

U.S. Equity Returns After Major Market Crashes

by Scott A. Leonard, CFP®, CEA™

Scott A. Leonard, CFP®, CEA™, is senior economist, chief investment officer (CIO), and founding partner for Trovena LLC and OnCubic LLC. In addition to running Trovena and OnCubic, Leonard is an instructor at UCLA Extension, teaching courses in the financial planning certificate program. He is also an instructor and dean of the school of investments for NAPFA University. He is a national speaker on investment and wealth management issues.

The genesis of this paper came from two factors: (1) the unexpected equity downturn in October and November 2008, and (2) an article by Mark Hulbert. Let's start with the first factor. During October and November, one of the most common questions we fielded from clients was how long it would take to see their investment portfolios recover from the devastating losses. The simple math that a 50 percent loss requires a 100 percent gain to break even was leading to a feeling of despair. Our clients felt that in a best case scenario, it would take 10 years for their equities to recover.

The second factor that triggered this research was an article by Mark Hulbert in *MarketWatch* titled, "Recovering from Bear Markets."¹ My main takeaway was that financial history had been misrepresented. The message that the Dow Jones Industrial Average took more than 25 years to recover from the Great Depression is wrong. From a price standpoint alone, market recovery took that long. However, that analysis does

Executive Summary

- Research shows that, on average, during periods of business cycle downturns, the expected equity risk premiums increase above the long-term average risk premiums.
- This paper examines the recovery of the U.S. market after extreme downturns and evaluates whether they follow the historical average results. Additionally, this paper seeks to observe the magnitude of the risk premiums during a recovery as an indication of the possible length of time it took for equities to recover after a market crash.
- This report analyzes the returns of the four major U.S. equity asset classes (large cap stocks, large cap value stocks, micro cap stocks, and small cap value stocks) during the 12-, 36-, and 60-month periods immediately after each major bear market. Based on this analysis, we can answer the question, "What equity asset class had the best returns after a major market crash?"
- Using the S&P 500 Index, and going back to January 1926, there have been 23 separate bear and bull markets. The average bear market lasted 11 months, while the average bull market lasted 32 months. Bull and bear markets are defined in hindsight, using cumulative monthly returns.
- Our analysis found that risk premiums are above average in periods of extreme bear markets. Additionally, the research shows that the asset class risk premiums of micro cap and small cap value stocks exceeded their average bear market expected returns by a magnitude much greater than anticipated.
- We determined that in the historical periods observed, a well diversified portfolio would fully recover to pre-market crash levels in three to five years, with the main factor being the amount of allocation to small cap stocks.

not take dividends or inflation into account. The actual recovery of the Dow was three or four years after the 1929–1933 bear market, if one considers dividends and inflation.

Armed with incomplete information, the

price change of the Dow, combined with the media coverage, sent many investors into a frenzy. Knowing that we provide our clients with a much more diversified portfolio than the Dow 30 and believing that there is a reversion to the mean with

equity returns, I was less concerned about the length of time necessary to recover the losses. This paper is the result of seeking to understand how the broader markets recovered after major downturns.

During a strong business cycle, research has shown the risk premium for publicly traded securities decreases.² Conversely, we've learned that in poor business cycles, the risk premium increases. In practical terms, when the business cycle is in distress (for example, during a recession), investors require higher expected returns to compensate them for buying securities. One of the questions this paper sought to answer was whether this average observation was experienced after rare, major market crashes.

Another question the research tried to address was to determine the length of time it took for stocks to recover after a major market crash, with an eye on the four major U.S. equity asset classes: large cap stocks, large cap value stocks, micro cap stocks, and small cap value stocks. This final question is really the bottom line question that many investors want answered: "How long will it take for my portfolio to recover?"

So why look beyond the standard S&P 500? In today's world, many investors apply an asset allocation approach to their portfolio, and to only examine the results of the S&P 500 would be to exclude a major part of many investors' portfolios.

This paper's goal is to evaluate and estimate the expected recovery time of a portfolio based on the experience of the major, although limited in number, market crashes. The purpose is not to suggest a specific investment strategy or to propose some type of tactical movement in one's portfolio. Instead, we seek to determine whether the time one should expect to see their equities recover is closer to three years or 25 years.

Methodology and Results

Few doubt that the current equity market crisis is one of the worst in history. How-

ever, this isn't the first bear market to have such a widespread effect. In fact, since the final bear market of the Great Depression, which ended in April 1938, there have only been three bear markets in which the S&P 500 Index declined more than 40 percent: the oil embargo crash of 1973–1974, the dot-com bust of 2000–2002, and our current market.

This report analyzes the returns of the four major U.S. equity asset classes during the 12-, 36-, and 60-month periods immediately after each major bear market. Based on this analysis, we can answer the question, "What equity asset class had the best returns after a major market crash?"

The four major U.S. equity asset classes analyzed are those defined by the Fama-French multi-factor research. They are large cap stocks, large cap value stocks, micro cap stocks, and small cap value stocks.³

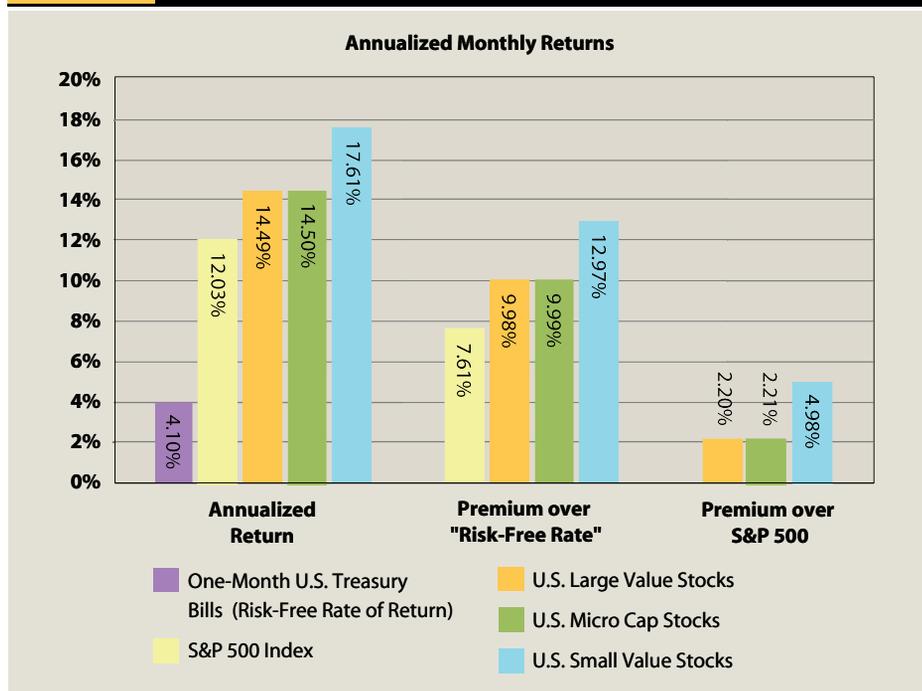
Historical Risk Premiums

The equity risk premium is the reward for owning stocks over a "risk-free rate of return." This risk-free rate is usually represented by one-month U.S. Treasury Bills. A common proxy for the market is the S&P 500 Index. For this paper, the value risk premium is the reward for owning value companies over the market. The size risk premium is the reward for owning micro cap stocks over large cap stocks.

As we will discuss in this paper, the premiums change over time. From April 1938 to September 2007, the period analyzed in this paper, the equity risk premium was 7.61 percentage points per year. The value premium was 2.20 percentage points per year. Combined, the equity risk-value premium was 9.98 percentage points, meaning the reward for owning large cap value stocks over the risk-free rate of return was 9.98 percentage points. All premiums are provided in Figure 1 (on page 86). These premiums are determined month-by-month and then annualized, which creates a more accurate result than using only the annualized returns. Note that since the risk

Terminology

- **Risk-Free Rate of Return:** Monthly, annualized returns of one-month U.S. Treasury Bills
- **Inflation:** Consumer Price Index (CPI)
- **Large Cap Stocks or "Market":** Monthly annualized returns of the S&P 500 Index⁴
- **Large Cap Value Stocks:** Market-capitalization-weighted index of securities in the top half of the U.S. market based on market cap and those whose book-to-market ratio falls in the top 20 percent of large cap securities⁵
- **Micro Cap Stocks:** Market-capitalization-weighted index of securities of the smallest U.S. companies whose market capitalization falls in the lowest 4 percent of the total market⁶
- **Small Cap Value Stocks:** Market-capitalization-weighted index of securities in the bottom half of the U.S. market based on market cap and those whose book-to-market ratio falls in the top 25 percent of small cap securities⁷
- **Equity Risk Premium:** Monthly annualized returns of the S&P 500 Index less the risk-free rate of return
- **Value Risk Premium:** Monthly annualized returns of large cap value stocks less the market rate of return
- **Micro Cap Risk Premium:** Monthly annualized returns of micro cap stocks less the market rate of return
- **Major Bear Market:** A market loss of 40 percent or more

Figure 1: Historical Risk Premiums, April 1938–September 2007

premiums are calculated monthly, but presented as annualized figures, one cannot simply add a premium over the S&P 500 to the premium of the S&P 500 and expect the same return as the annualized, monthly return for the asset class.

Previous Research

Previous research has shown that expected risk premiums change in relation to our position in the current market cycle.⁸ In times when the market cycle is positive, the expected risk premium decreases. In times of market downturns, the expected risk premium increases. The findings are consistent with efficient market theory. In good times, there is less perceived risk in owning equities and, as a result, the risk premium should be lower. In bad times, there would need to be an increased expected return, a risk premium, to justify purchasing equities in a period of declining prices.

Past research dealt with the average results over many different periods. There are periods when the averages do not apply. A goal of this paper is to evaluate the

returns of the various asset classes after a major market crash to see whether these periods of intense stress follow the historical experiences.

As expected, all four asset classes exceeded their average respective risk premiums. What was not expected was the magnitude by which large cap value, micro cap, and small cap value exceeded their risk premiums and the actual returns earned by large cap stocks. With only one exception, the 12-month period following the Great Depression bear market, large cap stocks drastically underperformed the other three asset classes.

Period Selection Process

Part of this paper's methodology included reviewing extreme historical periods similar to the current economic conditions. It is these outlying periods that conventional wisdom says are not part of the average, and as a result, require special considerations.

Using the S&P 500 Index, and going back to January 1926, there have been 23 separate bear and bull markets. The average bear market lasted 11 months, while

the average bull market lasted 32 months. Bull and bear markets are defined in hindsight using cumulative monthly returns. A bear market begins with a negative monthly return, must achieve a cumulative return less than or equal to -10 percent, and end at the most negative cumulative return prior to achieving a positive cumulative return. All data points that are not considered part of a bear market are designated as a bull market. (See Appendix A, on page 93.)

The period of the Great Depression (1929–1942) was one of massive volatility. During this period, the markets were also very different than they are today, from a regulatory standpoint to the types of investors and the social programs dealing with recessions, including a lack of fiscal and monetary policy from government agencies. As a result of these factors, the last bear market of the Great Depression is where we started the analysis.

Data selection was focused on extreme periods of equity market losses for the purpose of analyzing how the four major equity asset classes recovered. For the purpose of this paper, we define "extreme loss" as a loss of 40 percent or more on the S&P 500 Index. Once investors start looking at losses of 40 percent or worse, there's great pressure to sell because of panic and fear.

Counting the final bear market of the Great Depression, there are only four periods that qualify as an extreme bear market, including our current market. The other periods that qualify are:

- Oil embargo bear market, ended December 1974
- Dot-com bear market, ended September 2002

Final Bear of the Great Depression

Starting in March 1937 and lasting for 13 months, the final bear market of the Great Depression showed losses for this period of 50 percent. The following 12 months, from April 1938 to March 1939, was the only period of all the bear market recoveries when large cap stocks performed better

Figure 2: Total Returns (1938): 12, 36, & 60 Months

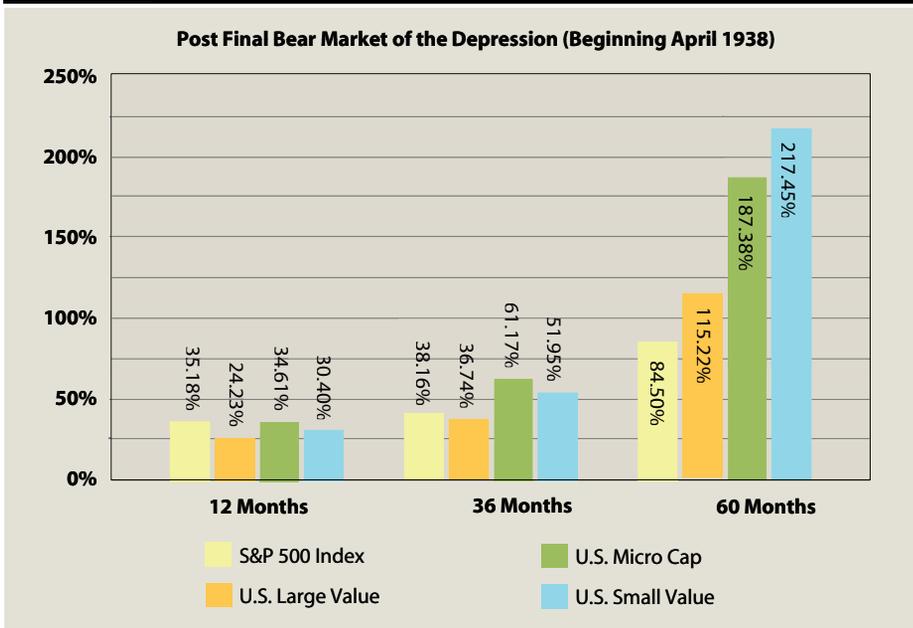
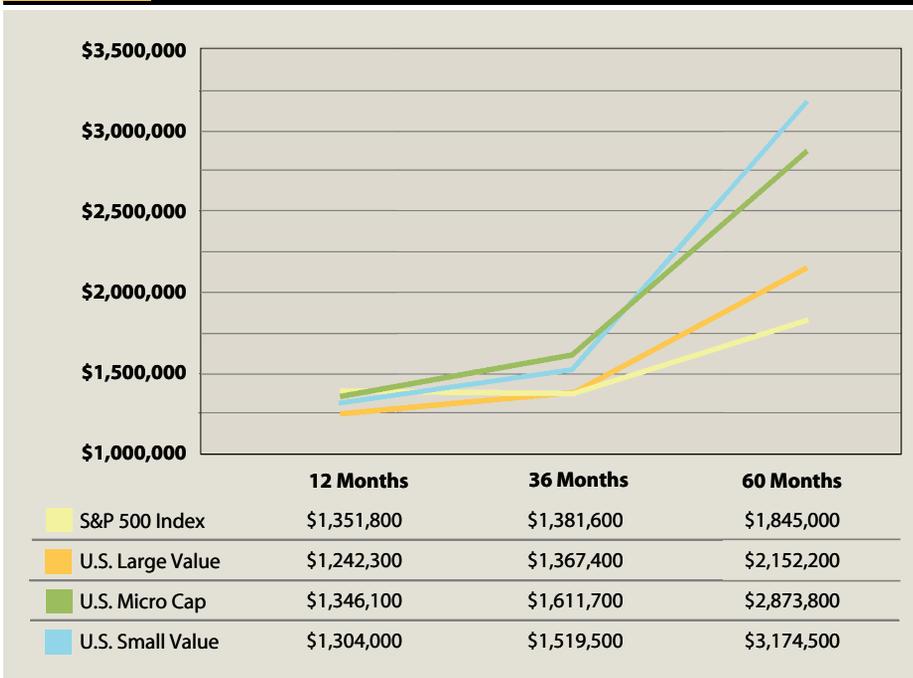


Figure 3: Growth of \$1 Million, April 1938



than the other asset classes. As a result, it does not follow the historical average observation of increased risk premiums in a downturn. Figure 2 shows the total return for the 12, 36, and 60 months starting April 1938.

Growth of \$1 Million Beginning April 1938

A 100 percent return is needed to recover from a 50 percent loss. While none of the asset classes were back even after 12 months or 36 months, all but the S&P 500

had recovered one's money within 5 years (see Figure 3).

Risk Premiums Beginning April 1938

At the end of the five-year period, the distribution of the results is what one would expect based on the expected risk premiums, with large cap stocks having the lowest returns and small cap value stocks having the highest returns (see Figure 4). The surprise was the magnitude of the value and size risk premiums over large cap stocks.

For the 60-month period beginning in April 1938, the equity risk premium was an annualized 12.95 percentage points, 5.34 percentage points above the long-term average equity risk premium. Most impressive was the annualized, small cap value risk premium (11.46 percentage points) for a total premium over the risk-free rate of 25.90 percentage points.

While beyond the scope of this paper, the poor performance of the risk-free rate (0.07 percentage points) is still worth noting. When adjusting for inflation, one-month Treasury Bills lost 17.16 percent for the period, delivering an annualized return of -3.84 percent. It causes one to question whether it is truly a risk-free rate of return.

Oil Embargo Bear Market

The period in the early 1970s was one of high inflation, an oil crisis, and the ending of the Vietnam conflict. An interesting note is that in real terms, net of inflation, this market crash was worse than the one experienced during the Great Depression. In the late 1960s, a 19-month bear market saw the S&P 500 Index lose 29 percent. Immediately before the oil embargo bear market, the S&P 500 experienced a 30-month bull market in which the index was up 76 percent.

The oil embargo bear market lasted 24 months, ending in December 1974. During this period, the S&P 500 Index lost 43 percent, which required a 75 percent return to reach its value at the beginning of the bear market.

Within 36 months, all of the major asset classes, other than the S&P 500 Index, were above the starting point, and the U.S. small value asset class was up an eye-popping 223.9 percent (see Figure 5).

Growth of \$1 Million Beginning January 1975

The subsequent bull market was so strong in the second half of the 1970s that \$1 million invested in either the small cap value or the micro cap asset class would have grown to more than \$5.4 million in five years (see Figure 6 on page 90).

The difference in the amount of wealth created in this recovery period for those investors with a properly diversified portfolio versus those who maintained the standard, large cap bias was life changing.

Risk Premiums Beginning January 1975

Of all three periods examined, the 60-month equity risk premium was the lowest for this period, at 7.56 percentage points. That premium is actually less than the 7.61 percentage point long-term average equity risk premium. Also during this period, the equity risk value premium (large value stocks less the risk-free rate of return) was the lowest of all three periods, at only 14.45 percentage points a year.

However, because the equity risk premium was so low, the large value premium (large cap value stocks less the market) was the highest of all three periods, at 6.41 percentage points. Both the micro cap stocks and the small cap value stocks had the highest risk premiums of all three periods (see Figure 7 on page 90).

Dot-Com Bear Market

Many believe that the dot-com bear market was a correction to the hype around technology and the world-changing effect of the Internet. However, this belief is interesting, because one would not expect a major positive correction after the bear market if the bear market was only properly adjusting prices due to a bubble.

Figure 4: Risk Premiums, April 1938

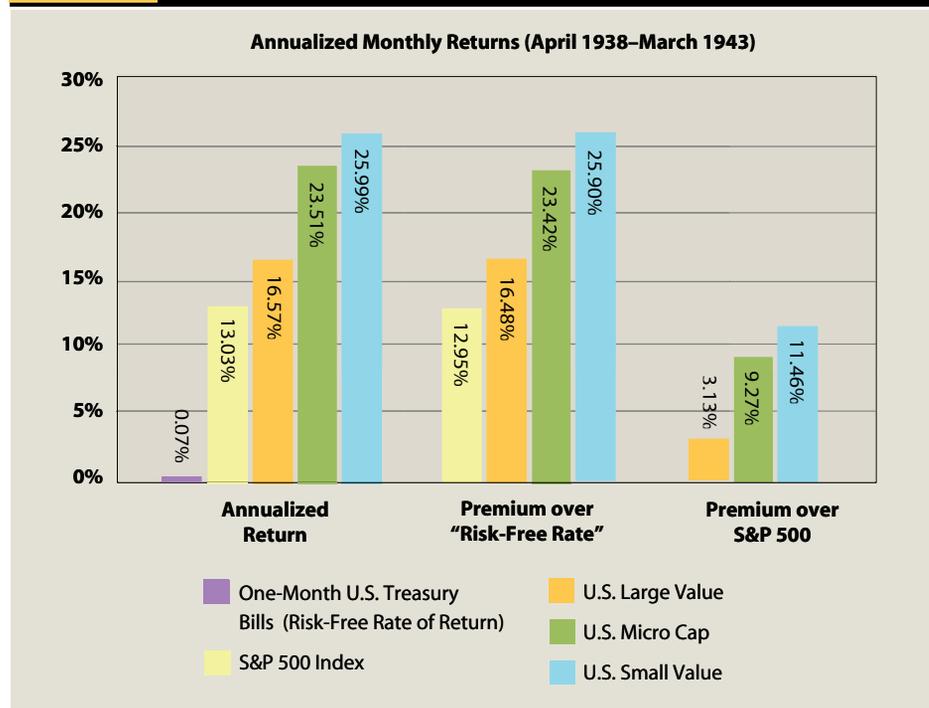
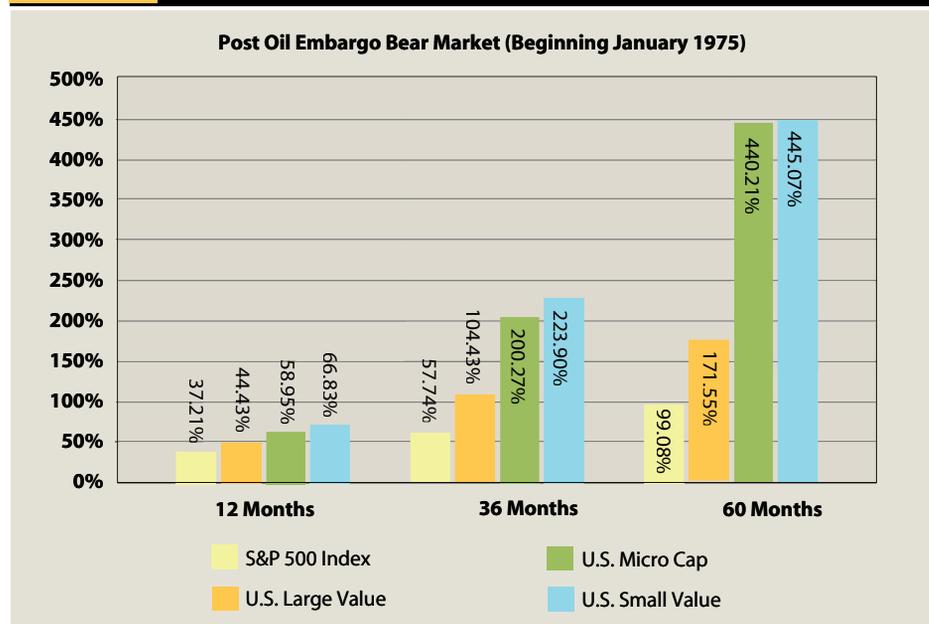


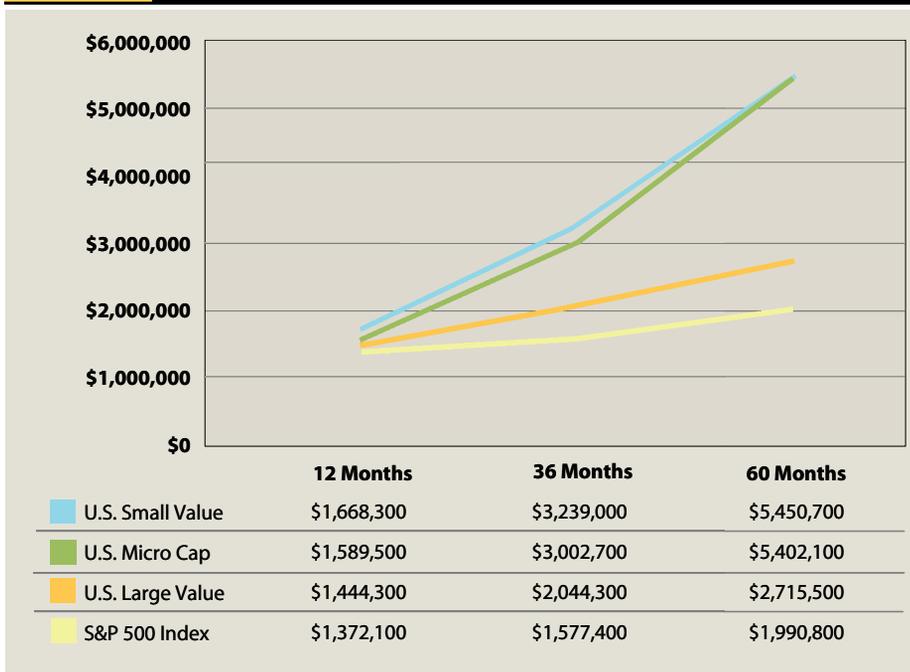
Figure 5: Total Returns (1975): 12, 36, & 60 Months



This bear market ended in September 2002. It lasted for 25 months, and the S&P 500 Index lost 45 percent. That loss would require an 82 percent return to get back to the peak of the bull market. One of the unique aspects of this bear market is that it was not a true market-wide crash, unlike the

other three. It was focused on the large cap and technology stocks. A diversified portfolio of large cap value, micro cap, and small cap value stocks would have lost less than 10 percent during the dot-com bear market. Granted, these asset classes did not see the huge run-up in valuations in the last half of

Figure 6: Growth of \$1 Million, January 1975



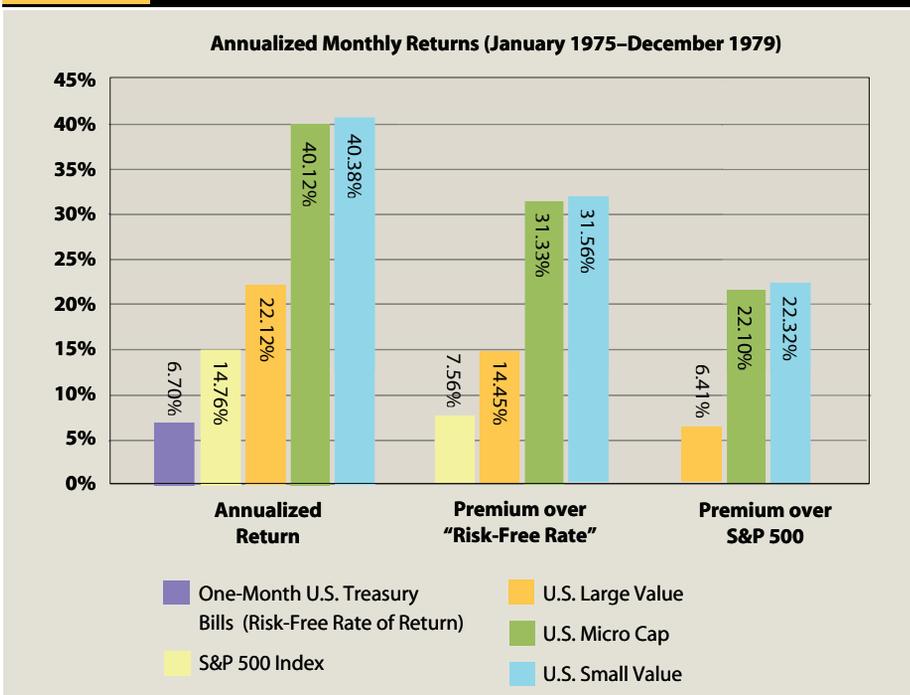
Growth of \$1 Million Beginning October 2002

Unique to this bear market is the 60-month period ending in September 2007, which goes into the beginning of the current toxic debt bear market. After only 36 months, the two small cap asset classes doubled in value, turning a hypothetical \$1 million into \$2.2 million and \$2.5 million for the asset classes of micro cap and small cap value, respectively (see Figure 9 on page 92). After five years, the small cap value assets class turned \$1 million into a little more than \$3 million.

Risk Premiums Beginning October 2002

Of all three periods examined, the various asset classes' risk premiums over the market were the lowest in this recovery. That should be no surprise, as the dot-com bear market was primarily limited to large cap stocks. Because value and small cap stocks did not come close to the 45 percent drop large cap stocks experienced, one would not expect them to have as much room for recovery (see Figure 10 on page 93). Regardless of this point, the risk premiums of all the asset classes were well above their respected long-term averages.

Figure 7: Risk Premiums, 1975



the 1990s as the large cap stocks did.

Because our focus is on the recovery, we're concentrating on the loss of a large cap portfolio, which represents how most portfolios are allocated. Within 36 months,

both small cap asset classes showed returns in excess of the break-even target of 82 percent. Within 60 months, all the asset classes returned over the targeted 82 percent (see Figure 8 on page 92).

Observations

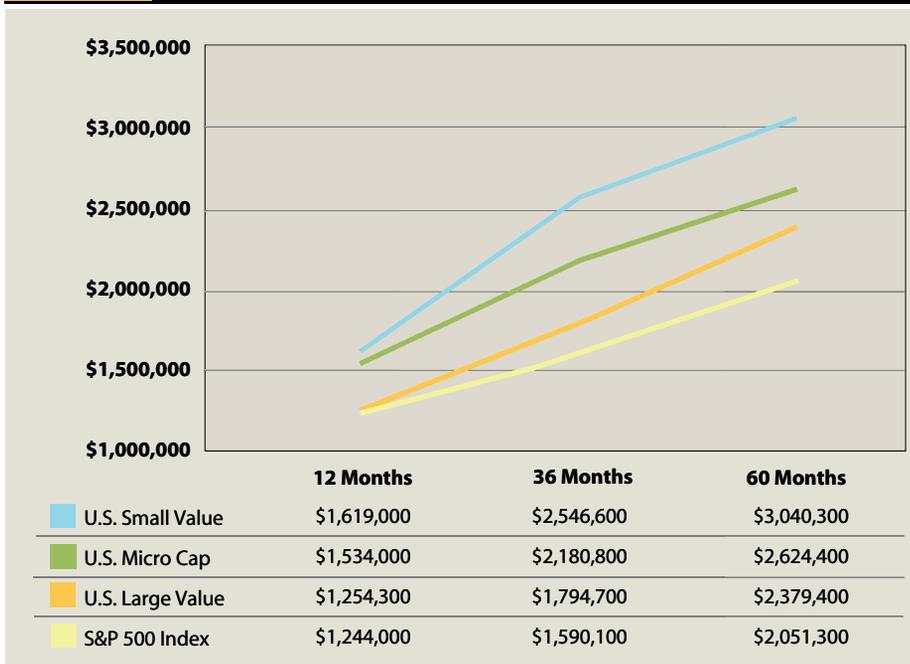
As a believer in market efficiency, whenever there is an observation of a "free lunch," one should be skeptical. One should always ask if there is a market efficient explanation to what has been observed in the past. If there is, then a greater likelihood exists that the historical observations will repeat in the future.

One possible explanation for the large added returns of value stocks and small stocks over large cap stocks could be a flight to quality. During major market downturns such as the ones highlighted in this paper, much of the security sell-off comes from panic rather than any fundamental analysis. In fact, panic selling and other forced selling, such as the unwinding of leverage, are efficient market

Figure 8: Total Returns (2002): 12, 36, & 60 Months



Figure 9: Growth of \$1 Million, October 2002



explanations of how the markets can become fundamentally mispriced in a moment. It is the same concept as the irrational buying that leads to a market bubble.

In times of panic, if one were to stay invested in equities, most would seek out the highest quality, most stable compa-

nies—large cap companies. So, an explanation could be that the added return of value and small cap companies is a reward for owning securities others are not willing to own. The wholesale selling of securities is driven more by fear than by any true fundamental analysis of a company's

proper value. The added premium may be for accepting a psychological risk factor, which is not illustrated in the numbers, providing the illusion of a free lunch.

From a pure numbers analysis, the conventional wisdom of owning only large cap, high quality companies in a major bear market is the least prudent course of action. There does not appear to be any likelihood of added loss from owning the small and value asset classes in the bottom of a major bear market. One could argue that large cap stocks seriously underperform in a market recovery.

Another point worth noting is that in two of the three periods observed, the small cap asset classes had returned enough to be back at peak value within 36 months. This result is excellent news for those who may be expecting the markets to take 5 to 10 years to recover from the current bear market. Having a diversified allocation that includes value and small cap equities has historically shortened the recovery time to three years or fewer.

Conclusion

This paper analyzed the 12-, 36-, and 60-month recovery periods after the three major bear markets experienced since the end of the Great Depression. The goal was to determine whether the average results of higher than average expected returns were experienced in the few, major market downturns.

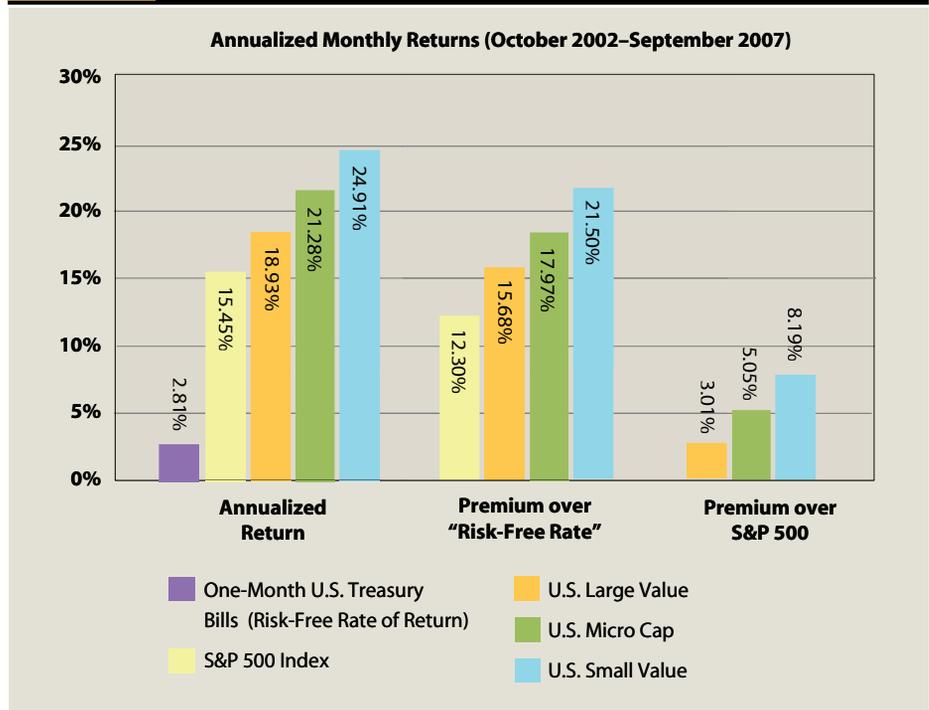
Not only were the average results consistent after the major bear markets, but the magnitude of the over-performance, especially with the value and small asset classes, exceeded the historical averages. This result leads to a suggestion that in a major market downturn, a substantial weighting to large cap value, micro cap, and small cap value asset classes could provide a substantial return with little to no increased risk to the portfolio.



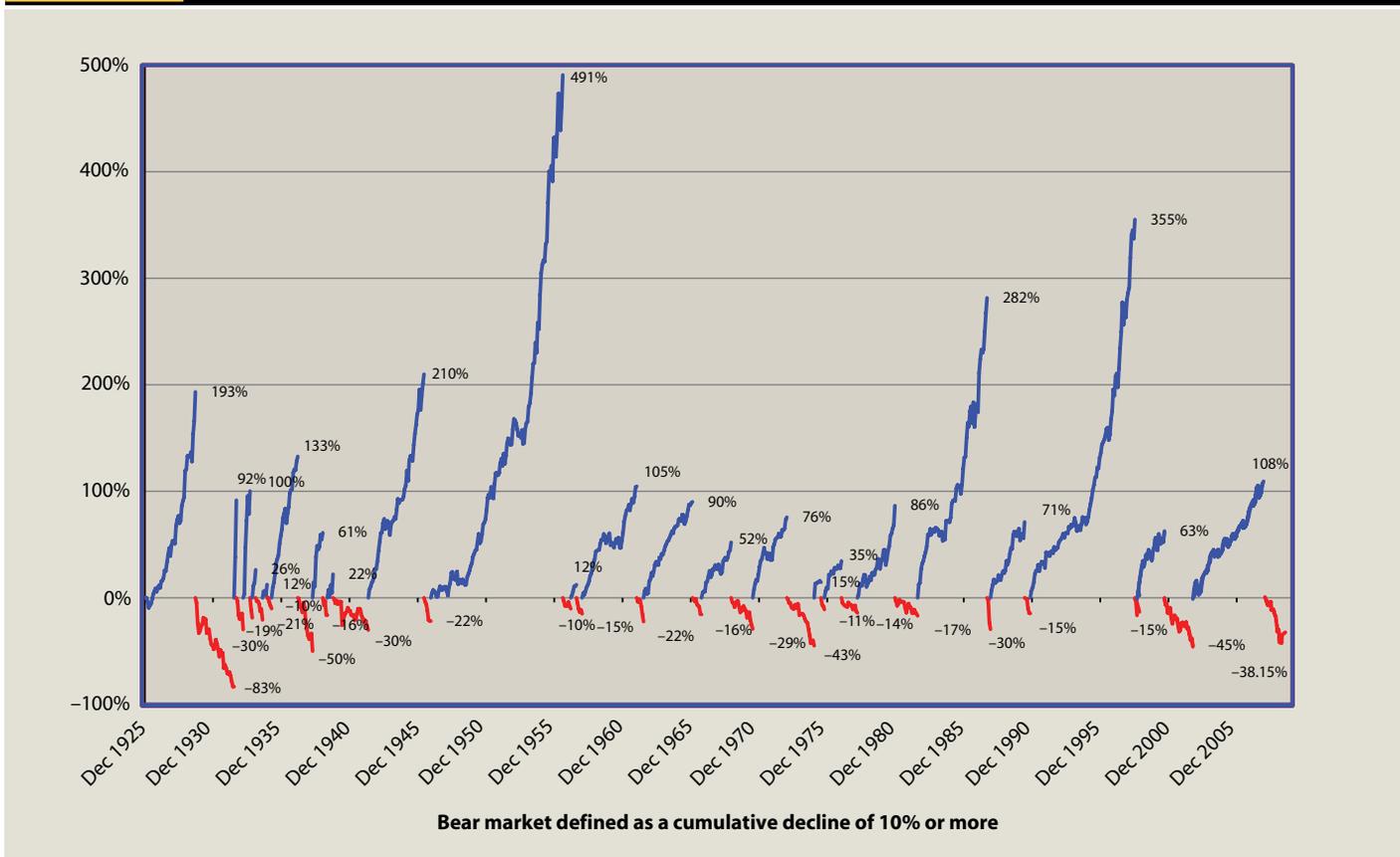
Endnotes

1. Hulbert, "Recovering from Bear Markets," *MarketWatch*, October 28, 2008.
2. Eugene Fama and Kenneth French, *Journal of Financial Economics*, 1989; John Y. Campbell and John H. Cochrane, *Journal of Political Economy*, 1999; Lettau and Ludvigson, *Journal of Political Economy*, 2001; Ralitsa Petkova and Lu Zhang, *Journal of Financial Economics*, 2005.
3. Eugene Fama and Kenneth French, "Common Risk Factors in the Returns of Stocks and Bonds," *Journal of Financial Economics* 33 (1993): 3–56.
4. U.S. Large Cap Index: The S&P 500 Index. Source: Standard & Poor's Index Service Group. Data provided by Dimensional Fund Advisors.
5. U.S. Large Cap Value Index: The index is determined first by selecting a large

Figure 10: Risk Premiums, October 2002



Appendix A: Bull & Bear Markets, S&P 500 Index (Monthly Total Returns: January 1926–June 2009)



cap composition that is the market-capitalization-weighted index of securities of the largest U.S. companies whose market capitalization falls in the highest 90 percent of the total market capitalization of the eligible market. The eligible market is composed of securities of U.S. companies traded on the NYSE, AMEX, and Nasdaq Global Market, excluding non-U.S. companies, REITs, UITs, and investment companies. From this set of companies, a subset is defined as companies whose book-to-market ratio falls into the top 20 percent of the first set of large companies after the exclusion of utilities, companies lacking financial data, and companies with negative book-to-market ratios. Source: CRSP and Compustat. Data provided by Dimensional Fund Advisors.

6. U.S. Micro Cap Index: The market-

capitalization-weighted index of securities of the smallest U.S. companies whose market capitalization falls in the lowest 4 percent of the total market capitalization of the eligible market. The eligible market is composed of securities of U.S. companies traded on the NYSE, AMEX, and Nasdaq Global Market, excluding non-U.S. companies, REITs, UITs, and investment companies. Source: CRSP and Compustat. Data provided by Dimensional Fund Advisors.

7. U.S. Small Cap Value Index: The index is determined first by selecting a large cap composition, which is the market-capitalization-weighted index of securities of the smallest U.S. companies whose market capitalization falls in the lowest 8 percent of the total market capitalization of the eligible market. The eligible market is composed of

securities of U.S. companies traded on the NYSE, AMEX, and Nasdaq Global Market, excluding non-U.S. companies, REITs, UITs, and investment companies. From this set of companies, a subset is defined as companies whose book-to-market ratio falls in the top 25 percent of the first set of small companies after the exclusion of utilities, companies lacking financial data, and companies with negative book-to-market ratios. Source: CRSP and Compustat. Data provided by Dimensional Fund Advisors.

8. See endnote 2.

FPA VIRTUAL LEARNING CENTER

YOUR ONLINE LEARNING CENTER FOR

- Live Distance Learning
- Self-Study Archives

FIND TIMELY AND RELEVANT FINANCIAL PLANNING CONTENT WHEN YOU NEED IT!

Choose from on-demand archived content or live sessions that answer your real-time questions. No matter what format you choose, this is top quality programming when and where you need it.

In addition, most sessions offer for CFP Board-approved CE credit and educational topics are applicable to all types of financial planning professionals.

www.FPAnet.org/VLC

