The Impact of an Economic Recession on ETF Sectors: Which ETF Sectors Are Most Recession-Proof?

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Abstract

This paper investigates which ETF sectors are most recession-proof by focusing on sector performance and finding the possibility of a positive or negative correlation between specific sectors and the overall market performance during such recessionary times. The study compares the percentage gain or loss by each ETF sector with regression analysis to determine which sectors perform better than the overall market performance during an economic downturn. The study incorporates the most recent recession and the recession during 2001, when the technology bubble burst occurred, to find any relevance and/or consistency in my study. The results show that out of all the sectors, Consumer Discretionary, Consumer Staples, and the SPDR Gold Trust outperformed the overall market.

JEL Classification: E44, G01, G11
Keywords: Market Performance, Sector Performance, Recession.

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1.0 Introduction

Every time a recession occurs and the overall stock market declines, many analysts develop theories about which ETFs are most 'recession-proof' and how to prevent your stock portfolio from getting hit with the recession tsunami. Some have argued that stocks within Consumer Staples are the most recession-proof while others have argued in favor of companies in Utilities, among others. However whichever way you slice it, no one has come up with a definitive answer as to which ETFs, if any, are recession-proof. Which ETFs should you invest in during a recession? That is the question that will be addressed.

This study aims to improve the understanding of the complex relationship between ETF sector performance and overall market performance. This analysis is important because if there is any weak positive correlation, negative correlation, or no correlation between the two measures, it will provide a resource or resources that investors can utilize during times of recessionary pressure. The relevance of this study is that it impacts the investing strategies of an immeasurable number of investors. If there is a strong positive correlation between ETF sectors performance and overall market performance, then we have not learned of any new information or ideas to prevent investors' portfolios from taking a hard loss during recessions. However, if any correlations that we are looking for do indeed exist, then this information immediately becomes valuable.

This paper looks at which ETF sectors tend, on average, to perform better than overall market performance during recessionary times as calculated through regression analysis. There has been much research done on this specific topic and this paper will successfully analyze each aspect and strategy to come up with the best solution possible for investors looking to minimize risk.

The rest of the paper is organized as follows: Section 2 analyzes the stock market trends over the past two recessions, three months before the recessions officially began to the end of the recession. Section 3 provides a brief literature review on other papers that discuss the main topic of this study. Section 4 outlines the empirical model, data and estimation methodology. Finally, section 5 presents and discusses the empirical results. This is followed by a conclusion in section 6.

2.0 Stock Market Trends

The extent of this study covers two specific time periods over the past decade, from beginning to the end of the 2001 recession with the technology bubble bursting and the 2007 recession with the financial crisis. Economic downturns and recessions are just as much of a characteristic in the stock market as economic booms and the aforementioned recessions in the past decade are the two most recent and major occurrences of an economic downturn in the stock market. Below are two charts that display the performance of the S&P 500 Index three months before the official start of the recession through the end of the recession.

Figure 1: 2001 Recession Timeline (December 1, 2000 – November 1, 2001)

Source: Yahoo! Finance

Figure 2: 2007 Recession Timeline (September 4, 2007 – February 1, 2010)

Source: Yahoo! Finance

Based on the above charts, during times of economic downturns, there is a major sell-off, with an increase in volume and volatility within the stock exchange. There is increasing downward pressure leading to a decline in the S&P 500 Index (SPY). In 2001, the decline in the market was led by the downward spiral of the technology sector. In 2007, the downturn was led by the financial sector. The question that I am ultimately looking to answer in this study is which ETF sectors outperformed the S&P 500 Index during the period of recession and if there are any trends between the 2001 and 2007 recessions. Both charts above will be a guideline to this answer as all ETF sectors will be compared with the performance of the S&P 500 and will be recorded based on percentage gain or loss versus the Index.

3.0 Literature Review

How to make your portfolio recession-proof is a very common theme during economic downturns. There are many different concepts and strategies that are discussed about how to make your portfolio least risky during such times, with many valuable lessons to be learned from the past and into the future. According to Faerber (2008), history of the performance of stocks provides

not only insights into past returns from investing in the stock market, but also valuable lessons for investing in the future. It has been suggested that before making your portfolio recession-proof, you must understand the history of past recessions in order to survive current and future recessions (Farago, 2002). Since the Great Depression ended in 1940, both Canada and the United States have recovered from the recessions they have faced due to the fact that there is a growing number of people that realize that the economy has its high and low points. This means that during times of recession, there is a call for strategy, not panic or distress.

There are many different strategies to attack a recession which involves investing in ETFs. Lydon (2008) suggests that Agriculture bucks the trend during recessionary times as no matter what the economy looks like, people must eat in order to survive and the growing world population only supports the theme of investing in Agriculture. He also suggests to invest in gold as it rises during times of downward pressure as there becomes geo-political tensions, a weakening U.S. dollar, and high energy prices which all drive the price of gold up.

Many economic analysts have weighed in on which sectors are best to invest in during economic downturns. According to Maierhofer (2008), there is belief that certain U.S. sectors outperform the market during recessionary times and deserve a higher weighting in a diversified portfolio in order to gain a less risky and outperforming portfolio. Maierhofer suggests that Utilities outperforms the overall stock market during a recession as, on average, over the past ten years, Utilities have returned over 12% from July through January. He also suggests an investment in SPDRs Gold Trust (GLD) as it has had a 3-year annualized return of over 30% and has continued to climb to all-time highs during the recession.

Countless number of economists have come out and suggested a variety of ETFs for investors to invest in. Rowland (2009) suggested two particular sectors. These two ETFs are Consumer Staples as this sector is made up of things that people use daily such as toilet paper, bread and milk, diapers, and coffee and Healthcare as many individuals will cut back on many other things before cutting back on ones' well-being. However, Rowland forewarns that though both these sectors have tended to do well in previous recessions, there is no assurance that they do well in future recessions.

Analyst Schultz (2009), makes note that investors sought out ETFs as more than a safe haven as they have become substitutes for single-stock exposure and the recent recession has only

sped up that trend as investors became increasingly cautious of investing their money into any specific company during the recent meltdown. As noted before, ETFs became a way to diversify an investors' portfolio while minimizing risk, especially during a recession.

4.0 Data and Empirical Methodology

4.1 Definition of Variables

$$SPY_p = \beta_0 + \beta_1 XLF + \beta_2 XLK + \beta_3 XLI + \beta_4 XLV + \beta_5 XLY + \beta_6 XLP + \beta_7 XLE + \beta_8 XLU + \beta_9 XLB + \beta_{10} GLD + \varepsilon$$

SPY_p represents the Standard & Poor's 500 index for time period, or "p." In this study, the S&P 500 Index is the dependent variable as it is used to indicate the overall market performance during the period of recession. Each independent variable indicated in the equation represents each sector of the stock market over the same period. XLF represents the Financial sector, XLK is Technology, XLI is Industrials, XLV is Healthcare, XLY is Consumer Discretionary, XLP is Consumer Staples, XLE is Energy, XLU is Utilities, XLB is Materials, and GLD is SPDR Gold Trust. Below, Table 2 displays each variable and what it represents.

Table 1: Variable Description

Description	Variable
S&P 500	SPY
Financial Sector	XLF
Technology Sector	XLK
Industrial Sector	XLI
Healthcare Sector	XLV
Consumer Discretionary Sector	XLY
Consumer Staples Sector	XLP
Energy Sector	XLE
Utilities Sector	XLU
Materials Sector	XLB
SPDR Gold Trust	GLD

Each independent variable is intended to track the performance of each individual sector. Each independent variable in this study are, as mentioned, an Exchange-Traded Fund (ETF) and can be traded on the stock market. The acronyms used are each sectors ticker symbols that can be viewed on any financial website or the website of their creator, www.sectorspdr.com. They are composed of approximately 50 companies that are considered major firms in their respective sectors, indicative of the overall trend of the sectors.

4.2 Data

The study uses the weekly closing price data of both periods of the recession, from March 1st, 2001 through November 1st, 2001 and from December 3rd, 2007 through February 1st, 2010. All archived data was obtained from Yahoo! Finance. A regression was then run to conclude which independent variables had a degree of positive, negative, or no correlation to the performance of the SPY. Once the regression analysis was completed, the weekly data for dependent variable, SPY, and all independent variables, the ETF sectors, were then condensed into a total percentage gain or loss and plotted and graphed. All independent variables were then compared versus the Index to see which sectors underperformed, market-performed, and outperformed the overall market.

Both determinants of correlation coefficient and percentage gain or loss of each sector is necessary as we are comparing the largest gaining or losing sectors along with their correlation with the SPY in order to determine if there are any trends between both measures. Both gain or loss and correlation coefficients are measures towards determining which ETFs are most recession-proof which is the key question that I am attempting to answer. If there is a strong positive correlation, most likely these will be sectors that underperform or market-perform the S&P 500. If there is any other sort of correlation, there is the possibility that the sector(s) outperformed the SPY.

5.0 Empirical Results

Table 2: 2001 Recession – Results of Regression Analysis

Dependent Variable:	SPYCLOSE			
Method:	Least Squares			
Sample:	3/2001 11/2001			
	Coefficient	Std. Error	t-Statistic	Prob.
XLBCLOSE	0.377213	0.193237	1.952072	0.0622
XLECLOSE	0.400447	0.081472	4.915156	0.0000
XLFCLOSE	1.112676	0.158320	7.028015	0.0000
XLICLOSE	0.004149	0.279105	0.014866	0.9883
XLKCLOSE	1.025628	0.061727	16.61542	0.0000
XLPCLOSE	0.729951	0.138256	5.279692	0.0000
XLUCLOSE	0.576221	0.087686	6.571397	0.0000
XLVCLOSE	-0.047201	0.185122	-0.254975	0.8008
XLYCLOSE	0.461923	0.103508	4.462691	0.0002
C	-5.331607	3.903175	-1.365967	0.1841
R-squared	0.998629	Mean dependent var		118.1394
Adjusted R-squared	0.998136	S.D. dependent var		7.719028
S.E. of regression	0.333258	Akaike info criterion		0.875155
Sum squared resid	2.776518	Schwarz criterion		1.319540
Log likelihood	-5.315215	Hannan-Quinn criter.		1.028557
F-statistic	2023.977	Durbin-Watson stat		1.291216
Prob(F-statistic)	0.000000			

Table 3: 2007 Recession – Results of Regression Analysis

Dependent Variable:	SPYCLOSE
Method:	Least Squares
Sample:	12/2007 2/2010

	Coefficient	Std. Error	t-Statistic	Prob.
XLBCLOSE	-0.003463	0.047143	-0.073447	0.9416
XLECLOSE	0.240120	0.020408	11.76617	0.0000
XLFCLOSE	0.966267	0.032976	29.30203	0.0000
XLICLOSE	0.404192	0.065083	6.210412	0.0000
XLKCLOSE	1.052200	0.054526	19.29717	0.0000
XLPCLOSE	0.477349	0.064293	7.424628	0.0000
XLUCLOSE	0.202336	0.046367	4.363766	0.0000
XLVCLOSE	0.538098	0.047069	11.43211	0.0000
XLYCLOSE	0.437832	0.058443	7.491657	0.0000
GLDCLOSE	0.000856	0.006501	0.131607	0.8956
C	0.017424	1.007122	0.017300	0.9862

R-squared	0.999736	Mean dependent var	109.9812
Adjusted R-squared	0.999710	S.D. dependent var	21.26084
S.E. of regression	0.361900	Akaike info criterion	0.896617
Sum squared resid	13.49009	Schwarz criterion	1.160636
Log likelihood	-40.10715	Hannan-Quinn criter.	1.003767
F-statistic	38989.42	Durbin-Watson stat	1.892289
Prob(F-statistic)	0.000000		

The results of the regression analysis were more consistent than I had expected. In both recessions, there was a very strong positive correlation in the Financial and Technology sectors. As shown in the two tables above, in both tests, the R-squared was nearly at a perfect 1.00, with an R-squared of .998 in 2001 and .999 in 2007, respectively. The high R-squared numbers indicate that the trends shown in the results are exceedingly likely. The tests also computed the Durbin-Watson statistic and the tables show the numbers for both recessions. During the 2001 recession, the Durbin-Watson statistic of 1.29 indicates that there is a positive serial correlation, however, during the most recent recession, the Durbin-Watson statistic was 1.89, very close to 2, which indicates that there is no autocorrelation.

Further below, tables 4 and 5 illustrate that the Technology sector had the most % loss in 2001 with the technology bubble bursting as it was the main cause of the downturn. In 2007, the Financial sector had the most % loss as the financial crisis involving sub-prime mortgage loans was the cause of the downturn.

The reasoning behind this is quite simple. In 1999, there was a technology bubble led by computer and software sales. Their increase in sales was due to many companies and individuals buying new computer systems to make sure their software abided by Y2K as that was a major concern entering into the new millennium. Due to the Y2K scare, there was a boom in sales which led many technology company's stock prices to rise and reach new peaks. There was a run on technology companies, especially dot.com companies. As the new millennium approached and passed, by January of 2000, there were already signs that computer orders were declining as computers are long-term assets and many companies and individuals recently bought their new computers and software before the turn of the decade. This led to the technology bubble bursting by March of 2000 as there was a major sell-off of tech and dot.com company's stocks which led to stock prices declining and the value of such companies to decrease with some of them going bankrupt.

The cause of the current recession originated in 2006 when there was an increase in rates which led to a decline in house prices. Homeowners who took loans with minimal money down realized that they would lose money by selling their house for less than their mortgage so instead they foreclosed. There was an increase in the foreclosure rate which led to huge losses of many banks and hedge funds who had bought mortgage-backed securities on the secondary market. By

August of 2007, many banks were scared to lend to one another as they did not want any ‘toxic’ loans. Due to this decrease, there was a $700 billion bailout, bankruptcies, and government nationalization of some of the most notable financial companies including: Bear Stearns, AIG, Fannie Mae, Freddie Mac, IndyMac Bank, and Washington Mutual. The two tables below show the percent gain or loss and the correlation coefficient of each sector versus the S&P 500 Index. Table 4 indicates the 2001 recession due to the technology bubble bursting. Table 5 indicates the 2007 recession due to the financial crisis.

Table 4: 2001 Recession - Gain or Loss and Correlation Coefficient (SPY: -12.22%)

Variable with Greatest % Gain or Loss	% Gain or Loss	Variable with Highest Correlation Coefficient	Correlation Coefficient
Technology	-20.54%	Technology	1.026
Energy	-16.94%	Energy	0.400
Industrials	-16.50%	Industrials	0.004
Healthcare	-16.29%	Healthcare	-0.047
Utilities	-11.83%	Utilities	0.576
Financials	-10.14%	Financials	1.113
Materials	-6.89%	Materials	0.377
Consumer Discretionary	-6.35%	Consumer Discretionary	0.462
Consumer Staples	-4.35%	Consumer Staples	0.730

Table 5: 2007 Recession - Gain or Loss and Correlation Coefficient (SPY: -27.73%)

Variable with Greatest % Gain or Loss	% Gain or Loss	Variable with Highest Correlation Coefficient	Correlation Coefficient
Financials	-53.78%	Financials	0.966
Utilities	-32.73%	Utilities	0.202
Industrials	-31.04%	Industrials	0.404
Materials	-27.15%	Materials	-0.003
Energy	-26.10%	Energy	0.240
Technology	-21.19%	Technology	1.052
Consumer Discretionary	-16.10%	Consumer Discretionary	0.438
Healthcare	-14.39%	Healthcare	0.538
Consumer Staples	-10.39%	Consumer Staples	0.477
SPDR Gold Trust	37.85%	SPDR Gold Trust	0.001

The data found from the tables above of the 2001 and 2007 recessions concluded that Maierhofers' (2008) belief that the Utilities sector is a safe haven and a sector to invest in during

economic downturns, is incorrect. Though the sector has a fairly low correlation coefficient versus the SPY, especially in the most recent recession with only 4% in common with the Index, Utilities have merely market-performed and/or underperformed the market in both recessions. In 2001, the sector essentially performed the same versus the SPY with a percentage loss of 11.83% versus the Index's percentage loss of 12.22%. In 2007, Utilities underperformed the Index by a full 5% with a percentage loss of 27.73%. From my perspective, due to the low correlation between Utilities and the SPY, the sector does not move in step with broader market indices. While there may be truth behind the public opinion that Utilities are a safe bet during an economic downturn because everyone needs water and electrical power, many households cut back on such needs when their pockets are getting hit due to the economy.

Two sectors with a point of emphasis in terms of not investing in during economic downturns are: Financials and Technology. In both recessions, both sectors had a near perfect to perfect correlation versus the SPY. For Financials, providers of investment services are negatively impacted by recessions as customers' demand for financial services decreases. The Financial sector clearly benefits from an economic upswing as the sector benefits from additional investments, more capital projects, and increased personal investing. None of those events occur during economic downturns as individuals and companies err on the side of caution and become risk-averse, saving their money/assets or putting their money/assets into something guaranteed rather than investing.

For the Technology sector, many individuals and companies will wait to get the new generation of technology. On occasion, the Technology sector, as noted by the 2001 recession, is the reason for the economic downturn as there is a period of a run on technology eventually leading to the bubble bursting within the sector. In general, the sector is all about what exactly is happening with the technology field. If there is an upward trend of new technology being introduced, then this may be a period of time to buy into the ETF, even during a recession. However, if the new wave of technology is at its maturity stage, it may be a suggestion to stay away and invest your money in another ETF as the life cycle is near its end.

Two sectors that also market-performed or underperformed the SPY and should not be invested in during an economic downturn are: Energy and Industrials. Neither sector has a strong correlation versus the Index, though both sectors in fact do have a positive correlation. The

Energy sector underperformed the overall market by more than 4.5% in the 2001 recession with a percentage loss of 16.94%. The trend for Energy is somewhat unexpected since energy producers are believed to perform much better during times of high oil and gas prices which is what has and continues to occur during this past recession. However, the Energy sector marginally outpaced the market during the 2007 recession with a percentage loss of 26.10% versus the Index's percentage loss of 27.73%. I expected the Energy sector to be one of the leading performers over the past downturn due to the high oil and gas prices but, to my surprise, it was not which makes me question how effective the Energy sector is during economic downturns, even with high prices.

One theory that I have is, due to the increase in the production of hybrid cars and the recent automobile crisis, companies within the Energy sector were unable to take advantage of the high oil and gas prices as much as past recessions that featured the same scenario as consumers have gained more knowledge and have put an emphasis on becoming fuel efficient, whether it is to stay away from buying SUVs, buying hybrids, or driving less.

The second sector that clearly underperformed in both recessions and should not be invested in during future recessions is Industrials. The sector underperformed the market in both recessions by 3 to 5%, respectively. The sector had a mere 0.004 correlations versus the SPY in 2001 and only 0.404, or 16% in common, with the Index in 2007 indicating that there are other reasons as to why the sector performed as poorly as it had. The clear reason for as to why the sector underperforms the market during recessions is because when the economy is on a downward swing, people tend to cut back on the purchase of durable goods like cars, appliances, and electronics. The explanation for this is that people believe that the durable goods that they had before the recession can last them through the recession.

Two sectors that showed a strong inconsistency between both recessions were: Healthcare and Materials. In the recession of 2001, Healthcare had a negative correlation coefficient of -0.047 versus the SPY yet underperformed the overall market with a percentage loss of 16.29% versus -12.22%. However, in the most recent recession, the Healthcare sector had a 0.538 correlation, or 25 to 36% in common with the SPY, yet clearly outperformed it by more than 13%. For the Materials sector, in the 2001 recession, it had a fairly low correlation of 0.377, or 9 to 16% in common, and the sector outperformed the Index -6.89% versus -12.22%.

However in the 2007 recession, the sector had essentially no correlation with the SPY yet only market-performed. I suggest that investors stay on the sidelines when it comes to Healthcare and Materials during recessions as there are no trends to base off of that will make one believe that either are recession-proof.

There were two sectors that outperformed the SPY during both recessions and they were: Consumer Discretionary and Consumer Staples. During both recessions, Consumer Discretionary had a consistent correlation coefficient between 0.438 and 0.462, or 16 to 25% in common, and in both recessions, the sector consistently outperformed the overall market as well. In the 2001 recession, the sector outperformed the SPY by nearly 6% with a percentage loss of 6.35%. In the 2007 recession, the sector outperformed the Index -16.10% versus 27.73%. Though Consumer Discretionary is a sector of the economy that consists of businesses that sell nonessential goods and services, it still performed very well during both recessions due to their holdings in retail and consumer durables/apparel companies since such companies took initiatives and called for deep price cuts along with other incentives in order to get consumers into the store and sustain their revenue.

The second sector that undoubtedly outperformed the SPY in both recessions and should be considered as a landing spot for investors during future recessions is Consumer Staples. Though the sector had a fairly high correlation coefficient of 0.730 during the 2001 recession, it managed to outperform the market by nearly 8% and, with a fairly low correlation of 0.477, or 16 to 25% in common, during the 2007 recession, the sector outperformed the Index by more than 17%. This sector is one of the least impacted areas within the market during an economic downturn. The reasoning for this is fairly simple since many companies within the sector like Wal-Mart, PepsiCo, Kraft Foods, Heinz, and cigarette company's Philip Morris International, Altria Group, Lorillard, and Reynolds American, all sell goods that have a relatively inelastic demand with respect to income. Many of the sectors' company goods are needed for daily use, such as food. No matter how poor the economy is doing, people still have to eat in order to survive and they will always continue to purchase food. There may be a cut back on particular foods but the demand for food is unlikely to decrease below a particular level that would affect the sector in a severely, negative way. Cigarettes also have inelastic demand. Though they are not considered a necessity, cigarettes are a very addictive substance that becomes a necessity to

many of their users despite their cost. In general, the Consumer Staples sector is mainly protected from recessions due to peoples' needs for products that are produced by the companies that are held within the sector.

Gold was the clear-cut 'winner' of any of the ten sectors noted in this study as it not only outperformed the SPY, it turned in a substantial profit during this past recession. The SPDR Gold Trust turned in a percentage gain of 37.85% in the 2007 recession, reaching all-time highs during a recession of all-time lows. As stated by Lydon (2008) and Maierhofer (2008) in which both suggested an investment in gold, gold has historically been known to rise during times of downward pressure. Gold has become a valuable tool for investors during times of geo-political instability, a falling currency, and high energy prices. All three of these events occurred during the most recent recession which in turn created the perfect storm to invest in gold, leading to a climb to all-time highs within SPDRs Gold Trust.

6.0 Conclusion

Through the results of the data above, I have determined that there are many sectors that are not recession-proof. The Industrial and Energy sectors performed the worst in both recessions outside of the main sector that caused the economic downturn (i.e. Technology in 2001 and Financials in 2007). In both recessions combined, the leading % losers were: Financials ('07), Technology ('01), Industrials, and Energy. Utilities have also underperformed or market-performed versus the S&P 500 during both declines.

Nonetheless, even with a positive correlation versus the SPY, there were a couple of sectors that did in fact buck the trend and drastically outperformed the overall market. Combining both tables above, you can conclude that there is a trend of Consumer Staples and Consumer Discretionary sectors outperforming the SPY in both economic downturns as, in both recessions combined, the least % losers were: Consumer Staples and Consumer Discretionary. The one sector that noticeably outperformed the overall market was Gold as there was no correlation between the overall stock market performance and the performance of Gold. In the most recent recession, where historical data is available, Gold, as mentioned above, had a percentage gain of 37.85%.

As pointed out by Faerber (2008), the trends found in this study of the past two recessions can provide invaluable insight and information on how to invest your money during

times of economic downturn. This study and analysis can prove to be very valuable as it will help investors understand the history of past recessions so they may survive current and future recessions. This information can help investors put their money in the least risky sectors which in turn will most certainly save them from losses but also create an opportunity for a profit. By knowing and understanding which sector performances positively correlate with the S&P 500 Index, we can become much more selective in which ETFs to invest in during economic downturns.

Appendix A: Variable Description and Data Source

Acronym	Description	Source

SPY	S&P 500 ETF, tracking the performance of the S&P 500	Yahoo! Finance
XLF	ETF designed to accurately track the Financial Sector	Yahoo! Finance
XLK	ETF designed to accurately track the Technology Sector	Yahoo! Finance
XLI	ETF designed to accurately track the Industrial Sector	Yahoo! Finance
XLV	ETF designed to accurately track the Healthcare Sector	Yahoo! Finance
XLY	ETF designed to accurately track the Consumer Discretionary Sector	Yahoo! Finance
XLP	ETF designed to accurately track the Consumer Staples Sector	Yahoo! Finance
XLE	ETF designed to accurately track the Energy Sector	Yahoo! Finance
XLU	ETF designed to accurately track the Utilities Sector	Yahoo! Finance
XLB	ETF designed to accurately track the Materials Sector	Yahoo! Finance
GLD	ETF designed to accurately track the Gold Sector	Yahoo! Finance

Appendix B: Results of Regression Analysis

2001 Recession

Dependent Variable:	SPYCLOSE
Method:	Least Squares
Sample:	3/2001 11/2001

	Coefficient	Std. Error	t-Statistic	Prob.
XLBCLOSE	0.377213	0.193237	1.952072	0.0622
XLECLOSE	0.400447	0.081472	4.915156	0.0000
XLFCLOSE	1.112676	0.158320	7.028015	0.0000
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C	-5.331607	3.903175	-1.365967	0.1841

R-squared	0.998629	Mean dependent var	118.1394
Adjusted R-squared	0.998136	S.D. dependent var	7.719028
S.E. of regression	0.333258	Akaike info criterion	0.875155
Sum squared resid	2.776518	Schwarz criterion	1.319540
Log likelihood	-5.315215	Hannan-Quinn criter.	1.028557
F-statistic	2023.977	Durbin-Watson stat	1.291216
Prob(F-statistic)	0.000000		

2007 Recession

Dependent Variable:	SPYCLOSE
Method:	Least Squares

Sample:	12/2007 2/2010			
	Coefficient	Std. Error	t-Statistic	Prob.
XLBCLOSE	-0.003463	0.047143	-0.073447	0.9416
XLECLOSE	0.240120	0.020408	11.76617	0.0000
XLFCLOSE	0.966267	0.032976	29.30203	0.0000
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GLDCLOSE	0.000856	0.006501	0.131607	0.8956
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S.E. of regression	0.361900	Akaike info criterion	0.896617
Sum squared resid	13.49009	Schwarz criterion	1.160636
Log likelihood	-40.10715	Hannan-Quinn criter.	1.003767
F-statistic	38989.42	Durbin-Watson stat	1.892289
Prob(F-statistic)	0.000000		

Appendix C: % Gain or Loss and Correlation Coefficient

2001 Recession

Variable with Greatest % Gain or Loss	% Gain or Loss	Variable with Highest Correlation Coefficient	Correlation Coefficient
Technology	-20.54%	Technology	1.026
Energy	-16.94%	Energy	0.400
Industrials	-16.50%	Industrials	0.004
Healthcare	-16.29%	Healthcare	-0.047
Utilities	-11.83%	Utilities	0.576
Financials	-10.14%	Financials	1.113
Materials	-6.89%	Materials	0.377
Consumer Discretionary	-6.35%	Consumer Discretionary	0.462
Consumer Staples	-4.35%	Consumer Staples	0.730

2007 Recession

Variable with Greatest % Gain or Loss	% Gain or Loss	Variable with Highest Correlation Coefficient	Correlation Coefficient
Financials	-53.78%	Financials	0.966
Utilities	-32.73%	Utilities	0.202
Industrials	-31.04%	Industrials	0.404
Materials	-27.15%	Materials	-0.003
Energy	-26.10%	Energy	0.240
Technology	-21.19%	Technology	1.052
Consumer Discretionary	-16.10%	Consumer Discretionary	0.438
Healthcare	-14.39%	Healthcare	0.538
Consumer Staples	-10.39%	Consumer Staples	0.477
SPDR Gold Trust	37.85%	SPDR Gold Trust	0.001

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