# Morningstar® ETFInvestor℠ Strategies: Model ETF Portfolios

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# Morningstar ETFInvestor Strategies: Model ETF Portfolios

We developed model portfolios based on academic research. Our strategies range from technical to fundamental, all-in-one portfolios to satellite offerings. These portfolios aren't meant to replace our existing real-money Hands-On and Hands-Free portfolios. Instead, we will be using them to inform trades in our Hands-On Portfolio. However, we realize that each investor has his own strategic ideas, and we believe these portfolios will provide additional insights to help investors make their own decisions.

The least-diversified strategies, the Country-Value, Global-Momentum, U.S.-Sector-Momentum, and Style- Momentum portfolios, must be used as part of a broader portfolio. They offer different ways to acquire momentum or value tilts. Our Real-Return and Yield-Seeking strategies are more diversified and could be used as stand-alone portfolios. However, every investor's need is unique. We suggest you use our strategies as complements to your current portfolios. Investors who wish to mitigate the tracking error of our strategies can do so in two ways: 1) when a moving-average signal indicates a full exit, exit from the ETF only partly; or 2) dedicate a sleeve of your portfolio to one of our strategies, or use them in combination. We strongly urge all investors to use our strategies in tax-sheltered accounts and with low brokerage fees, as they can generate annual turnover higher than 100%. We use buffer zones and rebalancing bands to keep turnover down, but some of our strategies have unavoidably high turnover.

Should you choose to use the information they provide—and we think you should—please be sure that the methodology backing each strategy is consistent with your own investment philosophy. Also, recognize that each strategy's past success is due largely to the discipline of the investor following the rules-based trading patterns. Following these esoteric models without gumption will likely lead to a poor investor experience.

**Developing Our Strategies**

In designing our strategies, we followed several principles:

- They must be transparent.
- They must be rules-based.
- They must be simple enough to implement effectively.
- They must have strong economic reasoning behind them, backed by data.

The principles led us to two opposing but complementary themes: value and momentum.

We know value works. In almost every market, portfolios of stocks cheap by fundamental measures such as price/book, price/earnings, and yield have beaten portfolios of expensive stocks on those measures. On a macro level, stock markets tend to do very well in the years after their dividend yields are high and poorly in the years after their yields are low.

If we accept that value opportunities are created by Mr. Market's excessive pessimism, then we must seriously consider the possibility that money can be made on Mr. Market's excessive optimism. In fact, like value, momentum strategies—buying what's recently gone up and selling what's gone down—have been profitable in almost every market studied, whether U.S. stocks, currencies, international stocks, bonds, REITs, or commodities.

The idea that value and momentum are the opposite sides of the same coin has been solidified in recent research by Cliff Asness and his colleagues at hedge fund AQR Capital Management. In *Value and Momentum Everywhere*, they found that value did well when momentum faltered and vice versa. The combination of the two resulted in resilient portfolios that did well in up or down markets. While we may lean toward either value or momentum in each strategy, we use elements of both to better profit from Mr. Market's wild mood swings. In that spirit, we implement risk controls in most of our strategies.

**Risk Control**

The moving average is a simple yet powerful risk-control tool. We make liberal use of it. By buying an asset when its current price is above its moving average—usually calculated with anywhere between 50 and 200 days of prices—and selling when it's below, we minimize our exposure to adverse fat-tail returns.

Eugene Fama and Kenneth French called market-timing with moving averages "an ancient tale with no empirical support." The judgment is far too harsh. We tested a simple moving-average strategy on 18 stock markets with returns dating back to 1970. We compared the returns of equal-weighting the 18 country stock markets with a moving-average strategy that allocates equal weights to each market but moves out of a market if its price is below its 12-month simple moving average.

| | Simple-Moving Average (%) | Equal Weight (%) |
|---|---|---|
| Annualized Return | 13.45 | 12.53 |
| Standard Deviation | 10.87 | 16.82 |
| Sharpe Ratio (Rf=5.4%) | 0.74 | 0.42 |

*Data is from December 1970 through October 2011 for 18 MSCI country indexes, including the United States. Returns are denominated in U.S. dollars and are before taxes, fees, and trading costs.*

The results show that, despite greater exposure to cash, the moving-average strategy actually slightly improved returns while reducing standard deviation. The Sharpe ratio improvement is dramatic but, if anything, understates the risk-adjusted performance improvement: The timing strategy had much lower drawdowns and less negative skew in its return distribution.

The overall returns look good, begging the question: How does the moving-average strategy fare on a country-by-country basis? Only in four markets—Australia, Germany, the Netherlands, and Switzerland—does the moving-average strategy fail to improve absolute returns. Only in two of them does it fail to improve Sharpe ratios.

How does the strategy hold up on a decade-by-decade comparison? The strategy reduces standard deviation and improves risk-adjusted returns in every decade. Note how it helps returns the most from 2000–09, the decade of the financial crisis. In only the '90s does it hurt absolute returns. Moving-average-based timing often detracts from returns during secular bull markets. However, we think it is a modest price to pay for its attractive tail-risk hedging qualities.

| | Return | | Standard Dev | | Sharpe Ratio | |
|---|---|---|---|---|---|---|
| Decade Ended | SMA | EW | SMA | EW | SMA | EW |
| 12-31-1980 | 15.88 | 14.82 | 10.11 | 15.47 | 0.90 | 0.52 |
| 12-31-1990 | 17.91 | 17.49 | 12.51 | 16.05 | 0.75 | 0.56 |
| 12-31-2000 | 10.67 | 12.70 | 10.04 | 13.71 | 0.59 | 0.58 |
| 12-31-2010 | 11.18 | 7.37 | 10.55 | 20.78 | 0.85 | 0.25 |

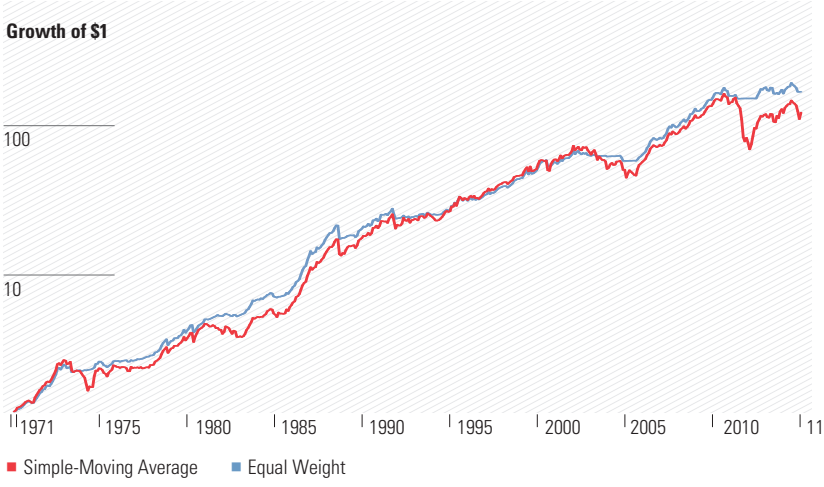
These results aren't unusual. In virtually every equity, currency, and commodity index we tested, moving-average-based timing schemes reduced drawdowns without sacrificing return (in many cases improving it). The improved risk-adjusted returns can't be explained by the increased average exposure to cash or to a few anomalous periods.

**Momentum Everywhere**

Moving-average-based strategies exploit the fact that market prices have momentum over the medium term. Momentum is an anomaly in the sense that traditional theories don't do a good job explaining it nor why it still persists decades after its discovery. Thankfully, we're not flying blind. Researchers have made good progress explaining the phenomenon.

Academics credit Narasimhan Jegadeesh and Sheridan Titman for discovering momentum, though practitioners had been exploiting it for decades by the time the duo's study came out in 1993. The pair found that a simple long-short strategy that every month bought the top 10% of best 12-month-performing U.S. stocks and sold short the worst 10% of 12-month performers earned excess returns of about 12% a year. Subsequent research has uncovered momentum in virtually every market studied, including commodities, currencies, stocks, and bonds, and over wide-ranging periods.

Simple Moving-Average Strategy vs. Equal-Weight Strategy on 18 Country Stock Markets



Of course, relative momentum isn't the same as time-series momentum, the kind moving averages exploit. But, in essence, both buy what's doing well and sell what's doing poorly. In *Time-Series Momentum*, Tobias Moskowitz, Yao Hua Ooi, and Lasse H. Pedersen have found time series momentum in each of the 58 liquid futures contracts they examined.

Momentum's ubiquity demands an explanation. Efficient-market types have bent over backwards to explain the trendiness of the various markets, and many of their explanations have an ad hoc feel to them. For equities, it's time-varying, serially correlated risk premiums, mysterious risk factors, or "good" versus "bad" beta. For commodities, it's the theory of storage, where price momentum signals tight inventories. A simple behavioral story of underreaction and overreaction explains momentum in one fell swoop.

A stylized version of the story goes like this: In light of surprising or extreme news, investors "anchor" new price estimates to old prices. They are also loath to realize losses, preferring to keep dogs until they break even, and are too quick to sell winners. Both biases also keep prices from instantly reflecting new information. Instead, prices slowly adjust to fair value, creating sustained price movements, up or down. Once an upward (or downward) trend is established, investors overextrapolate recent performance and herd in (or out) of the asset, further accentuating the trend. Over the medium term, the trend collapses after the market realizes it has overshot.

The story is parsimonious, but is it true? A wealth of experimental data supports the irrational or bounded-rational view of man, who anchors, is bad at estimating probabilities, engages in irrational mental accounting, is sometimes incredibly short-sighted, loves to over-extrapolate from modest data, and is supremely overconfident. We're not *homo economicus*, after all.

Better yet, many investors articulated behavioral explanations for market phenomena decades before the rise of behavioral finance. The broad contours of their theories are being filled in and expanded by academics. This is reassuring, suggesting the theories are congruent with reality.

**Why 12-Month SMA?**

The large body of research has spawned many ways to measure momentum. Most work fairly well. But we like 12-month simple-moving average and 12-month raw return because most of the information from past returns is contained in the past 12 months—more specifically, in returns from seven to 12 months ago. In other words, you can construct momentum strategies that look at returns only from seven to 12 months ago and earn outsized profits. Using shorter windows excludes those crucial periods.

**Risks**

Back-tested strategies all fall prey to some degree of data dredging, the misuse of data analysis to find spurious statistical relationships. We created these strategies aware that other researchers have found momentum strategies profitable. The risk is that the collective efforts of thousands of researchers combing over the same data set have uncovered relationships that are merely the product of luck. We can't expect models relying on data-mined relationships to hold up in the future. We take these issues very seriously. If markets were easy to beat by simply creating models that back-test well, far more people would succeed in the markets.

We mitigated the risk of data dredging through several means. We kept our strategies almost painfully simple, using typical measures such as 12-month total returns and 12-month simple-moving averages. We tested various periods and numerous specifications to ensure our results were robust. We also tested "out of sample"; in almost every equity market we tested, and in numerous different specifications, we found our procedure produced superior risk-adjusted returns. We think we're exploiting a real phenomenon. However, data dredging is unavoidable. We can't expect the eye-popping returns we find in back-tests of our models to continue.

Because we believe the momentum effect has behavioral origins, we operate on the assumption that, as more money follows the strategy, its profitability will decline. Hedge funds have been running global tactical-allocation strategies for years now. U.S. sector- and stock-based momentum strategies haven't been profitable over the past decade, owing to a dreadful 2009. We mitigate this risk by using extremely broad indexes. We highly doubt there's enough money arbitraging the momentum effect across the broad and liquid assets we're trading to extinguish momentum effects.

# Making Sense of the Global-Momentum Strategy

**Global-Momentum Strategy Overview**

The Global-Momentum Strategy is a simple momentum strategy relying on very broad indexes. At most, it will hold only two ETFs at a time, resulting in an idiosyncratic portfolio. However, the strategy gains diversification over time by switching to up-trending asset classes. Over the back-tested period from 1971 to 2011, all the strategy's asset classes were roughly equally represented. The strategy benefits in two ways from using such broad indexes. First, it reduces turnover. Second, it makes the strategy more robust to arbitrage—momentum strategies on individual securities or sectors have shown reduced profitability over time. It's unlikely that hedge funds will collectively make momentum across global stock markets and commodities disappear anytime soon.

**Strategy**

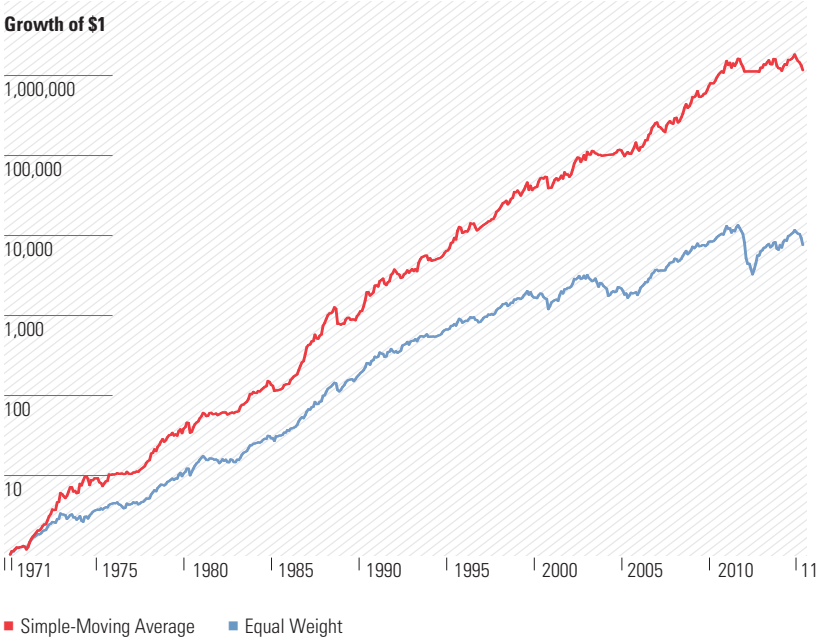
Every month, compare an eligible ETF's current price with its 12-month SMA. If it's below, remove the ETF from further consideration. Of the remaining ETFs, sort by trailing 12-month total returns. Select the two highest-returning ETFs and equal-weight them. If only one ETF is eligible, hold that ETF and cash in equal weightings. If no ETFs are eligible, hold only cash.

**Suitability**

The strategy is best suited for tax-sheltered investors willing to deviate from common benchmarks for long periods. Like any strategy, it demands a long-term commitment. Investors will hold uncomfortably compact portfolios, such as one ETF and the rest cash. In whipsaw markets, the strategy may require a lot of churning to seemingly little effect. Investors can mitigate many of the uncomfortable aspects of this strategy by making it a small sleeve of a broader, more passive portfolio.

| Eligible Global-Momentum Holdings | Expense Ratio (%) | Est Holding Cost (%) |
|---|---|---|
| Vanguard Total Stock Mrkt ETF VTI | 0.07 | 0.05 |
| Vanguard MSCI Emerging Mrkts ETF VWO | 0.22 | -0.13 |
| Vanguard MSCI EAFE ETF VEA | 0.12 | 0.08 |
| PowerShares DB Cmmdity Indx Trackg DBC | 0.85 | — |

## Global-Momentum Back-Tested Performance




| Performance | Simple-Moving Average (%) | Equal Weight (%) |
|---|---|---|
| Annualized Return | 16.41 | 10.26 |
| Standard Deviation | 13.34 | 10.64 |
| Sharpe Ratio | 0.82 | 0.45 |

**Back-Tested Performance**

The back-test was conducted for the period January 1971 to September 2011 on the following indexes: S&P 500 TR, S&P GSCI TR, MSCI EAFE GR, MSCI EM GR, and IA SBBI U.S. 30-Day T-Bill TR. The MSCI EM GR Index begins on January 1988 and becomes eligible for inclusion in the strategy on January 1989. The procedure is as follows: At the end of every month, exclude indexes below their 12-month simple-moving average. Of the remaining eligible indexes, equal-weight the top two by 12-month total returns. Results are before taxes and expenses. All indexes are denominated in U.S. dollars.

# Making Sense of the Yield-Seeking Strategy

**Yield-Seeking Strategy Overview**

This strategy focuses on high-yielding asset classes. High yield is a classic value strategy but often is vulnerable to severe drawdowns during bear markets. Some argue that value's poor performance during bad times generates the strategy's higher expected returns. We attempt to mitigate value's risks with moving-average-based timing. In order to maintain some income-generation potential from the portfolio, the strategy will never fully go to cash.

**Strategy**

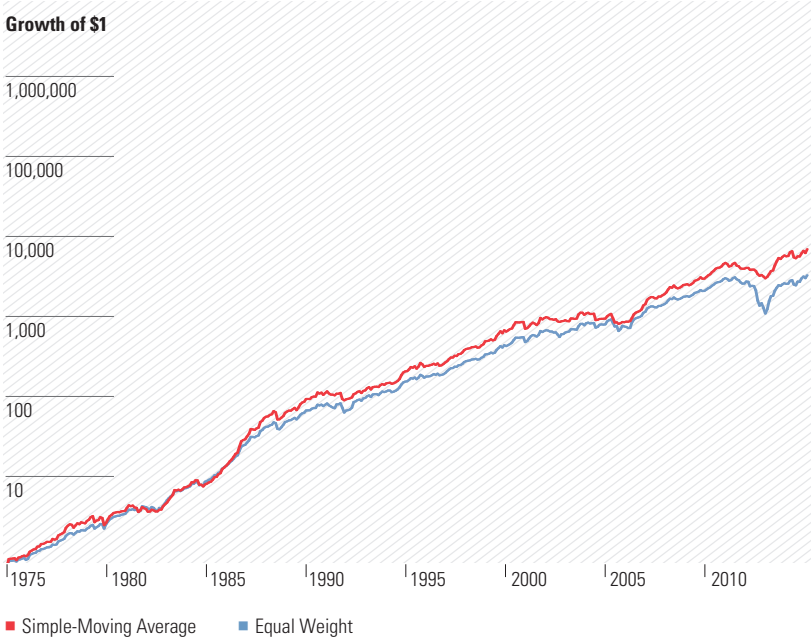
Every month, compare an eligible ETF's current price with its 12-month SMA. If above, hold it; if below, sell 75% of the position and keep the proceeds in cash. Each ETF will have a default allocation determined by the table below.

**Suitability**

The yield-seeking strategy is a diversified portfolio designed for investors seeking high income. The strategy does not always guarantee high yields, as it can hold up to 75% of its total assets in cash. However, we think it a small price to pay for potentially avoiding extreme downward market movements. Because the strategy will, at times, create sizable income, it will not be as tax-efficient as a total-return strategy. Ideally, its holdings would be held in a tax-sheltered account. Moving-average-based timing can sometimes create churn during whipsaw markets.

| Eligible Yield-Seeking Holdings | Expense Ratio (%) | Est Holding Cost (%) | 12-Mo Yield (%) | Default Alloc (%) |
|---|---|---|---|---|
| SPDR S&P Dividend SDY | 0.35 | 0.25 | 3.26 | 25.00 |
| iShares Dow Jones Intrntl Div IDV | 0.50 | 0.07 | 4.94 | 15.00 |
| WisdomTree Emerg Mrkts Incm DEM | 0.63 | 0.67 | 4.52 | 15.00 |
| SPDR Dow Jones Intl Real Est RWX | 0.59 | 0.74 | 9.96 | 15.00 |
| WisdomTree Emerg Mrkts Lcl ELD | 0.55 | — | 4.82 | 15.00 |
| SPDR Barclays Cap High Yld JNK | 0.40 | 1.04 | 7.88 | 15.00 |

## Yield-Seeking Back-Tested Performance




| Performance | Simple-Moving Average (%) | Equal Weight (%) |
|---|---|---|
| Annualized Return | 12.00 | 11.30 |
| Standard Deviation | 8.36 | 8.44 |
| Sharpe Ratio | 0.78 | 0.69 |

**Back-Tested Performance**

The back-test was conducted for the period January 1976 to December 2010 on the Fama-French International Hi30 Yield Index, the Fama-French U.S. Hi30 Yield Index, the BarCap U.S. High Yield Corporate Index (from its inception in July 1983), and SBBI U.S. 30-Day T-Bill TR. The procedure is as follows: The F-F International and U.S. indexes and the BarCap High-Yield Index are given a default equal weighting. At the end of each month, if an index's price is below its 12-month SMA, allocate that index's share to cash. Results are before taxes and expenses. All indexes are denominated in U.S. dollars.

# Making Sense of the Real-Return Strategy

**Real-Return Strategy Overview**

The Real-Return Strategy focuses on asset classes expected to hold up well during inflationary conditions. However, it also seeks positive real returns, which is why it contains no Treasury Inflation-Protected Securities. The strategy avoids traditional asset classes, so investors must be comfortable with deviating from the market. This is the broadest, most diversified portfolio of our six strategies.

**Strategy**

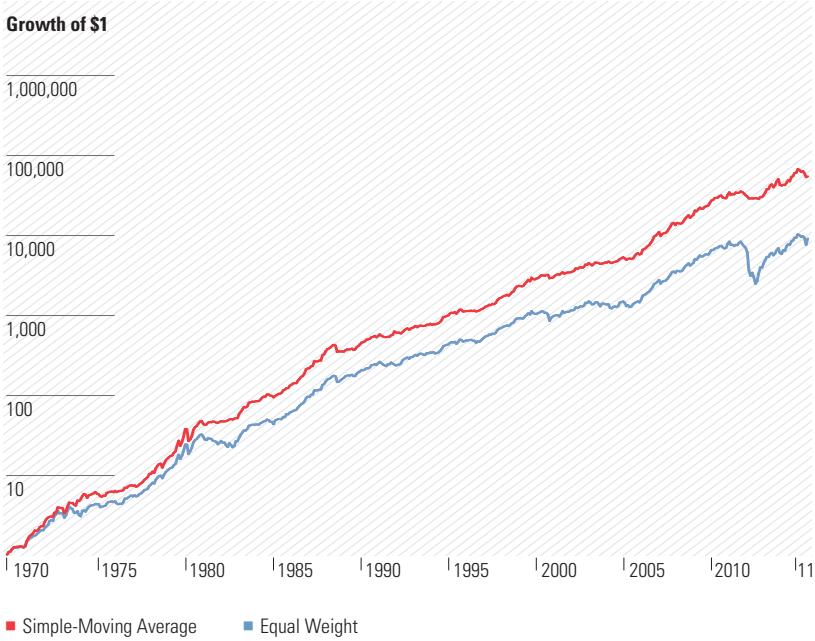
Every month, compare an eligible ETF's current price with its 12-month SMA. If an ETF is above its SMA, allocate it to its default share of the portfolio (12.5%); otherwise, devote its share to cash.

**Suitability**

The strategy de-emphasizes traditional asset classes such as equities and U.S. Treasuries in favor of commodities, real estate, and high-yield bonds. As such, its performance will likely deviate significantly from the traditional 60/40 stock/bond portfolio. Ideally, its holdings would be held in a tax-sheltered account. Moving-average-based timing can sometimes create churn during whipsaw markets. MI

| Eligible Real-Return Holdings | Expense Ratio (%) | Est Holding Cost (%) | Alloc. (%) |
|---|---|---|---|
| iShares Gold Trust IAU | 0.25 | 0.34 | 12.50 |
| PowerShares DB Commdty Indx Track DBC | 0.85 | — | 12.50 |
| SPDR Barclays Capital High Yield Bnd JNK | 0.40 | 1.04 | 12.50 |
| WisdomTree Emerg Mrkts Local Dbt ELD | 0.55 | — | 12.50 |
| Vanguard REIT Index ETF VNQ | 0.12 | 0.07 | 12.50 |
| SPDR Dow Jones Interntnl Real Estate RWX | 0.59 | 0.74 | 12.50 |
| Vanguard FTSE All-World ex-US ETF VEU | 0.22 | 0.15 | 12.50 |
| Vanguard Total Stock Market ETF VTI | 0.07 | 0.05 | 12.50 |

## Real-Return Back-Tested Performance




| Performance | Simple-Moving Average (%) | Equal Weight (%) |
|---|---|---|
| Annualized Return | 12.67 | 10.49 |
| Standard Deviation | 7.87 | 9.48 |
| Sharpe Ratio | 0.92 | 0.53 |

**Back-Tested Performance**

The back-test was conducted for the period January 1971 to October 2011 using MSCI World ex US GR, MSCI USA GR, London Fix Gold PM PR, BarCap Corporate High Yield TR, S&P GSCI TR, NAREIT Equity REITs TR, and S&P Developed REIT TR. The procedure is as follows: Each index is allocated an equal weighting. Each month, if an index's price is below its 12-month SMA, allocate the index's share to cash. The London Fix Gold PM PR begins January 1973, the BarCap U.S. Corporate High Yield TR on July 1983, the FTSE NAREIT Equity REITs TR on January 1972, and the S&P Developed REIT Diversified TR on July 1989. Results are before taxes and expenses. All indexes are denominated in U.S. dollars.

# Making Sense of the U.S.-Sector-Momentum Strategy

**U.S.-Sector-Momentum Strategy Overview**

The classic U.S.-Sector-Momentum Strategy every month sorts sectors by 12-month past returns and owns a fixed number of the highest-performing sectors. It worked like a charm until the financial crisis, when it gave up almost all of the excess return it accrued during the 2000s. Our variation of the strategy first filters sectors by their 12-month SMA before sorting by 12-month returns, possibly reducing adverse drawdowns.

**Strategy**

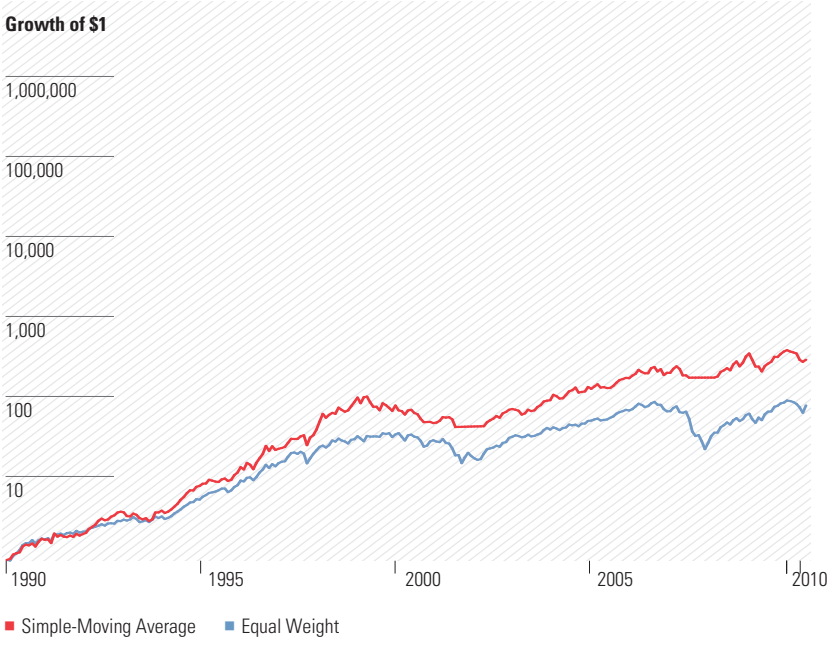
Every month, compare an eligible ETF's current price with its 12-month SMA. If it's below, exclude it from consideration. Sort the remaining ETFs by 12-month total returns. Hold the top three ETFs. If there are fewer than three ETFs chosen, redistribute those ETFs' shares to cash. If no ETF qualifies, hold all cash.

**Suitability**

Because of the number of potential holdings, the strategy aggressively churns its portfolio. Fortunately, the Select Sector SPDR ETFs are among the most liquid in the market, so bid-ask spreads are a relative nonissue. The corrosive aspects of this strategy include potentially high short-term capital gains and many trades. Investors should implement this strategy in a tax-sheltered account with very low brokerage commissions. The strategy could supplement a U.S. equity allocation. Moving-average-based timing can sometimes create churn during whipsaw markets. MI

| Eligible U.S.-Sector-Momentum Holdings | Expense Ratio (%) | Est Holding Cost (%) |
|---|---|---|
| Consumer Discret Select Sector SPDR XLY | 0.20 | 0.17 |
| Consumer Staples Select Sector SPDR XLP | 0.20 | -0.01 |
| Energy Select Sector SPDR XLE | 0.20 | 0.53 |
| Financial Select Sector SPDR XLF | 0.20 | 0.11 |
| Health Care Select Sector SPDR XLV | 0.20 | 0.07 |
| Industrial Select Sector SPDR XLI | 0.20 | -0.04 |
| Materials Select Sector SPDR XLB | 0.20 | — |
| Technology Select Sector SPDR XLK | 0.20 | — |
| Utilities Select Sector SPDR XLU | 0.20 | 0.28 |
| iShares S&P SmallCap 600 Index IJR | 0.20 | 0.12 |

## U.S.-Sector-Momentum Back-Tested Performance




| Performance | Simple-Moving Average (%) | Equal Weight (%) |
|---|---|---|
| Annualized Return | 13.01 | 9.90 |
| Standard Deviation | 14.20 | 13.16 |
| Sharpe Ratio | 0.65 | 0.47 |

**Back-Tested Performance**

The back-test was conducted for the period October 1990 to October 2011 using 10 S&P 500 sector indexes and the Russell 2000 TR. The procedure is as follows: Each month, if an index's price is below its 12-month SMA, exclude it from further consideration. Sort the remaining indexes by 12-month total return and equal-weight the top three. If fewer than three indexes are eligible, devote each of the empty index allocations to cash. Results are before taxes and expenses. All indexes are denominated in U.S. dollars.

# Making Sense of the Country-Value Strategy

**Country-Value Strategy Overview**

A common international-value strategy used by hedge funds and discussed in the academic literature involves sorting country stock markets by price/book and owning a set of the lowest price/book countries. The strategy produces excellent returns but can come with nauseating drawdowns. Our version of the strategy updates quarterly and uses moving averages for drawdown control. Theoretically the U.S. stock market is eligible as a holding, but in the past that has almost never been the case.

**Strategy**

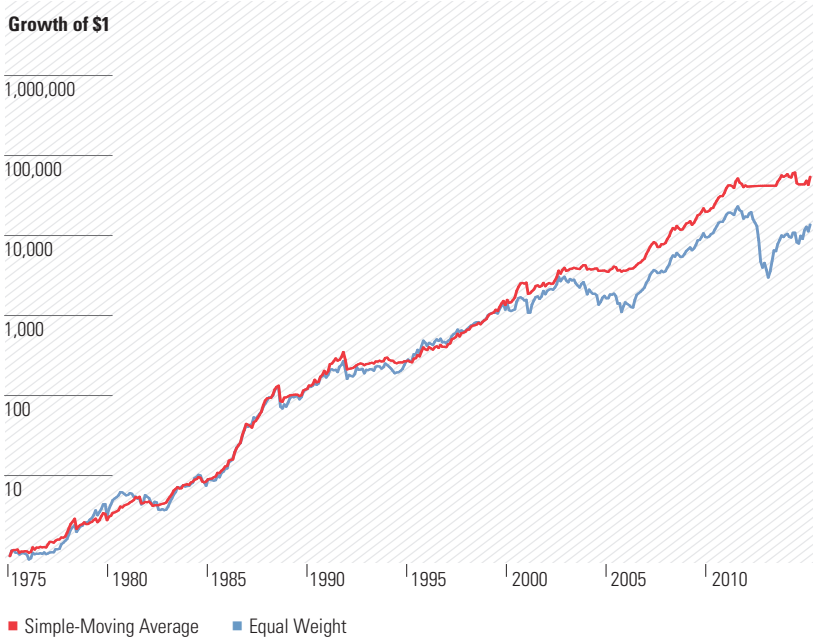
Every quarter, sort every eligible country ETF by price/book ratio. Select the lowest six. Of the six, select ETFs above their 12-month SMA. Substitute cash for ETFs of the six that are not above their 12-month SMA. Eligible country ETFs must have more than $50 million in assets as of each rebalance date.

**Suitability**

The strategy can complement an international-stock allocation. It should not be used as a stand-alone portfolio. The strategy will sometimes delve into less-liquid ETFs, so investors must take care to properly trade during the rebalances: Set limit orders based on current intraday indicative value. Owing to the nature of value strategies, the fund could experience high turnover. IM

*See next page for eligible holdings.*

## Country-Value Back-Tested Performance




| Performance | Simple-Moving Average (%) | Equal Weight (%) | MSCI World GR (%) |
|---|---|---|---|
| Annualized Return | 14.95 | 12.95 | 10.59 |
| Standard Deviation | 11.63 | 16.69 | 14.91 |
| Sharpe Ratio | 0.81 | 0.45 | 0.34 |

**Back-Tested Performance**

The back-test was conducted for the period January 1976 to December 2010 using international country return and price/book ratio data from the French Data Library. The 23 countries in the sample include the United States, United Kingdom, Japan, Germany, France, Indonesia, Malaysia, etc. The IA SBBI 30-Day T-Bill was used for cash return. The procedure is as follows: Each quarter, sort all country stock markets on price/book. Equal weight the lowest six country stock markets by price/book. However, if a country's current price is below its 12-month SMA, devote its share to cash. Results are before taxes and expenses. All indexes are denominated in U.S. dollars.

# Making Sense of the Country-Value Strategy, Cont.

## Eligible Country-Value Holdings

| Eligible Country-Value Holdings | Expense Ratio (%) | Est Holding Cost (%) |
|---|---|---|
| iShares FTSE China 25 Index Fund FXI | 0.72 | — |
| iShares MSCI All Peru Capped Index EPU | 0.62 | 0.34 |
| iShares MSCI Australia Index EWA | 0.53 | 0.56 |
| iShares MSCI Austria Investable Mkt Idx EWO | 0.54 | 0.69 |
| iShares MSCI Brazil Index EWZ | 0.61 | 0.74 |
| iShares MSCI Canada Index EWC | 0.53 | 0.91 |
| iShares MSCI Chile Investable Mkt Idx ECH | 0.61 | 2.28 |
| iShares MSCI France Index EWQ | 0.54 | 1.04 |
| iShares MSCI Germany Index EWG | 0.53 | 0.76 |
| iShares MSCI Hong Kong Index EWH | 0.53 | 0.37 |
| iShares MSCI Israel Cap Invest Mkt Index EIS | 0.61 | -0.97 |
| iShares MSCI Italy Index EWI | 0.54 | 1.71 |
| iShares MSCI Japan Index EWJ | 0.54 | 0.83 |
| iShares MSCI Mexico Investable Mkt Idx EWW | 0.53 | -1.44 |
| iShares MSCI Netherlands Invstbl Mkt Idx EWN | 0.53 | 0.91 |
| iShares MSCI New Zealand Invstb Mkt Idx ENZL | 0.55 | 2.71 |
| iShares MSCI Philippines Invstb Mkt Idx EPHE | 0.65 | 0.31 |
| iShares MSCI Poland Investable Mkt Index EPOL | 0.61 | 0.86 |
| iShares MSCI Singapore Index EWS | 0.53 | 0.13 |
| iShares MSCI South Africa Index EZA | 0.61 | 0.62 |
| iShares MSCI South Korea Index EWY | 0.61 | 0.82 |
| iShares MSCI Spain Index EWP | 0.54 | -1.9 |
| iShares MSCI Sweden Index EWD | 0.53 | 0.93 |
| iShares MSCI Switzerland Index EWL | 0.53 | -0.13 |
| iShares MSCI Taiwan Index EWT | 0.71 | 1.06 |
| iShares MSCI Thailand Invest Mkt Index THD | 0.62 | 0.85 |
| iShares MSCI Turkey Invest Mkt Index TUR | 0.61 | 0.95 |
| iShares MSCI United Kingdom Index EWU | 0.53 | 0.5 |
| Market Vectors Indonesia Index ETF IDX | 0.6 | 0.36 |
| Market Vectors Russia ETF RSX | 0.62 | -0.18 |
| Vanguard Total Stock Market ETF VTI | 0.07 | 0.05 |

# Making Sense of the Style-Momentum Strategy

**Style-Momentum Strategy Overview**

Styles display significant momentum effects, providing an alternative to the common sector-momentum strategy. In practice, the two are very similar. We use 12-month SMA to filter out downtrending styles and sort by 12-month total return to find the highest-momentum styles.

**Strategy**

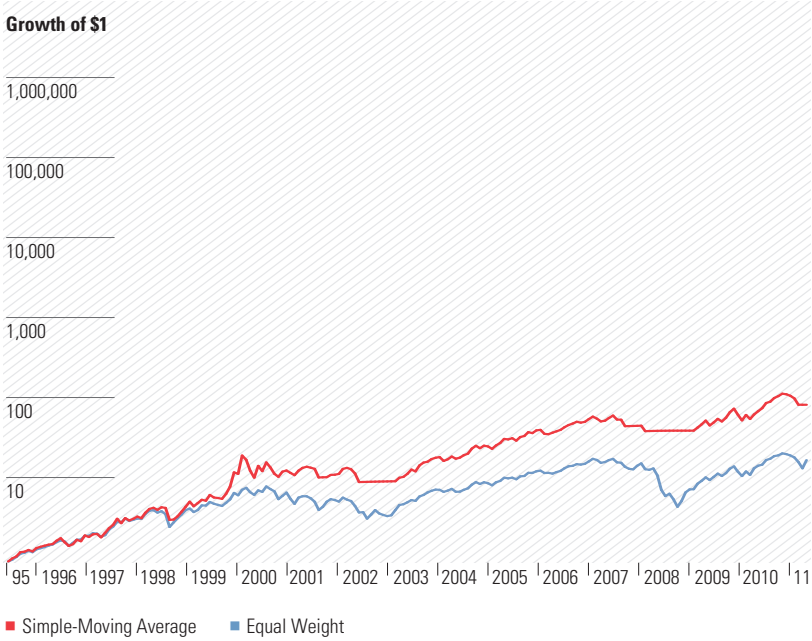
Every month, compare an eligible ETF's current price with its 12-month SMA. If it's below, exclude it from consideration. Sort the remaining ETFs by 12-month total return. Hold the top two ETFs. If there are fewer than two ETFs chosen, redistribute those ETFs' shares to cash. If no ETF qualifies, hold all cash.

**Suitability**

Because of the number of potential holdings, the strategy aggressively churns its portfolio. We've selected among the most liquid style ETFs on the market. The corrosive aspects of this strategy include potentially high short-term capital gains and many trades. Investors should implement this strategy in a tax-sheltered account with very low brokerage commissions. The strategy could supplement a U.S. equity allocation. M

| Current Style-Momentum ETF Holdings | Expense Ratio (%) | Est Holding Cost (%) |
|---|---|---|
| iShares S&P 500 Growth Index IVW | 0.18 | 0.18 |
| iShares S&P 500 Value Index IVE | 0.18 | 0.16 |
| iShares S&P MidCap 400 Growth Index IJK | 0.26 | 0.22 |
| iShares S&P MidCap 400 Value Index IJJ | 0.27 | 0.20 |
| iShares Russell 2000 Growth Index IWO | 0.25 | 0.00 |
| iShares Russell 2000 Value Index IWN | 0.40 | 0.18 |

## Style-Momentum Back-Tested Performance




| Performance | Simple-Moving Average (%) | Equal Weight (%) |
|---|---|---|
| Annualized Return | 13.02 | 8.23 |
| Standard Deviation | 17.14 | 15.58 |
| Sharpe Ratio | 0.56 | 0.31 |

**Back-Tested Performance**

The back-test was conducted for the period April 1995 to October 2011 using MSCI USA Large Cap Value, Large Cap Growth, Mid Cap Value, Mid Cap Growth, Small Cap Value, and Small Cap Growth indexes. The IA SBBI 30-Day T-Bill was used for cash return. The procedure is as follows: Each month, if an index's price is below its 12-month SMA, exclude it from further consideration. Sort the remaining indexes by 12-month total return and equal-weight the top two. If fewer than two indexes are eligible, devote each of the empty index allocations to cash. Results are before taxes and expenses. All indexes are denominated in U.S. dollars.

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