

# The Search For A Dog-Free Portfolio: Why Unions Matter To Investors

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## ABSTRACT

*This paper uses portfolio filtering and weighting research to create a dog-free portfolio. The variables used to create the dog-free portfolio include level of unionization and book-to-market. The filtered and weighted portfolio is averaging 47 basis points alpha per month from 1991-2007 over the benchmark S&P500, outperforming in 60.8% of the months. Using annual data, the portfolio averages 603 basis points alpha from 1991-2007 over the benchmark S&P500, outperforming 82.4% of the time.*

**Keywords:** performance, alpha, unions, book-to-market, portfolio filtering

## INTRODUCTION

Instead of trying to pick specific firms to beat the S&P 500, our approach is to eliminate those firms from the S&P 500 that are expected to underperform. The simplicity of our dog-free sample is that it includes only two filters - book-to-market and unions. Thus, we include only value firms (the top half by book-to-market) without unions. The rationale for choosing value firms stems from research by Rosenberg, Reid, and Lanstein (1985) who use book-to-market to obtain abnormal performance by buying stocks with a high book-to-market price and selling stocks with a low book-to-market ratio. Fama and French (1992) also find that stocks with high book-to-market stocks tended to outperform the market.

In light of the recent difficulties of the heavily unionized auto industry, we feel this paper is a timely look at the relationship between unionized firms and stock returns. Numerous academic studies have studied unionization and stock returns (Bronars and Deere, (1991), Danthine and Donaldson, (2002), Merz and Yashiv (2006). According to Bronars, Deere and Tracy (1994), unions have a strong negative effect on profitability in both manufacturing and nonmanufacturing. They suggest that this effect is due to strong evidence that higher union coverage reduces capital investments by the firm. Furthermore, Ruback and Zimmerman (1984) find that, on average, unionization is related to a decrease in equity value. By examining union election returns, they find that equity declines by an average of 3.8% when the union wins an election and also declines by 1.3% when the union loses an election. These findings lead us to examine what would happen if we took the S&P 500 and removed firms with unions.

We combined the findings on book-to-market and unions to create a dog-free portfolio where instead of picking a select number of firms that are intended to beat the S&P 500, we seek to take the S&P 500 and subtract the dogs. Another unique aspect of our study is that we utilize a fundamental weighted approach in contrast to the market value weighted approach. Research has shown that capital weighted indexes inadvertently overweight overpriced stocks and underweight underpriced stocks, but you don't know which is which without hindsight (Arnott, 2005, and Seigel, 2006). Specifically, we utilize a sales weighted and market value weighted approach, which are fundamental weighted approaches.

The implications of our research are that we have developed a strategy that beats the S&P. In addition, we shed light on the timely issue of unionization as well as showing the importance of value investing. The paper also compares our strategy under value weighting and sales weighting.

## DATA AND METHODOLOGY

The Center for Research in Security Prices' database is used to obtain return and market value data. Compustat is used to obtain book value and sales data. The market-to-book ratio is computed as price times shares divided by the book value of equity. To help ensure the ratio is known by investors, the ratio is determined in the fiscal year prior to the year of the returns. Union data is hand-collected data set of active unions in the S&P 500.

Firms comprising the actual S&P 500 Index are the starting point for the sample. To be considered for inclusion, the necessary data from CRSP and Compustat must be available. As a result of the data requirements, some S&P 500 firm-year observations are missing. As a validity check, the annual S&P 500 returns computed herein are compared to the annual returns of the actual S&P 500 Total Return Index. The S&P 500 Total Return Index includes dividends in the return calculation.

Table 1 presents the results of this comparison. The table indicates that S&P 500 of this study generates a significantly lower return versus that of the actual S&P 500. While the difference is statistically significant, the economic significance is rather small. The mean annual difference is only -0.29%. The lower return of the starting sample of S&P 500 firms is also conservative. Any excess return generated by the dog-free portfolio must compensate for this lower return. Thus, despite some missing firms, the starting sample of S&P 500 firms in this study is considered satisfactory.

**Table 1: Sample S&P 500 Returns Versus Actual S&P 500 Returns**

Year	Actual S&P 500 Annual Return	Sample S&P 500 Annual Return	Difference Actual – Sample
1991	0.3047	0.3234	-0.0187
1992	0.0762	0.0775	-0.0013
1993	0.1008	0.0905	0.0103
1994	0.0132	0.0178	-0.0046
1995	0.3758	0.3776	-0.0018
1996	0.2296	0.2332	-0.0036
1997	0.3336	0.3350	-0.0014
1998	0.2858	0.2892	-0.0034
1999	0.2104	0.2155	-0.0051
2000	-0.0910	-0.0851	-0.0060
2001	-0.1189	-0.1169	-0.0020
2002	-0.2210	-0.2149	-0.0061
2003	0.2869	0.2867	0.0002
2004	0.1088	0.1090	-0.0002
2005	0.0491	0.0521	-0.0030
2006	0.1579	0.1565	0.0015
2007	0.0549	0.0588	-0.0039
<b>Mean</b>	0.1269	0.1298	-0.0029**
<b>Median</b>	0.1088	0.1090	-0.0030***
<b>Maximum</b>	0.3758	0.3776	0.0103
<b>Minimum</b>	-0.2210	-0.2149	-0.0187

\*\*\*, \*\*, \* Indicates the difference is statistically significant with 99%, 95%, or 90% confidence, respectively, using a t-Test for the mean and a Wilcoxon Signed-Ranks Test for the median.

From the starting sample of S&P 500 firms, the dog-free portfolio is obtained. First, firms are sorted into two halves based on market-to-book ratio. All firms in the upper half are considered growth firms and are removed from the portfolio. All firms with unionized labor are then removed. The firms remaining in the portfolio are thus union-free, value firms.

The sample period begins in 1991 and extends through 2007. Monthly returns within a calendar year are compounded to obtain annual returns. To minimize transactions costs, the portfolio is rebalanced at the beginning of the calendar year. Firms in the portfolio at the beginning of the year are then kept in the portfolio until the end of the year.

The dog-free portfolio return is computed using two different weighting schemes. The first is market-weighted, which is the weighting scheme of the actual S&P 500 Index. The other weighting method is sales. Weights are determined at the beginning of the calendar year and kept constant throughout the year. Weights are computed by first summing the market values or sales figures of all sample firms. A firm's individual weight is determined by dividing that firm's market value or sales figure by the total. Dog-free portfolio returns are then compared to the returns of the actual S&P 500 Total Return Index.

## RESULTS

Using a value weighted approach, the mean return of the dog-free portfolio is 2.54% higher than the S&P 500, while the median return is 4.04% higher (Table 2). The results indicate the superiority of the dog-free S&P. In the year 2000, the return of the dog-free portfolio was 27.94% higher, while in the year 1999, the dog-free portfolio underperformed the S&P 500 by 11.90%. During the 17-year time period studied, the dog-free portfolio outperforms the S&P 500 in 10 of the 17 years.

**Table 2: Value Weighted Dog-Free Portfolio Returns versus Actual S&P 500 Returns**

Year	Actual S&P 500 Annual Return	Dog-Free VW Annual Return	Difference Dog-Free – Actual
1991	0.3047	0.2271	-0.0776
1992	0.0762	0.0699	-0.0063
1993	0.1008	0.1690	0.0682
1994	0.0132	-0.0043	-0.0175
1995	0.3758	0.3939	0.0181
1996	0.2296	0.2700	0.0404
1997	0.3336	0.3201	-0.0135
1998	0.2858	0.1675	-0.1183
1999	0.2104	0.0914	-0.1190
2000	-0.0910	0.1884	0.2794
2001	-0.1189	-0.0567	0.0622
2002	-0.2210	-0.1686	0.0524
2003	0.2869	0.3741	0.0872
2004	0.1088	0.2109	0.1021
2005	0.0491	0.1541	0.1050
2006	0.1579	0.2096	0.0517
2007	0.0549	-0.0275	-0.0824
<b>Mean</b>	0.1269	0.1523	0.0254
<b>Median</b>	0.1088	0.1690	0.0404
<b>Maximum</b>	0.3758	0.3939	0.2794
<b>Minimum</b>	-0.2210	-0.1686	-0.1190

If a portfolio manager were to use a sales weighted approach, the dog-free portfolio outperforms the S&P 500 by 6.03% on average and the median outperformance is 4.92% (Table 3). The results also confirm the superiority of the sales weighting approach. In the year 2000, using a sales weighted approach, the dog-free portfolio outperforms by 41.24% and underperforms in 1999 by 16.61%. During the 17-year study, the sales weighted dog-free portfolio outperforms the S&P 500 in 14 of the 17 years.

This paper uses portfolio filtering and weighting research to create a dog-free portfolio. We back-tested the data for 17 years, broke the results down on a monthly basis, and examined down-market periods (refer to Table 4) The filtered and weighted portfolio is averaging 47 bps alpha per month from 1991-2007 over the benchmark S&P500, outperforming in 60.8% of the months. On the risk side, Beta = 0.97, while correlation = 83.2% versus the S&P500. In months when the S&P500 is down, the portfolio has 39 bps alpha, has 65.9% correlation with S&P500, and outperforms in 59.4% of the months. Using annual data, the portfolio averages 603 bps alpha from 1991-2007 over the benchmark S&P500, outperforming 82.4% of the time. This portfolio is re-set once per year, so trading is minimal, providing low transaction costs and optimal tax benefits. Our back-testing timeframe of 17 years (1991-2007) is broad enough to cover several market cycles to ensure robustness of our approach.

Table 3: Sales Weighted Dog-Free Portfolio Returns versus Actual S&amp;P 500 Returns

Year	Actual S&P 500 Annual Return	Dog-Free SW Annual Return	Difference Dog-Free – Actual
1991	0.3047	0.3259	0.0212
1992	0.0762	0.1254	0.0492
1993	0.1008	0.1944	0.0936
1994	0.0132	0.0328	0.0196
1995	0.3758	0.3870	0.0112
1996	0.2296	0.2915	0.0619
1997	0.3336	0.3394	0.0058
1998	0.2858	0.1440	-0.1418
1999	0.2104	0.0443	-0.1661
2000	-0.0910	0.3214	0.4124
2001	-0.1189	0.0535	0.1724
2002	-0.2210	-0.2203	0.0007
2003	0.2869	0.4829	0.1960
2004	0.1088	0.2493	0.1405
2005	0.0491	0.2123	0.1632
2006	0.1579	0.2273	0.0694
2007	0.0549	-0.0282	-0.0831
<b>Mean</b>	0.1269	0.1872	0.0603*
<b>Median</b>	0.1088	0.2123	0.0492**
<b>Maximum</b>	0.3758	0.4829	0.4124
<b>Minimum</b>	-0.2210	-0.2203	-0.1661

Table 4: All markets versus Down Markets

Returns in Down Market							
	A	B	C	D			
	Actual	Weight only	Filter only	Filter + Weight	C - A	D - A	
	S&P Return	Adj return	Adj return	Adj return	Difference	Difference	
<b>Mean</b>	-0.0324	-0.0283	-0.0290	-0.0285	0.0034	0.0039	
<b>Median</b>	-0.0243	-0.0214	-0.0239	-0.0233	-0.0005	0.0024	
<b>Std Dev</b>	0.0265	0.0305	0.0318	0.0393	0.0210	0.0296	
<b>Max</b>	-0.0036	0.0249	0.0264	0.0466	0.0673	0.0895	
<b>Min</b>	-0.1446	-0.1408	-0.1776	-0.1680	-0.0385	-0.0787	
<b>avg annual correl</b>	-0.3888	-0.3391	-0.3478	-0.3415	0.7552	0.6592	
<b>D &gt; A: %superior</b>							0.5942
Returns in All Markets							
	A	B	C	D			
	Actual	Weight only	Filter only	Filter + Weight	C - A	D - A	
	S&P Return	Adj return	Adj return	Adj return	Difference	Difference	
<b>Mean</b>	0.0098	0.0117	0.0120	0.0145	0.0022	0.0047	
<b>Median</b>	0.0129	0.0145	0.0158	0.0175	0.0016	0.0058	
<b>Std Dev</b>	0.0388	0.0394	0.0408	0.0456	0.0196	0.0253	
<b>Max</b>	0.1144	0.1131	0.1153	0.1358	0.1104	0.1167	
<b>Min</b>	-0.1446	-0.1408	-0.1776	-0.1680	-0.0420	-0.0787	
<b>mean annual correl</b>	0.1175	0.1408	0.1437	0.1742	0.0262	0.0567	
<b>D &gt; A: %superior</b>							0.6078

## CONCLUSION

This paper uses portfolio filtering and weighting research to create a dog-free portfolio. The variables used to create the dog-free portfolio include level of unionization and book-to-market ratios. The filtered and weighted portfolio is averaging 47 bps alpha per month from 1991-2007 over the benchmark S&P500, outperforming in 60.8% of the months. Using annual data, the portfolio averages 603 bps alpha from 1991-2007 over the benchmark S&P500, outperforming 82.4% of the time.

#### AUTHOR INFORMATION

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**NOTES**