

A Columbine White Paper: Predicting the January Effect

By John S. Brush, Ph.D.

The January effect

For years investors have talked about a “January effect” in equity markets. At Columbine Capital Services we have just completed a research study of what happens to markets in January. Our efforts have produced a forecasting tool that may shed some light on whether or not January 2002 is likely to give investors something more to talk about.

The January effect scenarios described by different analysts vary, but the usual implication is that in January something exceptional (but not unexpected) could happen to stocks. Think of it as an *El Niño* in the markets.

We started our study by asking: Is there a January effect, and if so, just what is it? A search of the literature reveals that there are at least three notions in circulation: a *performance* effect, a *capitalization* effect, and a *reversal* effect.

Performance effect

The performance version of the January effect may be the most widely cited. It holds that markets tend to perform better in Januarys than in the rest of the year. When we analyzed averages of monthly returns over the years 1926-2001 this hypothesis appeared correct, at least by a few percentage points. But the year-to-year fluctuations in market return swamp this minor difference in statistical terms for all but small-cap stocks.

The chart in **Figure 1** sets out the mean returns by month for the stocks of big companies (*Big-Cap*), small companies (*Small-Cap*), and the difference between the Small- and Big-Cap returns (*Spread*). Error bars on the columns report the standard deviation of each mean. The exact values are reported in **Table 1**.

In the big-cap issues the mean January return, although higher on average than some other months, is not significantly different than the big-cap mean for All months as reported in the last grouping of columns. For small-cap stocks, however, the January mean return is dramatically bigger than the All-months mean, and that difference is statistically significant by more than five standard deviations. This effect is present in three out of four years since 1926. (See the “Batting Average” figure reported in **Table 1**. For the Big-Cap and Small-Cap stocks rows this batting average figure represents the percentage of the time that those stocks in that month outperformed their overall average return.)

Even if strictly true, this performance form of the January effect seems to be more of a statistical oddity than something that could be exploited by institutional investors who need to be fully invested year-round. We focused our attention on the other two forms that conceivably could be the subject of tactical or strategic portfolio action.

Capitalization effect

The capitalization form of January effect posits a tendency for small cap stocks to outperform big cap stocks in January. The results from **Figure 1** again make it clear that, on average, this version is correct. The *Spread* bar shows that the difference between small- and big-cap stocks is significantly different than zero, not just in January, but in February too, though to a lesser degree. In addition, there is a perverse capitalization effect in October, as big-cap issues generally outperform small-cap.

This cap effect is even more pervasive than the performance version; small-cap stocks have outperformed big-cap by at least some small amount in over 80 percent of the Januarys on record. This is reported as the “Batting Average” item in **Table 1**, the percentage of the time that small-cap stocks outperformed big-cap during a particular month.

The capitalization January effect offers at least theoretical benefit to equity portfolio managers. A strategy of shifting into smaller cap issues at year-end and holding them through the first two months of the following year could be profitable, at least in comparison to a big-cap benchmark. The cap effect is so pervasive (80% of the Januarys) that there really is no incentive to try to forecast it.

Reversal effect

In the reversal form of January effect, stocks that have displayed a strong price trend over previous months tend to reverse in Januarys and then reestablished their trends in February. (We believe we were among the first to document this effect and the potential portfolio benefit that accrues from avoiding price momentum at year-end.¹) The reversal form flies in the face of typical price behavior during the rest of the year. It is well known that in the US markets stocks generally persist in six- to twelve-month price trends. This can be easily confirmed by anyone with access to modern financial databases.

For the purposes of this study we used results from our own **Columbine Alpha Factor** as the measure of price momentum. But we have observed the reversal form of January effect in every measure of price momentum we have ever examined. If anything, we believe that less sophisticated models of price momentum or simple relative strength measures are even more likely to experience the reversal form of January effect.

The January reversal of the normal pattern of price momentum is illustrated in **Figure 2**. The graph charts the average active return (excess over the universe) month-by-month for the *Top* and *Bottom* deciles of the **Columbine Alpha Factor**, as well as the *Spread* (top decile minus bottom decile). Results are based on application of the model to the stocks of the *Columbine 1500 Universe* over the period 1971 through October of 2001. Just as in the prior graph, error bars set out the standard deviation of the means expressed by each column. In addition to the summary data for *All* months, in **Figure 2** we have added a final group of columns (*Ex-Jan*) that illustrate the overall results when Januarys are excluded from the computations. **Table 2** presents the numbers behind the graph in tabular form.

Looking at **Figure 2** it is easy to see why we have always recommended that price momentum (ours or anybody else's) not be used at year-end. Price momentum's average active returns are significantly inverted in January, and the overall average active returns and spread can be improved by excluding that month. Compare the results for the *All* and *Ex-Jan* groups of columns. Columbine Alpha's negative average top-bottom spread in January is significant by about two sigma.

The reversal form of January effect is not quite as consistent as the other two forms. The Batting Average figures reported in **Table 2** set out the percentage of the time that returns were "correct" in a given month. For the top decile that means that the average active return was positive, for the bottom decile that the average active return was negative, and for the spread that the top minus bottom spread was positive. The batting average for spread in January is only about 42%, meaning that in only 42% of the Januarys did price momentum generate a positive top-bottom spread. For the non-January months the spread batting average centers around 70%.

If a reversal effect occurred every year it would quickly be exploited by low transaction cost market participants. However, this form of January effect is distributed very strangely. A few years display an extreme effect, but there seems to be no January with an equally strong effect in the opposite direction. **Figure 3** illustrates the annual pattern of top-bottom spreads. It appears that in 2/3 of the Januarys there is no strong effect; weak and strong stocks exhibit normal fluctuation about a near zero average. In roughly 1/3 of Januarys there is a substantial effect. The dashed lines represent a ± 1 standard deviation band around the mean spread from the non-January months (+2.2%). In the majority of years the January price momentum spread is close to, or within the expected range of the non-January spreads. There are, however, some significant exceptions: 1971, 1974, 1975, 1988, 1992, and most dramatically, 2001.

What causes it?

The reversal version of the January effect seems to be a tax-related phenomenon. For example, suppose that in mid-December a taxable investor holds a stock that has been up strongly for the year and is considering selling it to take profits. If sold before year-end, taxes on the gains must be paid four months later in April. If the investor delays selling a few weeks until early January the tax will not be due until April of the following year. The time value of the tax not paid is obvious. Similarly, stocks with large declines for the year, if sold before year-end, produce losses that are valuable to offset gains and reduce taxes due in April. Investors have a similar tax-driven incentive to recognize those losses in December rather than wait until early January when the benefits won't be seen for another year. A further imperative for sales to offset existing realized gains comes from the uncertainty of gains in the following year.

It's easy to see how this tax induced effect might make stocks that have been strongly up for the year continue strong through December then drop in early January while stocks down strongly for the year might be forced even lower in December and rebound a bit in January.

Institutions are alleged to engage in year-to-year window dressing. The window dressing effect has institutions anxious to display this year's big winners in their holdings, and equally anxious to remove losers. If true, this works to strengthen the January reversal effect, but it is, of course, not tax driven.

Some have suggested that in recent years the January reversal effect may have shifted into the fourth quarter of the year. It is certainly possible that the delay and acceleration of sales could begin earlier, but pressure would not be released until the first of January. The monthly results in **Figure 2** do show lower than average top-decile active returns in October and November, but the spreads for those months are roughly normal. In fact, the October-November data does not look as bad as that for March or May—they all are weaker than average but not reversed. December's results actually are better than the overall average.

But perhaps this shift is a recent phenomenon. If we confine the study to only the past ten years, October does have a small negative spread on average, but the mean is not significant given the smaller data set. November is also weaker than the overall, but again not to a significant degree. Looking just at the past ten years the December results not only show no reversal, they become some of the best returns of the calendar year.

It is less obvious, but the capitalization version of the January effect may be tax driven too. Consider two stocks with identical capitalizations at the beginning of the year. Suppose one doubles in price while the other declines 50 percent. Of course the gainer will be larger capitalized than the loser, and the reversal effect will make it appear that the small-cap stock outperformed the big-cap at year-end.

Some money managers have learned to avoid being long big-cap risers at the year-end and short small-cap losers, but it is difficult and potentially costly to suffer the increased transaction costs of actively adjusting a large portfolio when it is futile 2/3 of the time. Clearly, some metric for predicting when a reversal January effect is likely would be helpful.

Predicting the January reversal

In our efforts to develop a predictor for the January reversal effect we examined valuation/momentum cycles, a wide range of fundamental factors, economic activity, market direction, and trading volume before settling on our current formulation. The approach we took allows us to make a forecast at the end of November of the price momentum top-bottom spread to be expected in the following January. Remember we pointed out that the reversal effect is non-linear; our forecaster reflects that fact. The most positive forecast it will make is a January spread of 0%. It seems to function quite well, however, at giving warning of those 1/3 of the Januarys when price momentum is likely to reverse spectacularly.

Figure 4 plots the January top-bottom spread forecast by our predictor on the horizontal axis, and the subsequent actual January spread on the vertical. The chart covers the years 1971 through 2001 in the stocks of the *Columbine 1500 Universe*. The measure never

predicts a spread greater than zero, so most of the forecasts line up on the vertical axis. You can see, however, that all of the actual spreads associated with a zero forecast are roughly within the range of what we would expect from any other month. None of the extreme actual spreads occurred in years when the forecast was zero. In fact, every time the predictor forecast a negative spread for January that was what happened (at least by a small amount). For those few years with extreme reversals the predictor's forecasts have been remarkably accurate, coming quite close to the actual magnitude of the subsequent January effect.

We have displayed the annual pattern of the predictor's forecasts and actual January spreads in **Figure 5**. The error bars associated with every forecast represent one standard deviation. For example, the 1974 forecast was a top-bottom spread of -21.3% , plus or minus 14.7% . That put the forecast substantially in the negative area, and the actual spread turned out to be -14.1% .

We suggest that a negative-spread forecast from this predictor indicates that price momentum should not be used at year-end. If we exclude all of the years for which the indicator forecast a negative spread from the overall measure, the average January spread changes from a -3.4% to a $+1.1\%$. In years when the forecast is zero, however, price momentum is probably safe to use just as in any other month.

2002 Forecast

You may note that the forecast for January 2002 is plotted in **Figure 5**. Extrapolating from conditions in late November, our indicator forecasts a strong January reversal effect for 2002. We anticipate a top-bottom price momentum reversal of -18% , plus or minus 13% .

With all the appropriate cautions called for by the small number of observations at the extreme negative levels of reversal, and by the fact that our study is based entirely on perfect hindsight, it appears that January 2002 will be a good time to avoid the use of price momentum. We will be zero-weighting the **Columbine Alpha Factor** in all of our multifactor models from mid-December to mid-January.

Notes

¹ Brush, J.S. 1986. "Eight Relative Strength Models Compared." *Journal of Portfolio Management*, vol. 13, no. 1 (Fall):21-28.

Table 1. Average Stock Returns by Month: 1926-2001

Big-Cap Stocks													
	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	All
Mean	1.7%	0.5%	0.5%	1.4%	0.5%	1.4%	1.9%	1.5%	-0.8%	0.3%	1.3%	1.8%	1.0%
Standard Deviation	4.8%	4.3%	5.3%	6.9%	5.9%	5.4%	6.4%	6.5%	6.0%	6.1%	5.3%	3.7%	5.6%
Std Dev of Mean	0.5%	0.5%	0.6%	0.8%	0.7%	0.6%	0.7%	0.8%	0.7%	0.7%	0.6%	0.4%	0.2%
Batting Average	56.6%	46.1%	51.3%	51.3%	52.6%	50.0%	56.6%	59.2%	40.8%	46.1%	55.3%	65.8%	52.7%
Small-Cap Stocks													
	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	All
Mean	6.4%	1.9%	0.1%	1.2%	0.6%	1.1%	2.0%	1.6%	-0.7%	-0.9%	1.2%	1.2%	1.3%
Standard Deviation	8.6%	6.6%	7.8%	9.7%	10.4%	8.0%	8.1%	10.3%	9.5%	8.2%	7.2%	6.1%	8.6%
Std Dev of Mean	1.0%	0.8%	0.9%	1.1%	1.2%	0.9%	0.9%	1.2%	1.1%	0.9%	0.8%	0.7%	0.3%
Batting Average	73.7%	53.9%	50.0%	55.3%	47.4%	43.4%	50.0%	50.0%	36.8%	39.5%	52.6%	55.3%	50.8%
Spread (Small- minus Big-Cap Return)													
	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	All
Mean	4.7%	1.4%	-0.4%	-0.2%	0.0%	-0.2%	0.1%	0.1%	0.2%	-1.3%	-0.2%	-0.5%	0.3%
Standard Deviation	6.2%	4.8%	4.4%	4.5%	6.8%	4.0%	4.2%	5.5%	5.2%	3.8%	3.9%	4.0%	5.0%
Std Dev of Mean	0.7%	0.5%	0.5%	0.5%	0.8%	0.5%	0.5%	0.6%	0.6%	0.4%	0.5%	0.5%	0.2%
Batting Average	80.3%	56.6%	47.4%	46.1%	44.7%	42.1%	47.4%	50.0%	51.3%	36.8%	44.7%	47.4%	49.7%

Table 2. Average Price Momentum Active Returns by Month: 1971-2001

Top Decile														
	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	All	Ex-Jan
Mean	-0.6%	2.0%	0.4%	0.7%	0.3%	2.0%	0.4%	1.0%	1.2%	0.4%	0.7%	2.1%	0.9%	1.0%
Standard Deviation	4.8%	6.6%	4.4%	2.7%	3.1%	4.5%	2.4%	2.7%	2.0%	3.2%	3.0%	3.9%	3.8%	3.7%
Std Dev of Mean	0.9%	1.2%	0.8%	0.5%	0.6%	0.8%	0.4%	0.5%	0.4%	0.6%	0.5%	0.7%	0.2%	0.2%
Batting Average	45.2%	67.7%	77.4%	74.2%	61.3%	74.2%	54.8%	61.3%	83.9%	58.1%	51.6%	61.3%	64.6%	66.4%
Bottom Decile														
	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	All	Ex-Jan
Mean	2.7%	-1.3%	-0.5%	-0.6%	-0.1%	-2.2%	-1.4%	-0.8%	-2.4%	-1.4%	-0.9%	-1.7%	-0.9%	-1.2%
Standard Deviation	6.5%	4.0%	2.7%	3.3%	2.8%	2.7%	3.9%	3.7%	3.9%	6.1%	4.7%	3.1%	4.3%	3.8%
Std Dev of Mean	1.2%	0.7%	0.5%	0.6%	0.5%	0.5%	0.7%	0.7%	0.7%	1.1%	0.8%	0.6%	0.2%	0.2%
Batting Average	38.7%	67.7%	64.5%	74.2%	58.1%	77.4%	83.9%	58.1%	83.9%	80.6%	54.8%	74.2%	68.4%	71.1%
Spread (Top minus Bottom decile)														
	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	All	Ex-Jan
Mean	-3.4%	3.3%	1.0%	1.2%	0.4%	4.2%	1.8%	1.8%	3.6%	1.8%	1.6%	3.8%	1.8%	2.2%
Standard Deviation	10.4%	9.3%	5.5%	5.1%	4.8%	6.1%	5.1%	4.9%	4.8%	7.7%	5.4%	6.0%	6.7%	6.1%
Std Dev of Mean	1.9%	1.7%	1.0%	0.9%	0.9%	1.1%	0.9%	0.9%	0.9%	1.4%	1.0%	1.1%	0.3%	0.3%
Batting Average	41.9%	71.0%	77.4%	71.0%	54.8%	77.4%	74.2%	61.3%	83.9%	77.4%	58.1%	71.0%	68.6%	71.1%

Figure 1. Average Stock Returns by Month: 1926-2001

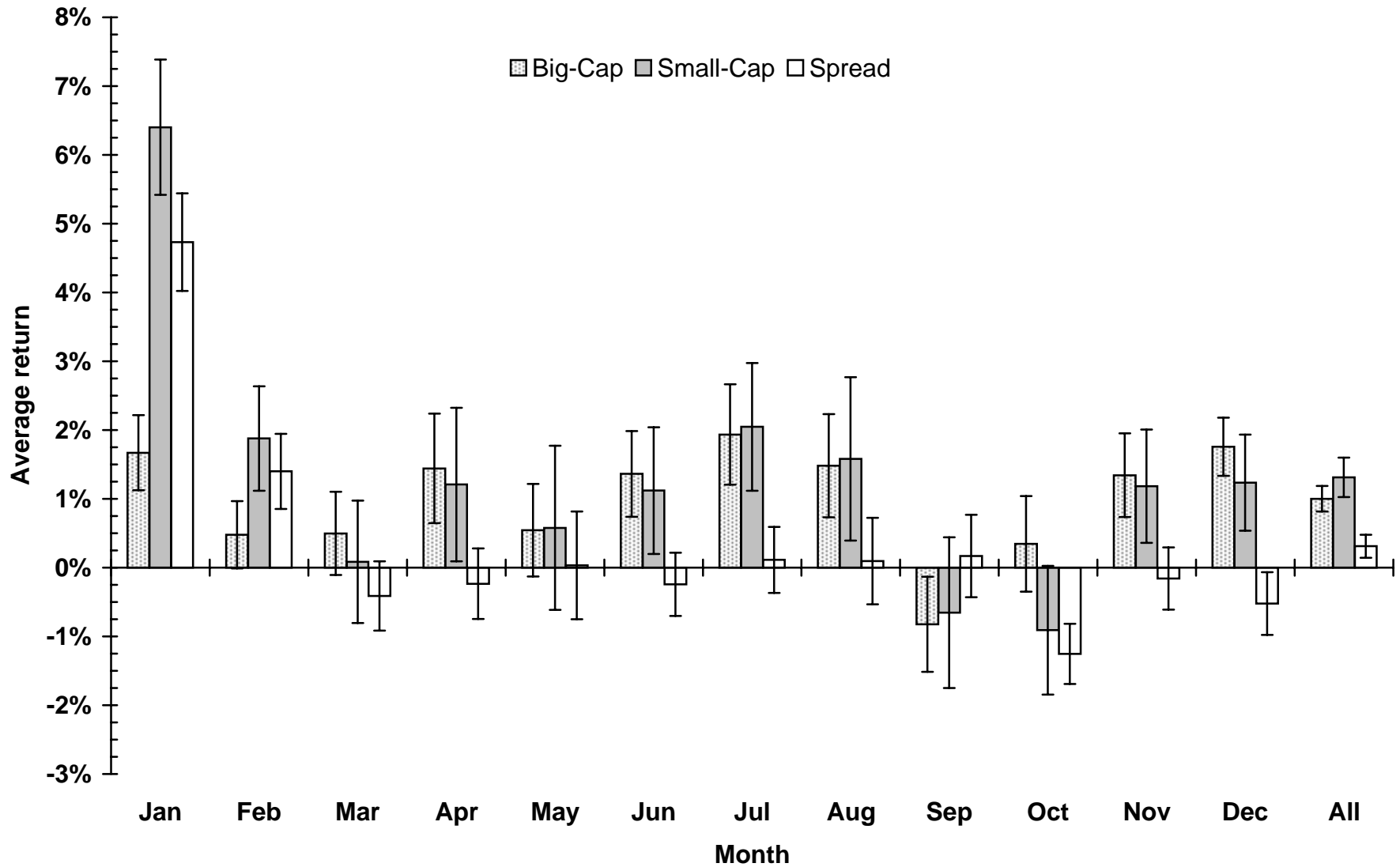


Figure 2. Price Momentum Active Returns by Month: 1971-2001

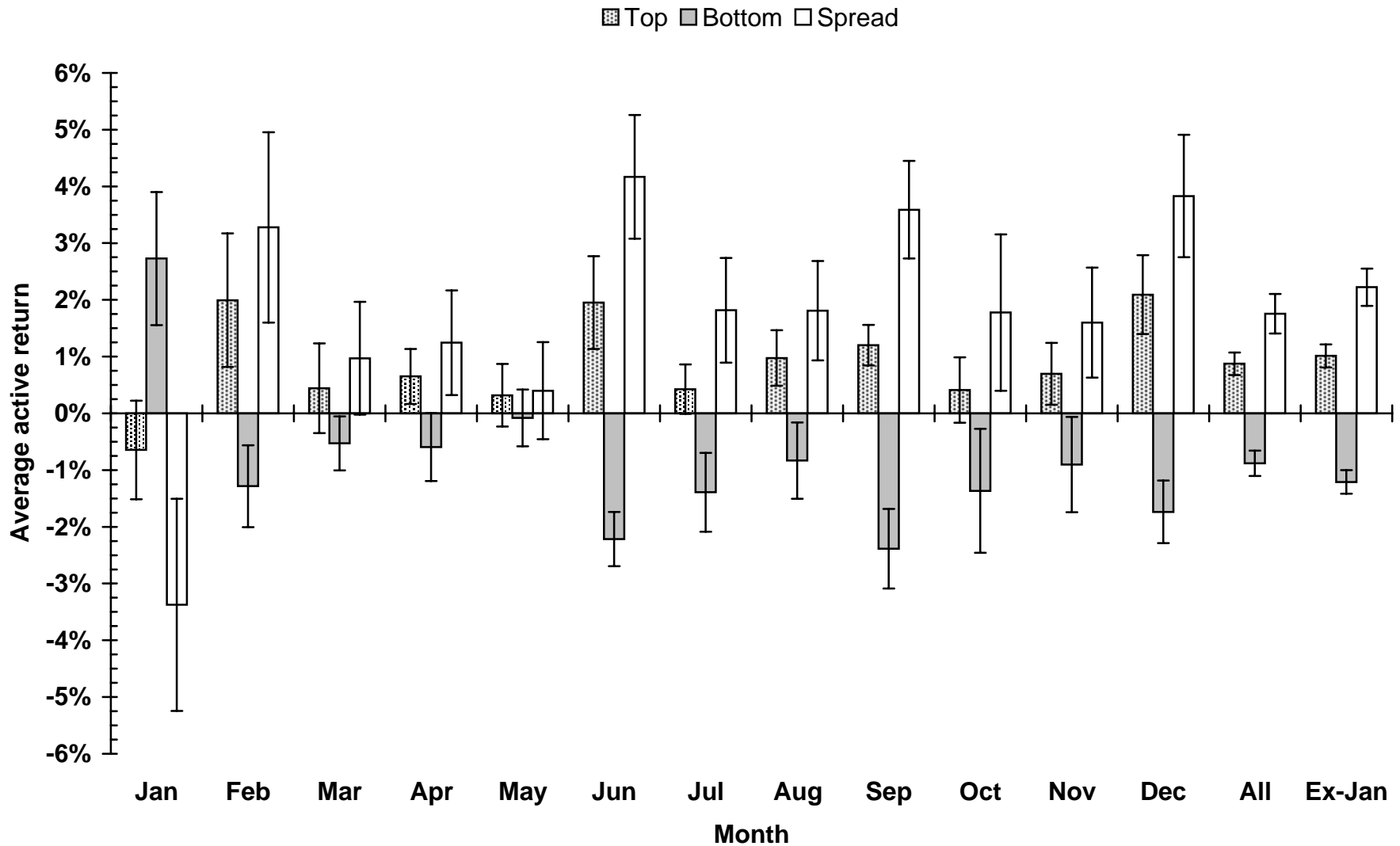


Figure 3. January Reversal Effect by Year

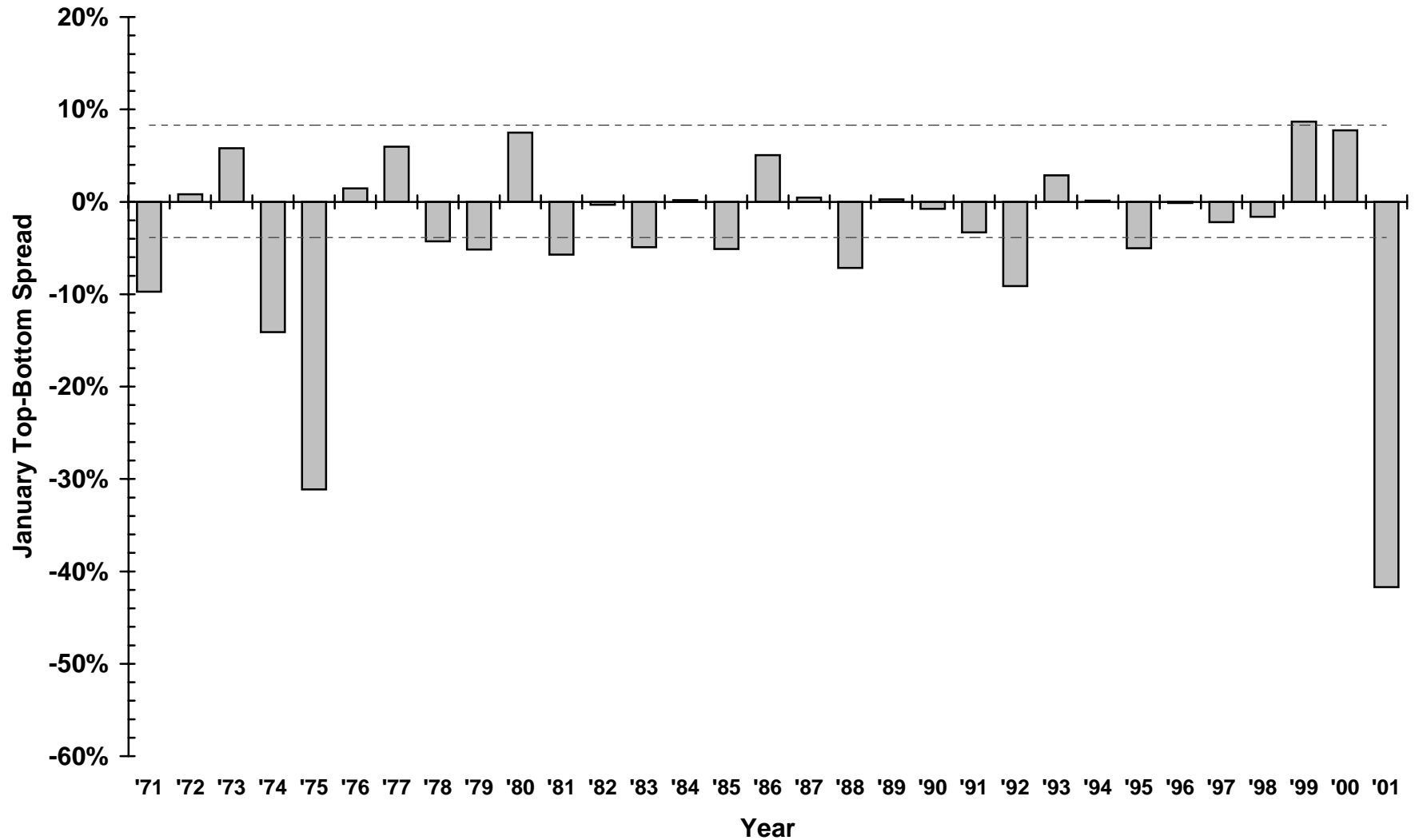


Figure 4. Forecast vs. Actual January Reversal Effect

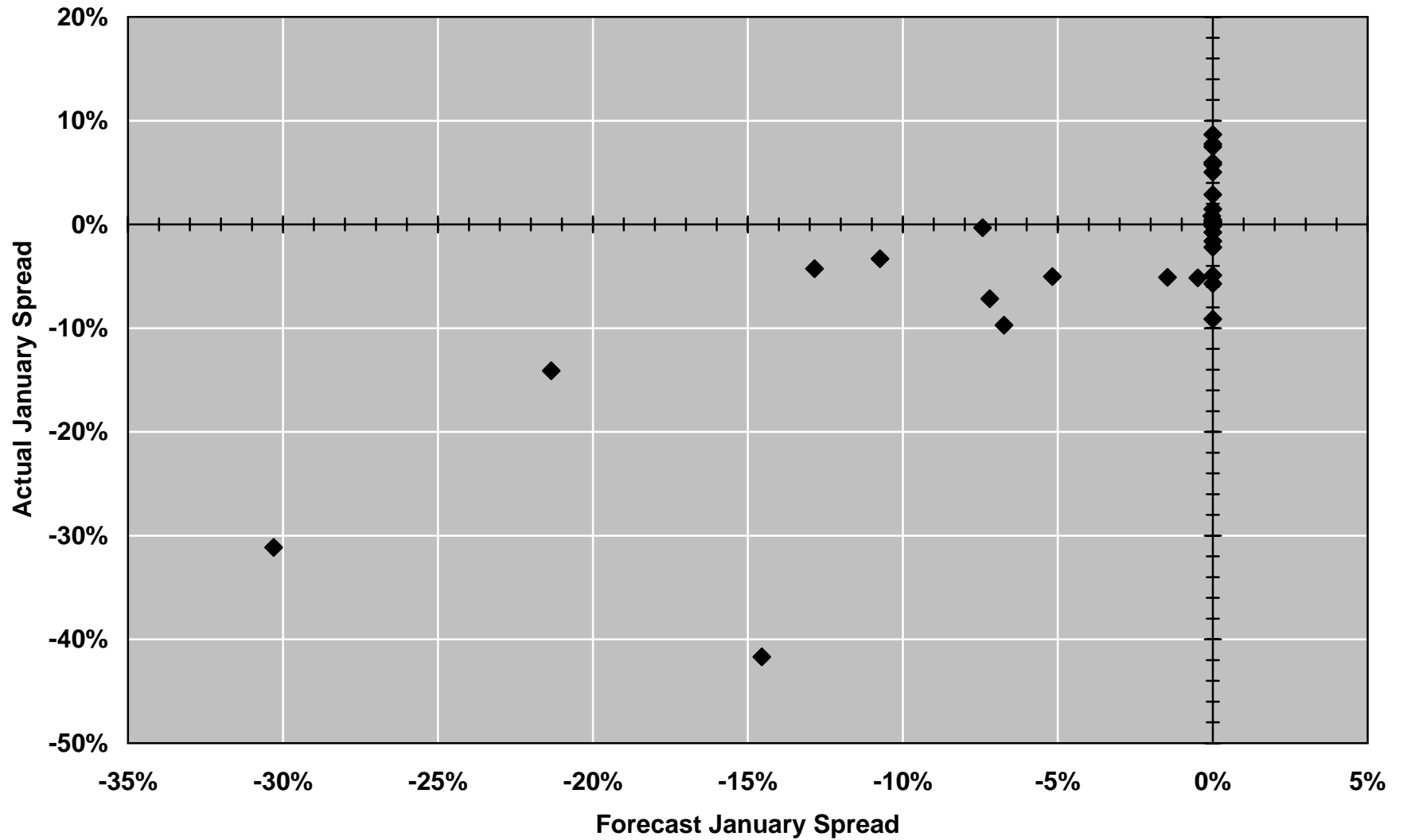


Figure 5. January Reversal Effect Predictor by Year

