

ETF OR CEF, WHICH ONE IS THE BEST?

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Abstract

This work performs an analysis between Exchange Traded-Funds (ETF) and Closed-end Funds (CEF), to help the common investor to decide for the best fund.

This analysis comprises a sample from the U.S. market fund that included 46 funds: 27 CEFs and 19 ETFs that represent 13 different benchmarks. All the funds are required to have at least five years of observations.

This work makes a comparative analysis of the performance of both funds using the Sharpe, Treynor, Appraisal, Hit and Sortino Ratio.

Results showed a clear superiority of ETFs, in the majority of benchmarks, ETF provided the best performance in two cases: the first, using all observations from all funds and the second using only the common period of observations between all funds with the same benchmark.

Next, the analysis focus on the presence of mispricing, to look for which fund in the sample, deviates furthest from the Net Asset Value. It was concluded that the large majority of the funds show mispricing, but ETF funds trade at premium while CEF funds trade at discount.

Finally, CEF volume is analyzed. The goal is to understand on the impact of CEF average trading volume after the inception of a similar ETF. The evidence shows that in most cases the CEF trading volume increased after the inception of a peer ETF.

Key-words: Performance analysis, CEF, ETF, liquidity, mispricing

JEL: G110; G23

Resumo

Este trabalho tem como objectivo fazer uma análise objectiva entre Exchange Traded-Funds (ETF) e Closed-End Funds (CEF). Desta forma pretende-se ajudar a escolha do investidor comum sobre qual dos dois fundos oferece melhores possibilidades de retorno.

Para esta análise foi utilizada uma amostra retirada na sua totalidade do mercado de fundos dos Estados Unidos da América (E.U.A.). A amostra em questão inclui 27 CEFs e 19 ETFs que partilham 13 benchmarks diferenciados. Todos os fundos incluídos na amostra devem conter no mínimo cinco anos de observações.

Este trabalho efectua uma análise de performance utilizando os rácios Sharpe, Treynor, Appraisal, Sortino e Hit.

A análise dos resultados demonstrou uma clara superioridade na performance dos ETF sobre os CEF, os fundos ETF tiveram uma performance ajustada ao risco superior em dois casos analisados: primeiro utilizando todas as observações de todos os fundos e o segundo utilizando apenas o período comum de observações entre os fundos de cada benchmark.

Foi feita também uma análise de desvio de preço, para compreender qual dos fundos tinha maior tendência a transacionar a valores mais afastados do Net Asset Value. Foi concluído que a larga maioria dos fundos evidencia a presença de mispricing, estando os CEF a transaccionar a desconto e os ETF a prémio.

Por último, foi estudada a tendência da evolução do volume de transacção dos fundos CEF após a introdução de um ETF similar. Esta análise mostra que após a introdução de um ETF similar o volume dos CEFs tende a aumentar no período imediatamente a seguir na maioria dos casos estudados.

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1. Introduction

In the latest years, the fund industry witnessed an explosive growth, which is represented by the number of funds and the assets value. The fund industry includes not only the mutual fund sector, but also Closed-End Funds (CEFs) and Exchange-Traded Funds (ETFs).

This work aims to make a comprehensive analysis between Exchange-Traded Funds and Closed-End Funds, in order to conclude which one is a better choice for a retail investor, as they are close products. Despite that ETF and CEF are both traded on an exchange like an ordinary stock, ETF often trade close to their NAV whether CEF trade at discount.

The literature relating these two kinds of funds is scarce, because ETFs are a relatively young security. The first was launched in 1991 in Canada, while CEF are available since 1950s.

Despite the first ETF was launched in Canada in the Toronto Stock Exchange, the US market is the largest ETF market in terms of market capitalization and volume due to a huge development in the past few years.

This work makes a quantitative analysis comparing both funds for the same benchmark, which has not been done previously. Known ratios for risk adjusted performance and indicators are used such as Sharpe, Treynor, Appraisal, Sortino and Hit Ratio to have an analysis as objective as possible, and to be understandable by the common investor.

This analysis comprises a sample that includes 46 funds: 19 ETFs and 27 CEFs all of them from the US market fund. After, the ratios were computed for each fund in the sample and they were compared within each benchmark. The results show that ETF seem to have performed better in two occasions. First, when using all observations of all funds, the entire sample, ETF performed better in 9 out the 12 benchmarks. Second, when the sample was narrowed only to include the common period of observations of each fund with the same benchmark, ETFs had a stronger performance beating CEF 11 out 12 benchmarks. Despite CEF funds are actively managed and ETFs do not, CEF funds only manage to perform better than ETF in Appraisal Ratio, that measures a fund manager picking ability, about 50% of times, which means that CEF fund managers can not add as much extra return as expected in the majority of cases.

I also analyze the impact on volume of a CEF fund after the inception of a peer ETF, which consists in analyzing CEF volume before and after the introduction of a peer ETF. Evidence

shows that CEF volume tends to increase in the majority of cases, after the inception of a similar ETF. It does not appear to exist a cannibalization effect.

Finally I study mispricing, a common risk that both ETFs and CEFs investors face, mispricing is the difference between fund market price and Net Asset Value, the real value of the fund's assets. Both assets trade at their market price and not at their Net Asset Value. Evidence shows that mispricing tends to be present in the majority of ETF and CEF funds. However, CEF funds are at discount while ETF funds are trading at premium.

The following sections present in more detail every step that leads to the conclusions presented previously.

First, in section 2, fund industry is characterized explaining what investors look for, how can funds help them, which types of mutual funds there are and what are their main characteristics. This section gives a focus on CEFs and ETFs showing their main common features and differences.

In section 3, the literature review presents the main references in the topic and what were their main conclusions of previous studies.

In section 4 is presented the sample used in the analysis, how the sample was narrowed into the final 46 funds. The sample is described using variables such as geographical focus, mean, standard deviation and launch date.

In section 5, methodology presents all the ratios used in the analysis and their interpretation. The last part of this section presents summary statistics for mispricing.

At last, section 6 presents the empirical results divided in three sub-sections: performance evaluation, mispricing analysis and volume analysis.

Performance evaluation presents the results of fund evaluation. There, is specified which benchmark performed better in each ratio, both using the entire sample and using only the common period of observations of each fund within the same benchmark.

Next, in mispricing sub-section are presented the main results of fund mispricing analysis and its conclusions.

At last, in liquidity analysis is presented the average trading volume for each CEF fund, its variation after the introduction of a similar ETF and is summarized the results that conclude that in the majority of times CEF volume increases after ETF inception.

2. Fund Industry

There are many different investments options available out there for investors to choose from. Each investor follows a strategy which depends on the relevant features for them. Among the features that are relevant for investors Markowitz (1952a, 1952b) identifies return and risk. An investor does not have unlimited funds to allocate to every existent security, so, the investor is forced to choose for the securities/products that are able to give him the desired return. The choice needs to be based on investors risk profile and investors needs, where one can seek a higher return or a safer return.

When the investor looks for a higher return, one has many different options to choose from. The most basic, even though riskier than risk-free deposit, are stocks and bonds, the most well known to the retail investor.

Besides from those securities, we have many more different options, which include mutual funds, complex products or derivatives, securities where their returns depends on the evolution of other securities like stocks, indexes or commodities.

A reason that makes an investor to look for mutual funds is diversification, with funds one has the opportunity of investing in illiquid assets, such as infrastructures, real estate, commodities or emergent markets assets that are only available to the common investor via fund.

A mutual fund is constructed in order to maintain to reach the investment objectives stated in the fund profile.

Funds allow investors to look for the liquidity premium, that the investor by himself is not able to achieve, due to the small amount in stake. Funds pool all the money from investors and get opportunities to invest that are not available to the retail investor.

One possibility of investing is enhanced indexing which combines elements of passive and active management. It attempts to generate modest excess returns compared to index funds and other passive management techniques.

Fund managers may achieve higher returns if they can identify undervalued stocks in the index, adjust holdings to include a larger proportion on better performance sectors or using other instruments such as derivatives.

Funds usually follow a benchmark, each one has a different number of stocks and companies from different sectors: that is the path to diversification.

In the fund industry this work is focused on Mutual Funds. There are four main kinds of mutual funds: Open-end Funds, Closed-End Funds, Unit Investment Trusts and Exchange-Traded Funds. Institutions like Vanguard, BlackRock, JP Morgan or PIMCO are usually in the top ten of mutual funds offer.

However, not all of these mutual fund types were available instantaneously by all the mutual fund companies. For example, John Boogle, founder of Vanguard refused for many years to offer ETFs because he considered them as short-term speculation.

Despite there are several mutual fund types, this work is focus in just two of those mutual funds: Exchange-Traded Funds (ETFs) and Closed-End Funds (CEFs).

ETF and CEF are available for retail investors however, as a complex product it is needed financial knowledge about them.

ETF and CEF are two kinds of investment funds (organized companies) that have similar characteristics. Both of them are organized structures that choose to track an index, and try to replicate its return. In ETFs case the fund needs to own all the stocks in the index with their real weight while in CEFs case they can choose which stocks to acquire to track the index, usually the ones with biggest market cap weight. The goal is having as few stocks as possible to track a high percentage of the index. In that way, they have some space to look for other securities for extra return.

Both funds acquire illiquid securities which gives the possibility to the retail investor to look for a liquidity premium. However is important to understand that the investor will never hold those securities, but the shares of the fund, either ETF or CEF shares.

In this way the retail investor only acquire fund shares and not their underlying assets, so they access illiquid securities in a liquid and cheap way. Why cheap? Because to hold all the stocks from same index the investor would bear transaction costs for all those stocks, and would need to re-balance it weekly or daily. CEFs and ETFs do it for us easily.

For an index like PSI-20 or IBEX-35 that could be feasible, while for indexes like NASDAQ100 or NIKKEI225 that would became totally unfeasible, due to the number of stock in stake.

So, with ETF and CEF the investor will only bear transaction costs of the fund, in ETF case every time when one changes his portfolio and in CEF case every time CEF changes its composition. This cost will be much lower than the investor trying to do the same on his own.

How such funds work? Let us understand next: All investors buy shares from the fund, which is basically a company, and that company is going to use all the money collected from investors to invest in some portfolio, that is going to have different weights in each sector and securities type. So if an investor puts 10,000€ in the fund, those 10,000€ are going to be proportionally distributed to the composition of the fund's portfolio.

Imagine 40% in security A, 35% in security B and 25% in security C with a value of 10 million Euros is the composition of the fund α ,

So the investor will have 4,000€ in security A, 3,500€ in security B and 2,500€ in security C, without owning any of those securities but replicating their return by buying a CEF/ETF share. He is going to have a return depending on the evolution of the value of each of those securities.

The investor remains with his units of participation but its value can increase like an ordinary stock on the market and investor's value can increase without any further changes in his portfolio.

This example is to understand some benefits of fund investing: reducing transaction costs (owning one security instead of three), diversification (money spread by different securities), and liquidity (is easier to trade a share of CEF/ETF than an individual share).

Both ETF and CEF are portfolios of securities traded on a stock exchange like a normal stock.

ETF and CEF are close products but are not the same thing.

They share characteristics, but they have some details that distinguish them. ETF is a young vehicle, the first ETF appeared in 1991 in Canada (Toronto S.E.) and in 1993 the first US ETF that is today the biggest by market cap.

ETF trade close to the Net Asset Value (NAV) – represents the real value of assets owned by the fund - because they are easier to arbitrage. When considering arbitrage opportunities in both funds is necessary to consider that sometimes arbitrage can become too costly.

Institutional investors can force creation and redemption process of ETF shares (via in-kind process), because they can begin to buy the underlying securities and to sell ETF shares, or vice-versa. In order to the arbitrage opportunity to disappear the price of ETF share must correct automatically.

Kato, Linn, & Schallheim (1990) "Found evidence that the market does not offer persistent arbitrage opportunities".

ETF are known for being a growing industry, in number, size, value, as a new investment vehicle and as an exotic investment, while CEFs are already in the stagnation stage.

When investing in ETF an investor knows exactly what he owns because he knows how it is constructed.

Each ETF fund provides detailed information available for investors, since its holdings, credit ratings, duration, yield and more, all this information is published almost in real time, so is possible to know what might affect future ETF price.

On the other hand CEFs that are also a basket of securities began with an IPO and it has a fixed number of shares, it can be traded at premium or discount.

CEF funds are actively managed (ETFs do not) and so they can use unconventional strategies to enhance their return, such as options or leverage. Because CEFs number of shares is fixed, managers do not have to worry about inopportune times to redemption and do not have to sell distress securities in a hurry.

More of the regular discount characteristics of CEF apply to ETFs. CEF are taxed each time the fund changes securities and ETF only when an investor trades shares, that is the tax advantage of the ETFs over CEFs.

3. Literature Review

ETF and CEF are two mutual funds that track an index used as benchmark with the goal of replicating their return. An investor when looking for mutual funds to replicate an index return must choose, because ETF and CEF are substitute products. To be able to choose, the investor needs to know which fund offers the best tracking ability, which fund has a lower cost or which fund has the higher liquidity. Because ETF and CEF are two different products, their share price and transaction costs will be different. Barnhart & Rosenstein (2010) test whether ETFs are a better tracking vehicle than CEFs. They find that ETFs record a higher trading volume making them more attractive for investors. ETFs seem less expensive because each investor only pays the trades that he/she makes, leading to lower trading costs.

If an investor holds the same portfolio of ETF shares, he has not transaction costs because it has the same number of ETF shares. However in the CEF structure each time there are trades, such as changes in the composition of the portfolio, transaction costs are pooled between all investors, which penalize investors who do not change their portfolio.

Both CEFs and ETFs use NAV (Net Asset Value) as a reference to their share price on the market. Usually ETF trade at a closer value to NAV, because as ETF can be traded at any point during the day, their arbitrage turns easier if share price deviates from NAV.

As for CEF their arbitrage is harder because they are only traded once a day, which usually leads to a larger difference between share price and CEF NAV, so CEF fund price are less connected to NAV.

Due to ETFs easier arbitrage Huguen & Mathew (2009) found consistent evidence of ETF being more efficiently priced than CEF, they conclude that otherwise any discount/premium can be used by institutional investors. When institutional investors face an ETF arbitrage opportunity they can take advantage though in kind via process forcing ETF share price to adjust automatically. Eventually investment companies are able to manage CEF shares supply.

When a new ETF, tracking the same benchmark as an existent CEF is launched, CEF tends to present abnormal discounts in his share price. Barnhart & Rosenstein (2010) conclude that abnormal discounts are verified because as soon as a new ETF is launched investors want to sell all their CEF shares because they see ETF as a better product.

CEF funds are launched into the market through an IPO where they initially trade at premium, Hughen & Mathew (2009) conclude that after one year CEF funds eventually fall into discount, however according to Yeyati & Ubide (1998) CEF country funds trade with a large premium in crisis events.

Investors look for funds in order to seek for an exposure to a diversified portfolio of foreign stocks, however Manzler & Slezak (2008) found that US ETFs still have a high correlation with S&P 500.

In the process they also look to lower their trading costs, Leonard & Shull (1996) suggest that ETFs may provide a more effective low-cost strategy of diversifying internationally than CEFs and according to Manzler & Slezak (2008) CEFs are more expensive than ETFs: 1.38% against 0.71%. So far, ETFs seem to be a better product for the investor: higher liquidity, easier arbitrage and lower trading costs.

However ETFs do not have only good features. When there are changes in the index, for instance two or three companies are going to be excluded from the index and new companies are going to enter in the index, ETFs have to follow also those changes in order to keep their tracking abilities (ETF need to fully replicate their benchmark), ETFs are going to have higher costs when comparing to other mutual funds such as CEFs or Open-End funds (OEFs). For ETF are better smaller indexes. They have fewer trades to make when a change in the index happens. Despite ETFs are more liquid than CEFs they are less liquid than OEFs, according to Guedj & Huang (2008). ETFs are more for long-term investors, however ETF seem better than OEFs because OEFs do not account for future price impact and they only trade once at the end of the trading day like CEFs.

Like CEFs, OEFs investors also share trading costs each time the fund changes assets, however Guedj & Huang (2008) state that OEF manager can be more efficient than ETF if he is able to decrease transaction costs by forecasting overall liquidity needs.

When comparing ETFs and CEFs performance, Harper, Madura, & Schnusenberg (2006) conclude that ETF have higher mean returns and Sharpe ratio. They conclude that ETF passive strategy, that is implicit with ETF, is better than CEF active management. CEF funds can not perform better than ETFs because active strategy increases CEF transaction costs. ETF tax advantage over CEF has been discussed, however Harper, Madura, & Schnusenberg (2006) conclude that is difficult to generalize it.

I-Shares was the pioneer of making ETF available for every retail investor around the world, they are today the main ETF provider in the world with more than 711 thousand million US dollars in assets. I-Shares are committed to help investment consultants in using it in the best way. I-Shares are currently managed by BlackRock. Despite I-Shares are able to replicate foreign index return, Pennathur (2002) found that they still have a high degree of U.S. market exposure. I-Shares do not track perfectly the benchmark, they invest about 95% on the index and leave the remaining to look for other assets like emergent markets, according to Pennathur (2002) this strategy is followed to look for risk sharing and low correlation. The capability of I-shares following MSCI indexes decreased in the past years due to Asian crisis, it forced redemption and forced to reduce transaction costs.

More often than not, an investor may want to increase his exposure to a certain index, without having to buy additional shares of ETF or CEF to increase that exposure. A common solution is to invest in LETFs (Leverage ETFs). Investing in LETFs is a common attempt to earn superior returns when betting on the direction of the market, however LETF may be unsuitable for buy/hold investors because it offers a big exposure to some ETF.

The fund manager will invest 2 times or 3 times the value of the index to try to replicate 2 or 3 times the return of the fund.

However, despite leveraged ETFs fund managers attempts to earn superior returns, according to Avellaneda & Zhang (2010) more often than not LETFs underperform (have moderate returns combined with high volatility) static leverage ETF (over-perform large return with relatively lower volatility). Avellaneda & Zhang (2010) state that LETF underperform is linked with their need to be rebalanced frequently, in the need to sell low and buy high, is going to lead to underperform to static leverage portfolios. In that way, Avellaneda & Zhang (2010) identified: funding rate, expense ratio, cost of borrowing (when short); convexity (relation of LETF prices and beta) associated with beta and realized variance as the main variables that the relation between LETF and its underlying ETF depends on.

LETF will not guarantees the desired return (the same as static ETF), is possible to adjust the holding of LETF by making dynamic hedging, in that way we should be able to replicate the target return of ETF without additional risk, due to volatility fluctuations. However, LETFs are more suitable for high frequency traders due to their very high trading needs.

4. Data

To be able to make a comparative analysis between ETF funds and CEF funds is necessary to select a representative sample of the U.S. market fund. U.S. market fund is the more developed market fund in the world, it has a high number of funds, a huge variety and it has available data.

A survivorship bias-free sample from Lipper with 1.117 ETFs and CEFs were the initial possible funds for the final sample. To filter funds, two main criteria were used: all the funds should have at least 5 years of observations and each ETF and CEF should share a benchmark.

If some index do not have both ETFs and CEFs tracking them they were automatically off the sample.

Despite the 5 years of observations, longer data was included in CEF funds in order to analyze CEF volume evolution throughout the years. Five years of observations should guarantee the decrease of the weight of one-time events, such as crisis events.

After all criteria were applied the sample was narrowed to 46 funds divided into: 19 ETFs and 27 CEFs with all of them traded in United States of America exchange. Price, volume, market value, NAV and price index were the variables extracted in order to analyze performance, volume and mispricing of each fund in the sample.

All data was extracted from Bloomberg Terminal and Thomson Reuters Datastream.

In the analysis daily data is used in order to provide a larger number of observations.

The following tables present CEFs (table 1), ETFs (table 2) and the link between each fund and its benchmark (table 3).

Table 1 and 2 describe several features of CEF and ETF funds used. Columns present code, name, geographical focus, inception date, mean and standard deviation.

Table 3 presents the match between each benchmark and each fund and each benchmark code.

Table 1 Description of CEF sample

Code	Fund name	Geo. Focus	Date	Mean	S. Deviation
1	ING Risk Managed Natural Resources Fund	Global	24-10-2006	-0,04%	1,61%
2	Asia Tigers Fund Inc	Asia Pacific	29-11-1993	0,02%	1,95%
3	B. Rock Int. Growth and Income Trust	Global ex US	30-05-2007	-0,06%	1,98%
4	AllianzGI Global Equity & Conv. Inc. Fund	Global	26-09-2007	-0,03%	2,19%
5	Lazard World Dividend & Income Fund Inc	Global	27-06-2005	-0,02%	1,78%
6	B. Rock Global Opportunities Equity Trust	Global	26-05-2005	-0,03%	1,79%
7	PIMCO Global StocksPLUS & Income Fund	Global	26-05-2005	0,00%	2,20%
8	AllianzGI InterR. & Premium Strategy Fund	Global ex US	27-04-2005	-0,04%	1,79%
9	Morgan Stanley E. M. Fund Inc	Global ex US	25-10-1991	0,02%	2,10%
10	Templeton E. M. Fund	Global	05-03-1987	0,01%	1,48%
11	India Fund	India	14-02-1994	0,02%	2,50%
12	H&Q Life Sciences Investors	USA	08-05-1992	-0,01%	1,51%
13	H&Q Healthcare Investors	USA	23-04-1987	0,00%	1,47%
14	Eaton Vance Enhanced Eq. Income Fund II	USA	26-01-2005	-0,02%	1,60%
15	First Trust Dividend and Income Fund	Global	20-09-2007	-0,05%	2,33%
16	Eaton Vance Tax-Adv. Div.Income Fund	USA	30-09-2003	0,00%	1,61%
17	Royce Micro-Cap Trust Inc	USA	14-12-1993	0,01%	1,77%
18	Royce Value Trust Inc	USA	19-11-1986	0,00%	1,65%
19	Eaton Vance Tax-Man. Global Eq. Inc Fund	Global	27-02-2007	-0,05%	1,86%
20	Alpine Total Dynamic Div. Fund	Global	26-01-2007	-0,10%	2,23%
21	Eaton Vance Tax-Man. Diver. Eq. Inc Fund	USA	30-11-2006	-0,04%	1,69%
22	Kayne Anderson Energy Develop. Company	USA	21-09-2006	0,01%	2,70%
23	Alpine Global Dynamic Dividend Fund	Global	26-07-2006	-0,08%	2,34%
24	Advent/Claymore Enha. Gr. & Inc. Fund	Global	26-01-2005	-0,03%	1,47%
25	Denali Fund	USA	25-11-2002	0,10%	1,67%
26	Adams Express Co	USA	30-10-1959	-0,01%	1,27%
27	BlackRock Enhanced Capital & Inc. Fund	USA	30-04-2004	-0,02%	1,49%

Note: Date stands for inception date of the fund, for CEF funds represents when IPO is launched and the fund became available for retail investor.

Despite all CEF funds in this sample are traded on the American market they can own assets with a different geographical focus.

Table 2 Description of ETF sample

Code	Fund	Geo. Focus	Date	Mean	S. Deviation
1	Direxion Daily Energy Bull 3x Shares	USA	06-11-2008	0,04%	5,21%
2	Select Sector Energy SPDR Fund	USA	16-12-1998	0,03%	2,05%
3	ISHares MSCI All Coun. Asia ex Japan ETF	Global Ex US	13-08-2008	0,03%	2,13%
4	ISHares MSCI ACWI ex US ETF	Global Ex US	26-03-2008	0,00%	1,89%
5	SPDR MSCI ACWI ex-US ETF	Global Ex US	10-01-2007	0,00%	1,87%
6	ISHares MSCI ACWI ETF	Global	26-03-2008	0,01%	1,75%
7	ISHares MSCI EAFE ETF	Global Ex US	14-08-2001	0,01%	1,74%
8	ISHares MSCI E. M. ETF	Global Ex US	07-04-2003	0,02%	2,35%
9	ISHares Nasdaq Biotech. ETF	USA	05-02-2001	0,05%	1,45%
10	ISHares Russell 1000 Growth ETF	USA	22-05-2000	0,04%	1,26%
11	ISHares Russell 1000 Value ETF	USA	22-05-2000	0,02%	1,43%
12	ProShares Ultra Russell2000	USA	23-01-2007	0,00%	3,84%
13	ISHares Russell 2000 ETF	USA	22-05-2000	0,03%	1,79%
14	Direxion Daily S&P 500 Bull 3X Shares	USA	05-11-2008	0,26%	2,22%
15	ProShares Ultra S&P500	USA	19-06-2006	0,02%	2,89%
16	ISHares Core S&P 500 ETF	USA	15-05-2000	0,02%	1,40%
17	SPDR S&P 500 ETF Trust	USA	22-01-1993	0,02%	1,41%
18	SPDR S&P 500 Value ETF	USA	25-09-2000	0,05%	1,09%
19	ISHares S&P 500 Value ETF	USA	22-05-2000	0,02%	1,51%

Note: Despite all CEF funds in this sample are traded on the American market they can own assets with a different geographical focus.

Table 3 Matching between benchmarks and funds

Code	Benchmark	ETF	CEF
1	Energy S. Sec. Index	Daily Energy 3x(1) SPDR Energy(2)	Risk Managed(1)
2	MSCI AC Asia ex Japan NR USD	IShares Asia(3)	Asia Tigers(2)
3	MSCI AC World ex USA NR USD	IShares ACWI(4) SPDR MSCI(5)	B. Rock International(3)
4	MSCI AC World NR USD	IShares ACWI(6)	Allianz GI(4) Lazard WD(5) B. Rock Global(6)
5	MSCI EAFE NR USD	IShares EAFE(7)	PIMCO(7) Allianz International(8)
6	MSCI EM NR USD	IShares E. M. (8)	Morgan Stanley E.M.(9) Templeton E.M.(10)
7	NASDAQ Biotech. CR	IShares Nasdaq(9)	H&Q Life(12) H&Q Healthcare(13)
8	Russell 1000 Growth TR	IShares Russel Gr.(10)	E. Vance Enhanced II(14)
9	Russell 1000 Value TR	IShares Russel Val.(11)	First Trust(15) E. Vance Tax-Adv.(16)
10	Russell 2000 TR	ProShares Russel(12) IShares Russel (13)	Royce Micro-Cap(17) Royce Value(18)
11	S&P 500 TR	Direxion Daily 3X(14) ProShares ultra (15) IShares Core(16) SPDR ETF trust (17)	E. Vance Tax-M. Global(19) Alpine Total(20) E. Vance Tax-M. Div. (21) Kayne Anderson(22) Alpine Dividend Fund(23) Advent/Claymore(24) Denali Fund(25) Adams Express(26)
12	S&P 500 Value TR Index	SPDR Value ETF (18) IShares S&P Value (19)	B. Rock En.Capital(27)
13	MSCI India NR USD	N/A	India Fund(11)

Note: CEF code and ETF code are presented next to the name. Each row represents a benchmark and ETFs and CEFs that track it.

5. Methodology

Following the literature on performance evaluation, several ratios were used to evaluate fund performance based on return measures and risk-adjusted returns.

5.1 Indicators

Mean (R_p) and standard deviation of returns (σ_p) will be the initial guidelines for fund evaluation, for return and risk comparison. The analysis will be based on risk adjusted returns in order to have a more accurate value of the real performance of the funds.

Alpha was computed through excel, making a regression with return of the security and returns of the benchmark using function intercept. Further it will be presented Jensen Alpha as well. Alpha concept is to look for excess returns in funds existent in the markets.

Market model is a regression constructed to explain the relation existent between excess returns on the market and an observable market index. Market model specified that stock returns can be explained properly by the broad market index. So this model uses an observable index as a proxy for the market model (that is not possible to observe) and uses observable realized returns from each securities that track some benchmark in order to estimate in an easy way the asset beta.

Market model equation is the following:

$$R_p = \text{Intercept} + \beta * R_m + \epsilon_T \quad (1)$$

Where,

R_p = total security return

β = security beta

R_m = market return

ϵ_T = error term

5.2 Risk measures

5.2.1 Beta (β): Is a systematic risk measure. It measures how a security return will follow benchmark return. 1 is the reference value which means that security return movement must be towards the same direction as benchmark, so both returns should be connected.

Beta will be used as reference of how each fund follows their benchmark and how much is expected to follow their return. Beta can be computed through excel function slope making a regression between security returns and benchmarks returns.

5.2.2 Specific Risk (σ_{ep}): Is the risk that can be diversified away. Each investor only bears that risk to look for extra return (due to extra risk beard). Specific risk can be obtained by excel STEYX function using security and benchmark returns X and Y variables.

5.3 Risk-adjusted returns

To compare performance of both funds is necessary to use risk adjusted measures in order to corroborate the conclusion for which fund to choose.

5.3.1 Jensen Alpha measures abnormal return over an expected (benchmark) return.

$$\alpha p = R_p - (R_f + \beta * (R_m - R_f)) \quad (2)$$

Whereas,

αp = alpha return

R_f =risk free rate

5.3.2 Sharpe Ratio

$$\text{Sharpe Ratio} = \frac{R_p - R_f}{\sigma_p} \quad (3)$$

Where,

σ_p = standard deviation

Sharpe Ratio measures the unit of extra return (risk premium over the risk free rate) per unit of total risk beard. Logic is: a higher value means a better fund performance.

5.3.3 Treynor Ratio

$$Treynor\ Ratio = \frac{Rp-Rf}{\beta} \quad (4)$$

Treynor Ratio measures extra return (over the risk free return) per unit of portfolio risk (β). The reasoning is the same as for Sharpe Ratio a higher value represents a better performance.

5.3.4 Sortino Ratio

$$Sortino\ Ratio = \frac{Rp-T}{DR} \quad (5)$$

Where;

T – Benchmark return

DR – Semi-standard deviation

Sortino Ratio is an update of Sharpe Ratio. It also measures funds/securities in a return-risk logic, however it does not penalize the upside potential volatility (because it is not a bad thing) and only penalizes the downside volatility – volatility under the target, downside volatility. Once more the higher value is the better fund.

5.3.5. Appraisal Ratio

$$Appraisal\ Ratio = \frac{\alpha p}{\sigma_e} \quad (6)$$

Whereas:

σ_e = unsystematic risk

Appraisal ratio is used to measure a fund manager picking ability. It compares fund alpha to unsystematic risk. Going along with previous ratios a higher value represents a higher performance of the fund.

5.4 Tracking error

Tracking error is a measure that has the goal of analyzing how much a fund tracks an index, which means that the return achieved by the fund should be more or less close to the one achieved by the index depending on the tracking error. A lower tracking error is better and with that we should expect a portfolio return closer to benchmark return.

$$T.E. = \sqrt{\frac{\sum_{i=1}^n (Rp - Rb)^2}{n-1}} \quad (7)$$

T.E. = Tracking error

Rb = Benchmark return

n = number of return periods (days)

If the tracking error is zero (0) means that the fund tracks perfectly the index.

According to Pennathur (2002) we should expect low tracking error for ETFs.

5.5 Hit ratio

$$\text{Hit Ratio} = \frac{(\text{Number of hits})}{(\text{Number of hits} + \text{Number of misses})} \quad (8)$$

Hit ratio concept is easy to understand. Its goal is to measure how many times each fund beat (outperform) their benchmark. A value over 0.500 is already considered good, because the fund wins in the majority of cases.

Despite CEFs attempt to beat the benchmark, according to Bal & Leger (1996) most of times they fail to achieve that.

5.6 Mispricing

As mentioned in the Literature Review CEF funds trade at discount approximately one year after inception. When funds trade at discount or premium, relatively to their NAV – Net Asset Value, the real share price, it means that the price is not correct – is mispriced.

This analysis looked for mispriced funds investigating which benchmarks have more mispriced funds and how mispricing is distributed throughout the sample.

Next, are going to be presented summary statistics of mispricing presented in sample used in the analysis in order to characterize variables such as mean, standard deviation, maximum or minimum were used. Below is presented the mispricing equation:

$$mispricing\ t = \frac{Price\ t - NAV\ t}{Price\ t} \quad (9)$$

Table 4 Mispricing by fund type

Fund	Mean	Standard deviation	Max	Min	Sum	N
CEF	-0,0555	0,1252	0,8804	-0,4032	-3228,633	58194
ETF	0,0004	0,0064	0,1211	-0,0971	11,4042	31446
Total	-0,0359	0,1044	0,8804	-0,4032	-3217,229	89640

Note: All presented variables are relative to the variable mispricing.

Table 4 presents summary statistics for the variable mispricing by fund type.

A larger number of observations for CEFs than ETFs was included to study volume before and after ETF inception.

It is possible to understand that CEFs are trading at discount and ETFs at premium.

6. Results

6.1 Performance evaluation

In order to compare ratios among all funds, the sample was divided by the 12 benchmarks that comprise both ETFs and CEFs. Sharpe Ratio, Treynor Ratio, Appraisal Ratio, Sortino Ratio and Hit Ratio were the ratios used in the analysis, which are mainly risk-adjusted measures.

In the analysis, first it was computed each one of the five ratios for all funds presented. Then, inside each benchmark it was computed which fund, either CEF or ETF, performed better comprising all the funds of each benchmark for each ratio used. Which means that using the values already computed it was only necessary to identify which fund type was best inside each benchmark in every one of the ratios.

At last, after knowing which fund type was best for each ratio inside each benchmark, it was only necessary to count which fund type was best more times in each benchmark.

The summary of results of the last two steps of these computations is possible to check in tables 5 and 6. Those tables present all the benchmarks, the ratios used and the combination of results. The last row summarizes which fund performed better in a risk-adjusted way in each benchmark. Between table 5 and 6 there is one difference: the sample size used. Table 5 summarizes the results when all the observations of each fund were used to compute the ratios, where can exist a huge difference in number of observations (for each year added or subtracted each fund can have more or less 250 observations – trading days).

However, when using all the observations for all funds the results can become biased because a worse period from one fund can become “hidden” in a larger number of observations accounted and in the same way a great year for one fund with fewer observations can have an over increase in the performance evaluation ratios. So, in order to achieve a more accurate comparison the sample size was narrowed. It was narrowed in order to all funds from each benchmark have the same number of observations, so, all the funds can be compared using the same time-frame and crossing the same events decreasing the possibility of an over or under reaction between them.

When using all observations of all funds Sharpe Ratio and Treynor Ratio give the exact same conclusion either CEF or ETF, however, which does not happen once the sample is narrowed.

Appraisal Ratio measures a fund manager picking ability, because CEF funds are actively managed and ETFs do not, it should be expected that CEF funds perform better in all funds despite the sample size. However, the results are mixed (each fund type is best in Appraisal Ratio about 50% of times) which can state that CEF fund manager ability to look for extra return is low.

Table 5 Fund evaluation: Summary of results using all observations of each funds

Each row represents for each ratio whether it were ETF or CEF that achieve the best performance in average between all the funds included in each benchmark. The last row summarizes which fund type performed better between all funds inside each benchmark in the majority of ratios used.

Best Fund	Hit	Sortino	Appraisal	Treynor	Sharpe	Ratio/Benchmark
ETF	ETF	ETF	CEF	ETF	ETF	Energy
CEF	CEF	ETF	CEF	CEF	CEF	Asia
ETF	ETF	ETF	ETF	ETF	ETF	World ex USA
ETF	CEF	ETF	CEF	ETF	ETF	World
ETF	CEF	ETF	ETF	ETF	ETF	EAFE
CEF	ETF	ETF	CEF	CEF	CEF	E. M.
ETF	ETF	ETF	CEF	ETF	ETF	Nasdaq
ETF	CEF	ETF	ETF	ETF	ETF	Russel 1000 Gr.
ETF	ETF	ETF	ETF	ETF	ETF	Russel 1000 Va.
CEF	ETF	ETF	CEF	CEF	CEF	Russel 2000
ETF	ETF	ETF	CEF	ETF	ETF	SP TR
ETF	CEF	ETF	ETF	ETF	ETF	SP Value

In both sample sizes there are two benchmarks that have total accordance in which fund type is the best. In the first case World ex USA and Russel 1000 Value are better with ETF no matter what ratio is used, with the narrowed sample Russel 1000 Value is able to maintain ETF dominance and instead of World ex USA is S&P Value that accomplishes ETF dominance with all the funds used.

After analyzing the results with the first stage, ETFs seem to have performed better, being the best fund 9 out of 12 possible times. Attached in tables 12 to 19 is possible to have more detail about the fund evaluation using all observations.

Table 6 Fund evaluation: Summary of results using only the common period of observations for each fund with the same benchmark

Each row represents for each ratio whether it were ETF or CEF that achieve the best performance in average between all the funds included in each benchmark. The last row summarizes which fund type performed better between all funds inside each benchmark in the majority of ratios used.

Best Fund	Hit	Sortino	Appraisal	Treynor	Sharpe	Ratio/Benchmark
CEF	ETF	ETF	CEF	CEF	CEF	Energy
ETF	CEF	ETF	ETF	ETF	ETF	Asia
ETF	CEF	ETF	ETF	ETF	ETF	World ex USA
ETF	CEF	ETF	CEF	ETF	ETF	World
ETF	CEF	ETF	ETF	ETF	ETF	EAFE
ETF	ETF	ETF	CEF	ETF/CEF	ETF	E. M.
ETF	ETF	ETF	CEF	ETF	ETF	Nasdaq
ETF	CEF	ETF	ETF	ETF	ETF	Russel 1000 Gr.
ETF	ETF	ETF	ETF	ETF	ETF	Russel 1000 Va.
ETF	ETF	ETF	CEF	ETF/CEF	ETF	Russel 2000
ETF	ETF	ETF	CEF	CEF	ETF	SP TR
ETF	ETF	ETF	ETF	ETF	ETF	SP Value

Despite the narrowed sample drops a lot of observations, it does not affect the final outcome, by the opposite it enhances the final conclusion even stronger. Instead of ETF being the best fund 9 out 12 times, ETF are able to accomplish that 11 out 12 times.

Attached in tables 20 to 27 is possible to have more detail about the fund evaluation when is used the same number of observations for funds inside each benchmark.

6.2 Mispricing analysis

In the following tables (7 and 8) are presented results from the mispricing analysis that characterizes the sample.

Table 7 Mispricing analysis

Number of observations = 89236
R-squared = 0,0718
Adjusted R-squared = 0,0717

Table 8 Mispricing analysis

Mispricing	Coefficient	Standard Error	t Statistic
ln_ret	0,1456	.0175	8,34
year	0,0029	.0001	24,73
CEF	-0,0519	.0007	-71,6
_cons	-5,8595	.2370	-24,7

-cons stands for constant

In the previous tables is possible to understand that CEF is trading at discount and ETF is trading at premium, because CEF coefficient is negative and statistically significant. The presence of CEF discount in the sample corroborates what was discussed and reviewed in the literature – CEF eventually end up trading at discount some time after inception.

One can conclude that as the years go by, mispricing tends to increase, which goes along with the literature because CEF price is said to be at discount after approximately one year, so more time after the inception reflect future CEF discount that has the trend to increase throughout the years. When return increases, mispricing increases as well. All these results are statistically significant despite R^2 tell us that this model explains few (7.18%) of mispricing.

Of the 13 benchmarks just one of them does not show in average, mispricing. All mispricing values are small, which makes it hard to take advantage of arbitrage opportunities. Most of CEF funds show in average mispricing which goes along with what was expected initially.

However ETF funds in a large majority also show mispricing which can suggest that ETF are not as efficiently priced as it was expected and that ETF arbitrage is not that easy to accomplish, otherwise institutional investors could take advantage of a lot of opportunities with ETF funds. Each fund and benchmark summary statistics are attached in tables 29 to 37 where is possible to find more detail.

All data used is end of day price which means that during the day arbitrage can exist just for a few seconds and even by a very small amount, which means that in the majority of cases arbitrage can only compensate with a very large trade.

Attached in table 41 a) to m), is possible to analyze benchmark mispricing regressions, whether benchmarks are at premium or discount and what is their evolution throughout the years. Benchmark 5 (MSCI EAFE NR USD Index) is the only one that is trading at premium, the remaining ones are trading at discount. All mispricing coefficients are statistically significant for all benchmarks. MSCI EAFE NR USD Index (benchmark 5), is used in the U.S. as the main benchmark to ensure international equity performance. The index comprises developed markets outside North America, such as Europe, Asia, Australia and Far East.

In benchmarks 1, 5, 6, 7, 9 and 12 the coefficient is positive and statistically significant for year, which means that mispricing tends to increase across the years. By the other hand benchmarks 3, 4, 8, 10 and 11 mispricing tends to decrease across the years. Only for benchmark 2 is not possible to take any conclusion because the coefficient is not statistically significant.

At last, the $\ln_ret$ coefficient is positive and statistically significant for benchmarks 2, 3, 4, 5, 6, 7 and 9, which means that when return increases mispricing increases as well. However, for the remaining benchmarks is not possible any conclusion because the coefficient is not statistically significant.

6.3 Volume Analysis

In this section is going to be presented CEF volume analysis. In table 9 is computed CEF funds average trading volume across the entire sample.

Table 9 CEF funds average trading volume

Funds	Average Trading Volume
cef_1	80,77
cef_2	19,02
cef_3	384,09
cef_4	34,45
cef_5	28,92
cef_6	149,35
cef_7	52,48
cef_8	49,86
cef_9	39,66
cef_10	120,20
cef_11	345,04
cef_12	51,88
cef_13	67,04
cef_14	153,02
cef_15	42,08
cef_16	187,14
cef_17	58,22
cef_18	146,06
cef_19	995,53
cef_20	991,84
cef_21	483,12
cef_22	61,60
cef_23	131,92
cef_24	47,72
cef_25	9,37
cef_26	109,41
cef_27	100,37

Note: All funds were divided according to their benchmarks. Then, CEFs trading volume was computed after the inception of the similar ETF (competitor within the same benchmark). For benchmarks that have more than one ETF, CEFs daily average trading volume was computed for each one of those different inception dates. The new average volume computed is between the ETF inception until 7 November of 2013 (last day of observation). Trading volume variation is shown at table 10 after the introduction of an ETF. The results are in percentage which represents the direction of the evolution of trading volume.

Table 10 CEF volume variation after peer ETF inception

Bench._1	cef_1								
etf_1	0,00%								
etf_2	4,61%								
Bench._2	cef_2								
etf_3	-39,53%								
Bench._3	cef_3								
etf_4	1,78%								
etf_5	0,00%								
Bench._4	cef_4	cef_5	cef_6						
etf_6	-0,53%	0,84%	35,91%						
Bench._5	cef_7	cef_8							
etf_7	1,86%	2,69%							
Bench._6	cef_9	cef_10							
etf_8	9,08%	16,01%							
Bench._7	cef_12	cef_13							
etf_9	27,99%	20,84%							
Bench._8	cef_14								
etf_10	2,74%								
Bench._9	cef_15	cef_16							
etf_11	0,00%	0,93%							
Bench._10	cef_17	cef_18							
etf_12	22,62%	29,61%							
etf_13	13,59%	17,02%							
Bench._11	cef_19	cef_20	cef_21	cef_22	cef_23	cef_24	cef_25	cef_26	
etf_14	4,32%	12,25%	6,21%	-10,11%	8,60%	2,77%	-42,08%	22,39%	
etf_15	0,00%	0,00%	0,00%	0,00%	0,00%	1,47%	-25,80%	15,25%	
etf_16	0,00%	0,00%	0,00%	0,00%	0,00%	2,01%	-25,10%	13,00%	
etf_17	0,00%	0,00%	0,00%	0,00%	0,00%	2,01%	-25,10%	13,00%	
Bench._12	cef_27								
etf_18	11,44%								
etf_19	11,44%								

If<0% volume decreased; If>0% volume increased; If=0% volume stable; CEF average trading volume was recomputed one time for each new ETF fund following the same benchmark that entered the market. The new CEF volume computed comprises observations between ETF fund inception and the last day of observations of the sample (07/11/2013). After, it was computed the variation in percentage, of CEF trading volume using all observations and CEF trading volume after each ETF inception.

Table 11 purpose is to summarize the results from table 10, which means that after the average trading volume is recomputed and after all the variations are accounted is necessary to identify what is the main trend of CEF average trading volume after the inception of a similar ETF. There were three possible outcomes: the average volume could remain stable either because ETF

inception was prior to that CEF or because after the ETF inception there was no difference. The remaining possible outcomes were that CEF average trading volume could increase or decrease after the inception of a similar ETF.

Table 11 Summary of volume variation

Volume variation/ Benchmark code	1	2	3	4	5	6	7	8	9	10	11	12	Total	%
Increased	1	0	1	2	2	2	2	1	1	4	12	2	30	54,55 %
Decreased	0	1	0	1	0	0	0	0	0	0	5	0	7	12,73 %
Stable	1	0	1	0	0	0	0	0	1	0	15	0	18	32,73 %
Total observations	2	1	2	3	2	2	2	1	2	4	32	2	55	100,00%

Note: In the first row benchmarks are identified by code. Second, third and fourth row accounted for the number of times the volume changed in each direction in each benchmark. The number of observations depends on the number of CEF and ETF funds included in each benchmark, benchmark 11 that include 4 ETFs and 8 CEFs has a higher number of observation because the average volume for each ETF inception was recomputed one time for each one of the different CEFs present in the sample. The last column summarizes in percentage the variation of the trading volume.

CEFs average trading volume increase 55% of times after the inception of a similar ETF and remain stable in 33% of times. According to the Literature Review when a new ETF fund is launched the interest in the similar CEF decreases, which means that investors want to trade all their CEF shares for ETF shares as soon as possible.

This phenomena is going to lead to more sell order for CEFs than usual because investors want to trade them out, eventually that leads to an increase of CEF trading volume. So, the results achieved in table 11 go along with the literature.

In order to give a visual idea of CEF trading volume before and after the inception of an ETF is possible to find graphs computed for each one of the 27 CEFs and for the CEF trading volume after the inception of each one of the new ETFs in the appendix in figures 1 to 59. For ETF launched before the inception of some CEF a graph was not computed.

7 Conclusion

In this thesis I have put myself in the role of the common investor that faces several investment opportunities in the market. Every investor despite their wealth wants to be sure that they invest their money in the best possible way, which means making the best asset allocation decision possible.

Asset allocation is one the most important decisions in modern finance it is the process of choosing which asset class will give the investor the desired return according to the risk he is committed to bear.

Each asset class offers several products as well as the mutual fund industry. It is necessary to choose which product to invest on.

In the mutual fund market the choice eventually comes between Exchange Traded-Funds (ETFs) and Closed-End-Funds (CEFs). CEFs are a mature security on the market, they are traded since 1950s by the other hand ETFs are a younger security, on the market since 1991, which makes interesting to study if the “new” security is able to achieve a superior performance.

So, to make a comparison between these two mutual funds, U.S. market fund is for sure the best to use: the more developed market in the world, huge variety and quantity of funds and there is available data to access.

In order to start the analysis between ETFs and CEFs it was defined a sample based on criteria such as funds having at least five years of observations and the majority of CEFs and ETFs should share a common benchmark between them, which means that each benchmark included in the sample must have both ETFs and CEFs in the sample tracking them. After starting with 1.117 from Lipper these criteria reduce the sample to 46 funds: 19 ETFs and 27 CEFs.

The analysis focused on a performance evaluation, but also in a liquidity analysis to understand what is the evolution of CEF volume after a similar ETF (tracking the same benchmark) is launched and in a mispricing study of both funds, to understand whether or not they are correctly priced or not.

In order to be able to make all the studies mentioned previously the data extracted focused on price, volume, market value and NAV from funds and price index from the benchmarks.

After, it was possible to use all extracted data to compute the necessary ratios and measures to analyze the sample. For the performance evolution were used five ratios: Treynor, Sharpe,

Sortino, Hit and Appraisal Ratio, those ratios were applied to all funds included into the sample and the result was clear: ETFs performed better than CEFs.

It is important to mention that ETFs performed better in two ways: the first all the ratios were applied using all observations available for each fund, the second all the ratios were applied using only the common period of fund observations with the same benchmark.

Despite CEF funds are actively managed and ETFs do not, CEF funds only manage to perform better than ETF in Appraisal Ratio, that measures a fund manager picking ability, about 50% of times, which means that CEF fund managers can not add as much extra return as expected in the majority of cases.

In the liquidity analysis the results show that CEF average trading volume tends to increase after the inception of a similar ETF (tracks the same benchmark). In order to get to this conclusion was necessary to compute for all observations the average CEF trading volume and the average volume only after the introduction of a similar ETF (using fewer observations), after, it was computed the variation respectively to the initial volume. So, in 55% of cases CEF volume increased after the introduction of an ETF, this conclusion goes along with the literature because many authors conclude that when a new ETF is launched investors want to sell as soon as possible their CEF shares, which eventually leads to an increase in CEF volume.

Finally, in the mispricing analysis is possible to conclude that despite the majority of funds show in average mispricing, CEF funds trade at discount while ETF funds trade at premium. This conclusion matches the literature because as several authors conclude CEF funds trade at discount some time after inception and ETF tend to be more correctly priced because their arbitrage is easier than CEF arbitrage.

As a bottom line for the analysis, is recommend to mutual funds investors that they should prefer ETFs rather than CEFs, because ETFs perform better using risk-adjusted returns, they provide higher liquidity, lower costs, tax-advantage and their price tends to be more accurate relatively to their NAV which means that ETF price is not expected to fall into discount so fast as CEF does. At last, evidence shows that CEF fund manager ability to look for extra return does not have as much success as expected, because ETFs often perform better in Appraisal Ratio, so there is no point to choose CEF funds over ETF funds.

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Notes by Ramos, S. (2013)

Terminals

Datastream

Bloomberg

9 Attachments

Table 12 – Performance analysis with entire sample Benchmarks 1, 2 and 3

Benchmark	Benchmark_1			Benchmark_2		Benchmark_3		
Fund	etf_1	etf_2	cef_1	etf_3	cef_2	etf_4	etf_5	cef_3
Arith. mean	0,04%	0,03%	-0,04%	0,03%	0,02%	0,00%	0,00%	-0,06%
St. Deviat.	5,21%	2,05%	1,61%	2,13%	1,95%	1,89%	1,87%	1,98%
Beta	2,70	0,98	0,57	0,74	0,69	0,94	0,92	0,84
Alpha Mont.	-0,09%	0,00%	-0,05%	0,01%	0,00%	-0,01%	-0,01%	-0,06%
Specific Risk	1,19%	0,38%	1,08%	1,79%	1,72%	1,34%	1,39%	1,59%
Risk prem.	0,09%	0,08%	0,01%	0,08%	0,07%	0,05%	0,05%	-0,01%
Sharpe R.	1,65%	3,88%	0,72%	3,65%	3,81%	2,82%	2,72%	-0,37%
Treynor R.	0,03%	0,08%	0,02%	0,10%	0,11%	0,06%	0,06%	-0,01%
Jensen Alp.	-0,15%	0,00%	0,00%	0,02%	0,02%	0,00%	0,00%	0,00%
Appraisal R.	-12,36%	0,37%	0,46%	1,12%	1,35%	0,25%	0,31%	-0,08%
Sortino R.	3,18%	19,79%	1,13%	6,28%	5,79%	5,78%	5,44%	-0,63%
Track. Error	3,52%	0,55%	1,42%	1,81%	1,77%	1,34%	1,40%	1,61%
Hit Ratio	52,44%	50,27%	47,05%	48,43%	49,66%	48,36%	47,86%	48,05%

Table 13 – Performance analysis with entire sample Benchmarks 4 and 5

Benchmark	Benchmark_4				Benchmark_5		
Fund	etf_6	cef_4	cef_5	cef_6	etf_7	cef_7	cef_8
Arith. mean	0,01%	-0,03%	-0,02%	-0,03%	0,01%	0,00%	-0,04%
Stand. Deviation	1,75%	2,19%	1,78%	1,79%	1,74%	2,20%	1,79%
Beta	1,17	1,19	1,06	1,10	0,83	0,65	0,79
Alpha Monthly	-0,01%	-0,04%	-0,04%	-0,05%	-0,01%	-0,02%	-0,06%
Specific Risk	0,81%	1,54%	1,27%	1,25%	1,35%	2,02%	1,47%
Risk premium	0,06%	0,02%	0,03%	0,02%	0,06%	0,05%	0,01%
Sharpe Ratio	3,68%	1,12%	1,84%	1,34%	3,32%	2,09%	0,48%
Treynor Ratio	0,05%	0,02%	0,03%	0,02%	0,07%	0,07%	0,01%
Jensen Alpha	-0,01%	0,00%	0,00%	0,00%	0,01%	0,02%	0,00%
Appraisal Ratio	-1,38%	-0,30%	-0,14%	-0,19%	0,73%	0,79%	0,12%
Sortino ratio	10,87%	2,20%	3,42%	2,52%	6,19%	2,97%	0,76%
Tracking Error	0,86%	1,56%	1,27%	1,25%	1,37%	2,07%	1,49%
Hit Ratio	48,54%	49,97%	50,21%	50,78%	47,60%	49,65%	48,83%

Table 14 – Performance analysis with entire sample Benchmarks 6 and 7

Benchmark	Benchmark _6			Benchmark _7		
Fund	etf_8	cef_9	cef_10	etf_9	cef_12	cef_13
Arith. mean	0,02%	0,02%	0,01%	0,05%	-0,01%	0,00%
Stand. Deviation	2,35%	2,10%	1,48%	1,45%	1,51%	1,47%
Beta	0,94	0,98	0,48	0,96	0,55	0,54
Alpha Monthly	-0,01%	-0,02%	-0,01%	0,00%	-0,02%	-0,02%
Specific Risk	1,91%	1,67%	1,34%	0,47%	1,16%	1,10%
Risk premium	0,07%	0,07%	0,06%	0,10%	0,04%	0,05%
Sharpe Ratio	3,10%	3,23%	4,24%	7,06%	2,93%	3,34%
Treynor Ratio	0,08%	0,07%	0,13%	0,11%	0,08%	0,09%
Jensen Alpha	0,00%	0,00%	0,03%	0,00%	0,02%	0,02%
Appraisal Ratio	0,22%	0,09%	2,41%	0,91%	1,74%	2,04%
Sortino ratio	5,56%	5,18%	5,86%	21,90%	4,28%	4,83%
Tracking Error	1,92%	1,67%	1,49%	0,71%	1,42%	1,38%
Hit Ratio	49,68%	49,35%	48,88%	50,47%	50,48%	49,77%

Table 15 – Performance analysis with entire sample Benchmarks 8 and 9

Benchmark	Benchmark _8		Benchmark _9		
Fund	etf_10	cef_14	etf_11	cef_15	cef_16
Arith. mean	0,04%	-0,02%	0,02%	-0,05%	0,00%
Stand. Deviation	1,26%	1,60%	1,43%	2,33%	1,61%
Beta	0,93	0,88	0,92	0,76	0,93
Alpha Monthly	0,00%	-0,05%	-0,01%	-0,07%	-0,04%
Specific Risk	0,41%	1,12%	0,43%	1,96%	0,97%
Risk premium	0,09%	0,03%	0,07%	0,00%	0,05%
Sharpe Ratio	6,85%	1,68%	4,74%	-0,18%	2,90%
Treynor Ratio	0,09%	0,03%	0,07%	-0,01%	0,05%
Jensen Alpha	0,01%	0,00%	0,01%	0,00%	0,00%
Appraisal Ratio	1,56%	0,30%	1,23%	-0,05%	0,32%
Sortino ratio	18,82%	3,10%	14,23%	-0,29%	6,14%
Tracking Error	0,66%	1,16%	0,67%	2,00%	1,00%
Hit Ratio	48,49%	48,96%	50,96%	49,54%	50,28%

Table 16 – Performance analysis with entire sample Benchmark 10

Benchmark	Benchmark _10			
Fund	etf_12	etf_13	cef_17	cef_18
Arith. mean	0,00%	0,03%	0,01%	0,00%
Stand. Deviation	3,84%	1,79%	1,77%	1,65%
Beta	1,96	0,96	0,78	0,79
Alpha Monthly	-0,05%	-0,01%	-0,02%	-0,03%
Specific Risk	1,03%	0,48%	1,24%	1,03%
Risk premium	0,05%	0,08%	0,06%	0,05%
Sharpe Ratio	1,43%	4,32%	3,47%	3,33%
Treynor Ratio	0,03%	0,08%	0,08%	0,07%
Jensen Alpha	-0,05%	0,00%	0,01%	0,01%
Appraisal Ratio	-5,08%	0,57%	1,10%	1,11%
Sortino ratio	3,37%	18,27%	6,26%	6,52%
Tracking Error	2,16%	0,58%	1,31%	1,11%
Hit Ratio	52,50%	48,69%	50,20%	49,98%

Table 17 – Performance analysis with entire sample Benchmark 11 (Just ETFs)

Benchmark	Benchmark _11			
Fund	etf_14	etf_15	etf_16	etf_17
Arith. mean	0,26%	0,02%	0,02%	0,02%
Stand. Deviation	2,22%	2,89%	1,40%	1,41%
Beta	2,83	1,92	0,96	0,97
Alpha Monthly	0,01%	-0,04%	-0,01%	-0,01%
Specific Risk	0,68%	0,76%	0,41%	0,39%
Risk premium	0,31%	0,07%	0,07%	0,07%
Sharpe Ratio	14,12%	2,32%	5,04%	5,03%
Treynor Ratio	0,11%	0,03%	0,07%	0,07%
Jensen Alpha	-0,57%	-0,06%	0,00%	0,00%
Appraisal Ratio	-83,47%	-8,09%	0,75%	0,53%
Sortino ratio	30,89%	5,64%	20,04%	21,30%
Tracking Error	1,57%	1,60%	0,49%	0,46%
Hit Ratio	57,10%	53,30%	49,33%	49,48%

Table 18 – Performance analysis with entire sample Benchmark 11 (Just CEFs)

Benchmark	Benchmark _11							
Fund	cef_19	cef_20	cef_21	cef_22	cef_23	cef_24	cef_25	cef_26
Arith. mean	-0,05%	-0,10%	-0,04%	0,01%	-0,08%	-0,03%	0,01%	-0,01%
S. Deviation	1,86%	2,23%	1,69%	2,70%	2,34%	1,47%	1,67%	1,27%
Beta	0,97	0,99	0,86	1,17	1,02	0,80	0,62	0,84
Alpha Mon.	-0,07%	-0,12%	-0,06%	-0,05%	-0,11%	-0,06%	-0,01%	-0,03%
Specific Risk	1,14%	1,64%	1,11%	2,04%	1,79%	1,00%	1,48%	0,63%
Risk prem.	0,01%	-0,04%	0,01%	0,06%	-0,03%	0,02%	0,06%	0,04%
Sharpe R.	0,28%	-2,02%	0,73%	2,12%	-1,17%	1,10%	3,60%	2,82%
Treynor R.	0,01%	-0,05%	0,01%	0,05%	-0,03%	0,02%	0,10%	0,04%
Jensen Alp.	0,00%	0,00%	0,00%	-0,01%	0,00%	0,00%	0,02%	0,01%
Appraisal R.	0,01%	-0,03%	0,15%	-0,48%	0,03%	0,32%	1,55%	0,92%
Sortino R.	0,57%	-3,51%	1,40%	3,89%	-1,93%	1,97%	5,26%	6,53%
Track. Error	1,17%	1,68%	1,14%	2,12%	1,83%	1,04%	1,55%	0,69%
Hit Ratio	48,54%	48,47%	48,71%	50,17%	48,41%	49,27%	50,67%	48,28%

Table 19 – Performance analysis with entire sample Benchmark 12

Benchmark	Benchmark _12		
Fund	etf_18	etf_19	cef_27
Arith. mean	0,05%	0,02%	-0,02%
Stand. Deviation	1,09%	1,51%	1,49%
Beta	0,92	0,96	0,73
Alpha Monthly	-0,01%	-0,01%	-0,04%
Specific Risk	0,36%	0,44%	1,07%
Risk premium	0,10%	0,07%	0,03%
Sharpe Ratio	9,27%	4,67%	2,15%
Treynor Ratio	0,11%	0,07%	0,04%
Jensen Alpha	0,01%	0,00%	0,01%
Appraisal Ratio	2,30%	0,60%	0,81%
Sortino ratio	35,82%	16,38%	3,66%
Tracking Error	0,42%	0,64%	1,15%
Hit Ratio	48,47%	49,63%	49,37%

Table 20 – Performance analysis with narrowed sample Benchmarks 1, 2 and 3

Benchmark	Benchmark _1			Benchmark _2		Benchmark _3		
Fund	etf_1	etf_2	cef_1	etf_3	cef_2	etf_4	etf_5	cef_3
Ar. Mean	0,04%	0,05%	-0,02%	0,03%	-0,02%	0,00%	0,00%	-0,05%
S. Deviation	5,21%	1,87%	1,51%	2,13%	2,10%	1,89%	1,92%	2,01%
Beta	2,70	0,98	0,57	0,74	0,70	0,94	0,93	0,87
Alpha Mon.	-0,09%	0,00%	-0,04%	0,01%	-0,03%	-0,01%	-0,01%	-0,05%
Specific Risk	1,19%	0,36%	1,06%	1,79%	1,80%	1,34%	1,39%	1,58%
Risk prem.	0,16%	0,17%	0,10%	0,15%	0,10%	0,11%	0,11%	0,06%
Sharpe R.	2,98%	9,03%	6,70%	6,94%	4,60%	6,05%	5,69%	3,16%
Treynor R.	0,06%	0,17%	0,18%	0,20%	0,14%	0,12%	0,12%	0,07%
Jensen Alp.	-0,26%	0,00%	0,04%	0,04%	0,03%	0,01%	0,01%	0,01%
Appraisal R.	-22,32%	1,07%	4,11%	2,13%	1,61%	0,54%	0,56%	0,50%
Sortino R.	5,74%	44,41%	10,07%	11,92%	6,87%	12,38%	11,78%	5,52%
Track. Error	3,52%	0,53%	1,35%	1,81%	1,86%	1,34%	1,41%	1,59%
Hit Ratio	52,44%	50,44%	48,04%	48,43%	49,96%	48,36%	47,80%	48,22%

Table 21 – Performance analysis with narrowed sample Benchmarks 4 and 5

Benchmark	Benchmark _4				Benchmark _5		
Fund	etf_6	cef_4	cef_5	cef_6	etf_7	cef_7	cef_8
Arith. mean	0,01%	-0,01%	-0,01%	-0,04%	0,01%	0,00%	-0,04%
Stand. Deviation	1,75%	2,23%	1,93%	2,01%	1,74%	2,24%	1,83%
Beta	1,17	1,22	1,07	1,14	0,83	0,66	0,79
Alpha Monthly	-0,01%	-0,03%	-0,03%	-0,06%	-0,01%	-0,02%	-0,06%
Specific Risk	0,81%	1,53%	1,30%	1,33%	1,35%	2,07%	1,49%
Risk premium	0,13%	0,10%	0,10%	0,07%	0,07%	0,06%	0,02%
Sharpe Ratio	7,16%	4,58%	5,19%	3,69%	3,99%	2,60%	1,09%
Treynor Ratio	0,11%	0,08%	0,09%	0,07%	0,08%	0,09%	0,03%
Jensen Alpha	-0,02%	-0,02%	-0,01%	-0,01%	0,01%	0,02%	0,00%
Appraisal Ratio	-2,69%	-1,45%	-0,53%	-0,78%	0,88%	0,97%	0,28%
Sortino ratio	21,15%	9,27%	10,40%	7,31%	7,45%	3,71%	1,74%
Tracking Error	0,86%	1,56%	1,31%	1,34%	1,37%	2,12%	1,52%
Hit Ratio	48,54%	50,39%	51,10%	50,60%	47,60%	49,73%	48,84%

Table 22 – Performance analysis with narrowed sample Benchmarks 6 and 7

Benchmark	Benchmark _6			Benchmark _7		
Fund	etf_8	cef_9	cef_10	etf_9	cef_12	cef_13
Arith. mean	0,02%	-0,02%	0,00%	0,05%	0,00%	0,01%
Stand. Deviation	2,35%	2,34%	1,63%	1,45%	1,50%	1,44%
Beta	0,94	0,99	0,53	0,96	0,73	0,70
Alpha Monthly	-0,01%	-0,04%	-0,01%	0,00%	-0,04%	-0,03%
Specific Risk	1,91%	1,84%	1,44%	0,47%	1,06%	1,01%
Risk premium	0,08%	0,05%	0,07%	0,11%	0,07%	0,07%
Sharpe Ratio	3,60%	1,98%	4,05%	7,87%	4,49%	5,21%
Treynor Ratio	0,09%	0,05%	0,12%	0,12%	0,09%	0,11%
Jensen Alpha	0,00%	0,00%	0,03%	0,00%	0,02%	0,02%
Appraisal Ratio	0,26%	0,04%	2,15%	1,01%	1,74%	2,21%
Sortino ratio	6,45%	3,12%	5,92%	24,40%	7,85%	8,99%
Tracking Error	1,92%	1,84%	1,59%	0,71%	1,15%	1,12%
Hit Ratio	49,68%	49,19%	48,25%	50,47%	49,78%	49,04%

Table 23 – Performance analysis with narrowed sample Benchmarks 8 and 9

Benchmark	Benchmark _8		Benchmark _9		
Fund	etf_10	cef_14	etf_11	cef_15	cef_16
Arith. mean	0,04%	-0,02%	0,00%	-0,05%	-0,03%
Stand. Deviation	1,26%	1,66%	1,60%	2,33%	1,91%
Beta	0,93	0,89	0,92	0,76	0,96
Alpha Monthly	0,00%	-0,06%	-0,01%	-0,07%	-0,04%
Specific Risk	0,41%	1,14%	0,48%	1,96%	1,02%
Risk premium	0,10%	0,04%	0,11%	0,05%	0,08%
Sharpe Ratio	7,78%	2,30%	6,65%	2,04%	3,94%
Treynor Ratio	0,11%	0,04%	0,12%	0,06%	0,08%
Jensen Alpha	0,01%	0,00%	0,01%	0,01%	0,00%
Appraisal Ratio	1,77%	0,37%	1,80%	0,57%	0,31%
Sortino ratio	21,37%	4,30%	19,73%	3,19%	9,17%
Tracking Error	0,66%	1,18%	0,67%	2,00%	1,01%
Hit Ratio	48,49%	49,14%	50,96%	49,54%	50,12%

Table 24 – Performance analysis with narrowed sample Benchmark 10

Benchmark	Benchmark _10			
Fund	etf_12	etf_13	cef_17	cef_18
Arith. mean	0,00%	0,02%	-0,02%	-0,02%
Stand. Deviation	3,84%	1,89%	2,00%	1,97%
Beta	1,96	0,96	0,85	0,88
Alpha Monthly	-0,05%	-0,01%	-0,04%	-0,04%
Specific Risk	1,03%	0,51%	1,18%	1,06%
Risk premium	0,09%	0,11%	0,07%	0,07%
Sharpe Ratio	2,40%	5,69%	3,53%	3,53%
Treynor Ratio	0,05%	0,11%	0,08%	0,08%
Jensen Alpha	-0,09%	0,00%	0,01%	0,01%
Appraisal Ratio	-8,55%	0,78%	0,90%	0,82%
Sortino ratio	5,67%	24,31%	7,40%	8,02%
Tracking Error	2,16%	0,61%	1,25%	1,13%
Hit Ratio	52,50%	48,85%	50,15%	49,62%

Table 25 – Performance analysis with narrowed sample Benchmark 11 (Just ETFs)

Benchmark	Benchmark _11			
Fund	etf_14	etf_15	etf_16	etf_17
Arith. mean	0,26%	0,18%	0,09%	0,09%
Stand. Deviation	2,22%	1,49%	0,76%	0,75%
Beta	2,83	1,89	0,97	0,96
Alpha Monthly	0,01%	0,01%	0,00%	0,00%
Specific Risk	0,68%	0,47%	0,24%	0,25%
Risk premium	0,42%	0,33%	0,24%	0,24%
Sharpe Ratio	18,74%	22,33%	31,87%	31,89%
Treynor Ratio	0,15%	0,18%	0,25%	0,25%
Jensen Alpha	-0,76%	-0,30%	0,01%	0,01%
Appraisal Ratio	-110,74%	-62,96%	3,31%	4,10%
Sortino ratio	40,99%	62,18%	143,74%	136,56%
Tracking Error	1,57%	0,86%	0,29%	0,30%
Hit Ratio	57,10%	57,10%	49,70%	50,30%

Table 26 – Performance analysis with narrowed sample Benchmark 11 (Just CEFs)

Benchmark	Benchmark _11							
Fund	cef_19	cef_20	cef_21	cef_22	cef_23	cef_24	cef_25	cef_26
Arith. mean	0,05%	0,00%	0,05%	0,04%	-0,02%	0,02%	0,10%	0,07%
S. Deviation	0,87%	1,00%	0,84%	1,10%	1,33%	0,76%	0,90%	0,73%
Beta	0,91	0,86	0,88	0,63	0,97	0,61	0,43	0,81
Alpha Mon.	-0,02%	-0,05%	-0,02%	-0,02%	-0,06%	-0,03%	0,07%	-0,01%
Specific Risk	0,54%	0,61%	0,53%	1,00%	0,78%	0,61%	0,84%	0,41%
Risk premium	0,20%	0,15%	0,20%	0,20%	0,14%	0,18%	0,26%	0,22%
Sharpe R.	23,65%	14,96%	24,25%	17,77%	10,32%	23,33%	28,58%	30,44%
Treynor R.	0,23%	0,17%	0,23%	0,31%	0,14%	0,29%	0,59%	0,27%
Jensen Alp	0,02%	0,02%	0,03%	0,07%	0,00%	0,07%	0,15%	0,04%
Appraisal R.	3,59%	3,43%	4,79%	7,23%	0,53%	11,12%	17,36%	10,11%
Sortino R.	47,41%	22,16%	47,46%	24,60%	13,59%	33,95%	40,70%	63,53%
Track. Error	0,57%	0,78%	0,56%	1,04%	1,13%	0,67%	0,94%	0,46%
Hit Ratio	50,30%	46,15%	47,93%	50,30%	46,45%	47,04%	50,89%	48,52%

Table 27 – Performance analysis with narrowed sample Benchmark 12

Benchmark	Benchmark _12		
Fund	etf_18	etf_19	cef_27
Arith. mean	0,05%	0,05%	-0,01%
Stand. Deviation	1,09%	1,09%	1,08%
Beta	0,92	0,88	0,74
Alpha Monthly	-0,01%	0,00%	-0,06%
Specific Risk	0,36%	0,44%	0,69%
Risk premium	0,16%	0,15%	0,09%
Sharpe Ratio	14,36%	14,12%	8,51%
Treynor Ratio	0,17%	0,18%	0,12%
Jensen Alpha	0,01%	0,02%	0,02%
Appraisal Ratio	3,57%	4,31%	3,43%
Sortino ratio	55,47%	44,43%	15,01%
Tracking Error	0,42%	0,50%	0,75%
Hit Ratio	48,47%	49,17%	48,89%

Figure 1 – CEF 1 Volume

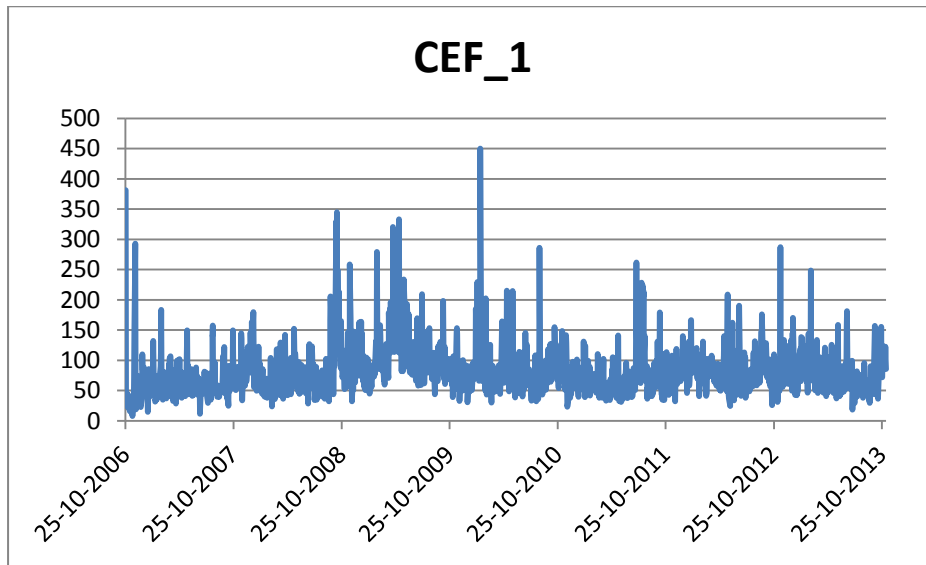


Figure 2 – CEF 1 Volume after ETF 2 inception

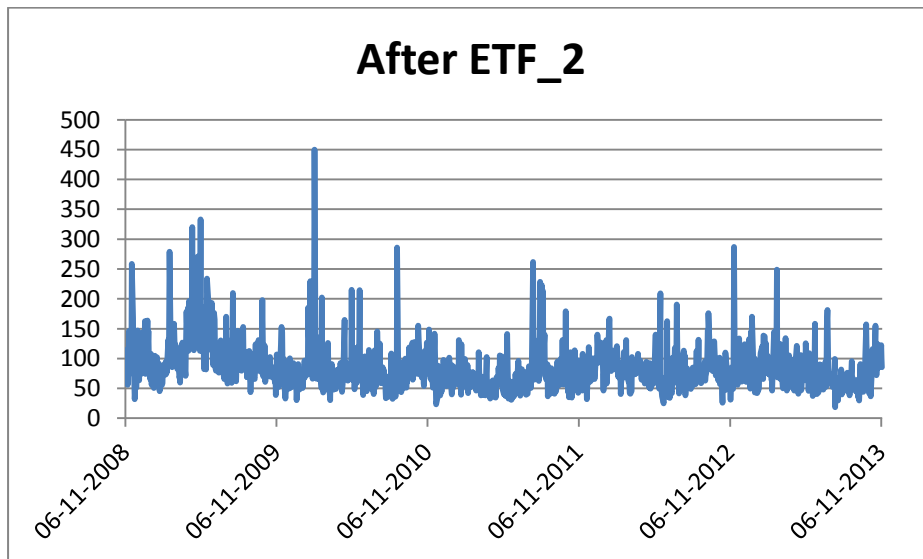


Figure 3 – CEF 2 Volume

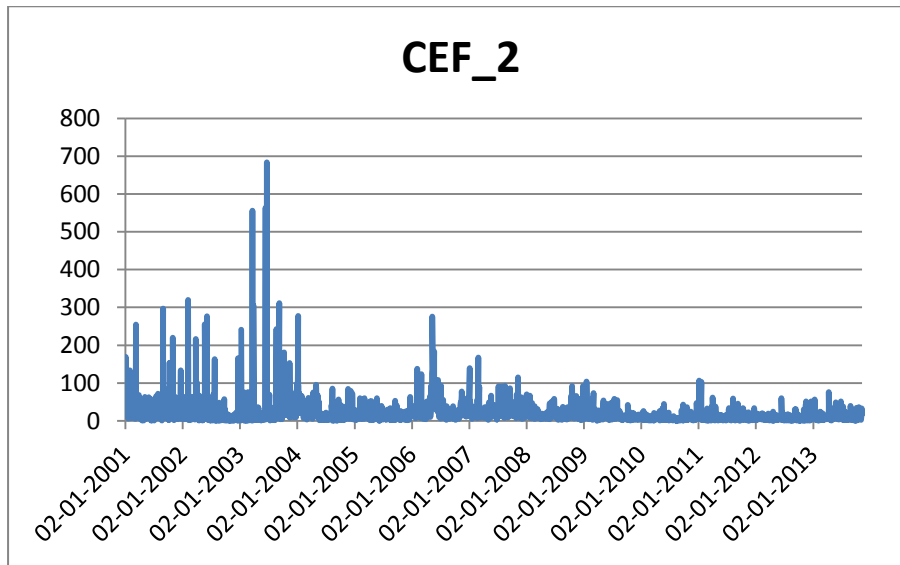


Figure 4 – CEF 2 Volume after ETF 3 inception

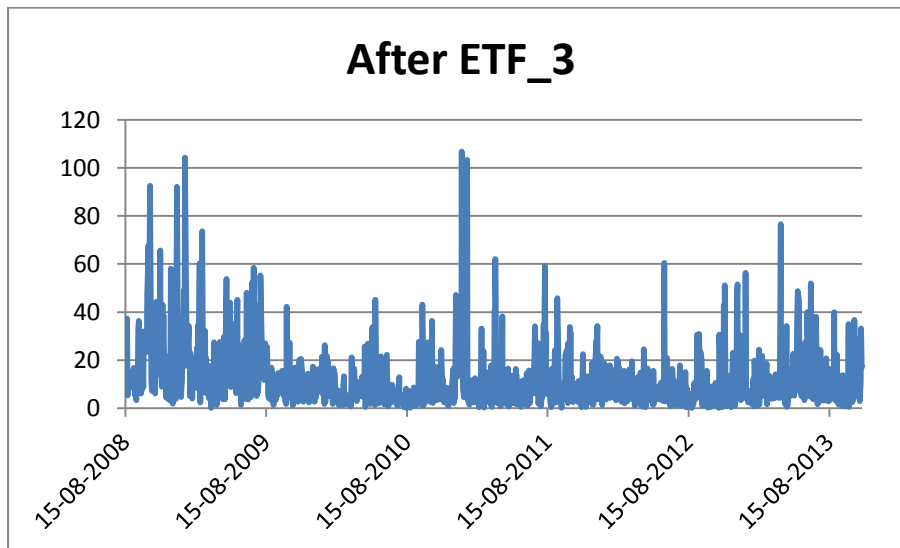


Figure 5 – CEF 3 Volume

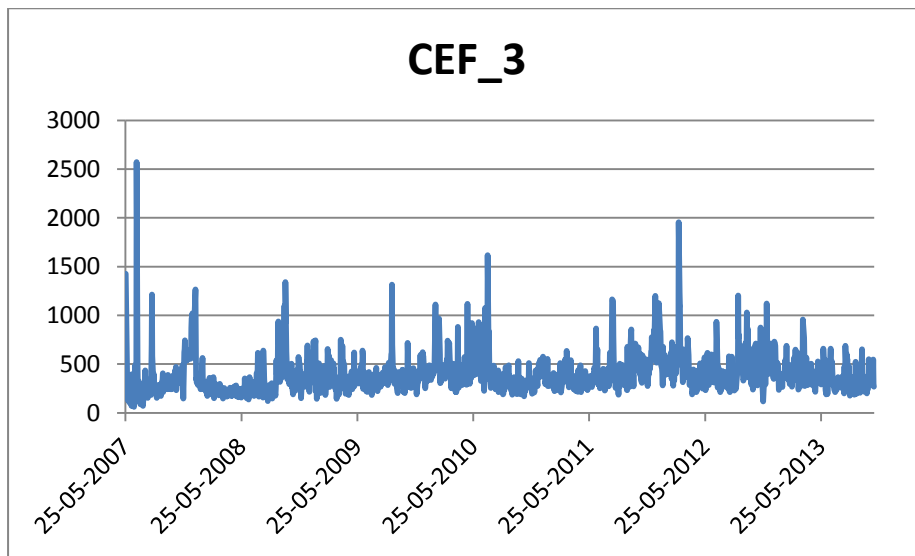


Figure 6 – CEF 3 Volume after ETF 4 inception

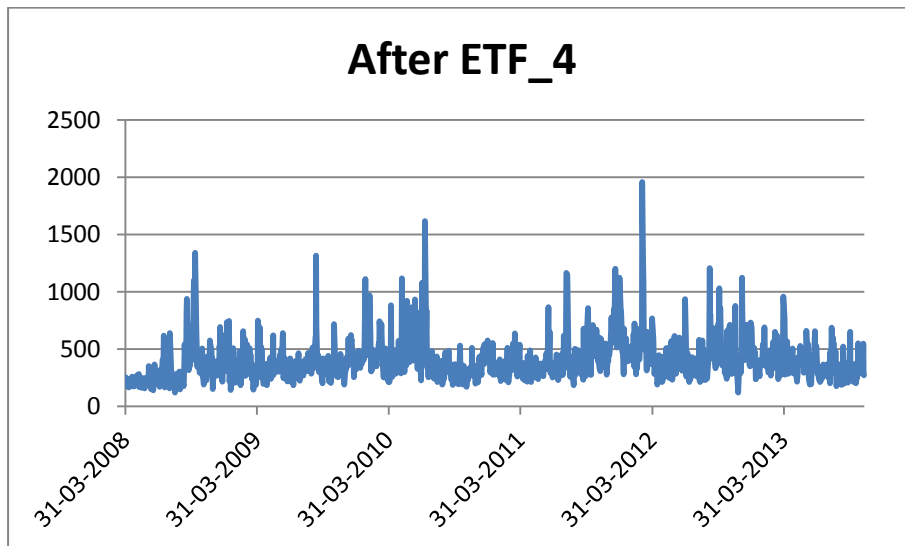


Figure 7 – CEF 4 Volume

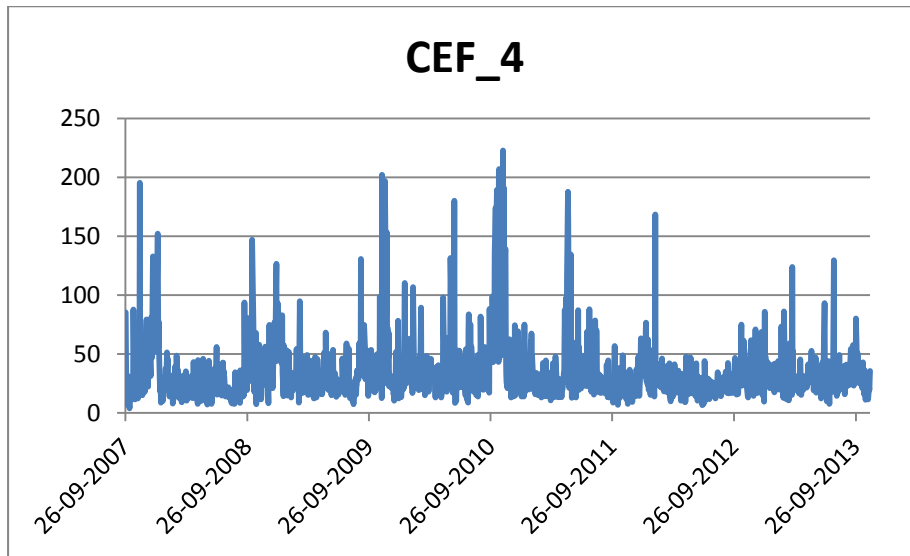


Figure 8 – CEF 4 Volume after ETF 6 inception

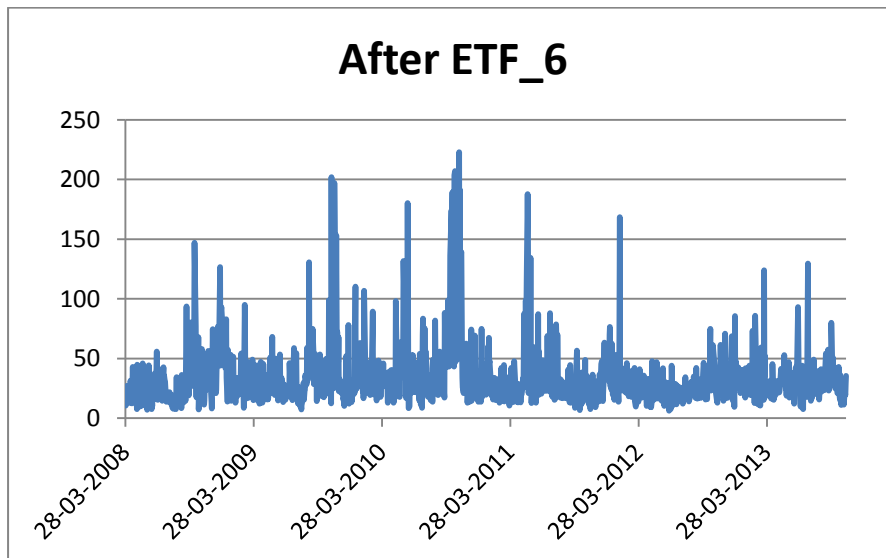


Figure 9 – CEF 5 Volume

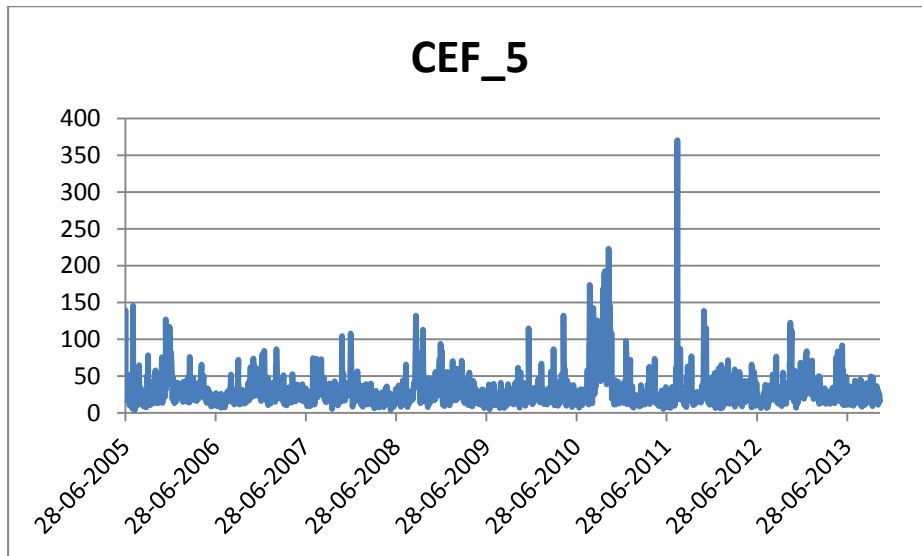


Figure 10 – CEF 5 Volume after ETF 6 inception

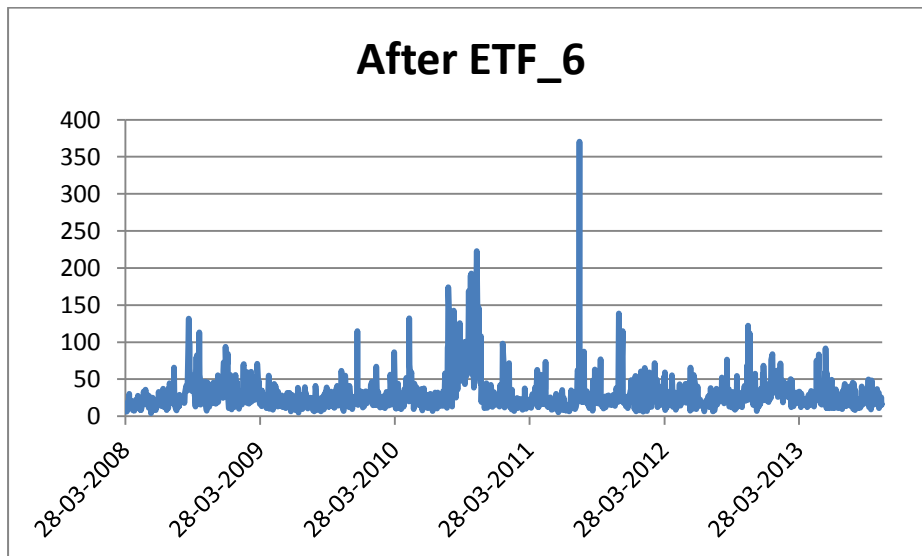


Figure 11 – CEF 6 Volume

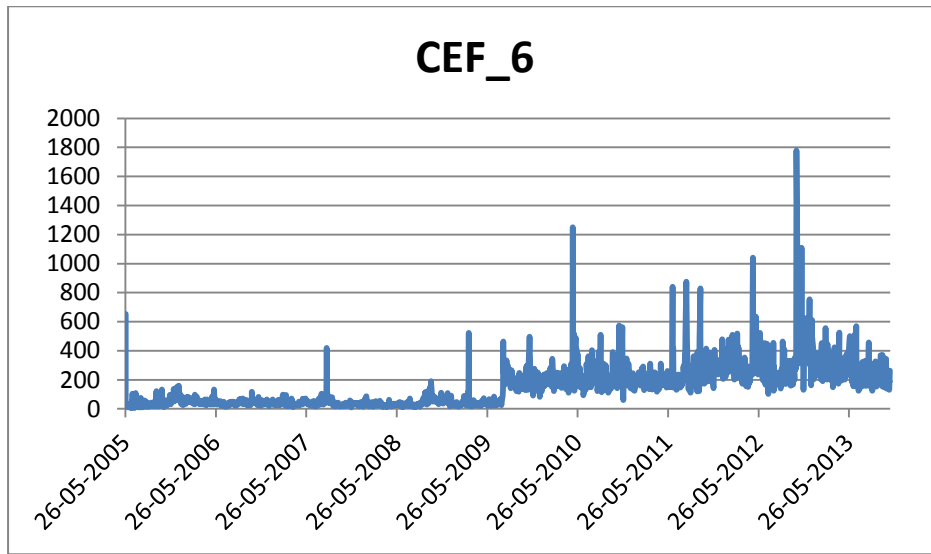


Figure 12 – CEF 6 Volume after ETF 6 inception

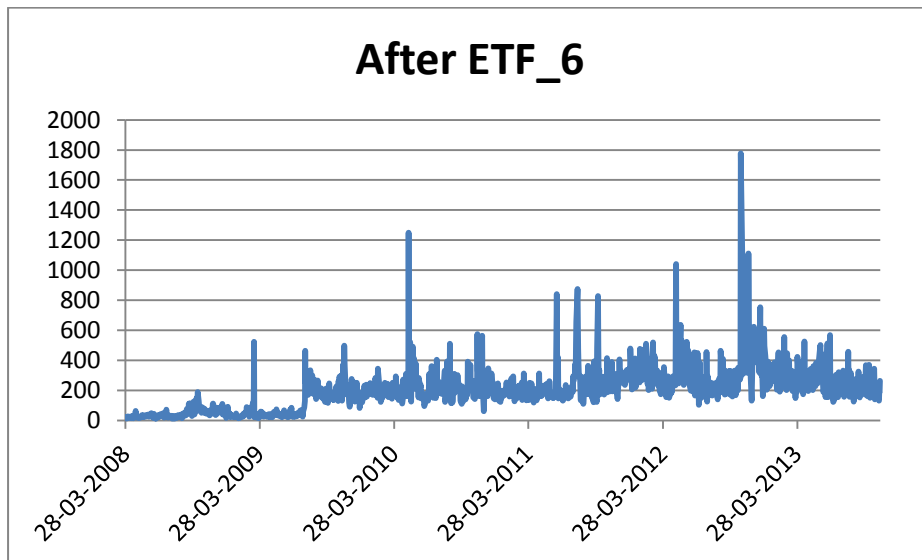


Figure 13 – CEF 7 Volume

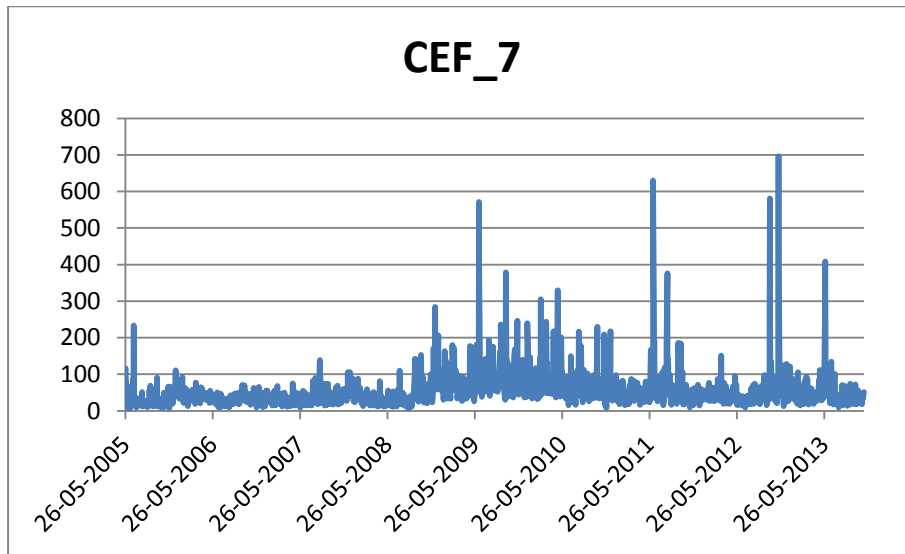


Figure 14 – CEF 7 Volume after ETF 7 inception

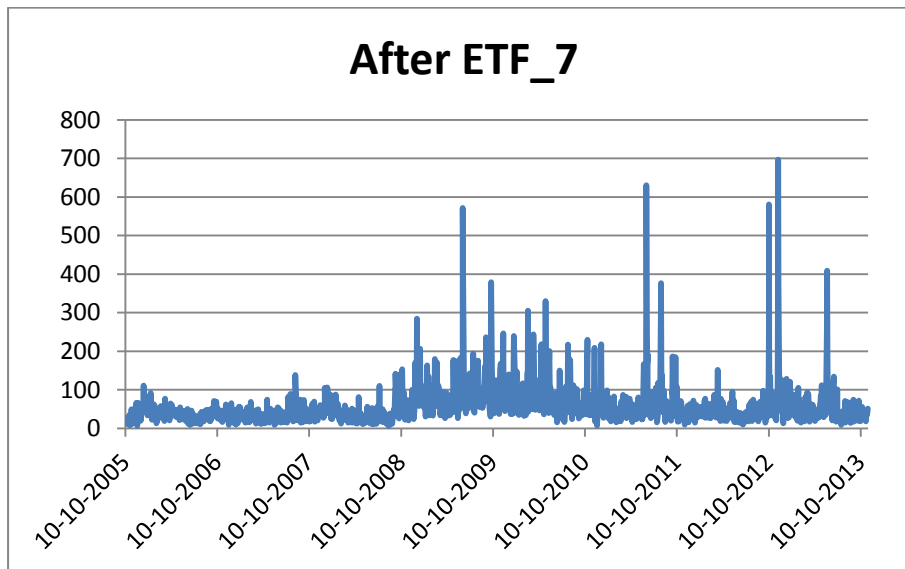


Figure 15 – CEF 8 Volume

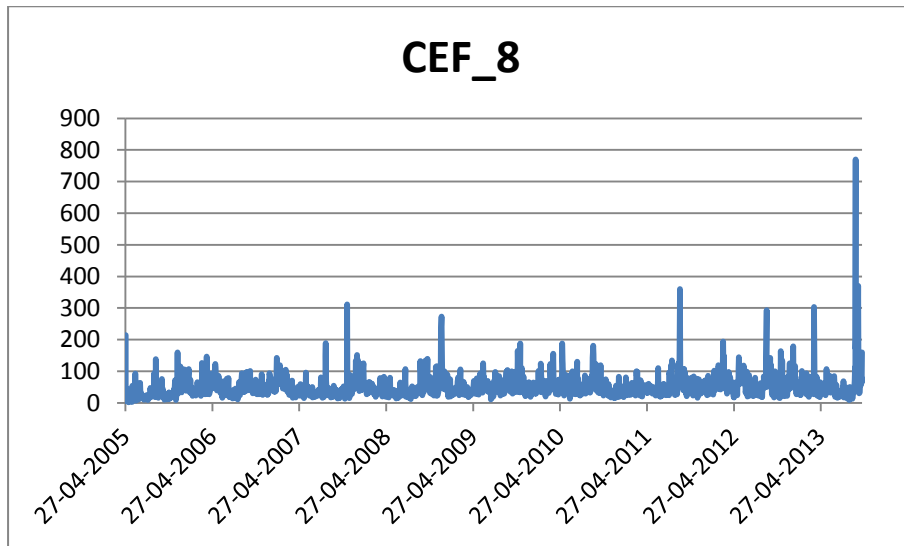


Figure 16 – CEF 8 Volume after ETF 7 inception

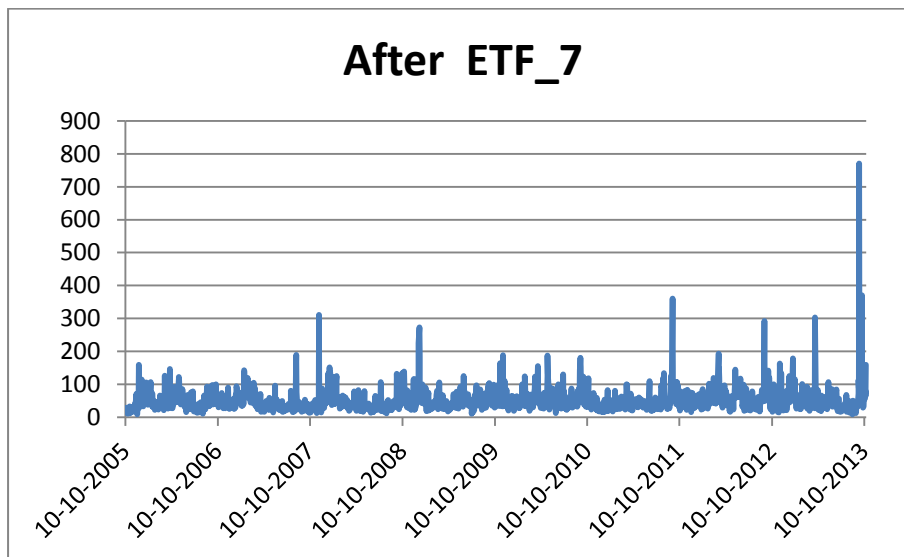


Figure 17 – CEF 9 Volume

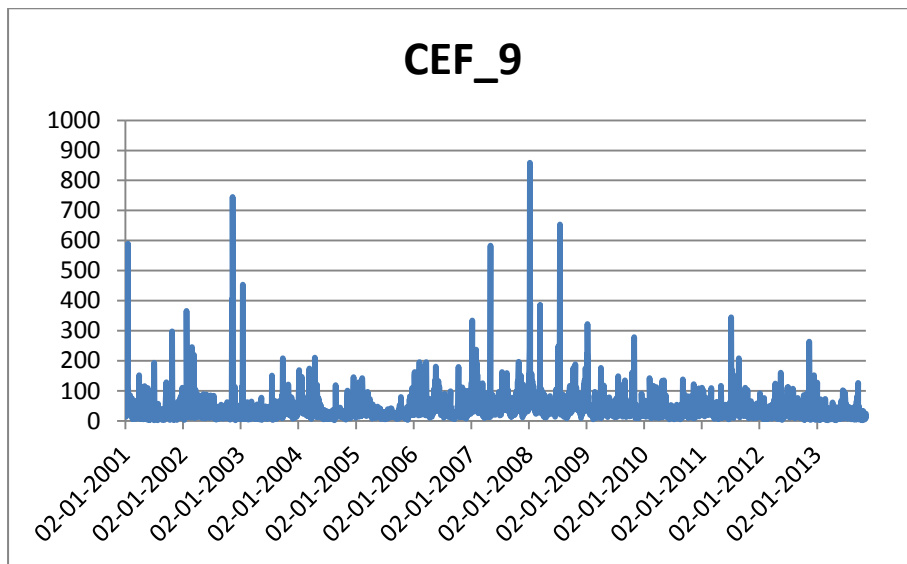


Figure 18 – CEF 9 Volume after ETF 8 inception

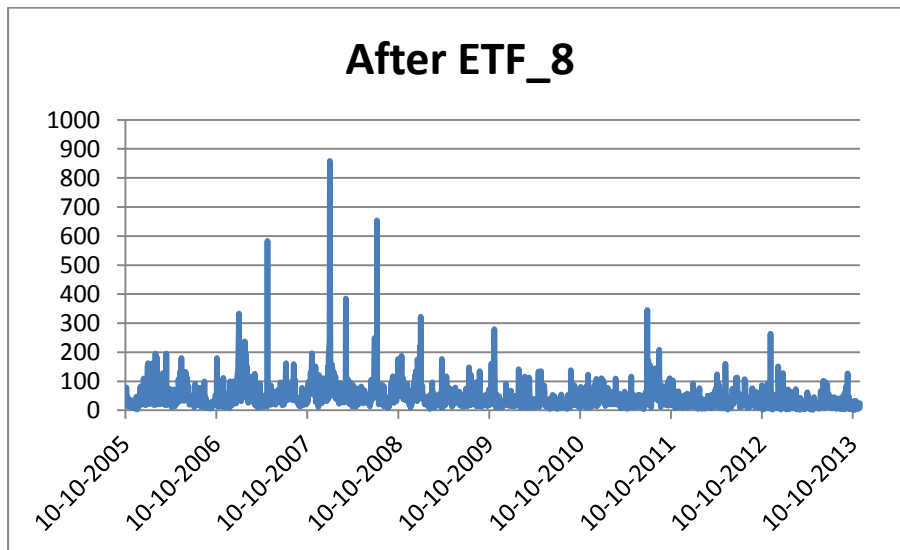


Figure 19 – CEF 10 Volume

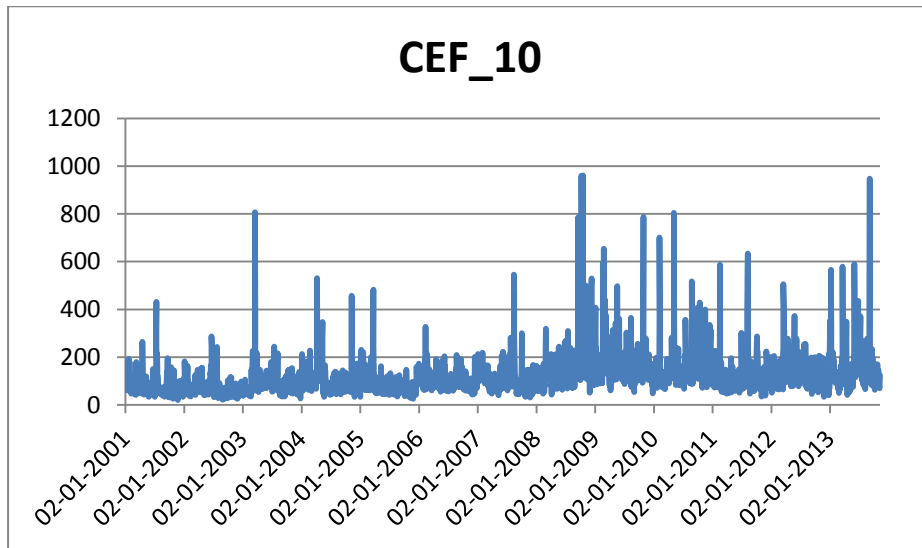


Figure 20 – CEF 10 Volume after ETF 8 inception

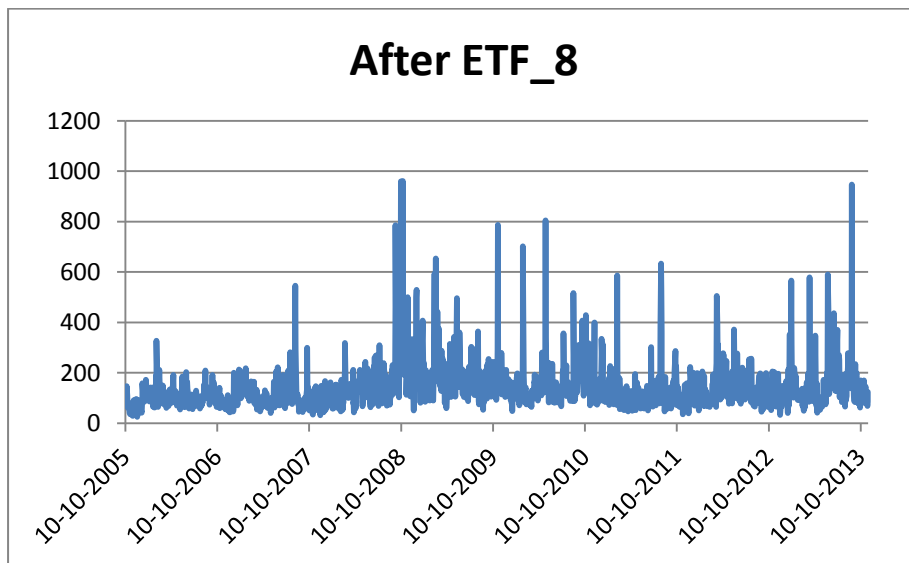


Figure 21 – CEF 12 Volume

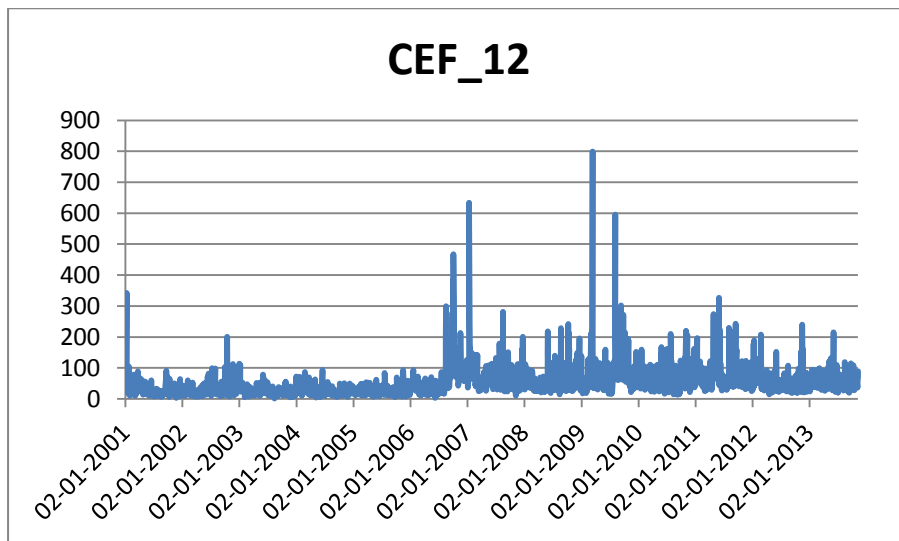


Figure 22 – CEF 12 Volume after ETF 9 inception

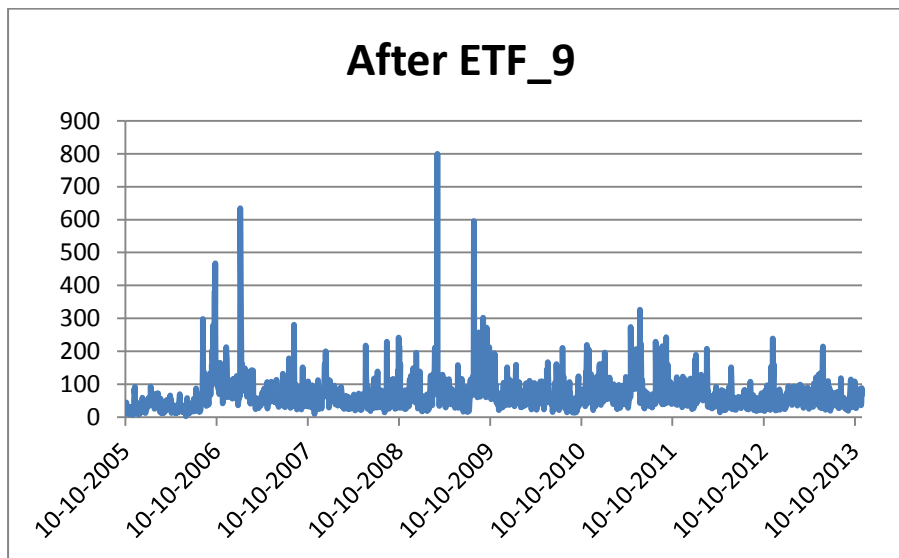


Figure 23 – CEF 13 Volume

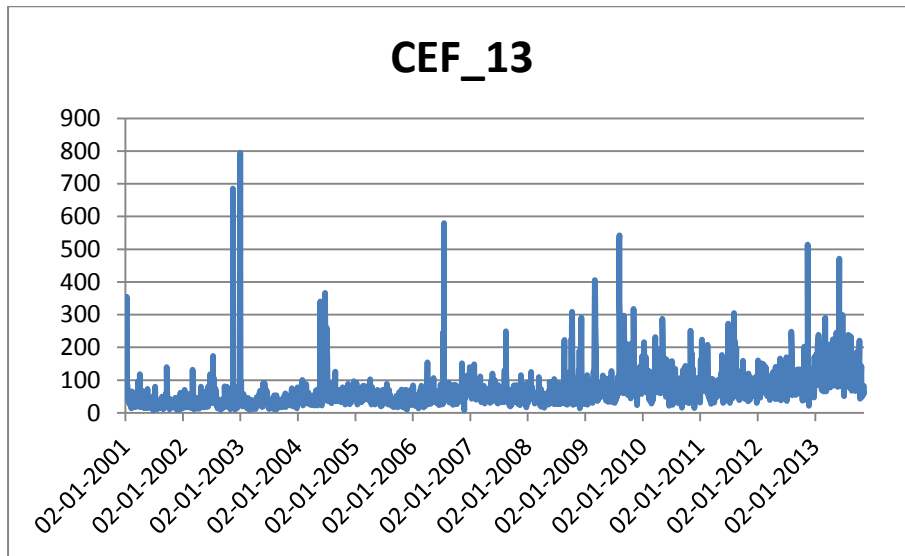


Figure 24 – CEF 13 Volume after ETF 9 inception

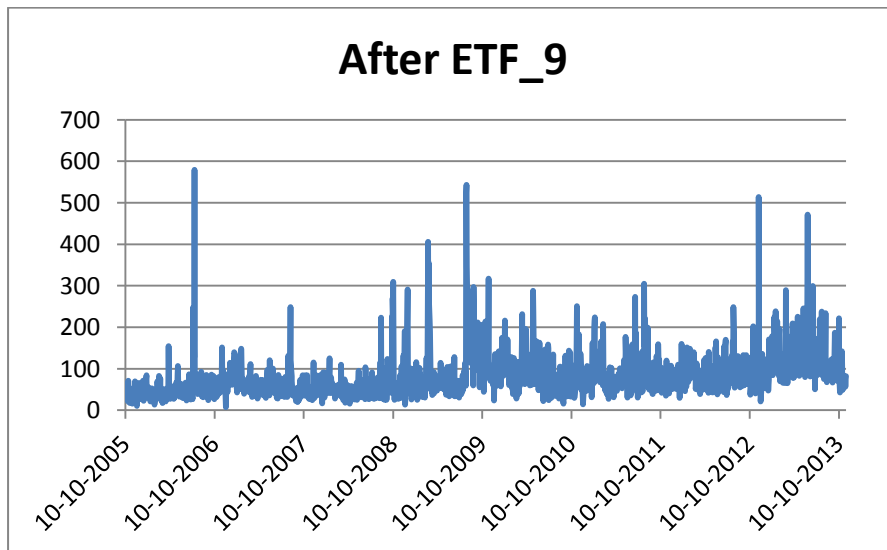


Figure 25 – CEF 14 Volume

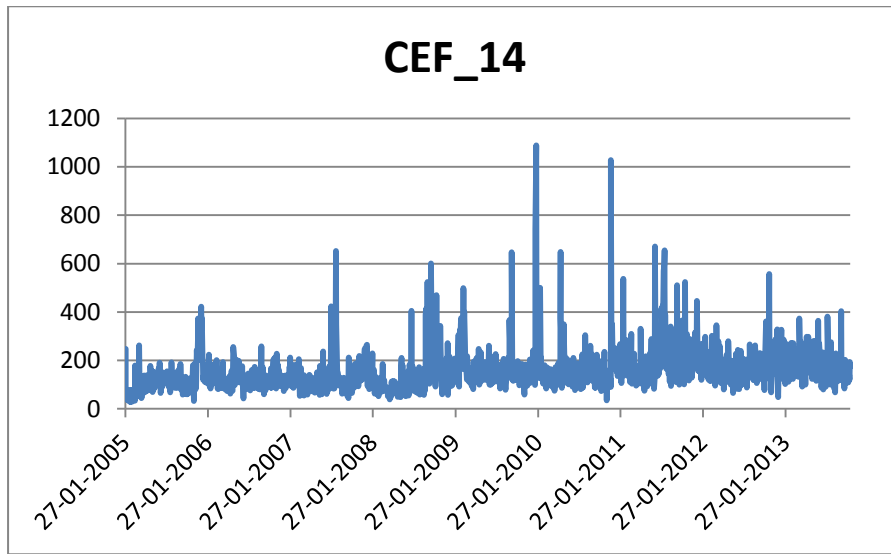


Figure 26 – CEF 14 Volume after ETF 10 inception

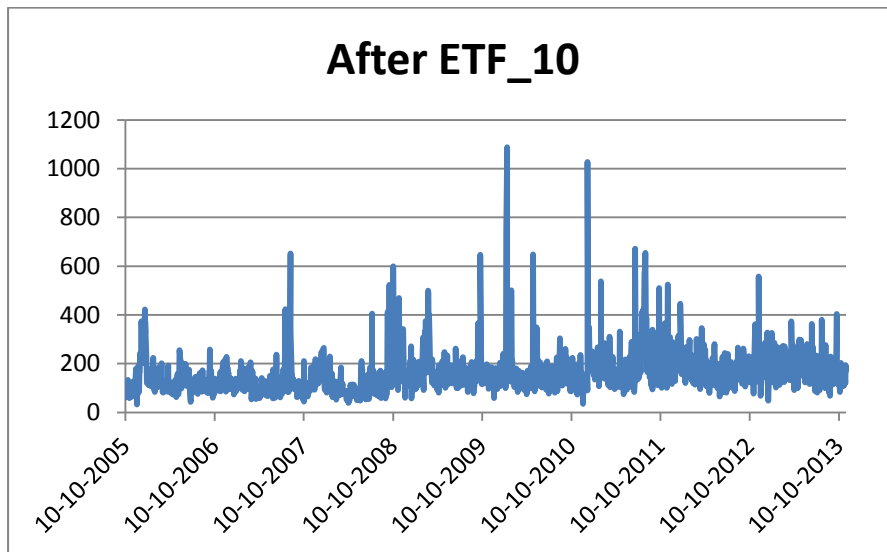


Figure 27 – CEF 15 Volume

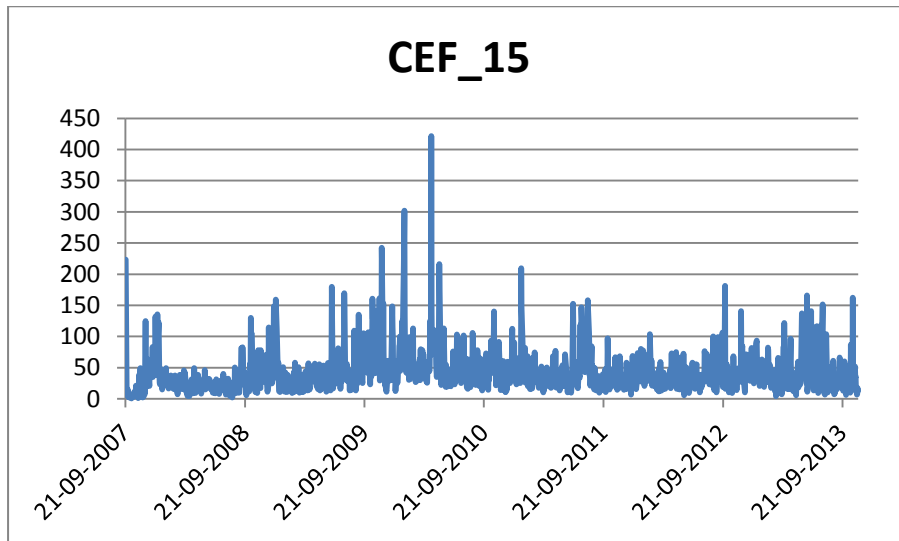


Figure 28 – CEF 16 Volume

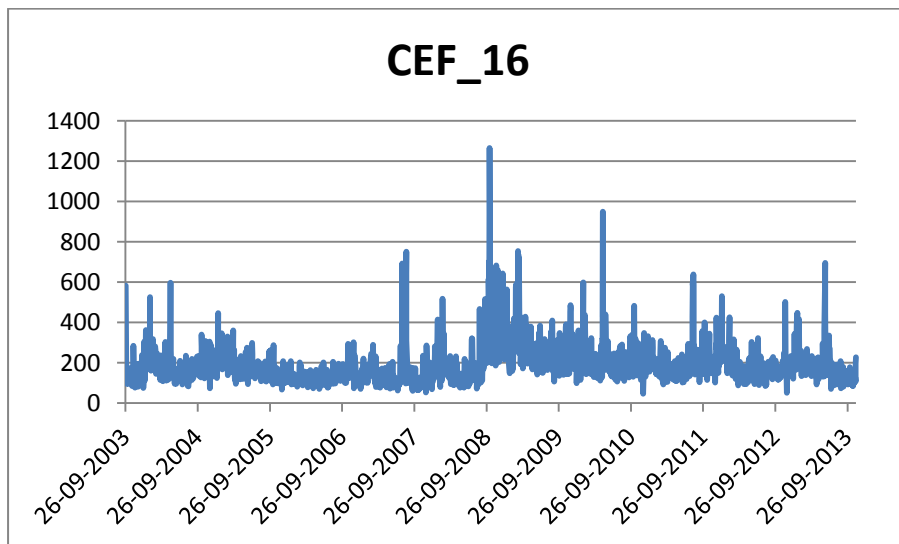


Figure 29 – CEF 16 Volume after ETF 11 inception

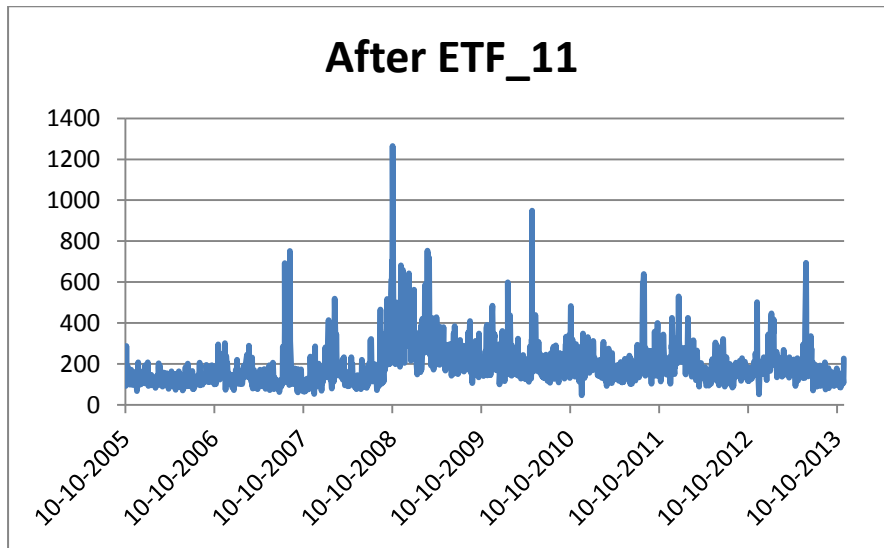


Figure 30 – CEF 17 Volume

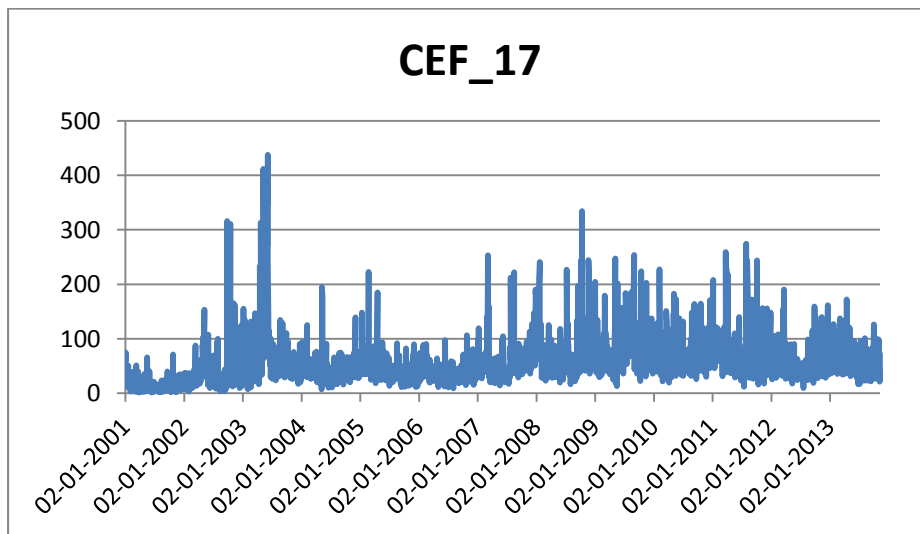


Figure 31 – CEF 17 Volume after ETF 12 inception

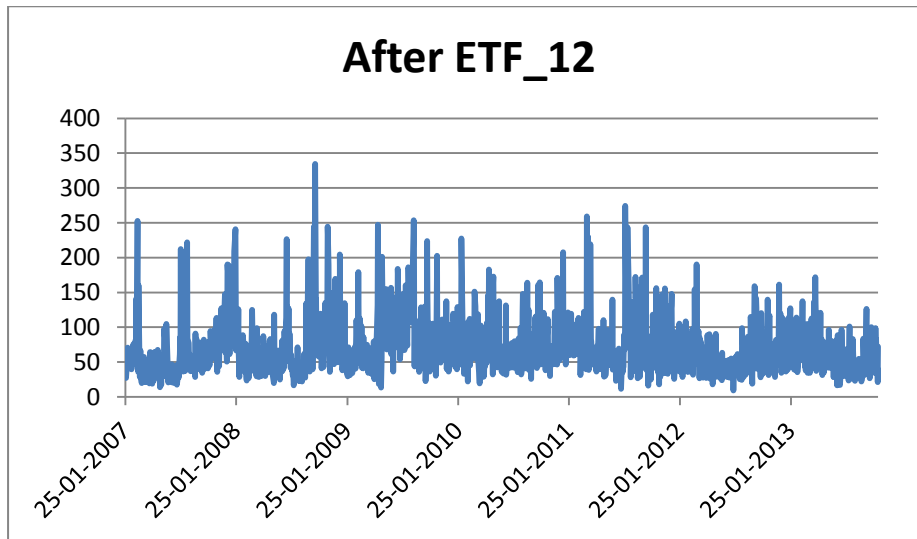


Figure 32 – CEF 17 Volume after ETF 13 inception

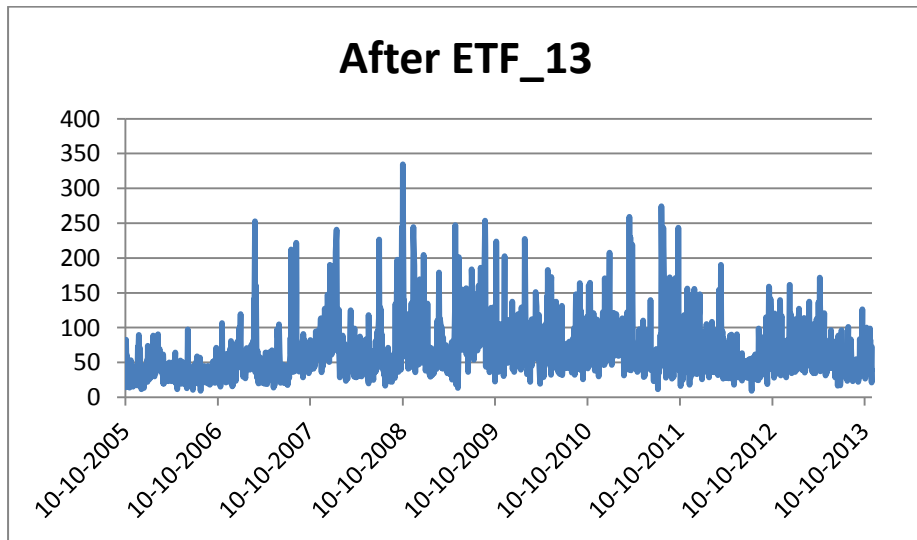


Figure 33 – CEF 18 Volume

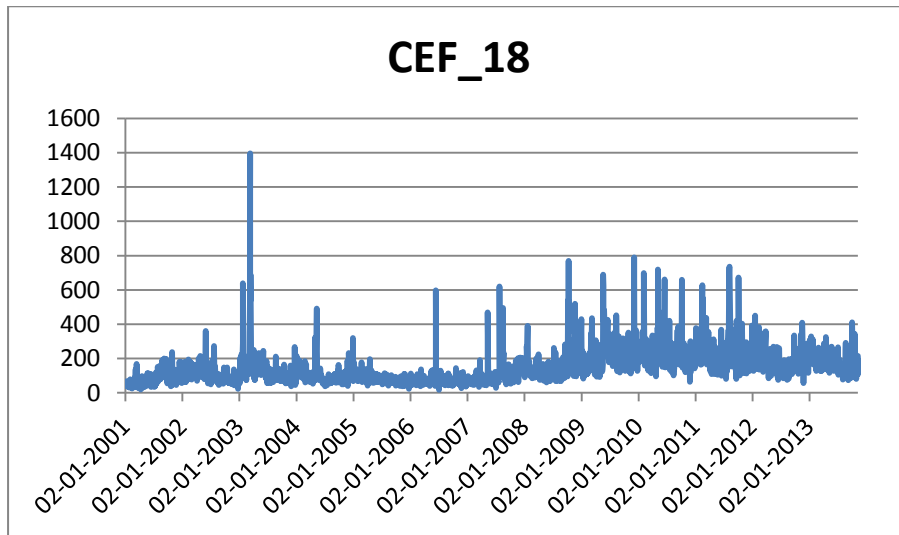


Figure 34 – CEF 18 Volume after ETF 12 inception

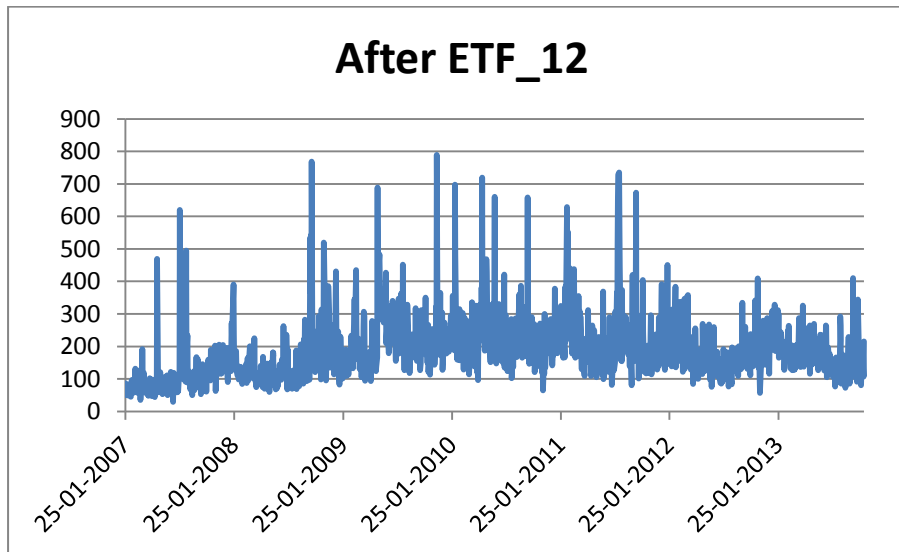


Figure 35 – CEF 18 Volume after ETF 13 inception

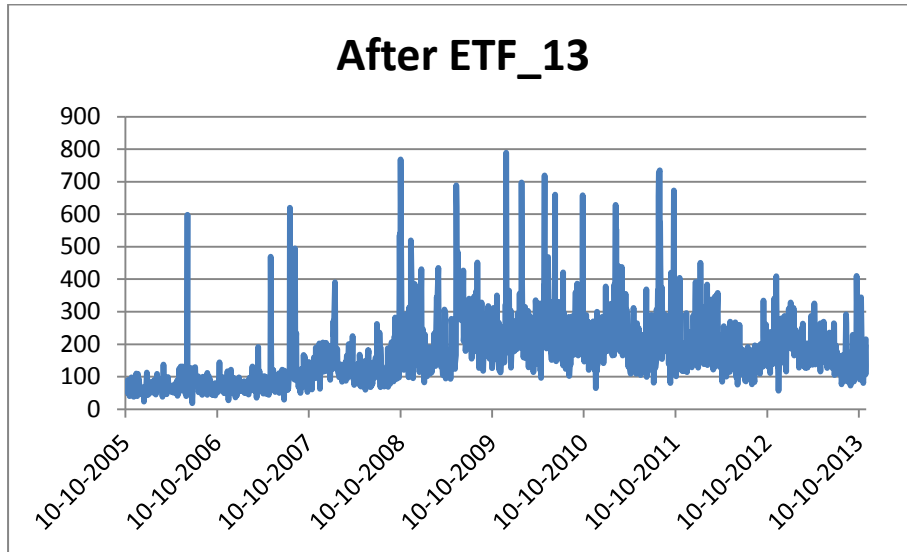


Figure 36 – CEF 19 Volume

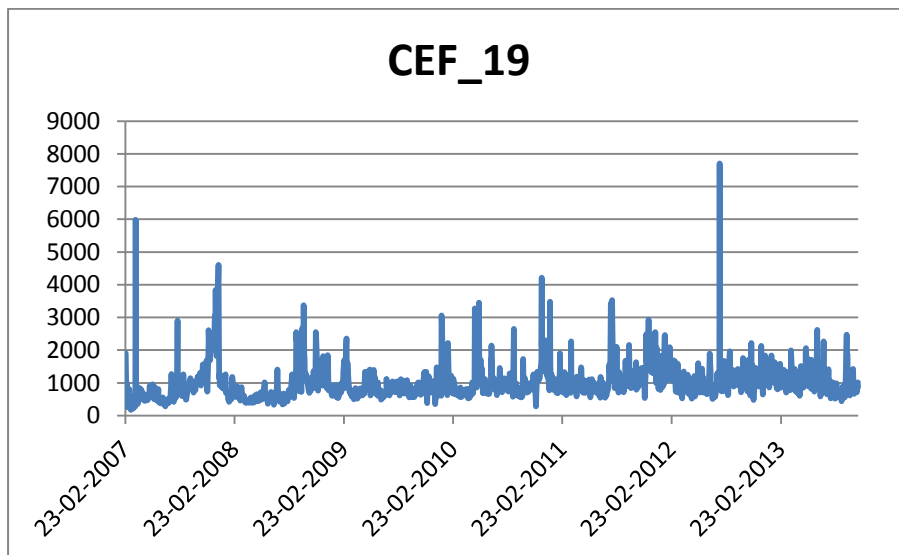


Figure 37– CEF 19 Volume after ETF 14 inception

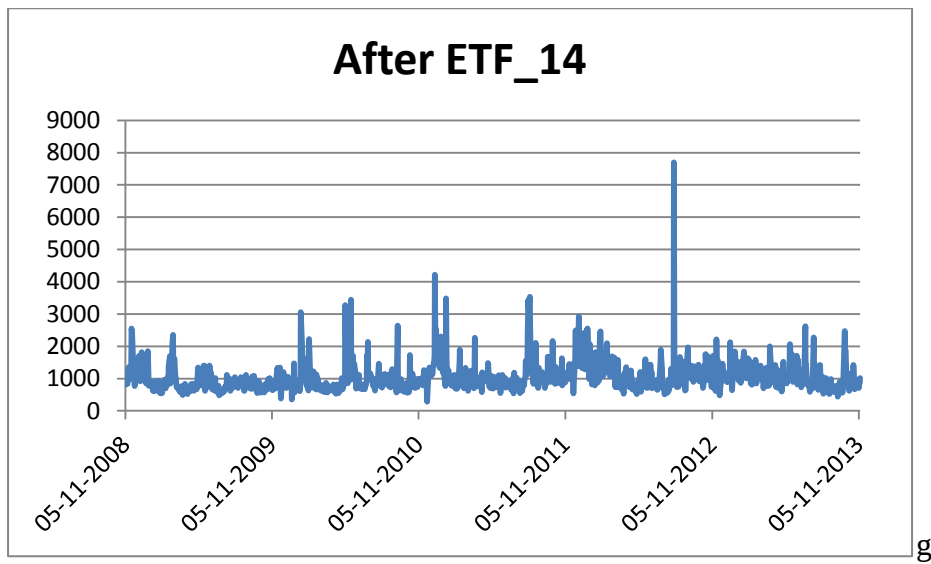


Figure 38 – CEF 20 Volume

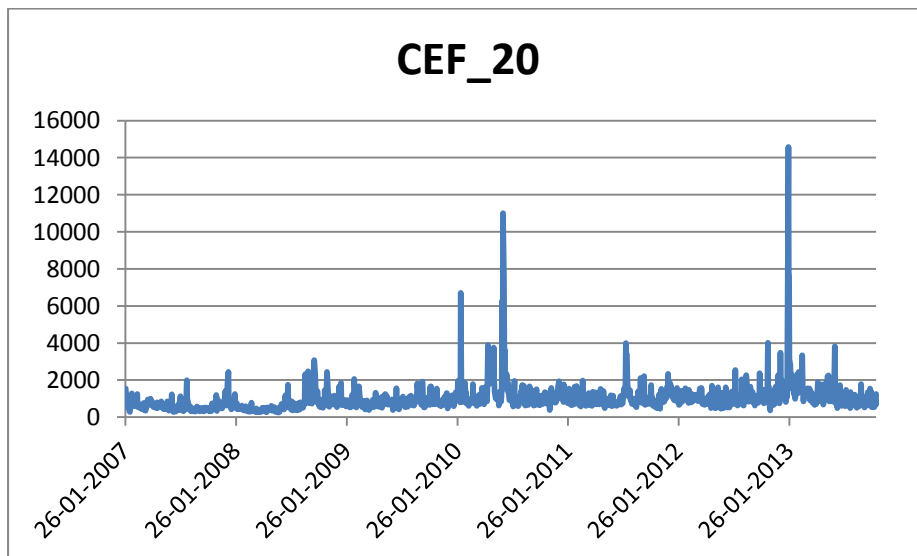


Figure 39– CEF 20 Volume after ETF 14 inception

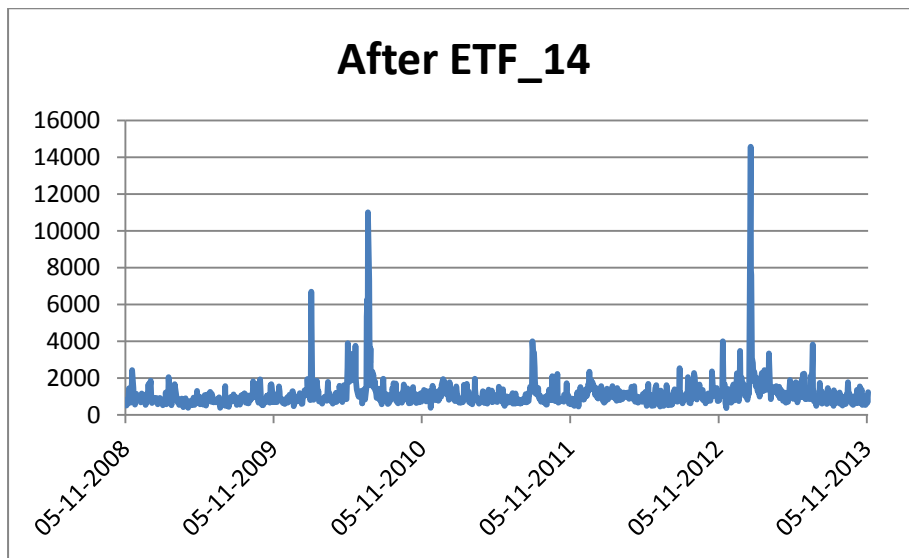


Figure 40 – CEF 21 Volume

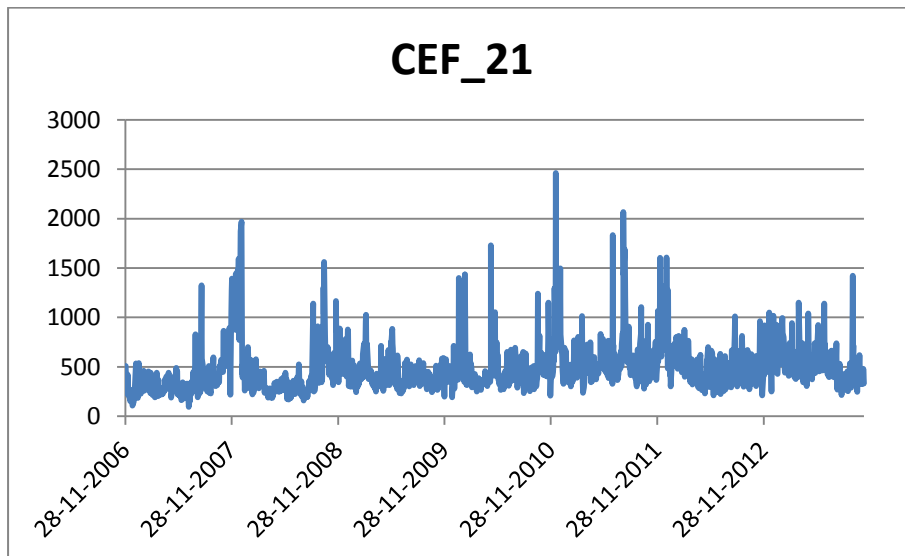


Figure 41– CEF 21 Volume after ETF 14 inception

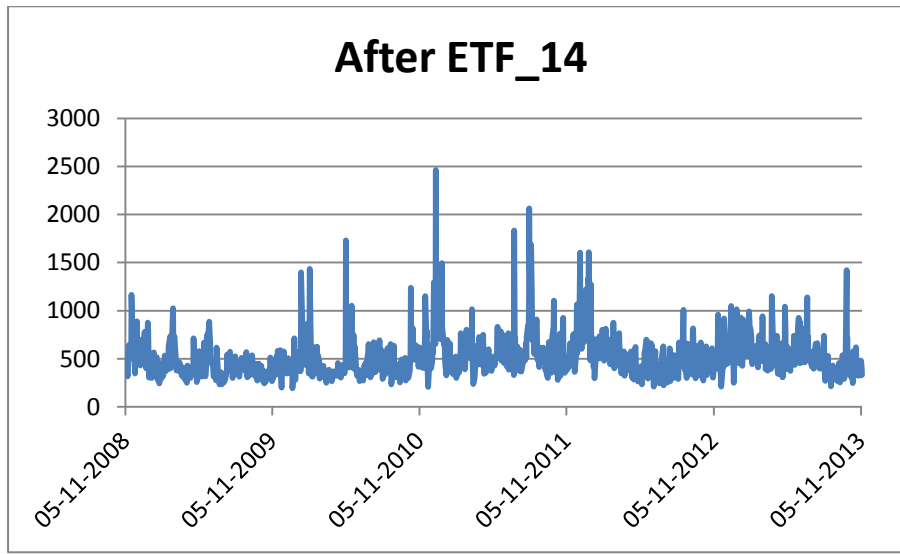


Figure 42 – CEF 22 Volume

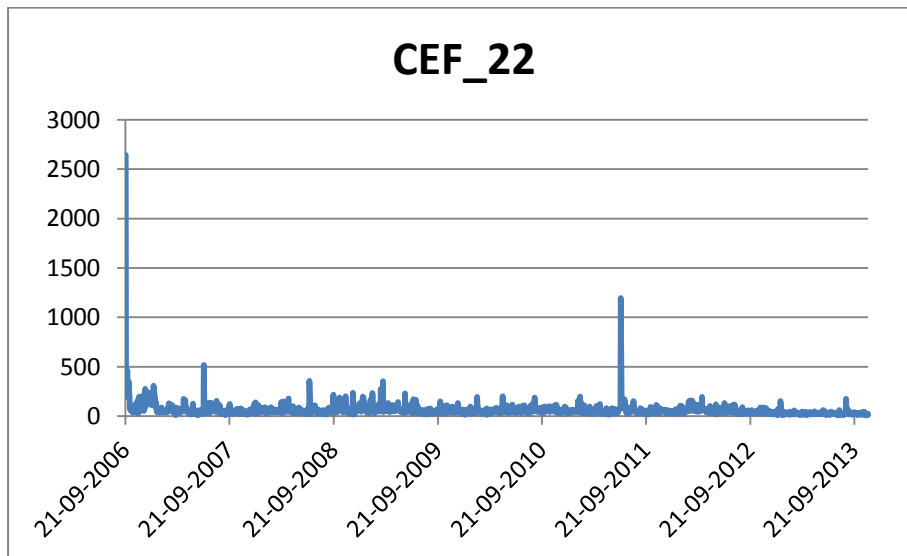


Figure 43– CEF 22 Volume after ETF 14 inception

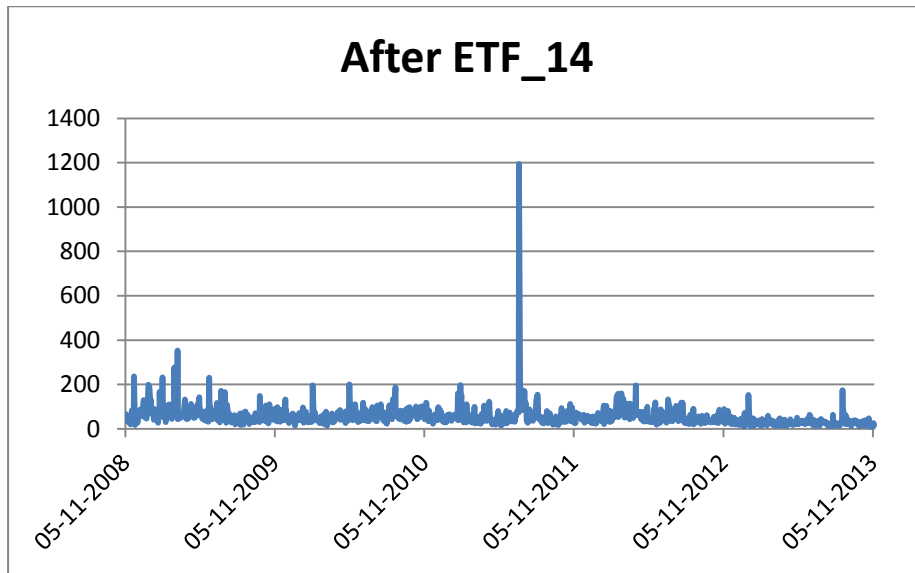


Figure 44 – CEF 23 Volume

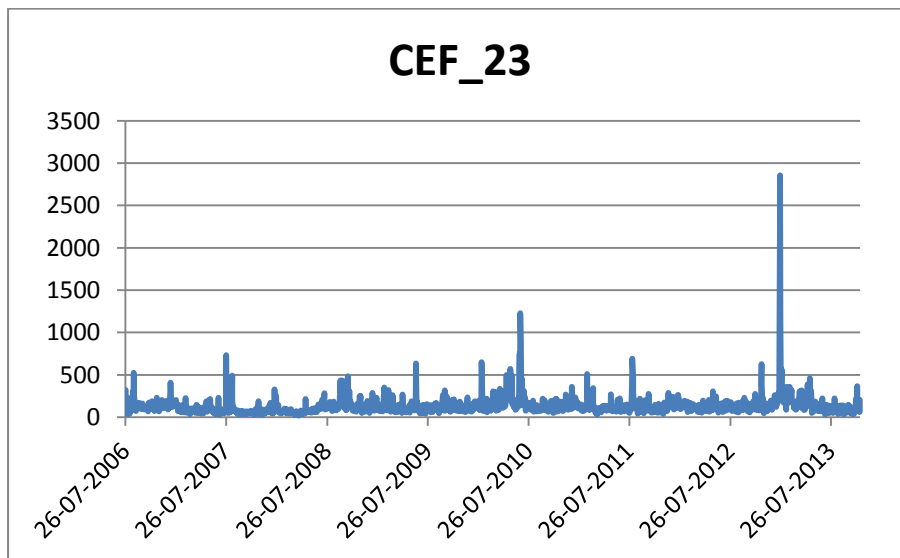


Figure 45– CEF 23 Volume after ETF 14 inception

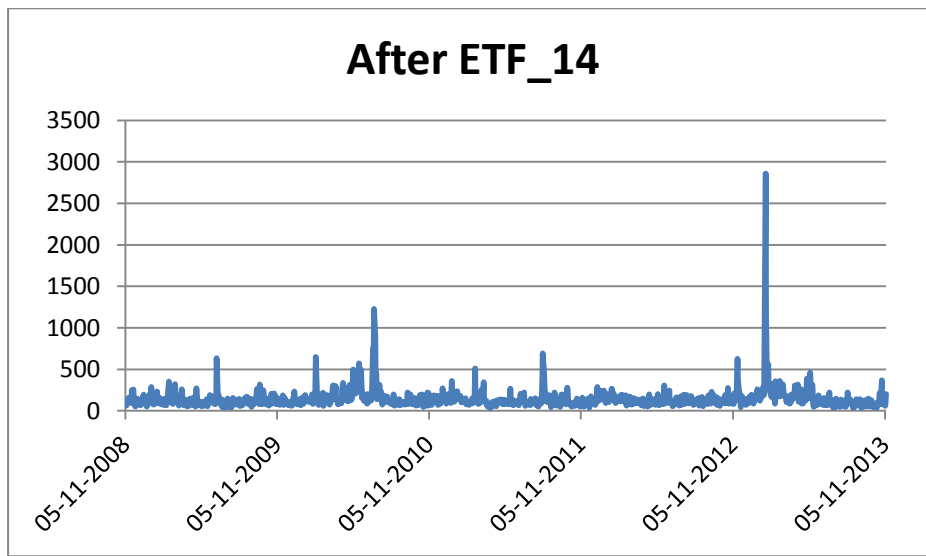


Figure 46 – CEF 24 Volume

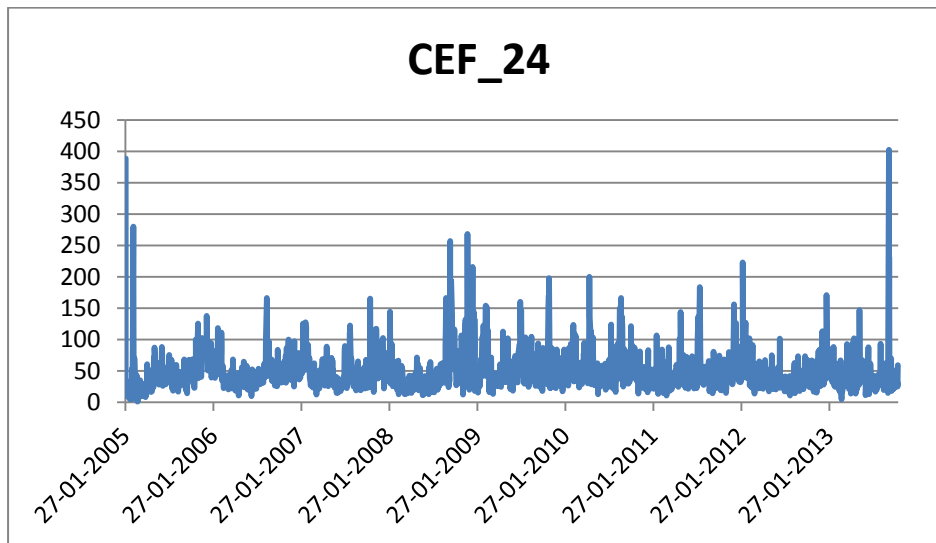


Figure 47– CEF 24 Volume after ETF 14 inception

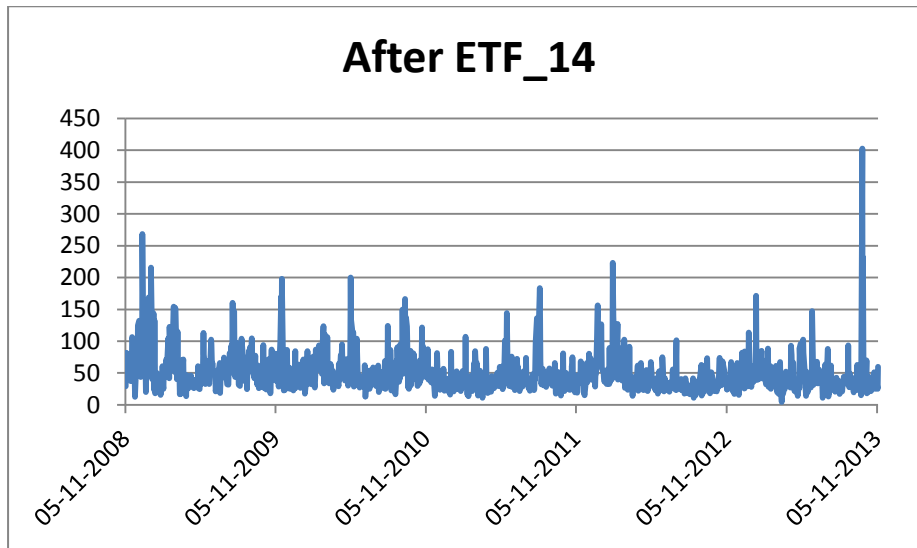


Figure 48– CEF 24 Volume after ETF 15 inception

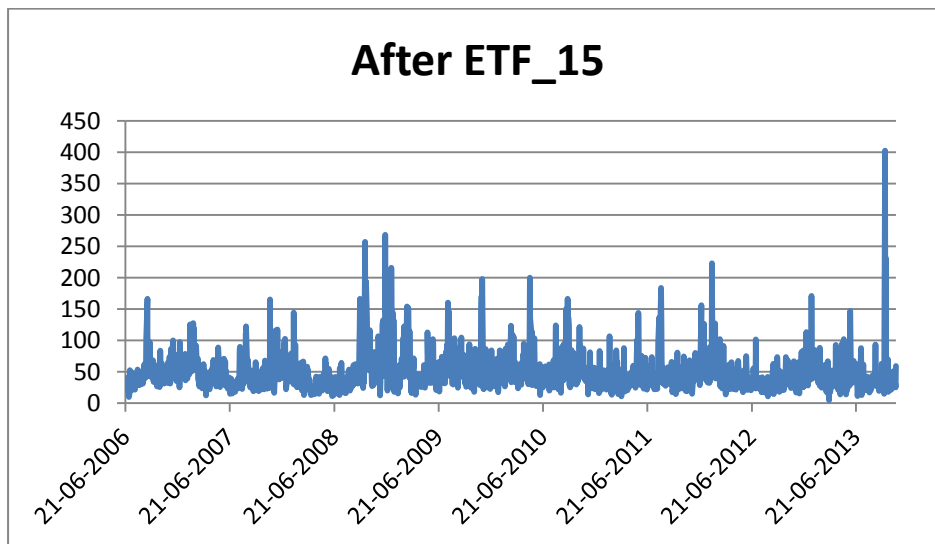


Figure 49– CEF 24 Volume after ETF 16/17 inception

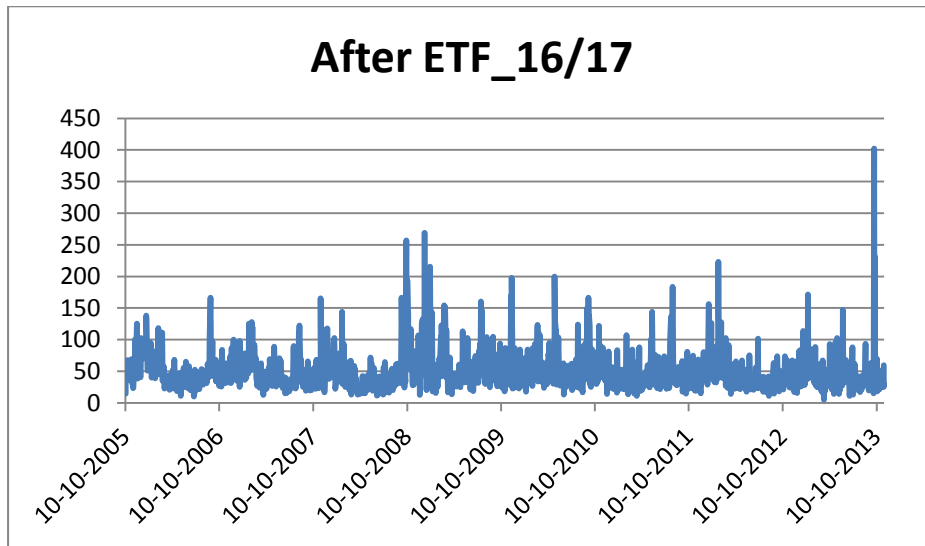


Figure 50 – CEF 25 Volume

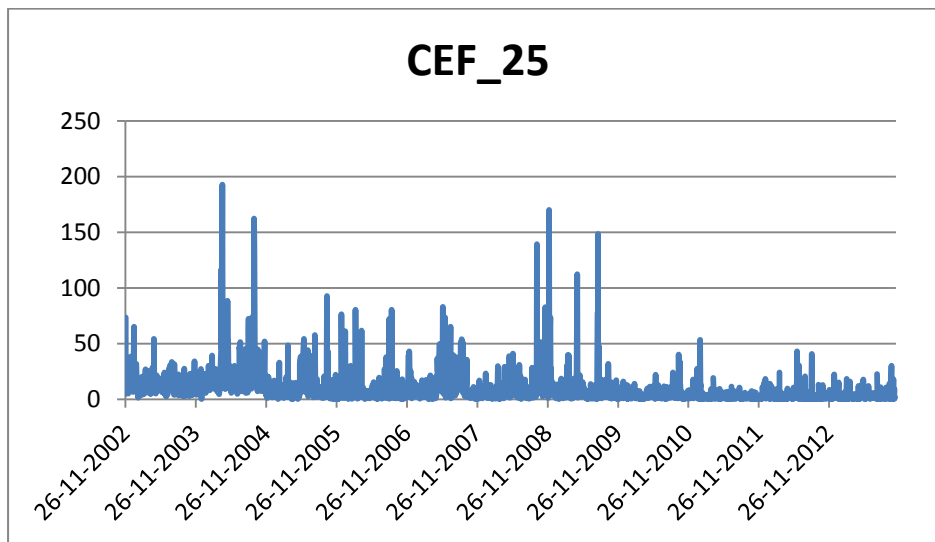


Figure 51– CEF 25 Volume after ETF 14 inception

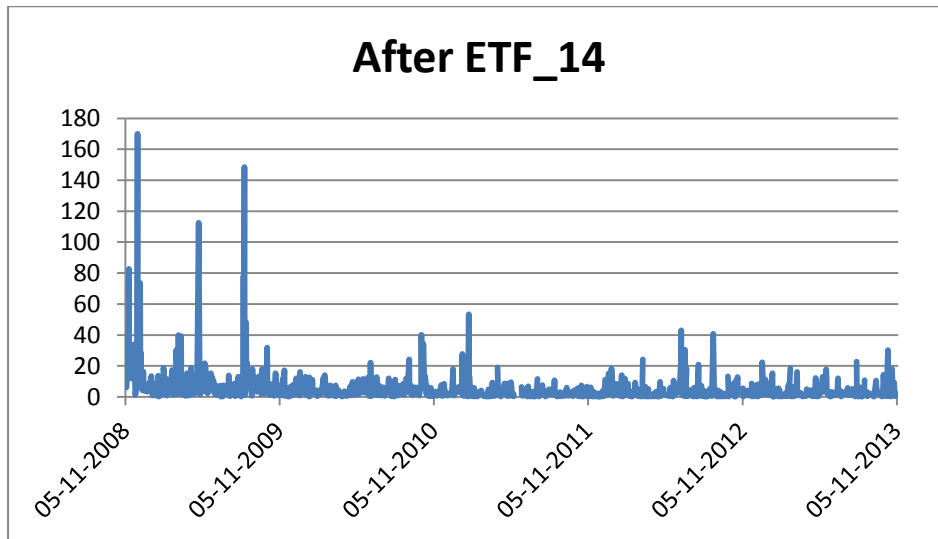


Figure 52– CEF 25 Volume after ETF 15 inception

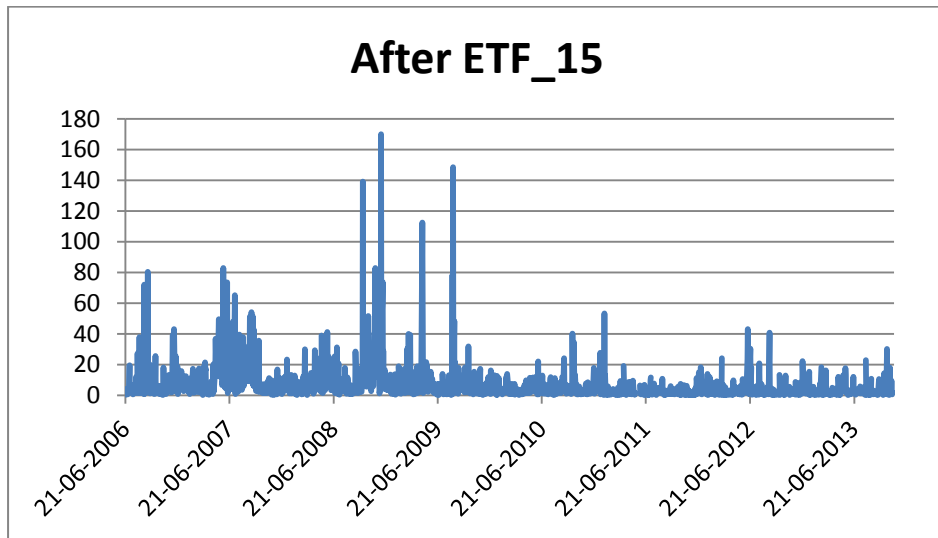


Figure 53– CEF 25 Volume after ETF 16/17 inception

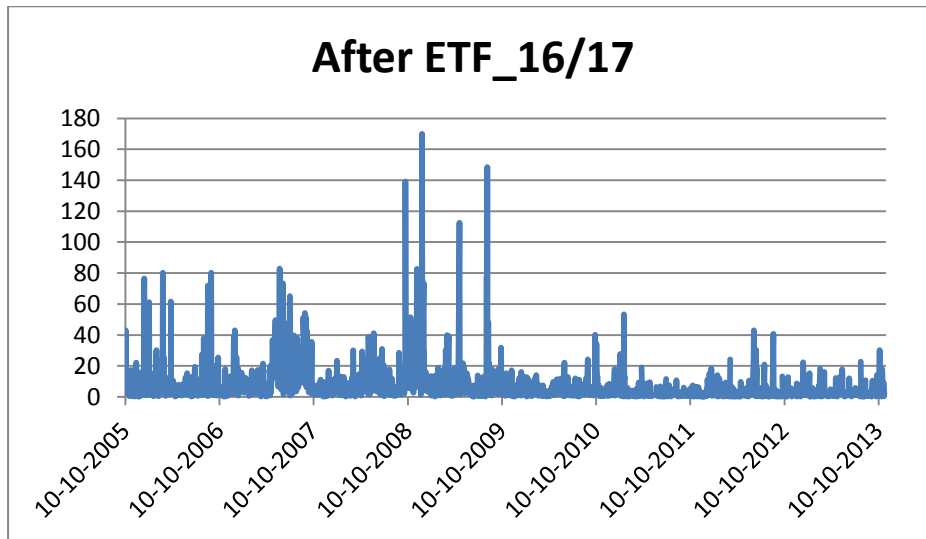


Figure 54 – CEF 26 Volume

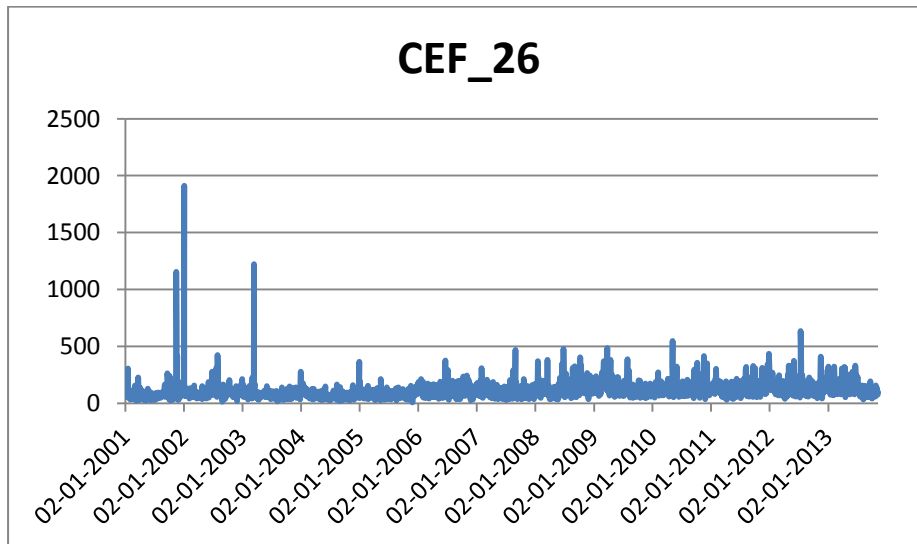


Figure 55– CEF 26 Volume after ETF 14 inception

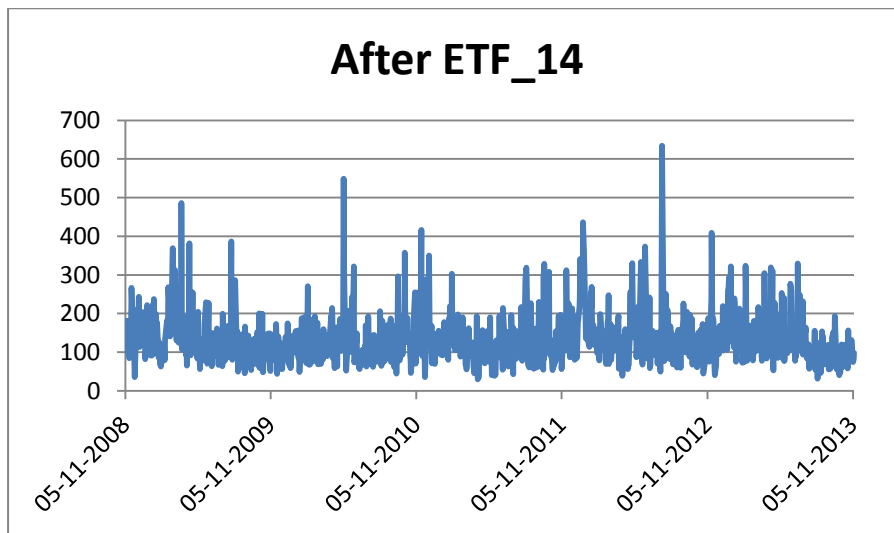


Figure 56– CEF 26 Volume after ETF 15 inception

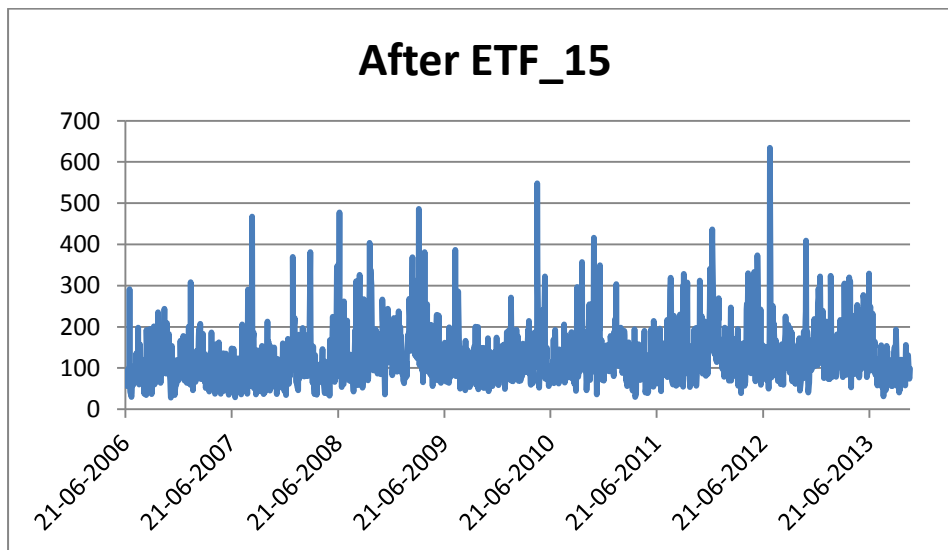


Figure 57– CEF 26 Volume after ETF 16/17 inception

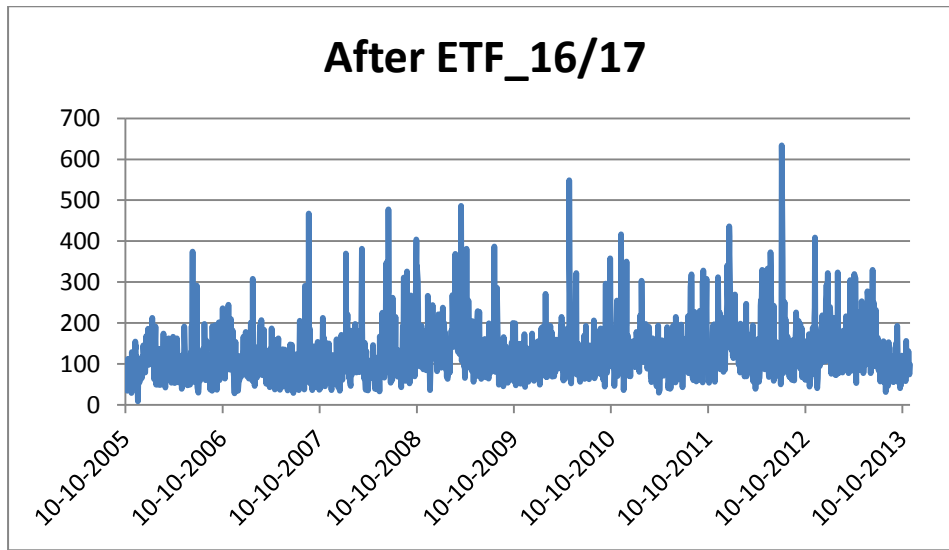


Figure 58 – CEF 27 Volume

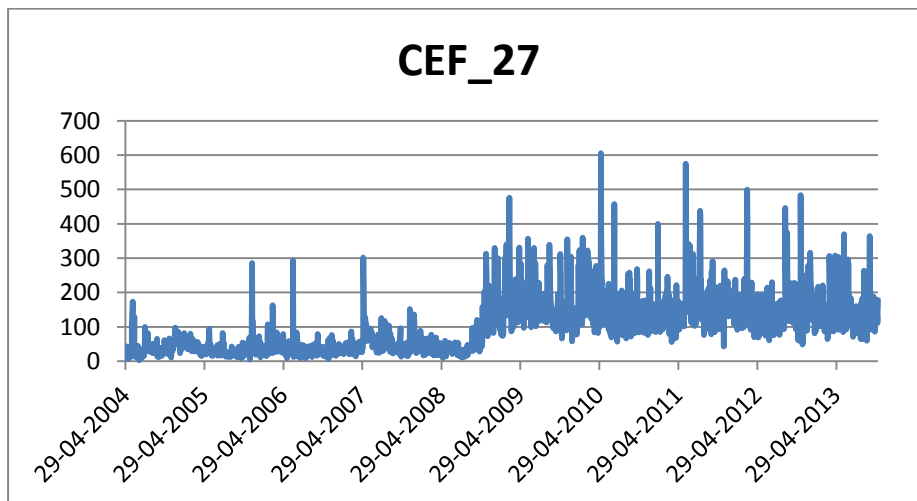


Figure 59 – CEF 27 Volume after ETF 18/19 inception

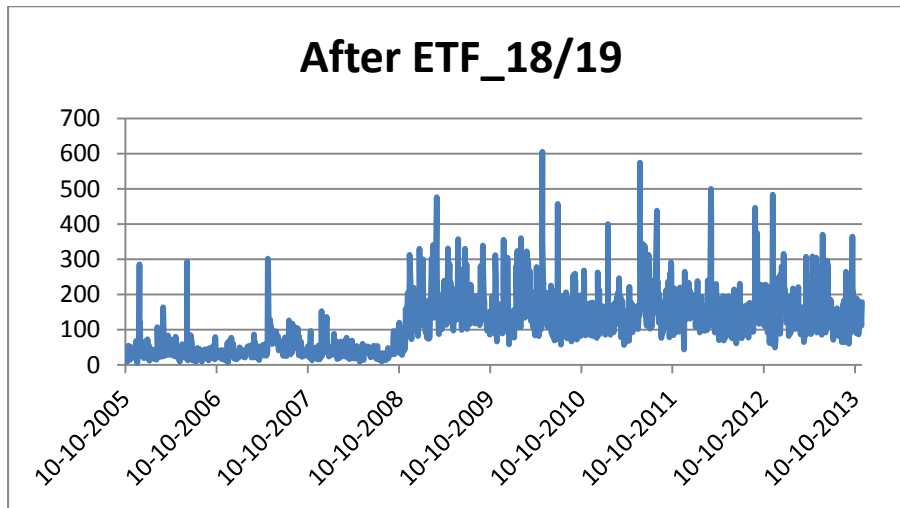


Table 28 – Summary statistics: mean, sd, min, max by categories of: benchmark_id

Benchmark_id mispricing

1	-0,015806	2	-0,025148	3	-0,018408
	0,051473		0,043625		0,050838
	-0,361596		-0,239639		-0,319231
	0,121076		0,178129		0,158088
4	-0,057120	5	0,094472	6	-0,054179
	0,057741		0,250721		0,061131
	-0,381068		-0,333080		-0,342714
	0,091362		0,880414		0,119431
7	-0,086912	8	-0,013750	9	-0,033642
	0,076461		0,044371		0,069134
	-0,316749		-0,270512		-0,318995
	0,058121		0,117386		0,331826
10	-0,047851	11	-0,043416	12	-0,081129
	0,072737		0,093892		0,061747
	-0,254546		-0,403152		-0,262984
	0,130665		0,609898		0,101293
13	-0,094799	Total	-0,03589		
	0,079248		0,1044		
	-0,317585		0,254566		
	0,254566		0,079248		

Table 29 – Summary statistics: mean, sd, min, max by categories of: i_cef mispricing

1	-0,01581	2	-0,02515	3	-0,01841
	0,051473		0,043625		0,050838
	-0,3616		-0,23964		-0,31923
	0,121076		0,178129		0,158088
6	-0,05712	8	0,094472	10	-0,05418
	0,057741		0,250721		0,061131
	-0,38107		-0,33308		-0,34271
	0,091362		0,880414		0,119431
11	-0,0948	13	-0,08691	14	-0,01375
	0,079248		0,076461		0,044371
	-0,31758		-0,31675		-0,27051
	0,254566		0,058121		0,117386
16	-0,03364	18	-0,04785	26	-0,04342
	0,069134		0,072737		0,093892
	-0,31899		-0,25455		-0,40315
	0,331826		0,130665		0,609898
27	-0,08113	Total	-0,03589		
	0,061747		0,1044		
	-0,26298		-0,40315		
	0,101293		0,880414		

Table 30 – Summary statistics: mean, sd, min, max by categories of i_etf mispricing

2	-0,01581	3	-0,02515	5	-0,01841
	0,05147		0,04363		0,05084
	-0,36160		-0,23964		-0,31923
	0,12108		0,17813		0,15809
6	-0,05712	7	0,09447	8	-0,05418
	0,05774		0,25072		0,06113
	-0,38107		-0,33308		-0,34271
	0,09136		0,88041		0,11943
9	-0,08691	11	-0,01375	13	-0,03364
	0,07646		0,04437		0,06913
	-0,31675		-0,27051		-0,31899
	0,05812		0,11739		0,33183
15	-0,04785	19	-0,04342	21	-0,08113
	0,07274		0,09389		0,06175
	-0,25455		-0,40315		-0,26298
	0,13066		0,60990		0,10129
Total	-0,03488				

	0,10449				
	-0,40315				
	0,88041				

Table 31 - Mispricing by benchmark: mean,sd,min,max by d_cef

a) Benchmark 1

d_cef	mispricing	volume	price	nav	ln_ret	i_etf	i_cef
0	-0,00011	1,4E+07	58,83	58,820	0,0003	2	1
	0,00575	1,3E+07	15,58	15,573	0,0360	0	0
	-0,04755	7,5E+03	17,52	17,299	-0,3435	2	1
	0,12108	9,3E+07	92,18	92,114	0,2504	2	1
1	-0,04497	8,1E+01	14,69	15,388	-0,0004	2	1
	0,07878	4,0E+01	2,85	2,815	0,0161	0	0
	-0,36160	8,1E+00	9,70	11,050	-0,1358	0	0
	0,09852	4,5E+02	20,15	20,730	0,1710	2	1
Total	-0,01581	9,2E+06	43,38	43,626	0,0001	2	1
	0,05147	1,2E+07	24,57	24,281	0,0305	0	0
	-0,36160	8,1E+00	9,70	11,050	-0,3435	0	0
	0,12108	9,3E+07	92,18	92,114	0,2504	2	1

b) Benchmark 2

d_cef	mispricing	volume	price	nav	ln_ret	i_etf	i_cef
0	0,0016666	452653,2	53,05307	52,975	0,0003	3	2
	0,0110029	656376,4	8,834857	8,8858	0,0212	0	0
	-0,048125	100	25,38	25,71	-0,123	3	2
	0,0768421	9487035	65,55	65,392	0,1548	3	2
1	-0,047146	19,54113	12,28359	14,0193	0,0002	3	2
	0,0478719	31,14494	4,841527	3,71952	0,0195	0	0
	-0,239639	0,1	4,1142	4,9569	-0,179	3	2
	0,178129	683,4	27,5902	28,7196	0,1628	3	2
Total	-0,025148	125525,3	23,57543	31,5752	0,0002	3	2
	0,0436253	400569,3	19,27392	20,4696	0,02	0	0
	-0,239639	0,1	4,1142	4,9569	-0,179	3	2
	0,178129	9487035	65,55	65,392	0,1628	3	2

c) Benchmark 3

d_cef	mispricing	volume	price	nav	ln_ret	i_etf	i_cef
0	0,00182	139339	35,80	35,74	-3,6E-06	5	3
	0,00933	241820	6,85	6,77	1,9E-02	0	0
	-0,08549	100	6,46	17,26	-1,2E-01	5	3
	0,09836	4903315	56,40	56,23	1,8E-01	5	3
1	-0,05723	388	10,64	11,23	-5,7E-04	5	3
	0,07132	188	3,52	3,56	2,0E-02	0	0
	-0,31923	63	6,27	7,56	-1,3E-01	5	3
	0,15809	2571	20,11	20,12	2,0E-01	5	3
Total	-0,01841	91686	27,17	27,35	-2,0E-04	5	3
	0,05084	206809	13,33	13,03	1,9E-02	0	0
	-0,31923	63	6,27	7,56	-1,3E-01	5	3
	0,15809	4903315	56,40	56,23	2,0E-01	5	3

d) Benchmark 4

d_cef	mispricing	volume	price	nav	ln_ret	i_etf	i_cef
0	0,00143	518732	43,9440	43,872	0,000139	6	6
	0,00623	555327	6,5929	6,581	0,017476	0	0
	-0,09705	200	23,8500	24,114	-0,104919	6	6
	0,04465	5054161	56,5700	56,450	0,140902	6	6
1	-0,07137	75	16,6686	17,713	-0,000220	6	6
	0,05567	104	5,1624	4,839	0,019025	0	0
	-0,38107	3	5,5400	7,230	-0,161356	6	6
	0,09136	1779	29,6100	31,090	0,312862	6	6
Total	-0,05712	100959	21,9740	22,831	-0,000151	6	6
	0,05774	319535	12,1034	11,620	0,018736	0	0
	-0,38107	3	5,5400	7,230	-0,161356	6	6
	0,09136	5054161	56,5700	56,450	0,312862	6	6

e) Benchmark 5

d_cef	mispricing	volume	price	nav	ln_ret	i_etf	i_cef
0	0,00159	1,7E+07	59,81	59,70	0,0001	7	8
	0,00946	1,1E+07	10,95	10,91	0,0174	0	0
	-0,07443	1,1E+06	31,40	32,16	-0,1140	7	8
	0,08170	7,5E+07	86,18	85,64	0,1572	7	8
1	0,13873	5,1E+01	19,18	17,68	-0,0002	7	8
	0,29445	4,1E+01	6,13	6,96	0,0200	0	0
	-0,33308	1,8E+00	6,80	5,89	-0,1896	7	8
	0,88041	7,7E+02	31,75	30,85	0,2457	7	8
Total	0,09447	5,3E+06	32,27	31,24	-0,0001	7	8
	0,25072	9,8E+06	20,60	21,38	0,0192	0	0
	-0,33308	1,8E+00	6,80	5,89	-0,1896	7	8
	0,88041	7,5E+07	86,18	85,64	0,2457	7	8

f) Benchmark 6

d_cef	mispricing	volume	price	nav	ln_ret	i_etf	i_cef
0	0,0005085	5,53E+07	39,38651	39,3701	0,0002215	8	10
	0,0104876	3,32E+07	6,887681	6,88986	0,0235225	0	0
	-0,083106	1453200	18,44	19,12	-0,1922016	8	10
	0,1071429	2,49E+08	55,75	55,13	0,2255659	8	10
1	-0,07137	79,82111	14,60304	15,7354	0,0001534	8	10
	0,0603448	76,53397	4,746982	5,22124	0,0181227	0	0
	-0,342714	1,4	6,4	7,27	-0,3073604	8	10
	0,1194307	960,3	35,1201	40,42	0,2083835	8	10
Total	-0,054179	1,32E+07	20,52615	21,3883	0,0001697	8	10
	0,0611311	2,86E+07	11,84089	11,5651	0,0195471	0	0
	-0,342714	1,4	6,4	7,27	-0,3073604	8	10
	0,1194307	2,49E+08	55,75	55,13	0,2255659	8	10

g) Benchmark 7

d_cef	mispricing	volume	price	nav	ln_ret	i_etf	i_cef
0	-1,5E-05	954665	98,785	98,71	0,000529	9	13
	3,3E-03	690365,8	34,320	34,23	0,014548	0	0
	-3,3E-02	80579	59,260	59,22	-0,117015	9	13
	3,4E-02	4893347	213,900	213,75	0,080881	9	13
1	-1,1E-01	59,20524	15,277	17,14	-0,000017	9	13
	6,8E-02	48,2822	3,870	4,25	0,014925	0	0
	-3,2E-01	0,9	6,397	9,28	-0,118618	9	13
	5,8E-02	799,2	26,535	33,38	0,140096	9	13
Total	-8,7E-02	216973,5	34,252	35,88	0,000103	9	13
	7,6E-02	517966,6	38,779	38,22	0,014845	0	0
	-3,2E-01	0	6,397	9,28	-0,118618	9	13
	5,8E-02	4893347	213,900	213,75	0,140096	9	13

h) Benchmark 8

d_cef	mispricing	volume	price	nav	ln_ret	i_etf	i_cef
0	-6E-05	2332836	62,78	62,77	0,00026	11	14
	3E-03	1773317	12,65	12,65	0,01350	0	0
	-4E-02	34711	30,37	30,49	-0,10107	11	14
	6E-02	1,71E+07	90,75	90,71	0,10465	11	14
1	-4E-02	153,3293	14,70	15,19	-0,00022	11	14
	7E-02	81,06505	3,77	3,40	0,01607	0	0
	-3E-01	28,3	7,59	9,72	-0,15917	11	14
	1E-01	1088,6	20,87	20,94	0,17524	11	14
Total	-1E-02	1490531	45,42	45,59	0,00008	11	14
	4E-02	1806801	25,31	25,07	0,01450	0	0
	-3E-01	28,3	7,59	9,72	-0,15917	11	14
	1E-01	1,71E+07	90,75	90,71	0,17524	11	14

i) Benchmark 9

d_cef	mispricing	volume	price	nav	ln_ret	i_etf	i_cef
0	-0,0003	3,5E+07	59,960	59,96	0,00017	13	16
	0,0054	3,9E+07	21,366	21,35	0,02913	0	0
	-0,0606	2,1E+03	9,280	9,25	-0,29044	13	16
	0,0329	3,6E+08	111,340	111,33	0,20684	13	16
1	-0,0642	1,3E+02	16,109	17,39	-0,00023	13	16
	0,0848	1,0E+02	5,924	6,75	0,01917	0	0
	-0,3190	8,0E-01	6,250	7,71	-0,18485	13	16
	0,3318	1,3E+03	30,760	33,34	0,26110	13	16
Total	-0,0336	1,7E+07	37,048	37,74	-0,00004	13	16
	0,0691	3,2E+07	26,760	26,34	0,02444	0	0
	-0,3190	8,0E-01	6,250	7,71	-0,29044	13	16
	0,3318	3,6E+08	111,340	111,33	0,26110	13	16

j) Benchmark 10

d_cef	mispricing	volume	price	nav	ln_ret	i_etf	i_cef
0	-0,00019	1,5E+07	54,96	54,96	0,0005	15	18
	0,00528	2,3E+07	21,69	21,67	0,0280	0	0
	-0,04170	2,6E+04	14,56	14,57	-0,1973	15	18
	0,04079	1,8E+08	100,16	100,34	0,2413	15	18
1	-0,06400	1,0E+02	12,58	13,30	0,0001	15	18
	0,07774	8,3E+01	3,60	3,12	0,0171	0	0
	-0,25455	1,2E+00	3,40	4,16	-0,1823	15	18
	0,13066	1,4E+03	21,83	20,63	0,1780	15	18
Total	-0,04785	3,8E+06	23,31	23,84	0,0002	15	18
	0,07274	1,4E+07	21,65	21,31	0,0204	0	0
	-0,25455	1,2E+00	3,40	4,16	-0,1973	15	18
	0,13066	1,8E+08	100,16	100,34	0,2413	15	18

k) Benchmark 11

d_cef	mispricing	volume	price	nav	ln_ret	i_etf	i_cef
0	-0,00004	5,6E+07	103,94	103,92	0,0002	19	26
	0,00291	1,0E+08	35,57	35,55	0,0141	0	0
	-0,02830	1,0E+02	31,16	31,27	-0,1044	19	26
	0,07875	8,7E+08	178,20	178,15	0,1427	19	26
1	-0,06426	3,0E+02	13,63	13,64	-0,0003	19	26
	0,10821	4,8E+02	5,65	5,64	0,0188	0	0
	-0,40315	1,0E-01	3,79	4,40	-0,2016	19	26
	0,60990	1,5E+04	30,90	34,52	0,2838	19	26
Total	-0,04342	1,6E+07	39,34	42,94	-0,0001	19	26
	0,09389	6,1E+07	45,21	47,10	0,0176	0	0
	-0,40315	1,0E-01	3,79	4,40	-0,2016	19	26
	0,60990	8,7E+08	178,20	178,15	0,2838	19	26

l) Benchmark 12

d_cef	mispricing	volume	price	nav	ln_ret	i_etf	i_cef
1	-0,081129	100,3736	15,8738	17,3481	-0,0001679	21	27
	0,0617467	75,42018	3,040503	3,58087	0,0149002	0	0
	-0,262984	3,3	8,04	10,62	-0,1089009	21	27
	0,1012931	605,6	22,86	24,45	0,2002792	21	27
Total	-0,081129	100,3736	15,8738	17,3481	-0,0001679	21	27
	0,0617467	75,42018	3,040503	3,58087	0,0149002	0	0
	-0,262984	3,3	8,04	10,62	-0,1089009	21	27
	0,1012931	605,6	22,86	24,45	0,2002792	21	27

m) Benchmark 13

d_cef	mispricing	volume	price	nav	ln_ret	i_etf	i_cef
1	-0,0947993	340,1281	24,4601	26,79613	0,0002084	0	11
	0,0792475	344,6607	11,9402	8,845614	0,0249554	0	0
	-0,3175848	0,9	6,2106	8,52	-0,2204398	0	11
	0,254566	5190,6	65,2553	67,53	0,1950552	0	11
Total	-0,0947993	340,1281	24,4601	26,79613	0,0002084	0	11
	0,0792475	344,6607	11,9402	8,845614	0,0249554	0	0
	-0,3175848	0,9	6,2106	8,52	-0,2204398	0	11
	0,254566	5190,6	65,2553	67,53	0,1950552	0	11

Table 32 – Variables mean

stats	volume	price	mv	nav	ln_ret	mispricing
mean	7727956	3,205905	5,082676	3,366122	-4,16E-06	-0,035891

Table 33 - Number of observations by fund

year	CEF	ETF	Total
2000	9	0	9
2001	2.349	0	2.349
2002	2.396	0	2.396
2003	2.709	0	2.709
2004	3.145	0	3.145
2005	4.447	1.082	5.529
2006	5.232	2.887	8.119
2007	6.762	3.414	10.176
2008	7.074	4.1	11.174
2009	7.047	4.245	11.292
2010	7.047	4.405	11.452
2011	7.02	4.667	11.687
2012	7.047	4.943	11.99
2013	2.484	1.748	4.232

Table 34 – Means, Standard Deviations and Frequencies of mispricing

Year	0 (dummy etf)	1	Total
2000	-0,17738	0	-0,17739
	0,071525	0	0,071525
	6	0	6
2001	-0,139023	0	-0,13902
	0,053921	0	0,053921
	1882	0	1882
2002	-0,097411	0	-0,09741
	0,079836	0	0,079836
	1971	0	1971
2003	-0,062403	0	-0,0624
	0,065340	0	0,065341
	2279	0	2279
2004	-0,05616	0	-0,05617
	0,061062	0	0,061063
	2713	0	2713
2005	-0,054303	0,000791	-0,04257
	0,067311	0,003734	0,063855
	3991	1080	5071
2006	-0,038976	0,00029	-0,02402
	0,069650	0,004118	0,05808
	4691	2886	7577
2007	-0,063471	0,000207	-0,0404
	0,057387	0,005443	0,055207
	6008	3413	9421
2008	-0,102761	0,000600	-0,06166
	0,095007	0,011982	0,089738
	6206	4097	10303
2009	-0,006880	0,000779	-0,00382
	0,178281	0,00561	0,138286
	6390	4245	10635
2010	-0,018810	0,000287	-0,01116
	0,147765	0,004791	0,114806
	6587	4405	10992
2011	-0,049707	-0,000021	-0,02906
	0,162302	0,006385	0,126536
	6564	4667	11231
2012	-0,060334	0,000240	-0,03443
	0,143515	0,003926	0,112661

	6590	4924	11514
2013	-0,072941	0,000507	-0,04155
	0,138964	0,004128	0,111278
	2316	1729	4045
Total	-0,055480	0,000362	-0,03589
	0,125191	0,006395	0,1044
	58194 (CEF)	31446 (ETF)	89640

Table 35 - Summary for variables: volume price mv nav ln_ret mispricing by categories of: d_etf (dummy etf)

d_etf	mean	sd	max	min	sum	N
0	158,9615	287,36	14573	0,10	1,0E+07	64646
	15,12225	6,16	65	3,40	9,8E+05	64768
	583,8909	708,25	5665	0,08	3,8E+07	64767
	15,71946	5,78	68	4,16	9,1E+05	58194
	-0,0001202	0,02	0	-0,31	-7,8E+00	64741
	-0,0554805	0,13	1	-0,40	-3,2E+03	58194
1	2,36E+07	55500000	872000000	100,00	7,4E+11	31489
	66,89321	32,41	214	6,46	2,1E+06	31491
	14376,27	22502,66	158952	3,96	4,5E+08	31352
	66,86426	32,40	214	9,25	2,1E+06	31446
	0,0002375	0,02	0	-0,34	7,4E+00	31095
	0,0003627	0,01	0	-0,10	1,1E+01	31446
Total	7727956	33600000	872000000	0,10	7,4E+11	96135
	32,05905	30,97	214	3,40	3,1E+06	96259
	5082,676	14398,33	158952	0,08	4,9E+08	96119
	33,66122	31,39	214	4,16	3,0E+06	89640
	-4,16E-06	0,02	0	-0,34	-4,0E-01	95836
	-0,0358905	0,10	1	-0,40	-3,2E+03	89640

Table 36- Summary for variables: volume price mv nav ln_ret mispricing by categories of: i

i	mean	sd	max	min	sum	N
1	80,96807	39,94912	450,1	8,1	142746,7	1763
	14,69487	2,85484	20,15	9,7	25907,05	1763
	321,6245	56,09828	418,11	212,48	567024	1763
	15,38832	2,815178	20,73	11,05	27083,44	1760
	-0,0003965	0,0161348	0,1710275	-0,1357629	-0,6986596	1762
	-0,0449721	0,0787772	0,0985222	-0,361596	-79,15087	1760
2	19,54113	31,14494	683,4	0,1	62902,9	3219
	12,28359	4,841527	27,5902	4,1142	39602,29	3224
	132,1593	88,46345	431,25	37,8	426081,6	3224
	14,01934	3,719529	28,7196	4,9569	21071,06	1503
	0,0002385	0,0194675	0,1627993	-0,1785753	0,768841	3223
	-0,0471456	0,0478719	0,178129	-0,2396386	-70,8599	1503
3	387,7621	188,2759	2570,8	62,6	627399,1	1618
	10,64268	3,522466	20,11	6,27	17219,86	1618
	1113,283	323,943	1980,96	617,63	1801291	1618
	11,23121	3,562726	20,12	7,56	18115,94	1613
	-0,0005682	0,019791	0,1979706	-0,1283569	-0,9187939	1617
	-0,0572337	0,0713235	0,1580883	-0,3192308	-92,318	1613
4	34,65645	26,57047	222,8	3,8	53163	1534
	14,94643	3,166917	25,15	7,47	22927,82	1534
	104,7145	22,09415	176,16	52,32	160527,4	1533
	16,04422	2,610599	24,58	10,25	24355,13	1518
	-0,0002462	0,0219425	0,3128624	-0,1613564	-0,377461	1533
	-0,0805537	0,0518591	0,059322	-0,3810679	-122,2806	1518
5	29,02855	22,25155	370,5	3,4	60901,9	2098
	14,66676	4,509252	24,26	5,54	30770,85	2098
	55,40801	40,66095	129,35	0,08	116246	2098
	16,02223	4,484705	25,3	7,23	33518,5	2092
	-0,0001672	0,0178021	0,2073725	-0,1262714	-0,3506959	2097
	-0,0925861	0,0458882	0,0638298	-0,3148148	-193,6901	2092
6	149,8942	138,5765	1778,6	6,1	317775,7	2120
	19,89579	5,330866	29,61	10,81	42179,07	2120
	503,3379	499,0283	1387,9	2,16	1067076	2120
	20,61486	5,048759	31,09	13,6	43105,68	2091
	-0,0002532	0,0178998	0,2023248	-0,1457118	-0,5364854	2119
	-0,0434648	0,0556872	0,0913621	-0,3052692	-90,88496	2091
7	52,6775	46,94782	696,7	5,1	111676,3	2120
	21,12506	4,479337	28,35	6,8	44785,13	2120

	219,0303	55,45157	311,85	63,86	464344,2	2120
	17,421	6,760215	28,75	5,89	36862,84	2116
	-0,0000274	0,0219747	0,2457373	-0,189612	-0,0580333	2119
	0,314658	0,3275717	0,8804142	-0,2963247	665,8163	2116
8	50,05784	34,94455	770,5	1,8	106372,9	2125
	17,25775	6,89246	31,75	8,21	36948,85	2141
	166,4164	63,7342	301,62	77,99	356297,5	2141
	17,93917	7,151157	30,85	9,47	38138,68	2126
	-0,0003894	0,0179108	0,2169813	-0,1487524	-0,8332691	2140
	-0,0363791	0,0688802	0,1552795	-0,3330804	-77,34196	2126
9	39,94981	44,99464	858,7	1,4	128798,2	3224
	15,67139	6,171591	35,1201	6,4	50524,55	3224
	285,5526	119,5982	664,16	121,03	920621,5	3224
	17,47361	6,749278	40,42	7,27	56125,23	3212
	0,0001803	0,0209423	0,2083835	-0,3073604	0,5812292	3223
	-0,1063863	0,0367425	-0,0023613	-0,2355728	-341,7128	3212
10	119,6924	80,69555	960,3	19,5	385888,3	3224
	13,5347	2,168573	18,09	7,18	43635,86	3224
	638,7553	104,4375	860,32	337,42	2059347	3224
	14,00154	1,732597	16,92	9,98	45084,97	3220
	0,0001265	0,0147777	0,1901168	-0,1630841	0,4077137	3223
	-0,0364415	0,0590302	0,1194307	-0,3427144	-117,3417	3220
11	340,1281	344,6607	5190,6	0,9	1096573	3224
	24,46009	11,94016	65,2553	6,2106	78859,32	3224
	1049,367	597,5487	3033,02	221,91	3383158	3224
	26,79613	8,845614	67,53	8,52	40408,57	1508
	0,0002084	0,0249554	0,1950552	-0,2204398	0,6716703	3223
	-0,0947993	0,0792475	0,254566	-0,3175848	-142,9573	1508
12	51,67401	44,0704	799,2	0,9	166597	3224
	13,92256	3,462388	23,0221	6,3972	44886,34	3224
	173,14	43,75205	297,6	80,6	558203,4	3224
	15,50392	3,588574	27,92	9,28	48945,89	3157
	-0,0000426	0,0151468	0,1400961	-0,1186178	-0,1373728	3223
	-0,1108191	0,070928	0,0581207	-0,3167487	-349,8558	3157
13	66,73648	51,06261	795,5	7,2	215158,4	3224
	16,63047	3,781488	26,5345	8,2568	53616,64	3224
	291,6458	114,2396	701,68	146,06	940266,2	3224
	18,76598	4,223017	33,38	11,62	59919,76	3193
	9,36E-06	0,0147026	0,0924265	-0,0977815	0,0301825	3223
	-0,1148199	0,065512	0,0510102	-0,3007096	-366,6198	3193
14	153,3293	81,06505	1088,6	28,3	337784,4	2203

	14,70469	3,771846	20,87	7,59	32394,43	2203
	674,1632	142,571	913,06	363,14	1485181	2203
	15,18773	3,396103	20,94	9,72	33413,01	2200
	-0,0002201	0,0160674	0,1752439	-0,1591657	-0,4846965	2202
	-0,0379791	0,0672212	0,1173857	-0,2705118	-83,55411	2200
15	42,08178	32,35875	421,7	0,8	64679,7	1537
	10,76506	2,987995	20,75	6,25	16545,89	1537
	79,02626	16,4513	132,8	40	121463,4	1537
	10,92668	2,930317	19,85	7,71	16794,3	1537
	-0,0005563	0,0233088	0,2611042	-0,1502968	-0,8544903	1536
	-0,0140249	0,1102756	0,3318263	-0,3189946	-21,55629	1537
16	187,1757	91,54487	1264,9	46,3	475239,2	2539
	19,34342	4,814939	30,76	6,81	49112,93	2539
	1408,28	350,5779	2240,43	496,01	3575623	2539
	21,32267	5,220883	33,34	9,26	53818,41	2524
	-0,0000299	0,016159	0,1603764	-0,1848484	-0,0758016	2538
	-0,0947073	0,041136	0,0725309	-0,2880794	-239,0413	2524
17	57,25692	40,81593	437,7	1,2	184596,3	3224
	10,81548	2,851706	17,36	3,4	34869,1	3224
	197,6546	54,89323	367,12	86,35	637238,4	3224
	11,59632	2,365256	15,97	4,16	37340,15	3220
	0,00011	0,0176813	0,1779985	-0,1523407	0,3544126	3223
	-0,0772729	0,0707021	0,1282051	-0,2545455	-248,8188	3220
18	143,8572	91,32496	1395,2	18,1	463795,6	3224
	14,33529	3,40188	21,8294	4,5674	46216,98	3224
	736,376	166,5346	1165,58	305,17	2374076	3224
	14,99781	2,845342	20,6322	5,5867	48352,93	3224
	0,0000487	0,0164983	0,1298547	-0,182309	0,1569503	3223
	-0,0507512	0,0820837	0,1306648	-0,2056776	-163,6218	3224
19	995,7861	517,0897	7701,3	173,8	1674912	1682
	11,69407	3,435959	20,6	6,86	19669,43	1682
	3406,413	870,4305	5665,1	1886,53	5729587	1682
	12,67177	3,211792	20,11	9,03	21275,9	1679
	-0,0004256	0,0185646	0,1585233	-0,1612061	-0,7153928	1681
	-0,0847497	0,0643133	0,1104942	-0,3091085	-142,2948	1679
20	991,926	731,8601	14572,7	245,4	1687266	1701
	8,820761	5,61833	21,8501	3,79	15004,11	1701
	1315,633	748,3371	3626,62	311	2237891	1701
	8,562393	5,206992	20,59	4,4	14564,63	1701
	-0,0009453	0,0222814	0,2837681	-0,1541507	-1,607002	1700
	0,0133979	0,133246	0,4672414	-0,2699619	22,78986	1701

21	483,2479	236,2007	2462,4	95,7	840851,3	1740
	12,56882	3,42406	20,66	7,87	21869,74	1740
	1891,892	505,8452	3093,03	1178,23	3291893	1740
	13,52923	3,183856	20,67	9,64	23500,28	1737
	-0,0003645	0,0169136	0,1423051	-0,1733872	-0,6339354	1739
	-0,0776636	0,0605267	0,079149	-0,2515953	-134,9016	1737
22	61,59575	79,61082	2641,7	7,6	110071,6	1787
	20,46211	5,355465	29,6	6,55	36565,79	1787
	211,1565	57,14483	308,74	66,17	377336,7	1787
	22,34905	3,795197	28,46	15,22	938,66	42
	0,0001138	0,0270912	0,2109376	-0,2016491	0,2032809	1786
	-0,0749442	0,1324369	0,148273	-0,4031517	-3,147657	42
23	131,9304	109,0939	2857,5	19,9	241036,8	1827
	10,98603	6,771585	25,36	4,36	20071,47	1827
	263,0928	155,6885	595,34	102,35	480670,6	1827
	10,18389	6,461497	23,99	4,86	18575,42	1824
	-0,0007658	0,0234048	0,272402	-0,1597796	-1,398367	1826
	0,0847056	0,1333114	0,6098982	-0,2176101	154,503	1824
24	47,72519	29,80282	402,4	1,5	105138,6	2203
	13,08682	3,880511	20,48	6,5718	28830,26	2203
	171,092	44,40177	257,02	89,4	376915,7	2203
	14,28144	3,774432	20,79	9,19	31433,44	2201
	-0,0003203	0,0147376	0,1895418	-0,1734062	-0,7052197	2202
	-0,0906178	0,0555128	0,0535152	-0,3533271	-199,4498	2201
25	9,376199	13,3428	192,6	0,1	24818,8	2647
	17,92446	4,603365	30,9	6,29	49256,41	2748
	78,25239	22,61518	141,49	26,15	215037,6	2748
	22,32498	5,23999	34,52	9,08	35608,35	1595
	0,000102	0,0166968	0,1822603	-0,1542751	0,2801538	2747
	-0,1037711	0,0700503	0,1766917	-0,3160653	165,5149	1595
26	108,5873	72,9747	1910,8	8,2	350085,3	3224
	12,16304	2,351983	21,9375	6,062	39213,64	3224
	1042,159	182,9718	1737,14	513,03	3359920	3224
	14,00555	2,480161	24,28	7,5	44999,83	3213
	-0,0001403	0,0126623	0,1004187	-0,1122195	-0,4520552	3223
	-0,1341707	0,0188495	-0,0644016	-0,1917334	-431,0904	3213
27	100,3736	75,42018	605,6	3,3	239993,3	2391
	15,8738	3,040503	22,86	8,04	37954,26	2391
	306,7938	259,8872	692,63	21,03	733544	2391
	17,34814	3,580865	24,45	10,62	41427,35	2388
	-0,0001679	0,0149002	0,2002792	-0,1089009	-0,4012241	2390

	-0,0811293	0,0617467	0,1012931	-0,2629844	-193,7368	2388
101	2539718	1771288	1,00E+07	7500	3,17E+09	1250
	49,32153	16,6047	92,18	17,52	61651,91	1250
	247,2659	104,8604	478,897	4,126	308835,1	1249
	49,31848	16,59653	92,1139	17,2985	61549,47	1248
	0,0003764	0,0521399	0,2503985	-0,3435067	0,4694019	1247
	-0,0003801	0,0085913	0,1210762	-0,047554	-0,4743527	1248
102	2,14E+07	1,15E+07	9,34E+07	2041992	4,32E+10	2025
	64,69673	11,49785	90,19	38,14	131010,9	2025
	5977,07	1773,792	11576,3	2395,28	1,21E+07	2024
	64,68099	11,4992	90,0649	38,0741	130849,7	2023
	0,0002899	0,0204764	0,1629803	-0,1709377	0,5864173	2023
	0,0000519	0,0028183	0,017516	-0,0181258	0,1049091	2023
103	452653,2	656376,4	9487035	100	5,59E+08	1235
	53,05307	8,834857	65,55	25,38	65520,54	1235
	1694,459	782,5721	2831,3	3,96	2090962	1234
	52,97561	8,885835	65,392	25,71	65318,93	1233
	0,0002538	0,0212438	0,1548088	-0,1226372	0,299984	1182
	0,0016666	0,0110029	0,0768421	-0,0481251	2,05487	1233
104	200847,3	293661,4	4160450	100	2,81E+08	1400
	40,09952	5,843756	56,4	22,23	56139,33	1400
	755,5898	476,6009	2033,42	10,06	1057070	1399
	40,00521	5,815736	56,23	22,5365	55927,29	1398
	0,0000261	0,0188864	0,1652762	-0,1154399	0,0362924	1393
	0,0022564	0,0091077	0,0983635	-0,0591381	3,154509	1398
105	88684,22	173112,6	4903315	306	1,51E+08	1700
	32,25875	5,452079	45,23	6,46	54904,4	1702
	328,0431	125,646	567,72	21,89	557345,2	1699
	32,23547	5,334424	44,88	17,2587	54735,82	1698
	-0,0000281	0,0187537	0,1773916	-0,11453	-0,0475192	1692
	0,001462	0,0094949	0,0749279	-0,085486	2,482414	1698
106	518732,2	555327,2	5054161	200	7,21E+08	1389
	43,94402	6,592873	56,57	23,85	61038,24	1389
	1738,357	1304,282	4706,68	5,01	2412840	1388
	43,8717	6,580609	56,45	24,1142	60850,04	1387
	0,0001394	0,0174761	0,1409018	-0,104919	0,1911402	1371
	0,0014333	0,0062277	0,0446513	-0,0970537	1,987926	1387
107	1,65E+07	1,06E+07	7,47E+07	1096400	3,34E+10	2025
	59,80898	10,94632	86,18	31,4	121113,2	2025
	36481,43	7006,086	52627,4	19305,2	7,38E+07	2022
	59,70375	10,90964	85,64	32,16	120661,3	2021

	0,0000721	0,0174388	0,1571856	-0,1139945	0,1459017	2023
	0,0015853	0,0094557	0,0817002	-0,0744336	3,203833	2021
108	5,53E+07	3,32E+07	2,49E+08	1453200	1,12E+11	2025
	39,38651	6,887681	55,75	18,44	79757,68	2025
	28964,79	11688,71	52950,9	7112,95	5,86E+07	2024
	39,37007	6,889861	55,13	19,12	79606,29	2022
	0,0002215	0,0235225	0,2255659	-0,1922016	0,4481356	2023
	0,0005085	0,0104876	0,1071429	-0,0831057	1,028232	2022
109	954665	690365,8	4893347	80579	1,81E+09	1896
	98,78476	34,31959	213,9	59,26	187295,9	1896
	1739,052	597,4118	4324,38	955,89	3295504	1895
	98,70915	34,2302	213,75	59,22	186955,1	1894
	0,0005291	0,0145483	0,0808805	-0,1170154	0,9533874	1802
	-0,0000154	0,0033352	0,0343401	-0,032999	-0,0291985	1894
110	2685258	1933557	1,71E+07	94426	5,23E+09	1948
	56,29685	9,655848	82,15	30,37	109666,3	1948
	12031,23	4077,902	21422,4	4238,54	2,34E+07	1947
	56,28138	9,63755	82,25	30,49	109523,6	1946
	0,0003644	0,0126337	0,0653792	-0,098583	0,684008	1877
	-0,0000559	0,0030346	0,0613119	-0,0385122	-0,1088257	1946
111	1980776	1518137	1,35E+07	34711	3,86E+09	1950
	69,24974	11,95688	90,75	34,06	135037	1950
	10301,37	3287,854	19938,3	5097,73	1,95E+07	1891
	69,24389	11,95502	90,71	34,22	134887,1	1948
	0,0001515	0,0143144	0,1046506	-0,1010651	0,2863904	1890
	-0,0000657	0,0031904	0,0415552	-0,0418767	-0,1280077	1948
112	2282859	2457498	2,26E+07	2100	3,88E+09	1700
	43,81141	17,38601	81,04	9,28	74479,39	1700
	320,8282	355,898	1941,66	19,34	545087,1	1699
	43,81182	17,38383	81,22	9,25	74392,47	1698
	0,0000534	0,0384516	0,2068387	-0,2904445	0,0906522	1697
	-0,000469	0,0070425	0,0329437	-0,0606323	-0,7963142	1698
	6,19E+07	3,34E+07	3,55E+08	5152575	1,25E+11	2025
	73,51693	13,53735	111,34	34,32	148871,8	2025
	13145,77	4404,898	28561	12,37	2,66E+07	2024
	73,50773	13,50844	111,33	34,37	148706,1	2023
	0,0002742	0,0179145	0,1010408	-0,1088861	0,5547021	2023
	-0,0002019	0,003372	0,0178868	-0,0559946	-0,4084618	2023
114	1845205	760316,7	5717088	159887	6,26E+08	339
	37,49018	8,853318	56	23,33	12709,17	339
	224,0334	44,59155	675,527	164,465	75723,28	338

	37,4735	8,791496	55,89	23,68	12628,57	337
	0,0025847	0,0221772	0,0869757	-0,0704601	0,8736454	338
	-0,0003916	0,0046167	0,0262461	-0,0211531	-0,1319707	337
115	1,75E+07	2,47E+07	1,83E+08	26200	3,23E+10	1849
	58,16171	21,81859	100,16	14,56	107541	1849
	1408,74	800,8359	3683,13	10,48	2603351	1848
	58,14648	21,8041	100,34	14,57	107396,5	1847
	0,0001574	0,0288855	0,2412607	-0,1973113	0,2905123	1846
	-0,0001561	0,0053983	0,0407874	-0,0417001	-0,2882353	1847
116	3549066	2596474	2,27E+07	162300	7,18E+09	2024
	129,2956	20,89561	178,2	68,11	261694,3	2024
	23382,87	8257,016	50160,9	12010,2	4,73E+07	2023
	129,2733	20,87661	178,15	68,24	261132,1	2020
	0,000198	0,0140071	0,1089612	-0,0905514	0,4000903	2021
	-0,0000348	0,0029539	0,0504052	-0,0174299	-0,0703233	2020
117	1,82E+08	1,12E+08	8,72E+08	1,35E+07	3,68E+11	2025
	128,8635	20,79021	177,23	68,14	260948,7	2025
	83288,74	24813,26	158952	45382,9	1,69E+08	2024
	128,8387	20,76928	177,16	68,13	260640,6	2023
	0,0002011	0,014113	0,1426692	-0,1043701	0,4067605	2023
	-0,0000403	0,0026995	0,0297957	-0,025037	-0,081585	2023
118	8007,9	39541,28	1007674	100	5749672	718
	71,31414	8,390405	89,85	54,29	51203,55	718
	146,0793	28,80134	183,73	91,63	104738,8	717
	71,29358	8,351985	89,54	54,27	51046,2	716
	0,0004956	0,0109387	0,051716	-0,068267	0,3538764	714
	-0,0000821	0,0026133	0,0194532	-0,0136799	-0,0587788	716
119	672124,9	687465,6	7638383	29222	1,32E+09	1966
	64,06453	11,44368	84,2	31,16	125950,9	1966
	4087,034	859,2602	6497,62	2065,91	7793975	1907
	64,0561	11,44172	84,24	31,27	125806,2	1964
	0,0001898	0,0150967	0,1118741	-0,1034725	0,3624247	1910
	-0,0000186	0,0031786	0,0787525	-0,0283019	-0,0364749	1964
Total	7727956	3,36E+07	8,72E+08	0,1	7,43E+11	96135
	32,05905	30,9691	213,9	3,4	3085972	96259
	5082,676	14398,33	158952	0,08	4,89E+08	96119
	33,66122	31,39358	213,75	4,16	3017392	89640
	-4,16E-06	0,019755	0,3128624	-0,3435067	-0,3983173	95836
	-0,0358905	0,1043997	0,8804142	-0,4031517	-3217,229	89640

Table 37 – Correlations

	volume	price	mv	nav
volume	1,000			
price	0,422	1,000		
mv	0,713	0,639	1,000	
nav	0,422	0,999	0,639	1,000

Table 38 – Correlations

	mispricing	nav	price
mispricing	1,000		
nav	0,1858	1,000	
price	0,2275	0,9989	1,000

Table 39 – Correlations

	mispricing	volume
mispricing	1,000	
volume	0,0818	1,000

Table 40 – Correlations

	volume	d_etf
volume	1,000	
d_etf	0,3294	1,000

Table 41 – Mispricing by benchmark

a) Benchmark 1

Number of obs =	5026
F(3, 5022) =	194,97
Prob > F =	0,0000
R-squared =	0,1746
Root MSE =	0,0468

	Mispricing Coef.	Std. Err.	t	P>t	[95% Conf. Interval]	
ln_ret	0,0117045	0,0207803	0,56	0,573	-0,0290339	0,052443
year	0,0010436	0,000243	4,3	0	0,0005672	0,00152
d_cef	-0,0448001	0,0018724	-23,93	0	-0,0484708	-0,04113
_cons	-2,097191	0,4882646	-4,3	0	-3,054403	-1,13998

b) Benchmark 2

Number of obs =	2683
F(3, 2679) =	595,03
Prob > F =	0,0000
R-squared =	0,3268
Root MSE =	,03602

Robust

	Mispricing Coef.	Std. Err.	t	P>t	[95% Conf. Interval]	
ln_ret	0,3424257	0,0446365	7,67	0	0,2549001	0,4299512
year	-0,0004867	0,0004214	-1,15	0,248	-0,0013131	0,0003397
d_cef	-0,0494762	0,0011958	-41,37	0	-0,0518211	-0,0471313
_cons	0,9800531	0,847254	1,16	0,247	-0,6812848	2.641.391

c) Benchmark 3

Number of obs =	4693
F(3, 4689) =	545,27
Prob > F =	0,0000
R-squared =	0,3220

Root MSE = ,04192

	Mispricing Coef.	Std. Err.	t	P>t	[95% Conf. Interval]	
ln_ret	0,3083782	0,0569695	5,41	0,000	0,1966912	0,4200651
year	-0,0020146	0,0002997	-6,72	0,000	-0,0026022	-0,0014271
d_cef	-0,0590628	0,0017606	-33,55	0,000	-0,0625143	-0,0556113
_cons	4,050973	0,6023407	6,73	0,000	2,870102	5,231844

d) Benchmark 4

Number of obs = 7070
F(3, 7066) = 4247,30
Prob > F = 0,0000
R-squared = 0,2943
Root MSE = ,04851

	Mispricing Coef.	Std. Err.	t	P>t	[95% Conf. Interval]	
ln_ret	0,1539871	0,0622354	2,47	0,013	0,0319872	0,2759871
year	-0,0056744	0,000228	-24,88	0,000	-0,0061214	-0,0052274
d_cef	-0,0787212	0,0007178	-109,67	0,000	-0,0801283	-0,077314
_cons	11,40809	0,458385	24,89	0,000	10,50952	12,30666

e) Benchmark 5

Number of obs = 6261
F(3, 6257) = 480,66
Prob > F = 0,0000
R-squared = 0,2242
Root MSE = ,22091

	Mispricing Coef.	Std. Err.	t	P>t	[95% Conf. Interval]	
ln_ret	0,6117926	0,1590739	3,85	0,000	0,2999532	0,923632
year	0,0423671	0,0011715	36,16	0,000	0,0400705	0,0446638
d_cef	0,145599	0,0046791	31,12	0,000	0,1364263	0,1547717
_cons	-85,1127	2,353576	-36,16	0,000	-89,72652	-80,49888

f) Benchmark 6

Number of obs =	8450
F(3, 8446) =	3112,55
Prob > F =	0,0000
R-squared =	0,3266
Root MSE =	,05014

Robust

	Mispricing Coef.	Std. Err.	t	P>t	[95% Conf. Interval]	
ln_ret	0,275873	0,0320507	8,61	0,000	0,2130457	0,3387002
year	0,0048149	0,0002006	24	0,000	0,0044216	0,0052081
d_cef	-0,0608742	0,0008816	-69,05	0,000	-0,0626023	-0,059146
_cons	-9,672484	0,4030126	-24	0,000	-10,46249	-8,88248

g) Benchmark 7

Number of obs =	8149
F(3, 8145) =	5719,17
Prob > F =	0,0000
R-squared =	0,3849
Root MSE =	,05984

	Mispricing Coef.	Std. Err.	t	P>t	[95% Conf. Interval]	
ln_ret	0,1393976	0,0577411	2,41	0,016	0,0262103	0,252585
year	0,0020435	0,0001972	10,36	0,000	0,0016569	0,0024302
d_cef	-0,108168	0,0009455	-114,4	0,000	-0,1100214	-0,1063146
_cons	-4,105451	0,3962522	-10,36	0,000	-4,882207	-3,328696

h) Benchmark 8

Number of obs =	5963
F(3, 5959) =	504,94
Prob > F =	0
R-squared =	0,2623
Root MSE =	0,03849

	Mispricing Coef.	Std. Err.	t	P>t	[95% Conf. Interval]	
ln_ret	0,1098716	0,0591661	1,86	0,063	-0,0061153	0,2258585
year	-0,0057699	0,0001904	-30,3	0	-0,0061432	-0,0053967
d_cef	-0,0397965	0,0013261	-30,01	0	-0,0423961	-0,037197
_cons	11,59161	0,3825432	30,3	0	10,84	12,342

i) Benchmark 9

Number of obs = 7776
F(3, 7772) = 799,66
Prob > F = 0,0000
R-squared = 0,2146
Root MSE = ,06129

	Mispricing Coef.	Std. Err.	t	P>t	[95% Conf. Interval]	
ln_ret	0,0782736	0,0334774	2,34	0,019	0,0126488	0,1438984
year	0,0008713	0,0001845	4,72	0,000	0,0005096	0,001233
d_cef	-0,0633724	0,0013448	-47,12	0,000	-0,0660085	-0,0607363
_cons	-1,751036	0,3707327	-4,72	0,000	-2,477772	-1,0243

j) Benchmark 10

Number of obs = 8622
F(3, 8618) = 4018,57
Prob > F = 0,0000
R-squared = 0,3384
Root MSE = ,05918

	Mispricing Coef.	Std. Err.	t	P>t	[95% Conf. Interval]	
ln_ret	0,0199936	0,0266203	0,75	0,453	-0,0321885	0,0721756
year	-0,0097558	0,0001943	-50,2	0,000	-0,0101367	-0,0093748
d_cef	-0,0937626	0,000886	-105,83	0,000	-0,0954993	-0,0920259
_cons	19,60659	0,3905927	50,2	0,000	18,84094	20,37225

k) Benchmark 11

Number of obs = 20647
F(3, 20643) = 1709,75
Prob > F = 0,0000
R-squared = 0,1022
Root MSE = 0,08908

	Mispricing Coef.	Std. Err.	t	P>t	[95% Conf. Interval]	
ln_ret	0,0777175	0,0515491	1,51	0,132	-0,0233229	0,1787578
year	-0,0000824	0,0001583	-0,52	0,603	-0,0003926	0,0002278
d_cef	-0,0642567	0,000956	-67,21	0,000	-0,0661306	-0,0623829
_cons	0,1655089	0,3180142	0,52	0,603	-0,4578242	0,7888419

l) Benchmark 12

Number of obs =	2388
F(2, 2385) =	188,51
Prob > F =	0,0000
R-squared =	0,1209
Root MSE =	,05792

	Mispricing Coef.	Std. Err.	t	P>t	[95% Conf. Interval]	
ln_ret	0,1078713	0,1215227	0,89	0,375	-0,1304297	0,3461722
year	0,0080308	0,0004139	19,4	0	0,0072191	0,0088425
d_cef	0	(omitted)				
_cons	-16,20914	0,8310874	-19,5	0	-17,83887	-14,57941

m) Benchmark 13

Number of obs =	1508
F(2, 1505) =	12,57
Prob > F =	0,0000
R-squared =	0,0286
Root MSE =	,07816

	Mispricing Coef.	Std. Err.	t	P>t	[95% Conf. Interval]	
ln_ret	0,3404225	0,1184427	2,87	0,004	0,1080922	0,572753
year	0,003559	0,0008225	4,33	0,000	0,0019457	0,005172
d_cef	0	(omitted)				
_cons	-7,244614	1,653642	-4,38	0,000	-10,4883	-4,00093