

# "Using Momentum for a Long-Only Strategy in US Market" A Historical Review

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## Introduction

Momentum is a well-known market anomaly indicating persistence of market returns. Rising markets tend to continue to rise, and falling markets tend to continue to fall. Studies have shown that the momentum phenomenon persists across many markets. Generally, momentum is applied in rule-based, systematic, and disciplined strategies for building more efficient portfolios.<sup>1</sup>

Momentum has been applied as a cross-market relative strategy with long positions in markets with higher momentum, and short positions in markets with lower momentum. Momentum has also been applied as a long-only strategy selecting individual stock with highest (e.g. top 20%) momentum. It has also been applied to single markets as a signal for long positions when momentum is positive and as signal for short position when momentum is negative – known as “Time-Series Momentum”.

In this note, we are focused on using momentum as a risk-management tool in a long-only strategy for investing in US equities market. Using historical simulations beginning in 1971, we have found that reallocating from US equities to a money market investment when momentum was negative resulted in superior returns versus a simple buy and hold strategy. In addition to higher average return, lower standard deviation, and lower drawdown (drop from previous peak), we have found that in any 5-year period since 1971, following momentum was always profitable.

## Data and Methodology

Our data set is the total return including dividend of MSCI US Index, dating back to 1970 and through June of 2013. At end of each month, we have used the trailing 12-month total return of the index as the signal. If that return was positive, for the next month we fully invested in the index. Otherwise, we fully invested in a hypothetical US T-Bill money market fund. Hence, using momentum terminology, our “look-back” period is twelve months, and our “holding” period is one

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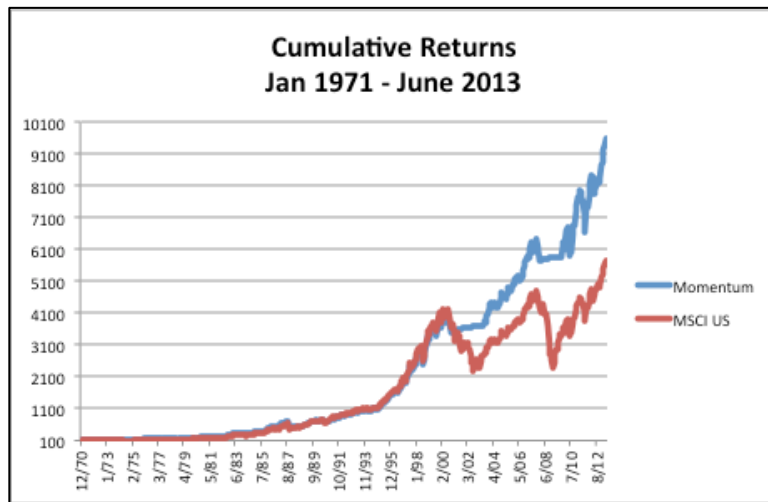
<sup>1</sup> Since early 90's numerous academic and practical papers have been published on momentum investing. For recent references, see Ilmanen (2011), Moskowitz (2010), Moskowitz et al (2011), Nozari (2013), and Antonacci (2013).

month. For the money market fund, we estimated its return as the trailing 3-month average yield of the 3-Month US Treasury Bill.

### Historical Results

Figure 1 shows the cumulative return of momentum strategy (MO) versus the index from January of 1971 thru June 2013. Figure 2 shows the various long-term performance measures. These charts show that during this period of more than 42 years, with frequent dislocation of various magnitudes in the US equity markets, the momentum strategy produced, on average, an annual return of about 1.3% higher than the index. This was accomplished along with a significantly lower annual standard deviation and smaller drawdown. Hence, resulting in higher “reward/risk ratios”.

**Figure 1. Cumulative Returns**

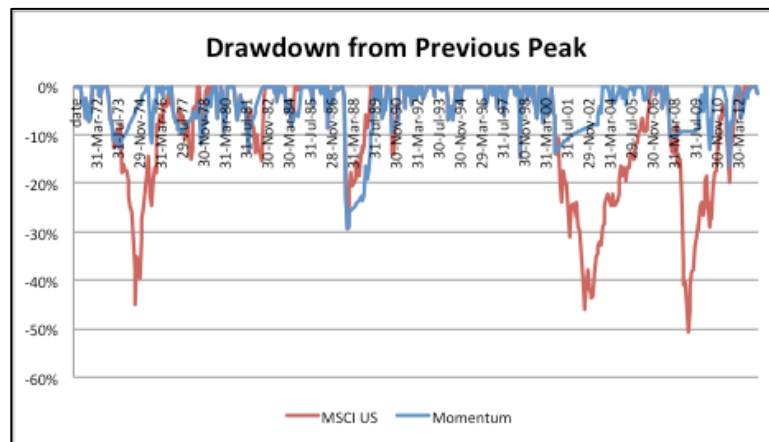


**Figure 2. Summary Statistics**

	Jan 1971 - June 2013		
	MSCI US	MO	Diff
<b>Avg Annual Return</b>	9.9%	11.3%	1.3%
<b>Standard Deviation</b>	15.4%	12.2%	-3.3%
<b>Max Drawdown</b>	50.6%	29.4%	-21.2%
<b>Sharpe Ratio</b>	30%	49%	19%
<b>Avg Ret / Std Dev</b>	64%	93%	28%
<b>Avg Ret / Max DD</b>	20%	38%	19%

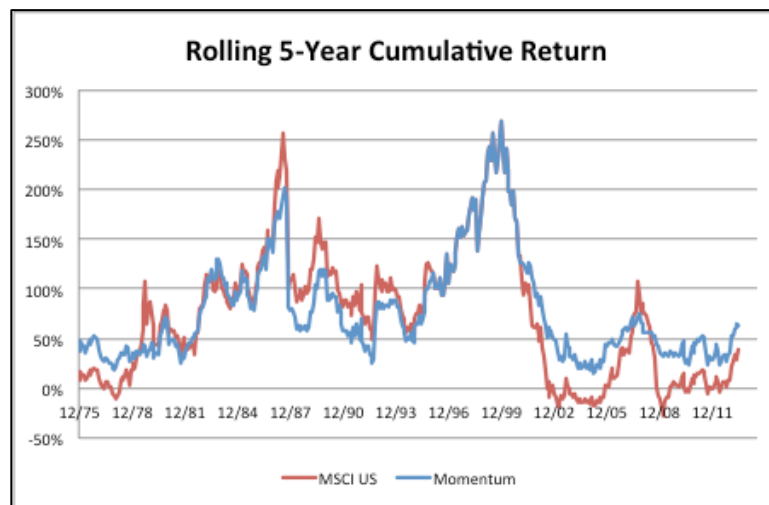
Figure 3 shows the results of the drawdown analysis on a monthly basis. As can be seen, using 1-year momentum as a risk management tool was effective in 1970's, and in the 2000s. Indeed, avoiding these large events was the source of the better long-term return profile. It is important to note that momentum strategy was effective over the long run, but not over every possible time window. For example, in the market crash of October 1987, momentum produced the same result as the index, but then trailed the index as it switched to money market while the index enjoyed a recovery rally.

**Figure 3. Drawdown Statistics**



Focusing on a longer-term perspective, Figure 4 shows the 5-year rolling cumulative return for both the index and our momentum strategy. The chart shows that unlike the index, in every 5-year holding period since 1971, momentum strategy produced positive returns (it was always profitable).

**Figure 4. Rolling 5-year cumulative return**



### Calendar Year Analysis

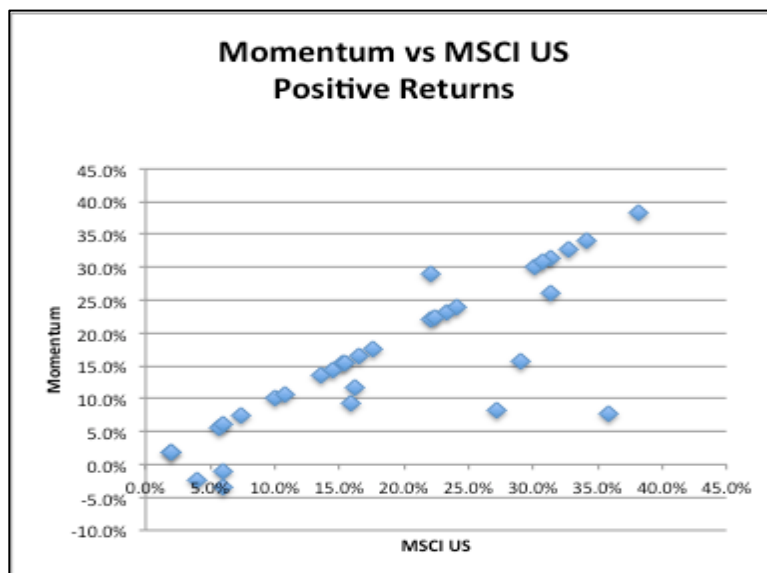
Over the 42 calendar years of the study, MSCI US had 33 years (78%) of positive returns and only 9 years (22%) of negative returns -- with the worst year return of -37% in 2008. While not exactly in the same years, momentum strategy also had 9 years of negative returns, with the worst return of -12% in 2000. Figure 5 compares the results for the 9 years that the index experienced negative returns. In 8 of those 9 negative years, momentum produced significantly higher annual return – see Figure 5. In other words, for the most part, momentum met its goal of avoiding the bad years.

**Figure 5. Years of negative performance for MSCI US**

Year	MSCI US	Momentum	Diff
1973	-16.2%	-10.5%	5.8%
1974	-27.7%	8.0%	35.7%
1977	-8.0%	-7.6%	0.4%
1981	-4.1%	-4.0%	0.1%
1990	-2.1%	-3.7%	-1.6%
2000	-12.5%	-12.0%	0.6%
2001	-12.0%	4.0%	16.1%
2002	-22.7%	1.7%	24.4%
2008	-37.1%	-4.7%	32.4%

Figure 6 shows how momentum strategy participated in all the good years for the index. As pointed out earlier, in the past 42 years, the index offered 33 years of positive returns, and momentum strategy participated in 30 (90%) of those good years. And, in 23 of those positive years, momentum matched the performance of MSCI US.

**Figure 6. Years of positive performance for MSCI US**



## Performance in Recovering Rallies

Figure 7 compares the performance of MSCI US and momentum in every calendar year. It shows that in the 3 major dislocations in the 1970s and 2000s momentum performed as was expected in the downside. On the other hand, momentum did not fully participate in the subsequent recovery rallies. In those three recoveries, momentum did produce solid positive returns, but not as strong as the index.

The lack of full participation in recovering rallies was also the cause of underperformance in 1987 and 1988. Post the crash, the momentum strategy switched to money market and missed the equity rally. As a result, it underperformed the index by about 6.5% in each of those two years. But, the negative return in 1987 was only -2.5%, and the momentum had positive return of over 9% in 1988.

**Figure 7. Calendar-Year Performance**

Year	MSCI US	Momentum	Diff	Year	MSCI US	Momentum	Diff
1971	13.5%	13.5%	0.0%	1992	7.4%	7.4%	0.0%
1972	16.6%	16.6%	0.0%	1993	10.1%	10.1%	0.0%
1973	-16.2%	-10.5%	5.8%	1994	2.0%	2.0%	0.0%
1974	-27.7%	8.0%	35.7%	1995	38.2%	38.2%	0.0%
1975	35.8%	7.8%	-28.0%	1996	24.1%	24.1%	0.0%
1976	23.2%	23.2%	0.0%	1997	34.1%	34.1%	0.0%
1977	-8.0%	-7.6%	0.4%	1998	30.7%	30.7%	0.0%
1978	6.0%	-1.0%	-7.0%	1999	22.4%	22.4%	0.0%
1979	14.4%	14.4%	0.0%	2000	-12.5%	-12.0%	0.6%
1980	30.0%	30.0%	0.0%	2001	-12.0%	4.0%	16.1%
1981	-4.1%	-4.0%	0.1%	2002	-22.7%	1.7%	24.4%
1982	22.1%	29.0%	6.9%	2003	29.1%	15.8%	-13.3%
1983	22.0%	22.0%	0.0%	2004	10.7%	10.7%	0.0%
1984	6.0%	-3.4%	-9.4%	2005	5.7%	5.7%	0.0%
1985	32.8%	32.8%	0.0%	2006	15.3%	15.3%	0.0%
1986	17.5%	17.5%	0.0%	2007	6.0%	6.0%	0.0%
1987	3.9%	-2.5%	-6.4%	2008	-37.1%	-4.7%	32.4%
1988	15.9%	9.3%	-6.6%	2009	27.1%	8.3%	-18.9%
1989	31.4%	31.4%	0.0%	2010	15.4%	15.4%	0.0%
1990	-2.1%	-3.7%	-1.6%	2011	2.0%	2.0%	0.0%
1991	31.3%	26.1%	-5.3%	2012	16.1%	11.7%	-4.4%

## Conclusion

Using a historical simulation study we have shown that since 1971 using 12-month return of MSCI US index as a momentum signal has been effective for avoiding large secular equity market downturns, and for participating in longer market rallies. It produced higher average returns, lower standard deviation, and lower drawdowns. While there is no guarantee that future performance be similar to that of the past, this study confirms the persistence of the anomaly that rising markets tend to continue to rise, and falling markets tend to continue to fall. And utilizing that anomaly may be an effective risk management tool for protecting against secular dislocations, and for offering higher long-term returns.

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