Hedged ETFs: Do they add value?

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Abstract

Hedged Exchange Traded Funds (ETFs) provide individual investors with the opportunity to invest in ETFs that follow strategies similar to those of hedge funds and seek returns uncorrelated with the market. In this article I analyze the performance of six different categories of 49 Hedged ETFs and 539 Hedged Mutual from January 2008 to December 2014, and compared them with five different asset categories of index ETFs. Hedged ETFs and Mutual Funds had highly negative or low correlation with other index ETFs which indicates that they did help investors diversify. Hedged ETFs also had much lower risk compared with other index ETFs with the exception of bond market ETF AGG. However, this did not translate into superior absolute or risk-adjusted performance, and Hedged ETFs underperformed all other asset categories (with the exception of Commodities ETF DBC). The absolute- and risk-adjusted performance of Hedged Mutual Funds was similar to that of Hedged ETFs. Based on these findings investors would have been better off with index fund ETFs. © 2016 Academy of Financial Services. All rights reserved.

Keywords: Hedge funds; Investments; Exchange Traded Funds (ETFs); Index fund ETFs

1. Introduction

Hedged Exchange Traded Funds (ETFs) are relatively new entrants into the ETF industry. These ETFs follow investment strategies similar to those of hedge funds and are attractive to individual investors who are often unable to invest in hedge funds because of high initial investment requirements and longer lock-up periods. These Hedged ETFs offer hedge-fund-like strategies for a fraction of the cost, and zero restrictions around getting into or out of these funds. These ETFs normally have a goal of providing individual investors with access

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to investment strategies that offer non-correlated returns and diversification benefits. This goal of Hedged ETFs is in contrast with traditional or long only ETFs that try to replicate a benchmark such as S&P 500 or Russell 3000. There are a number of ways ETF can act or replicate Hedge Fund returns.[1] The different methods are Direct Approach, Hedge Fund Replication, and Copycat (see Appendix B for a brief description of these three different methods).

2. Motivation

This article looks at the merits of holding Hedged ETFs versus holding different (asset) categories of index ETFs. There has been a significant increase in the number of Hedged ETFs. Lot of retail and institutional investors are increasingly drawn to ETFs that aim to mimic hedge-fund strategies. As of December 2014, there were 34 live and 15 dead Hedged ETFs. The assets under management (AUM) under the surviving Hedged ETFs as of December 2014 were $3.42 billion. With the increase in the number of funds and the growth in assets under management it is obvious that investors thought that Hedged ETFs would provide higher risk adjusted returns or benefits from diversification.

3. Literature

This is the first article that looks at the characteristics and performance of Hedged ETFs as an asset class. Previous literature has only looked at hedge funds or alternative or hedged mutual funds (AMFs). Although AMFs are relatively new, there has been some research in this field. Koski and Pontiff (1999) and Deli and Varma (2002) find that the flexibility to use derivatives, sell securities short, and borrow money to create leverage help managers to control expenses, risk, and manage cash flows more efficiently that makes the AMFs appear to be an attractive alternative to standard mutual funds and subject to analysis. Agarwal et al., (2009) were the first to look at the performance of 52 hedged mutual funds over the period 1994–2004. They form a single portfolio of six different categories of 52 Hedged Mutual Funds from 1994 to 2004 and compare them to traditional mutual funds and hedge funds. They find that these Hedged Mutual Funds outperform traditional mutual funds, but underperform similar hedge funds. Kanuri and McLeod (2014) conduct a similar study of 256 AMFs period January 1998 through December 2011using the Carhart four-factor model and the Fung-Hsieh seven-factor model. Their results indicate that most AMFs have not been able to create any value for their investors over this period. Furthermore, the performance of these mutual funds was even worse during the recent financial crisis (October 2007 through March 2009).

This article looks at the performance of surviving as well as dead Hedged ETFs since their inception and compare them to U.S. stock market (IVV), Aggregate bond market (AGG), Total World Ex U.S. (VEU), Real estate market (IYR), and Commodities market (DBC). We compare the performance of Hedged ETFs to different index ETFs for an equal comparison or compare performance after expenses. Elton, Gruber, and Blake (1996) find that previous

mutual fund studies suffered from survivorship bias as funds that merge or die have worse performance than funds that do not and failing to account for survivorship bias will lead to higher risk-adjusted returns for mutual funds. Excluding dead ETFs can lead to similar problems. Therefore, dead ETFs were included in the analysis to control for survivorship bias. Following Agarwal et al., (2009), a single portfolio of all Hedged ETFs (surviving and dead) is formed from January 2008 through December 2014.

4. Hypothesis

In this article I am interested in determining whether or not Hedged ETFs can provide benefits to individual investor through their promise of delivering returns that are uncorrelated with the market. Do

Hypothesis 1: Hedged ETFs have more flexibility than long-only ETFs (which try to which try to mimic a benchmark such as S&P 500 or Russell 3000). They can take long (short) positions in undervalued (overvalued) securities. Additionally, they can use derivatives (including forwards, options, or swaps) to seek absolute returns that is, positive returns in all market conditions. Therefore, they should have lower correlation and better absolute- and risk-adjusted performance compared to traditional benchmark ETFs.

Hypothesis 2: Because of the reasons mentioned in Hypothesis 1, Hedged ETFs should help investors diversify, and have low correlation with other asset categories.

5. Data and methodology

The list of Hedged ETFs has been taken Morningstar Direct database. Hedged ETFs were first created in late 2007. Appendix A shows the different categories of Hedged ETFs. Therefore, for an equal comparison, equally weighted portfolios for Hedged ETFs have been formed monthly from January 2008 through December 2014. There are total of 34 live and 15 dead Hedged ETFs at the end of December 2014. We include all surviving Hedged ETFs in the analysis that have at least 12 months of returns as of December 2014. We also compare the performance of Hedged ETFs to the U.S. stock market that is, S&P 500 ETF (IVV), foreign stock market ETF that is, FTSE All World Ex U.S. (VEU), Barclays Aggregate Market ETF (AGG), U.S. Real Estate ETF (IYR), and Commodity ETF that is, PowerShares DB Commodity Tracking ETF (DBC). We also form two different portfolios:

1. 65% U.S. stock market (IVV)/35% Bond market (AGG) – Following Stout and Mitchell (2006) and Brown et al., (2003), a portfolio of 65% in a broad index of index of equities of U.S. corporations and 35% intermediate term bonds is formed. This is also the allocation for Rep. DeMint's Social Security Savings Act of 2003.
2. 45% U.S. stock market (IVV)/10% foreign stock market (VEU)/5% Real estate market (VEU)/5% Commodity market (DBC)/35% Bond market (AGG) – As a

Table 1   Shows the summary statistics for Hedged ETF portfolio and other index ETFs for the period of our study

ETF category	Total ETFs	Number surviving (December 2014)	Number dead (December 2014)	AUM for surviving ETFs (December 2014)	Average expense ratio	Average turnover ratio
Hedged ETFs	49	34	15	$3,415,247,306	0.84%	138.58%
IVV (S&P 500)	1	1	0	$69,686,294,171	0.07%	5%
AGG (Total Bond)	1	1	0	$24,092,634,308	0.08%	180%
VEU (Total World Ex U.S.)	1	1	0	$12,272,804,784	0.14%	4%
IYR (Real Estate)	1	1	0	$6,021,577,713	0.45%	27.00%
DBC (Commodities)	1	1	0	$4,036,424,446	0.88%	0%

robustness test, another portfolio comprising of 45% U.S. stocks, 10% foreign stocks, 5% real estate, 5% commodities, and 35% bonds is also used for comparison purposes.

Appendix C shows all the Hedged ETFs and their inception date. Appendix D shows the different index ETFs used for comparison.

The monthly returns, annual expenses, annual turnover, and assets under management at the end of each year for Hedged ETFs, IVV, AGG, VEU, IYR, and DBC have been obtained from Morningstar Direct database.

6. Results

Table 1 shows descriptive statistics. The total AUM for 34 surviving Hedged ETFs, IVV, AGG, VEU, IYR, and DBC of December 2014 were $3.42 billion, $69.69 billion, 23.02 billion, $24.09 billion, $12.27 billion, $6.02 billion, and $4.04 billion, respectively. Hedged ETFs are much more expensive than all other categories of ETFs and have average expense ratio of 0.84% and are more expensive than all other categories of ETFs (with the exception of DBC). The range of expense ratios for Hedged ETFs varies from 0.24% to 1.65%. The average turnover for Hedged ETFs was also very high compared with most other index ETFs. The average turnover for Hedged ETFs was 138.58%. In comparison, the turnover of S&P 500 ETF (IVV) was only 5%. Expenses and turnover are very important as previous literature finds that expenses and turnover are negatively related to fund performance (Blake et al., 1993; Carhart, 1997; Dellva and Olson, 1998; Domian and Reichenstein, 1998; Dowen and Mann, 2004; Golec, 1997; Kanuri and McLeod, 2014).

Table 2 shows the average, maximum and minimum net asset allocation of Hedged ETFs. Hedged ETFs are highly diversified across different asset classes (both foreign and domestic). Hedged ETFs have highly negative allocations indicate short selling of assets exploit arbitrage conditions. This is consistent with Koski and Pontiff (1999) and Deli and Varma (2002).

Table 2   Shows the average net allocations of Hedged ETFs

Hedged ETFs	Asset allocations equity % (net)	Asset allocations bond % (net)	Asset allocations cash % (Net)	Asset allocations non-U.S. bond % (net)	Asset allocations non-U.S. equity % (net)	Asset allocations other % (net)
Average	25.33%	9.19%	63.49%	3.95%	4.28%	1.99%
Max	104.25%	91.33%	192.35%	23.08%	31.00%	22.60%
Min	−97.95%	−99.19%	−4.25%	0.00%	−19.19%	−15.77%

6.1. Correlation

Table 3 shows the results for Spearman Rank Correlation test between Hedged ETF portfolio, IVV, AGG, VEU, IYR, and DBC, 65% U.S. stock market (IVV)/35% Bond market (AGG) portfolio and 45% U.S. stock market (IVV)/10% foreign stock market (VEU)/5% Real estate market (VEU)/5% Commodity market (DBC)/35% Bond market (AGG) portfolio during the period of our study.

Results indicate that Hedged ETF portfolio have highly negative correlation with all other asset categories with the exception of Commodities (DBC). Correlation between Hedged ETF portfolio and IVV (S&P 500) is −0.4285, whereas correlation between Hedged ETF portfolio and AGG (Total bond market) is −0.0643. Hedged ETF portfolio is only positively correlated with Commodity Index ETF. However, even correlation between Hedged ETF portfolio and Commodity Index ETF is very low (0.0247). Results were statistically significant in the case of IVV, VEU, IYR, and 45% U.S. stock market (IVV)/10% foreign stock market (VEU)/5% Real estate market (VEU)/5% Commodity market (DBC)/35% Bond market (AGG) portfolio. These results indicate that Hedged ETFs are highly diversified and, therefore, have highly negative or very low correlation with all other asset categories.

6.2. Returns and standard deviation

Table 4 shows average monthly returns, median monthly returns, standard deviation of monthly returns, and cumulative returns over the entire period (January 2008 through December 2014). Hedged ETF portfolio severely underperformed all asset categories with the exception of Powershares DB Commodity Tracking ETF and has much lower average monthly returns compared with all other asset categories p value of average returns are significantly different than zero (5% or better) for all portfolios In fact, Hedged ETF portfolio lost value and had negative average monthly returns. The only other category that had negative average monthly returns was Commodity Index ETF. However, Hedged ETF portfolio had lower standard deviation of returns compared with all other categories except the total market bond ETF (AGG). The cumulative returns for Hedged ETF portfolio for the entire period were −14.76%. Only Powershares DB Commodity Tracking ETF lost more value (−40.56%) over this time period.

Table 5a shows the annualized returns every year, average annual returns (both arithmetic and geometric) as well as standard deviation of annual returns. Results again indicate that Hedged ETF portfolio underperformed most asset categories (with the exception of Power-

Table 3   Shows the Spearman Rank Correlation test between equally weighted Hedged ETF portfolio and other index ETFs for the period of our study (January 2008 through December 2014)

Correlation	Hedged ETFs	IVV (S&P 500)	AGG (total bond)	VEU (Total World Ex U.S.)	IYR (real estate)	DBC (commodities)	65% IVV/35% AGG	45% IVV/10% VEU/5% IYR/5% DBC/35% AGG
Hedged ETFs	1							
IVV (S&P 500)	−0.1835*	1						
AGG (total bond)	−0.0401	−0.0054	1					
VEU (Total World Ex U.S.)	−0.2354**	0.8762***	0.0672	1				
IYR (real estate)	−0.2315**	0.7663***	0.2339**	0.7412***	1			
DBC (commodities)	0.0592	0.5193***	−0.0082	0.5890***	0.3268**	1		
65% IVV/35% AGG	−0.1734	0.9914***	0.0876	0.8908***	0.7994***	0.5069***	1	
45% IVV/10% VEU/5% IYR/5% DBC/35% AGG	−0.1985*	0.9664***	0.1298	0.9345***	0.8333***	0.5600***	0.9850***	1

* Significant at 10%; ** significant at 5%; *** significant at 1%.

Table 4   Shows the average monthly returns, median monthly returns, standard deviation of monthly returns, and cumulative returns (January 2008 through December 2014) for equally weighted Hedged ETF portfolio and other index ETFs for the period of our study

January 2008 through December 2014	Average monthly	Median returns	Standard deviation	Cumulative returns (January 2008 through December	p value of average returns
Hedged ETFs	−0.12%	−0.22%	3.51%	−13.94%	0.008***
IVV (S&P 500)	0.70%	1.41%	4.85%	62.91%	0.011**
AGG (total bond)	0.38%	0.32%	1.00%	37.43%	0.002***
VEU (Total World Ex U.S.)	0.17%	0.50%	6.35%	−2.87%	0.014**
IYR (real estate)	0.87%	2.02%	7.93%	57.78%	0.017**
DBC (commodities)	−0.42%	−0.30%	6.20%	−40.56%	0.013**
65% IVV/35% AGG	0.59%	1.17%	3.19%	57.12%	0.007***
45% IVV/10% VEU/5% IYR/5% DBC/35% AGG	0.49%	0.94%	3.35%	43.78%	0.007***

* Significant at 10%; ** significant at 5%; *** significant at 1%.

shares DB Commodity Tracking ETF) and had negative average annualized returns (both geometric and arithmetic). However, standard deviation of annualized returns for Hedged ETF portfolio was much lower than all asset categories with the exception of Barclays Aggregate Bond market ETF (AGG).

Following Woolridge (2004), I also compute the cumulative wealth index (CWI) for each category. The CWI measures the outcome of investing $1,000 in each category at the beginning of January 2008, presuming reinvestment of dividends. Investors who would have invested in Hedged ETFs would have lost the most money compared with other categories (with the exception of Commodities index ETF which lost 40.56% during this time period).

6.3. Risk adjusted performance

A portfolio may have higher returns, but it could have achieved them by taking higher risk. Therefore, we compute risk adjusted performance to compare the different portfolios.

Table 5a   Shows the annualized returns every year, average annual returns (both arithmetic and geometric), and standard deviation of annual returns for equally weighted Hedged ETF portfolio and other index ETFs for the period of our study (2008–2014)

Annual returns	Hedged ETFs	IVV	AGG	VEU	IYR	DBC	65% IVV/35% AGG	45% IVV/10% VEU/5% IYR/5% DBC/35% AGG
2008	2.68%	−36.95%	5.88%	−44.02%	−40.02%	−30.80%	−23.85%	−24.10%
2009	−4.69%	26.43%	5.14%	38.89%	30.14%	15.08%	19.08%	20.27%
2010	−2.77%	14.96%	6.30%	11.85%	26.36%	11.86%	12.37%	12.53%
2011	−5.27%	2.03%	7.58%	−14.25%	5.63%	−2.71%	4.24%	2.50%
2012	−4.20%	15.91%	4.04%	18.55%	18.36%	3.31%	11.78%	11.61%
2013	0.83%	32.31%	−2.15%	14.50%	1.05%	−7.57%	19.23%	13.96%
2014	−1.16%	13.62%	6.04%	−4.05%	26.62%	−28.18%	10.99%	7.36%
Arithmetic average	−2.08%	9.76%	4.69%	3.07%	9.73%	−5.57%	7.69%	6.30%
Geometric average	−2.12%	7.22%	4.65%	−0.42%	6.73%	−7.16%	6.67%	5.32%
Standard deviation	3.00%	22.76%	3.20%	26.77%	24.56%	18.12%	14.83%	14.49%

Table 5b　Shows the Cumulative Wealth Index (CWI)

Year	CWI-Hedged ETFs	CWI-IVV	CWI-AGG	CWI-VEU	CWI-IYR	CWI-DBC	CWI-65% IVV/35% AGG	CWI-45% IVV/10% VEU/5% IYR/5% DBC/35% AGG
2008	$1,026.77	$630.45	$1,058.80	$559.80	$599.82	$692.00	$761.49	$759.04
2009	$978.59	$797.07	$1,113.21	$777.53	$780.61	$796.35	$906.81	$912.87
2010	$951.45	$916.32	$1,183.36	$869.65	$986.37	$890.82	$1,019.01	$1,027.27
2011	$901.32	$934.91	$1,273.03	$745.75	$1,041.91	$866.71	$1,062.23	$1,052.98
2012	$863.50	$1,083.70	$1,324.49	$884.06	$1,233.16	$895.41	$1,187.35	$1,175.21
2013	$870.71	$1,433.81	$1,296.02	$1,012.24	$1,246.09	$827.58	$1,415.66	$1,339.31
2014	$860.57	$1,629.13	$1,374.26	$971.27	$1,577.79	$594.36	$1,571.20	$1,437.84
Cumulative (2008–2014)	−13.94%	62.91%	37.43%	−2.87%	57.78%	−40.56%	57.12%	43.78%

The CWI measures the outcome of investing $1,000 in each category at the beginning of January 2008, presuming reinvestment of dividends.

Table 6   Shows risk-adjusted performance measures (Sharpe, Sortino, Kappa 3, and Omega Ratios) for equally weighted Hedged ETF portfolio and other index ETFs from January 2008 through December 2014

January 2008 through December 2014	Sharpe Ratio	Sortino Ratio	Kappa 3 Ratio	Omega Ratio
Hedged ETFs	−0.041	−0.064	−0.018	0.851
IVV (S&P 500)	0.139	0.196	0.064	1.432
AGG (total bond)	0.358	0.696	0.120	2.642
VEU (Total World Ex U.S.)	0.023	0.032	0.011	1.064
IYR (real estate)	0.107	0.148	0.057	1.373
DBC (commodities)	−0.072	−0.092	−0.033	0.826
65% IVV/35% AGG	0.177	0.253	0.071	1.580
45% IVV/10% VEU/5% IYR/5% DBC/35% AGG	0.139	0.194	0.056	1.447

We calculate Sharpe Ratio (1964), Sortino Ratio (1991), Omega Ratio (2002), and Kappa 3 Ratio (2004) for each portfolio from January 2008 through December 2014 to compare their risk-adjusted performance (see Appendix E for a brief description of these measures). Results indicate that Hedged ETF portfolio had lower risk-adjusted performance compared to all asset categories with the exception of Powershares DB Commodity Tracking ETF (Table 6).

7. Hedged Mutual Funds (HMFS) versus Hedged ETFS

As a robustness test, Hedged ETFs are also compared with the same six categories (Long/Short, Market Neutral, Managed Futures, Multi-alternative, Bear Market, and Non-Traditional Bond) of Hedged Mutual Funds (HMFs) for this time period (January 2008 through December 2014). The list of all HMFs (surviving and dead) was obtained from Morningstar Direct database. Following Bauer et al. (2005, 2006, and 2007), all funds with at least 12 months of return data were included in the analysis. This means that funds that were created after January 2014 were excluded from the analysis. Following Baks (2003) and Wermers et al. (2012), funds with several share classes were combined and the asset-weighted returns were computed. Also following Agrawal et al. (2004) a single portfolio of all Hedged Mutual Funds was formed to compare with Hedged ETFs. There were a total of 539 Hedged Mutual Funds with $149.77 billion in assets as of December 2014.

Table 7a shows the descriptive statistics for both Hedged Mutual Funds and ETFs. As expected, Hedged Mutual Funds are much expensive (average expense ratio of 1.82%) and also have much higher turnover (327.08%).

Table 7a   Shows the descriptive statistics for Hedged ETFs and Hedged Mutual Funds

ETF category	Total number (surviving and dead) December 2014	AUM for surviving funds (December 2014)	Average expense ratio	Average turnover ratio
Hedged ETFs	49	$3,415,247,306	0.84%	138.58%
Hedged Mutual Funds	539	$149,772,989,903	1.82%	327.08%

Table 7b   Shows the Spearman Rank Correlation test between Hedged ETFs, Hedged Mutual Funds and different index ETFs

Correlation	Hedged ETFs	Hedged Mutual Funds	IVV (S&P 500)	AGG (total bond)	VEU (Total World Ex U.S.)	IYR (real estate)	DBC (commodities)	65% IVV/35% AGG	45% IVV/10% VEU/5% IYR/5% DBC/35% AGG
Hedged ETFs	1								
Hedged Mutual Funds	0.2572**	1							
IVV (S&P 500)	−0.1835*	−0.2471**	1						
AGG (total bond)	−0.0401	−0.1752	−0.0054	1					
VEU (Total World Ex U.S.)	−0.2354**	−0.1590	0.8762***	0.0672	1				
IYR (real estate)	−0.2315**	−0.1941*	0.7663***	0.2339**	0.7412***	1			
DBC (commodities)	0.0592	0.0360	0.5193***	−0.0082	0.5890***	0.3268**	1		
65% IVV/35% AGG	−0.1734	−0.2145**	0.9914***	0.0876	0.8908***	0.7994***	0.5069***	1	
45% IVV/10% VEU/5% IYR/5% DBC/35% AGG	−0.1985*	−0.1898*	0.9664***	0.1298	0.9345***	0.8333***	0.5600***	0.9850***	1

* Significant at 10%; ** significant at 5%; *** significant at 1%.

Table 8a   Shows the average monthly returns, median monthly returns, and standard deviation of monthly returns for Hedged ETFs and Hedged Mutual Funds

January 2008 through December 2014	Average returns	Median returns	Standard deviation	Cumulative returns (January 2008 through December 2014)	*p* value of average returns
Hedged ETFs	−0.12%	−0.22%	3.51%	−13.94%	0.008***
Hedged Mutual Funds	−0.10%	−0.14%	0.58%	−8.34%	0.001***

* Significant at 10%; ** significant at 5%; *** significant at 1%.

Table 7b shows the Spearman Rank correlation test between Hedged ETFs, Hedged Mutual Funds, and different index ETFs. Correlation between Hedged ETFs and Mutual Funds was 0.2572. Results were statistically significant at 5%. Both Hedged ETFs and Mutual Funds have highly negative or low correlation with other index ETFs. Both Hedged ETFs and Mutual Funds had positive correlation only with Commodity index fund (DBC). However, the correlation was very low even in this case. These results indicate that Hedged ETFs and Mutual Funds did help investors diversify.

7.1. Risk, returns, and risk-adjusted performance

Table 8a shows the average monthly returns, median monthly returns, and standard deviation for Hedged ETFs and Mutual funds. The average monthly returns were very similar for Hedged ETFs and Hedged Mutual Funds (−0.12% and −0.10%, respectively). Results were statistically significant at 1% in both the cases. However, Hedged ETFs had much higher standard deviation (of monthly and annual returns) or risk compared with Hedged Mutual Funds. Table 8b shows the annualized returns and Cumulative Wealth Index (CWI) from 2008 to 2014. Both Hedged ETFs and Hedged Mutual Funds lost value, and had negative cumulative returns of −13.94% and −8.34%, respectively. Both categories also had negative risk-adjusted performance.

Table 8b   Shows the annualized returns (2008–2014) and Cumulative Wealth Index (CWI) for Hedged ETFs and Hedged Mutual Funds

Annual returns	Hedged ETFs	Hedged Mutual Funds	CWI (Hedged ETFs)	CWI (Hedged Mutual Funds)
2008	2.68%	−0.34%	$1,026.77	$996.64
2009	−4.69%	0.26%	$978.59	$999.27
2010	−2.77%	−0.46%	$951.45	$994.72
2011	−5.27%	−2.01%	$901.32	$974.69
2012	−4.20%	−2.29%	$863.50	$952.35
2013	0.83%	−3.33%	$870.71	$920.62
2014	−1.16%	−0.44%	$860.57	$916.56
Arithmetic average	−2.08%	−1.23%		
Geometric average	−2.12%	−1.24%		
Standard deviation	3.00%	1.32%		
Cumulative Returns			−13.94%	−8.34%

The CWI measures the outcome of investing $1,000 in each category at the beginning of January 2008, presuming reinvestment of dividends.

Table 9   Shows the risk-adjusted performance (Sharpe, Sortino, Kappa 3, and Omega Ratios) for Hedged
ETFs and Hedged Mutual Funds

January 2008 through December 2014	Sharpe Ratio	Sortino Ratio	Kappa 3 Ratio	Omega Ratio
Hedged ETFs	−0.041	−0.064	−0.018	0.851
Hedged Mutual Funds	−0.217	−0.262	−0.044	0.571

8. Conclusions

Hedged ETFs help retail or individual investors invest in ETFs that follow strategies similar to Hedge Funds at a fraction of the cost. They are also very liquid and do not have high initial investment or longer lock-up periods that Hedge Funds have. In this paper I analyze the performance of six different categories of Hedged ETFs (Long/Short, Market Neutral, Managed Futures, Multi-alternative, Bear Market, and Non-Traditional Bond) for the time period January 2008 through December 2014. The performance of these Hedged ETFs was compared to five categories of index fund ETFs. Our results indicate that Hedged ETFs have not delivered on their promise of absolute returns that is, positive returns regardless of market conditions. Hedged ETFs have very high expense ratios and turnover compared with other index ETF categories. Hedged ETFs did help investors diversify and had highly negative or low correlation with all other asset categories. However, this did not translate into superior absolute or risk-adjusted performance, and Hedged ETFs underperformed all other categories (with the exception of Commodities ETF DBC). As a robustness test the performance of Hedged ETFs was also compared with the same six categories of Hedged Mutual Funds during this time period (Table 9). There were 539 Hedged Mutual Funds (surviving and dead) at the end of December 2014 with $149 billion in assets. Both Hedged ETFs and Mutual Funds have highly negative or low correlation with other asset categories. These results again indicate that Hedged ETFs and Mutual Funds did help investors diversify during the period of our study. However, this did not help investors as both the categories had negative absolute- and risk-adjusted performance. Based on our findings, investors would have been better off with index funds.

Notes

   1 http://www.etf.com/etf-education-center/21043-article-46-alternatives-etfs-can-an-etf-replicate-a-hedge-fund.html.

Acknowledgments

Appendix A

ETF categories (*Source:* Morningstar)

Bear market: Bear-market portfolios invest in short positions and derivatives to profit from stocks that drop in price. Because these portfolios often have extensive holdings in shorts or puts, their returns generally move in the opposite direction of the benchmark index.

Long-short: Long-short portfolios hold sizable stakes in both long and short positions. Some funds that fall into this category are market neutral–dividing their exposure equally between long and short positions in an attempt to earn a modest return that is not tied to the market's fortunes. Other portfolios that are not market neutral will shift their exposure to long and short positions depending upon their macro outlook or the opportunities they uncover through bottom-up research.

Managed futures: These ETFs typically take long and short positions in futures or other derivative contracts according to a trend-following or momentum strategy.

Market neutral: These ETFs try to earn income by maintaining low correlation with the market. These funds usually have 50% of net assets in long positions while holding 50% of net assets in short positions. Their goal is to deliver positive returns regardless of fluctuations in market.

Multi-alternative: These ETFs offer investors exposure to a combination of strategies like long-short equity and debt, managed futures, global macro, and convertible arbitrage, among others. These strategies may change in response to market conditions.

Non-traditional bonds: Many ETFs in this group describe themselves as "absolute return" portfolios, which seek to avoid losses and produce returns uncorrelated with the overall bond market; they use a variety of methods to achieve those aims.

Appendix B shows the different replication strategies for Hedged ETFs

1. Direct approach: The easiest way for Hedged ETFs to replicate Hedge Fund returns would be to hold the Hedge Fund themselves. However, Hedge Funds have much longer lock-up periods and ETFs require their assets to be traded daily. Therefore, Hedged ETFs can directly follow Hedge Funds strategies wherever strategy permits. For example, Hedged ETFs can buy underpriced securities and short overpriced ones. These ETFs can also use leverage, derivatives, options, and swaps (like Hedge Funds) to seek higher returns.

2. Hedge fund replication: Lot of these Hedged ETFs seeks to track a custom index that, in turn, seeks to track the risk-adjusted return characteristics of Hedge Funds. This process is called Hedge fund replication. Hedge Funds report their returns to a Hedge Fund indexing firm. The Hedge Fund indexing firm then creates an index that replicates the returns of the Hedge Funds either broadly or by a specific strategy. These ETFs try to replicate the returns of Hedge Funds by buying actual assets that Hedge Funds hold using regressions and other statistical process. (However, according to Morningstar Direct some of these Hedged ETFs do not have a benchmark.)

3. Copycat: Hedge Funds by law are required to disclose their holdings. Hedged ETFs rely on 13F filings reported by the Hedge Funds. However, Hedge Funds are secretive and don't publish their holding unlike ETFs. However, the law requires Hedge Funds to disclose their data on a quarterly, lagged basis. Most Hedge Funds could have already sold their stock by the time the filings are public.

Appendix C: Shows the list of Hedged ETFs, the category to which it belongs and their inception date

Number	ETF	Ticker	Category	Inception
1	Rydex Inverse 2× S&P MidCap 400*	RMS	Bear	11/5/2007
2	Rydex Inverse 2× Russell 2000*	RRY	Bear	11/5/2007
3	Rydex Inverse 2× S&P Select Sector Engy*	REC	Bear	6/10/2008
4	Rydex Inverse 2× S&P Select Sector Fincl*	RFN	Bear	6/10/2008
5	Rydex Inverse 2× S&P Select Sector Hlth*	RHO	Bear	6/10/2008
6	Rydex Inverse 2× S&P Select Sector Tech*	RTW	Bear	6/10/2008
7	MacroShares Major Metro Housing Down*	DMM	Bear	6/30/2009
8	Direxion Daily 2 Yr Trsy Bear 3× Shares*	TWOZ	Bear	2/25/2010
9	AdvisorShares Ranger Equity Bear ETF	HDGE	Bear	1/26/2011
10	AdvisorShares Athena Intl Bear ETF*	HDGI	Bear	7/18/2013
11	PowerShares NASDAQ-100 BuyWrite*	PQBW	Long Short	6/12/2008
12	AdvisorShares Accuvest Glbl Lg Sht ETF	AGLS	Long Short	7/8/2010
13	AdvisorShares QAM Equity Hedge ETF	QEH	Long Short	8/7/2012
14	First Trust CBOE S&P 500 VIXTail H ETF	VIXH	Long Short	8/29/2012
15	PowerShares S&P 500 Downside Hedged ETF	PHDG	Long Short	12/5/2012
16	US Equity High Volatility Put Write ETF	HVPW	Long Short	2/27/2013
17	Janus Velocity Tail Risk Hdgd Lg Cp ETF	TRSK	Long Short	6/20/2013
18	Janus Velocity Volatility Hdgd Lg Cp ETF	SPXH	Long Short	6/20/2013
19	WisdomTree Managed Futures Strategy ETF	WDTI	Managed Futures	1/5/2011
20	First Trust Morningstar Mgd FutsStrt ETF	FMF	Managed Futures	8/1/2013
21	iShares Diversified Alternatives Trust*	ALT	Market Neutral	10/6/2009
22	IQ Merger Arbitrage ETF	MNA	Market Neutral	11/17/2009
23	ProShares RAFI Long/Short	RALS	Market Neutral	12/2/2010
24	QuantShares U.S. Mkt Neut Anti-Momen ETF*	NOMO	Market Neutral	9/7/2011
25	QuantShares U.S. Market Neut Quality ETF*	QLT	Market Neutral	9/7/2011
26	QuantShares U.S. Market Neutral Size	SIZ	Market Neutral	9/7/2011
27	QuantShares U.S. Market Neut Momentum	MOM	Market Neutral	9/7/2011
28	QuantShares U.S. Mrkt Neut High Beta ETF*	BTAL	Market Neutral	9/13/2011
29	QuantShares U.S. Market Neut Anti-Beta	BTAL	Market Neutral	9/13/2011
30	QuantShares U.S. Market Neutral Value	CHEP	Market Neutral	9/13/2011
31	AdvisorShares Rockledge SectorSAM ETF*	SSAM	Market Neutral	1/11/2012
32	IQ Hedge Market Neutral Tracker ETF	QMN	Market Neutral	10/3/2012
33	ProShares Merger	MRGR	Market Neutral	12/11/2012
34	IQ Hedge Multi-Strategy Tracker ETF	QAI	Multialternative	3/25/2009
35	ProShares Hedge Replication	HDG	Multialternative	7/12/2011
36	First Trust Tactical High Yield ETF	HYLS	Non Traditional Bond	2/25/2013
37	Market Vectors Trs-Hdgd Hi-Yld Bd ETF	THHY	Non Traditional Bond	3/21/2013
38	ProShares High Yield-Interest Rate Hdgd	HYHG	Non Traditional Bond	5/21/2013
39	ProShares Investment Grade-Intr Rt Hdgd	IGHG	Non Traditional Bond	11/5/2013
40	WisdomTree BofA Mrl Lynch HYBd NgtDr ETF	HYND	Non Traditional Bond	12/18/2013
41	WisdomTree BofA Mrl Lynch HYBd ZrDr ETF	HYZD	Non Traditional Bond	12/18/2013
42	WisdomTree Barclays US AggtBd NgtDur ETF	AGND	Non Traditional Bond	12/18/2013
43	WisdomTree Barclays US AggtBd Zr Dur ETF	AGZD	Non Traditional Bond	12/18/2013
44	WisdomTree Japan Interest Rate Strat ETF	JGBB	Non Traditional Bond	12/18/2013
45	IQ Hedge Macro Tracker ETF	MCRO	Other - Allocation	6/9/2009
46	IQ Real Return ETF	CPI	Other - Moderate Allocation	10/27/2009
47	WisdomTree Global Real Return ETF	RRF	Other - Global Fixed Income	7/14/2011
48	SPDR SSgA Multi-Asset Real Return ETF	RLY	Other - Allocation	4/25/2012
49	AlphaClone Alternative Alpha ETF	ALFA	Other - U.S. Equity Large Cap Growth	5/31/2012

ETFs marked with a * in front of them have been liquidated, merged, or closed as of December 2014.

Appendix D: Shows the different index ETFs used for comparison

Number	ETF	Ticker	Category	Inception	Benchmark
1	iShares Core S&P 500	IVV	U.S. ETF Large Blend	5/15/2000	S&P 500
2	iShares Core U.S. Aggregate Bond	AGG	U.S. ETF Intermediate-Term Bond	9/22/2003	Barclays U.S. Agg Bond TR USD
3	Vanguard FTSE All-World ex-U.S. ETF	VEU	U.S. ETF Foreign Large Blend	3/2/2007	FTSE AW Ex U.S. TR USD
4	PowerShares DB Commodity Tracking ETF	DBC	U.S. ETF Commodities Broad Basket	2/3/2006	PowerShares DB Commodity Index
5	iShares U.S. Real Estate	IYR	U.S. ETF Real Estate	6/12/2000	Dow Jones U.S. Real Estate Index

Appendix E shows the different risk-adjusted measures of performance

Sharpe Ratio: The Sharpe Ratio (Sharpe, 1964) evaluates how well an ETF compensates its investor for each unit of risk they incur. The higher the Sharpe Ratio, the better is the performance of the ETF.

$$Sharpe\ Ratio = \frac{(R_p - R_f)}{R_f}$$

where R_P denotes the monthly returns on the portfolio.

R_f is the monthly risk free rate.
σ_P is the standard deviation of portfolio's excess returns.

Sortino Ratio: The Sortino Ratio (Sortino and Van Der Meer, 1991) differentiates between good and bad volatility in the Sharpe Ratio. The differentiation of upward and downward volatility allows the calculation of the risk-adjusted return to provide a performance measure of an investment without penalizing it for positive returns. Similar to the Sharpe Ratio, the higher the Sortino Ratio, the better is the performance of a portfolio. The Sortino Ratio is shown as follows:

$$Sortino\ Ratio = \frac{(R_p - R_f)}{\sigma_{df}}$$

Where R_P and R_f are described as above and σ_d is the standard deviation of portfolio's negative returns.

Omega Ratio: Introduced by Keating and Shadwick (2002), it is a way of measuring the performance of financial assets based on the level of returns they offer in return for the risk of investing in them. It is a ratio of weighted gains to weighted losses. The measure divides expected returns into two parts – gains and losses, or returns above the expected rate (the upside) and those below it (the downside). Therefore, in simple terms, consider omega as the ratio of upside returns (good) relative to downside returns (bad). While the Sharpe Ratio covers only the first two moments of return distribution (means and variance), Omega Ratio covers all moments of return distribution or the Omega Ratio is an alternative measure of asset performance that gives the investor the information the Sharpe Ratio discards.

$$\Omega = \frac{\int_r^b (1 - F(x))dx}{\int_a^r F(x)dx}$$

Where $F(x)$ is the cumulative probability distribution (i.e., the probability that a return will be less than x), r is a threshold value selected by the investor and a,b are the investment

intervals. It is effectively equal to the probability weighted gains divided by the probability weighted losses after a threshold.

Kappa 3 Ratio: Motivated to find a more generalized risk-adjusted performance measure, Kaplan and Knowles (2004) developed the Kappa-measure. They show that the Omega and the Sortino Ratios are only special cases of Kappa, whereby the parameter n of Kappa determines whether the Sortino Ratio, Omega, or another risk-adjusted return measure is generated. The general form of Kappa is described by the expression below.

$$K_n(\tau) = \frac{\mu - \tau}{n\sqrt{LPM_n(\tau)}}$$

Choosing $n = 1$ and $n = 2$ yields the Omega ($=$K1) and the Sortino Ratio ($=$K2), respectively. In general, any number is possible for the parameter n. Kappa 3 ($=$K3) however, seems to be the most frequently used version of the Kappa measure in literature (e.g., Eling and Schumacher (2007), Kaplan and Knowles (2004)). Thus, K3 shall also be applied in the empirical examination of performance measures in this composition.

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