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Structure and Systemic Risk Factors of Exchange-Traded Funds

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STRUCTURE AND SYSTEMIC RISK FACTORS OF EXCHANGE- TRADED FUNDS



Trent Mangold

ABSTRACT

This paper is to serve as an investor's guide to understanding the exchange-traded fund industry, where both the benefits and risks of these investment vehicles are presented. There will be a general overview of what an exchange-traded fund is, why it was created, how it was created, and why it is different from other similar types of investment products on the market today. There are many benefits that exchange-traded products offer investors, both institutional and retail, however, there are also risks associated with this industry. The Flash Crash of May 6, 2010, serves as an example for when a sophisticated market system fails to deliver. From research I have gathered, it appears that exchange-traded products were partially to blame for this failure, and will be looked at more closely to discover if there are any potential systemic risks that this investment vehicle may cause in the future.

INTRODUCTION

The exchange-traded fund (ETF) industry is a relatively new product in the global securities markets but has ballooned to massive proportions today. This product carries with it many benefits that more than explain for the large popularity amongst institutional and retail investors that it currently has. This paper serves to lay out the benefits that exchange-traded products (ETPs) offer to those investors. To do this, there will be a brief history given of the ETF industry since its inception, which will include main competitors in the industry, the growth that has taken place, and the evolution of the product in general. It will also be helpful to compare and contrast an ETF from a typical mutual fund, since it is the most similar form of investment vehicle in the markets today. Since there are many different types of ETFs out there, there will be a brief summary and explanation of the most popular types today. Each type will be laid out

in a way so that a new investor in these products can gather a general sense of how the product works, what the benefits of adding it to their portfolio would be, and what types of risks come with that specific product.

To better understand the benefits and risk that come with trading ETFs, it is necessary to discuss the creation and redemption mechanism that makes the ETF what it is. This will also cover the concept of arbitrage and how authorized participants (APs) interact with the ETFs to make them function properly.

The paper is laid out with the benefits that ETFs offer being presented first, followed by the mechanics of how the ETF functions, and then finishing with the current and potential risks that ETFs may pose to the investor. The details presented in each of the sections are there to guide a potential ETF investor into making an intelligent and informed investment decision. Understanding the unique characteristics that ETFs offer and how they function is a critical part of making this decision.

Background on ETF Industry

The first ETF was launched in January of 1993 and was called the SPDR trust (SPY) by State Street.¹ There would not be another competitor in the market until March of 1996, when WEBS (later renamed iShares) created 17 international single-country ETFs. By October 2005, there were 200 funds, over the next decade this industry would begin exploding with growth, reaching 1,435 U.S. traded funds by 2014, with almost \$2 trillion in assets.² At the end of the

¹ Petajisto, Antti. "Inefficiencies in the Pricing of Exchange-Traded Funds." *Financial Analysts Journal* 73.1 (2017): 24-54. Web. Pg. 8

² Ibid

fiscal first quarter for 2016, there were over 6,240 ETFs/ETNs, with \$3.07 trillion in assets.³ This speaks to the popularity of this investment vehicle throughout the global securities markets.

There are over 277 providers of ETFs, but it is a highly concentrated industry, with four players dominating the market and with several large financial institutions trying to capture market share. The largest four, according to assets under management (AUM), as of April 20th, 2017 are Blackrock (\$1,088,292.08 mm), Vanguard (684,483.04), State Street Global Advisors (523,240.07), and Invesco Powershares (119,830.45), respectively.⁴ For frame of reference, the next largest competitor in this industry (Charles Schwab) has \$70,915.32 million AUM. Even though this industry has grown very large and there are many more providers in the space today, it is highly concentrated and oligopolistic. The largest three providers make up close to 82% of the market share for AUM, and if the top five providers are grouped, then the market share is almost 89%.⁵ However, now that this industry has topped the \$3 trillion mark, even just competing for 1% market share can bring in billions of dollars for the provider.

³ "Global ETF Assets Top \$3 Trillion." *Global ETF Assets Top \$3 Trillion* | *ETF.com*. N.p., 12 Apr. 2016. Web. 05 May 2017.

⁴ "ETF League Table As Of April 20, 2017." *ETF League Table As Of April 20, 2017* | *ETF.com*. N.p., 21 Apr. 2017. Web. 05 May 2017.

⁵ My own calculations

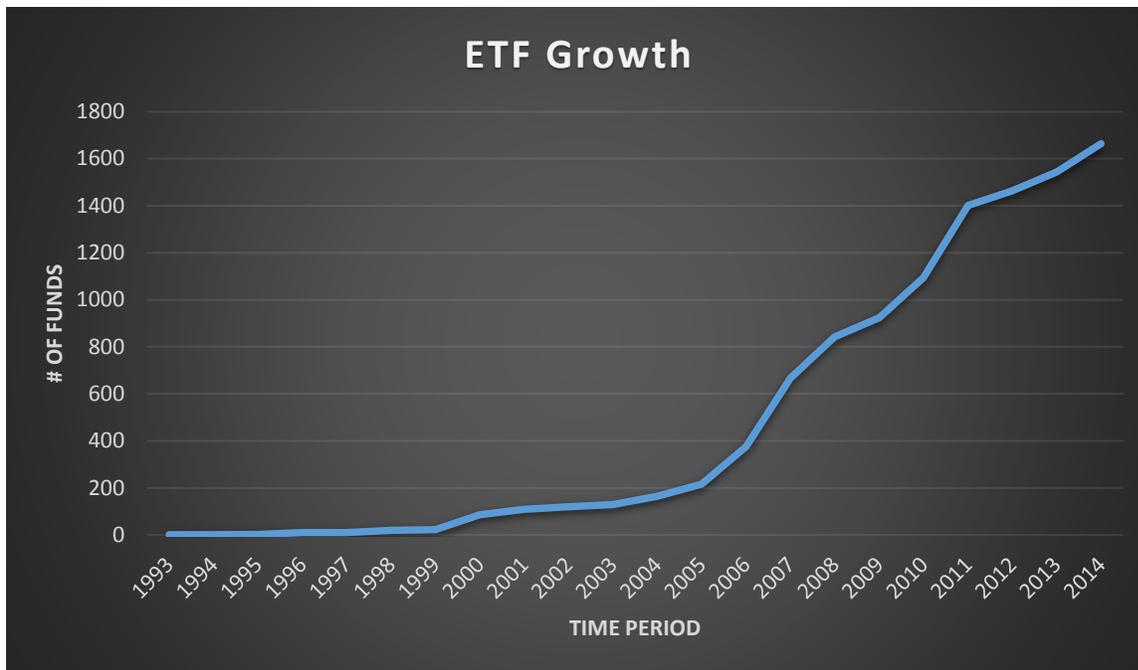


Figure 1⁶

So what exactly is an ETF? An ETF represents a basket of securities that can provide diversified exposure to a particular area of the market. It is very similar to a mutual fund in that it is a pooled investment vehicle. Mutual funds and ETF's typically have different goals though. While the majority of mutual funds seek to create alpha by beating a particular market index, an ETF seeks to mimic a particular market index or industry by holding all of the securities found in that particular segment. ETF's can be invested in many different types of assets, including stocks, bonds, commodities, and currencies.

⁶ FactSet Research Systems

ETFs vs. Mutual Funds

There are some other key differences between an ETF and a mutual fund. One of these differences is in how they are traded. Mutual funds can only be traded once per day, which is at the end of the trading day. ETF's can be traded at any time when the market is open. ETF's can also be sold short, have stop-loss and limit orders, and margin buying, which are not features that mutual funds have.⁷

A key element that increases the popularity of this investment vehicle is the lower costs that are associated with ETF's compared to mutual funds or from trading many individual stocks. An investor can buy one ETF that may hold hundreds of different stocks and only pay for that one transaction, instead of paying for hundreds of transactions by trying to replicate the index themselves.

ETFs allow investors to access different corners of the market. Retail investors now have the ability to purchase stocks and bonds from different countries in a cheap and diversified way. Investors can use ETFs to buy commodities, bonds, and foreign securities in a much simpler and cost effective way.

Costs and Fees of Trading ETFs

One of the major reasons that ETFs are as popular as they are today in the markets is due to their low fees. The average U.S. equity mutual fund will cost you 1.42 percent in annual

⁷ Ramaswamy, Srichander. "Market structures and systemic risks of exchange-traded funds." Bank For International Settlements, Apr. 2011. Web. 4 May 2017.

expenses, while the average equity ETF charges .53 percent.⁸ That is a significant amount when investing hundreds of thousands of dollars or more. So why are they so much cheaper? For starters, most mutual funds are actively traded, which means that there is an expensive fund manager and employees that have to do individual research on various securities to add to the fund, whereas most ETFs are passively traded and do not require as many employees to manage the fund's day to day operations and research. However, that doesn't explain why ETFs are still cheaper than mutual funds that just track an index like an ETF would. The process of submitting a "buy" or "sell" order to a mutual fund is much more complicated and costly than it would be for an ETF. If a mutual fund receives a "buy" order, then the mutual fund's portfolio manager must go to the market and invest that money that was put in by the investor. This results in having to pay spreads and commissions for various securities bought. When investors decide to sell their stake in the mutual fund, this process will work in reverse. All of this results in more paperwork and time by the employees of the mutual fund, in addition to the commissions from a broker from trading both ways, which ultimately drives up fees for the investor.

The process for investing in an ETF is much simpler. Investors simply have to submit an order with their brokerage and the order is completed. Since ETFs trade like other stocks in the secondary market, investors are buying and selling between one another, and not going through the ETF provider itself to make the trades. By not having to go into the market to invest your money, the ETF provider saves a lot of time and money.⁹

⁸ "Why Are ETFs So Cheap?" *Why Are ETFs So Cheap?* | *ETF.com*. N.p., 01 May 2017. Web. 05 Apr. 2017.

⁹ Gastineau, Gary L. "An Introduction to Exchange-Traded Funds." *The Exchange-Traded Funds Manual* (2011): 1-18. Web.

Creation/Redemption

The process that allows ETFs to be traded like this is called the “creation/redemption” mechanism. This mechanism is what allows ETFs to be less expensive, more transparent, and more tax efficient than a traditional mutual fund. When a new ETF is being created or when new shares of an existing fund are being created, the ETF provider will use an authorized participant (AP) to make this work. AP’s are organizations that have a lot of buying power, such as large financial institutions, a specialist, or a market maker. The AP will go out to the market and acquire the securities that the ETF will hold. For instance, if the ETF is tracking the S&P 500 Index, then the AP will go out and purchase shares in all of the companies that are within that index, in the exact same weights that are in the index. The AP will deliver these shares to the ETF provider, in exchange for what is called a creation unit, which is a block of equally valued ETF shares. The blocks are usually in increments of 50,000 shares.¹⁰ Both parties in this process end up benefitting, as the ETF provider gets the shares that it needs to track the index, and the AP gets an equally valued amount of ETF shares that it is able to resell on the secondary market for a profit.

The AP also has a hand in making sure the ETF trades at its underlying net asset value (NAV) throughout the trading day. Due to supply and demand from investors, the price of the ETF on the secondary market can get out of line with its NAV. When this happens, the AP will intervene by either selling off excess shares of the fund when the price is overvalued, or buy up shares when the price is undervalued. When the ETF is overpriced in the market, the AP can go and buy shares of the underlying securities in the market that the ETF is comprised of and then sell ETF shares in the open market. This will typically drive the price of the ETF back down to

¹⁰ Ramaswamy, Srichander. "Market structures", pg. 3

fair value. It also will allow the AP to earn a profit from the arbitrage. Conversely, if the ETF is trading at a discount in the secondary market, then the AP can go and purchase blocks of shares of the ETF and then redeem for the underlying securities that the ETF is comprised of. This also should bring the price of the ETF back to fair value and will make the AP a profit from this activity.¹¹ The arbitrage opportunities that the AP is taking place in allow the ETF to constantly trade near its NAV. There are usually multiple APs watching most ETFs. What is essential to know is that the AP bears the cost of trading expenses, whereas in a mutual fund the investor will end up taking on those expenses.

Transparency and Tax Efficiency

A key benefit of investing into an ETF is the transparency of the fund. An investor is able to verify individual positions on a daily basis. Mutual funds are only required to disclose the positions in their fund on a quarterly basis, and then with a 30-day lag put in place.¹² This lag is put in place so that other investors and fund managers will not steal their trading strategies or ride on their coattails to success.

Another key benefit that ETFs have over mutual funds is the tax efficiency that these investment vehicles have. If a mutual fund or ETF holds securities that appreciate during the year and then subsequently sells those securities for a gain at some point throughout the year, a capital gain is booked. A fund is required by law to pay out these capital gains to shareholders at the end of the year. It has been shown that the average equity mutual funds for emerging markets had a pay-out ratio of 6.46%, which means that 6.46% of the NAV of the fund was paid out as capital

¹¹ Petajisto, Antti. "Inefficiencies in the Pricing of Exchange-Traded Funds." *pg. 2*

¹² "Why Are ETFs So Tax Efficient?" *Why Are ETFs So Tax Efficient? | ETF.com*. N.p., 01 May 2017. Web. 05 Mar. 2017.

gains to the shareholders. Contrast this with ETFs in the same category, where only .01 percent of NAV was paid out. This is because ETFs are index funds that have very little turnover and amass much fewer capital gains than a typical mutual fund would. The difference here is that with an active manager at the end of a mutual fund, they may believe prices in the markets to be too high, so they use their best judgement to decide to sell particular securities that they may hold. This may end up as a successful strategy, but will still result in some form of capital gains for the fund. However, a passive ETF is price agnostic, where it does not look into whether the prices of the overall index or whether particular securities within that index are overpriced or not, so it will not sell and adjust the portfolio. This is up to the discretion of the investor that owns shares of the ETF. Since an ETF is traded on the secondary market with usually liquid prices, the investor can decide to sell shares in the ETF if they believe prices are too high in the market at the time. ETFs have two decades of history showing that they are the most tax efficient fund in the business.¹³

However, the taxation structure of an ETF depends on the underlying securities that the ETF is made up of. Different asset classes have different taxation structures. There are five asset class categories: fixed income; currencies; commodities; equities; and alternatives. There are also five separate structures for taxation purposes: exchange-traded notes (ETNs); open-end funds; grantor trusts; limited partnerships (LPs); unit investment trusts (UITs).¹⁴

Taxes for ETFs are treated just like the tax situation for other stocks and bonds. Taxes are paid for capital gains from selling shares of the ETF or from periodic distributions, such as dividends received or interest received.

¹³ Ibid

¹⁴ "Legal Structures, Regulation And Taxes." *Legal Structures, Regulation And Taxes / ETF.com*. N.p., 05 May 2017. Web. 05 May 2017.

Premium and Discount Phenomena

ETFs have more than one price, which can easily complicate an investing decision when looking at one of these products. There is the actual value of the ETF, which is measured by the NAV at the end of each day, and the intraday NAV (iNAV) at the middle of the trading day. To complicate things, ETFs trade on an exchange, where there is the current market price, which may or may not be in line with the actual value of the ETF. When the share price of the ETF is trading above its actual value, the ETF is considered to be trading at a premium. When the share price of the ETF is trading below its actual value, the ETF is considered to be trading at a discount. The reason this can happen is because the ETF and the underlying securities that it holds are loosely linked. They are essentially two separate pools of liquidity that do not always match each other, due to investor demand. One way to adjust for this as an investor is to set a limit order as close as possible to the NAV so that the ETF will not be purchased at a premium.¹⁵

There are several reasons why the NAV does not always reflect the actual value of the ETF portfolio. One of these reasons is due to what is called stale pricing. Since NAV is calculated based on the latest closing prices of the underlying securities that are in the ETF portfolio, or the latest bid prices in fixed-income markets, then it can become a problem when the markets that the underlying securities trade in are different than the U.S. market.¹⁶ In markets where the closing day ends before the U.S. begins, situations can occur where the prices are mismatched and the timing is off, which can complicate the arbitrage trade. Also, ETFs that track illiquid securities, such as high-yield bonds can cause stale prices because the NAV might not be estimating the actual value. Another reason why premiums and discounts appear in the markets

¹⁵ Jacobsen, Brian. "The Big ETF Charade." *The Journal of Portfolio Management* 41.2 (2015): 3-4. Web. 3 Mar. 2017.

¹⁶ Petajisto, Antti. Pg. 2

is due to investor demand. There are times when the ETF is being traded more frequently than the underlying securities, which creates upward or downward pressure on the share price of the ETF. Just because an investor is buying shares in an ETF, does not mean that they are buying shares in the underlying securities. Since the ETF is a derivative of the underlying shares, there will often be disconnects between the two securities, which is why the premiums and discounts can arise.

It should be noted that the premium and discount phenomena is a disadvantage to the majority of investors. There are a few traders and institutions that are able to profit on this mispricing, but the majority of retail investors' end up losing in this scenario. Understanding how premiums and discounts work and how to spot when an ETF is trading at one is essential when looking to purchase shares in an ETF. The ETF provider is required to publish their NAV and iNAV daily, which allows investors to determine if there is mispricing on either end.

Tracking Difference and Tracking Error

One of the most important statistics to consider when searching for an ETF to purchase is the tracking difference. Many investors will look at past performance of an ETF to determine whether to purchase it or not, but markets go up and down, and if this is a passive index then it has no indication of whether the ETF is actually doing its job properly. The job that a passive index is supposed to be doing is accurately replicating the returns of a particular index or basket of securities. The tracking difference is simply the difference between the returns of the index that the ETF is tracking and the individual ETF returns. There are many factors that prevent the ETF from perfectly mimicking its index, which is why the tracking difference is very rarely zero.

Tracking error is a similar metric but is about variability rather than performance. According to Vanguard, “tracking error is calculated as the annualized standard deviation of excess return data points. While excess return measures the extent to which an index product’s return differs from that of its benchmark index, tracking error indicates how much variability exists among the individual data points that make up the fund’s average excess return.”¹⁷ Tracking error is essentially looking at the volatility in the difference of the performance between the ETF and the index it is tracking.

One of the easiest ways to find future tracking difference is to look at the ETFs total expense ratio (TER). ETFs are constantly competing to lower this fee to attract investors. For instance, if an ETF charges a 1% fee to track an index, then the funds returns should lag the index by 1%, if other factors are constant. There are also transaction and rebalancing costs that go into a fund. When constituents change in an index, the fund will need to buy or sell those securities, which will cause the fund’s assets to decrease from the transaction fees involved. Equal-weighted indexes rebalance regularly, which ends up increasing the overall tracking difference.

The tracking difference is not always a negative value. Some activities that the ETF will do can actually produce an excess return. One of these activities is securities lending. Some ETFs will lend out the securities that it holds of a particular index to paying borrowers, which are usually short-sellers. This creates a revenue source for the fund and can help make the tracking difference smaller or even positive.

¹⁷ "Understanding excess return and tracking error." *Mutual funds, IRAs, ETFs, 401(k) plans, and more* / Vanguard. N.p., 2009. Web. 04 May 2017.

The tracking difference is very useful to know when deciding on an investment in an ETF. This statistic will allow the investor to see if they are buying into an ETF that is managed well and is following the fund's objective. For instance, if an investor is looking to buy a general ETF that tracks the S&P 500 index, then it would make sense to purchase shares in the ETF that has the lowest tracking difference, with all things being equal. Since the ETF industry has become highly competitive, there are usually multiple different ETF providers that track the same index. Using the tracking difference and tracking error are very useful when deciding between similar types of funds.

ASSET CLASSES

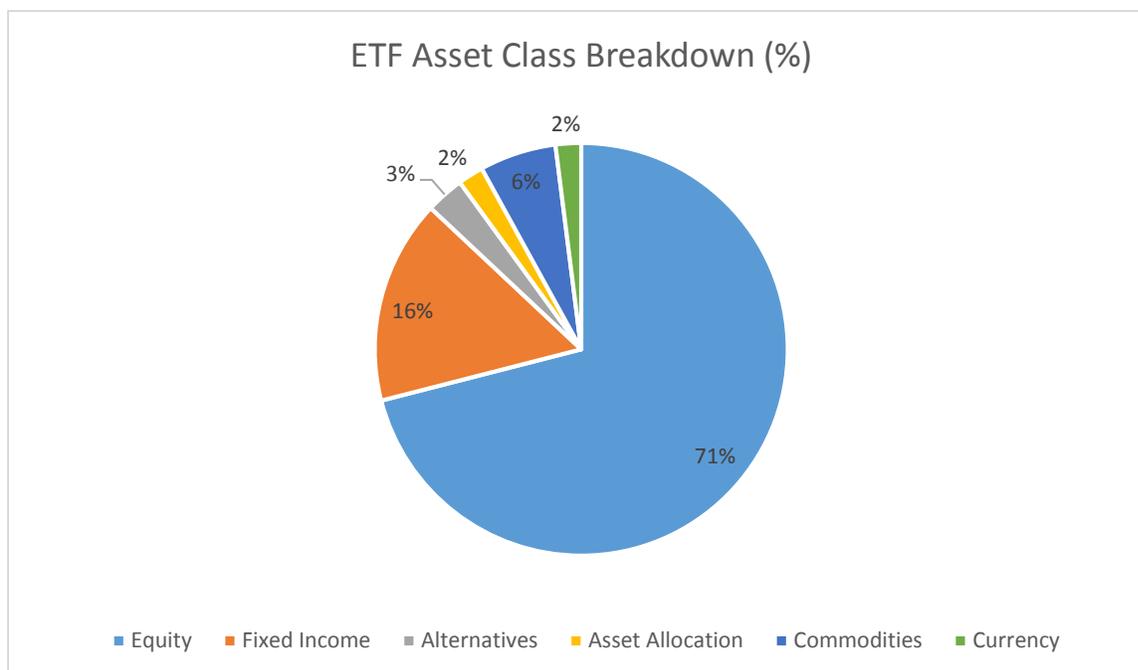


Figure 2

By and large, equity ETFs dominate the market with over 70% of the funds in the U.S. being an equity based ETF and around 78% all U.S. ETF assets are in equity funds.¹⁸ A breakdown of the different types of ETPs can be seen in the pie chart above.

Fixed-income ETFs are the second-largest asset class, with around \$490 billion in total assets. Only about 16% of all U.S. ETF listings are in fixed-income though, which may prove to be the asset class that will grow the most in the ETF industry in the future.¹⁹ Since equity ETFs have been previously discussed, there is no need to mention them again in this section.

Fixed-Income ETFs

Just like equity ETFs, fixed-income ETFs offer exposure to a basket of securities, but instead of having this basket consist of various stocks, it is filled with bonds. Fixed-income ETFs allow investors to target different corners of the bond market that many retail investors would not normally have the ability or capital to do, such as emerging market debt. There are four broad exposure categories that fixed-income ETFs fall into: sovereign, corporate, municipals, and broad market.²⁰ Sovereign bond funds target fixed-income security issues by governments or sovereign nations, such as U.K. gilts or U.S. Treasurys. Corporate bond funds target issuances by corporations. Municipal bond funds target issuances by U.S. municipalities, and broad market ETFs offer exposure to both sovereign and corporate debt. This is a large and growing area in the ETF industry, which means there are more and more funds coming online that allow investors to specify preferences. Some of the current types of funds allow the investor to choose the fund

¹⁸ "What US ETF Market Looks Like Today." *What US ETF Market Looks Like Today* / *ETF.com*. N.p., 13 Apr. 2017. Web. 05 May 2017.

¹⁹ *Ibid*

²⁰ "Fixed-Income Investing ETFs: The Basics." *Fixed-Income Investing ETFs: The Basics* / *ETF.com*. N.p., 01 May 2017. Web. 05 May 2017.

based on bonds with particular credit ratings, currency denomination, geographic location, and liquidity.²¹

A major difference between fixed-income ETFs and equity ETFs is that most equity ETFs will hold every security that is in a particular index in its portfolio, while fixed-income ETFs will use optimization or sampling to choose the bonds that go into the portfolio. The major reason for doing this is because bond indexes are much larger and can include up to thousands of different securities. This can be a very expensive process, especially when the bonds are purchased in illiquid markets. Therefore, the fund managers will choose to find bonds that make up the most representative sample of the index that it is tracking.²² Optimization certainly saves on costs, but if the sample chosen was not a good representation of the index, then returns can drift away from the benchmark index.

Due to the illiquid nature of some types of bonds, premiums and discounts can arise in the ETFs share price. Arbitrage opportunities are more straightforward with equity ETFs because there is usually a highly liquid market that the underlying securities can be measured against. However, with illiquid bonds that don't trade frequently, the price of the bond is more questionable, which will also complicate the arbitrage process if there is a premium or discount in the ETFs price compared to its NAV. With that being said, bond ETFs are still superior to trading individual bonds when it comes to liquidity. Bonds are bought and sold over-the-counter (OTC), with no specific exchange that they trade in, whereas a bond ETF is traded on an exchange, like an individual stock. Therefore, even when the underlying bonds in the bond ETF are illiquid, the ETF itself is still a relatively liquid instrument in normal market conditions.

²¹ Ibid

²² "How Do Bond ETFs Work?" *How Do Bond ETFs Work?* | *ETF.com*. N.p., 01 May 2017. Web. 05 May 2017.

Alternative ETFs

Alternative ETFs are a niche area in the ETF industry but are interesting to look at. The intention of one of these funds is to provide alternative strategies that are more common in the hedge-fund space. The problem with hedge funds is that they usually charge high fees, have gate provisions that lock in the investor's money for a specified time, and are typically only accessible by wealthy individuals or institutions. ETFs could not be more different than a hedge fund. However, this slice of the ETF market has found a way out of holding hedge funds (due to the lockup fees) and tries to mimic the strategies that are more popular in the hedge-fund community. Some of these strategies include, long/short, currency-carry, merger arbitrage. Another popular type of alternative ETF is one that attempts to track the volatility of the markets or the VIX futures index, which is known as the fear gauge. However, the VIX ETFs do not track the VIX index very well and are typically a losing strategy over the long-term, but can also be a very profitable strategy in the short run.²³

One simple way for an ETF to mimic a hedge-fund is by copying the assets that certain hedge-funds hold in their portfolios. Hedge funds tend to have a lot of secrecy surrounding their trading, but are required to publish their holdings on a quarterly, lagged basis. This allows ETFs to go through the public records and find assets that they could also hold, which are usually stocks. ETFs can take a direct approach and implement some of the strategies that a hedge-fund would use, such as a currency-carry ETF, which would take long and short positions in currency-

²³ "Alternatives ETFs: Understanding VIX ETFs." *Alternatives ETFs: Understanding VIX ETFs | ETF.com*. N.p., 05 May 2017. Web. 05 May 2017.

forward contracts. Alternative ETFs were created to act as a liquid alternative to hedge-funds, however, around 75% of them have fewer than \$30 million in assets. This creates a paradox since they are small and rarely trade, it makes them a relatively illiquid product.²⁴ The main benefits to be received out of investing in these types of ETFs is the access to the hedge-fund universe that is restricted to most small non-institutional investors, as well as being able to diversify your portfolio into strategies that tend to have low correlation to other asset classes and benefit from down-market cycles.²⁵

Commodity ETFs

Most ETFs don't invest in commodities directly. Instead, they purchase commodity futures contracts that have three different sources of returns. The way to calculate the return on a commodities futures contract is by summing the change in spot price, roll yield, and collateral yield.²⁶ Spot price and roll yield returns are used in the calculation for excess returns indexes, and total return indexes use all three returns. Therefore, an investor needs to know more than the current price that the commodity the chosen ETF is tracking to determine the return they will receive. The spot price of a commodity is the quoted price for immediate or short-term delivery. However, few investors have the ability to take physical delivery of the commodity that they are trading, so those that are investing for a long duration in futures must sell or close out their expiring futures contracts and then reinvest back into longer-term contracts. However, the price for this new contract will more than likely be different from the current spot price, causing the

²⁴ Dieterich, Chris. "Alternative ETFs: Watch Out!" *Barron's*. N.p., 24 Oct. 2015. Web. 05 May 2017.

²⁵ "Alternatives ETFs: Understanding VIX ETFs." *Alternatives ETFs: Understanding VIX ETFs | ETF.com*. N.p., 05 May 2017. Web. 05 May 2017.

²⁶ "Commodity ETFs: Three Sources Of Returns." *Commodity ETFs: Three Sources Of Returns | ETF.com*. N.p., 01 May 2017. Web. 05 May 2017.

roll yield. If the price of the commodity for future delivery is higher than the current spot price, then the futures market is said to be in contango. When the futures market is doing the opposite, where the price of the commodity for future delivery is lower than the spot price, then the market is said to be in backwardation. A futures market in contango generates a negative roll yield, and a futures market in backwardation creates a positive roll yield. The roll yield is usually offset by rising or falling spot prices. The final component in a commodity futures investor's return is the collateral yield. Investors in commodity futures must set aside collateral to make the trade. This collateral will generate interest income, which is passed on in the futures price.²⁷

There are commodity ETFs that actually purchase and take physical delivery of the commodity that the fund is tracking, such as precious metals. For instance, if an investor is to purchase shares of a gold ETF, then the providers of the fund will have gold bought and will store it in vaults. Essentially, it is like buying gold for yourself, except you don't have to go through the trouble of storing it. However, physically held precious metal ETFs like this are taxed in the grantor trust structure and are considered collectibles, which means they are taxed at the 28 percent long-term tax rate instead of the 20 percent long-term tax rate that applies to traditional equity investments. If they are held for a shorter period than one year, then they are taxed as ordinary income, with a maximum rate of 39.6%.²⁸

There are also commodity exchange-traded notes (ETNs), which do not hold the physical commodity, or the futures contracts. They are unsubordinated, unsecured debt notes that are issued by banks that are promising to provide the return of a specific index.²⁹ However, these

²⁷ Lydon, Tom. "Diversifying with Commodity ETFs." *Journal of Financial Planning*, vol. 27, no. 10, 2014, pp. 30, *ProQuest Central*

²⁸ "How Are Commodity ETFs Taxed?" *How Are Commodity ETFs Taxed? | ETF.com*. N.p., 01 May 2017. Web. 05 May 2017.

²⁹ *Ibid*

carry counterparty credit risk, so if the bank that is making this promise happens to default or go bankrupt, then the investor could lose their entire investment.

Currency ETFs

Getting exposure to the currency market through ETFs is a complex process that must be examined closely. There are two sources of returns for investors in currencies: spot rates and interest. When holding a foreign currency, the investor has access to local interest rates. Over a period of time holding that foreign currency, the investor will receive interest payments, which is a common type of strategy used in currency trading called the “carry trade”.³⁰ Currency ETFs are great for hedging purposes as well, and can help balance out a portfolio that is heavily invested into U.S. equity ETFs by purchasing a currency ETF that is short the U.S. dollar against a basket of other currencies. Currency ETFs can add exposure to emerging markets by sampling currencies from various countries.³¹

There are a few different structures when looking at currency ETFs. First, there is the grantor trust structure, which is similar to the grantor trust situation for commodity ETFs, where the precious metals are stored in a vault. In this case, these currency ETFs give the investor exposure to spot exchange rates for a particular currency by holding that currency in bank accounts. Then there are the open-ended funds that hold the majority of their assets in T-bills, which gives them exposure to the currency through forward-currency contracts. Much like commodity ETFs, there are currency funds that gain exposure to the underlying currencies through a structure similar to commodity pools that hold futures contracts. Finally, there are currency ETNs, which are unsubordinated, unsecured debt notes that are issued by banks that are

"Currency ETFs: The Basics." *Currency ETFs: The Basics | ETF.com*. N.p., 01 May 2017. Web. 05 May 2017.

³¹ Williams, S. O. "Country ETFs, Currencies and International Diversification." *Journal of Asset Management*, vol. 15, no. 6, 2014, pp. 392-414, ProQuest Central

promising to provide the return for a specific exchange rate. This method has counterparty credit risk and should be examined with caution.

Leveraged and Inverse ETFs

Leveraged and inverse ETFs can be a powerful tool that may allow an investor to maximize returns, however, these types of ETFs are highly specialized tactical tools that should be chosen with caution. Inverse and leveraged ETFs were created in order to allow investors to have a tool that could engage in short-term hedging or speculation across an entire market index or sector. These ETFs are not typically used as a long-term investment tool due to the daily rebalancing that these funds take place in. These funds adhere to strict leverage ratios that are usually stated in the fund's name, such as a 2x S&P 500 ETF, which would give the investor double exposure to the returns of the S&P 500 over a stated period of time. Similarly, an inverse fund might be listed as a -1x S&P 500 ETF, which would yield a return for the investor when the market index that the ETF is tracking drops in value. This is essentially like taking a short position in a normal ETF. However, the difference is that an investor would have to borrow the shares of the ETF that are going to be sold short, which can be costly. With an inverse ETF, it can be bought and sold just like a normal stock, which can make it easier and less costly to take a bearish position in a particular market index or sector. Leveraged funds, which include inverse funds, have a target daily leverage ratio that they adhere to. This causes a continuous pattern of buying notional when the market goes up and selling when the market is down.³² One of the benefits of this daily rebalancing is that the losses are capped at the amount invested into the fund, whereas when shorting the underlying index, losses can be much higher due to the

³² Barnhorst, Bradley C., C.F.A., and Coccozza, Christopher R., C.P.A., J.D. "Inverse and Leveraged ETFs: Considering the Alternatives." *Journal of Financial Planning*, vol. 24, no. 1, 2011, pp. 44-49, ProQuest Central

leverage. One of the major problems is that with greater volatility in the index and the longer the ETF is held, then the more the fund will underperform its benchmark index. In an oscillating market, this type of fund can lose significant amounts of money over the long-term due to the leverage reset.³³ The time period for these funds is specified in advance, but it is usually for just one day, which implies that these funds are meant to typically be used to make a speculative bet on the direction of the market or to hedge against an event. They are not meant to be used as buy-and-hold instruments.

There are a few other major issues with these types of funds. Since these funds have to perform daily resets in leverage ratios, they will either be buying or selling at some point in the day, typically very close to market close. From this knowledge, it is very easy to see how “front-running” becomes a major issue and can cause major swings in volatility near market close. Front-running is the act of trading on advanced knowledge of a block transaction that will be taking place, which will most likely influence the price of the underlying security.³⁴

There is a similar product that allows the investor to take a leveraged or inverse position on the markets without the daily reset feature. There are ETNs that are leveraged or inverse trackers of the total return index of popular indexes, like the S&P 500. The leverage is set at the inception of the fund and does not adjust for market moves. This means that the investor that buys into the ETN now will not have the same degree of leverage as the fund had at inception, but the level of leverage should stay fixed over the life of the ETN.³⁵ Once again, the major issue

³³ "Leveraged And Inverse ETFs: Why 2x Is Not The 2x You Think." *Leveraged And Inverse ETFs: Why 2x Is Not The 2x You Think | ETF.com*. N.p., 01 May 2017. Web. 05 May 2017.

³⁴ "Definition of "Front running" - NASDAQ Financial Glossary." *NASDAQ.com*. N.p., n.d. Web. 05 May 2017.

³⁵ Barnhorst, Bradley C., C.F.A., and Cocozza, Christopher R.C.P.A., J.D. "Inverse and Leveraged ETFs: Considering the Alternatives." *Journal of Financial Planning*, vol. 24, no. 1, 2011, pp. 44-49, *ProQuest Central*

with purchasing ETNs is that they are unsubordinated, unsecured debt that is issued by a bank, so there is counterparty credit risk involved.

RISKS OF ETFS

So far, the picture that has been painted of the ETF industry has been mostly positive. To recap, it is a financial product that allows portfolio managers and investors to lower the overall risk of their portfolio due to the widespread diversification that these vehicles offer, while also being much more cost effective than the majority of index mutual funds and any other diversification strategies out there. ETFs are not exempt from risks though. Just like any other investment, ETFs have market risk. If the S&P 500 index dropped 30% in one day, then an ETF tracking the S&P 500 index would also go down by 30%, with all things equal. ETFs have allowed investors to put their money in exotic baskets of securities, such as an index tracking Malaysian technology stocks, or an ETF comprised of various option trading strategies. This could be a great way to get exposure to these types of investments, but as investments become more complex, risk is increased. ETFs can also shut down, where the unpopular ones are removed from trading. This happens to around 100 ETFs a year.³⁶ Shareholders of the fund will still be compensated in cash once the fund is liquidated, but it can be a complex process where transaction fees will eat away at the value and there is the potential for uneven tracking of the index, which will cause the investor to not gain the full value of the basket of securities that the fund was comprised of.

There are also liquidity risks that must be taken into account. ETFs do not trade with zero transaction costs. Like trading a stock, there is a spread that the investor will have to pay to

³⁶ "What Risks Are There In ETFs?" *What Risks Are There In ETFs?* | *ETF.com*. N.p., 01 May 2017. Web. 05 May 2017.

acquire the ETF. Spreads can vary widely if the ETF being traded is not very liquid. For instance, some ETFs may have a spread of only a few cents, while others may have spreads of up to several dollars.³⁷ It is important to understand the liquidity of any ETF that is going to be traded. Also, sometimes ETFs will trade outside the net asset value (NAV) of the fund. This can happen if there is strong investor demand for the ETF and it gets bid up for a period of time. This usually corrects quickly due to arbitrageurs taking advantage of the gap in NAV and price of the ETF. However, if an investor was to buy at a time when the ETF is out of alignment with its NAV, then this could end up as a losing scenario for the investor.

Flash Crash

There may not be much history to support the potential danger that this industry may pose yet, but there is an example from May 6th, 2010 when an event known as the “Flash Crash” took place. On this day, major U.S. equity indices began to drop suddenly, for almost no reason at all. The Dow Jones Industrial Average (DJIA) fell 998.5 points, which was the largest intraday price drop in history.³⁸ This drop was followed by a 600-point recovery within 20 minutes of the incident. Several stocks traded at unreasonable prices during this event, with names such as Accenture and 3M trading for mere pennies. Similarly, there were securities that traded as high as \$100,000 before returning to the price levels seen before the crash. There were 300 individual securities that traded at prices more than 60% away from the values that were in place moments

³⁷ Petajisto, Antti. "Inefficiencies in the Pricing of Exchange-Traded Funds." *Financial Analysts Journal* 73.1 (2017): 24-54. Web.

³⁸ Madhavan, Ananth. "Exchange-Traded Funds, Market Structure, and the Flash Crash." *Financial Analysts Journal*, vol. 68, no. 4, 2012, pp. 20–35., www.jstor.org/stable/41713431.

before.³⁹ ETFs represented a disproportionate amount of the securities that were affected by this event, with their prices on the exchanges varying quite substantially from their NAV.

It appears that the arbitrage pricing mechanism with ETFs did not work properly during this event, which is what caused the price to stray so far from the NAV. According to an analysis done by Madhavan (2012), ETFs accounted for 70% of equity transactions on May 6th that were later cancelled due to the extreme price drops.⁴⁰ Prices in the futures and equities markets eventually recovered by the end of the day to close at about 3% losses from the previous day.⁴¹

After this event, the SEC applied stock-specific liquidity time-outs, which are essentially circuit breakers that stop the trading of stocks in highly volatile times when huge sell-offs are occurring.⁴² However, the SEC did not extend these time-outs to ETFs. Since ETFs are continuing to grow in size and already take up a large share of overall trading, the SEC should consider adding these circuit breakers to them as well.

Potential Systemic Risk

It is important to remember that ETFs are derivatives. Their value is derived from the value of securities that make up the baskets of stocks.⁴³ With the explosion in the ETF industry in the past decade and the expanding pipeline of new ETFs in the works, a potentially systemic risk could be posed if there was a rush to unwind these ETFs.

³⁹ "FINDINGS REGARDING THE MARKET EVENTS OF MAY 6, 2010." *Sec.gov*. SEC/CFTC, 30 Sept. 2010. Web. 1 May 2017.

⁴⁰ Madhavan, Anath, ETF, Pg. 4

⁴¹ SEC/CFTC, Flash Crash, pg. 1

⁴² Bradley, Harold and Litan, Robert E., Choking the Recovery: Why New Growth Companies Aren't Going Public and Unrecognized Risks of Future Market Disruptions (November 8, 2010). Available at SSRN: <https://ssrn.com/abstract=1706174> or <http://dx.doi.org/10.2139/ssrn.1706174>

⁴³ Jacobsen, Brian. "The Big ETF Charade."

One of the largest attracting forces that an ETF offers, is the ability to short an entire index of securities. Typically, it is very expensive to borrow a stock that an investor is wishing to short sell, especially if it is a “hard to borrow” stock, which are considered those that have 4 to 5 percent of shares sold short.⁴⁴ Take Tesla Motors (TSLA) for example, where it was reported in October of 2010 that 5 percent of its outstanding stock was net short. Short sellers were charged a 30 percent annual interest rate to borrow TSLA stock to sell it short.⁴⁵ It is much different when shorting ETFs, since ETFs are theoretically created to match demand from the market, the investors pay no attention to borrowing the underlying shares of stock that make up the ETF, which makes it much cheaper and simpler to short. One of the major risks that investors are faced with when shorting common stocks that are already heavily shorted is the “short squeeze”. A short squeeze is when a stock’s price can rapidly rise to bring out new supply that can be borrowed.⁴⁶ Five percent short interest is considered to be very high for common stocks, but as of August, 2016, there were ETFs, such as the SPDR S&P Oil and Gas Exploration & Production ETF that had a net short interest of 126 percent. The 20th largest ETF in terms of net short interest was the Health Care Select Sector SPDR ETF that had 18.4 percent net short interest.⁴⁷ A potential equity market short squeeze could prove to be a major concern for the ETF industry.

Many will argue that a short squeeze will not affect the ETF industry since ETFs can theoretically be created without limit. However, the more units that are created by the ETF provider, the larger the obligation by the AP to purchase the ETF’s underlying securities. This raises the concern for whether the cash on hand will be enough to cover the increase in prices of

⁴⁴ Bradley, Harold and Litan, Robert E., *Choking the Recovery*, pg. 32

⁴⁵ *Ibid*

⁴⁶ *Ibid*

⁴⁷ Bloomberg: "Does High ETF Short Interest Mean Higher Risk?" *SPDR*. N.p., n.d. Web. 05 May 2017.

the underlying securities if there is a market wide short squeeze.⁴⁸ Also, when an AP creates more ETF units, it will elevate the prices of underlying stocks by significant margins, especially if the index is made up of small cap stocks. This could potentially cause heavy losses to those parties that are holding short interest. If this is widespread then it could echo throughout the financial system and could lead to systemic risk.⁴⁹ The arbitrage mechanism that currently exists works well in normal market conditions, however, as seen during the Flash Crash in 2010, it fails to deliver during highly volatile market conditions. Right before the crash on May 6th, the volatility index (“VIX”) was up 22.5% from levels seen at the beginning of the day, which indicates how quickly investor perception can change.⁵⁰

Another potential systemic risk with ETFs is the ease at which they can be shorted. Since it is much simpler, quicker, and cheaper to short an ETF rather than the underlying securities, they are potentially a source of market panic on the downside. If a major selloff is imminent, traders could rush into shorting certain ETFs in order to profit or hedge from the sharp declines in market values. This sounds like a winning strategy, but only exacerbates the situation by creating a panic and making the falloff larger than it would be without that option present. It is important to remember that well over half of the trades in securities that had sharp declines on May 6th were in ETFs.⁵¹ Think how much easier it is in a market panic to short an ETF when a market selloff is imminent, instead of having to do thorough research and find individual securities that are likely to fall in value.

⁴⁸ Bradley, Harold and Litan, Robert E., Choking the Recovery, pg. 60

⁴⁹ Ibid, Pg. 40

⁵⁰ SEC/CFTC

⁵¹ Ibid

The concept of transparency that ETFs are praised for does not eliminate the possibility that these funds can fail. If there were a massive sell-off of particular ETFs or of the total market in general, then these funds are heavily exposed to “unwind risk”.⁵² If everyone is selling their ETFs, then an ETF provider would have to unwind the fund that they have manufactured, but who will buy those underlying securities in a major market sell-off? One of the reasons the ETF industry is popular and growing today is because it allows investors that typically do not have access to particular corners of the market to be able to trade those securities, such as emerging market debt, baskets of small capitalization stocks, and physical gold bullion. The ETF has allowed these investors to pour their money into these smaller areas of the market, but what happens when these investors turn sour toward their investment and begin to sell? Who will be there to pick up the pieces and purchase the underlying securities that these particular ETFs are made up of? Take gold bullion for example, where a combination of commodity ETFs are the fifth-largest physical holder of gold bullion.⁵³ If gold ETF holders decide to sell their shares, it is very unlikely that there will be anyone there to unwind these ETFs and purchase the gold at the same pace that this particular segment of the ETF market has grown during the past few years. There are not nearly as many investors that will want to take physical delivery of the gold bullion, what with all the storage and delivery costs involved. This is just one small example in this gigantic industry of how unwinding a complex derivative like an ETF could cause massive losses in particular markets.

Another highly touted benefit that ETFs offer is the ability to own a liquid security that is comprised of illiquid securities, such as owning an ETF of illiquid small capitalization stocks.

⁵² Bradley, Harold and Litan, Robert E., Choking the Recovery: Why New Growth Companies Aren't Going Public and Unrecognized Risks of Future Market Disruptions (November 8, 2010). Pg. 45

⁵³ Ibid

This was a similar issue with asset-backed securities, where an illiquid product, such as a mortgage, was packaged together into a relatively liquid product. However, just because these illiquid securities are repackaged, they do not all of a sudden become liquid. The Flash Crash of May 6th was evidence that highly volatile market conditions and massive selling of ETFs can rapidly transform into destroying the value of the underlying securities that the ETF is comprised of, and also turning the once liquid ETF into a very illiquid investment vehicle.⁵⁴

One of the largest causes for concern with the ETF industry today is how the growth and popularity of this investment vehicle has taken away the price discovery function of the markets, specifically in small cap stocks. When equal capital is being spread around an entire index of stocks, agnostic to the intricacies and potential success of individual companies in these indexes, then potential problems can arise. Most importantly, this is not the function of the capital market system. The role of the capital markets is to properly allocate monies between different assets in a way that rewards success and controls risk.⁵⁵ We are living through a time with unprecedented correlation in the capital markets, where stock prices for large cap common stocks move in the same direction and in the same percentage increments 60% of the time.⁵⁶ There have only been two times in history where the markets moved in a more correlated fashion (1929 and 2009). Both of these were obviously times of massive market panic, which begs the question of why the markets are moving in such a correlated fashion but with such little current panic, demonstrated by the low VIX in today's markets. The answer to this question, is that the markets are no longer paying attention to individual company performance, instead the capital is being allocated to the ETFs and index funds to evenly distribute between the securities. This model of capital

⁵⁴ Ibid. pg. 47

⁵⁵ Ibid. pg. 38

⁵⁶ Empirical Research Partners LLC, Systematic Risk Within Sectors, Consumer Cyclical: Still Exploiting Retreat, The Housing Cycle: Bouncing Along the Bottom, research report, July 28, 2010.

allocation would work well in a utopian world where every company is created equal, but that is not the world we live in, and that is not how capital markets are supposed to function.

CONCLUSION

The invention of the exchange-traded fund has drastically changed the capital markets landscape in the relatively short period of time that this product has been around. This product clearly has properties that benefit institutional and retail investors alike. ETFs have allowed investors to reach securities in far corners of the market that were once too expensive and complicated to procure without significant amounts of money. They have given investors an inexpensive product that is able to meet diversification goals and lower the total risk in a portfolio, while being transparent and tax-efficient. This industry has seen abnormal growth since its beginning in 1993, with expectations that the growth trend will only continue. Many investors no longer comb through the Wall Street Journal stock list during the week to find suitable stocks to invest in, instead they look for an ETF that has the lowest tracking difference and the smallest fee.

The benefits that ETFs offer are clear and hard to ignore, but has this product grown too large and too complex? With the growing number of speculators in the market that have caused massive net short interest in particular ETFs, there is reason for concern if the markets opinion on this product changes. A liquid product that is comprised of illiquid securities will not be a liquid product when the markets begin to fall. This industry has the potential to tank more than just ETF prices if investor sentiment sours, due to the heavy connection it has with the underlying securities. An investor should approach these products with caution, fully understanding what the particular ETF is comprised of and the ability for the AP to redeem those

shares if prices begin to decline. This product often gets overlooked by regulators, since it is typically deemed a safe investment. The SEC and CFTC should look into more strict regulations surrounding this industry, especially in regards to safety procedures when markets begin to fall. For instance, having circuit breakers on ETF prices would be a good place to start. Innovation is constantly occurring within the financial system, therefore, it is important to stay informed about the risks that new products have before the individual risk of a security becomes market risk.

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