# The Faces of Fear in the Flight to Quality during the Lehman Brothers Failure and the Flash Crash

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## Abstract

*September 15, 2008 and May 6, 2010 mark events that shook the financial markets and sparked investor fears to quickly flee to quality financial instruments. The Lehman Brothers failure and the Flash Crash produced investor responses that were rapid and profound. Investors discriminated across high quality products and the ones with the highest levels of safety attracted funds. The panic from the Lehman announcement produced a longer term refuge in the safety of quality. The fear from Flash Crash lasted only 30 minutes. Both events provide a look at the difference between investor behavior that is predicated on real fear rather than on engaged portfolio managers actively rotating in and out of sectors as their outlook changes.*

**Keywords:** flight to quality, Lehman failure, flash crash

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*Oh, a storm is threatening my very life today.*
*If I don't get some shelter, I'm gonna fade away.*
*See the fire is sweeping our very street today.*
*Burns like a red coal carpet. Mad bull lost its way!*
** Excerpt from Gimme Shelter (M Jagger/K. Richards)*

## *1. Introduction*

Although several dramatic financial events during early 2008 sparked the markets to drift lower, the shot heard around the world to usher in the financial meltdown we are still experiencing occurred on September 15, 2008 when Lehman Brothers filed for Chapter 11 bankruptcy protection following the exit of most of its customers, huge losses in the value of its stock, and the downgrade by credit rating agencies of Lehman assets. The filing marks the largest bankruptcy in U.S. history and shook the worldwide markets. The failure of Lehman Brothers and the ensuing fear that the rest of the financial sector, the entire U.S. economy and even the whole world were on the verge of cataclysmic collapse plunged the Dow Jones Industrial Average (DJIA) 504 points and triggered a fear among investors that was manifested in a flight to quality.

Twenty months later, on May 6, 2010, the equity markets experienced the largest intraday point drop ever. In the span of a few minutes, the DJIA plunged 998 points before recovering almost 600 points of that loss to close down 347.80 points. The swing from the intraday high to the low was 1,010.14 points and occurred in the span of only a few minutes. Although there were important announcements that day involving rioting in Athens following the report that the European Union and the International Monetary Fund will fund the Greek crisis, and the ensuing drop in the Euro to a 14 month low, the investigation of the behavior of the markets has focused on potentially erroneous trades in several securities that triggered a piling on effect from computer trading programs. The unusual market activity during the volatile 30 minutes has become known as "Flash Crash." Eight of the stocks in the S&P 500 Index fell to $0.01 – a drop of 100% in a half hour. For example, 20,365 shares of Accenture (ACN) traded at $39.98 at 2:46pm. A minute later, 68,516 shares traded at $38.00. At 2:49pm, 66,277 shares traded at $0.01. A minute after that Accenture traded back up at $39.51. Boston Beer (SAM) and Exelon (EXC) are other stocks experiencing similar behavior in the span of a few minutes.

In the face of this extreme and unprecedented volatility, investors grew fearful that a collapse in the markets was underway and they fled to quality.

According to investopedia.com, flight to quality is *"the action of investors moving their capital away from riskier investments to the safest possible investment vehicles. This flight is usually caused by uncertainty in the financial or international markets. One indication of a flight to quality is a dramatic fall of the yield on government securities, which is a result of the increased demand for them."* Wikipedia.com defines flight to quality as *"when investors sell what they perceive to be higher-risk investments and purchase safer investments. This is considered a sign of fear in the marketplace"*. According to investorwords.com, flight to quality is the *"flow of funds from riskier to safer investments in times of marketplace uncertainty (or fear)"*. In the Princeton Encyclopedia of the World Economy, Aizenman(2009) describes flight to quality as behavior by savers to *"liquidate assets in financial institutions due to a sudden increase in their perceived risk."* So, flight to quality is more than simply rotating out of a sector or a class of security that is out of favor and into something with more promise, which is what a good active portfolio manager practices. Rather, a flight to quality is a response to tremendous macro uncertainty and sudden fear. It is a broad-based reaction to a significant shock that permeates throughout the whole market, not just involving a single company or industry or even a single investor, and that reaction is not methodical or gradual but very rapid.

There has been some attention directed at the study of asset class behaviors in periods of financial crisis. These include the relationship between gold and bond markets (de Goeij and Marquering, 2006) and U.S. Treasuries across maturity structures (Dunguey, McKenzie and Tambakis, 2009). The findings generally show higher return volatility for the higher quality instrument following price shocks (Hartman, Straetmans and de Vries, 2004).
This paper gives evidence showing real-time flight to quality during September 15, 2008 and May 6, 2010. The evidence includes volume and price changes for various exchange traded funds (ETF) of varying risk qualities. They include short-term and intermediate term U.S. government bonds, high quality U.S. corporate bonds and high yield corporate bonds. A scrutiny of the overall stock market during the 504 and 998 point plunges of the DJIA is also provided. A decomposition of the risks of the market and the sample of financial instruments is provided. Despite the perception that ETFs are markedly less risky than equities, investors, in their flight to quality, discriminated across these securities on these dates. They were not all treated the same.

Furthermore, the two events are related to two different types of fear which, consequently, produced two different types of responses. The evidence is overwhelming that the behaviors on these days were not a rotation into and out of asset classes because of changes in outlook or to lock in returns, but they were dramatic flights to quality induced by fear – just like the definitions above describe. This paper provides a rare real-time look at the behavior of fearful investors in their pursuit of safety in the midst of extreme and sudden financial uncertainty. The objective of this series of examples is to provide an empirical window into flight to quality that goes beyond simple words or definitions and will, consequently, enhance an understanding of investor behavior in a financial crisis.

Our insight into flight to quality comes from four securities. Two are ETFs of U.S. government securities and two are corporate debt ETFs. All four ETFs are in the Barclays Global Investors fund family (iShares). The U.S Treasury ETFs include 1-3 Year Treasury Bonds (SHY) and 3-7 Year Treasury Bonds (IEI). The corporate debt ETFs are the Lehman Aggregate Bond tracking index (AGG) comprised of high quality corporate issues and a high yield fund (HYG). [After the demise of Lehman Brothers, the Lehman index was renamed the Barclays Aggregate Bond Index.] Three measures of behavior involving these four ETFs are considered. The percentage change in return for a typical day and during the flight to quality, volume for the flight to quality day and average volume provide evidence that September 15, 2008 and May 6, 2010 are indeed days on which investors positioned out of riskier assets and into safer assets as a result of fear as defined by flight to quality.

## *2. Lehman Brothers Failure - September 15, 2008*

The full page cover of the New York Daily News on September 15, 2008 shows a panicked floor trader and the headline "Shock Market." The Wall Street Journal headline is "AIG, Lehman Shock Hits World Markets." Both of these headlines use a term that describes an emotional state – shock, and a reaction to shock is fear. The way to handle fear from an investment standpoint is to quickly move from riskier assets to safer assets. At the Lehman announcement, the DJIA plunged 504 points or -4.4%. Normal volume on the New York Stock Exchange is between 3 billion and 4 billion shares per day. On September 15 it is more than double normal to 8 billion shares.

Investors quickly fled the stock market. It is interesting to observe the quick, deliberate and discriminating response around the Lehman failure. We cannot always tell what investors are thinking, but on September 15, 2008 we see through the flight to quality the investor fear that is manifested in fleeing the risky stock market and entering high quality instruments.

Figure 1 presents the behavior of SHY leading up to Monday, September 15. Price is shown on the top line and volume is in the lower bars. The price itself is not important to show flight to quality. Rather, the difference from normal behavior induced by fear is what the price line shows. With government securities of maturities ranging from 1 to 3 years, the duration of SHY is very short and has little exposure to interest rate risk, default risk or liquidity risk. Consequently, the yield on SHY is low. It is a near cash instrument. The Tuesday through Friday line shows a tight range of movement which is typical or normal for SHY. At the Lehman announcement at the open, SHY spiked and stayed there for the rest of the day (all of the Figures for September 15 are through 2:02pm and are from yahoo.com), rising more than 71 basis points – a huge run up for this ETF. Average daily volume (10 days) is 766,901 shares. For September 15, volume is more than double to 1,710,200 shares. The large rise in the volume portion of the Figure indicates that a very large amount of the volume is concentrated near the open. It appears that investors expressed fear at the open as a result of the shocking news of Lehman's failure and fled the risky part of the stock market for the safety of SHY. The volume is substantially higher than normal and the high volume pushed prices higher and yields lower, just like the investopedia.com definition presents.

The performance of the 3 to 7 Year Treasuries ETF - IEI - is represented in Figure 2. The duration of IEI is about 5 years and it has more risk than SHY. Still, IEI is considered a very safe instrument. The ETF traded in a tight range leading up to Monday and then skyrocketed at the Lehman announcement at the open. The return for IEI for September 15 is an astounding 1.46%. Average volume is 222,002 shares per day but for September 15 the volume is almost double at 412,400 shares. With a monthly dividend of $0.2648, the yield fell from 2.93% to 2.89%, a large one-day move for a high quality government asset. This behavior is consistent with Vayanos (2004) who links positive price shocks in a low risk asset accompanied with large volatility to flight to quality. Furthermore, the divergence in returns between the U.S. equity markets and both U.S. Treasury ETFs in our sample support the decoupling phenomenon between these two classes during periods of market stress (Gulko, 2002).

The Lehman Aggregate Bond Index ETF (AGG) depicted in Figure 3 is comprised of high quality corporate issues. About 76% of the holdings are rated AAA and the duration of the fund is about 5 years, the same as IEI. Ordinarily, investment grade corporate securities are considered a safe haven. High quality corporate bonds are still exposed to default risk, but the AAA rating on most of the positions in AGG signifies that this risk is low. Furthermore, the short duration exposes the ETF to low interest rate risk. Average daily volume for AGG is 621,805 shares, indicating good liquidity in this issue. It thus appears that AGG meets all of the characteristics of a safe haven instrument and should receive much investor attention during a flight to quality event; however, volume on September 15 is about half of normal at only 386,900 shares. AGG did attract some buying interest and the price ended 40 basis points higher by the end of day, but that is lower than what the less risky SHY and IEI produced. Although this instrument is considered less risky than equities in general, it appears investors did not consider it enough of a safe haven to flee to with their funds. It was largely bypassed or hurdled for the highest quality instruments in the pecking order (government issues). AGG is not of a high enough quality to be worthy of fearful investor funds.

The High Yield Corporate Bond ETF (HYG) is comprised of speculative grade debt so it is essentially a junk bond fund. High risk debt exhibits many of the characteristics of equities and so it is not surprising to see in Figure 4 that HYG received the same treatment as the stock market on September 15. The DJIA plunged -4.4% with double normal volume. HYG also plunged, -3.7%, with an almost five-fold increase in volume. Normal daily volume is 78,743 shares. The volume on September 15 is 377,800 shares. With such abnormal volume and a large negative return, it appears that investors fled HYG, just like they fled the risky stock market. The flight from risk in HYG - despite it being in the fixed income asset class - to quality instruments like SHY and IEI is consistent with flight to quality behavior. The behavior of investors on September 15, 2008 indicates a fear that was manifested in a rapid move out of risky instruments and into the safest ones available. The high volume on the NYSE and in SHY and IEI accompanied by unusually high returns for SHY and IEI and negative returns on the DJIA provides a window into what flight to quality looks like.

Furthermore, the low volume and negligible return for AGG indicates that this instrument is not considered high quality enough for the money coming out of the risky stock market. Although HYG is a portfolio of fixed income securities, it is largely a junk bond fund with risk unacceptable to fearful investors. Consequently they fled from that instrument. All of these behaviors indicate that on September 15 investors did not simply rotate out of securities and sectors in a rebalancing effort to reflect their changing outlooks – which is a prudent action among active portfolio managers. Rather, investors fled risk in a rapid and panicked action, which is what flight to quality is all about.

### *3. Flash Crash - May 6, 2010*

There is nothing distinctive in the behavior of the stock market throughout most of the trading day on May 6, 2010. There are some dramatic announcements coming from Europe about a financial bailout of Greece by the International Monetary Fund and of a continued drifting lower of the Euro currency; however, the markets absorbed that information with little drama or volatility. The stability of the day was ambushed at around 2:40pm when the DJIA plunged almost 1,000 points in a few minutes before erasing two-thirds of that loss a few minutes later. The Securities and Exchange Commission (SEC) and the Commodity Futures Trading Commission (CFTC) recently concluded that the behavior was caused by a combination of an unusually large futures trade on the S&P 500 Index and high frequency traders using algorithms to buy and sell based on price points (CFTC/SEC, 2010). Blogger Tyler Durden captured the panic during this largest intraday point swing in history through an audio recording from the S & P 500 Index futures pits. The stunning play by play is available on the link below and reveals the panic among traders during those 30 minutes.

http://www.zerohedge.com/sites/default/files/Market%20Crash.mp3

In a flight to quality situation, investors quickly flee riskier assets for the safety of high quality securities like U.S. Treasuries. The trading action is rapid and the price impacts are large. Just like with the behavior on September 15, 2008, Flash Crash shows a deliberate and swift move out of risky assets and into safety. The securities under consideration are the same ones as for the Lehman Brothers event.

Figure 5 shows that until 2:40pm SHY traded in a narrow band of about $0.10, consistent with the behavior of a typical day. During the 30 minute period of fear, SHY sharply spiked higher and then stabilized to close up 0.22%. The price range from $83.55 to $83.83, or $0.28, is almost triple that of a normal day of $0.10. Volume is also triple normal at 1,864,500 shares. SHY received unusual attention during the late afternoon of May 6, 2010 that was manifested in higher prices, higher volume and a wider price range. It appears that fearful investors rapidly sought the safety of this security amidst the shock induced by the mysterious plunge of the DJIA. The behavior of IEI is even more profound than for SHY. Figure 6 presents the behavior for the day. Leading up to 2:40pm the behavior is typical within a trading range of about $0.25. The spike at Flash Crash is steep up, short-lived, and steep down. The price range is wide, from $112.24 to $116.69. IEI closed 0.56% higher for the day but at the peak of the fear the price change is up an astonishing 3.96%. Volume is concentrated around the 2:40pm panic. Again, investors appear to have fled risk for safety and, once the fear abated – even 30 minutes later – behavior resumed a more normal pattern.

It appears in Figure 7 that the high quality corporate ETF, AGG, received some attention induced by the flight to quality as evidenced by the large spike around 2:40pm, but it is as short-lived as the Flash Crash as prices drop precipitously a few minutes later and then continue retreating to close up only 0.14%. The price range from $104.72 to $105.59 is much wider than the $0.10 spread on a typical day. Volume is more than double normal at 1,366,600 shares, a large proportion of that concentrated around 3:00pm when stability starts to resume. The junk bond fund, HYG, drifts lower with the rest of the stock market as the day evolves and then plunges with heavy volume after the 2 o'clock hour. A few minutes later, as the stock market reevaluates the fear, the stock market and HYG recover. Figure 8 marks the dramatic turnaround. The heavy volume from about 2:20pm to 2:50pm indicates a great deal of money is coming out of HYG as the fear intensifies, and then a great deal of money reenters HYG a few minutes later as the fear subsides. The gradual downward slide throughout most of the day is not due to fear or a flight to quality, but rather a rational response to the new information coming out of Europe. Mounting fear is reflected in the behavior of HYG shortly after 2:00pm.

### *4. Conclusions*

Although the events of September 15, 2008 and May 6, 2010 produced fear among investors, the Figures show two different flight to quality behaviors.

The reaction around the failure of Lehman Brothers on September 15 sparked a panic that the U.S. financial system and the economy are unraveling before investor eyes. The protection of the safest instruments in the pecking order (SHY, IEI) was quickly sought and these safe haven positions were maintained as returns did not reverse because the fear did not abate. Relatively safe instruments like AGG were bypassed. The fear on September 15, 2008 was more permanent. May 6, 2010 also produced a fear reaction; however this one was temporary and was resolved in a few minutes. Still, the sudden impact of the fear was jarring and shook the market. The reversal a few minutes later is as dramatic as the plunge and indicates that fear- albeit very real – can also be temporary and short-lived. Either way, the treatment for investor fear is a rapid move away from risky assets and into the safest haven possible until that fear subsides and an appetite for the risk of regular uncertainty returns.

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Figure 1: Price and Volume Behavior for 1 to 3 Year Treasuries (SHY), September 9-15, 2008

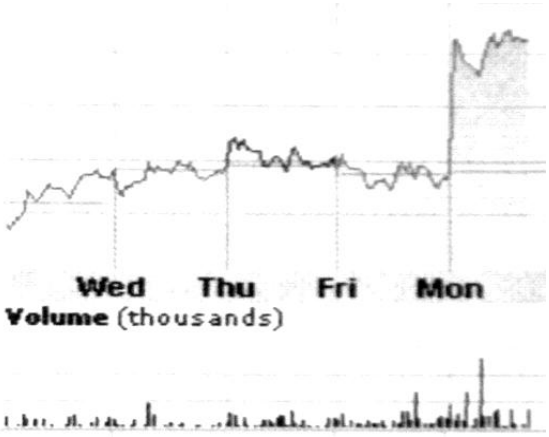


Figure 2: Price and Volume Behavior for 3 to 7 Year Treasuries (IEF), September 9-15, 2008

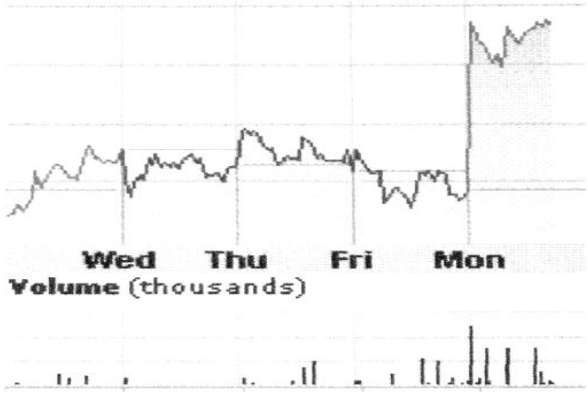

Figure 3: Price and Volume Behavior for Lehman Aggregate Bond Index (AGG), September 9-15, 2008


Figure 4: Price and Volume Behavior for High Yield Corporate Bonds (HYG), September 9-15, 2008

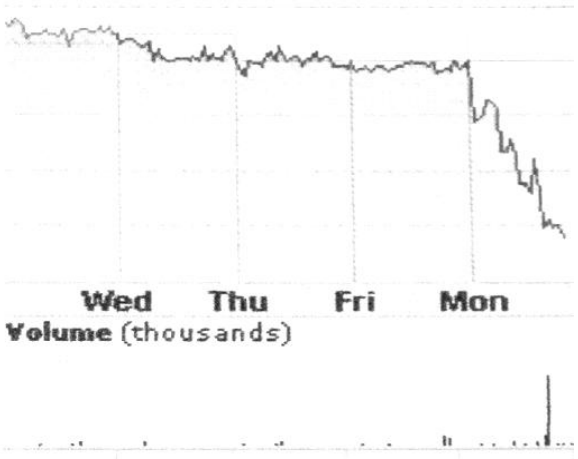


Figure 5: Price and Volume Behavior for 1 to 3 Year Treasuries (SHY), May 6, 2010

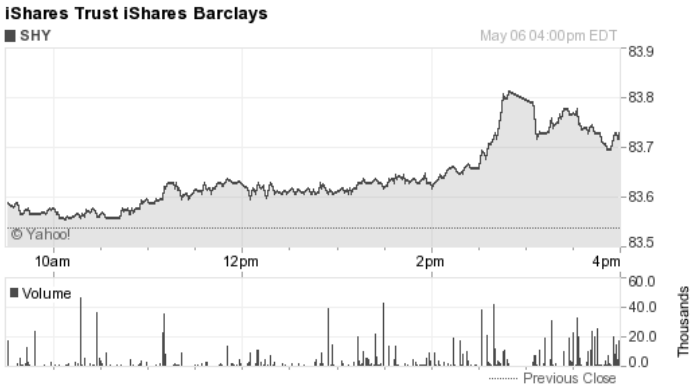

Figure 6: Price and Volume Behavior for 3 to 7 Year Treasuries (IEF), May 6, 2010

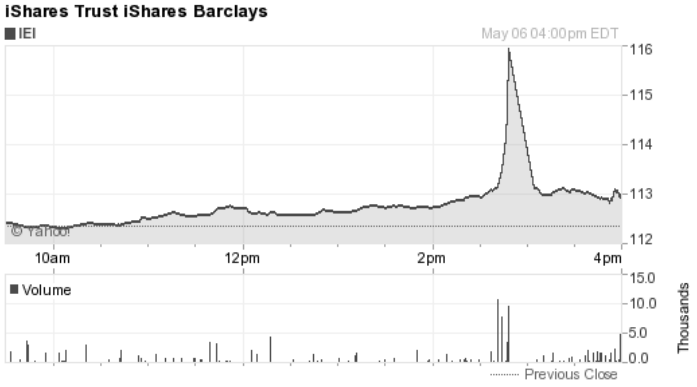


Figure 7: Price and Volume Behavior for Barclays (Lehman) Aggregate Bond Index (AGG), May 6, 2010


Figure 8: Price and Volume Behavior for High Yield Corporate Bonds (HYG), May 6, 2010