

MARKET CAPITALIZATION-WEIGHTED INDEXES: AN ACCIDENT OF HISTORY

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THE S&P 500'S SIMPLE HISTORY

The S&P 500 Index has existed in various forms since 1923,¹ but its current market capitalization-weighted² tracking of 500 stocks took form in 1957. To shine a spotlight on the early days of our industry's best-known market capitalization-weighted benchmark, it may help to view it in the context of the long-standing Dow Jones Industrial Average (DJIA).

When Charles Dow first calculated the DJIA in 1896, he took a basket of stocks and weighted them by their price. The problem with that method was that if an original Dow component such as U.S. Rubber was trading for \$25 while American Tobacco was \$50, the latter would receive twice the weight of the former, regardless of the fundamental profile or investment merit of either stock.

To most practitioners, owning twice as much American Tobacco as U.S. Rubber makes little sense in retrospect. Yet at the same time, so many in our industry make a similar leap of faith and blindly accept that it is OK to hold more than twice as much Microsoft as Procter & Gamble, simply because Microsoft's market cap is that much larger. To us, the exercise of cap weighting is just as foolish.

In response to the flawed price-weighting methodology of the Dow, Standard & Poor's was seeking a way to track the market in aggregate³ to generate a view of the investment experience of investors as a collective, and the index it invented was rightly capitalization weighted. That means the objective was not to find investment optimization based on a reading of the academic literature, but more likely the need at S&P's headquarters to come up with an index that would approximate the public's total returns.

Furthermore, consider what we take for granted today: Fundamentally weighted investing strategies like those utilized by WisdomTree need modern computing power to run stock screens, and that would have been an impossibility in 1957. In contrast, cap-weighted index construction was about as simple as the painstaking process could be: An employee could record 500 stock prices, flip through 500 annual reports to find shares outstanding, then work out the multiplication with pen and paper. To S&P's credit, as we understand it, by the early 1960s the company was able to utilize some early technology to receive "live" quotes at various times during the day. However, running stock screens for what is today known as "smart beta"⁴ was a virtual impossibility.

¹ Source: Marco Sampaolo, "S&P 500," Encyclopedia Britannica, 2016.

² Market capitalization weighting: Market cap = share price x number of shares outstanding. Firms with the highest values receive the highest weights.

³ Aggregate: Collective amount, sum or mass arrived at by adding or putting together all components, elements or parts of an assemblage or group, without implying that the resulting total is whole (contains everything that should be in it).

⁴ Smart beta: A term for rules-based investment strategies that don't use conventional market cap weightings.

Because of these realities, we surmise that S&P developed its famous Index all the way back in 1957, with predecessor S&P Indexes before that, not because academia said cap weighting was optimal but because index construction was captive to the primitive nature of computing technology at the time.

Our conclusion: The trillions tracking the S&P 500⁵ is tracking an Index that was created largely by accident, and the fact that the Index was the first of its kind is the main reason it is “the benchmark,” not because its construction is based on academic diligence.

AN ALTERNATE UNIVERSE

Consider another course that history could have taken—one that we think makes more sense. Imagine if, instead of weighting by the total value of the company, someone at S&P decided to consult the line item for earnings instead of shares outstanding in those 500 annual reports. A stock’s weight in the Index based on the cap-weighted and “alternate universe” earnings-weighted calculations are/would have been:

<p>Course that was taken by S&P:</p> <p>Alternate course of history (S&P’s Mindset = WisdomTree):</p>	$\frac{\text{Stock Price x Shares Outstanding}}{\text{Total Value of All Stocks}}$ $\frac{\text{Earnings Per Share x Shares Outstanding}}{\text{Total Earnings of All Stocks}}$
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REVISIONIST HISTORY

Unfortunately—and this is the troubling part—many investors have come to believe that Standard & Poor’s decided to embark on capitalization-weighted indexes in response to the Efficient Market Hypothesis (EMH). That theory states that all known information is already baked in to the prices of all assets, so there is no point in doing research or trying to select stocks. Proponents of the theory conclude the proper course of action is to purchase a capitalization-weighted index fund, as any other effort is a fool’s errand.

The theory has many adherents, but the problem is that it did not even exist when the S&P 500 was created in 1957. That is because the academic studies that are considered the “definitive classics” in terms of the EMH were not even written until years later. To reiterate, the S&P 500, with trillions tracking it, took its cap-weighted form largely because S&P employees had no choice; their computing capacity was virtually nonexistent.

If S&P has any literature in its archives that states any reference to academic theory being the justification for cap weighting circa 1957, we would like to see it.

⁵ S&P Dow Jones Indices.

MALKIEL'S CITATIONS: CONFIRMING THE ACCIDENT

Perhaps the best-known work on efficient markets is Princeton Professor Burton Malkiel's 1973 classic, "A Random Walk Down Wall Street," which stood as the benchmark for market pricing theory for decades after its publishing. The EMH was called into question after the 1987 stock market crash and again in the wake of the dot-com meltdown in the early years of this century. The EMH was put on the witness stand to testify against itself, and in 2003 Malkiel penned "The Efficient Market Hypothesis and Its Critics,"⁶ a 47-page research paper that delved into many of the classic studies written for and against the EMH up to that point.

Malkiel was doing some heavy reading. In his 2003 look back, he made reference to no fewer than 57 research conclusions from such heavyweights as Eugene Fama, Ken French, Ben Graham, Robert Shiller and Malkiel himself. What we found interesting was that, aside from a reference to work by Graham & Dodd in 1934—and that duo, of course, was the antithesis of the EMH—all of the studies that Malkiel felt important enough to include in his 2003 report were published after 1957.

Basically, this means that Malkiel found nothing on EMH pre-1957 that was worthy of note in a research report that included almost five dozen key studies. The logical conclusion is that cap weighting was invented to make life easy on the poor guy who had to work out the math with pen and paper, not because of investment merit.

⁶ Burton Malkiel, "The Efficient Market Hypothesis and Its Critics," CEPS Working Paper No. 91, 2003.

FIGURE 1: Malkiel's Citations (2003)

Citations in Malkiel, "The Efficient Market Hypothesis & Its Critics" (2003)		
Researcher(s)	Year of Study/Citation	Malkiel's Summary of Conclusion
Graham & Dodd	1934	Value stocks return more than Growth stocks
Nicholson	1960	Low P/Es provide higher rates of return
Cootner	1964	A stock's past performance does not indicate future returns
Benjamin Graham	1965	The stock market is a long run weighing mechanism
Jensen	1969	First study of fund performance. Active managers couldn't add value
Eugene Fama	1970	Markets are efficient
Burton Malkiel	1973	Prices reflect all known information
Fama & Schwert	1977	Short-term rates related to future returns
Basu	1977	Low P/Es provide higher rates of return
Ball	1978	Low P/Es provide higher rates of return
French	1980	Higher returns on Mondays
Grossman & Stiglitz	1980	Market cannot be perfectly efficient; otherwise no incentive to study market
Kahneman & Tversky	1982	Investors are overconfident
Keim	1983	Small-cap factor is evident
Keim (cited again)	1983	Small-cap factor is evident (second citation)
Keim & Stambaugh	1986	High-yield sperads have predictive power
Campbell	1987	Interest rate term structure influences stock prices
Poterba & Summers	1988	Stock market mean reversion over long horizons
Haugen & Lakonishok	1988	January Effect
Lakonishok & Smidt	1988	Stocks exhibit notable performance patterns around turn of the month
Fama & French	1988	Dividend yields forecast returns
Campbell & Shiller	1988	Dividend yields forecast returns
Bagwell & Shoven	1989	U.S. corporate dividend behavior has evolved
Ariel	1990	Stock market patterns on holidays
Miller	1991	October 1987 crash was the accumulation of unfavorable "fundamental" events
Fama & French	1992	Small-cap factor is evident
Fama & French	1992	Size and price-to-book explain future returns
Roll & Shiller	1992	Market "inefficiencies" cannot be exploited
Fama & French	1993	Low price-to-book captures financial distress
Lakonishok, Shleifer & Vishny	1994	CAPM doesn't capture all risk dimensions
DeBondt & Thaler	1995	Investor emotions cause prices to deviate
Hawawini & Keim	1995	Foreign nations' varying average daily returns
Hawawini & Keim	1995	Low price-to-cash flow generates excess returns
De Bondt & Thaler	1995	Stocks underreact to certain new events
Malkiel	1995	Repeat of Jensen (1969). Active managers didn't add value
Fluck, Malkiel & Quandt	1997	Stocks with previously low returns subsequently outperformed
Fluck, Malkiel & Quandt	1997	High dividend yields do not earn a high rate of return
Fama & French	1997	Price-to-book effect more powerful outside of U.S.
Campbell, Lo & MacKinlay	1997	Stocks underreact to certain new events
Fama	1998	Stocks "respond efficiently to events like earnings surprises"
Campbell & Shiller	1998	P/E ratios partially explain the variance of future returns
Kahneman & Riepe	1998	Value stocks return more than Growth stocks
Lo and MacKinlay	1999	Supportive of serial correlation
Odean	1999	Traders underperform buy-and-hold
Lo, Mamaysky & Wang	2000	Modest predictive power in technical analysis
Shiller	2000	"Irrational exuberance" in 1990s U.S. equities
Shiller	2000	Dot-com bubble is evidence of irrationality
Shleifer	2000	Noise trader risk limits arbitrage when in a bubble
Shleifer	2000	Closed-end funds sell at irrational discounts to NAV
Lesmond, Schill & Zhou	2001	Trading costs negate relative strength strategies
Schwert	2001	Predictable patterns disappear after publication
Fama & French	2001	U.S. corporate dividend behavior has evolved
Schwert	2001	DFA fund based on Fama & French (1993)
Rasches	2001	Stocks with similar tickers experience co-movement
Cooper, Dimitrov & Rau	2001	Adding ".com" to corporate name led to positive stock reaction
Ross	2001	Closed-end fund discounts explained by management fees
Fama & French	2002	High average returns result partly from large unexpected gains

"THE BENCHMARK"

A benchmark is a standard to which we should all aspire. From auto manufacturing to fine watchmaking, the benchmark for excellence will cease representing the "industry standard" once the weight of evidence shifts to a superior product.

For autos, the top standards are a combination of objective measures (measurable speed, safety, etc.) and subjective ones (the look and feel of the car). In investing, we have the benefit of measurement that is completely objective and quantifiable (returns, risk).

Yet even so, when the goal is favorable risk-adjusted returns, investment management's accepted benchmarks continue to be those that prize both mediocrity (by cap weighting) and a championing of the acceptance of futility (blindly following the S&P 500).

Like a fine Swiss watch or an ultraluxury vehicle, the benchmark for investment managers should be a form of passive index construction that strives for excellence. The triumvirate of logic, reason and decades of data points to long-term excellence in indexing concepts that utilize fundamental weighting by factors such as earnings and dividends.

THE EVIDENCE

At WisdomTree, we argue that earnings- and dividend-focused indexes are the benchmark. Having witnessed the dot-com bubble, the Lehman crisis and numerous other episodes of extreme sentiment in the last few decades, we adhere to what our Senior Investment Strategy Advisor, Jeremy Siegel of the Wharton School, calls the "Noisy Market Hypothesis." That hypothesis logically says that the prices of securities are not the best approximation of the true value of a stock.

Siegel and others came to that conclusion after witnessing evidence that suggests that blindly cap weighting may have cost investors dearly for several generations. According to Cass Consulting, a research-led consultancy service provided by Cass Business School, returns of traditional market capitalization-weighted indexes lagged various fundamentally weighted indexes by as much as 2% per year from 1969 to 2011.⁷

MORE RESULTS: EARNINGS WEIGHTING

We used famed professor Kenneth French's data library⁸ to analyze performance of the total market against subgroups based on the earnings-to-price ratio from 1957 to 2017.⁹ The study breaks the market into five quintiles ranging from the highest earnings-to-price ratio to the lowest, excluding companies with negative earnings, across all NYSE, AMEX and NASDAQ stocks for which French has data.

The results are telling. The highest quintile, representing the cheapest stocks in terms of their E/P ratios, returned 15.28% annually during those 60 years, or 460 basis points (bps) more than the total market. This occurred despite a standard deviation that was only moderately higher than the total market (16.45% vs. 14.95%, respectively), leading to considerably higher Sharpe and information ratios.

⁷ Source: Andrew Clare, Nick Motson and Steve Thomas, "An Evaluation of Alternative Equity Indices Part 2: Fundamental Weighting Schemes," Cass Business School, March 2013.

⁸ Kenneth French, Detail for Portfolios Formed on Earnings/Price, Dartmouth University, May 2018.

⁹ Price-to-earnings (P/E) ratio: Share price divided by earnings per share. Lower numbers indicate an ability to access greater amounts of earnings per dollar invested. Earnings-to-price ratio (E/P) is the reciprocal and is thus another way to phrase the same concept.

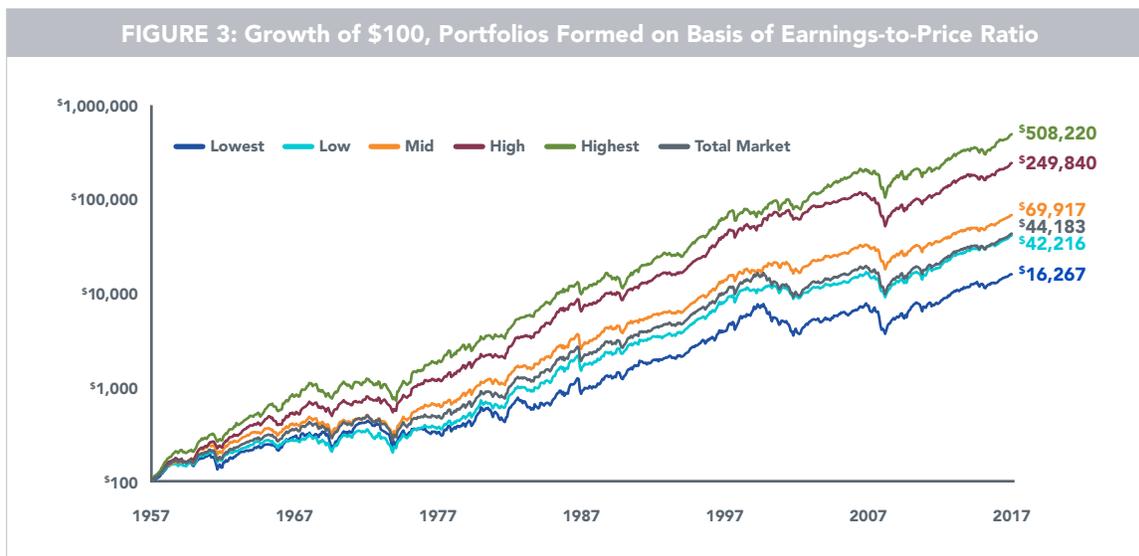
FIGURE 2: Long-Term Performance, Portfolios Formed Using Earnings-to-Price Ratio (12/31/1957 – 12/31/2017)

Quintile	Return (%)	Std Dev. (%)	*Beta	Sharpe Ratio	*Information Ratio	*Tracking Error (%)	*Correlation
Highest	15.28%	16.45%	0.97	0.65	0.60	7.69%	0.88
High	13.93%	14.49%	0.89	0.65	0.53	6.12%	0.91
Mid	11.53%	14.42%	0.90	0.49	0.16	5.35%	0.93
Low	10.60%	14.60%	0.92	0.42	-0.02	4.85%	0.95
Lowest	8.86%	17.14%	1.09	0.25	-0.34	5.35%	0.95
Total Market	10.68%	14.95%	1.00	0.41	0.00	0.00%	1.00

Sources: Kenneth French Data Library, WisdomTree, as of 12/31/17. Standard Deviation (Std. Dev): measure of how widely an investment or investment strategy's returns move relative to its average returns for an observed period. A higher value implies more "risk", in that there is more of a chance the actual return observed is farther away from the average return. Beta: Measure of the volatility of an index or investment relative to a benchmark. A reading of 1.00 indicates that the investment has moved in lockstep with the benchmark; a reading of -1.00 indicates that the investment has moved in the exact opposite direction of the benchmark. Information ratio: A risk-adjusted return measure calculated by taking the excess return against the benchmark and dividing by the tracking error. Tracking Error: A divergence between the price behavior of a position or a portfolio and the price behavior of a benchmark. Correlation: Statistical measure of how two sets of returns move in relation to each other. Correlation coefficients range from -1 to 1. A correlation of 1 means the two subjects of analysis move in lockstep with each other. A correlation of -1 means the two subjects of analysis have moved in exactly the opposite direction.

* Beta, Information Ratio, Tracking Error and Correlation are calculated relative to the index occupying the last row of each individual table. Past performance is not indicative of future results. You cannot invest directly in an index.

Figure 3 shows the growth of \$100 using these series in a hypothetical portfolio, excluding any fees or expenses that would have been incurred. What is so interesting about the study is the sheer power of compound interest. The fact that a \$100 investment in the "total market" would have grown to \$44,183 is truly powerful in and of itself. However, what is eye-catching is the more than 5,000-fold return on investment of the top quintile (highest E/P, lowest P/E) stocks, with even the second highest quintile turning \$100 into \$249,840.



Source: WisdomTree. Data from 12/31/1957-12/31/2017. Past performance is not indicative of future results. Growth does not take into account fees and expenses. Returns would be lower after fees and expenses.

TIME FOR A NEW BENCHMARK

We think that part of the reason some investors have concluded that market cap-weighted indexes are the gold standard for investment performance is their observation that so many active managers fail to beat those indexes. However, we believe the fact that a large proportion of active managers cannot beat cap-weighted benchmarks is not a testament to how good the existing benchmarks are, but simply how bad so many active managers are.

The WisdomTree Earnings 500 Index offers an intuitive twist on core indexing of U.S. large caps. It takes the 500 largest companies ranked by market capitalization in the WisdomTree Earnings Index, but the key is that the Earnings Index is weighted based on our Earnings Stream methodology, which allocates to companies based on their earnings as a proportion of the total earnings of all companies in the Index. For example, if all companies combined earn \$1 billion, and one company earned \$30 million, it would be 3% of the Index.

Unlike the S&P 500, which will give a stock a larger weight at the annual index rebalance just because it may have rallied strongly, meaning that it may now be expensive, our methodology requires a company’s earnings to become a larger portion of the pie in order for our rules to make it a larger allocation in the WisdomTree Earnings Index.

Rationally, this creates a tilt to the value factor in our methodology.

THE WISDOMTREE EARNINGS 500 FUND THROUGH THE YEARS

Nevertheless, if we had been told when the WisdomTree Earnings 500 Fund (EPS) was launched on February 23, 2007 that the S&P 500 Growth Index was poised to outperform the S&P 500 by 196 bps annually from that day until March 31, 2018, we would have expected a pretty rough decade for the ETF because of its earnings-weighting (and thus value-tilted) methodology.

But the trouble never came. The WisdomTree Earnings 500 Index returned 7.97% from its inception through March 31, 2018, ahead of the S&P 500 by 15 bps annually. That allowed EPS to clock in with a 7.65% return despite more than a decade of difficulty for value strategies.

FIGURE 4: Us Large Cap Earnings ETFs (Average Annual Total Returns as of 03/31/2018)

	Fund Information			Total Return NAV (%)							Total Return Mkt (%)						
	Ticker	Exp. Ratio	Fund Inception Date	QTD	YTD	1 Yr	3 Yr	5 Yr	10 Yr	Since Fund Inception	QTD	YTD	1 Yr	3 Yr	5 Yr	10 Yr	Since Fund Inception
WisdomTree Earnings 500 Fund	EPS	0.28%	2/23/2007	-1.92%	-1.92%	13.48%	10.46%	12.89%	9.24%	7.65%	-1.93%	-1.93%	13.67%	10.50%	12.96%	9.29%	7.67%
WisdomTree Earnings 500 Index				-1.85%	-1.85%	13.85%	10.77%	13.21%	9.55%	7.97%	-1.85%	-1.85%	13.85%	10.77%	13.21%	9.55%	7.97%
S&P 500 Value Index				-3.57%	-3.57%	7.69%	8.40%	10.87%	7.42%	5.67%	-3.57%	-3.57%	7.69%	8.40%	10.87%	7.42%	5.67%
S&P 500 Index				-0.76%	-0.76%	13.99%	10.78%	13.31%	9.50%	7.82%	-0.76%	-0.76%	13.99%	10.78%	13.31%	9.50%	7.82%
S&P 500 Growth Index				1.93%	1.93%	19.69%	12.66%	15.37%	11.35%	9.78%	1.93%	1.93%	19.69%	12.66%	15.37%	11.35%	9.78%

Sources: WisdomTree, Bloomberg, Zephyr StyleADVISOR, as of 3/31/18. Performance is historical and does not guarantee future results. Current performance may be lower or higher than quoted. Investment returns and principal value of an investment will fluctuate so that an investor’s shares, when redeemed, may be worth more or less than their original cost. Performance data for the most recent month-end is available at www.wisdomtree.com. WisdomTree shares are bought and sold at market price (not NAV) and are not individually redeemed from the Fund. Total returns are calculated using the daily 4:00 p.m. EST net asset value (NAV). Market price returns reflect the midpoint of the bid/ask spread as of the close of trading on the exchange where Fund shares are listed. Market price returns do not represent the returns you would receive if you traded shares at other times. You cannot invest directly in an index. Index performance does not represent actual fund or portfolio performance. A fund or portfolio may differ significantly from the securities included in the index. Index performance assumes reinvestment of dividends but does not reflect any management fees, transaction costs or other expenses that would be incurred by a portfolio or fund, or brokerage commissions on transactions in fund shares. Such fees, expenses and commissions could reduce returns.

Interestingly enough, of 748 large-cap core managers that Morningstar measured from our Fund's 02/23/2007 inception to 03/31/2018, 75% could not outperform EPS—and that was despite the headwinds that faced value factor-loaded ETFs in a growth cycle¹⁰.

A BETTER WAY

For investors who think there is something a bit counterintuitive in basing trillions in index tracker funds on the S&P 500, an index that gives increased weight to stocks that have already rallied (with decreased weight to stocks that have already declined), we propose the WisdomTree Earnings 500 Index.

More than 11 years ago, we launched a series of earnings- and dividend-focused core beta ETFs to finally give open-minded investors a chance to break the shackles placed on them by the S&P 500, an index that we think was invented with little thinking and that became “the benchmark” almost solely because it was the first one to exist.

For a core holding—a real core holding that is based on the relative investment merit of the companies owned—the WisdomTree Earnings 500 Index provides investors with broad large-cap exposure while increasing allocations to stocks because their earnings rose, not because their stock prices rose.

¹⁰ Rankings based on total return as of 3/31/2018.

Investors should carefully consider the investment objectives, risks, charges and expenses of the Fund before investing. To obtain a prospectus containing this and other important information, please call 866.909.9473, or visit WisdomTree.com to view or download a prospectus. Investors should read the prospectus carefully before investing.

There are risks associated with investing, including possible loss of principal. Funds focusing their investments on certain sectors may be more vulnerable to any single economic or regulatory development. This may result in greater share price volatility. Please read the Fund's prospectus for specific details regarding the Fund's risk profile.

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