

Timing the Market Revisited

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We've heard all the arguments

The buy-and-hold believers will swear to you that you cannot beat the market by timing it. They'll point out the costs of timing. They'll point out all the money you could lose by missing out on the best days of the stock market, but conveniently avoid talking about missing the bad days and the effect on the investor's portfolio and psyche (more on that later). They'll make it sound complicated, too hard to do and something only an idiot would try.

We must be die-hard idiots then, because we've been timing the market in one form or the other for about 17 years now, and I would never feel comfortable buying and holding the stock market. Rather than saying timing doesn't work, financial advisors need to see it as just another way to approach investing with a different, lower risk return stream. I would argue that everyone should consider having some form of timed investment as part of their well-diversified portfolio.

Constructing a reasonable study of timing

The first step is to understand what constitutes a timing strategy. The following is a basic, yet effective timing strategy that anyone could do on a calculator or spreadsheet using a simple moving average, trend-following strategy to time the market. Moving averages allow us to focus on the overall direction of the market by minimizing the noise of daily market volatility. Think of a moving average of a combination of many days of prices. This reduces the effect any one day has on your decision-making. Many advisors use various moving averages, since these indicators ensure that investors participate in every major up move of the market. Followed religiously, moving averages cannot miss out on a major move. Moving averages also get the manager out of down periods at some point, preserving part of the portfolio's value. The negative of using moving averages is that during sideways, volatile markets, moving average tend to give a lot of signals that do not last long, leading to possibly frequent, brief trades, many at a loss. These trades are usually called whipsaws.

First, we create a slow, exponential moving average (EMA), using a 0.05 smoothing constant. The specific math formulae are at the end of the report. Next we use a fast average of 0.3 for a second EMA. As with most simple moving average strategies, when the faster moving average is above the slower one, we want to buy that investment. When it is lower than the slow average, we want to sell the investment. When out of the market, we credited the account with the yield on 3-month Treasury bills. and invested in the S&P 500 index when

in the market. Since the S&P 500 is an index, investors cannot invest directly in the index, however, a number of proxies exist for the S&P 500 including index funds and various exchange traded index funds.

One criticism of timing is that trading costs are not included in the studies, resulting in an overly optimistic return. An investor could buy and sell an S&P 500 Index fund for free, but I assumed a 0.2% per year cost for the expense ratio of an index fund, since I found a number of them available at that level of expense ratio. No-load funds have no other costs and can be purchased and sold easily using toll-free telephone calls or, in some cases, the internet.

Another criticism of many timing studies is that the money manager uses end-of-day prices to make the timing decisions, then credits the timed portfolio with the end-of-day price. Critics correctly point out that you wouldn't know you needed to buy until the end of the day, then it would be too late to buy. To correctly time the market, our simple example model will use the end-of-day data to calculate the buy and sell signals, then buy or sell at the close the next day. This would give us an entire day to call in the trade to the mutual funds.

I had data on the S&P 500 composite index, including dividends, going back to January 1960, and used that as my starting point for the study. For a money market, I use the 3 month T-Bill yields from the Federal Reserve Economic Data (FRED) database over that same time period.

What is the potential objective of perfect timing?

The first thing we looked at was the potential benefit of timing the market. What if we had a perfect crystal ball each day? To get a feel for this we took the S&P 500 Index and T-Bills. If the stock market went up by more than the T-Bill yield, we credited ourselves with the stock returns as measured by the S&P 500 Index minus the costs of the mutual fund. If T-Bills yielded more than the S&P 500, then we credited ourselves with the interest on T-Bills.

Over the 41 years of the data we had, the annualized return for perfect timing was +142.7% per year. The Sharpe ratio, which measured the annual returns over a risk-free rate divided by the standard deviation of those returns was 6.78 one of the highest ratios that I've ever seen. Of course when timing the market in this ideal way, there was never a down day.

An investor owning one of those perfect crystal balls would have to make 4648 trades over the 41 years or about 113 trades per year, a lot of work. The best 250 day (about a year of trading days) rolling period for perfection would have been a smoking +372.3%, while the worst 250 day rolling period would still have been a lofty +50.3%.

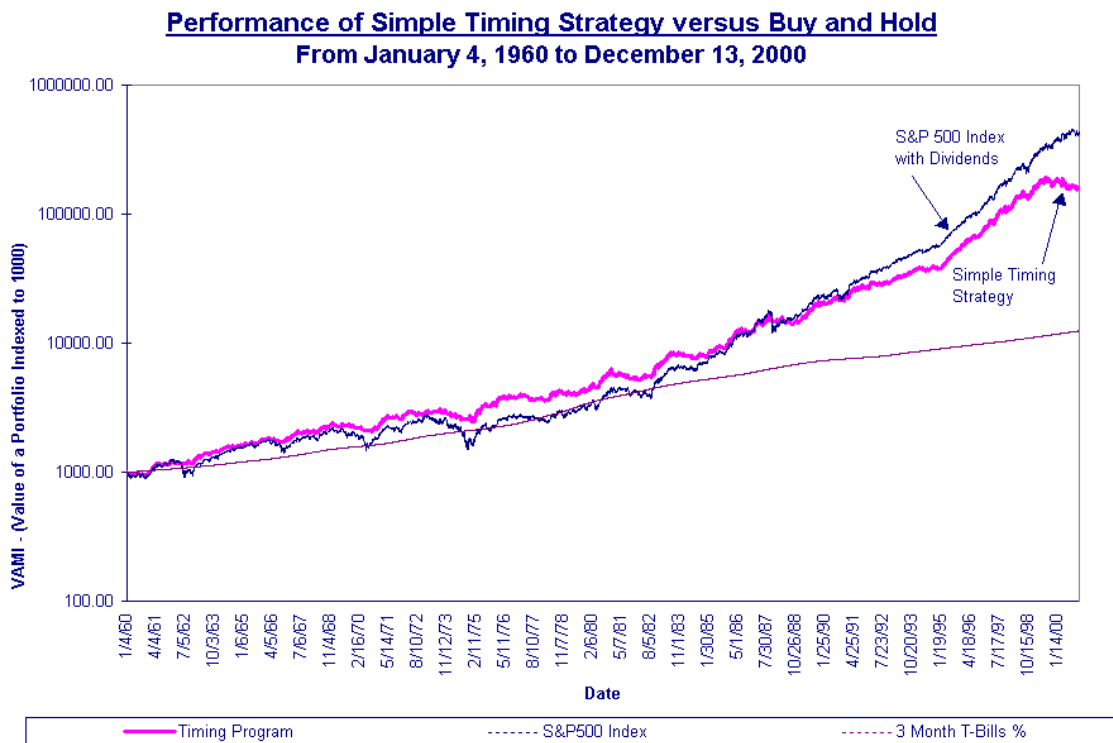
Is this realistic? I would be the first in line to say definitely not, but it is helpful to give us a feel for the magnitude of the potential we are trying to achieve using any timing technique.

Performance of a simple timing strategy

To test the validity of timing, our simple strategy needed to be one an investor could quite easily execute, without a lot of strain or stress. The approach using two moving averages outlined above produced only 335 trades over the 41 years, averaging about 9 trades per year. This would not be a heavy burden for most investors.

Not surprising to me, the simple timing strategy excelled through much of the '60s and '70s. By the late '80s, buy and hold had finally caught the timing performance, and, during the bull market of the '90s, buy and hold was an easy winner. Figure A, shows a performance chart of a buy-and-holding strategy using the S&P 500 and T-Bills versus our simple timing approach. The '60s and '70s were a timing market and the timing strategy got off to a good start. The early '80s gave the investing public very high interest rates, so T-bills did well during then. Finally, the buy-and-hold stock strategy did well in the late '80s and '90s, catching up to and exceeding the returns on the other two strategies.

Figure A



The simple timing strategy holds up well here against the buy-and-hold strategy. Interestingly, simple T-Bill growth was ahead of buy and hold as recently as 1983, some 23 years into the study. Yet, the timing strategy stayed ahead of our money market benchmark for most of the time period studied.

More results of the study

We looked at a number of different commonly used statistics on trades, return and risk to see how comfortable we'd be with the strategy. These results are found in Table 1.

Table 1

	Return/Yr.	Maximum Drawdown	Longest Time In Drawdown In Days	Average Hi to Lo Drawdown	Trades	Trades/Year	Monthly St.Dev.	Annual St.Dev.
S&P500 Index Buy and Hold	15.9%	-45.2%	1344	-5.6%	1	0	4.3%	19.1%
Three Month T-Bills	6.3%	0.0%	0	0.0%	166	4	0.2%	2.6%
Simple Timing Strategy	13.2%	-20.1%	777	-4.3%	335	8	3.3%	16.0%
Combined 50/50	14.7%	-30.8%	1089	-4.5%	336	8	3.6%	17.0%
Perfect Timing	142.7%	0.0%	0	0.0%	4648	113	3.9%	19.3%

Data from January 4, 1960 through December 13, 2000

Not too many surprises here either. As I would expect, the risk of the timing strategy is lower than buy-and-hold due to being in T-Bills some of the time, which is considered risk-free. The timing strategy also keeps the maximum drawdown much more tolerable. In 1973-1974, the market fell by over 45%. Many investors bailed out with large losses and swore never to return to the stock market. Most investors of today either have never experienced this level of devastation to their portfolio or simply have forgotten that the stock market can make these kinds of moves or believe that the stock market has a different set of rules now.

The simple timing strategy cut the maximum length of time an investor would have to suffer through a drawdown to 777 days (about 2.1 years) from 1344 days (about 3.7 years) with a buy-and-hold S&P 500 strategy. Average drawdowns were much lower with timing as well, giving the investor a more comfortable ride through the rough periods for the stock market.

Figure 2

	Return to Maximum Drawdown	Sortino Ratio	Sharpe Ratio	Correlation to S&P 500
S&P500 Index Buy and Hold	0.35	3.46	0.49	1.00
Three Month T-Bills			0.00	-0.04
Simple Timing Strategy	0.65	3.37	0.42	0.73
Combined 50/50	0.48	3.54	0.48	0.73
Perfect Timing			6.78	0.81

Data from January 4, 1960 through December 13, 2000

Shown in Figure 2 is some return-to-risk measures. The timing strategy is the winner with the return-to-maximum drawdown ratio. What this shows us is that the timing strategy was able to produce more return for a unit of maximum drawdown suffered by investors. The Sortino ratio, which ratios return over the losses from just the losing months, was close with a slight edge to the Buy and Hold strategy. Although possibly the most popular, my least favorite return-to-risk is the Sharpe ratio. It implies a normal distribution of returns, something which actively managed strategies almost never have. Buy and hold has a better Sharpe ratio than the simple timing strategy.

The best Sortino ratio of all is created by combining 50% buy-and-hold with 50% timing strategy. This provides enough of a different return stream that the Sortino ratio of the entire portfolio is improved slightly over the timing strategy. The simple timing strategy had a 0.73 correlation to the S&P 500. Even those critics of timing should realize the beneficial effect to an overall portfolio in introducing a different, less correlated return stream into any mix of investments.

They were the best of days, the worst of days...

I think I've seen the same study quoted 15 times criticizing timing strategies for what they potentially give up by missing the best 10 or 20 days of the stock market's movements. Interesting perhaps, but what's wrong with flipping that on its head and looking at the possibility or benefit of missing the worst days the market has dealt us over time.

In Table 3, we see that the worst day the market experienced in our database was the October 19, 1987 crash for a loss of -20.4%. Many investors may not recall sitting in front a quote machine, like I did, watching the Dow go down 5 points every few seconds and realizing that what you were looking at was about one hour behind reality due to the volume of panic selling. The banks had to intervene the next day to provide liquidity and help prevent a breakdown of the financial system as we know it. Many thought the whole system was crumbling. Now sharp down moves are thought to be buying opportunities. Sell-offs are "profit-taking". Does anyone really believe that everyone is taking profits when the market declines?

Table 3

	10 Best Days Total Percent	10 Worst Days Total Percent	Single Best Day Percent	Single Worst Day Percent	Best Rolling 250 Days Percent	Worst Rolling 250 Days Percent
S&P500 Index Buy and Hold	53.71%	-77.34%	9.1%	-20.4%	74.0%	-41.6%
Three Month T-Bills	1.6%	0.1%	0.2%	0.0%	15.6%	2.8%
Simple Timing Strategy	37.9%	-49.5%	5.2%	-6.8%	64.4%	-17.1%
Combined 50/50	39.3%	-56.5%	5.2%	-10.2%	67.6%	-28.3%
Perfect Timing	53.7%	0.1%	9.1%	0.0%	372.3%	50.3%

Data from January 4, 1960 through December 13, 2000

Our simple timing strategy noted the down direction of the market leading up to the crash and was safely tucked away in T-Bills 10 days before the day of the crash. The worst single day suffered by the timing strategy was -6.8% , about what investors are now used to seeing their tech stocks move each day.

What the timing critics don't realize, or don't want to talk about, is the devastating effect of losses on a portfolio. The 10 worst days of the buy-and-hold strategy during this period cost investors a total -77.3% , while the timing strategy's 10 worst days total was only -49.5% . Looking at the impact of both the 10 best and 10 worst days, the buy-and-hold portfolio yields -23.6% . Had the simple timing strategy missed participating in the 10 worst and the 10 best days, the result is -11.6% for, a $+12.0\%$ advantage to timing.

There clearly is more emotional impact when markets drop than when they increase, probably due to the panic in down markets being scarier to investors than their enthusiasm when it goes up.

If we look at 250-day rolling periods, the advantage stays with timing. Adding the total of the best 250-day periods to the worst 250-day periods, timing turned in a 47.3% total gain, while the buy-and-hold came in +32.4%. Looking at all the periods that make headlines, both to the upside and downside, I have to conclude that a timing strategy is a more sensible approach because it offers less risk, less emotional stress and comparable returns.

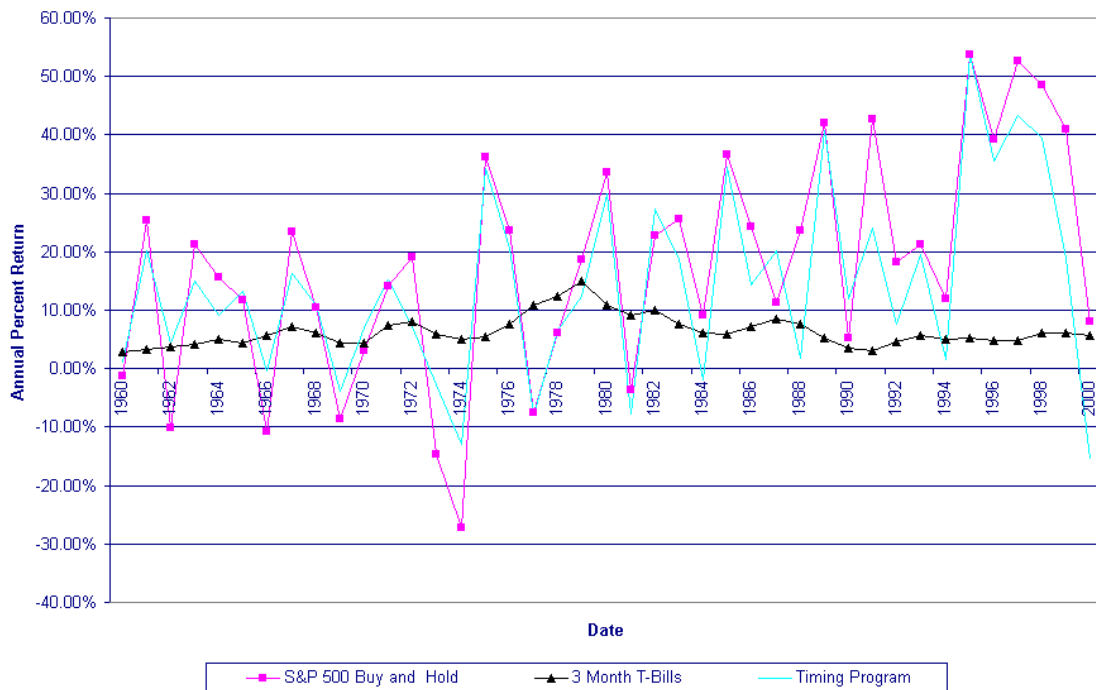
Annual returns

I like to study the down periods, because it is those periods that stress out investors and cause them to abandon their investment plans. Ignoring investor behavior is a major oversight in many academic studies. The reality is that investors don't like losses and make emotional decisions, especially when seeing losses in their portfolio. To analyze down periods, we plotted the annual returns of each 12-month period (from February to the end of January) in Figure B below. The buy-and-hold strategy had 8 losing 12-month periods, while the simple timing strategy totaled 7 losing periods. More important, you can see visually that the magnitude (and therefore the pain and stress) of the timing strategy was far less than some of the larger downs of the buy-and-hold strategy.

Figure B

Annual Returns of Simple Timing Strategy against Buy and Hold and T-Bills

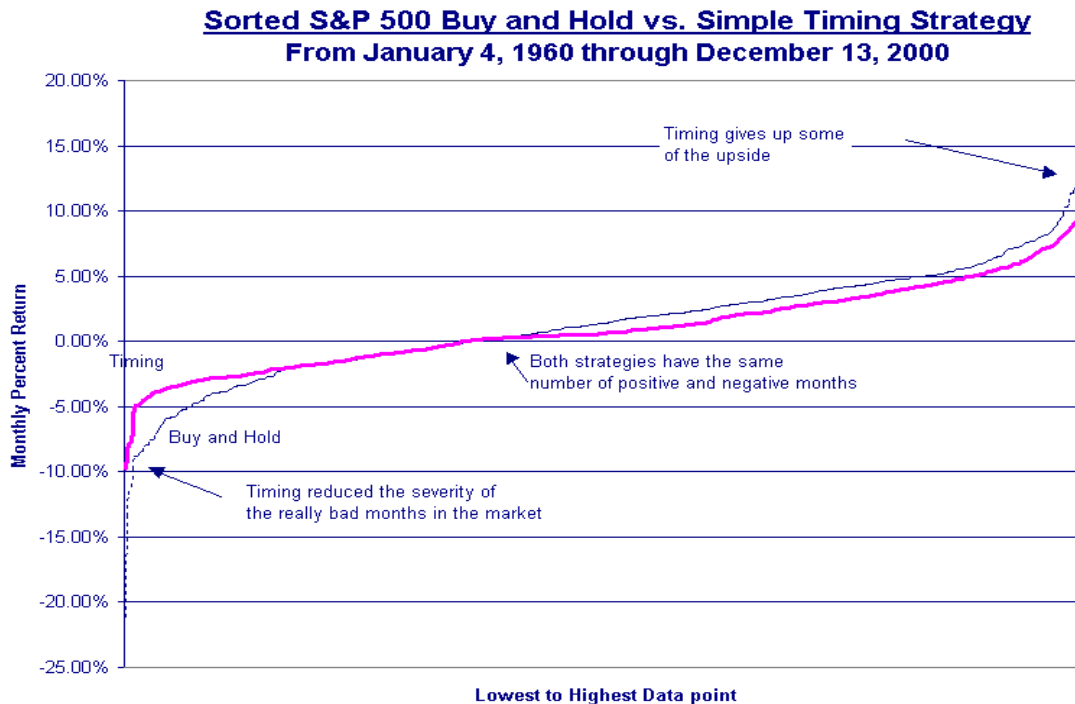
Data from January 4, 1960 through December 13, 2000



Sorting the monthly returns

Another way to profile two different strategies is to sort their returns from worst to best and compare the profiles. In Figure C, below, we plotted the sorted monthly returns from both strategies. You can see that the timing strategy cut out some of the risk of the really bad months and gave up a little performance in the upside months. On a monthly basis, both strategies have about the same number of positive and losing periods.

Figure C



The real reason that timing helps the investor

I believe that the most important reason to consider timing for a portion of your clients' portfolios is one that I cannot develop using these statistics. Twenty-four years of managing client assets has shown me that investors like to chase hot returns, buying into something that has done well recently and selling that investment out at lower prices after a bad period of performance. This is why numerous studies have shown that actual investor timing of assets has hurt their overall performance.

Why then would we want to time the market, if all the studies have shown that actual client timing is so poor? The answer is that actual client timing has been driven more by investor psychology than logic. Our simple timing strategy (or more sophisticated ones used by many investment managers) forces the investor to buy when the market is moving up, not question the direction or how long the move will last. It forces the investor to sell out of the market after he's made large profits, is euphoric with the market, but the market starts to move lower. It helps to provide the discipline that the typical investor lacks.

Another psychological aspect that drives me to use timing techniques on my portfolio is understanding myself well enough to know that I could never sit in a buy-and-hold strategy for two years during 1973 and 1974, watch my portfolio go down -48% and do nothing, hoping it would come back someday. Timing

strategies give me the psychological lift that allows me to react to market risks and modify my exposure to those risks over time. It's empowering to be able to know that I can cut losses short and let gains run. It keeps my investing mind concentrated on doing the right thing each day, rather than succumbing to all emotional swings that most investors go through in up and down markets.

If an investor's mental process is not sharp and disciplined, the market has ways of teaching that investor what risk really is. Unless investors prescribe to the paradigm that the "new" economy has created a stock market that is a money machine and always goes up, then they should consider professionally managed timing strategies for at least a portion of their diversified portfolio.

Math used in creating an Exponential Moving Average (EMA)

Today's Fast Moving EMA = Yesterday's Fast Moving EMA + 0.3 X (Today's price – Yesterday's Fast Moving EMA)

Today's Slow Moving EMA = Yesterday's Slow Moving EMA + 0.05 X (Today's price – Yesterday's Slow Moving EMA)