The Bottom Line: *Earnings—A Study of S&P 500 Operating Earnings*

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Human emotion plays a large role in investor decisions on a daily basis. Thus, we must acknowledge that greed and fear will always be present in the marketplace. Investors need to have a game plan for market corrections, which typically produce irrational behavior, to ensure future investment decisions are made in a sensible manner. Executing such rational behavior is, however, certainly easier said than done. Alan Greenspan pondered in his December 5, 1996 speech to The American Enterprise Institute for Public Policy Research (Federal Reserve Board [1996]), "But how do we know when irrational exuberance has unduly escalated asset values, which then become subject to unexpected and prolonged contractions as they have in Japan over the past decade?" To answer this question, investors might turn toward a common market valuation tool, such as the price to earnings (P/E) ratio. They may also use Robert Shiller's cyclically adjusted price to earnings (CAPE) ratio, presented in his 1996 paper, "Price-Earnings Ratios as Forecasters of Returns: The Stock Market Outlook in 1996" (Shiller [1996]). These valuation tools can provide guidance as to whether price versus earnings is relatively high or low compared with historical readings; but the issue remains: at what reading can we assume a change in the earnings cycle has been reached? For instance, Shiller's CAPE ratio has produced a reading greater than 20 since January 1, 2010, a level that is significantly higher than the historical average of 16.61 (Shiller [2000]). The S&P 500, since January 1, 2010, has offered returns of 205% (with dividends). Although this is only one example, the main point is that a historically high or historically low CAPE ratio does not necessarily signal a peak or trough in the current earnings cycle.

Few investors will be able to predict what the cause of the next recession will be, but this article aims to provide investors with a clear indication of when the earnings cycle has changed for any of a variety of reasons. The results of this study show that investors have been able to generate excess returns over the past 26 years by making asset allocation decisions on the basis of the rate of change in S&P 500 operating earnings data.

METHODOLOGY

A portfolio that simulates the S&P 500 index return, including dividends, is compared with 30 different customized portfolios over a 26 year period (1989–2014). The 26-year period constitutes the extent of the operating earnings data compiled by S&P Dow Jones indexes (Silverblatt [2014]). Each of the custom portfolios follows strict buy/sell decisions based solely on the rate of change in operating earnings. All portfolios

begin 100% invested in the S&P 500 index and sell only when operating earnings fall by the mandated percentage (e.g., –5%, –4%, –3%, –2%, –1%). When a custom portfolio liquidates its S&P 500 holdings the entire portfolio is reinvested into U.S. Treasury one-year notes at the prevailing market rate (U.S. Department of Treasury [2014]). The custom portfolio will continue to hold U.S. Treasury one-year notes and, if necessary, reinvest at maturity until the rate of change in operating earnings increases by the mandated percentage of the portfolio (e.g., +5%, +4%, +3%, +2%, +1%, +0%). Once the custom portfolio has been credited the interest earned from holding the one-year notes, the portfolio repurchases the S&P 500 index. This cycle continues throughout the 26-year period.

The operating earnings of the S&P 500 are reported on a quarterly basis, and this study uses trailing 12-month operating earnings data to calculate the rate of change of earnings between quarters (Exhibit 1). Because it takes two months for >90% of the S&P 500 companies to report their earnings, a two-month lag has been incorporated before any buy/sell transactions occur. To explain further, end of quarter dates are March 31, June 30, September 30, and December 31, but the final operating earnings number used to calculate the delta of earnings are unavailable until February 28, May 31, August 31, and November 30. Therefore, the price of the S&P 500 index used for purchases or liquidations and the rate of U.S. Treasury one-year notes are based on the February 28, May 31, August 31, and November 30 dates each year.

Operating Earnings

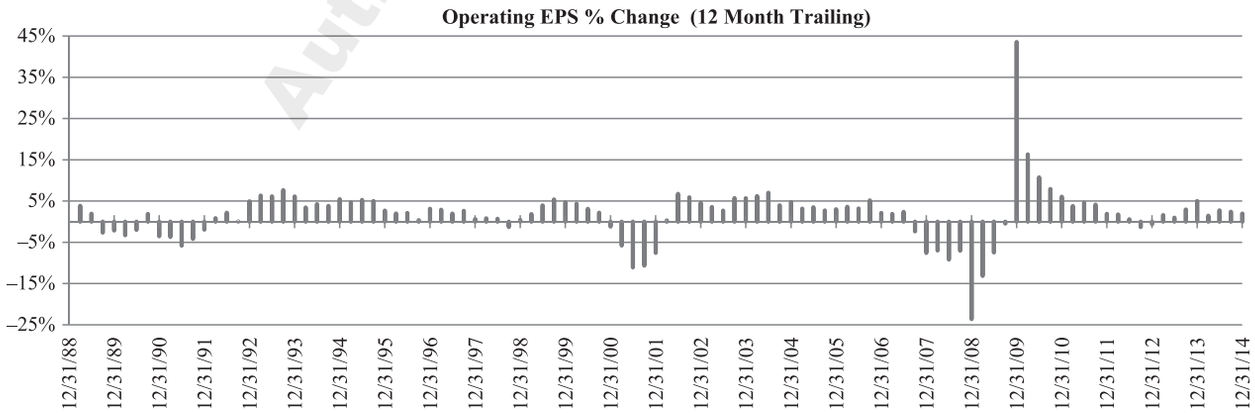
We have chosen operating earnings for this study because they represent the earnings generated by the core businesses of S&P 500 companies. Operating earnings represent the income produced by companies for selling their goods or services. The standard calculation for operating earnings is revenue minus operating expense (cost of golds sold; selling, general, and administrative expense; depreciation and amortization; and other general operating costs). An alternative method used to report earnings known as GAAP (generally accepted accounting principles) is not as useful for this study because of the volatility of its output. The volatility of GAAP earnings can be attributed to extraordinary items, such as one-time gains or write-offs, which companies have to include under the GAAP reporting standards. The large fluctuations produced by noncore operations can disturb the overall trend of the earnings results. This study was interested in obtaining a smooth set of data in which it would be easier to spot subtle changes in the core operations of the S&P 500 businesses.

U.S. Treasury One-Year Note

U.S. Treasury one-year notes were chosen as our custom portfolios' alternative investment to the S&P 500 index. Treasuries are a safe and secure investment backed by the full faith and credit of the U.S. government. Also, the U.S. Treasury market is extremely liquid and would provide the opportunity for the custom portfolios to enter or exit the notes as needed.

Exhibit 1

S&P 500 12-Month Operating Earnings Data, Earnings per Share (EPS)



Total Return: Dividends and Interest

All returns were calculated to provide the total return of each portfolio. Any portfolio that held the S&P 500 index at the end of a quarter (March 31, June 30, September 30, and December 31) was credited with a dividend payment on that date. Interest payments from U.S. Treasury notes are paid upon maturity; in the case of a custom portfolio having to liquidate a note before maturity, interest was divided into monthly payments and credited upon liquidation. We have assumed U.S. Treasury notes sold before maturity would not experience any principal gain or loss.

Taxes and Fees

The study does not account for taxes or fees, which would reduce the returns generated by both the buy and hold portfolio and the custom portfolios. The tax and fee burden would be of greater consequence to the custom portfolios, as they would be responsible for any capital gains generated from portfolio liquidation in a taxable account.

RESULTS

The results of the study concluded that 29 out of 30 custom portfolios generated excess return over the S&P 500 index buy and hold portfolio (including dividends). The buy and hold portfolio generated an annualized return of 10.40% for the 26-year period (1989–2014). The custom portfolio that generated optimal results was the –2%/+1% portfolio, which was mandated to sell the index when operating earnings fell by 2% and to repurchase the index once operating earnings increased by 1%. The optimal portfolio returned 13.18% on an annualized basis, which generated 2.78% of excess return per annum over the buy and hold portfolio (Exhibits 2 and 3).

The custom portfolios that were required to sell once operating earnings fell by only 1% had the worst relative performance. It is no surprise that the only custom portfolio that underperformed the buy and hold portfolio was the –1%/+5% portfolio, which represents an investor who sells at the first sign of an earnings drop and waits to repurchase the portfolio until a significant increase in earnings is realized. On the other hand, regardless of their sell mandate, the custom portfolios that tried to re-enter the market when earnings stabilized but had not increased (+0%) saw a relative underperformance.

Because the custom portfolios and the buy and hold portfolio only differ in asset allocation decisions, a yearly return chart displays the advantage of avoiding large market corrections (Exhibit 4). In 2001 and 2002, the optimal portfolio returned –2.51% and –1.01%, respectively, compared with the buy and hold portfolio, which returned –11.84% and –22.05%. In 2008 and 2009, the optimal portfolio returned 2.95% and 0.76%, respectively, whereas the buy and hold portfolio returned –36.96% and 26.36%. The 2008–2009 scenario is intriguing, as many will point out that, although the –36.96% drop in 2008 was avoided, the 2009 total return of 26.36% was missed. Although this is true, because yearly returns are not independent of each other, a $100 portfolio invested at the beginning of 2008 in the buy and hold portfolio would be worth $79.66 at the end of 2009, whereas the optimal portfolio would have a final portfolio value of $103.73.

EXHIBIT 2
Custom Portfolio Results—Annualized Return

Custom Portfolio Returns

EPS	5%	4%	3%	2%	1%	0%
–5%	12.10%	12.17%	12.17%	12.46%	12.46%	11.75%
–4%	12.17%	12.17%	12.17%	12.46%	12.46%	11.75%
–3%	11.96%	12.01%	12.01%	12.28%	12.77%	12.08%
–2%	12.33%	12.39%	12.39%	12.66%	13.18%	12.48%
–1%	10.16%	10.48%	10.66%	11.07%	12.07%	11.58%

Note: Shading from light to dark indicates worst to best returns, respectively.

EXHIBIT 3
Custom Portfolio Results—Excess Return over Buy and Hold Portfolio

Custom Portfolio Excess Returns

EPS	5%	4%	3%	2%	1%	0%
–5%	1.70%	1.77%	1.77%	2.06%	2.06%	1.35%
–4%	1.77%	1.77%	1.77%	2.06%	2.06%	1.35%
–3%	1.56%	1.61%	1.61%	1.88%	2.38%	1.68%
–2%	1.93%	1.99%	1.99%	2.26%	2.78%	2.08%
–1%	–0.24%	0.08%	0.26%	0.67%	1.67%	1.18%

Note: Shading from light to dark indicates worst to best returns, respectively.

EXHIBIT 4
Portfolio Growth and Yearly Return

Panel A: Yearly Return Chart (1989–2014)

Year	Portfolio (Buy & Hold)	Portfolio –2%/+1%
1989	31.88%	28.88%
1990	–3.04%	10.80%
1991	30.59%	17.20%
1992	7.67%	10.33%
1993	10.06%	10.06%
1994	1.40%	1.40%
1995	37.55%	37.55%
1996	22.90%	22.90%
1997	33.33%	33.33%
1998	28.52%	28.52%
1999	20.62%	20.62%
2000	–8.81%	–8.81%
2001	–11.84%	–2.51%
2002	–22.05%	–1.01%
2003	28.72%	28.72%
2004	10.85%	10.85%
2005	4.92%	4.92%
2006	15.78%	15.78%
2007	5.48%	6.18%
2008	–36.96%	2.95%
2009	26.36%	0.76%
2010	15.08%	16.24%
2011	2.09%	2.09%
2012	15.88%	15.88%
2013	32.34%	32.34%
2014	13.59%	13.59%
Ann Ret	10.40%	13.18%

Panel B: Growth of $100 Investment (1989–2014)

Year	Portfolio (Buy & Hold)	Portfolio –2%/+1%
Beg	$100.00	$100.00
1989	$131.88	$128.88
1990	$127.87	$142.80
1991	$166.99	$167.36
1992	$179.80	$184.65
1993	$197.89	$203.22
1994	$200.66	$206.07
1995	$276.00	$283.44
1996	$339.21	$348.35
1997	$452.27	$464.46
1998	$581.25	$596.91
1999	$701.11	$720.00
2000	$639.33	$656.56
2001	$563.66	$640.07
2002	$439.38	$633.58
2003	$565.55	$815.53
2004	$626.91	$904.01
2005	$657.74	$948.46
2006	$761.52	$1,098.11
2007	$803.29	$1,165.99
2008	$506.38	$1,200.38
2009	$639.86	$1,209.55
2010	$736.35	$1,405.92
2011	$751.73	$1,435.28
2012	$871.07	$1,663.15
2013	$1,152.76	$2,200.98
2014	$1,309.48	$2,500.20
Ann Ret	10.40%	13.18%

Another way to characterize the difference between the buy and hold portfolio and the optimal portfolio would be a yearly chart that displays the growth of a $100 portfolio invested at the beginning on 1989 and held until the end of 2014.

The optimal portfolio increased by a multiple of 25× compared with the buy and hold portfolio, which only increased by a multiple of 13× over the 26-year period. The outperformance of the optimal portfolio is very apparent when portfolio values replace annualized returns: Although the annualized returns are the same in both panels of Exhibit 4 (10.40% versus 13.18%), the difference between portfolios is even more pronounced when portfolio values are displayed.

Portfolio Risk

The previous return comparisons have only described the excess return of the optimal portfolio versus the buy and hold portfolio. The excess return, although a valid metric, does not account for the amount of risk taken by each portfolio. The Sharpe ratio, introduced by William Sharpe in his 1966 paper, "Mutual Fund Performance," (Sharpe [1966]) is a widely used risk-adjusted performance measurement that is calculated by taking the excess return of the portfolio minus the risk-free rate and dividing by standard deviation. On an annualized basis, the excess return above the risk-free rate (U.S. Treasury three-month bill) was 6.86% for the buy and hold portfolio and 9.71% for the optimal portfolio. The standard deviation, defined as the volatility of portfolios returns, shows the buy and hold portfolio as having an annualized standard deviation of 17.94%, 12.20% for optimal portfolio. The corresponding Sharpe ratios are 0.38 for the buy and hold portfolio and 0.80 for the optimal portfolio. Therefore, because the optimal portfolio achieved a greater excess return with less portfolio volatility, it displays a superior risk-adjusted return over the buy and hold portfolio.

CONCLUSION

The study incorporated a 26-year history of S&P 500 operating earnings data. Although some might question the validity of using only a 26-year period, this time frame encompasses the entire history of operating earnings data published by S&P Dow Jones indexes. In addition, according to NBER (National Bureau of

Economic Research [2014]), the data include three separate business cycles, two of which included 50% market corrections. Furthermore, using recent data incorporates new market dynamics, such as a global economy, investors' ample access to market data, and an electronic trading environment. Investors, with only a click on their computers, can easily move assets from one index to another, relying on data published only a few minutes beforehand. Trading algorithms can move markets when certain parameters are breached. These trends have only recently surfaced, but they certainly influence investors' decisions and, as a result, the price of the S&P 500 index.

Some investors would point to Eugene Fama's work on the efficient market hypothesis, which states that "In an efficient market, competition among the many intelligent participants leads to a situation where, at any point in time, actual prices of individual securities already reflect the effects of information based both on events that have already occurred and on events which, as of now, the market expects to take place in the future" (Fama [1965, pp. 55–59]), These investors would assume that outperforming the S&P 500 would have not been possible using the S&P 500 operating earnings data, but this study's results prove otherwise.

Operating earnings should be an investor's guide through turbulent times in which market pundits call for 10% and 20% market corrections. This article provides a simple answer to the question, "Are you a buyer or seller of the S&P 500?" The answer, of course, depends upon the trend of earnings. The market, inevitably, will experience price fluctuations based on events from around the globe, but most of these headlines will not result in a significant reduction of S&P 500 operating earnings. As an example, using the optimal portfolio from the study, there were only four instances in which a liquidation of the equity portfolio and subsequent purchase of U.S. Treasury notes occurred over the past 26 years. Additional instances in which operating earnings decreased by more than 2% from one period to the next have occurred, but they happened after the custom portfolio was invested in U.S. Treasury notes. Investors must respect the business cycle and should take notice when corporate earnings decline, for whatever reason.

The final results of this study prove that outperforming the S&P 500 index solely using operating earnings data was achievable over the prior 26 years. In addition, this article demonstrates that the delta in operating earnings can be an effective tool used to cultivate an asset allocation strategy. Investors who want equity exposure should participate in the market when corporate earnings are rising, but they also need a plan to reduce their equity exposure when the corporate earnings environment changes. This study delivers a simple, unemotional process that investors can use to determine when to make that asset allocation decision.

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