# The Trend *is* Your Friend

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John Hussman's recent market commentary, The Trend is Your Fickle Friend, highlighted the limitations of trend-following investment strategies that rely on moving-average crossover rules as a primary filter. But an extensive study conducted by our firm demonstrated that a simple moving-average crossover system outperforms buy-and-hold, while reducing drawdown risk and volatility.

Hussman is not a fan of this approach, and he cites studies that (correctly) highlight two important drawbacks of tactical strategies based on moving averages. First is the risk of being "whipsawed" by counter-productive trading. In a choppy, trendless market environment, moving-average crossover strategies sometimes buy into rallies just before those rallies fail, or sell into corrections that promptly reverse and turn higher.

The recent market environment of policy-driven swings in market sentiment between risk-on and risk-off is a perfect example of the whipsaw hazard, which leads to the second drawback of these strategies – tracking error. Moving-average strategies can produce very wide gaps in relative performance, as compared to buy-and-hold benchmarks, over time periods as short as one to five years.

In the end, Hussman concludes, "Typically, the best that can be achieved with popular moving-average crossover systems is a moderate reduction in drawdown risk, but zero or negative incremental long-term return versus buy-and-hold."

While there is a case to be made for Hussman's point of view, I have a deep conviction that moving-average crossover strategies work, and it's based on extensive research conducted by analysts at my firm, Capital Advisors, Inc. Our work in this area suggests that simple moving-average strategies can deliver substantial benefits for investors in the areas of diversification and risk management.

Such strategies can be particularly effective in addressing three important challenges in portfolio management:

1. Reducing drawdown risk
2. Narrowing the range of expected outcomes over rolling forecast periods of three to five years
3. Reducing the frequency of negative returns over rolling periods of three to five years

For investors who follow goals-based planning strategies built around absolute, rather than relative, return objectives, moving-average strategies offer a new approach to diversification and risk management when used as a complement to more traditional, buy-and-hold allocations.

**Study methodology**

The remainder of this article presents data from an extensive study we at Capital Advisors conducted of every country-specific equity market index tracked by MSCI with at least 40 years of history – 18 different indexes in all. The study measured numerous characteristics for each country index, using a tactical strategy driven by a moving-average crossover signal.

Data for this study was obtained from MSCI. It is not possible to invest directly in any of the strategies presented here. Transaction costs and taxes would reduce the annualized return of the tactical strategy if executed with real capital.

At each month-end during the study period, the price of the market index was compared to its trailing six-month moving average. If the current price of the index was above its moving average, we assumed that the tactical strategy held the market index for the subsequent one-month period. When the index closed below its moving average at the end of a month, the tactical strategy switched to the *BarCap Aggregate Bond Index* for the subsequent one-month period. This binary trading rule was applied monthly throughout the 41-year study period, between January 1971 and December 2011.

For example, the data below show that the tactical strategy reduced substantially the maximum drawdown risk as compared to the analogous buy-and-hold index over rolling three-year and five-year holding periods (measured as of each month-end). There were no exceptions to this finding among the 18 countries included in the 41-year study.

***Hypothetical Back-Test Study***
***Maximum Drawdown***
***1971 - 2011***

| | Rolling 36-Months | | Rolling 60-Months | |
|---|---|---|---|---|
| | Tactical | Buy & Hold | Tactical | Buy & Hold |
| Australia | -33.08% | -34.36% | -15.78% | -28.93% |
| Austria | -26.54 | -70.39 | -17.18 | -67.72 |
| Belgium | -44.27 | -63.21 | -42.62 | -54.30 |
| Canada | 1.95 | -34.04 | 7.40 | -20.63 |
| Denmark | -20.73 | -31.33 | -18.85 | -21.84 |
| France | -14.50 | -49.61 | 3.33 | -32.49 |
| Germany | -15.27 | -63.53 | -3.74 | -49.18 |
| Hong Kong | -33.53 | -68.10 | -32.70 | -68.72 |
| Italy | -34.22 | -66.31 | -36.38 | -68.38 |

| | | | | |
|---|---|---|---|---|
| Japan | -11.25 | -58.44 | 6.24 | -45.21 |
| Netherlands | -26.83 | -48.30 | -8.76 | -42.79 |
| Norway | -15.84 | -55.61 | -13.43 | -62.64 |
| Singapore | -15.66 | -61.04 | 6.50 | -51.18 |
| Spain | -23.05 | -66.93 | -24.83 | -65.75 |
| Sweden | -10.68 | -68.45 | 26.32 | -38.80 |
| Switzerland | -20.77 | -37.17 | -12.38 | -32.86 |
| United Kingdom | -26.10 | -64.18 | -18.90 | -47.08 |
| United States | -11.43 | -43.98 | 10.66 | -20.50 |

The tactical strategy also yielded both a much narrower range of outcomes and a lower frequency of negative returns over intermediate holding periods throughout the study. The data below summarize these two metrics for the tactical strategy versus buy-and-hold over 463 overlapping three-year holding periods (measured monthly) between 1971 and 2011.

***Hypothetical back-test study***
***Range of outcomes and frequency of losses***
***463 overlapping three-year periods***
***1971 - 2011***

| | **Best period minus worst period** | | **% of periods negative** | |
|---|---|---|---|---|
| | **Tactical** | **Buy & Hold** | **Tactical** | **Buy & Hold** |
| Australia | 153.7% | 223.4% | 8.2% | 22.5% |
| Austria | 348.3* | 372.9 | 8.6 | 34.8 |
| Belgium | 349.6 | 414.5 | 9.9 | 24.6 |
| Canada | 135.4 | 190.8 | None | 18.6 |
| Denmark | 237.1 | 277.0 | 8.2 | 16.0 |
| France | 305.2* | 331.3 | 5.8 | 27.2 |
| Germany | 207.3 | 309.5 | 3.9 | 24.6 |
| Hong Kong | 339.0 | 485.8 | 11.4 | 22.2 |
| Italy | 541.9* | 491.4 | 18.1 | 38.7 |
| Japan | 404.3* | 437.7 | 1.9 | 32.6 |
| Netherlands | 237.0 | 297.2 | 6.5 | 20.3 |
| Norway | 254.1 | 362.8 | 9.7 | 33.7 |
| Singapore | 359.1 | 521.4 | 0.9 | 23.8 |
| Spain | 302.0 | 477.4 | 16.6 | 35.9 |
| Sweden | 202.6 | 302.7 | 1.3 | 21.2 |
| Switzerland | 224.6 | 251.3 | 7.3 | 20.1 |
| United Kingdom | 200.4 | 301.7 | 5.6 | 23.5 |
| United States | 142.8 | 178.5 | 6.5 | 19.2 |

* Countries marked with an asterisk indicate that the best three-year period for the tactical strategy was higher than the best three-year period for buy-and-hold. In these instances, the

spread between the best-case and worst-case outcomes is wide for the tactical strategy for a good reason – i.e. better outcomes on the best-case *and* worst-case metrics compared to buy-and-hold.

The tactical strategy delivered substantial diversification benefits during periods when the buy-and-hold strategy delivered negative returns. The table below shows the three-year return for the tactical strategy during whichever period represented the single-worst three-year outcome for buy-and-hold for each country included in the study.

***Hypothetical back-test study***
***Relative return during the worst 3-year period for buy-and-hold***
***463 overlapping three-year periods***
***1971 - 2011***

| | **Buy & Hold Corresponding Worst 36-Mos.** | **Corresponding Tactical Return** |
|---|---|---|
| Australia | -34.36% | 26.76% |
| Austria | -70.39 | 26.34 |
| Belgium | -63.21 | 21.39 |
| Canada | -34.04 | 18.21 |
| Denmark | -31.33 | -20.73 |
| France | -49.61 | -8.11 |
| Germany | -63.53 | 4.81 |
| Hong Kong | -68.10 | -19.11 |
| Italy | -66.31 | -18.36 |
| Japan | -58.44 | -4.69 |
| Netherlands | -48.30 | 15.95 |
| Norway | -55.61 | -15.84 |
| Singapore | -61.04 | 12.40 |
| Spain | -66.93 | -0.08 |
| Sweden | -68.45 | -10.68 |
| Switzerland | -37.17 | 27.93 |
| United Kingdom | -64.18 | 7.69 |
| United States | -43.98 | -2.25 |

Despite the potential benefits of the tactical strategy presented above, it did little better than a coin-toss at outperforming buy-and-hold over shorter time periods. The frequency of outperforming buy-and-hold improved modestly as the holding period increased, but the win-loss ratio was balanced throughout the study period.

Investors seeking a “magic” strategy that captures the upside of the equity markets without downside risk will not find it in a moving-average crossover approach. The table below shows the relative returns of the tactical strategy versus buy-and-hold during overlapping one-year, three-year and five-year holding periods included in the study.

***Hypothetical back-test study***
***Percentage of periods when tactical outperformed buy-and-hold***
***1971 - 2011***

| | 12-Months | 36-Months | 60-Months |
|---|---|---|---|
| Australia | 44.6% | 51.0% | 55.8% |
| Austria | 67.6 | 69.3 | 83.6 |
| Belgium | 45.4 | 42.3 | 47.2 |
| Canada | 45.2 | 61.1 | 76.5 |
| Denmark | 56.9 | 56.2 | 62.0 |
| France | 51.5 | 65.0 | 62.2 |
| Germany | 42.7 | 42.1 | 54.7 |
| Hong Kong | 45.4 | 41.3 | 47.6 |
| Italy | 54.4 | 66.5 | 77.4 |
| Japan | 70.2 | 78.0 | 86.8 |
| Netherlands | 44.1 | 43.4 | 49.4 |
| Norway | 47.6 | 57.7 | 71.1 |
| Singapore | 60.0 | 67.0 | 72.9 |
| Spain | 49.7 | 49.7 | 56.5 |
| Sweden | 52.4 | 58.5 | 67.2 |
| Switzerland | 49.5 | 44.9 | 47.8 |
| United Kingdom | 50.3 | 53.6 | 53.1 |
| United States | 44.1 | 40.4 | 50.6 |

At times, tracking error was dramatic for the tactical strategy. The following table shows the maximum outperformance and underperformance of the tactical strategy relative to buy-and-hold over every rolling three-year holding period included in the study (measured monthly). Most countries in the study include a period when the tactical strategy under-performed buy-and-hold by *more than 100%* during a 36-month period. If the study period were extended through August, 2012, many countries, including the United States, would show dramatic underperformance for the tactical strategy relative to buy-and-hold over the most recent three-year period. The data below suggest that such episodes should be expected from time to time.

***Hypothetical back-test study***
***Maximum tracking error***
***463 overlapping three-year periods***
***Tactical vs. buy-and-hold 1971 - 2011***

| | Maximum Outperformance | Maximum Underperformance |
|---|---|---|
| Australia | 125.8% | -102.6% |
| Austria | 130.2 | -76.9 |
| Belgium | 102.4 | -107.8 |

| | | |
|---|---|---|
| Canada | 84.8 | -51.0 |
| Denmark | 118.9 | -35.0 |
| France | 99.0 | -118.7 |
| Germany | 86.6 | -82.2 |
| Hong Kong | 176.1 | -149.6 |
| Italy | 174.8 | -94.7 |
| Japan | 82.9 | -115.8 |
| Netherlands | 75.1 | -59.7 |
| Norway | 137.0 | -149.2 |
| Singapore | 164.8 | -116.9 |
| Spain | 107.8 | -180.4 |
| Sweden | 146.1 | -110.5 |
| Switzerland | 96.0 | -44.5 |
| United Kingdom | 88.4 | -90.8 |
| United States | 67.0 | -60.7 |

A final table below shows the cumulative annualized return and standard deviation for both strategies over the entire 41-year period of the study. This comparison is extremely favorable to the tactical strategy, despite frequent periods of under-performance relative to buy-and-hold, including the multiple three-year periods we have seen for most countries in the study when the cumulative underperformance exceeded 100%.

It bears noting that it's not possible to invest directly in these strategies. Transaction costs, taxes, and expense ratios would all eat into the advantage of the tactical strategy presented here. Nonetheless, our findings demonstrate *the way asset markets work* and that there were *no exceptions* among any of the markets to our finding that the tactical strategy offered benefits across 18 geographically diverse countries, cultures and geopolitical systems.

***Hypothetical back-test study***
***Long-term growth and volatility***
***1971 - 2011***

| | **Annualized Return** | | **Standard Deviation** | |
|---|---|---|---|---|
| | **Tactical** | **Buy & Hold** | **Tactical** | **Buy & Hold** |
| Australia | 10.88% | 8.53% | 19.5 | 26.9 |
| Austria | 15.85 | 7.57 | 34.4 | 38.7 |
| Belgium | 13.14 | 9.78 | 21.9 | 28.3 |
| Canada | 13.59 | 9.24 | 15.7 | 22.3 |
| Denmark | 15.95 | 12.33 | 24.1 | 29.0 |
| France | 13.15 | 9.20 | 19.9 | 28.4 |
| Germany | 12.41 | 9.63 | 23.3 | 29.8 |
| Hong Kong | 17.16 | 14.12 | 34.3 | 46.6 |
| Italy | 11.68 | 4.86 | 29.5 | 36.2 |

| | | | | |
|---|---|---|---|---|
| Japan | 17.19 | 9.45 | 26.7 | 33.7 |
| Netherlands | 12.52 | 11.21 | 17.3 | 21.2 |
| Norway | 13.21 | 10.09 | 34.9 | 45.5 |
| Singapore | 21.18 | 11.59 | 39.6 | 47.3 |
| Spain | 11.57 | 8.31 | 24.9 | 31.9 |
| Sweden | 17.88 | 13.48 | 22.0 | 29.9 |
| Switzerland | 13.58 | 11.21 | 18.5 | 24.0 |
| United Kingdom | 12.81 | 9.90 | 14.6 | 28.2 |
| United States | 10.25 | 8.58 | 14.0 | 18.0 |

**Conclusions**

According to the experience of 18 countries across 41 years of market history, a simple tactical investment strategy offers substantial diversification benefits relative to buy-and-hold. The tactical strategy narrowed the range of outcomes over intermediate holding periods, and it delivered much shallower drawdowns during periods when a buy-and-hold strategy had negative returns in each country. By reducing the frequency and magnitude of large drawdowns, the tactical strategy delivered a higher cumulative return with less volatility compared to buy-and-hold over the entire 41-year period for every country.

The primary drawbacks to the tactical approach included whipsaw risk, frequent underperformance versus buy-and-hold over shorter periods of one to five years, and, at times, considerable tracking error in both directions. These hazards of trend-following strategies appear to be unavoidable.

From a total portfolio perspective, however, investors can combine tactical strategies similar to the approach examined in this study with buy-and-hold positions to add a new dimension of diversification and risk management to their portfolios. In addition to traditional diversification through asset class selection, a complement of tactical exposure helps investors to reduce drawdown risk and narrow the range of expected outcomes from their investments over three-to-five year forecast horizons. And moving-average strategies like the one presented here have shown promise in their tendency to deliver valuable diversification benefits when they are needed most – during bear markets.

It's an approach, at the very least, that you'd be remiss never to even consider.

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*Hannah Newman and Will Wright contributed materially to the research studies presented.*

## Disclosures

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### Description of the Back-Test Studies

The following indices were utilized in the back-test studies described in this paper:

**MSCI Country Indices** are designed to measure the performance of the equity markets of single countries globally. The indices assume the reinvestment of dividends. Returns for these indices were utilized throughout the study period for each country included in the hypothetical back-test studies.

**Barclays Capital Aggregate Bond Index** is an unmanaged index made up of U.S. Government, corporate, mortgage backed and asset-backed securities rated investment grade or higher. The index is designed to measure the performance of the domestic investment-grade bond market. It is not possible to invest directly in the index. This index was formerly known as the "Lehman Aggregate Bond Index" prior to Lehman's sale of assets to Barclays in 2008. Returns for this index were utilized in all of the back-test studies for periods beginning in January 1976 and thereafter.

**Intermediate Government Bond Index** is an unmanaged benchmark for 5-Year U.S. Treasury Notes maintained by Ibbotson Associates since 1926. Monthly returns for this index were utilized in each back-test study for the period from January 1971 through December 1975.

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