards and made profits and will therefore not be taxed on them.

In practice, the ETF sells shares only if there is a change in the composition of the index, which it simulates. The stocks that make up an index change at regular intervals and when that happens the portfolio of the respective ETF changes as well. On the contrary, a Fund with active management necessarily constantly proceeds to buying and selling, which also entails increased expenses in taxes, which undermine the returns of investors. In the potential scenario where many holders want to liquidate their positions in a Mutual Fund at the same period, it is possible that the company managing the Mutual Fund will not have the necessary cash and will be forced to sell some of its profitable positions in securities, thus creating capital gains for which it will be taxed even if the total return of the mutual fund is negative.

This reduces the yield of the remaining shareholders. In ETFs, on the other hand, the purchase and sale of shares is made on the stock exchange without the management company being involved and therefore the sale of shares does not imply the sale of shares by the ETF, with the result that no capital gains are generated for the ETF and the rest of the holders are not burdened. If there is no investor in the market who wants to take the opposite position from them who wishes to buy or sell an ETF, then the process of creating and redeeming units occurs, which also does not burden the other holders in tax.

The ability that ETFs give investors to invest in any market in the world may also change the criteria by which they invest. That is, they are likely now to be more interested in the long-term prospects of an economy, in which they can invest with a single mandate (e.g., in which growing market it would be preferable to invest - developing market ETFs have flourished in recent years) than in which stock in an economy is overvalued/ undervalued. In general, the risk of investors who do not have enough information compared to

institutional investors is significantly lower in the ETF market than in the purchase of individual shares, thus reducing the risk they run from asymmetric information phenomena (Fevurly, 2013)

4.2 Advantages of ETF's

1. Reproduction of a very wide range of assets, such as stock indices, commodities (precious metals, agricultural products, natural resources), bonds, exchange rates or even groups of stocks.
2. They are traded in real time on stock exchanges, as opposed to Mutual Funds that can only be bought or sold once at the end of the day.
3. They do not have a predetermined maturity date and a margin account is required to invest in them.
4. They have significantly lower management costs compared to Mutual Funds.
5. Diversification of non-systematic risk is achieved without the need for a retail investor to pay large amounts in commissions.
6. They are very transparent, as they must disclose how they will carry out the stated investment policy.
7. They are fully liquidated due to the presence of a market maker, the sale of their units can be made at any time during the stock exchange session.

8. Very few investors are given the opportunity to invest in growing markets or commodities, which until recently was very difficult.
9. Investors can sell ETFs just as they sell shares.
10. Because of their structure they show significant tax benefits compared to other financial products.

4.3 Disadvantages of ETF's

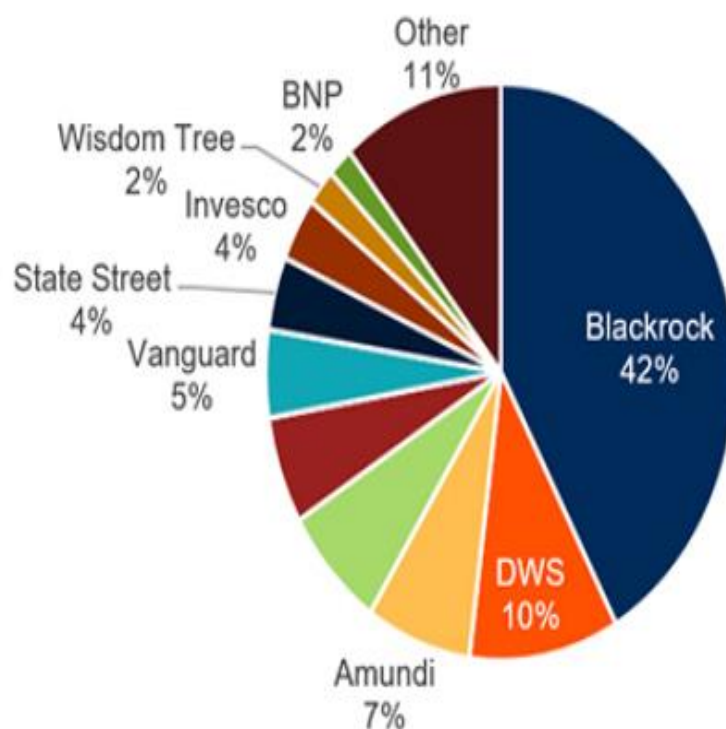
1. Investing in ETFs cannot eliminate the systematic risk that exists in the markets.
2. Depending on the type of ETF it is likely to suffer a significant number of tracking error.
3. For the newest ETFs there is not enough historical data for investors to assess their profitability over time.
4. The practice of borrowing shares, but also the realization of Swaps to replicate an index, lurk counterparty risk.
5. ETFs investing in foreign equities are subject to foreign exchange rate risk.
6. There are significant concerns that the widespread use of ETFs increases volatility in the markets.

4.4 European Market landscape

The guidelines for Undertakings for Collective Investment in Transferable Securities apply to most European investment funds, including exchange traded funds (UCITS). The goal of the directive, which was first enacted in 1985, was to achieve a uniform regulatory framework and make it easier to distribute investment capital across European borders (Grudzinski, 2012). Because the UCITS law is an EU directive, it must first be implemented into national legislation. The UCITS legislation is founded on a set of principles aimed at ensuring the safety of investors. The notion of asset segregation, which requires the assets of the fund to be deposited in a segregated account with a custodian bank, is undoubtedly the most important.

These assets are not included in the insolvency estate and are thus protected in the event of the ETF issuer's bankruptcy. Importantly, the UCITS guidelines prescribe limits for asset eligibility and portfolio diversification, restricting, for example, the percentage of the fund's portfolio that can be invested in a single title or titles from a single issuer. Furthermore, the rule mandates that specific information be made public to investors and that shares be redeemed at NAV, distinguishing UCITS compliant funds from hedge funds (Fevurly, 2013).

The European ETF market's competitive landscape is characterized by fierce competition among providers. While market leader BlackRock (iShares) controls about half of all assets under management, the followers, especially DWS is fiercely competing for market dominance and second place. The balance of the market is split amongst a slew of smaller players. The following graph depicts the market share distribution among the top 37 ETF providers active in Europe in 2021.



4.5 Delimitation to similar financial products

4.5.1 ETCs and ETNs

Following the popularity of ETFs, additional products with names that sound a lot like ETFs were launched to the market: exchange traded commodities (ETCs) and exchange traded notes (ETNs) (ETNs). Although the products share several features, such as exchange tradability, high liquidity, and a similar creation and redemption procedure, they are fundamentally different from a legal standpoint (Rubinstein, 2018). ETCs and ETNs, unlike ETFs, are debt securities, not collective investment vehicles (funds), and hence subject investors to issuer risk.

ETCs were designed as a replacement for commodity ETFs, which are restricted to tracking diversified commodities indices due to their status as funds under the UCITS legislation.

ETCs, as debt securities, are exempt from this restriction and can provide exposure to a single commodity (ETF Securities, 2013, p. 12). ETNs are debt securities that, like ETCs, are issued by a financial institution. The notes, like conventional bonds, have a set maturity date, but there are no interest payments. Instead, the performance of the notes is tied to that of an underlying index or asset. ETNs provide a mechanism to gain exposure to specific markets even when they are experiencing liquidity difficulties because repayment is solely dependent on the issuer.

However, because ETNs are not collateralized, investors are exposed to full issuer risk, which means that the issuing entity's creditworthiness becomes more important. As a result, a downgrade of the issuer can result in a loss of value for the note.

5 ETF's performance

5.1 Introduction

According to the EY Global ETF Survey 2020, ETFs are expected to increase at a rate of 15% per year over the next five years. Aside from that, EY estimates that ETF assets would reach \$7.6 trillion by 2024. According to Deloitte's Growth of ETFs in Europe research, ETFs have grown by an average of 20.4 percent every year in Europe. For the past decade, the European ETF's asset under management has grown at a rate of 20.1 percent per year.

ETFs (Exchange Traded Funds) have been a hot topic in academic circles for quite some time. Since the first ETF was established in 1993 in the United States (US), ETFs have grown at an exponential rate, reaching a market capitalization of 19.8 billion dollars by the end of 1999. The first literature to discuss ETFs following their formation is Elton et

al (2000). According to Elton et al (2000), Spider, an ETF that tracks the S&P500, had the largest daily dollar volume for any share traded in 1998. This demonstrates how important ETFs are. Meanwhile, the first ETF was issued in Europe in April 2000, as Mussavian and Hirsch (2002) explain in their research. Both Elton et al (2000) and Mussavian and Hirsch (2002) stated that ETFs in the United States and Europe are transparent, with small price variations from their Net Asset Value (NAV). This is due to ETFs' capacity to be created and deleted. Gallagher and Segara (2006) agree with Elton et al (2000), finding consistent data indicating that the ETFs instruments in Australia do not have a substantial price-to-NAV variance.

As a result, various countries throughout the world have established ETFs to copy indexes, after the formation of ETFs in the United States and the issuance of ETFs in Europe. Despite the massive rise of ETFs, Gallagher and Segara (2005) found that ETFs are not as widely used in Australia as they are in the US and Europe. According to Gallagher and Segara (2005), the reason why investors do not embrace Australian ETFs is because the up-front cost that is necessary to enter the funds in Australia is not present in most US funds. As a result, fund managers in Australia are at a disadvantage when it comes to launching ETFs.

The study of ETF performance is one area that is important in observing ETF behavior. The average performance of the ETFs might be found in the literature by Svetina and Wahal (2008). This is due to the vast number of ETFs deployed and the diversity of sectors and markets covered by the ETFs. The ETFs utilized in this study are in total 584 and cover a wide range of sectors, including domestic equity, overseas equity, and fixed income ETFs. The literature demonstrates that ETFs, on average, underperform the benchmark index.

Another conclusion reached by Syetina and Wahal (2008) is that 83 percent of ETFs are focused on a specific and narrow market in order to provide investors with niche exposures, and so cannot be directly invested in utilizing index mutual funds. There is additional research being conducted to see if trading tactics may be used to obtain an excess return while investing in ETFs. Tse (2015) investigates the use of ETFs in momentum trading methods. The data, however, show that momentum trading methods have a statistically small impact on ETF returns. Only a few ETFs have shown excess return, especially since the financial crisis of 2008. However, after the financial crisis, the return dropped. Overall, ETF-based momentum strategies outperform traditional buy-and-hold investment strategies. The disadvantage is that it excludes the effects of momentum methods on other ETF-based investment strategies, such as value and other trading strategies.

5.2 ETF's Performance across different Countries

There are other studies that compare the performance of ETFs in different nations and the reasons behind the ETF's performance. In the United States, Elton et al (2000) found that Spider underperforms the S&P500 Index, with the major explanations being management fees and dividend reinvestment, which results in a loss of return. Similarly, European ETFs underperform their benchmark index, as Blitz et al (2012) reported in their study. However, according to Blitz et al (2012), the underperformance is explained not only by the spending ratio, but also by dividend withholding taxes. Milonas and Rompotis (2014) focused their investigation on ETFs sold in the Swiss market.

One of the most striking results they make is that the ETF's tracking error is quite big. The global emerging markets ETF is in the same boat. According to Blitz and Huij (2012),

the returns of ETFs in comparison to the returns of the benchmark index in the global emerging markets, which include countries such as Russia, China, South Korea, India, South Africa, and Brazil, have no significant meaning because ETFs have high levels of tracking error. In markets where ETFs are in their early stages of growth, the situation is different. According to Prasanna (2012), ETFs listed on the Indian Stock Exchange grew at a stunning 37 percent every year from 2006 to 2011.

MSCI Index Total Return					
Index	Proxy ETF	1 Yr	3 Yr	5 Yr	10 Yr
DENMARK	EDEN	24.41%	18.70%	13.21%	11.97%
IRELAND	EIRL	16.85%	19.33%	15.60%	-4.32%
BELGIUM	EWK	12.98%	15.13%	14.10%	3.47%
ISRAEL	EIS	10.83%	14.77%	1.35%	5.11%
JAPAN	EWJ	9.90%	10.45%	4.61%	1.08%
AUSTRIA	EWO	3.87%	-5.72%	-7.38%	-6.91%
FINLAND	EFNL	3.13%	15.44%	4.34%	3.32%
ITALY	EWI	2.99%	4.37%	0.06%	-2.14%
PORTUGAL	PGAL	1.88%	-10.69%	-10.21%	-4.06%
NETHERLANDS	EWN	1.71%	9.08%	6.79%	5.43%
USA	VTI	1.32%	15.06%	12.52%	7.37%
SWITZERLAND	EWL	1.20%	9.12%	8.20%	7.29%
FRANCE	EWQ	0.78%	5.40%	3.85%	3.26%
WORLD	VT	-0.32%	10.23%	8.19%	5.56%
WORLD	ACWI	-0.32%	10.23%	8.19%	5.56%
EAFE	VEA	-0.39%	5.46%	4.07%	3.50%
HONG KONG	EWH	-0.54%	5.10%	4.57%	8.29%
EMU	EZU	-0.76%	5.99%	3.93%	3.12%
GERMANY	EWG	-1.27%	5.66%	5.16%	6.07%
EUROPE	VGK	-2.34%	5.08%	4.48%	3.96%
WORLD ex USA	VXUS	-2.60%	4.41%	3.28%	3.41%
SWEDEN	EWD	-3.99%	4.18%	3.44%	7.05%
NEW ZEALAND	ENZL	-5.35%	4.74%	9.76%	4.76%
UNITED KINGDOM	EWU	-7.51%	1.86%	3.50%	3.09%
PACIFIC ex JAPAN	EPP	-8.35%	-1.19%	1.00%	6.44%
AUSTRALIA	EWA	-9.77%	-3.06%	-0.12%	5.66%
NORWAY	ENOR	-14.22%	-9.31%	-4.10%	1.81%
SPAIN	EWP	-15.39%	2.30%	-0.08%	2.49%
SINGAPORE	EWS	-17.68%	-4.79%	-1.48%	6.94%
CANADA	EWC	-23.59%	-5.97%	-4.30%	2.61%

Figure 1 MSCI Index Total Return (2021),

MSCI Index Total Return					
MSCI Index	Proxy ETF	1 Yr	3 Yr	5 Yr	10 Yr
HUNGARY	n/a	36.31%	-2.34%	-5.37%	-3.07%
RUSSIA	RSX	5.00%	-16.79%	-11.86%	-4.03%
INDIA	INDA	-5.99%	3.55%	-2.39%	7.23%
PHILIPPINES	EPHE	-6.25%	5.11%	11.39%	15.57%
KOREA	EWY	-6.30%	-4.47%	-1.35%	3.26%
CHINA	MCHI	-7.62%	1.31%	0.91%	10.31%
TAIWAN	EWT	-10.97%	2.46%	0.21%	4.79%
MEXICO	EWV	-14.24%	-7.94%	-2.42%	4.82%
EMERGING MARKETS	VWO	-14.59%	-6.43%	-4.47%	3.95%
CHILE	ECH	-16.85%	-16.90%	-13.04%	3.35%
UNITED ARAB EMIRATES	UAE	-17.94%	21.04%	13.22%	-6.71%
INDONESIA	IDX	-19.08%	-7.49%	-2.37%	12.43%
QATAR	QAT	-19.52%	6.86%	5.28%	2.06%
MALAYSIA	EWM	-20.06%	-8.38%	-2.53%	8.00%
THAILAND	THD	-23.32%	-8.45%	0.21%	9.01%
EGYPT	EGPT	-23.52%	2.29%	-3.51%	1.51%
POLAND	EPOL	-24.91%	-12.40%	-7.75%	-1.09%
SOUTH AFRICA	EZA	-25.13%	-9.33%	-5.35%	3.59%
TURKEY	TUR	-31.55%	-15.71%	-8.53%	-0.52%
PERU	EPU	-31.66%	-19.08%	-12.91%	9.62%
BRAZIL	EWZ	-41.18%	-24.68%	-19.59%	-0.55%
COLOMBIA	ICOL	-41.80%	-28.33%	-13.83%	2.10%
GREECE	GREK	-61.25%	-29.17%	-32.49%	-24.61%

Figure 2 MSCI Index Total Return (2021)

Unlike the previously reported study on ETFs in developed and emerging economies, the Indian ETFS exceed the benchmark index, CNX NIFTY, by 3% every year. Furthermore, after the financial crisis, Gold ETFs produced a 13 percent excess return over the market. Moving on to South Africa, Strydom et al (2015) discovered that South African ETFs outperformed index funds in terms of tracking the benchmark index. As a result, the author suggests that for better replication of the index benchmark, investors seeking exposure to the South African market should consider ETFs rather than mutual index funds. However, ETFs behave similarly to developed market ETFs in that they underperform the benchmark index, which in this case is the FTSE/JSE Top 40 Index.

5.3 ETF's Performance Advantages

Aside from that, another benefit of ETFs is that they give investors with a specific exposure to a specific market. This is abundantly demonstrated in the literature by Meric et al (2010), who used ETFs to establish the industry that suffered the most losses during the financial crisis. Meric et al (2010) examined the performance of ETFs during the bear market, which lasted from 2007 to 2009. The authors find that ETFs in the financials and home construction sectors produce the biggest losses, whilst ETFs in the healthcare and consumer staples sectors produce the least losses and thus the best performances, based on the data they obtained using the Sharpe and Treynor ratios. As a result, the feature of an ETF that focuses on a small, specialist market is beneficial not just to investors but also to academic study.

Moving on to another subject, many studies have been conducted to determine the differences between ETFs and other typical index mutual funds about the effects in the financial markets. The key differences between index mutual funds and ETFs, according to Kostoversky (2003), are management fees, shareholder transaction fees, and taxation efficiency. The author also concludes that the two investing instruments have a few qualitative differences. One advantage of ETFs is that they are relatively easy to trade, as they may be purchased and sold at any time of day, comparable to regular stock.

Aside from that, investors can use ETFs to place stop-loss and limit orders, which are important for limiting the amount of loss an investment can suffer. The advantage of index funds, on the other hand, is that they make the entire investment process easier for investors than ETFs. The execution of an investment in an index fund needs fewer procedures. The author states that the models given are not a perfect approximation of real-world circumstances, which is a shortcoming of this paper.

Agapova (2010) analyzes index funds with exchange-traded funds (ETFs) and concludes that the two financial products are equivalents for each other, though not perfect substitutes. In contrast to Kostoversky's (2003) article, the findings in Agapova's (2010) paper suggests that the many characteristics of index funds and ETFs are influenced by more than just price and cost. Because the funds coexist, they naturally target separate market groups, resulting in the funds focusing on different market niches.

Aside from that, there is also research looking into the differences in performance between ETFs and closed-end country funds. The overall finding of Harper et al. (2005) is that ETFs outperform closed end funds due to lower expense ratios. ETFs also have a greater Sharpe ratio than closed-end funds. Furthermore, closed end funds have negative alpha, which means that investing in a passively managed ETF yields a larger return than investing in an actively managed closed end fund.

Considering all the preceding research, it is clear that there are less studies on European ETFs, despite the fact that the European market is the second largest in terms of ETF trading volume and frequency. In addition, there are fewer studies that employ recent data, which is the gap that I seek to fill. The finance research that I intend to conduct will look at the performance of European index mutual funds and exchange-traded funds (ETFs) using up-to-date data.

Although there are few ETF research studies in the Asia market, and it is worthwhile to conduct one given the region's rapid expansion and the potential for ETFs to beat the market, there are limits in terms of data availability from Asian countries. Aside from that, the US has the most ETFs traded, followed by Europe, Asia, and the rest of the globe. As a result, this research will be possible due to the large amount of data available for the European market. One of the motivations for performing this research is to see if the

conclusions found by Blitz et al (2012) regarding ETF performance still hold true in the present financial market.

	S&P500 OR MSCI USA	MSCI EUROPE	MSCI JAPAN OR TOPIX	MSCI WORLD	MSCI EM	Median
ETFs						
iShares	-0.54%	-0.31%	-0.34%	-0.36%	-0.14%	-0.34%
Lyxor	-0.44%	-0.33%	-0.39%	-0.27%	-0.20%	-0.33%
INDEX FUNDS						
Vanguard	-0.30%	-0.12%	-0.36%	-0.02%	-0.24%	-0.34%
PICTET	0.03%	-0.32%	0.002%		0.02%	0.01%
Median	-0.44%	-0.32%	-0.35%	-0.32%	-0.20%	-0.34%

Figure 3 Performance of Funds (source (Chan, Shelton, & Wu, 2018):

Almost all funds, according to above figure, underperformed their benchmark indices. The equity indexes were outperformed by 3 basis points, 0.2 basis points, and 2 basis points, respectively, by PICTET funds that tracked the S&P500, MSCI Japan, and MSCI Emerging Markets (EM). The level of fund underperformance for the remaining funds ranges from 2 to 54 basis points per year, which differs slightly from the underperformance identified in Blitz et al (2012).

Blitz et al (2012) estimated the underperformance of European index funds and ETFs to be between 50 and 150 basis points per year in their paper. Furthermore, the underperformance of the funds in my sample is 34 basis points on average. This result is significantly lower than the median underperformance of European funds observed by Blitz et al (2012) in their analysis, which is 84 basis points. This suggests that the funds' performance may have improved from 2011 to 2021 when compared to the funds listed in Europe from 2003 to 2008, as determined by Blitz et al (2012).

However, in our study, the underperformance of European ETFs and index funds is greater than that of the US's oldest ETF, The Standard and Poor's Depository Receipts (Spider), which tracked the S&P 500 index and underperformed the benchmark index by only 28 basis points, as reported by Elton et al (2000).

We also should point out that funds that track different benchmark indexes have varied returns. In previous table we show that the median underperformance of funds monitoring the S& P 500 and MSCI USA is 44 basis points, whereas the median underperformance of funds tracking MSCI Europe, MSCI Japan, and MSCI EM is 32, 35, and 32 basis points, respectively. Unlike the findings of Blitz et al (2012), the lowest median underperformance of funds in our sample comes from funds that track MSCI EM, with a median underperformance of only 20 basis points, rather than funds that track Japan benchmark indexes. The fund that tracks the MSCI EM, on the other hand, has a huge

tracking error, therefore the median has no value. Finally, fund performance varies depending on the benchmark indices that the funds tracked.

6 Effects of ETF's Liquidity in the market

According to Chen J., 2020 one of the biggest fears about this financial product is the effect they have on the market and whether it can create financial bubbles. That is, if the increase in prices is not their real valuation but is created by the market at an uncontrolled growth rate, which does not correspond to reality. There are many ETFs that were created during the crisis period which have a terrible inflow and outflow of capital.

While they are currently one of the most competitive and profitable products, it is not certain that this will continue in times when the market will be stagnant or growing. However, this does not contradict the fact that in May 2010, August 2015 and February 2018, ETFs were the products that many consider having stopped the decline of the market. Apart from this fear, too, the great tension over the buying and selling of these mutual funds is undoubtedly whether it will attract today's plethora of investors in the future. As a result, there will be an oversupply of mutual funds, and this will not be able to be met by the demand that exists at the time. Therefore, this will bring about a "bursting of the bubble" in the market.

Liquidity is the ease with which a financial product or asset can be sold and converted into cash. Liquidity is directly influenced by the supply and demand that exists for the specific product or asset and indirectly by other factors such as possible market disturbances.

Think about the liquidity of an asset in relation to how easily that asset could be converted into money that can be used. Shares are liquid assets as they can be converted very easily into usable money. This does not mean that they retain their value, but that whatever their

value at the given time you decide to sell them, this will be the amount of cash that you will be able to access very quickly.

Liquidity is, in other words, the ability to quickly resell an asset without much change in its price and with minimal loss of value. Money is the most liquid element because it can be used directly for all transactions of a business. In Accounting, liquidity is the ability of current Assets to cover current Liabilities when they become due. The degree of liquidity of an asset is the period that is expected to elapse until the Receivables are converted into cash. A company that has high liquidity, has a lower risk of liquidity, that is, a risk of finding it difficult to meet its debts, than a company that does not have this ability.

We also should note that the debut of 30 ETFs (AMEX listed) on the New York Stock Exchange is investigated by Boehmer and Boehmer (2003). (NYSE). The authors see a significant boost in market liquidity and quality following the debut of these ETFs. Spreads (quoted, effective, and realized) all fell by double digits, while price impact fell and quoted depth rose. Similarly, Hegde and McDermott (2004) examine the DIAMONDS (Q) ETF's debut in 1998. (1999).

The authors found that, following the debut of these ETFs, market liquidity of component equities improved dramatically over the first 50 trading days, confirming the arbitrage theory. Richie and Madura (2007) found that stocks with a lower weighting in the QQQ ETF experienced a bigger increase in liquidity than stocks with a higher weighting, indicating an asymmetric liquidity effect. Marshall, Nguyen, and Visaltanachoti (2015) examine the liquidity of over 800 exchange-traded funds (ETFs), including sector stock, commodities, real estate, and bond funds.

The findings show a substantial positive relationship between the ETF's liquidity and the underlying securities. Furthermore, the authors show that the liquidity of ETFs and

underlying securities is reciprocal: The liquidity of ETFs has an impact on the liquidity of the underlyings, but it is also influenced by the latter.

Hamm (2014) examines the liquidity of individual assets and how it is influenced by ETF ownership. When compared to similar securities that are not included in an ETF, ETF equities have more liquidity. These results, on the other hand, could be due to endogenous factors. The effect of ETF ownership on liquidity is investigated by Agarwal, Hanouna, Moussawi, and Stahel (2018), who conclude that ETF ownership boosts liquidity comovement of securities through the arbitrage channel. As a result, owning an ETF exposes you to additional liquidity risk that you can't diversify away.

6.1 Factors that influence ETF Liquidity

ETFs do, after all, have more liquidity than mutual funds. The liquidity of an ETF is determined by a number of primary and secondary factors:

The following are the most important factors:

- The ETF's composition
- The total trading volume of the ETF's individual securities.

Secondary factors include:

- The ETF's overall trading volume
- The current investment climate

Let's take a closer look at each of these.

6.1.1 Primary Factor of ETF Composition

ETFs can be used to invest in real estate, fixed income, equities, commodities, and futures, among other asset classes. Most ETFs replicate certain indices within the stock market, such as large-cap, midcap, small-cap, growth, or value indexes. ETFs that specialize on certain market sectors, such as technology, as well as specific countries or regions, are also available.

The most liquid ETFs are those that invest in large-cap, domestically listed corporations. Several aspects of the securities that make up an ETF will have an impact on its liquidity in the Market. The most important are listed below.

Asset Class

ETFs investing in securities, such as real estate, are less liquid than those investing in more liquid assets, such as equities or fixed income.

Market Capitalization

Market capitalization is calculated by multiplying the number of outstanding shares of a publicly listed company by the current market price per share. Large-cap stocks, which are by definition the most valuable and lucrative of publicly listed equities, are frequently the most well-known traded securities.

If the securities are well-known and widely traded, ETFs that invest in equities are usually more liquid. Because these companies are well-known, they are frequently held in investor portfolios, and their trading volume is large, resulting in high liquidity.

Small-cap and midcap company equities, on the other hand, are neither in high demand nor commonly held in investment portfolios, as a result, an ETF tracking low-cap firms

is a low-volume ETF, implying that liquidity for these stocks is limited (Grudzinski, 2012).

6.1.2 Risk Profile of the underlying Securities

The more liquid an asset is, the less hazardous it is. Consider the following scenario: Small-cap and midcap equities are thought to be riskier than large-cap companies. Securities issued by corporations in mature economies are thought to be less hazardous than those issued by companies in emerging economies. ETFs that invest in broad market indices are safer than those that target individual industries.

ETFs that invest in investment-grade corporate bonds and Treasury bonds are less hazardous than those that invest in lower-grade assets in the fixed-income industry. ETFs that invest in large-cap equities, developed economies, broad market indexes, and investment-grade bonds will be more liquid as a result than those that invest in riskier assets.

6.1.3 Where the Securities in an ETF Are Domiciled

For a variety of reasons, domestic securities are more liquid than foreign assets:

- Different time zones are used to trade foreign securities.
- Different trading laws and regulations govern foreign exchanges and the countries in which they are based, affecting liquidity.
- Because most international equities are held through American depositary receipts (ADRs), which are securities that invest in the

securities of foreign businesses rather than the actual foreign securities, ETFs that invest in ADRs have lower liquidity than ETFs that do not.

The size of the exchange where the ETF's securities are traded also matters. ETFs that invest in assets that trade on large, well-known exchanges are more liquid than ETFs that do not (Chen, Kwong, & Shum, 2012).

6.1.4 Trading Volume of ETF Component Stocks

Trading volume, like market price, has an impact on a stock's liquidity. The volume of trading is determined by supply and demand. Lower-risk assets are more readily exchanged in the financial market, resulting in higher trading volume and liquidity. As a rule of thumb, the more actively traded an asset is, the more liquid it is. Hence, ETFs that invest in actively traded securities will be more liquid than those that do not.

6.2 Trading Volume of the ETF

An ETF's trading volume has just a little impact on its liquidity. ETFs that invest in SP 500 stocks, for example, are regularly traded, resulting in slightly increased liquidity. Low-volume ETFs usually track small-cap firms, which are traded less frequently and so have less liquidity.

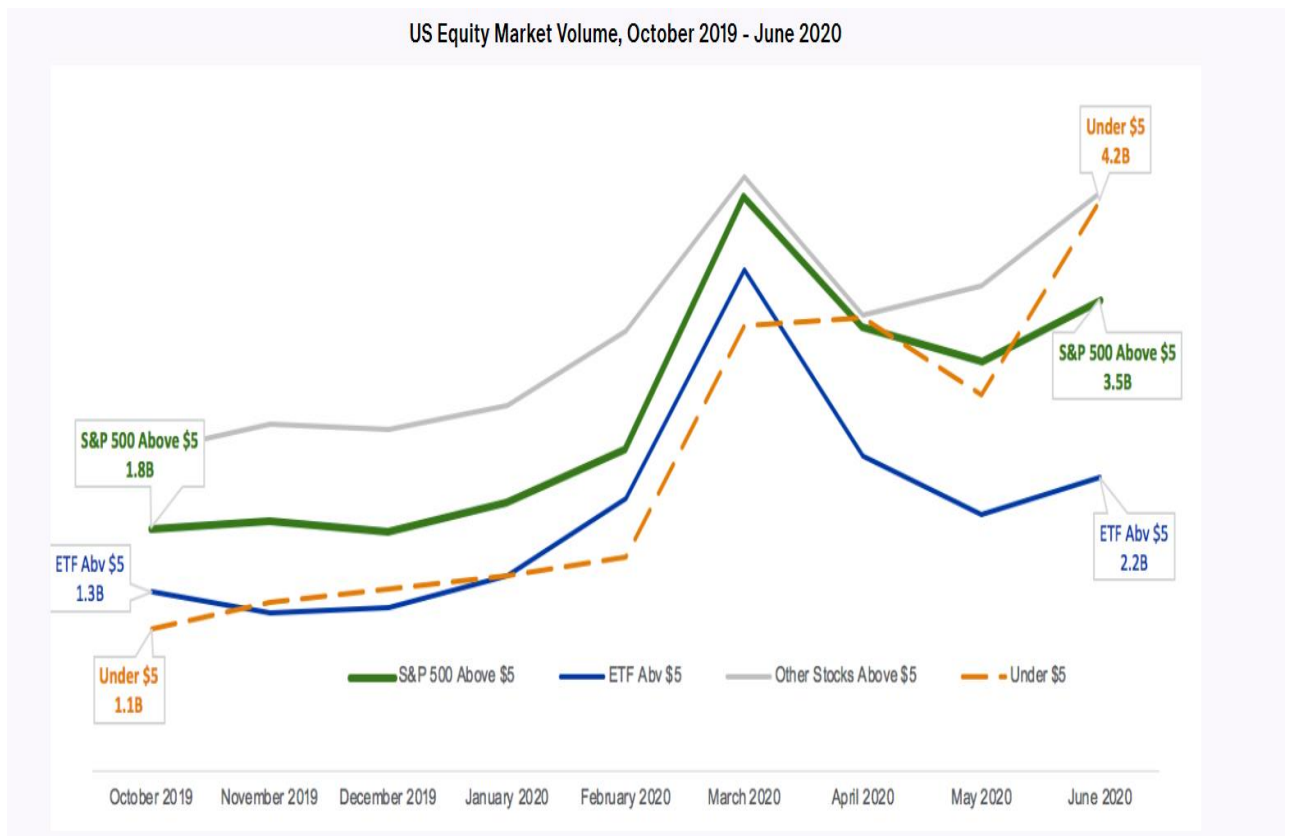


Figure 4 US Equity Market Volume, October 2019 - June 2020

Source <https://www.nyse.com/data-insights/market-volume-and-off-exchange-trading>

We also note that (Agarwal, Hanouna, Moussawi, & Stahel, 2018) utilize the reconstitution of the Russell 1000 and Russell 2000 indices as a natural experiment, capturing exogenous change in ETF ownership, and their findings can be interpreted causally. Furthermore, they demonstrate that these findings are unaffected by mutual fund and big institutional investor ownership. Finally, Agarwal et al. (2018) show that increased arbitrage activity in the primary and secondary markets of ETFs is linked to increased liquidity in component stocks.

6.3 The investment environment

The trading environment will affect liquidity since trading activity is a direct reflection of supply and demand for financial products. For example, if a specific market sector becomes popular, so will ETFs that invest in that sector, causing temporary liquidity concerns.

6.4 Chapter Conclusion

Overall, most studies conclude that ETFs increase the liquidity of their underlying security baskets. However, Flash Crashes (e.g., May 6th, 2010 and August 24th, 2015) have shown how acute market instability affects ETF liquidity provision. The academic literature on ETFs in times of financial difficulty is presented in the next Chapter.

6.5 Financial Distress

The impact of Covid-19 was felt throughout asset classes, but the impact on corporate bond markets was especially severe. Issuance in primary markets halted, mutual funds faced significant outflows, and yield gaps on government securities in secondary markets increased dramatically. In this Thesis, we will examine the impact of these events on corporate bond exchange-traded funds (ETFs). We do so to learn more about how the corporate bond market works during times of stress, as well as how it reacts to policy moves that promote short-term business funding.

Many corporate-bond ETFs' prices fell significantly below their portfolio values (net asset values (NAVs)) in mid-March of 2019. Several reasons contributed to the NAV reductions. First, because corporate bond markets are somewhat illiquid, NAVs take longer to incorporate information than prices. As a result, when markets are volatile, deviations are more likely to open. Second, dealers gave corporate bond liquidity less support, potentially restricting the arbitrage of NAV discounts. Third, after US federal banking authorities established the Money Market Mutual Fund Liquidity Facility, money market funds (MMFs) saw an increase in inflows. Concurrent outflows from investment grade (IG) mutual funds spiked, implying a shift away from short-duration IG ETFs and toward MMFs.

These occurrences can be used to make several conclusions. When investors quickly alter their portfolios, policy actions in one market sector can have large, if transitory, effects on linked segments — even as market functioning improves. Furthermore, ETF prices are more responsive to market changes than underlying bond values, particularly during times of market stress. As a result, ETF prices are likely to be more suitable inputs to monitoring efforts and risk management models, such as those used to calculate regulatory capital, than rather stale bond benchmarks.

If we want to say something about the past, ETFs have faced severe illiquidity during times of financial hardship, despite their reputation for being highly liquid. Price dislocations and illiquidity of ETFs were prompted by the DJIA's 9% plunge during the Flash Crash in 2010. Domestic equity-based exchange-traded funds (ETFs) were disproportionately impacted. Following the Flash Crash in 2010, the SEC enacted a rule requiring that high-volatility securities and exchange-traded funds (ETFs) cease trading under specified conditions. The first time this new rule was put into effect was on August 24, 2015, when over 300 ETFs were taken off the market.

When markets are volatile, the trading volume of stocks drops dramatically, raising the danger of liquidity in times of financial turmoil. Similarly, (Itzhak, Franzoni, Landier, & Moussawi, 2011) show that during periods of market crisis, arbitrageurs considerably restrict their trading activity, potentially deteriorating liquidity and market conditions. (Itzhak, Franzoni, & Moussawi, Do ETFs Increase Volatility?, 2018) provide evidence to their research that stocks with high ETF ownership display stronger negative skewness during moments of financial turmoil.

(Madhavan, Exchange-Traded Funds, Market Structure and the Flash Crash, 2019) further demonstrates that when markets are fragmented, ETFs tied to very illiquid companies lose considerable trading volumes, resulting in price changes. (Dannhauser, 2017) concludes by looking into the corporate bond market. According to the findings, liquidity traders' participation declined after the debut of corporate bond ETFs, whereas educated investor ownership soared.

(Borkovec, Domowitz, Serbin, & Yegerman, 2010) back up the SEC's position, citing increased spreads and considerable illiquidity of ETFs during the 2010 Flash Crash. (Pan & Zeng , 2017) offer a possible explanation. The authors look at how arbitrage activity deteriorates as the underlying securities become more illiquid.

6.6 Price Discovery

Price discovery is the process of incorporating new information into asset values via trading activity, for example see (Anthropelos, Bouras , & Malmpanzi, 2017). If a market is the first to capture “fresh” knowledge about an asset's underlying value, it is thought to contribute more to price discovery. Even though there is a well-documented difficulty with identification: its dependence on the ordering of the variable in the price vector and its non-uniqueness.

Price discovery has become a major research topic in the financial economics literature because of recent market changes. Trading of identical ETFs in several venues (market fragmentation) and trading of closely related assets (for example, derivatives, futures and spot, ETFs tracking the same market index, etc.) in the same or different venues are recent aspects of financial markets. The most extensively used empirical measure to identify and quantify the process of price discovery is Hasbrouck's (1995) information share (IS).

Numerous studies in various financial market-related scenarios have used IS. When idiosyncratic innovations to distinct market prices in Hasbrouck's (1995) model are contemporaneously connected, however, it is well-documented that IS has a potentially major identification problem. When the correlation is significant, the IS measure, which is normally provided as a range, can become quite broad, making it difficult to distinguish between the price action.

Because the top and lower bounds of the range that IS gives are dependent on the order in which the prices enter the vector of prices, this issue has been referred to as the "order dependence problem of IS" in earlier work. Several research (e.g., (Grudzinski, 2012)) has presented various strategies and measures to solve this shortcoming of IS. However, no agreement has emerged thus far because each of these approaches has been demonstrated to be either effective in a specific environment or to have its own set of problems with identification.

Also, the availability of liquidity by ETFs may have a favorable impact on price discovery in the component equities. The price discovery hypothesis proposed by Ben-David et al. is depicted in Fig. 5. (2018). The ETF price and NAV are matched at the fundamental value in the initial equilibrium (fig. 5, panel A). Consider what would happen if an ETF's component securities experienced a fundamental shock (fig. 5, panel B). The price of ETF shares responds to the fundamental shock first, according to the price discovery

hypothesis (fig. 5, panel C). A new equilibrium will emerge because of arbitrage between ETF shares and the NAV (fig. 5, panel D).

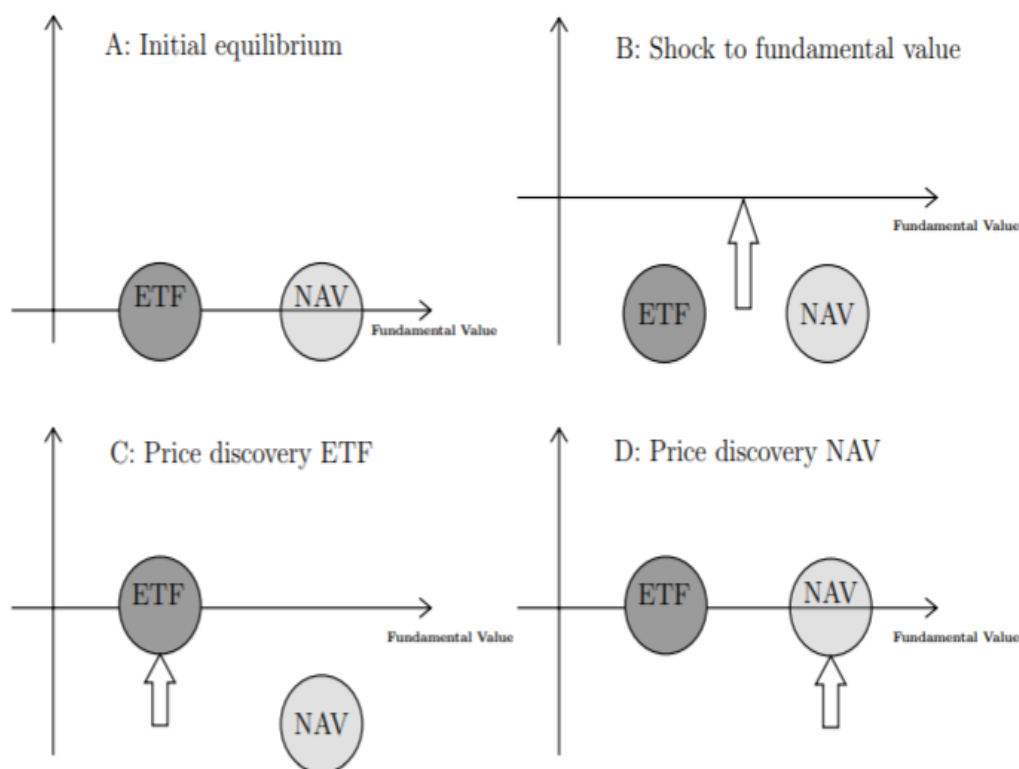


Figure 5 Price discovery hypothesis

Source Ben-David et al. (2018).

(Madhavan & Sobczyk, 2016) Propose and experimentally evaluate a dynamic ETF price model in which arbitrage reduces the price differential between ETF shares and the underlying assets. As long as arbitrage is frictionless, the authors show that ETFs can speed up the price discovery of securities. For domestic US equity (international fixed income) ETFs, empirical data suggests that price discovery through arbitrage is the fastest (slowest). (Glosten, Lawrence, Nallaredy, & Zou, 2015) validate these findings,

demonstrating that increased ETF trading activity leads to increased information efficiency of the underlying stocks. The authors suggest that ETF securities reflect more systematic fundamental information, which is particularly important for small businesses.

(Bradley & Litan, 2011) claim that ETFs drive the prices of the underlying assets, whereas it should be the other way around: underlying securities prices should drive the price of ETF shares. Since of the high volume and influence of ETFs, private companies fear going public because massive ETFs would cause small-company stock values to be disrupted. Finally, Ben-David et al. (2018) show that the price discovery theory is false. In the following part of this thesis, we will present their findings later.

We can say that ETFs help component stocks enhance their information efficiency. To distinguish informed from noisy trades, (Wermers & Xue, 2015) investigate the lead-lag relationship between the ETF price and the underlying assets empirically. When ETFs outperform the underlying security, the authors believe that intelligent trades will “win out” over noise trades. When the index outperforms the ETF, though, noise trading takes over. Although noise trading has an impact on ETF prices, it is significantly smaller than the impact of intelligent trades. Overall, Wermers and Xue (2015) conclude that noise traders have a small and reversing pricing impact.

(Sridharan, Lee, & Israeli, 2017) on the other hand, they reveal a negative side to ETFs, discovering that ETF-owned equities have a stronger correlation with the index, lower informational efficiency, and lesser analyst coverage. (Deville, Laurent, Gresse, & Severac, 2014) investigate the impact of the first ETF tracking the CAC 40 index on future market price efficiency. Despite a large increase in price efficiency in the futures market following the launch of the ETF, the authors do not link this to ETF arbitrage trading.

To summarize, the literature on the impact of exchange-traded funds (ETFs) on market efficiency is mixed. On the one hand, some articles claim that ETFs improve price discovery by adding another layer of liquidity. On the other side, some data suggest that component stock information efficiency can be harmed by noise trading. In the following section, we demonstrate that both occurrences may coexist.

6.7 Volatility

Investors in ETFs have access to intraday liquidity. As a result of the arbitrage relationship between the ETF and its stocks, they draw high frequency demand, which results into price pressure on the underlying stocks. Because it is likely to represent non-informational objectives, this trading activity has the potential to destabilize the underlying securities' prices.

We also can say and it's arguable that knowledgeable traders take advantage of their advantage by trading individual stocks rather than index products like ETFs. The reduced trading costs of ETFs compared to the underlying securities might exacerbate this effect by speeding up the “arrival” of demand shocks in the market. Trading techniques that would have been prohibitively expensive without ETFs have suddenly become affordable thanks to these instruments. As a result of ETFs, noise trading can have a larger impact on asset prices, implying that ETFs may bring additional obstacles to the efficient pricing of underlying securities.

Arbitrage trading has been proposed as a noise propagation channel. ETF prices are under pressure as a result of demand shocks in the market. Arbitrageurs trade the underlying assets in the same direction as the initial price pressure when the ETF price differs from the portfolio holdings' net asset value (NAV). As a result, price pressure from the ETF market might be transferred to portfolio holdings through arbitrage. This effect is similar

to the effect of mutual fund flows on portfolio holdings prices (Coval & Stafford, 2007). The fundamental distinction between ETFs and mutual funds is that ETF transactions and arbitrage activity occur continually throughout the day.

The observed rise in volatility corresponds to a rise in stock price noise. However, as (Andrei & Hasler, 2015) illustrate, it could also indicate increased investor attention, which causes prices to react more strongly to fundamental information.

There are several equilibrium models that emphasize the importance of volatility on financial markets (Anthropelos & Kardaras, Price Impact Under Heterogeneous Beliefs and Restricted Participation, 2021) . Regarding the ETF market, (Malamud, 2016) creates a model of the ETF market's dynamic equilibrium. The ETF sponsor can use, create and redeem ETF shares in this approach. The ETF sponsor's connection with the AP acts as a shock propagation channel, allowing demand shocks to spread to the underlying pricing. ETFs can affect the volatility of component equities via the arbitrage channel, according to the author. Furthermore, Malamud (2016) shows that the shock propagation is strongly correlated with the underlying assets' liquidity. He also demonstrates that non-fundamental shocks at the ETF level propagate to the underlying equities via the arbitrage channel, resulting in increased component stock volatility.

Ben-David et al. have recently used such an empirical scenario (2018). They investigate how ETFs affect the volatility of the underlying equities. Non-fundamental shocks at the ETF level, according to the liquidity trading hypothesis, may lead to higher underlying volatility. The liquidity trading hypothesis is seen in Figure 6. The ETF price and NAV are at their fundamental value in the initial equilibrium (fig. A). When a demand shock occurs (for example, hedge funds investing in the ETF), the ETF's price rises above its basic value (fig. 6B).

Arbitrageurs short ETF shares and invest in the underlying equities in this case. The price of an ETF and its NAV will be aligned as a result of arbitrage (fig. 6C). Both prices will eventually return to their underlying value (fig. 6D). As a result, rising ETF ownership may have a favorable impact on the underlying stocks' volatility. This is only the case if ETFs attract new short-term investors who have never traded the underlying before. It's worth noting that both the price discovery and liquidity trading hypotheses predict that securities with substantial ETF ownership are more volatile.

Ben-David et al. (2018) devotes an entire section to separating noise trades from educated trades.

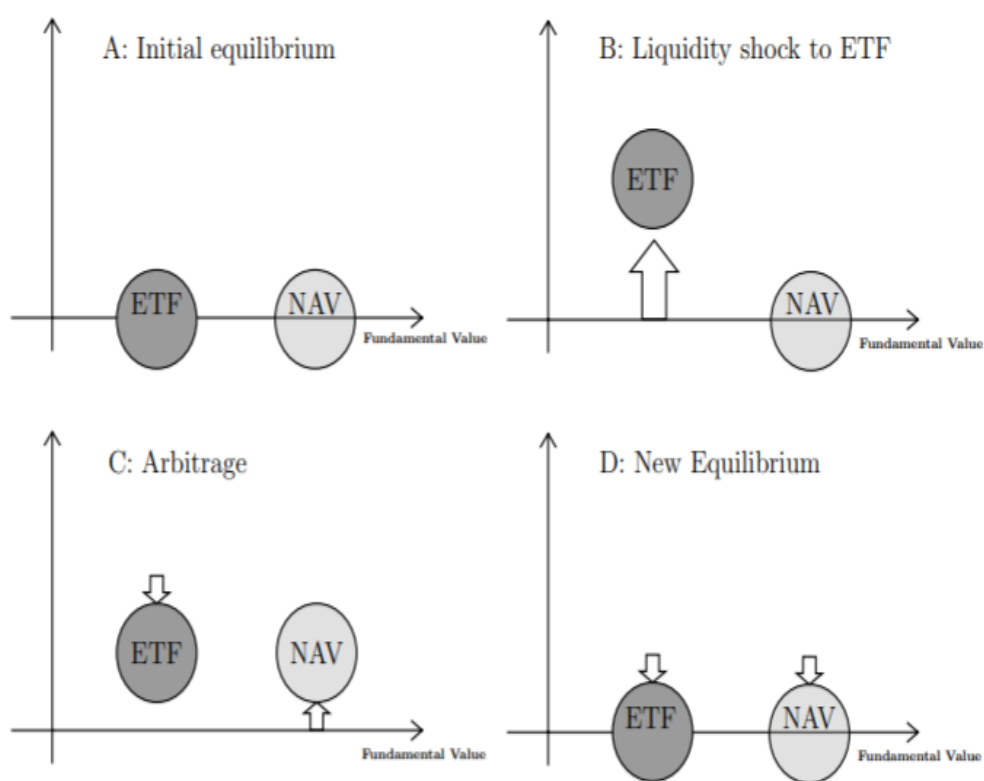


Figure 6 Liquidity trading hypothesis

Under the liquidity shock concept, the above diagram demonstrates how a non-fundamental shock propagates. ETF price and NAV are aligned in the initial equilibrium

(panel A). At the ETF level, there is a liquidity shock (panel B). Arbitrage will result in the ETF and NAV being aligned (panel C). ETF and NAV align on intrinsic value in the long run (panel D). This graph was created using data from Ben David et al (2018).

First, Ben-David et al. (2018) regress daily stock volatility on ETF ownership, while controlling for index, active, and hedge fund ownership. The findings demonstrate that a one-standard-deviation rise in ETF ownership is associated with 16.4 percent (7.8%) of a standard deviation increase in volatility for S&P500 (Russell 3000) equities. Second, the authors leverage the yearly index switching process of the Russell 1000 and 2000 indices, as (Chang, Cheng, Hong, & Liskovich, 2016) have done.

Even though the Russell 1000 contains greater-capitalized securities, ETF ownership of the largest securities in the Russell 2000 is higher than that of the smallest companies in the Russell 1000 (Chang et al., 2015). Ben-David et al. (2018) uses a two-stage least squares estimator to show that switching from the Russell 1000 to the Russell 2000 boosts ETF ownership by 19.6% of a standard deviation in the first stage. When ETF ownership is higher, switching to the Russell 2000 index has a beneficial effect on daily volatility of component companies.

As a result, the findings can be interpreted in a causal manner: ETF ownership has a beneficial impact on the volatility of the underlying assets. Furthermore, Ben David et al. (2018) demonstrate that rising security volatility is not due to a better price discovery process. Non-fundamental flows, on the other hand, are to blame for the underlying's rising price volatility. The authors corroborate the liquidity trading theory by discovering a mean-reverting component. Finally, Ben-David et al. (2018) divide stocks into quintiles based on their ETF ownership, demonstrating that a long-short portfolio earns a 56-basis point monthly return premium.

As a result, investors are rewarded for taking on non-diversifiable volatility risk associated with ETF ownership. Lin and Chiang (2005) examine the launch of the first Taiwanese exchange-traded fund (TTT) in June 2003. Volatilities grew significantly for 61.2 percent of component stocks once the TTT ETF was introduced, compared to the pre-TTT period. Surprisingly, volatility variations vary by industry, with the electronic and financial (mixed) sectors having the highest (lowest) volatility. (Wang & Xu, 2019) give additional data for the Chinese market on the effect of ETFs on component stock volatility. The authors discover that larger ETF flows are linked to higher component stock volatility on the next trading day.

6.8 Comovement

The price of a security will match its fundamental price in frictionless markets with rational investors, and any comovement in returns must be due to comovement in fundamentals. However, in economies with frictions or irrational investors, and in which arbitrage is limited, comovement in returns can be largely decoupled from fundamentals, resulting in excess comovement. Investors allocate money at the style level and engage in short-term style, according to (Barberis, Shleifer, & Wurgler, 2005), for reasons unrelated to fundamentals, allocating more capital to styles that have recently performed well and taking money out of styles that have recently performed poorly. Excess comovements among security returns in similar styles can result from the consequent price impact.

Investor demand should be directed first to securities with the cleanest play and the most liquidity. ETFs (exchange-traded funds) give investors quick access to popular investment types (such as large, small, value, growth, and sector) at a lower cost than the underlying basket of assets. Furthermore, because ETFs have relatively modest short-

selling fees, it is simple to shift money between two different styles and into long-short trading strategies (e.g., value-growth).

Our hypothesis is that ETFs attract a clientele of short-term investors with associated non-fundamental demand at the style level due to the simplicity of investing in investment styles using ETFs and their high liquidity. As a result, relative to their underlying stocks, ETF returns will be more exposed to a common source of style-based non-fundamental risk.

Several existing studies show greater anomalous comovements among stocks with higher limits-to-arbitrage and lower liquidity (Malamud, 2016) among stocks with lottery-like characteristics, such as low price, high volatility, and high skewness (Wang & Xu, 2019). In contrast, our findings indicate the possibility of excessive comovements among highly liquid and low limits-to-arbitrage assets.

Consider a case in which the ETF is trading at a premium to demonstrate the arbitrage process via the share creation mechanism (the ETF price is above the NAV). An AP would then purchase the underlying basket (at the NAV), swap it for new ETF shares with the ETF issuer, and then sell the newly formed shares on the secondary market. In practice, an AP may buy the underlying basket while shorting the ETF. The AP would exchange the underlying basket for ETF shares at the end of the trading day and close the short ETF position.

For US equity funds, the direct costs of establishing ETF shares are low (the focus of this thesis). A creation unit is often composed of 50,000 or 100,000 shares with monetary values ranging from \$300,000 to \$10 million. The fixed costs of creation range from \$500 to \$3,000. The set cost of \$3,000 for SPY, the world's largest and most actively traded ETF tracking the S&P 500, translates to about 5 basis points (bps) for one creation unit

worth \$6 million, or 1 bps for five creation units worth approximately \$30 million (Andrei & Hasler, 2015)

(Dannhauser, 2017) report that shares creations/redemptions occur on 30.9 percent (22.7 percent) of trading days on average (median) and, conditional on such days, the magnitudes are \$69.6 million (\$12.4 million), or 244.3 percent (27.4 percent) of daily dollar volume for a sample of equity U.S. ETFs. This suggest that APs routinely create/redeem many creation units at the same time, possibly to save money.

The theoretical channel for ETF returns' excess comovement is based on restricted arbitrage, correlated demand, and clientele effects. Investors allocate funds at the style level (e.g., small or value) rather than at the particular asset level in the (Barberis, Shleifer, & Wurgler, 2005) model. The vast number of ETFs, mutual funds, and hedge funds that follow distinct investing styles and are employed by both individual and institutional investors demonstrates the high demand for investment styles. The style investing model also assumes that investors will shift into styles that have done well in the past and out of styles that have performed poorly in the past.

According to academic papers, adding a new stock to an index boosts its correlation to equities already in the index. Over the sample period 1988-2000, Barberis, Shleifer, and Wurgler (2005) show that inclusion of a stock in the S&P500 boosts the stock's market beta by 0.2. Surprisingly, from 1976 to 1987, the average daily market beta grew by only 0.07. (Greenwood & Sosner, 2007) use the April 2000 redefinition of the Nikkei 225 index to show that the betas of newly included (removed) stocks increased (decreased) by 0.45 on average (0.63).

Furthermore, the rise of index investing is connected not only with an increase in comovements, but also with a considerable index membership premium of close to 40% (Mock & Yang, 2001).According to (Wurgler, 2010), despite the diversification potential

of index investment, adding small-caps to an index diminishes the diversity potential. (Adams & Gluck, 2015) show that the comovement between commodity and stock markets has increased dramatically since the commodity market's finalization. According to the authors, this can be explained by the style effect of large investors.

(Da & Zhi, 2013) suggest arbitrage opportunities between ETF shares and underlying securities as a new source of rising return correlation in the context of ETFs. (Staer & Sottile, 2018) discover, using intraday data, that a higher ETF turnover is associated with an increase in stock return comovement. To quantify the correlation between individual stocks, the authors employ a dynamic conditional correlation model based on (Eagle, 2002). Despite the paucity of information on how ETFs alter the correlation structure among underlying securities, the conclusions are consistent with those found in the previously cited literature on index inclusion and comovement.

Overall, we say that ETFs with more associated demand shocks and more desirable liquidity features have a higher degree of commonality in misvaluation. This lends credence to our hypothesis that the excess comovement of ETF returns is driven by correlated non-fundamental demand and assisted by investors with short time horizons who are drawn to ETFs due to their high liquidity.

6.9 Leveraged ETF's

During the financial crisis of 2008, leveraged ETFs were blamed for causing volatility increases. When compared to the underlying index, leveraged ETFs use leverage or derivatives to generate greater or lower returns. When the underlying index rises by 1%, leveraged ETFs typically have a multiple of 2, yielding a return of 2%. Short strategy ETFs, commonly referred to as bear (leveraged inverse) ETFs, are also available (Ben-David, Franzoni, and Moussawi (2016)).

Leveraged ETFs must rebalance their portfolio at the conclusion of the trading day, which is done as soon to market close as practicable. Traditional ETFs (physical or synthetic) do not have to rebalance on a daily basis. These end-of-day flows of leveraged ETFs appear to have a favorable impact on component stock liquidity and volatility. (Cheng & Madhavan, 2009) create a model that shows how rebalancing leveraged ETFs affects market-on-close volume, liquidity, and volatility of the underlying assets.

In addition, the consequences are proportionate to the amount of money invested in leveraged ETFs. The literature on the stock market is not restricted to it. According to (Curcio, Anderson, Guirguis, & Boney, 2012), the introduction of leveraged and standard real estate ETFs has had a favorable impact on real estate stock volatility. Furthermore, leveraged ETFs have a greater impact on volatility than regular ETFs. In commodity markets, (Chan, Shelton, & Wu, 2018) show that financialization has an impact on non-energy commodity volatility in particular.

(Da & Zhi, 2013) on the other hand, found no indication that leveraged ETFs are responsible for volatility increases in the last 30 minutes of the trading day. Using intraday data, the authors finds that non-rebalancing periods had similar volatility increases as rebalancing periods for leveraged ETFs. Furthermore, despite the increase of leveraged ETFs, they claim that anomalous market volatility has decreased. However, the authors warn that if the market share of leveraged ETFs grows, volatility spikes may become more common.

7 Conclusion

Most publications (e.g., (Hegde & McDermott, 2004)), Richie and Madura (2007)) concur that ETFs boost the liquidity of their component equities during non-turbulent market moments. In other times, ETF liquidity can decrease, resulting in increased illiquidity of ETFs, which then spreads to the underlying assets (see, for example, (Zeng & Pan, 2017)). ETFs reduce market efficiency, according to the price discovery (liquidity trading) concept. Even though both ideas appear to be at odds, it is possible that both events coexist.

ETFs, on the one hand, boost liquidity and information efficiency, according to the research. Non-fundamental information is reflected in the pricing because noisy traders utilize ETFs as an investing instrument. Securities included in an ETF may integrate fundamental information more quickly, but they are also influenced by non-fundamental noise transactions. Ben-David et al. (2018) goes into great depth about how ETFs enhance the volatility of the stocks they own. Both instances are confirmed by the writers.

However, we discover that increasing volatilities in the security basket are the result of non-fundamental information by decomposing the information efficiency benefit from the non-fundamental influence of ETFs. Finally, academic research shows that when a stock is included in an index, its correlation with the other equities in the index grows. This mechanism may be reinforced by the continued expansion of passive investments in general, and ETFs in particular.

Under this thesis, we look at whether the returns of exchange-traded funds (ETFs) in comparable investment approaches vary disproportionately. My hypothesis is that, because to the simplicity with which ETFs can be purchased and their high liquidity, ETFs attract a clientele of short-term investors who are more vulnerable to non-fundamental demand shocks at the style level than investors in the underlying baskets.

Because academic research has tended to focus on equity-based ETFs, a more in-depth look into bond, commodity, and money-market ETFs would add to present findings. In the topic of leveraged ETFs, more study is also needed. Despite the late debut of leveraged ETFs in 2006, analyzing the influence of leveraged ETFs on volatility might assist policymakers comprehend potential systemic risks of ETFs by consolidating current results in the literature.

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