Brief

Stocks for the Long Run Revisited: Dividends and "The Return Nobody Got"

Paul McCaffrey

CFA Institute Research Foundation

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STOCKS FOR THE LONG RUN REVISITED: DIVIDENDS AND "THE RETURN NOBODY GOT"

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Foreword

Why aren't we all rich? Equity markets have delivered stunning returns. A dollar invested in 1871 grew to more than $20,000 in real terms by 2025. *In real terms*. In nominal terms, it is, to quote the jazz standard, "How High the Moon." That dollar would now be worth half a million.

Surely somebody's great-grandparents invested in the US stock market during Ulysses S. Grant's presidency and forgot they owned the shares, leaving vast wealth to their heirs 154 years later. Why don't we hear these stories? Victor Haghani and James White referred to such people, who either do not exist or are so few in number that we never hear about them, in the title of their 2023 book, *The Missing Billionaires*.[1] Why do we all know about the great fortunes made by such entrepreneurs as Rockefeller, Ford, and Carnegie, but the only stock market investor most people can name is Warren Buffett, who made 97% of his money after 1995?

Few people have gone from rags to riches in the stock market. Many more have done something else to make their money and then invested in stocks to stay ahead of inflation.

There's no single reason why the stock market has failed to make most long-term investors rich. I attribute the cause to the so-called death by 1,000 cuts:

- Most dividends were consumed, and these constitute much of the market's total return, especially before about 1990.
- It was impossible to buy an index fund until 1976. If you wanted one—a tall order for a strategy that did not exist even as a concept until 1951—you had to assemble it yourself, paying brokerage commissions and other fees that subtracted materially from performance.
- The data on market returns are before taxes, but most people have to pay taxes, sometimes quite a large amount of them.
- Generational wealth dissipates over time as the number of descendants expands, heirs spend money, and "life happens." A 154-year investment horizon is mostly an academic exercise. Few people have even a 40-year planning horizon. Something comes up, and withdrawals are made from the fund.

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[1]Victor Haghani and James White, *The Missing Billionaires: A Guide to Better Financial Decisions* (Wiley, 2023).

- Just because any given investor can earn the index return by buying an index fund (now that those exist), *we can't all do that*. Such a strategy is not "macroconsistent" but is instead subject to a fallacy of aggregation. The problem is that for the investor to realize the index total return, dividends would need to be reinvested in the fund, and if everyone is an indexer, there are no spare shares of the fund to buy. Investors would have to buy the shares from another indexer who already owned them. Any attempt to pursue this ultimately fruitless plan would drive the fund share prices up and expected returns down—*way* down.
- Finally, the market return data from the distant past may be overstated. If the market returned much less than we think it returned, no wonder we aren't all rich!

This brief is the second in our recent series revisiting Jeremy Siegel's *Stocks for the Long Run* thesis and featuring original insight from Siegel, Edward McQuarrie, Rob Arnott, Hendrik Bessembinder, Elroy Dimson, Roger Ibbotson, and myself. Paul McCaffrey addresses these last two crucially important points.[2] He draws on McQuarrie's groundbreaking work in reconstructing stock-by-stock data from about 1800 to January 1897 and uses Cowles and Ibbotson data thereafter to explain why the market's return in the olden days was probably lower than what we have read about in books by Siegel (*Stocks for the Long Run*)[3] and other advocates of buy-and-hold-forever investing. In two sidebars, Dimson and Ibbotson also offer their perspectives, respectively, on the US-focused nature of the discussion and the value of hypothetical index fund returns from the pre-index-fund era.

Future work, if I have anything to say about it, will address the rest of the issues—many of them not listed here—in solving the riddle of "Why aren't we all rich?"

—Laurence B. Siegel

Dividends and the *Realized* Equity Premium: "The Return Nobody Got"

How equity returns are measured over extended time horizons suffers from an underlying paradox. The crux of this issue is how to account for dividends. As the first brief in this series highlighted, dividends have been the principal driver of equity returns going back over the past 100-plus years. So, as Hendrik Bessembinder pointed out, "When we compound returns that include dividends, we implicitly assume a strategy that is buy-and-hold except for the reinvestment of each dividend."

Where these dividends are theoretically reinvested varies depending on how a given investor behaves. Dividends, for example, could be used to purchase more stock in the company that paid them, or, as in Roger Ibbotson's approach, the dividends collected during a particular month could be reinvested at month-end in a hypothetical index fund with perfect tracking, zero transaction costs, and zero fees. Finally, following a more conservative pathway, the dividends could simply be used to buy Treasury bills.

Such strategies make intuitive sense, which explains why they have become the convention. All things equal, where would a hypothetical long-horizon investor direct the proceeds from an

[2]Unless otherwise noted, quotations by the aforementioned researchers in this brief are from an email exchange among them.

[3]Jeremy J. Siegel, *Stocks for the Long Run: The Definitive Guide to Financial Market Returns and Long-Term Investment Strategies*, 6th ed. (McGraw Hill, 2022).

enterprise if not back into that enterprise, into a larger index fund of which that enterprise is a constituent, or into safer assets, such as Treasuries? Therefore, when calculating long-term equity returns, we assume the dividends may be used to purchase more shares in the issuing company, in the larger index, or in some other asset.

Yet, real-world investors on the whole do not actually follow these strategies, for a host of reasons. "Dividends in aggregate are not and cannot be reinvested in the same stocks through secondary market trading, since any purchase of shares for dividend reinvestment requires another investor to sell the same number of shares," Bessembinder said. "For [everyone to reinvest] the funds paid out as dividends . . . in the same firms requires that the firms issue new shares."

With company-sponsored dividend reinvestment programs, this is exactly what happens. But issuing new shares causes dilution, which leaves the company's investors no wealthier in aggregate. It is a zero-sum game. Investors who receive the dividends are better off because their share count has gone up by more than the amount the share's value was reduced through dilution. Wealth has been transferred from shareholders who did not reinvest the dividends to those who did. No wealth has been created.

By the same token, dividends can be reinvested in the index only by buying index fund shares from an entity that is selling them—think Vanguard and the like. Of course, going deeper under the hood, the issuing index fund, in turn, must also buy shares (or fractions of shares) of the index fund constituents (companies).

Index funds have to find sellers, too, and in a theoretical index-only world, no sellers exist. It is a zero-sum game in this case as well. Moreover, a world of perfect tracking, no fees, and no transaction costs is a purely theoretical one. Index fund costs, although small, can add up over long periods of time to a significant total.

To illustrate the salience of this issue, Bessembinder presented two charts. **Exhibit 1** depicts the hypothetical returns of a value-weighted (VW) portfolio composed of all Center for Research in Security Prices (CRSP) common stocks relative to those of a buy-and-hold Treasury bill portfolio from 1926 to 2022.[4] The results resemble those from Ibbotson's compilation of US equity returns presented in the first brief, with the stock portfolio generating a 9.9% geometric mean annual return, or 9,362 times the original investment, over the sample period. The T-bill portfolio, by comparison, had a 3.3% geometric mean annual return, or 22×, over the 1926–2022 sample.

In **Exhibit 2**, Bessembinder added a third line to demonstrate how the buy-and-hold position in the VW portfolio would have fared if instead of being reinvested in stocks, the dividends had gone into T-bills. In this scenario, the geometric mean return is 6.6% per year, which compounds to 487×, barely one-fifth the ending wealth that would have been generated had the dividends been reinvested in the same stocks.

To be sure, the T-bill dividend reinvestment strategy also does not reflect real-world behavior and could be as risk-averse as reinvesting the dividends in the underlying stock, or hypothetical stock index, is bullish. Nevertheless, Bessembinder posed the question, "Is there a plausible alternative (to [the] US equities) reinvestment assumption that would have involved long-run outcomes as high as the 9.9% geometric mean on US stocks during this period?" If there is not, he concludes, that 9.9% return does not accurately reflect what investors in US equities since 1926 have experienced.

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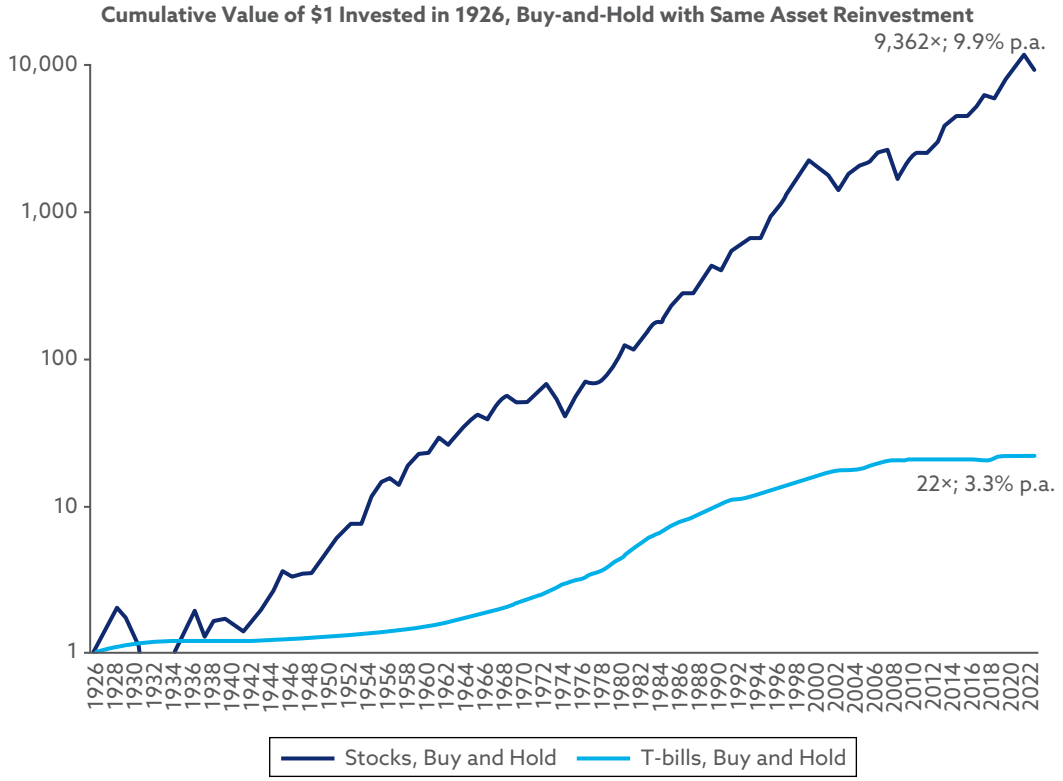
[4]Research results are calculated using data on all US stocks from the Center for Research in Security Prices, LLC (CRSP), Booth School of Business, University of Chicago. Used with permission. All rights reserved. www.crsp.org.

Exhibit 1. Motivating Example: Cumulative Returns to VW Portfolio of CRSP Common Stocks, 1926–2022



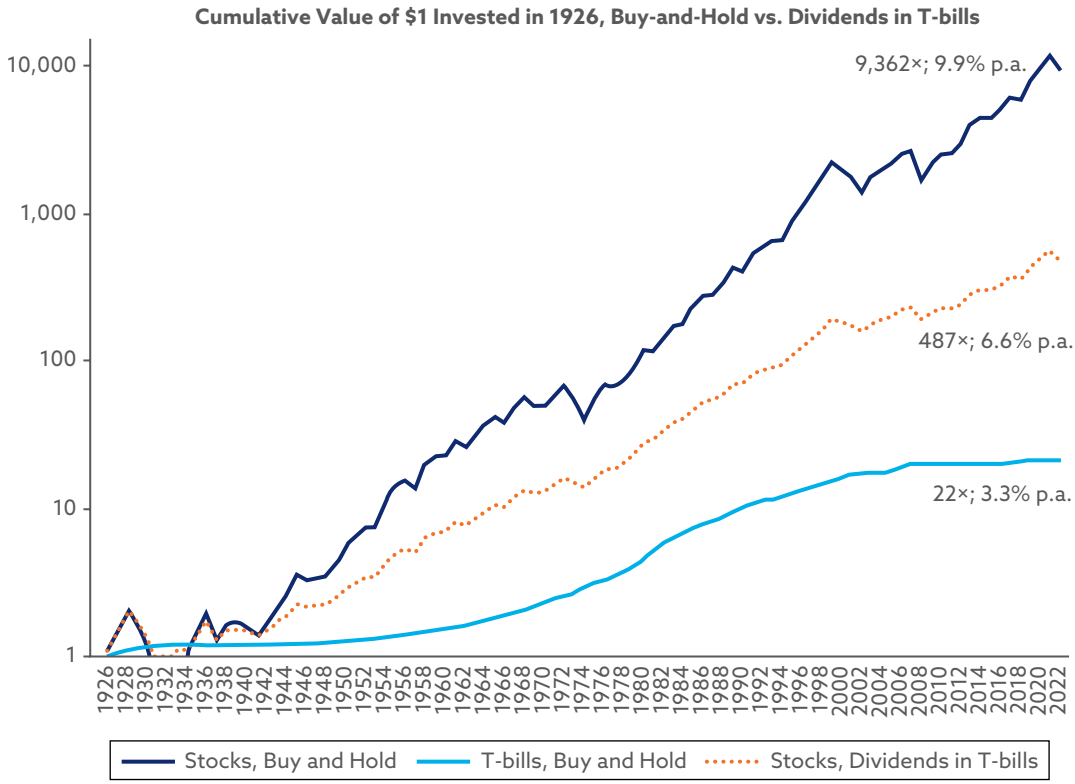
Source: Hendrik Bessembinder, using CRSP data.

Jeremy Siegel acknowledged Bessembinder's point but did not believe it took away from the strength of the analysis or the underlying thesis. That someone could theoretically reinvest the dividends is the point, in his eyes. "Any individual can get the total stock return," Siegel countered. "But of course everyone can't." Investors tend to consume capital returns, however those returns are generated, whether through dividends or buybacks. They do not reinvest all cash flows. This manifests in different ways. For one, the rate at which the stock market's value increases is nowhere close to the rate at which the stock total return index grows. Instead, its trajectory is similar to GDP growth.

"I remember Bill Gross once questioned me, 'How can stocks give 6% to 7% real returns when the economy is growing at only 3%?' " Siegel said. "The answer is that the capital stock, or the total value of equity, is *not* growing at 6% to 7% but is only growing at 3% real, yet stock returns are higher since investors consume the difference."

Of course, the capital stock of the economy cannot outpace the growth of GDP indefinitely; otherwise, the economy would eventually be taken over entirely by capital, with nothing left for labor and the government, among other claimants. Investors can earn a better return than GDP growth because the capital stock pays a dividend. That is, the so-called supply model

Exhibit 2. Motivating Example: Cumulative Returns to VW Portfolio of CRSP Common Stocks, 1926–2022



Source: Hendrik Bessembinder, using CRSP data.

theorizes that the market index's expected return equals the growth rate of the economy plus the dividend yield of the index.[5]

In Siegel's mind, Bessembinder's point hardly necessitates any major rethinking or adjustment of his approach. "There is no puzzle or contradiction or need to make any other calculations," Siegel said. "Recall from growth theory, even in a world of zero growth, the rate of return on capital equals the rate of time preference, which is positive."

That investors *could* realize the total return of the equity market if they avoided consuming their stock returns is all that matters. Whether or not they do is immaterial.

Index constructors also have a role to play, according to Laurence Siegel. They have to determine, on paper, how the dividends will be reinvested. "The customary way is to conceive of, say, the S&P 500 as a transaction-cost-free, zero-fee index fund," he said, referencing Ibbotson's preferred method.

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[5]Jeffrey J. Diermeier et al., "The Supply of Capital Market Returns," *Financial Analysts Journal* 40, no. 2 (1984): 74–80, https://doi.org/10.2469/faj.v40.n2.74; and Richard C. Grinold et al., "A Supply Model of the Equity Premium," in *Rethinking the Equity Risk Premium*, ed. B. Hammond et al. (CFA Institute Research Foundation, 2011).

"When a dividend is received from one of the companies, it is reinvested in *shares of the index fund*, not in the company that paid the dividend or into some other medium, such as the riskless rate."

Of course, this strategy is not macroconsistent—that is, not everyone can do it, because there would be no one from whom to buy the shares if everyone tried to. Using it to construct a historical database does yield an illuminating total return figure for a potential investment, before taxes and fees.

Box 1. Commentary from Elroy Dimson: Don't Forget Non-US Markets!

The focus on US numbers overlooks large differences in returns from other markets. In emphasizing the United States, we are studying an (admittedly important) outlier.

In fact, the United States was the very best performing market in US dollar terms. Whether we are trying to capture what investors might (years ago) have anticipated or whether we are making projections for the future, focusing only on the United States is misleading. The United States has been a winner over the past 125 years. We do not know, however, whether US outperformance was a consensus expectation historically or whether American exceptionalism was just good luck.

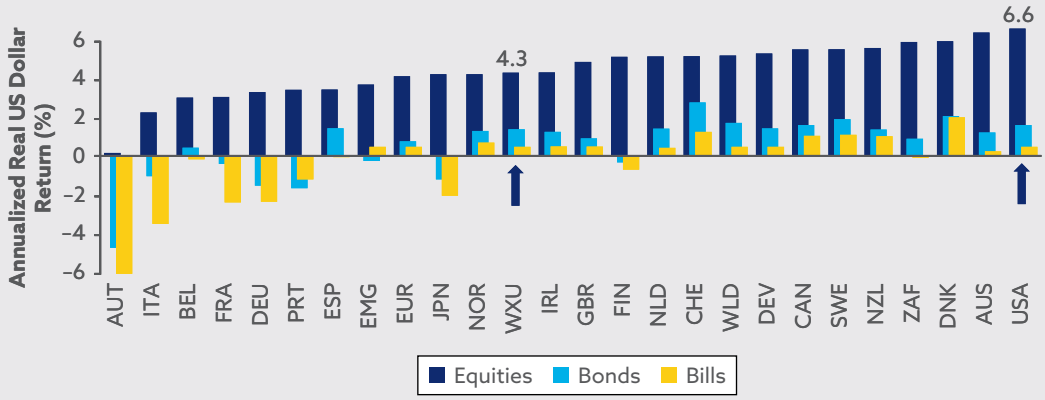
The equity premium relative to bonds or relative to bills has been higher in the United States than in most other countries, as **Exhibit 3** shows. It is dangerous to assume that "what's past is prologue." It suggests that savers should extrapolate favorable returns into the future and that corporate officers should set high required rates of return. These would be dangerous interpretations of the data.

Our discussion correctly highlights the importance of reinvested income. In this, the United States (and United Kingdom) are not unique, however, as dividends are a crucial component of long-run returns everywhere.

In the *UBS Global Investment Returns Yearbook 2025*, Paul Marsh, Mike Staunton, and I examine 21 national indexes and five composite indexes.[6] Based largely on US results, some people might expect dividends to grow faster than inflation. In fact, the equally weighted average real dividend growth rate across the 21 countries, over the 125 years of our study, was 0.16%, while the annualized real dividend growth rate of the cap-weighted world index was 0.50%. Dividends barely matched inflation.

[6] Elroy Dimson et al., *UBS Global Investment Returns Yearbook 2025* (2025). Available from London Business School. Contact mstaunton@london.edu.

Exhibit 3. Real US Dollar Returns on Stocks, Bonds, and Bills, 1900–2024



Notes: All bond and bill returns are based on 125 years of data, with the exception of Germany, which are based on 123 years of data, omitting 1922 and 1923 when bonds and bills had –100% returns. ISO codes are as follows: AUT, Austria; ITA, Italy; BEL, Belgium; FRA, France; DEU, Germany; PRT, Portugal; ESP, Spain; EMG, Emerging; EUR, Europe; JPN, Japan; NOR, Norway; WXU, World ex United States; IRL, Ireland; GBR, United Kingdom; FIN, Finland; NLD, Netherlands; CHE, Switzerland; WLD, World; DEV, Developed; CAN, Canada; SWE, Sweden; NZL, New Zealand; ZAF, South Africa; DNK, Denmark; AUS, Australia; USA, United States. To analyze historical data, Elroy Dimson, Paul Marsh, and Mike Staunton applied MSCI's annual classification to distinguish between developed and emerging markets after 1987. They used their own algorithm for data before 1987.

Source: Elroy Dimson et al., DMS Database (2025).

The market cap-weighted capital gain for world equities ex United States over that same period was 0.3% in real terms; for European equities, it was 0.0%. So Laurence Siegel's notion that "for the investor to realize the index total return, dividends would need to be reinvested" misses a key point. With a near-zero real capital gain, dividends *are* the return.

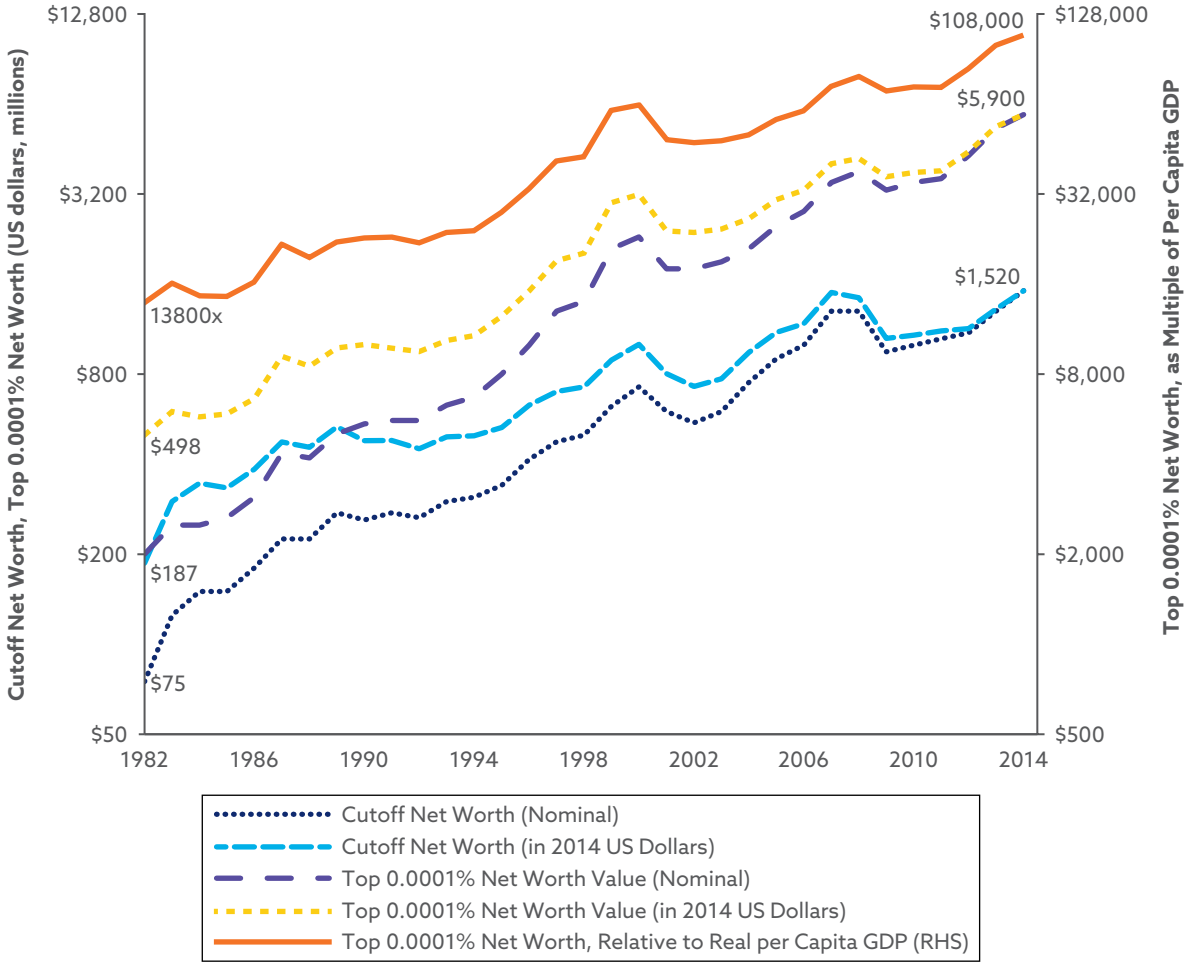
That "the rate at which the stock market's value increases is nowhere close to the rate at which the stock total return index grows" (as stated in the previous section) is obvious given these facts. The difference between the two rates is the dividend yield. Dividends are absolutely crucial to understanding equity returns.

—Elroy Dimson

The Law of Dissipation of Wealth

For his part, the debate about what happens to equity market returns reminded Rob Arnott of Jeremy Siegel and Jeremy D. Schwartz's 2006 paper, "Long-Term Returns on the Original S&P 500 Companies," in the *Financial Analysts Journal*, and Arnott's research,

Exhibit 4. The Rich Get Richer: The Growing Wealth of the Forbes 400, 1982–2014

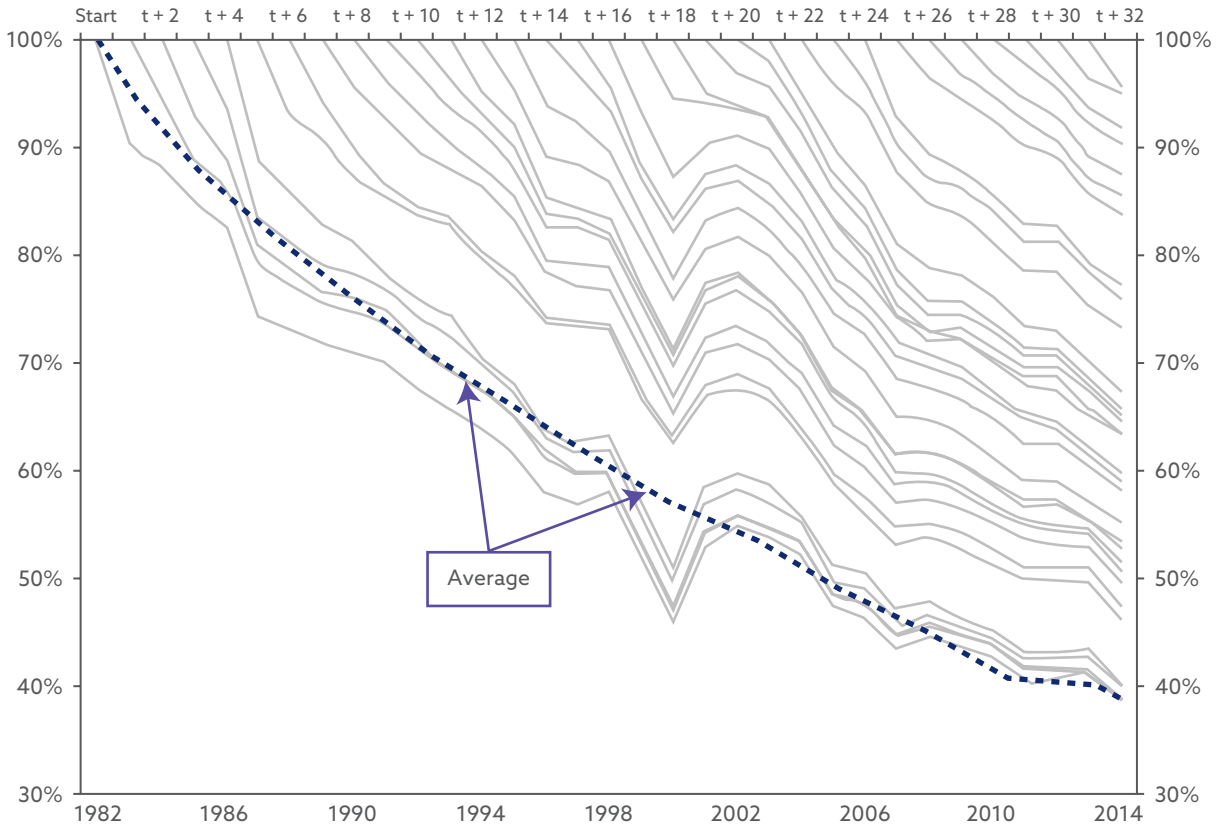


Source: Robert D. Arnott et al., "The Myth of Dynastic Wealth: The Rich Get Poorer," *Cato Journal* 35, no. 3 (2015): 462. www.cato.org/sites/cato.org/files/serials/files/cato-journal/2015/9/cj-v35n3-1_0.pdf.

with William J. Bernstein and Lillian J. Wu, into the precariousness of generational wealth.[7] In the latter piece, a response to Thomas Piketty's calculation that rich families could expect to see their wealth expand at a fairly regular rate, about 5% per year, over generations—a rate high enough to cause them to become even richer relative to the rest of the population—Arnott and his coauthors showed that the fortunes of über-wealthy heirs tend to lose half their value compared with per capita GDP every 20 years or so.

[7]Jeremy J. Siegel and Jeremy D. Schwartz, "Long-Term Returns on the Original S&P 500 Companies," *Financial Analysts Journal* 62 (January/February 2006): 18–31, https://doi.org/10.2469/faj.v62.n1.4055; and Robert D. Arnott et al., "The Myth of Dynastic Wealth: The Rich Get Poorer," *Cato Journal* 35, no. 3 (2015): 447–85, www.cato.org/sites/cato.org/files/serials/files/cato-journal/2015/9/cj-v35n3-1_0.pdf.

Exhibit 5. Erosion of the 1982–2013 Forbes 400 Wealth Share in Subsequent Lists



Source: Arnott et al., "The Myth of Dynastic Wealth:" 465.

"The rich are getting richer," Arnott said. "Vastly so. But, it's never the same people for long." The name Rockefeller, for example, has been synonymous with vast generational wealth going back more than a century. You will not, however, find any Rockefellers on today's Forbes 400 list of the wealthiest Americans, Arnott observed. "After a scant 50–100 years, there are no Carnegies or Mellons or Fricks," he said, "and certainly no Morgans, Vanderbilts, Astors, or du Ponts, where the fortunes date back to the nineteenth century."

Arnott presented two graphics to support his case. **Exhibit 4** tracks the wealth of the individuals in the Forbes 400 in 1982, measured as a share of the total, in subsequent years. The average half-life of each fortune is 22 years. **Exhibit 5** depicts how quickly the hyperwealthy accumulated wealth net of taxes, spending, and so on. Their pace was much slower than that of a typical 60/40 portfolio.

That pattern is not likely to change. Indeed, individual wealth may be influenced by a kind of inversion of the law of conservation of mass. Although mass can neither be created nor destroyed, wealth created is inevitably wealth consumed. Therefore, the rich may be

collectively getting richer, but each individual fortune lives on borrowed time and the clock never stops ticking.

This is why names that currently appear on the Forbes 100 list probably will not appear on the list 100 years from now. "The chances are very slim that any Junior Bezos, Musk, Arnaud, Buffett, or Gates will have the same work ethic, ambition, passion, drive, and creative spark as their papa," Arnott explained.

Just as these forces influence familial wealth, some variation of them likely applies to both stocks and investment portfolios. After all, the twenty-first-century growth giants, like the railroad stocks of the nineteenth century, may become tomorrow's dinosaurs. The question is, Do total return charts à la Ibbotson or Jeremy Siegel accurately account for these forces?

Revisiting that question and Bessembinder's critique, Edward McQuarrie homed in on Ibbotson's Stocks, Bonds, Bills, and Inflation (SBBI®) analysis of S&P 90 Index stocks and asked, "Do the S&P 90 total returns tabled in the Ibbotson SBBI give a true representation of the wealth accumulation possible from stocks over the 31 years 1926–1956 inclusive?"

"The Return Nobody Got"

In McQuarrie's eyes, the SBBI series does not meet this standard. Why? "As Jason Zweig put it . . . those values are 'The Return Nobody Got.' "

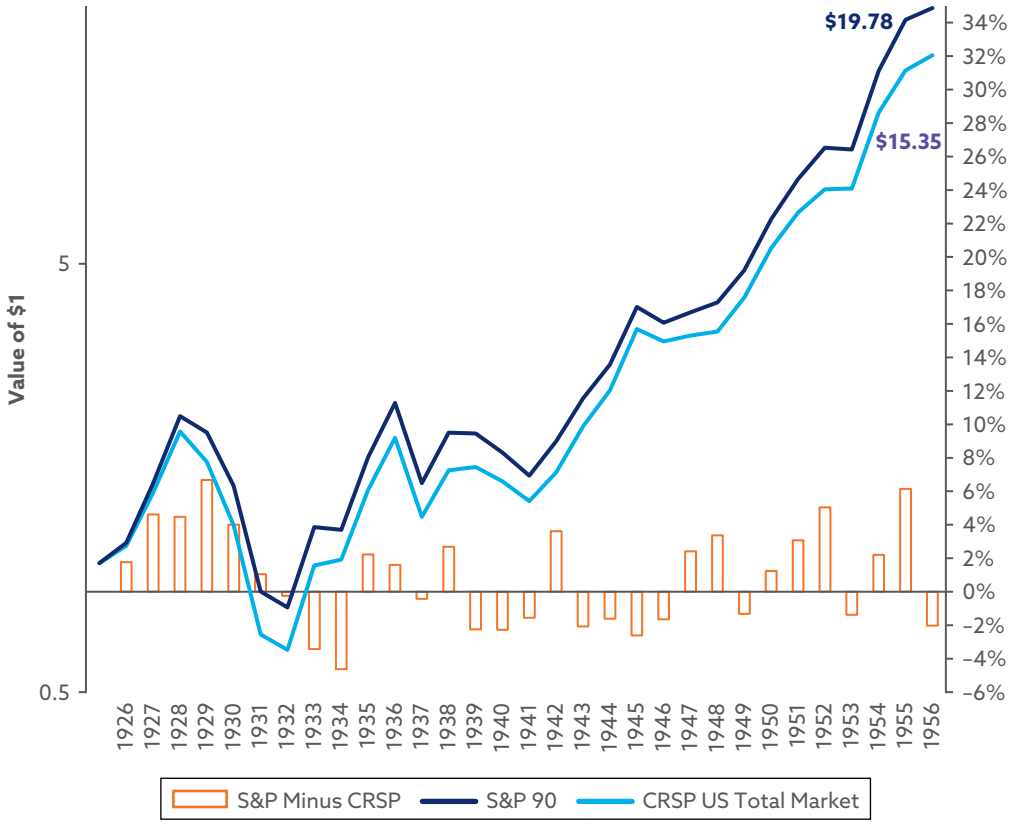
To help make his case, McQuarrie presented **Exhibit 6**, which compares the cumulative total return wealth lines of the S&P 90 and CRSP US Total Market Index over the years in question.

According to the results, over just 31 years, an investor would have generated nearly 30% more ending wealth investing in the S&P 90 stocks, accruing 90 basis points (bps) more on an annualized basis, or 10.11% versus 9.21%. "That's quite a difference in wealth accumulation," McQuarrie noted.

In contrast, McQuarrie highlighted the much larger values, after 66 additional years of compounding, depicted in Exhibit 1 and Exhibit 2. What if, McQuarrie wondered, the results had been the opposite and the S&P 90 had lagged the CRSP total market? "We would shrug it off and chalk it up to the size effect," he said. "But the chart shows the very large stocks in the S&P 90 outperforming the total market." The orange bars in Exhibit 6 indicate that the S&P 90's outperformance varies over time, but that outperformance did not occur only in the 1930s. About 400 other stocks beyond the S&P 90 were listed in the CRSP index in 1926 and nearly 1,000 more were listed 30 years later. Hence, the CRSP index offers a better reflection of true "stock" returns over those years. As such, S&P 90 returns look exaggerated, and that means any equity risk premium calculated based on those numbers would also be exaggerated.

Because Jeremy Siegel used CRSP numbers in his calculations, that risk is not front of mind in the particular context of his *Stocks for the Long Run* thesis. It does reveal, however, how such long look-backs may be prone to these sorts of distortions. Delving deeper then, does the root of the problem, in this instance, boil down to the dividend reinvestment calculation?

Exhibit 6. Total Return: S&P 90 Versus CRSP US Total Market, 1926–1956



Sources: CRSP US Total Market Index accessed through Wharton Research Data Services (WRDS), https://wrds-www.wharton.upenn.edu/; S&P 90 data from Ibbotson SBBI; calculations by Edward McQuarrie.

Dividends and S&P 500 Returns

To tackle that query, McQuarrie deconstructed the four-step method Ibbotson used in his SBBI analysis to determine how much dividends contributed to the S&P 500's total return.

In the 2020 edition of SBBI, Ibbotson and coauthor James P. Harrington observed, "From January 1926 to January 1970, quarterly dividends were extracted from rolling yearly dividends reported quarterly in S&P's *Trade and Securities Statistics*, then allocated to months within each quarter using proportions taken from the 1974 actual distribution of monthly dividends within quarters."[8]

[8]Roger G. Ibbotson and James P. Harrington, *Stocks, Bonds, Bills, and Inflation® (SBBI®): 2020 Summary Edition* (Duff & Phelps, 2020), 39, https://rpc.cfainstitute.org/research/foundation/2020/sbbi-2020-summary-edition.

Ibbotson first had to determine how much of the total return the dividends had accounted for, as estimated by Standard & Poor's (S&P), based on data when firms issued new shares and how it calculated share prices over the previous year. Did S&P take an average, or did it use some other method?

From these totals of rolling annual dividends, Ibbotson extracted the quarterly income from the quarterly updates, allocated quarterly income to each month based on the pattern in the last year available, and back-applied this method over the previous 50-odd years. Finally, Ibbotson hypothetically reinvested that income into the index at the month-end index price rather than on the specific ex-dividend date of the stocks in question.[9]

Although Ibbotson acknowledges that the pre-dividend data before 1970 are estimates, his method holds up quite well. The monthly dividends may vary, but added up over a year, they do equal annual dividends as reported by S&P. One potential explanation for some of the divergence in total return between the CRSP and the S&P 90 results is that the former is reinvesting dividends on the ex-dividend date, in the individual equities. But that is not the only possibility.

The Past Imperfect

What if S&P or its pre-1941 predecessor, Standard Statistics, made mistakes? From McQuarrie's point of view, it would not be hard to dive into the CRSP data and build the total return of the 90 stocks in the S&P 90, cap-weighting them just as S&P did but using current CRSP data on those stocks rather than the data that S&P relied on many decades ago. According to McQuarrie, for the S&P calculations to be accurate across the decades, the S&P team would have had to get a lot of things right despite the limited computing technology available at the time. With every stock in every quarter, the S&P team would have had to track and correctly date all the share count changes, whether from dividends, splits and reverse splits, spin-offs, rights, or acquisitions, while simultaneously accounting for and correctly dating every special and regular dividend paid, suspended, or reduced. Trusting that they were accurate in all their calculations is quite a leap of faith.

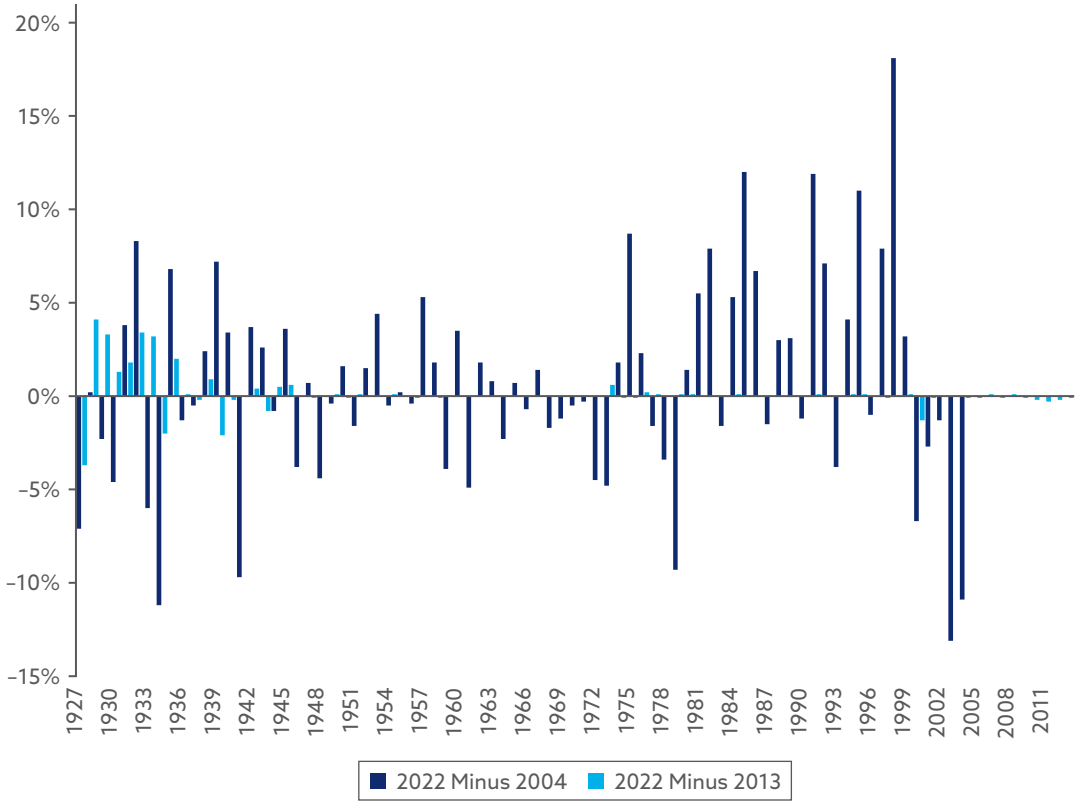
"Here is my primary piece of indirect evidence for why there may be errors," McQuarrie said. "As far as I can tell, the values reported contemporaneously in S&P publications, which have been issued since the 1920s, have *never* been revised in the decades since."

CRSP data, by contrast, is more reliable in the sense that it has been corrected, according to McQuarrie. Kenneth French has started to build archives that make factor estimates going back to the mid-aughts, and McQuarrie noted that CRSP conducted major data revisions in 2004 and 2013.

To support his skeptic's case, McQuarrie presented **Exhibit 7**, which compares the return for the cap-weighted market based on 2022 estimates with the return estimates prior to the two series of CRSP revisions. He noted that the Fama–French cap-weighted market returns represent a subset of CRSP's total stock universe.

[9]This procedure leaves the dividend money uninvested between the ex-dividend date and the end of the month and thus understates the total return (by an amount too small to make a difference).

Exhibit 7. Variation in Estimates of the Fama–French Market Return



Note: First calendar year is 1927.

Sources: Edward McQuarrie, based on data from the Kenneth R. French Data Library, https://mba.tuck.dartmouth.edu/pages/faculty/ken.french/data_library.html.

Comparing the 2022 estimates with the older ones, the CRSP data had 15 upward revisions of more than 0.5% for the whole cap-weighted stock market, with four of those exceeding 1%. The CRSP data also had eight downward revisions of more than 0.5%, with three of those greater than 1%. These are significant revisions. The dark blue bars in Exhibit 7 indicate the entire difference between the 2004 and 2022 estimates and show that the largest revisions involved returns in the prior 25 years. The light blue bars, depicting the difference between the 2013 and 2022 estimates, are comparably smaller, with the only sizable ones applying to the pre-1945 era, which was a focal point of the 2013 revisions. Again, however, this analysis is for the CRSP data only. No comparable efforts have been made for S&P material. "The complete absence of such revisions to the S&P data inclines me to believe that there are undiscovered errors," McQuarrie remarked.

Arnott believes McQuarrie's argument is valid: "I've looked at CRSP all-shares versus S&P 90. The latter wins by [about] 1% [per annum]," he said. "I've long wondered but never taken the time to investigate whether there was survivorship bias."

McQuarrie turned next to Jeremy Siegel's book *The Future for Investors: Why the Tried and the True Triumph over the Bold and the New*, quoting Arnott, who said, "Dividends . . . dwarf the combined importance of inflation, growth, and changing valuation levels."[10] Siegel added, "From 1871 to 2003, 97 percent of the total after-inflation accumulation from stocks comes from reinvesting dividends. Only 3 percent comes from capital gains."[11]

This explains the enormous gulf between the upper and middle lines shown in Exhibit 2, according to McQuarrie, even after price appreciation is supplemented by putting the dividends into Treasuries. That augmentation makes sense in McQuarrie's estimation inasmuch as T-bill rates correlate with inflation over time. In his characterization, Exhibit 2 reflects "*consuming* dividends rather than reinvesting them."

This view contrasts with Jeremy Siegel's accounting, which, according to McQuarrie, equates consuming dividends with eating one's seed corn. That is, consuming dividends has a drastic and distorting effect on long-term value creation.

Hyperbole or Compound Skewness?

McQuarrie also took issue with the notion that 97% of real stock wealth results from reinvested dividends, describing it as a rhetorical flourish. Why? As impressive as 97% sounds, it really comes down to what Bessembinder described as the math of compound skewness. Given a long enough compounding period, a dividend contribution to stock returns of 90% or more is almost inevitable.

McQuarrie posed a simple example, shown in **Exhibit 8**. If a $10,000 investment annually generates 3% in dividends and 3% in price appreciation, we would have $10,600 after one year, with dividends accounting for half of the added wealth. After two years, the total would grow to $11,236 with dividends compared with only $10,609 with price appreciation alone. Fast-forward 50 years, and dividends (reinvested in the rising market) generate 80.6% of the wealth.

Adjust the 3% dividend and 3% appreciation to 1% and 5%, respectively, and the same pattern holds, although at a somewhat slower rate. "The mathematical point is clear," McQuarrie said. "The slightest addition to the rate at which some quantity is compounded will eventually produce a very large difference in final wealth. Einstein didn't say it, but compounding *is* one of the wonders of the universe."

As true as that concept is, so too is its opposite. Any expense that eats into dividends, whether through taxes or consumption, and reduces the amount of added wealth that would otherwise be reinvested and subject to decades of compounding is painful.

To prove his point, McQuarrie repeated the $10,000 investment with 3% price appreciation and 3% dividend each year but with 50 bps—the average expense ratio for mutual funds from the 1920s to the1980s—subtracted from those dividends. Over 100 years—about the extent of CRSP and S&P data—that leads to a loss of more than $1.25 million, relative to the wealth accumulation with no expenses.

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[10]Jeremy Siegel, *The Future for Investors: Why the Tried and the True Triumph over the Bold and the New* (Crown Currency, 2005), 182.

[11]Siegel, *The Future for Investors*, 166.

Exhibit 8. A Hypothetical $10,000 Investment Deconstructed: 3% Dividend Yield, 3% Price Appreciation

Years Elapsed	Price Change	Dividend Yield	Wealth with Dividends	Wealth from Price Appreciation	Dividend Proportion
0			$10,000	$10,000	
1	0.03	0.03	$10,600	$10,300	50.0%
2	0.03	0.03	$11,236	$10,609	50.7%
10	0.03	0.03	$17,908	$13,439	56.5%
20	0.03	0.03	$32,071	$18,061	63.5%
30	0.03	0.03	$57,435	$24,273	69.9%
50	0.03	0.03	$184,202	$43,839	80.6%
100	0.03	0.03	$3,393,021	$192,186	94.6%
200	0.03	0.03	$1,151,259,039	$3,693,558	99.7%

Source: Calculations in Excel by Edward McQuarrie.

According to McQuarrie, ignoring the costs associated with taxes, consumption, and fees is all too common in multicentury series of financial data. Practicality plays a big role in that. The data from 25 or 50 years ago simply were not reliable enough, whether about the true cost of bid–ask spreads or of management fees and commissions. But does that render all such efforts flawed?

"As long as we ignore costs on *all* the series, bonds as well as stocks, there should be no difficulties—right?" McQuarrie asked. "We can proceed directly to equity premium calculations."

Not so fast. We cannot simply calculate the equity premiums for two key reasons: First, what if the total transaction costs for government bonds are less than those for stocks? "Omission of all costs would then lead to an inflated estimate of the equity premium," McQuarrie said. Second, for most of its history, stock trading was an expensive endeavor. Only recently have costs come under control. Commission-free trading and low-cost exchange-traded funds have reduced prices considerably. "The cost of investing in a broad index of stocks has indeed been driven almost to zero," McQuarrie said. "But that was never true historically."

The Price of Stock Trading in the Past

How unrealistic is it to think that dividends could be reinvested without charge in, say, the 1920s or even the 1970s? To answer that question, McQuarrie began with the assumption that the average stock in the 1920s cost $40 and received quarterly dividends at the rate of

4% per year. Because fractional shares were not available then, an investor would have to hold exactly 40 shares of every stock to buy a single share each quarter that the dividend was paid.

"If we have more than 40 shares, some portion of the dividend will not be reinvested," McQuarrie observed. "Once we have invested one dividend, we *will* have more than 40 shares. The 'loss ratio' from uninvested dividends will grow until, say, we have 80 shares (≈10 years later), when it will ratchet back, and then begin to mount again."

To make these numbers comparable to the SBBI data, we would have to own 90 stocks in a cap-weighted index. For this aspect of his analysis, McQuarrie assumes that the largest stock is 100 times the size of the smallest.

Thus, if we have to own 40 shares at $40, we will need $1,600 to buy the smallest stock in the index by cap weight and $160,000 to buy the largest stock. After our calculation for the largest and smallest stocks, we would have to run a similar formula for the next largest and smallest stocks, and so on, and then multiply by 45, which is the smallest possible portfolio size to avoid the need for fractional shares in the first investment quarter. That gives us a minimum portfolio size of $7 million in 1926 dollars, or $100 million in 2025.

As far-fetched as such a portfolio might seem, it would still be impossible to maintain because each dividend in its entirety cannot be reinvested in the underlying stock. McQuarrie explained: "Unless dividend yield is tightly bunched around the mean up and down the capitalization ladder, the portfolio will begin to drift away from value-weighting, as when the largest stock has a yield of only 2%, so that fewer shares of it can be bought than in the case of the smallest stock."

That is before we determine how much had to be paid in commission for purchasing a share of the $40 stock. "The idealized total return figures in the SBBI must be fictional," McQuarrie said. "But the price appreciation returns are likely *less* fictional (there would be some trading costs as additions or deletions are made to the index)." For this reason, Bessembinder's chart (from McQuarrie's vantage point) is likely a more accurate summary of the return investors might have earned, especially when the Consumer Price Index stands in for Treasuries.

Laurence Siegel found McQuarrie's case a compelling one: "If you borrow $*x* at *y*% compound interest and you don't pay back any principal, after enough periods, almost all of the debt will be interest—for any values of *x* and *y*," he said. "This is just the law of compound interest."

The same logic applies to the dividend issue. By consuming dividends, investors deny themselves the magic of compound interest. So, if McQuarrie's critique is accurate and the result of all these highly touted look-backs is simply "the return that nobody got," what return did investors get by investing in the stock market writ large? McQuarrie addressed that question next, exploring how real-world stock investors would have fared in the pre–index fund era.

The Return Somebody Got (Hypothetically)

McQuarrie began his experiment by emulating SBBI and building an index, from 1926 on, composed of the largest equity mutual funds. For a record of the total returns of these funds, he referenced the Wiesenberger Investment Companies yearbooks.

"In the early years," McQuarrie said, "the selected large funds in the index accounted for 80% of all the assets under management in open-end funds and, presumably, reflect the lived experience of 80% of the investors in mutual funds, most of whom were small investors with less (much less) than $10,000 to invest, who could not have owned enough shares of even a single stock to be able to reinvest the dividend, much less owned the VW S&P 90."

McQuarrie calculated the returns of this hypothetical index-like fund through 1986. By that time, the Vanguard 500 Index Fund had been around for a decade and the Vanguard Total Bond Index had just been minted. "Investors could now own the market, or a balanced mix," he said.

In trying to gauge the divergence between the ideal yearbook returns as presented in SBBI and what real-world investors were getting in the pre–index fund era, McQuarrie identified five reasons why actual investors would have underperformed the S&P 500.

- By buying and selling equities, whether these securities were selected by fund managers or because of fund flows, investors would incur commission fees. Moreover, because buying and selling at the dead center of the bid–ask spread is largely the domain of academics, these real-world investors would more likely buy at the ask and sell at the bid.
- Reinvesting dividends would likewise include commission-related expenses.
- In the early years, dividends could not be reinvested on the date they were officially issued but only later, perhaps weeks later, after the investor received the check, presumably by mail, cashed it, and then sent their own check to their investment manager. Later, funds made automatic reinvestment possible but often charged the sales load on this reinvestment.
- Administering fund operations would not have been a free service. Investors would have had to pay management fees.
- In the all-paper, postal-service-dependent world of preelectronic trading, between at least 5% and 10% of a fund's value would have had to sit on the sidelines to accommodate inflows and outflows, although funds could presumably ameliorate this by accessing lines of credit—at a cost.

In addition to these technology-related impediments, however, investors would also have had to contend with potential management errors of both the stock-selection and market-timing varieties.

"All early funds assumed the need for stock selection," McQuarrie said. "Indexing had not yet been invented. Most early funds also had a tacit policy of not necessarily being fully invested at all times, in order to take advantage of favorable pricing in stocks of interest or the movement of market prices."

Michael C. Jensen introduced the assessment of fund manager alpha in the late 1960s.[12] Even after accounting for operating costs, fund managers as a whole underperformed the market. Before index funds, errors—whether of execution or of stock selection—were inevitable and thus would have had an effect on fund performance.

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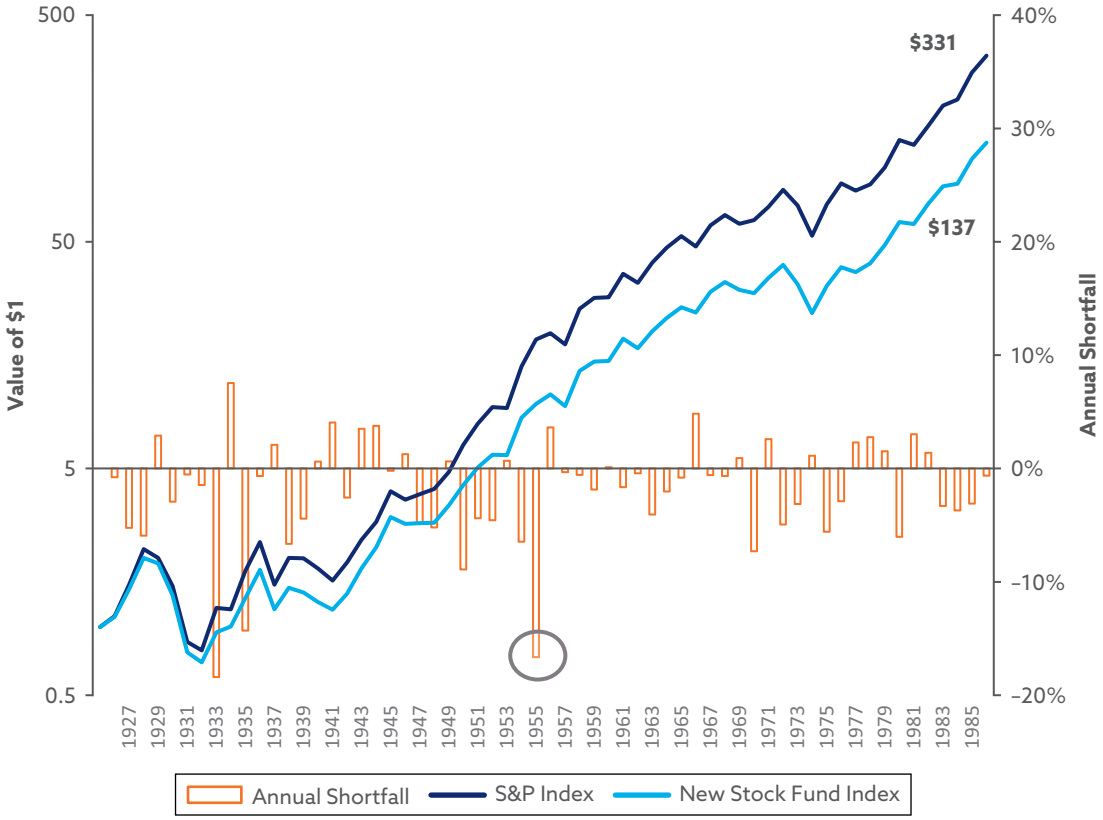
[12]Michael C. Jensen, "The Performance of Mutual Funds in the Period 1945–1964," *Journal of Finance* 23, no. 2 (1968): 389–416, https://onlinelibrary.wiley.com/doi/10.1111/j.1540-6261.1968.tb00815.x.

Exhibit 9. S&P 500 Index versus Hypothetical Fund of Mutual Funds, 1926–1986



Sources: S&P data from Ibbotson SBBI; mutual funds from Edward F. McQuarrie, "Before Index Funds: How Much of the Market Return Could Investors Have Got?," working paper (23 May 2023), https://papers.ssrn.com/sol3/papers.cfm?abstract_id=4457203.

To determine how big of an effect, McQuarrie presented **Exhibit 9**, which shows the annual returns of $1 invested in the theoretical S&P 500 fund—"the return nobody got"—and a real-world, index-like mutual fund aggregate from 1926 through 1986. The hypothetical shortfall constitutes the "best-case" scenario for the investors of the day. The reality was likely far worse.

The SBBI yearbook suggests that $10,000 invested in a hypothetical S&P 90/S&P 500 fund in 1926 would have grown to $3.33 million 61 years later. The comparable real-world mutual fund, however, would have compounded only to $1.37 million. That is a total performance gap of nearly $2 million, again, in the best-case scenario. The annual shortfall adds up to 158 bps, or 8.40% versus 9.98%, in average yearly returns.

A more realistic assessment has to consider other factors:

- According to McQuarrie, the big mutual funds throughout the 1970s were load funds that subtracted a sales charge (load) from the investor's net asset value when shares of the fund

were bought. Their average load started at about 7% and, after rising through the 1960s, ended up in the 8% plus range. That indicates that as much as 7% of that $1.37 million would have been paid out in loads, reducing that $1.37 million by a bit.

- But during the pre–index fund era, reinvesting cash dividends would have incurred that 7% to 8% plus load fee as well. On the basis of his analysis of SBBI data, McQuarrie estimates that the average dividend was around 5% before 1956 and about 4%, with considerable volatility, thereafter. Load fees applied to reinvested dividends thus would have eaten up about 30–40 bps of an investor's returns, which makes that hypothetical $1.37 million in gains more like $1.05 million and far from the SBBI's idealized $3.33 million.

Even if we set aside dividend reinvestment costs and the load fee, there is still that 158-bp gap in annual returns. An average expense ratio of 50 bps explains only a portion of that gap. Unprofitable market-timing or stock-selection decisions must account for much if not all of the rest.

Looking at SBBI records, McQuarrie observed that the S&P 90 had its second-best calendar year ever in 1954, rising 52.6%. Twenty-five years after the Great Crash of 1929, the stock market had finally recovered in full. Following such a banner year, however, a typical active manager would have anticipated a market retreat in 1955 and duly locked in their profits and raised cash. But 1955 turned out to be another banner year, with the S&P 90 soaring further, by 31.6%.

This resulted in one of largest shortfalls ever for the fund index, as indicated by the gray circle in Exhibit 9. The exhibit also suggests that fund managers were chastened by the Great Crash, holding on to too much cash, and subsequently missed out on big market upswings in 1933 and 1935.

Box 2. Commentary from Roger G. Ibbotson

I was involved in index funds from the start, attending meetings at the University of Chicago and Wells Fargo when I was a PhD student. I consulted with Rex Sinquefield on creating index funds for American National Bank in the late 1970s. We did not buy all the stocks. Instead, we replicated the indexes with stratified sampling techniques. Vanguard also did stratified sampling at first.

Part of Edward McQuarrie's premise is that index fund investing was practical by 1987. I invested in Vanguard almost from the start in 1976. I did reinvest, and I never really withdrew, as I consumed and paid taxes from my household income. I essentially dollar averaged in over time, because part of our savings from HH income bonds went into Vanguard. Some of these savings also went into my businesses, Ibbotson Associates and later Zebra Capital, from which, for much of the time, I took no salary.

Sinquefield and I created the original SBBI in the early 1970s, first publishing two *Journal of Business* articles in 1976. The launch of SBBI and the marketing of indexes were intertwined. SBBI demonstrated what total return indexes could accomplish. Those 1926–1975 index returns might not have been achievable without the index innovations and infrastructure, but it was mostly possible to earn those 1976–2024 forward returns. I personally have!

The pre-1976 data were not realizable because there would have been substantial costs, which we always admitted. After 1976, with the innovations of total returns, index funds, and automatic reinvestment, the results were mostly achievable, provided investors did not consume or pay taxes out of the account. Pre-1976 is illustrative of what can be accomplished going forward.

We should not put a negative spin on an unachievable past. Instead, SBBI showed the great potential of index funds, without even relying on the prevailing active management. We are measuring asset class total returns pretax, precost, and pre–active management. Even if the representative investor cannot be macroefficient, SBBI highlights the tremendous wealth-building opportunities the capital markets provide.

One minor point that McQuarrie covers well is that comparing ending dollar values can be misleading, given the explosive character of exponential growth. In SBBI and Jeremy Siegel's work, the vertical axis is always in log form. Thus, the return is the slope, no matter where it is on the wealth graph. The compound annual returns are the most informative. The ending exponential numbers do demonstrate the tremendous wealth creation, but we should not be comparing ending wealth ratios across differing strategies and costs, since the answers are time dependent.

—Roger G. Ibbotson

Before and After Index Funds

McQuarrie next presented a table calculating the equity risk premium (ERP) before and after the advent of the modern index fund. In the top row of **Exhibit 10**, the cost-free values are the SBBI returns for equities and the Intermediate Treasury (IT) series, in which a new five-year bond is bought each year. The with-cost values are the new equity fund index and then the

Exhibit 10. Stock and Bond Returns Before and After Index Funds

Period	Cost-Free Bonds			With-Cost Returns		
	Equities	IT/ Bloomberg	ERP	New Equity Fund Index	IT/Total Bond Index	ERP
Before index funds (1926–1986)	9.98%	4.80%	518 bps	8.40%	4.52%	388 bps
After index funds (1987–2022)	10.37%	5.36%	501 bps	10.28%	5.17%	511 bps

Note: Bonds (column 2) are Intermediate Treasuries before and Total Bond index after.

Sources: SBBI, Bloomberg, and Vanguard.

SBBI IT series, which assumes that on each roll the now-four-year bond was sold at the bid and each five-year replacement bond was bought at the ask.

In the bottom row, the cost-free equities are again the SBBI return for the S&P 500, and cost-free bonds reflect the published return on the Bloomberg US Aggregate Bond Index. With-cost returns are the published Vanguard 500 Index Fund returns and the published Vanguard Total Bond Market Index Fund returns.

Even if we assume, wrongly, that there were no sales charges in the time period before the index funds, the average equity investor would have lost out on about 25%, or at least 1 percentage point, of the realized equity premium. Owning a broad portfolio of mutual funds before the index fund revolution would have been expensive. Bond costs before and after indexing would not have changed much. Thus, McQuarrie concluded, "index funds gave ordinary investors the ability to harvest basically the entire available equity premium."

The situation, however, was entirely different in the pre–index fund era. Costs then were decremental to index returns for stocks in particular, which suggests that index return calculations from those days could have been misleading. Moreover, portfolios that investors could have realistically built had a lot of tracking error relative to the index, which caused additional potential losses (or possibly gains—we will never know). Conditions are so different in the twenty-first century that the eras are simply not comparable. Investors in large-cap US equity funds almost never pay loads any more, index funds are no longer prone to management error, and expenses have plunged to a few basis points.

"If the costs experienced were endogenous to the index returns of the day—higher returns had to be on offer given the higher costs investors had to incur—then financial historians do the investing public a disservice by reporting cost-free yearbook returns as if these could have been realized by investors in the world," McQuarrie said.

The transaction cost discussion is critical, according to Jeremy Siegel. Transaction costs obviously influence index returns and, without the ability of index funds to eliminate most of those costs, the average index fund investor's returns would have been much lower. "It is not just that the index returns, historically, could not have been achieved but also that the reduction in transaction costs in recent decades significantly influences the equilibrium price-to-earnings ratio of today's market," he said. This observation leads us to ask, How large was the influence?

Price-to-Earnings Ratios: Where Is the Equilibrium?

Between 1871 and 1960, the stock market's price-to-earnings ratio (P/E) was just over 15, which adds up to a roughly 6.5% earnings yield. That is also approximately the real return generated by equity indexes over that time frame. But what about transaction costs? "Building and maintaining a fully diversified capitalization portfolio could easily have been 150 bps per year," Jeremy Siegel said. "Investors who tried to hold all stocks continuously in the right proportion realized only a 5% real annual return."

In the twenty-first century, the stock market's P/E is much higher, almost double, in fact. "There's no question that the equilibrium has changed," Arnott commented. "Short lives meant that investors would require higher real returns in order to defer consumption." In addition, a more mature economy is a less risky economy, and that means lower real returns.

"Cost structures have come way down," he said. "So the *realized* real return was lower than the paper portfolio index return in the past and far less so today." To emphasize the point, Arnott presented **Exhibit 11**, which shows a roughly 10% increase in the P/E every quarter of a century.

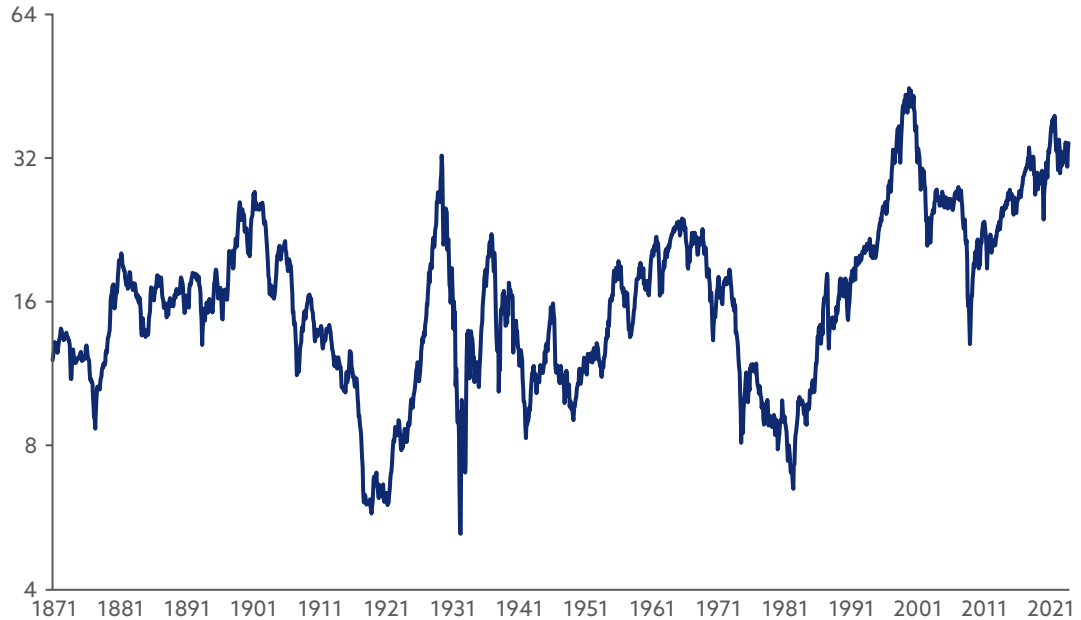
Although Arnott believes Jeremy Siegel's estimate of 150 bps in costs for a market portfolio in the pre–index fund era is a little high, the implication is that the new P/E equilibrium of 20× means the expected real return on equities is about 5%. (The expected real return on equities can be interpreted as the ERP relative to a hypothetical riskless asset returning the inflation rate.) If, however, the real return on bonds and bills is 2% and 1%, respectively, then the equilibrium expected real equity return is likely lower than 5%—perhaps 3% or 4%. If the expected equity return is 5% over the inflation rate, it is 3% or 4% over the bond or bill rate because those assets now pay a positive real yield. Of course, with the CAPE (cyclically adjusted P/E ratio) at 34 or higher, the mean reversion back to that 20× would indicate, given moderate assumptions about the speed of reversion, a 3% equilibrium return and an equity risk premium between 1% and 2%, or maybe 3% if real bond yields revert to the zero bound.

"Today you can get a fully diversified cap-weighted portfolio for zero cost," Jeremy Siegel said. "To get that same 5% real return corresponds to a P/E ratio of 20. So 20 is the 'New 15.' "

This means that falling transaction costs have contributed to a rising equilibrium P/E. "This is one reason why virtually all studies based on reversion to historical P/E ratios have given the wrong results, particularly the much-loved Shiller CAPE," Siegel said.

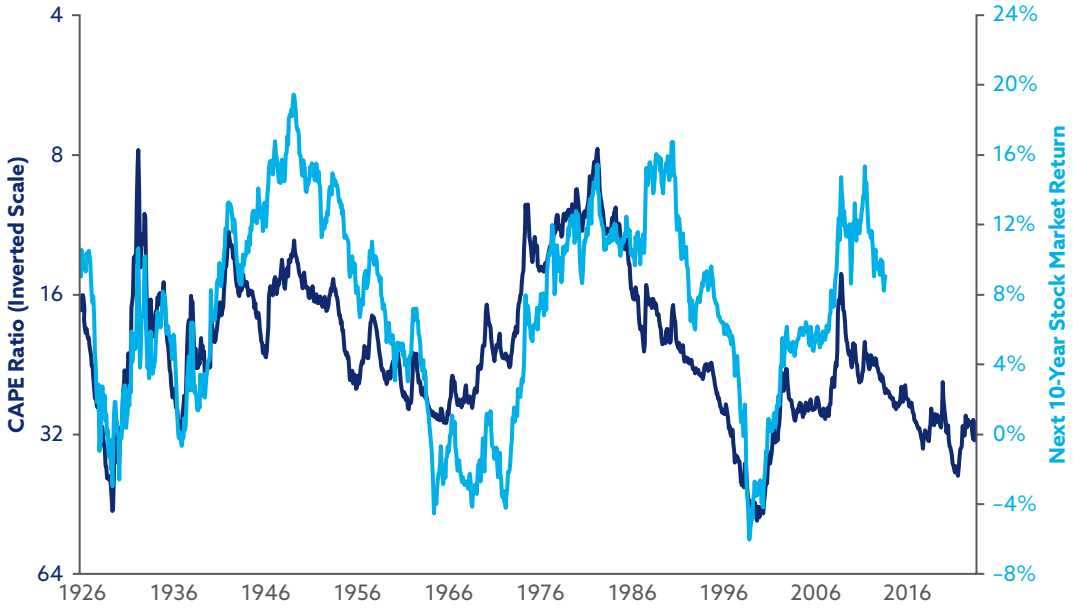
"People always complain about the CAPE, as a predictive measure, whenever CAPE suggests caution," Arnott countered. "But the critics have some explaining to do. Once the SEC reined

Exhibit 11. 10-Year Normalized P/E, 1871–2023



Source: Research Affiliates, LLC.

Exhibit 12. 10-Year Detrended CAPE versus Next 10-Year Return, 1926–2023



Note: Detrended simply means the ratio was adjusted for the log-trend identified in Exhibit 11.

Source: Research Affiliates, LLC.

in some of the flimflammery, the fit is near perfect, especially if we take out the trend that's seen in the previous graph."

In **Exhibit 12**, Arnott presented an inverted scale for CAPE. "Low is good!" he said, noting that the correlation is more than 70%.

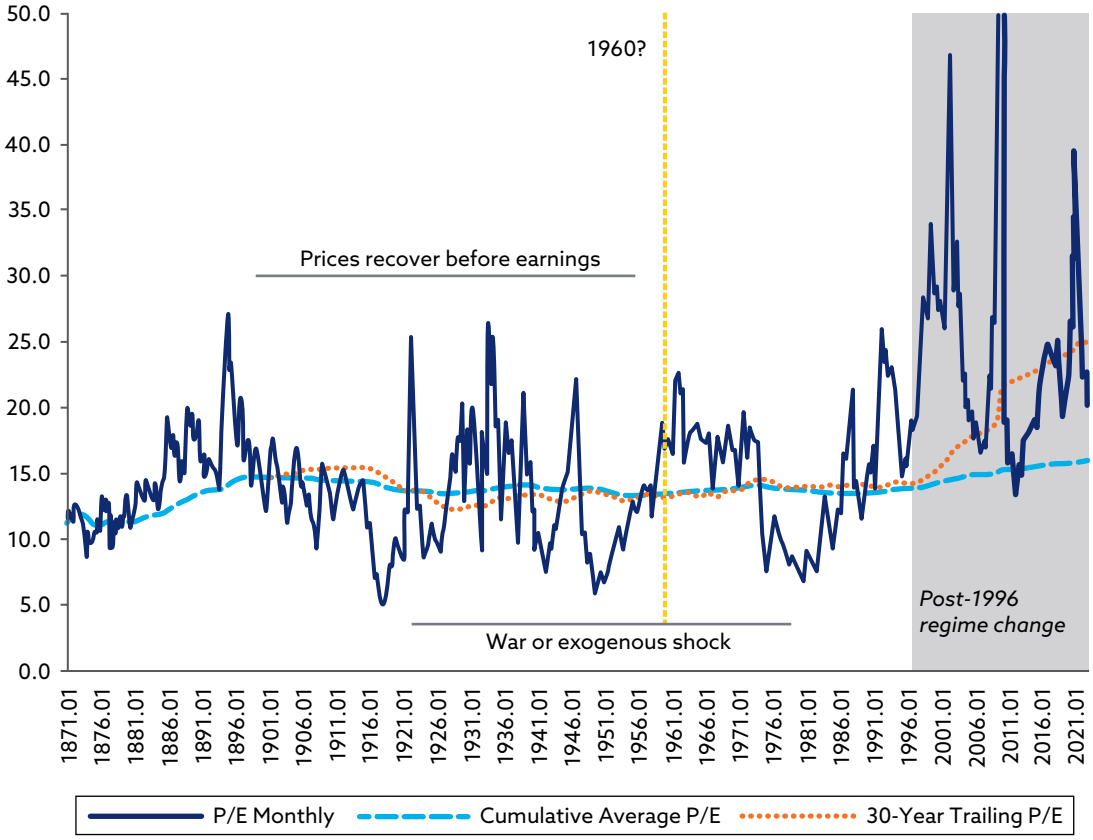
For Jeremy Siegel, the key implication of the decline in transaction costs is not that the actual returns shareholders earned in the past failed to match the results for the index but that lower transaction costs increase the current market's equilibrium P/E. He acknowledged, however, that this might mean lower-than-historical real returns for equities, but equities would still outpace bonds. "Mean reversion is a powerful force for the patient long-term investor," Arnott said. "But it's *most* unreliable over short spans. And it's mean-reverting towards a moving target."

The Case for Nonstationarity

True to his skeptic's assessment of "simple one-number summaries" of century-long return data, McQuarrie offered a similarly wary critique of the concept of an equilibrium P/E.[13] He quoted Paul Samuelson: "I doubt that the devil himself knows what is the equilibrium

[13]Paul McCaffrey, "Stocks for the Long Run? New Evidence, Old Debates" (CFA Institute Research Foundation, 2025), 9, https://rpc.cfainstitute.org/research/foundation/2025/stocks-for-long-run-new-evidence-old-debates.

Exhibit 13. Comparison of Market P/Es Calculated Using Different Methods, 1871–2022



Sources: Cowles data reconstituted by Robert Shiller at https://shillerdata.com, with calculations by Edward McQuarrie.

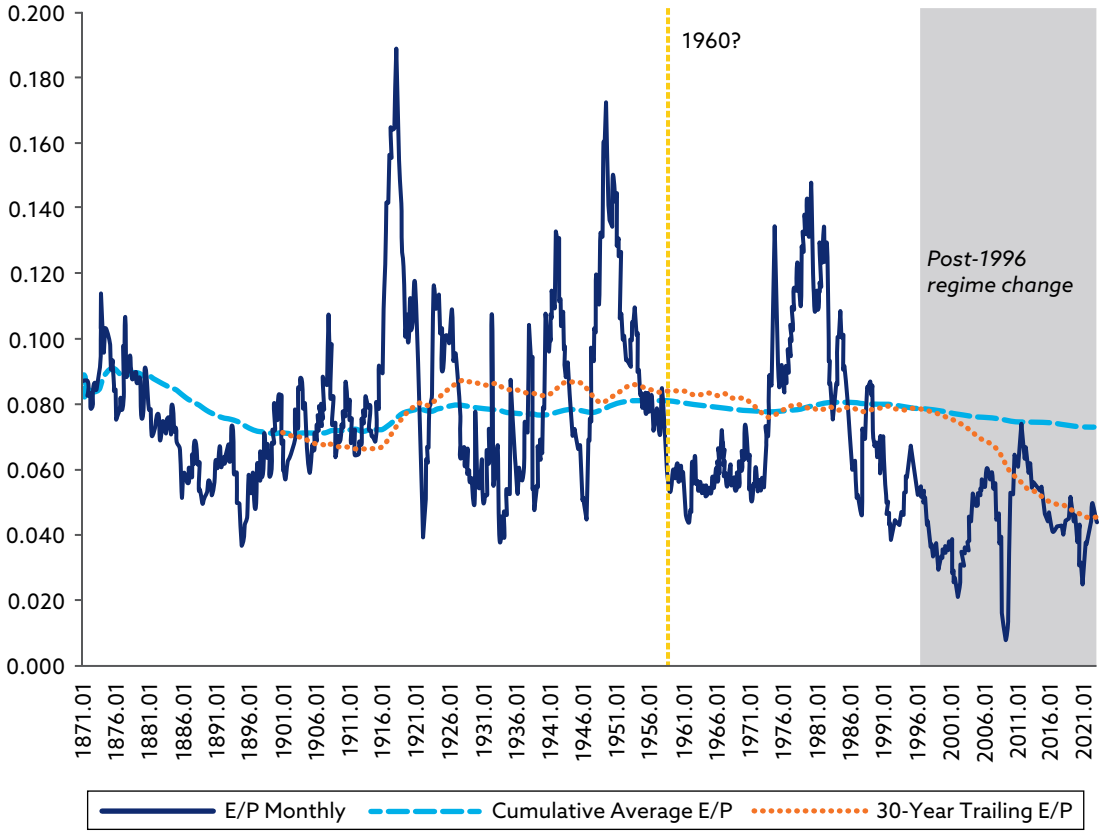
P/E ratio on stocks. Eighteen to 1, as so long held? Fifteen to 1 as [Treasury] Secretary Douglas Dillon once rashly averred? Twenty-five to 1? Or 14 to 1, as the tape enunciates now [in the 1960s]. . . . No one knows."[14]

In his *Financial Analysts Journal* article, McQuarrie makes the case for nonstationarity in asset pricing—that is, there is no such thing as equilibrium.[15] Just as illogical to his mind is attempting to pinpoint a particular year as the pivot from one state of equilibrium to another, whether 1934, when the gold standard lapsed; 1945, when World War II ended; 1966, the beginning of the so-called Great Doldrums; or 1982, when the United States emerged from the stagflation years and a major new bull market began.

[14]Cited in Siegel, *Stocks for the Long Run*, 150.

[15]Edward F. McQuarrie, "Stocks for the Long Run? Sometimes Yes, Sometimes No," *Financial Analysts Journal* 80 (First Quarter 2024): 12–28, https://rpc.cfainstitute.org/research/financial-analysts-journal/2023/stocks-for-the-long-run.

Exhibit 14. Comparison of E/Ps Calculated Using Different Methods, 1871–2022



Sources: Cowles data reconstituted by Robert Shiller at https://shillerdata.com, with calculations by Edward McQuarrie.

"When in doubt, my druthers are to go back to the data—in this case, the Shiller spreadsheet," McQuarrie said. From there, he provided an outsider's assessment of what he terms the "historical P/E ratio per Shiller." He presented **Exhibit 13**. The dark blue line depicts the monthly P/E from January 1871 to December 2022, the light blue line shows the cumulative average over all previous months, and the orange line represents the trailing 30-year average.

Both the light blue and orange lines, representing the cumulative and trailing 30-year averages, respectively, stayed relatively stable and moved more or less in parallel up until the past several decades. The mean P/E value for both lines over much of that time stayed around the 14-to-1 mark that Samuelson noted, according to McQuarrie. "Peaks in the P/E ratio can be related to rapid recovery of prices in advance of earnings, and troughs to war and other exogenous shocks," he said.

To McQuarrie's eyes, the real dividing point was not 1960 or any of the other supposed pivots. "The 30-some years following 1960 show the same swing/range between the low 20s and the high single digits that had prevailed for almost a century," he said. The point of regime change, based on his analysis, is 1996, which is also, he noted, the same year that a certain Fed chair

noted an "irrational exuberance" in stock prices. McQuarrie, however, does not believe 1996 indicated a shift from one equilibrium to another. "Paul Samuelson had the right of it: Apparent equilibria are in fact nonstationary," he said. Before 1996, whenever the P/E exceeded 20, it eventually declined back to the single digits. Since 1996, 20 has come to constitute the floor rather than the ceiling. "The orange line lifts off from the [light blue] line, showing how different recent decades have been," McQuarrie said. "The regime has changed."

Whether P/Es are the right metric is debatable. "P/E ratios can go to infinity when earnings approach zero," Jeremy Siegel observed. "You should use E/P ratios if you are going to average them." McQuarrie took this point and regenerated the chart using earnings-to-price ratios (E/Ps) in **Exhibit 14**.

"Nonstationarity is preserved after the switch to E/P," McQuarrie said. Jeremy Siegel was not quite convinced, stating that the E/P "drifted down after index funds came in. That is *not* the same as nonstationarity."

Dividends Revisited

From a historical perspective, McQuarrie believes it is intuitive that the total return on stocks with dividends reinvested would be the conventional template for assessing the total wealth accumulated from equity investing. That said, just because investors today can reinvest their dividends with little or no transaction costs that does not mean they were always able to do so.

In fact, investors have not tended to reinvest their dividends. To prove his point, McQuarrie returned to the data. Although reliable records are not available of what individual stock investors did with their dividends from, say, the 1930s through the 1960s, we do know what mutual fund investors did thanks to the Wiesenberger Investment Companies yearbooks. "As these yearbooks evolved over the decades from their launch in 1941, they took on the role of booster and defender of the value of mutual funds to the little guy," McQuarrie said. "For instance, Wiesenberger would justify the sales load by calculating what the odd lot commissions would be to buy and sell a small number of individual stocks, tout the value of 'professional management,' 'a diversified portfolio,' and so forth."

Wiesenberger would also emphasize the importance of dividend reinvestment and calculated the total return for funds. "That practice dates back at least to the Securities and Exchange Commission report of 1939 that laid the foundation for the Investment Company Act of 1940 (albeit, the calculation was cruder than those used today)," McQuarrie said.

Looking back over past editions, he found that in 1955, the Wiesenberger yearbook calculated that only 26% of fund investors reinvested dividends. By 1965, that figure had more than doubled to 56%, and by 1993, reinvestment without load was customary. "Before 1955? Before the Investment Company Act?" McQuarrie asked. "I presume dividend reinvestment to have been uncommon." It was, in effect, the return nobody got.

He concluded: This "might make the bottom line on Hendrik [Bessembinder's] chart, perhaps reduced further by an initial sales load, *the* most accurate historical depiction of stock market returns, as received by investors in the world, prior to the 1980s."

Not reinvesting is more than just the dominant pattern over the decades, however. Investors simply cannot reinvest everything. They have real-life expenses, and investing itself is not "free." "All investors face—and have always faced—spending and tax obligations (even if deferred), and (diminishing) costs for turnover, fees, and custody," Arnott said. "So, the available real return is and always has been materially higher than the retained real return."

Bessembinder brought the discussion back to the fundamental question: What should we be trying to measure? Determining how a particular investing strategy would have fared would certainly be valid, whether accounting for trading costs or other potential frictions. Buy-and-hold would also be an obvious choice given its simplicity. "But is the buy-and-hold strategy the most important and relevant one?" he wondered. "It depends in part on whether we want to focus on representative or nonrepresentative outcomes. The buy-and-hold investor is not representative of investors' overall experience."

Investors as a whole do not reinvest dividends, but they do buy new equity issuances and sometimes their shares are repurchased. "We should pay more attention to aggregate investment outcomes or at least caution consumers of our research that outcomes to 'buy-and-hold-with-dividends-reinvested' strategies are not representative," Bessembinder said.

That dividends may fund consumption is a critical point. Even more important is how much investors consume *with or without* dividend reinvestment. The flow of funds out of the market and into investors' hands for consumption has basically the same impact whether the funds come from dividends, share repurchases by the issuer, or sale of the stock on the open market.

According to Bessembinder's calculations based on the VW CRSP portfolio from 1926 to 2022, if all dividends are reinvested, giving up a single unit of consumption at the start of the series enables the consumption of 552 units at the end of the series. This mirrors the return of an inflation-adjusted buy-and-hold strategy. If, however, the investor consumes the dividends, then forgoing that single unit of consumption in 1926 would allow for only 18.21 units of consumption during the 96 years of this sample. "Yes, it is intuitive that the outcome will be lower without reinvestment," Bessembinder said. "But the effect is huge, and the without-reinvestment-of-dividends outcome applies to investors in aggregate." In that sense, reinvestment of dividends is not macroconsistent inasmuch as we do not all do it and cannot all do it.

Laurence Siegel believes the most revealing analysis is still the approach of Ibbotson and Jeremy Siegel because it measures what he calls "asset performance," or what an asset class could provide any given investor who chose to index to that asset class. Strategies that reflect real-world investor behavior (such as dividend consumption) provide additional insight, he says, by revealing some things about how the market does or does not grow with the economy—a phenomenon that we cannot observe from the "asset performance" analysis. "If our goal is to document how stocks and other assets have *performed*, the Ibbotson total return (or real total return) before fees, transaction costs, and taxes is the right thing to measure," Laurence Siegel said. This sounded like moving the goalposts to McQuarrie, who noted the difference between a measure of investor return versus a measure of asset performance. This led McQuarrie to his ultimate conclusion—and his final admonition to financial historians: "There is more than one metric for what happened in times past," he said. "The 10% nominal, which people take from the SBBI, or the 6.6% real that Jeremy has asserted is not the only answer."

"There is not one number to rule them all," he said.

Conclusion

At the center of his painting *The School of Athens*, the Renaissance artist Raphael depicts the ancient philosophers Plato and Aristotle walking side by side, lost in debate. Ever the idealist, Plato is pointing upward, toward the heavens, while his long-time student, Aristotle, is gesturing to the ground and, presumably, the world as it is.

Although hardly a perfect metaphor, the discussions emanating from Jeremy Siegel's *Stocks for the Long Run* thesis and Edward McQuarrie's critique of it demonstrate a similar dynamic at work. The material in these briefs and the video debate that inspired them[16] provide a window into how some of modern finance's leading thinkers approach the epistemology of the discipline. At bottom, how do we know what we know? And how do we communicate what we know to one another, to end clients, and to the world at large?

These are simple questions, but the answers in our rarefied corner of the economic sciences are not simple, obvious, or universal. Finance, after all, is subject to innumerable variables, across time, geography, and all else. The various debates chronicled in these pages, whether about gold returns, the changeability of asset classes, the presentation of financial data, or the law of dissipation of wealth, reflect this. Consensus is hard, and even when it is achieved, long-established orthodoxy can quickly become outmoded and irrelevant in the face of new developments or new evidence. We do not always know what we know, and what we know today may be wrong tomorrow.

Through the course of this exercise, each participant has offered a glimpse into how they navigate investing's inherent uncertainty. We all see through a glass darkly. But to be successful, we have to develop a consistent lens, a philosophical prism, through which we sort and interpret potentially contradictory and incomplete information and convert it into actionable insight that can (mostly) hold up under scrutiny. Like Plato, Aristotle, and the other philosophers and scientists evoked in Raphael's painting, everyone's prism is distinct, but the effective ones share certain characteristics: curiosity; an openness to dialogue and persuasion; and an inclination to prove, disprove, and convince rather than merely to speculate.

Intrinsic to our pursuit of financial knowledge, therefore, should be an awareness of both the inevitability of doubt and the human demand for certainty. Everyone has to bridge this paradox and find an operating synthesis among these conflicting conditions. We are all unique, so how we do that is up to us. But at the very least, the discourse among the experts in this series should not only increase our understanding of the intellectual foundations of the *Stocks for the Long Run* thesis but also inform how we process, apply, and understand financial knowledge more generally.

To be sure, such endeavors are by no means guaranteed to succeed, let alone make everyone rich, but they will help us become better thinkers and analysts, and that will pay at least figurative dividends in bear and bull markets alike.

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[16]CFA Institute Research and Policy Center, "New Insights on 'Stocks for the Long Run'" (28 June 2024), https://rpc.cfainstitute.org/research/multimedia/2024/new-insights-on-stocks-for-the-long-run.

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