Buy and Hold Versus Timing Strategies: *The Winner Is…*

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The motivation of the article is to propose three new market-timing strategies, which have not been tested in the literature (to our knowledge). We compare and contrast these strategies and other well-known market-timing strategies against a benchmark strategy consisting of simply holding the S&P 500.

Our first market-timing strategy is a fundamental-based one that switches from fully invested in the S&P 500 to fully invested in three-month T-bills, whenever the conference board leading economic indicator (LEI) declines three months in a row. The switch back into the S&P 500 occurs when the LEI increases three months in a row. Our other two strategies are sentiment-based and use the Baker and Wurgler [2006] and Feldman [2010] sentiment indices to trigger the switch between the S&P 500 and three-month T-bills.

We take an identical approach with the other market-timing strategies in our study, switching between 100% allocation to the S&P 500 index or 100% to three-month T-bills. The other well-known market-timing strategies are the Shiller CAPE, the U.S. Treasury yield curve, 200-day S&P 500 simple moving average, and S&P 500 earnings yield versus Treasury yield. The benchmark strategy is 100% invested in the S&P 500 index at all times.

We compare market-timing strategies over the period from 1970 to 2012. To our knowledge, no other market-timing articles to date have included the financial crisis of 2007 to 2009. Although most sentiment indicators do not have data from earlier than 1995, we were able to obtain data from as early as 1970 for both the Baker & Wurgler index and the Feldman perceived loss index (PLI). We assume all data is available at the end of the month. Therefore, any rebalancing occurs on the first trading day of the following month. Some of the data is available on a daily or weekly basis; others are only available on a monthly basis. For example, the LEI is a monthly number, published the third week of the month.

We use a simple market-timing strategy to minimize any incentive to mine the data. Typically as strategies become more sophisticated, complexity may lend itself to data mining. An example of a simple timing strategy is to switch into the S&P 500 whenever the spread between the 10-year and three-month Treasury yield turns positive, and to switch into three-month T-bills whenever it turns negative. Other yield curve strategies use more sophisticated statistics and let us easily manipulate the switching threshold to game the highest simulated return.

Another goal of the article is to compare how sentiment and technical market-timing strategies stack up against fundamental market-timing strategies. Sentiment strategies are becoming more popular, exploiting such

indicators as the AAII sentiment index, VIX, Market Vane, put/call ratio, etc. Citigroup has its own sentiment index, which it calls the economic surprise index. Traders use sentiment to gauge the market's level of optimism and pessimism, which they use to identify market tops and bottoms or the probability of a recession or crash. Sentiment and technical strategies are somewhat ad hoc; fundamental strategies are founded on economic theory.

Lastly, we conclude the article by combining the most successful market timing strategies to test whether combined strategies can produce even greater results. We test whether combining fundamental and technical indicators creates synergies that produce even higher returns. For example, we combine the LEI one-month window strategy with the 200-day moving average strategy.

Results suggest that the most successful strategy is the Conference Board's LEI strategy. The LEI strategy generates a 11.67% annualized return using a three-month window and a 12.12% annualized return using a one-month window. The downside of the one-month window is that the portfolio turns over twice per year, versus once every three years using a three-month window. The second- and third-most successful strategies are technical strategies, the 200-day moving average, and the PLI strategy, respectively. We find no advantage to using fundamental market-timing strategies versus technical or sentiment strategies.

Lastly, we find that combining the LEI one-month window and 200-day moving average strategies produces greater risk/return results than does any single market-timing strategy alone. The combination of LEI one-month and 200-day moving average strategies produces an annualized return of 12.7% and the highest Sharpe ratio among all strategies over the 43-year period.

LITERATURE REVIEW

Market-timing strategies have a history dating back to at least 1938, when Mitchell and Burns [1938] developed a list of economic time series that changed direction before changes in economic activity. These came to be called LEI, which the Conference Board publishes today. The basic data came from Mitchell's 1913 work on business cycles. More recently, Copeland and Copeland [1999] tested two market-timing strategies using the VIX. When the VIX increased, their strategy shifted to value stocks (e.g., large-cap stocks); and when the VIX decreased, it shifted to growth stocks (e.g., small-cap stocks). They found that rotating between style and size was also effective. Campbell and Shiller [1998] showed that the P/E ratio at the beginning of a 10-year period is negatively correlated with stock returns for the next 10 years.

Resnick and Shoesmith [2002] used the yield curve to time the stock market. For the period from 1971 to 1999, their strategy yielded a return of 16%, versus a 14% return from holding the S&P 500. Estrella and Mishkin [1996, 1998, 2006] used a probit model to trigger their timing strategy. Shen [2003] found that a strategy based on the spread between the E/P ratio and a short-term interest rate beat the market index, even when he incorporated transaction costs. Siegel [2014] investigated the use of the 200-day simple moving average (SMA) in timing the Dow Jones industrial average (DJIA) from 1886 to 2006. He switched between an allocation of 100% to the DJIA when the index closed at least 1% above its 200-day moving average, to an allocation of 100% in Treasury bills when the DJIA closed at least 1% below its 200-day moving average. The strategy earned 2% more than simply holding the DJIA, and with significantly less risk.

CONFERENCE BOARD STRATEGY

The Conference Board LEI is a composite of economic indices designed to signal peaks and troughs in the business cycle. The Conference Board describes their index as a way "to summarize and reveal common turning point patterns in economic data in a clearer and more convincing manner than any individual component primarily, because they smooth out some of the volatility of individual components." The index consists of average weekly hours for manufacturing, average weekly initial claims for unemployment insurance, manufacturers' new orders, consumer goods and materials, ISM index of new orders, manufacturers' new orders, non-defense capital goods (excluding aircraft orders), building permits, new private housing units, stock prices, 500 common stocks, the leading credit index, the interest rate spread, 10-year Treasury bond rate less the Fed funds rate, and average consumer expectations for business conditions.

The Conference Board releases its LEI in either the third or fourth week of the month. Consequently, any triggered portfolio changes are made at the beginning

of the next month. The portfolio remains fully invested in the S&P 500 unless the LEI falls for three months in a row. For example, if the LEI decreases during the months of February, March, and April, the portfolio switches out of the S&P 500 and into three-month T-bills at the beginning of May. If the LEI subsequently rises for three months in a row, the portfolio switches from T-bills into the S&P 500. We ignore months in which the LEI is unchanged. For example, if the LEI declines for two months in a row, remains flat for the third month, and then declines again in the fourth month, the portfolio switches into T-bills at the beginning of the fifth month.

YIELD CURVE STRATEGY

We examine two market-timing strategies that employ the Treasury yield curve. The first one (yield curve) uses the end-of-the-month yield spread between the ten-year T-note and three-month T-bill. If the spread is positive, the portfolio is 100% invested in the S&P 500. Otherwise, the portfolio switches to a 100% investment in three-month T-bills. The second strategy calculates the probability of a U.S. recession in the next twelve months using Estrella's and Mishkin's [1996, 1998, 2006] probit model (EM), based on the spread between the ten-year and three-month T-bills. We calibrate probabilities relative to the size of the spread. For example, a spread of -0.82 corresponds to a 50% probability of a recession in the next 12 months. We chose 30% as our switch threshold. If the probability is 30% or greater, the portfolio is 100% invested in three-month T-bills for the next 12 months. Otherwise, it is 100% invested in the S&P 500. We also use thresholds of 40% and 50%, as in Resnick and Shoesmith [2002].

FED MODEL STRATEGY

The Fed model compares the S&P 500 earnings yield against the 10-year T-note yield. If the earnings yield is greater than the yield on the T-note, then the U.S. stock market is considered undervalued. Conversely, if the S&P 500 earnings yield is less than the 10-year T-note yield, then the U.S. stock market is overvalued. We employ a strategy used by Shen [2003]. At the end of every month, we look at the value of the spread between the earnings yield and 10-year T-note. We define a trigger threshold as the historical 10th percentile of this spread, tabulating it as a running total starting from January 1, 1950. If the spread is above the threshold, we invest the portfolio in the S&P 500 for the next month. If the spread is below the threshold, we liquidate the portfolio at the month-end market price and invest in three-month T-bills for the next month. For the next month, we update the trigger threshold to include that month's spread. If the spread is still below the updated threshold, the portfolio remains 100% invested in the three-month T-bill through the following month. If the spread rises above the updated threshold, we move the portfolio into the S&P 500 for the next month. We repeat this process at the end of every month.

SHILLER CAPE STRATEGY

The Shiller cyclically adjusted P/E is the S&P 500's price divided by its average earnings over the past 10 years. Annual earnings are adjusted for inflation using the CPI, and then averaged over 10 years to minimize the effect of wild swings in any one year. We follow the Shiller cyclically adjusted PE 10 stock market timing strategy from VlidFi, which divides the market into five valuation categories, based on the ratio of the current CAPE10 to the long-term average CAPE10.

	CAPE10 Ratio (R)	S&P 500	Three-Month T-Bills
Significantly Overvalued	$R \geq 150\%$	0%	100%
Modestly Overvalued	$117\% \leq R < 150\%$	25%	75%
Fairly Valued	$83\% \leq R < 117\%$	50%	50%
Modestly Undervalued	$67\% \leq R < 83\%$	75%	25%
Significantly Undervalued	$R < 67\%$	100%	0%

200-DAY SIMPLE AVERAGE STRATEGY

We use a test similar to one in Jeremy Siegel's [2014] book, *Stocks for the Long Run*. We buy the S&P 500 when it closes above its 200-day SMA, and sell the S&P 500 and invest in three-month T-bills when the S&P 500 closes below its 200-day SMA.

PERCEIVED LOSS INDEX SENTIMENT STRATEGY

We create the PLI for the U.S. stock market in several stages. First, on Fridays we calculate weekly returns for each fund, using mutual fund data found in Morningstar Direct. If markets are closed on Friday

holidays, then we use Thursday's prices. In addition, we add back distributions, because they reduce the fund's net asset value. Second, we only pick up negative returns for each fund, setting positive returns to zero. Third, we calculate an exponential average of negative returns for each fund, using a half-life of one year. Taking an exponential average of historical data is a common practice among financial analysts, because investors seem to judge managers by their overall historical track records, placing greater emphasis on more recent results. The exponential average formalizes that idea by weighting the most recent observation more heavily than past observations. Lastly, we calculate the sentiment index or PLI for each time period by taking the weighted average of the exponential averages of each fund, weighted by total assets.

In this strategy, we divide the current PLI number by its running two-year average to calculate a normalized PLI. The strategy is to remain fully invested in the S&P 500, if the normalized PLI is below its threshold. If the normalized PLI is at or above the threshold, we sell the S&P 500 portfolio and move into three-month T-bills.

BAKER AND WURGLER STRATEGY

Baker and Wurgler (BW) create an index based on the first principal component of six (standardized) sentiment proxies over data from 1962 to 2005, where each of the proxies has first been orthogonalized with respect to a set of macroeconomic conditions. The six underlying proxies for sentiment include the closed-end fund discount, NYSE share turnover, the number and average first-day returns on initial public offerings (IPOs), the equity share in new issues, and the dividend premium. The closed-end fund discount CEFD is the average difference between the net asset value of closed-end stock fund shares and their market prices. NYSE share turnover is based on the ratio of reported share volume to average shares listed from the NYSE Fact Book. The IPO market is often viewed as sensitive to sentiment, and high first-day returns on IPOs are cited as a measure of investor enthusiasm. The share of equity in total equity and debt issues is another measure of financing activity that may capture some aspect of sentiment. We define the equity share as gross equity issuance divided by gross equity plus gross long-term debt issuance, using data from the Federal Reserve Bulletin. The sixth and last sentiment proxy is the dividend premium, which is the log difference between the average market-to-book ratios of payers and nonpayers.

The strategy invests in the S&P 500 at all times, unless the change in sentiment decreases by more than 200%. In that case, we switch out of the S&P 500 and into three-month T-bills for the year.

EMPIRICAL MODEL STRATEGY

We use the Henriksson-Merton [1981] parametric model to determine whether any of the strategies are capable of producing statistically significant market-timing results. The model is

$$R_{pt} - R_{ft} = \beta_{0P} + \beta_{1P}\gamma_{1t} + \beta_{2P}\gamma_{2t} + E_{pt} \qquad (1)$$

R_{pt} is the monthly return on the market timing strategy, R_{ft} is the risk-free rate of return, $\gamma_{1t} = max(0, R_{bt} - R_{ft})$, $\gamma_{2t} = min(0, R_{bt} - R_{ft})$, and E_{pt} is the residual error term. The benchmark return (R_{bt}) is the total return on the S&P 500 index. The β_{1p} represents the up-market beta and the β_{2p} represents the down-market beta. Successful market timing requires that the difference between the two, $\beta_{1p} - \beta_{2p}$, is greater than zero.

RESULTS

We calculate the growth of a hypothetical $100 from 1970 to 2012 for each market-timing strategy. The best performer is the three-month LEI fundamental strategy, growing from $100 to $13,693.52 by the end of 2012. The second best performer is the PLI sentiment strategy, which grew to $11,115.87. Not unexpectedly, timing strategies outperformed the S&P 500 benchmark strategy in market downturns. Exhibits 1 and 2 illustrate the growth of the hypothetical $100, using a natural log scale to show each strategy's growth more clearly.

Exhibit 3 results indicate that of the seven market-timing strategies tested, five outperformed, one performed similarly, and one underperformed the S&P 500 benchmark strategy. Our two new strategies, the LEI3 fundamental and PLI sentiment strategies, were the best performers, outperforming the benchmark by 1.66% and 1.57% per year, respectively. The 200-day SMA and yield curve strategies came in third and fourth. The

EXHIBIT 1
Growth of $100 Using Fundamental Strategies

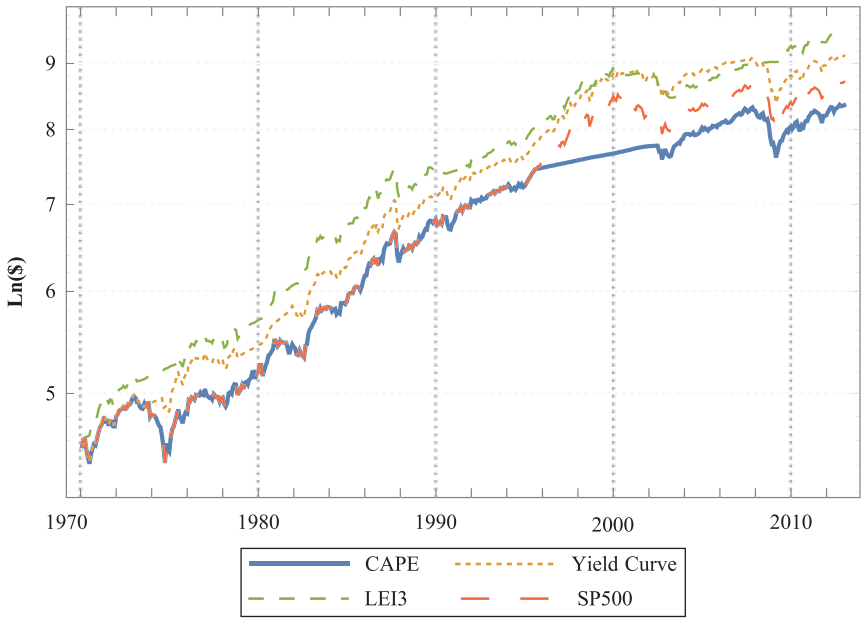
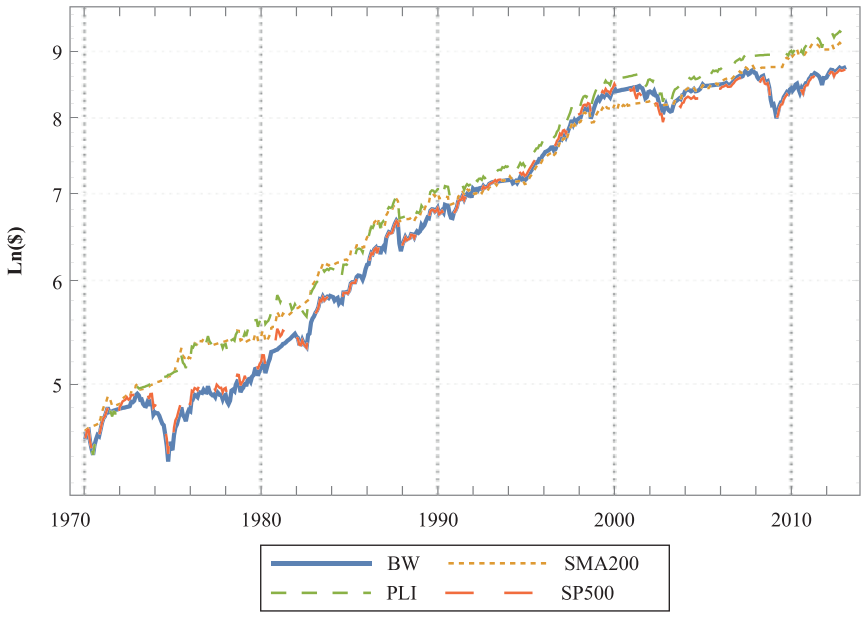


EXHIBIT 2
Growth of $100 using Sentimental Strategies



200-day SMA is a technical strategy that is not based on fundamentals or academic theory. The yield curve is one of the most reliable indicators of an impending recession. As people demand less credit, interest rates fall, pushing the yield curve down. The simple inverted yield curve strategy outperforms the Estrella and Mishkin probit model, using a 30% probability threshold. Consequently, we display only the results for the simple inverted yield curve.

In contrast to our results, Resnick and Shoesmith [2002], using a 50% probability threshold for 1970 to 1999, find that monthly returns for the probit model are significantly different from the S&P 500 benchmark strategy. However, unlike our study, their study does not include the dot.com crash of 2000 and the global financial crash of 2008. If we included these events, we find that the 50% probability threshold is not statistically significant based on the Henriksson-Merton test, because the threshold was never reached in either 2007 or 2008. However, if the probability is lowered to 40%, the threshold was reached in 2007, triggering a switch out of the S&P 500 and into T-bills.

The Fed model and Baker & Wurgler (BW) sentiment strategies came in fifth and sixth, respectively. The Fed model signals when the stock market is undervalued relative to three-month T-bills. It outperforms the S&P 500 benchmark by 0.65%. The Baker & Wurgler strategy performs similarly to the benchmark strategy, earning a total annualized return of 10.01% from 1970 to 2012.

The Shiller cyclically adjusted P/E 10 stock market-timing strategy came in last at seventh, underperforming the S&P 500 benchmark strategy by 1.97% per year. The underperformance occurs

EXHIBIT 3
Summary Statistics

Annualized return is over the 43-year period from 1970 to 2012. Excess return is the annualized return difference between the market timing and S&P 500 benchmark strategies. Max and min are the maximum and minimum monthly returns over the period from 1970 to 2012.

Variable	Annualized Return	Excess Return	Stdev	Min	Max
LEI3	11.67%	1.66%	12.44%	–21.54%	13.47%
PLI	11.58%	1.57%	14.91%	–21.54%	16.81%
SMA200	11.09%	1.08%	13.16%	–21.54%	13.47%
Yield Curve	11.08%	1.07%	14.16%	–21.54%	13.47%
Fed Model	10.66%	0.65%	13.36%	–16.79%	16.81%
BW	10.09%	0.08%	10.98%	–21.54%	13.47%
Benchmark	10.01%	0.00%	15.57%	–21.54%	16.81%
CAPE	8.04%	–1.97%	9.72%	–11.52%	16.81%

because the Shiller CAPE consistently overvalues the S&P 500 (Siegel [2013] & Anonymous [2014]). Consequently, the Shiller market-timing strategy underallocates to it. We experimented with other Shiller CAPE strategies, such as switching to three-month T-bills when the CAPE exceeds one standard deviation above its long-term moving average. Otherwise, the strategy remains fully invested in the S&P 500. However, these proved to be poor market-timing strategies.

Exhibit 4 displays the LEI strategy's performance using different timing windows of one, two, and three months. For example, the LEI1 strategy switches from the S&P 500 to three-month T-bills when the LEI index falls for one month and switches back to the S&P 500 when the LEI increases for the month after having fallen in the previous month. LEI2 switches to three-month T-bills when the LEI falls for two months in a row and switches back to the S&P 500 when it increases for two months in a row, etc. The LEI1, using the one-month window from 1970 to 2012, produces the greatest annualized return of 12.12% with a Sharpe ratio of 0.59. However, an investor would have switched 111 times between the S&P 500 and three-month T-bills over the 43-year period. In contrast, an investor would have only switched 13 times by using a three-month window. As the window increases beyond three months, the results converge to results similar to those of the S&P 500 benchmark strategy. We showcase the LEI3 strategy because its turnover is significantly lower.

Exhibit 5 displays each strategy's annualized return on a decade-by-decade basis. The top three strategies during the bear decades of 1970 to 1979 and 2000 to 2009 are the PLI, LEI3, and 200-day SMA. For the decade from 1970 to 1979, the PLI, LEI3, and 200-day SMA strategies outperformed the S&P 500 benchmark by 4.34%, 3.32%, and 2.46%, respectively. For the decade from 2000 to 2009, the outperformance is 6.14%, 4.92%, and 8.92%, respectively. During the bull decades of 1980 and 1990, the yield curve and Fed model outperformed the benchmark strategy.

However, underperformance during the bear decades is the reason these strategies rank lower overall for the period from 1970 to 2012. Ideally, if we had the prescience to realize when we are in a bull or bear market, then we would benefit by switching to the LEI3 sentiment strategy in a bear market and to the yield curve fundamental strategy in a bull market.

Exhibit 6 displays the results of the Henriksson-Merton test. The intercept coefficients are insignificant and are not presented. This is to be expected, because the intercept indicates selection ability. We show only the up- and down-market betas and their differences. A positive difference indicates market-timing benefits. At the 10% level, both the 200-day SMA and LEI3 strategies show market-timing abilities. The difference

EXHIBIT 4
LEI Windows and Performance

Conference Board's leading economic indicator strategy for windows of one, two, and three months. Annualized return is over the 43-year period from 1970 to 2012. The Sharpe ratio uses the average three-month T-bill yield of 5.2% from 1970 to 2012.

Variable	Return	Stdev	Sharpe	# of Switches
LEI1	12.12%	11.72%	0.59	111
LEI2	11.30%	11.91%	0.51	21
LEI3	11.67%	12.44%	0.51	13

EXHIBIT 5
Annualized Return by Decade

Return annualized over a 10-year period.

Variable	1970s	1980s	1990s	2000s
SMA200	8.60%	17.10%	12.50%	7.97%
LEI3	9.46%	16.91%	15.75%	5.19%
PLI	10.48%	15.65%	16.90%	3.97%
CAPE	7.14%	16.19%	6.55%	3.14%
BW	5.51%	18.33%	17.48%	–0.07%
Fed Model	6.22%	21.48%	16.33%	–0.14%
Yield Curve	8.78%	18.05%	19.11%	–0.40%
Benchmark	6.14%	17.55%	18.21%	–0.95%

EXHIBIT 6
Henriksson-Merton Market-Timing Test

From equation 1, a positive difference between B1 and B2 implies a beneficial market-timing strategy.

Variable	B1	B2	B1-B2
SMA200	0.577¨(0.064)	0.281¨(0.054)	0.295¨(0.098)
LEI3	0.522¨(0.069)	0.336¨(0.058)	0.185†(0.107)
PLI	0.617¨(0.075)	0.468¨(0.063)	0.149 (0.115)
Yield Curve	0.728¨(0.075)	0.624¨(0.063)	0.103 (0.115)
CAPE	0.438¨(0.054)	0.387¨(0.046)	0.050 (0.084)
Fed Model	0.626¨(0.072)	0.586¨(0.061)	0.040 (0.111)
BW	0.669¨(0.076)	0.795¨(0.064)	–0.125 (0.117)

between the PLI up- and down-market betas is positive at 0.15. It is not statistically significant at the 10% level, but is at the 20% level. All of the other market-timing strategies are statistically insignificant.

However, under the Newey West serial correlation consistent standard errors with one lag, the results change. The LEI3 estimator becomes statistically insignificant at a p-value of 0.31. The 200-day SMA remains significant at the 10% level. Even after adjusting the standard errors for serial correlation, we still find strong evidence that the 200-day SMA is significantly different from the S&P 500 benchmark strategy.

Exhibit 7 displays the number of one-way switches between the S&P 500 and T-bill strategies. LEI3 has the smallest number of switches at 13, with PLI second at 14. At 59, the 200-day SMA has the largest number of switches. We also compare the number of switches in the first half of our sample to those in the second half. Exhibit 7 suggests that almost all strategies switched more during the first half of the sample, from 1970 to 1991. Perhaps the strategies become more accurate, with better and more useful data?

Exhibit 8 displays various risk metrics. The drawdown measure shows the lowest six-month returns over the period from 1970 to 2012. Only the 200-day SMA, CAPE, LEI3, and PLI strategies offer some protection from market downturns, recording a drawdown of –28% or lower. By design, market-timing strategies have higher Sharpe and Sortino ratios than simply holding the S&P 500, because the strategies switch out of higher risk stocks into lower-risk, three-month T-bills during periods of high market volatility. Nonetheless, the ratios are useful in comparing the strategies' risk/return properties. The LEI3 strategy has the highest Sharpe ratio and second-highest Sortino ratio. The 200-day SMA strategy has the highest Sortino ratio.

Exhibit 9 displays results from combining the LEI1 strategy with one of the other strategies. The logic behind combining the strategies is that the LEI1 strategy produces the largest annualized return—12.12%—but has a high turnover. Therefore, we combine strategies in order to maintain or increase the return, but reduce the turnover. The combination strategies invest in three-month T-bills if the LEI1 and additional strategy both call for investing in three-month T-bills. Otherwise, the combination strategies call for remaining in the S&P 500. For example, assuming we use the combination of the LEI1 and 200-day SMA strategy, we invest in three-month T-bills only if the LEI declined the previous month and the current S&P 500 index price is below its 200-day moving average.

EXHIBIT 7
Number of Switches Between Stock and T-bill

Switches are number of turnovers, percent of time in stocks, and percent of time in three-month T-bills. Switches < 91 equals switches from 1970–1991 and Switches > 91 equals switches from 1991–2012. The data is from 1970 to 2012.

Variable	Switches	% Stocks	% T-bill	Switches < 91	Switches > 91
Benchmark	0	100%	0%	0	0
LEI3	13	77%	23%	9	4
PLI	14	84%	16%	10	4
BW	15	87%	13%	8	7
Yield Curve	19	86%	14%	15	4
CAPE	30	84%	16%	17	13
Fed Model	37	76%	24%	28	9
SMA200	59	67%	33%	37	22

EXHIBIT 8
Risk Analysis

Six-month drawdown is the largest percent decline over a six-month horizon. The Sharpe and Sortino ratio calculations use the average three-month T-bill yield from 1970 to 2012: 5.2%. The Sortino ratio is the annualized return divided by the standard deviation of monthly losses.

Variable	Drawdown	Sharpe	Sortino
SMA200	–21.86%	0.45	0.93
CAPE	–27.49%	0.29	0.55
LEI3	–28.36%	0.51	0.93
PLI	–28.36%	0.43	0.88
Yield Curve	–41.82%	0.42	0.97
Fed Model	–41.82%	0.41	0.70
BW	–41.82%	0.45	0.57
Benchmark	–41.82%	0.31	0.57

EXHIBIT 9
Combination Strategy Performance

Performance results from combining the LEI1 strategy with the other strategies. The Sharpe ratio calculation uses the average three-month T-bill yield from 1970 to 2012: 5.2%.

Variable	Return	Stdev	Sharpe
LEI1 SMA200	12.77%	12.65%	0.60
LEI1 EM	12.48%	13.18%	0.55
LEI1 PLI	11.67%	13.38%	0.48
LEI1 Yield Curve	11.43%	14.40%	0.43
LEI1 Fed Model	11.20%	15.01%	0.40
LEI1 BW	10.71%	15.16%	0.36
LEI1 Shiller	9.08%	15.00%	0.26

Results suggest that the LEI1 and 200-day SMA combination strategy produces the highest annualized return at 12.77%, along with the highest Sharpe ratio of 0.60. This combination strategy produces at least a 1% higher annualized return over the top-ranked individual strategies presented in exhibit 3. It also reduces the number of switches to 43, compared to 111 from the LEI1 strategy alone. This means turning over the portfolio once per year. These results suggest that fundamental and technical strategies may complement each other, with the combination generating higher returns.

We also find that the LEI1 combined with the Estrella and Mishkin (EM) probit model strategy produces greater returns than using LEI1 combined with the simple yield curve strategy, generating a return of 12.48% and a Sharpe ratio of 0.55.

CONCLUSION

The Conference Board's LEI strategy is the best-performing market-timing strategy of those considered in this study, outperforming the benchmark strategy of simply holding the S&P 500 by 1.66% annually over the period from 1970 to 2012. The LEI also has low correlation with the benchmark strategy, the lowest turnover, the lowest drawdown, the highest Sharpe ratio, and the second-highest Sortino ratio. The monthly returns generated from the LEI strategy are significant at the 10% level, relative to the S&P 500 benchmark strategy. The second- and third-highest performing strategies are the PLI and 200-day simple moving averagea, followed by the yield curve and the fed model. Five of the seven strategies outperform the S&P 500 benchmark strategy. However, if we apply a 1% transaction fee per switch, only three outperform the benchmark strategy. The Shiller CAPE strategy was ranked last, because the strategy consistently implied an overvaluation of the U.S. stock market; consequently, the strategy underallocates to the S&P 500. Therefore, two of our three new strategies, LEI and PLI, outperformed other well-known market-timing strategies.

We find no evidence to suggest that fundamentally based market-timing strategies are any more effective than sentiment or technical market-timing strategies. The PLI and 200-day SMA sentiment strategies perform, as well as some well-known fundamental strategies, e.g., the yield curve and earnings yield versus Treasury strategies.

Lastly, we discover that combining fundamental and technical strategies can produce even greater performance results than using a fundamental or technical strategy alone. The combined LEI1 plus 200-day SMA strategy grows from $100 at the beginning of 1970 to $17,566 by the end of 2012, resulting in an annualized return of 12.77%.

Despite our findings, it is impossible to know if our outperforming strategies will continue to work in the future.

Future research should explore other new market-timing strategies, including further exploration to confirm whether fundamental or sentiment strategies are more effective.

ENDNOTE

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