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Investment Newsletter – December 2023

Executive Summary

Long term interest rates have fallen dramatically as it seems the Federal Reserve Bank will cut short-term interest rates in 2024. This has driven big gains in both stocks and bonds, though the majority of the stock market's gains are concentrated in just a few stocks. Valuations are high and the future uncertain – a perfect time to make use of risk allocation timing systems from Part II in our series analyzing these systems. Continuing the quantitative analysis focus, we present a preview of a promising new quantitative equity strategy currently being tested.

Current Market Environment

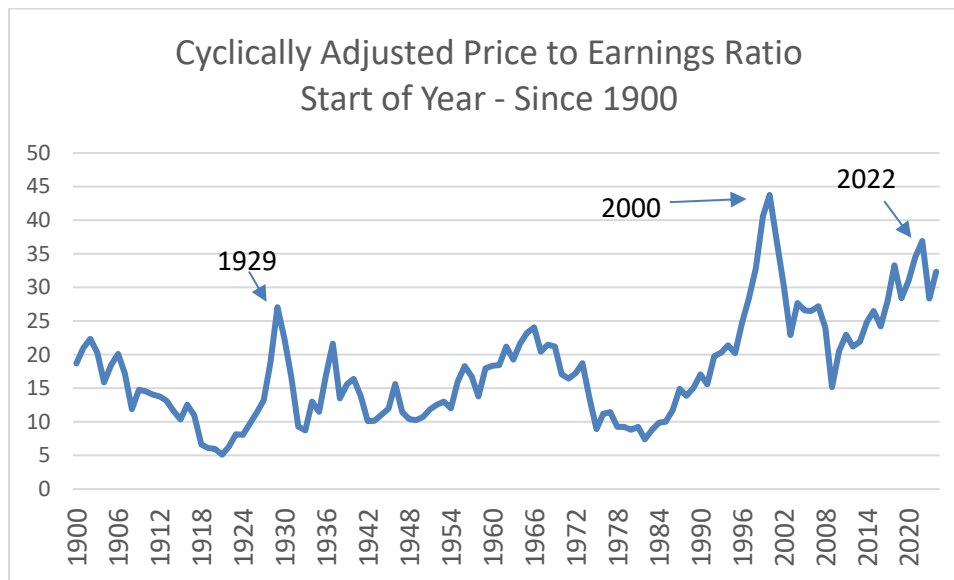
Favorable inflation reports led the Federal Reserve board to indicate a bias towards lower interest rates. Markets reacted strongly with long-term interest rates continuing to come down (meaning bond prices are up) and stocks are rising relentlessly. Sentiment has turned very positive for now. The market is pricing in the 1 year yield at 3.72% starting one year from now, which implies the Fed will cut rates by 1.5% over the next 12-18 months. Consequently the 10 year treasury yield has declined from a high of 5% down to 3.8%. This is the exact opposite of what was going on last quarter. Given that inflation is seasonal when looked at monthly, there is still a substantial chance that higher inflation numbers in the months ahead reverse the bond market gains we've seen.

The S&P 500 stock index gains for the year are large, but these are still very concentrated in the Magnificent Seven (Apple, Amazon, Google, Microsoft, Meta, Nvidia, and Tesla). Through November 30th, these seven stocks were up 71% for the year while the other 493 companies in the index were up just 6%. This seems to be driven by the idea that these companies will use artificial intelligence to capture an ever increasing share of the value created in the global economy. While investing in momentum can pay off, in

Berkeley Investment Advisors
Investment Newsletter – December 2023

the end, stock prices should reflect actual earnings and cash flows - as those who rode the SPAC¹ frenzy in 2021 eventually discovered.

Currently valuations are very high relative to history. Below is a chart of the Cyclically Adjusted Price to Earnings (CAPE) ratio, Professor Shiller's famous valuation measure. This shows the S&P 500 index relative to the average inflation-adjusted earnings of the index companies over the trailing 10 years. This measure is designed to smooth out volatility in the business cycle so as to give a better sense of underlying business values compared to the market prices. This is based on data from Professor Shiller's website.



The CAPE ratio mostly fluctuates in range from 9.2 to 28.2 (80% of the time). We see peaks during speculative episodes in 1929, 1999, and 2021, among others. The current level of 32.4 is at the 94th percentile, meaning it has only been higher in 6% of the years since 1899. This does not mean the market will crash, but it does imply that downside risk is worse than normal.

Quantitative Methods for Asset Allocation (Part II): Can we time the market to improve investment results?

Part I of this article was published in the June 2023 newsletter. The goal of the series is to analyze quantitative rules for adjusting investment allocations (and risk) so as to capture higher returns with lower risk than a static allocation. We seek answers to three key questions:

- Can we do this – is it possible?
- If so, how do we do it?
- Should we try?

¹ SPAC stands for Special Purpose Acquisition Company. These became a popular alternative to initial public offerings in 2020-21 as they circumvented disclosure rules and allowed huge sums to flow to sponsors.

Berkeley Investment Advisors
Investment Newsletter – December 2023

In part I we focused on the Dual Momentum strategy which uses only market prices for its rules. Based on historical results, this strategy outperforms the comparable static allocation – if held long enough. This strategy also has significantly lower risk as measured by maximum drawdown compared to the static benchmark portfolio. In this newsletter we analyze the use of a fundamental valuation methodology and combinations of the two different types of timing systems to develop a rule to make decisions. Part I in June also explained why market timing may not work for many investors. I'll revisit this later in the current newsletter.

Fundamental Value Allocation

Fundamental value refers to valuation measures which relate stock prices to the performance of the underlying businesses. For example the ratio of price to earnings for stocks, i.e. the P/E ratio is perhaps the best known metric relating business value to stock price. Other such metrics include the price to book value ratio (P/B), price to free cash flow (P/FCF) and more complex versions of P/E using earnings stretching back years so as to smooth out business cycle fluctuation effects.

Such measures are appealing because it makes intuitive sense that we should earn higher returns if we are able to buy businesses (stocks) low (relative to value) and sell high. It is the equity market equivalent of buying a bond after its price has fallen and therefore its yield has risen (i.e. future expected returns are higher). Note that a fundamental valuation timing strategy is inherently contrarian: it will indicate a buy signal as prices drop and a sell signal as price rise relative to some standard range. Academic research shows that buying at lower valuations relative to fundamentals, produces higher long-term returns. However, as we'll see in the next section, a practical system for using this for asset allocation within a reasonable time horizon is a much more challenging task.

Academic Research Findings

A paper titled "Another Look at Timing the Equity Premiums", dated October 2023, conducts backtests for 720 versions of 3 basic types of timing over the period July 1927 to December 2022:

- a. Valuation Ratio (meaning price to book value)
- b. Momentum
- c. Mean Reversion (meaning trade opposite of momentum)

The strategy permutations differed by geographic region, the category of equities traded, and the trading rules. Although 720 is a lot of strategies to test, it still does not come close to covering all the possibilities, or even all the strategies actually published. For example, it does not cover the Dual Momentum strategy.

Berkeley Investment Advisors
Investment Newsletter – December 2023

The authors conclude that although some strategies tested show statistically significant positive returns compared to a benchmark portfolio, these instances can be attributed to randomness when testing 720 different strategies – i.e. some of them should outperform by accident. This paper demonstrates that it is not easy to construct a good timing strategy that works across the last 95 years – especially when you’re not focusing on a plausible hypothesis.

An earlier paper in the 2017 Journal of Portfolio Management, titled “Contrarian Factor Timing is Deceptively Difficult”, tested the price to book value ratio along with a more complex composite valuation metric for timing risk allocation changes. They refer to this as contrarian because it generally means going against the recent trend in the market. I.e. as the market goes down, we buy, and as it goes up, we sell. This is basically the value investing approach to stocks (which we know works) but applied at an aggregate level rather than on a relative value basis, security by security. They apply their strategy within equity styles. That is, within subsets of stocks categorized by academic factors: Value, Low Beta (Defensive), and Momentum.

When the authors implement their value timing in this way, they find somewhat disappointing results. The paper includes the following key conclusions:

“It is hard for contrarian style timing to meaningfully improve upon simple strategic diversification. Thus, while value timing of a factor may boost the performance of a single-factor strategy, especially a negatively-correlated factor like momentum, it is of little added benefit to a diversified portfolio that already includes a strategic allocation to value. Indeed, tactical timing using a combination of value and momentum, may have potential.”

Finally, a paper published in the 2017 Journal of Investment Management, titled “Market Timing: Sin a Little – Resolving the Valuation Timing Puzzle” explains why valuation factors with statistically explanatory power in long horizon data may fail when used in market timing strategy tests. The sin in the title refers to market timing. They use the Cyclically Adjusted PE ratio (CAPE) of Shiller to construct their timing signals and rebalance monthly.

Although statistically this valuation ratio is correlated with returns, it is rather weak. They find that a tactical trading strategy using it does not improve results in the real world – using their trading rule². This is the puzzle they mention in the title of their paper. They show that the reason for this failure is the long term upward drift in valuations (CAPE). This upward momentum over the last 50 years works against the value factor as a timing

² The system added .8% annually to returns from 1900 to 2015 but if they set the start date in 1958 the allocation algorithm, using only historical data, under-performed their static benchmark.

signal for market exposure. While there is reason to suspect this upward drift in valuations will stop or reverse going forward, there is no way to know ahead of time if that will be the case.

The suggested solution to improve on the timing signal is to combine it with momentum signals – which effectively offset: they find negative correlation between the signals. Their results show that momentum works better alone in timing from 1900 to 2015 but they argue this may not persist; therefore a blended signal will reduce risk for the tactical timing system. Their data indicates a 50% weight on each signal. This system minimizes the drawdown relative to buy and hold – meaning it reduces extreme under-performance relative to a static allocation.

I find this last paper particularly helpful in pointing out that the valuation drift over such a long cycle means that we need to focus on what can work over our (shorter) investment horizon.

Based on my reading of the research, an asset allocation strategy based purely on fundamental measures of value is not optimal. Price momentum strategies show very good performance but inconsistent results across time periods. Momentum strategies' negative correlation with value strategies imply that a combined strategy could provide a higher degree of confidence in good future performance. This is especially relevant in the current environment where equity valuations are high relative to history.

Strategy Testing

There are a large number of asset allocation models with published rules and past returns data. From this large set, I compared two fundamental value timing models and found them almost identical. I will report results for the higher performing one, which is called "Best Simple Asset Class ETF Value Strategy" (Best SACEVS). I also compared price momentum strategies including the Dual Momentum strategy discussed in the June 2023 newsletter. I found that two other momentum strategies had significantly better results based on annual returns and maximum drawdowns (i.e. risk):

1. "Simple Asset Class ETF Momentum Strategy" (SACEMS), and
2. "Dual and Canary Momentum Hybrid Asset Allocation (HAA).

I use the "Top 2" version of SACEMS³ in which we compare momentum for eight asset class ETFs and we invest in the two highest. These eight ETFs represent commodities, emerging market bonds, international equities, gold, U.S. small capitalization stocks, S&P 500 large capitalization stocks, 20+ year Treasury bonds, 3 month Treasury bills, and Real Estate Investment Trusts.

³ Proposed by the CXO research website.

Berkeley Investment Advisors

Investment Newsletter – December 2023

The HAA algorithm comes from a paper by Professor Wouter J. Keller. It is similar to Dual Momentum in the sense that it first tests whether the momentum measure is positive for its “canary asset” which is the Treasury Inflation-Protected Securities ETF. If not, the system invests in the defensive asset with the highest momentum measure. The defensive assets are Treasury Bills or intermediate-term Treasury bonds via an ETF (ticker IEF). If the canary signal is positive, the system invests 25% in each of the “offensive” top four momentum measure asset class ETFs, out of the eight possible asset classes. However, the defensive asset is substituted for any ETFs where the momentum measures are negative. The eight asset classes are commodities, emerging market equities, developed market international equities, U.S. small capitalization stocks, S&P 500 large capitalization stocks, long-term Treasury bonds, intermediate-term Treasury bonds, and Real Estate Investment Trusts.

Focusing on the above set of timing algorithms, we want to analyze risks and returns for the two momentum strategies and then also for combining each with the SECEVS value based strategy. For these combined strategies I use 50% weightings for the value and momentum components⁴.

As benchmarks for comparison to these various strategies, I’ll use U.S. large capitalization stocks as well as the traditional blend of 60% equity and 40% government bonds. For large capitalization stocks I use the S&P 500 as implemented in the ETF (ticker SPY). For the bonds portion, I use 10 year U.S. Treasuries as implemented in the ETF (ticker IEF).

As we know from Part I of this series, test results for these quantitative allocation strategies vary greatly depending on the market environment at the starting date for calculating returns. Therefore, in order to analyze how results may vary in the future, I’ve selected four different starting dates while using 11/30/23 as the end date for each set of calculations. Because the SACEMS strategy data starts the latest - in July 2006, this is the earliest starting date for the backtest analysis.

After inspecting the data for periods of significant divergence across strategies, I’ve chosen these additional starting dates for my illustration:

- March 2009 – bottom of the market during the global financial crisis.
- December 2019 – starting just prior to the pandemic, this includes the worst bond market returns ever.
- December 2013 – exactly a 10 year lookback chosen as so as to get a period length between the two periods selected above.

First let’s consider risk. The maximum drawdown percentages for each strategy and backtest period are in the table on the next page:

⁴ Research on this topic indicates 50% is at or near the optimal weighting.

Berkeley Investment Advisors
Investment Newsletter – December 2023

Maximum Drawdown % by start month (periods ending 11/30/23)				
Strategy/type	July 2006	Mar. 2009	Dec. 2013	Dec. 2019
HAA/momentum	-9.5	-9.2	-6.3	-4.6
HAA + Best SACEVS/combined	-18.2	-11.6	-11.1	-11.1
Top 2 SACEMS/momentum	-21.0	-21.0	-21.0	-11.2
Top 2 SACEMS + Best SACEVS/combined	-14.2	-14.2	-14.2	-14.2
60% SPY + 40% IEF/tradition benchmark	-28.4	-26.2	-26.2	-26.2
100% SPY/highest risk benchmark	-50.5	-23.9	-23.9	-23.9

I've shaded the best result for each period in green and the worst result is red. Equities perform worst during extended recessions. There was a major recession from 2007 to 2009 and a very short recession in the beginning of 2020. Thus we only see the worst equity risk manifested for the backtest period starting in July 2006. Rapidly increasing interest rates are bad for both equities and bonds. Thus the drawdown for the 60/40 traditional benchmark in 2022 shows as the worst drawdown for all periods starting after the financial crisis. The HAA momentum strategy has the lowest drawdown in all periods tested here. It appears to be the best strategy for managing drawdown risk. It is also worth noting that both of the combination strategies (using 50% momentum and 50% value) exhibit very good risk control – with all drawdowns below the 20% level that tends to knock investors out of their positions.

Now let's look at the returns we would have gotten from these strategies. The table below shows the annualized returns earned by each strategy over the four backtest periods:

Annualized Return % by start month (periods ending 11/30/23)				
Strategy/type	July 2006	Mar. 2009	Dec. 2013	Dec. 2019
HAA/momentum	9.9	10.1	8.8	13.0
HAA + Best SACEVS/combined	11.0	12.2	10.8	11.5
Top 2 SACEMS/momentum	13.1	12.1	7.6	13.9
Top 2 SACEMS + Best SACEVS/combined	12.6	13.3	10.2	11.9
60% SPY + 40% IEF/tradition benchmark	7.8	10.4	7.8	3.8
100% SPY/highest risk benchmark	9.7	15.3	11.7	11.5

Again I've shaded the best result for each period in green and the worst result is red. As one should expect, the riskiest strategy, 100% S&P 500, earns the highest returns if we look at periods that are most favorable to taking risk, but underperforms when risk management becomes important. Thanks to the huge equity losses in 2008-2009 and the huge bond market losses in 2022, the traditional 60%/40% benchmark has performed relatively poorly in every period backtested here. The two momentum

Berkeley Investment Advisors
Investment Newsletter – December 2023

strategies have done very well since 2019, but these strategies alone are somewhat erratic across periods. Long periods of relative underperformance increases the chances that investors will abandon such timing strategies. The combination strategies are never the top performers for any period, but they show good results for all backtest periods here, and might be easier to stick to psychologically.

If we look at both the risk numbers and the return numbers, we can get a sense of which strategies are likely to work best going forward for a given drawdown amount that we can tolerate. For example, if you cannot handle more than a 10% drawdown, then HAA is your only choice. If you can handle up to a 20% drawdown, then you could also choose either of the two combination strategies. Over longer time horizons these will tend to produce higher returns than HAA alone (because they are taking a bit more risk). The Top 2 SACEMS strategy looks like it might generate the highest returns of all. It is, however, a bit inconsistent and may not work as well in the future as it has in the past. Next, I'll discuss the potential pitfalls of these quantitative asset allocation schemes.

Caveats to Consider: Why Market Timing May Not Work

In Part I of this series, I included a quote (which is worth repeating) from the pre-eminent market timer, Paul Merriman, who wrote an article titled "[Why market timing doesn't work](#)":

"Nearly half a century of working with investors has taught me this: Many people who try buy and hold succeed, while most of those who try timing (particularly those who do it themselves) fail".

The June newsletter (Part I) lays out a list of issues that make these strategies very difficult psychologically for investors. By design, timing strategies (or most any risk management strategy), will have periods of low correlation with the stock market. You can experience significant periods where your portfolio does not track the market closely. In a declining stock market you will be pleased, but if a large move up in stocks leaves your portfolio returns in the dust, you will feel like an idiot and possibly abandon your strategy at precisely the wrong time.

While I agree that the mental aspects are the biggest challenge, there are also technical reasons for caution in choosing a quantitative asset allocation (timing) system. Markets are complex and changing systems with a lot of random variations which we refer to as "noise" for statistical tests. Researchers who develop timing systems may utilize statistical techniques inappropriately in the sense that they design a system that predicts the past perfectly but may not explain future.

This is especially likely when the system is developed by trying a large number of signals without an underlying economically based logic as to why

Berkeley Investment Advisors
Investment Newsletter – December 2023

a signal should predict future results. This is referred to as data snooping. This problem is nicely illustrated by the first academic paper discussed above in which they tested 720 strategies. While they found some strategies that worked, they attributed their findings to luck in that they were bound to find a few winning strategies when testing such a large number of variations.

Even if we find a good strategy that is based on sound economic logic, its usefulness may degrade through time. Just as with story stocks, once everyone is on board, future returns are can be disappointing and a new story must be found. The strategies most likely to endure are the ones that do not gain too much popularity. This points towards strategies that are hard to implement or hard to stick with psychologically (as noted by Paul Merriman in his article). In my opinion the combined strategies we've tested in this newsletter are both hard to implement and difficult to stick with in an up market. Thus they are less likely to spur market changes that cause them to stop working.

Summary and Conclusions

Based on the analysis presented, the potentially achievable goal here is capturing much of the long term upside in stocks while avoiding most of the downside. Yes, we can do it with some of these strategies, but with the understanding that these techniques have the highest chance of working when pursued over long (or lucky) time horizons.

Looking forward, valuations are quite high relative to history. Fundamentally, things look a lot more like July 2006 than March 2009. In my assessment, this is a reason to favor the combination strategies. By doing so, the strategy diversification can help us psychologically by reducing periods of significant underperformance compared to the S&P 500. This, in turn, should alleviate the fear of missing out on (temporary) gains which can cause investors to increase risk taking at the wrong time. Of the two combined strategies, I prefer Best SACEVS + HAA as it has performed better over the past 10 years and with lower risk.

Given that most investors are uncomfortable with drawdowns above 20%, and, at the same time, they don't want to miss out on rising equity markets, I believe we can and should employ these strategies. Taking into account the caveats mentioned above and Paul Merriman's advice, we should limit this to only a portion of our investments.

While using this dynamic risk management strategy, we must keep in mind it will not outperform riskier strategies in rapidly rising markets. The benefit of using a timing strategy, is not to beat the market long term (though that may happen), but rather to avoid big drawdowns and the likelihood of selling out and not knowing when to go back in.

Another Quantitative Approach to Equity Risks – Tracking the Market with less risk

Besides the market timing approach above, we can also seek an investing edge by doing things differently than the rest of the market – which is focused mostly on large cap and particularly large cap technology. In my experience, investors prefer to reduce tracking error versus the S&P 500 to address the fear of missing out, while also avoiding the large losses that inevitably come from herding behavior in markets. We want to keep up with the crowd, but still maintain our risk management discipline to address the fear of losing too much money.

In pursuit of this goal I've been using quantitative rankings for stocks. I have been testing these for trading small capitalization stocks in my own account since 12/31/2021. The results shown below are excellent.

	SPY ETF (S&P 500)	Small Capitalization Quantitative Strategy
Return for 2022	-18.2%	-1.1%
Return for 2023	26.2%	32.6%
Two year cumulative return	3.2%	31.1%
Maximum Drawdown	-23.9%	-14.9%

Over its first two years, my strategy outperformed the S&P 500 by a cumulative 27.9%.

Unfortunately the small capitalization strategy cannot be implemented for client accounts directly because the stocks involved are too illiquid to replicate these results. In 2024 I plan to perform backtesting to determine if we can expect similar results when trading more liquid stocks. If so, I will roll out the new strategy to clients.

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