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Counterpoint Global Insights

Charts From the Vault

Pictures to Ponder

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Introduction

The Consilient Research team spends a lot of time on, well, research. The reports we publish reflect this effort. But there are times when we study a topic and either do not write about it, or a subject gets limited attention because it plays a small role in explaining something larger.

As a change of pace, we have decided to publish some of our favorite charts that went unused or got lost in the shuffle. Most of these exhibits explain themselves, but we add a little commentary in each section to set the tone. We have placed the pictures in five (loose) categories: overall valuation, empirical regularities, capital intensity of "big energy" versus "big technology," corporate performance, and investment management.

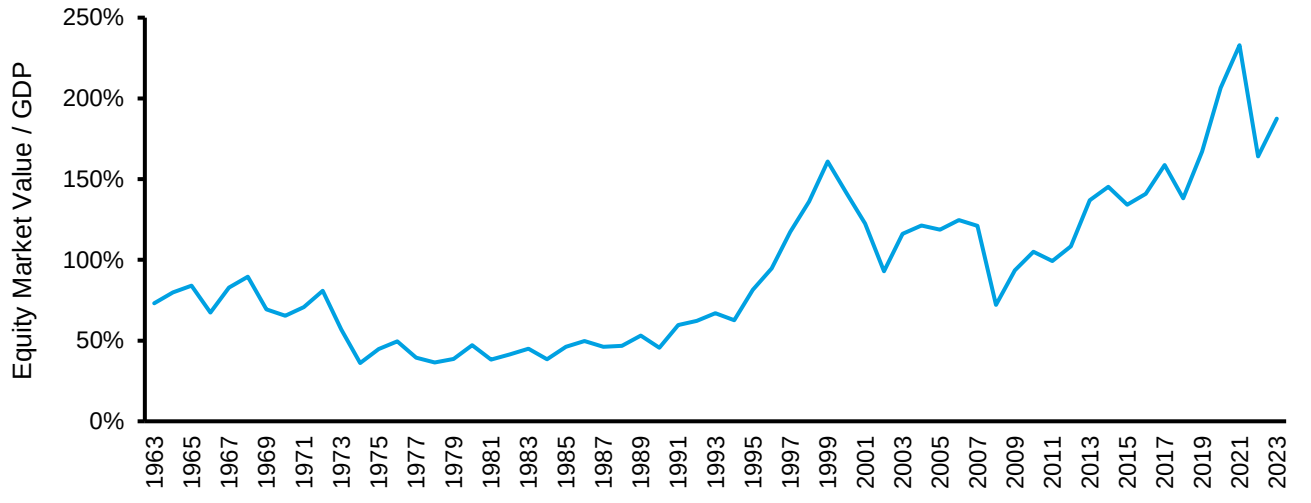
Overall Valuation

Warren Buffett, the chairman and chief executive officer of Berkshire Hathaway and one of the finest investors in history, has called the ratio of the market value of all publicly-traded equity securities to gross national product (GNP) the "best single measure of where valuations stand at any given moment." GNP measures the total value of goods and services that a country's citizens produce domestically and abroad in a time period. According to Buffett, GNP captures "the country's business."[1]

Exhibit 1 shows this ratio from 1963 to 2023. We use gross domestic product (GDP) in our analysis as it is the measure economists commonly reference today and is highly correlated with GNP. Buffett discussed the ratio near the peak of the dot-com bubble when equity market value to GDP was about 160 percent. The measure dropped sharply from this apex and reached 72 percent, the lowest annual level of the 21st century, in 2008.

From there the ratio resumed its ascent, hitting 233 percent in 2021. This reflected the equity market's strong gain and GDP at a level below its long-term trend because of the deleterious impact of the COVID pandemic. It subsided to 187 percent in 2023.

Exhibit 1: Equity Market Value-to-GDP for U.S. Companies, 1963-2023

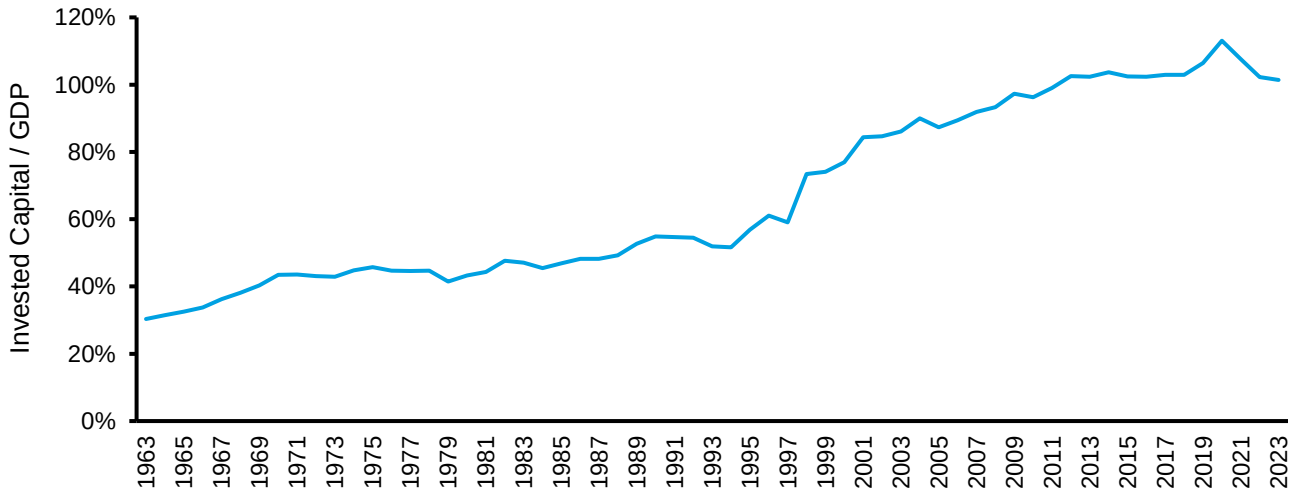


Source: Counterpoint Global, Compustat, Federal Reserve Board, and Bureau of Economic Analysis.
Note: Year-end values; Equity values: (1963-1984) Nonfinancial Corporate Businesses and (1985-2023) companies on New York Stock Exchange, NASDAQ, and NYSE American stock exchanges, excluding American depositary receipts (ADRs).

There are a couple of reasons that the ratio of equity market capitalization to GDP may not be comparable over time. The first is that U.S. companies now get more of their sales from outside the U.S. than they did in past decades. GDP does not include those sales. That means the numerator, market capitalization, reflects a larger addressable market than what the denominator, GDP, captures. Second, GDP is arguably understated because it fails to measure accurately the quality of goods and services as well as the value of new goods and services.[2] The rise of digitalization makes measurement today more challenging than in the past.

We were curious about how much capital companies have invested over the years, including spending for internally-generated intangible assets.[3] In 1963, public companies in the U.S. had only one dollar of invested capital for every three dollars of GDP. That figure rose steadily over time and for the year ended 2023, both adjusted invested capital and U.S. GDP were roughly $28 trillion (see exhibit 2).

Exhibit 2: Invested Capital-to-GDP for U.S. Companies, 1963-2023

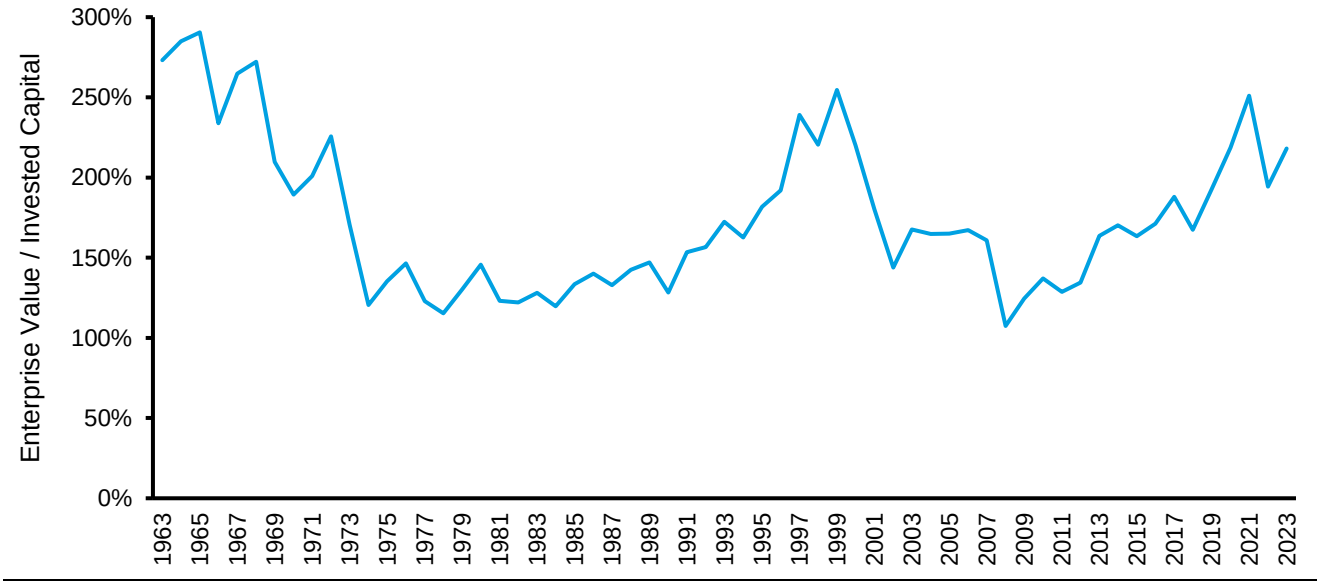


Source: Counterpoint Global, Compustat, and Bureau of Economic Analysis.
Note: Year-end values; Invested capital reflects companies listed on New York Stock Exchange, NASDAQ, and NYSE American stock exchanges, excluding ADRs; Shareholders equity used as a proxy for companies in the finance sector.

Public companies in the U.S. have more invested capital, including intangible assets, per dollar of GDP than they did years ago. Notably, the inclusion of internally-generated intangible assets increased invested capital by 34 percent in 1963 and 51 percent in 2023. This is consistent with research showing that book value, a component of invested capital, is understated.

We can compare enterprise value, which equals the market value of equity plus debt, to invested capital to see how that relationship has evolved over time (see exhibit 3). This is a more comprehensive version of the multiple of share price to book value per share. We see three peaks over the 60 years that we measured: 1965 at 291 percent, 1999 at 255 percent, and 2021 at 251 percent. The compound annual total shareholder return for the S&P 500, an index of 500 of the largest stocks by market capitalization, was 3.3 percent in the decade following the 1965 top and minus 0.9 percent in the decade after 1999.

Exhibit 3: Enterprise Value-to-Invested Capital for U.S. Companies, 1963-2023



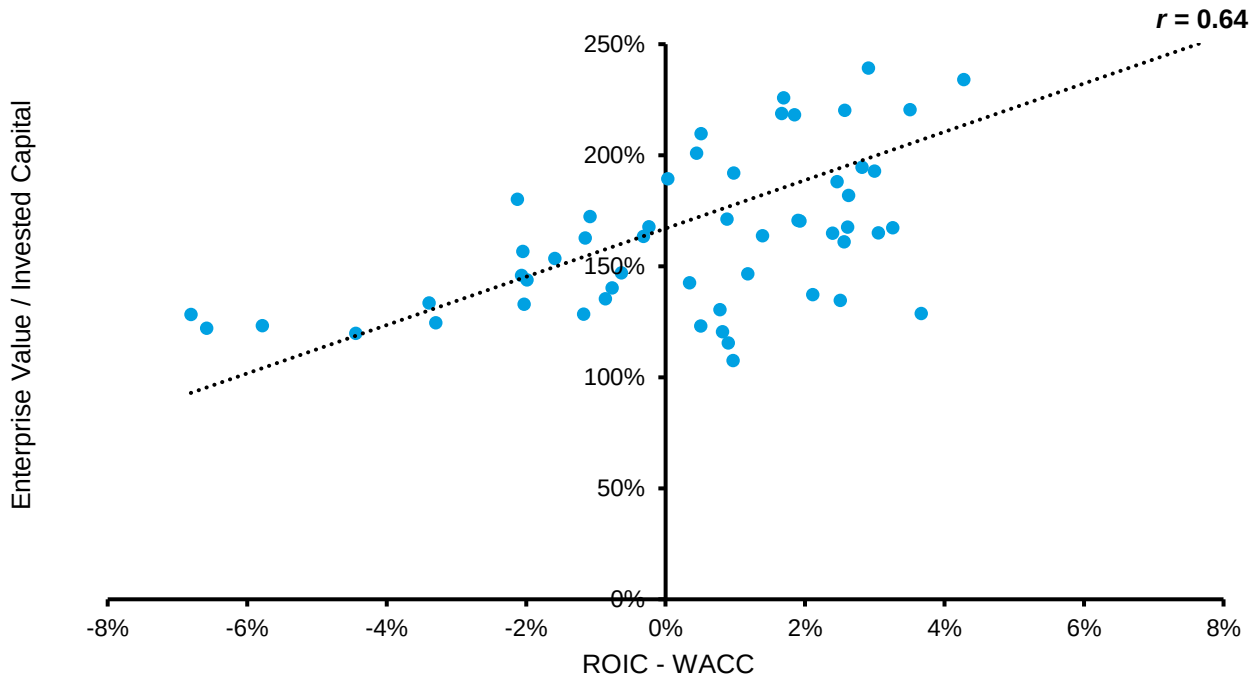
Source: Counterpoint Global, Compustat, and Federal Reserve Board.

The spread between return on invested capital (ROIC) and weighted average cost of capital (WACC) provides a sound basis for explaining the ratio of enterprise value to invested capital.[4] The intuition is straightforward. If a company invests $100 and it earns exactly the cost of capital, the market should value it at $100. For instance, say a company invests $100, earns $8 in perpetuity (an ROIC of $8 ÷ $100, or 8 percent), and has a cost of capital of 8 percent. The market value should be $100, or $8 ÷ .08. Enterprise value to invested capital should be above 100 percent when the ROIC is above WACC, and below 100 percent when ROIC is below WACC.

This economic logic means that we cannot consider the ratio of enterprise value to invested capital in a void. We have to assess whether public companies in America earn a sufficient spread between ROIC and WACC to justify a premium to invested capital.

Exhibit 4 shows this relationship for the years we examine. The correlation is far from perfect, but we can see that higher ratios are associated with higher positive spreads. This ratio should be considered in the context of the economic return on capital.

Exhibit 4: ROIC−WACC and Enterprise Value-to-Invested Capital for U.S. Companies, 1963-2023



Source: Counterpoint Global, Compustat, FactSet, Federal Reserve Board, FactSet, Moody's, and Aswath Damodaran.
Note: Year-end values; Debt is book values of U.S. listed companies excluding finance sector and ADRs; Invested capital: Shareholders equity used as a proxy for companies in the finance sector. ROIC-WACC: Capital structure reflects book value of total long- and short-term debt and market value of equity; Cost of debt is the Moody's Seasoned Baa Corporate Bond Yield; Cost of equity = yield on 10-year U.S. Treasury note + equity risk premium.

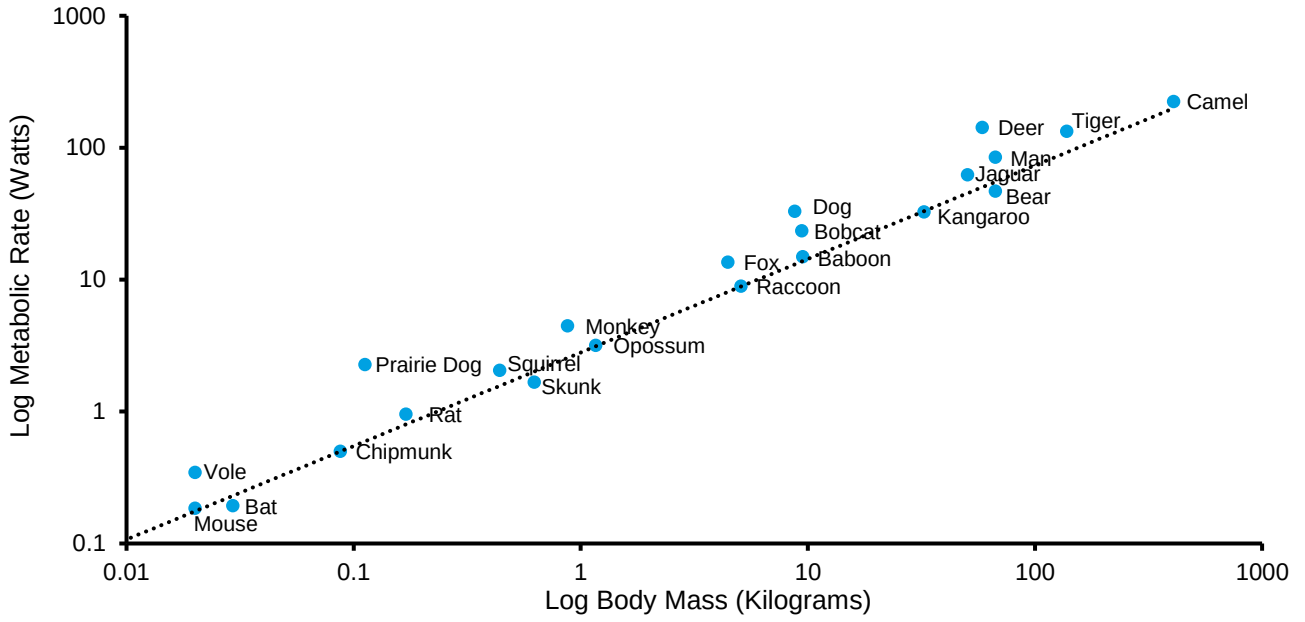
What does all of this mean for the Buffett ratio? As with most measures, we need to be careful using it when we compare the present to the past. In this case, the total U.S. equity market capitalization may have benefitted from an increase in non-U.S. sales as well as an increase in ROIC among large companies. These developments have likely boosted the numerator of the ratio. Further, GDP may be understated because of measurement challenges. Adjustments to increase GDP would lift the denominator and lower the ratio.

That said, the peaks in 1965 and 1999 were followed by a decade of stock market returns below the long-term average. The 2021 peak was not as high as prior ones and was accompanied by relatively low interest rates and a relatively high aggregate ROIC. Time will tell if it provided a worthwhile signal.

Empirical Regularities

Scaling laws, mathematical relationships between specific properties of a system and size, are fascinating.[5] One of the most famous of these is called Kleiber's Law. It shows that the body mass of mammals and their metabolic rate (how much energy they need) closely trace a straight line, with a slope of three-quarters, when plotted on a logarithmic (log) scale on both the x- and y-axes (see exhibit 5). Biologists observed the law empirically before an interdisciplinary group of scientists explained it is the result of how energy is optimally distributed through a network.[6]

Exhibit 5: Kleiber's Law



Source: Counterpoint Global based on Supplementary Material 1: Basal Metabolic Rate, Body Mass & Temperature in Mammals, Data set for Andrew Clarke, Peter Rothery, and Nick J. B. Isaac, "Scaling of basal metabolic rate with body mass and temperature in mammals," Journal of Animal Ecology*, Vol. 79, No. 3, May 2010, 610-619.*

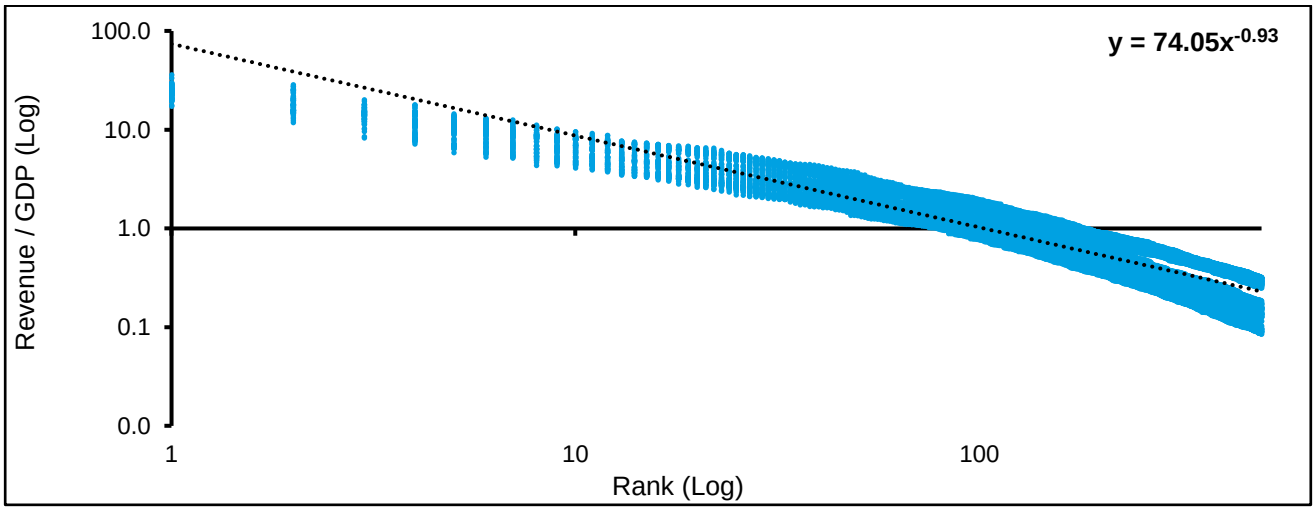
There are lots of scaling laws in the social sciences as well. Zipf's Law is a well-known example. Take the ranking of cities in a country on the x-axis and the population of each city on the y-axis, again using a log scale for both, and what emerges is a nearly straight line with a slope of -1.0. Zipf demonstrated a version of his law with the frequency of word usage by the author James Joyce in his novel, *Ulysses*.[7] The law indicates that you will see a few words frequently and lots of words infrequently.

Zipf's Law is an example of a power law, a relationship between two variables where one varies as a constant power of the other. The slope of the line that best fits the data is the exponent, or "power," that defines the law. Zipf's Law is the narrow case of an exponent of -1.0.[8] But the exponents can vary, as Kleiber's Law shows.

This leads to our next set of charts. Exhibit 6 shows the log rank (x-axis) and log revenue/GDP (y-axis) for companies in the Fortune 500 over its full existence from 1955 to 2024 (35,000 data points). The Fortune 500 is an annual list of the largest companies in the U.S. by revenue that is collected and published by *Fortune* magazine. It includes private companies for which there are data. About two-thirds of the companies on the list are also in the S&P 500.

On a log scale, the distance between the tick marks represents the same percentage change. The revenue reflected on the y-axis is scaled to GDP to remove the impact of growth and inflation on annual results. While not a perfect fit, the regularity is clear with a slope of -0.93 and a correlation, *r*, of -0.90.[8] Here again, this says that a few companies are really large and lots are relatively small.

Exhibit 6: Fortune 500 Companies, Rank and Revenue-to-GDP, 1955-2024



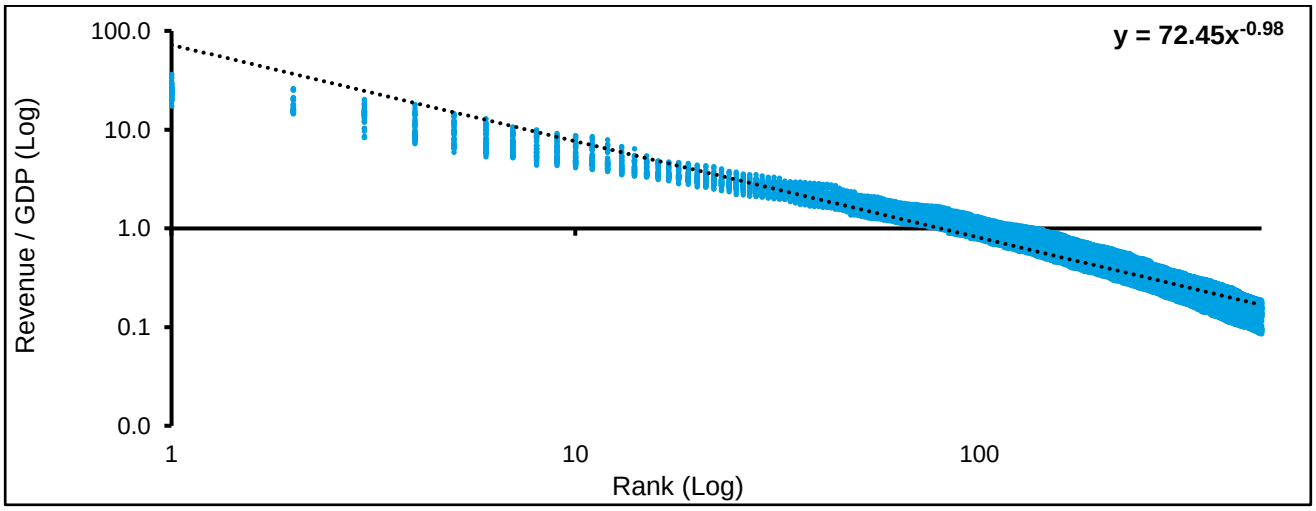
Source: Counterpoint Global and Fortune*.*

Fortune's original list included only industrial companies. The magazine changed its methodology in 1995 (based on 1994 sales) and thereafter started including service companies such as banks, utilities, and retailers.[10] For example, Walmart, AT&T, and Sears, Roebuck were immediately in the top 10 when they joined the list in 1995.

Because the first 40 years comprised only industrials whereas the following 30 years had services as well, we look at the pre- and post-services eras separately. (Forty-nine companies have been on the list all 70 years.)

Exhibit 7 shows the early period. The exponent is -0.98—very close to Zipf's -1.0—and the correlation, *r*, is -0.93. This means that you could randomly pick a year and ranking and, if you knew the GDP for that year, the equation would produce a relatively accurate estimate of revenue for the company of that rank.

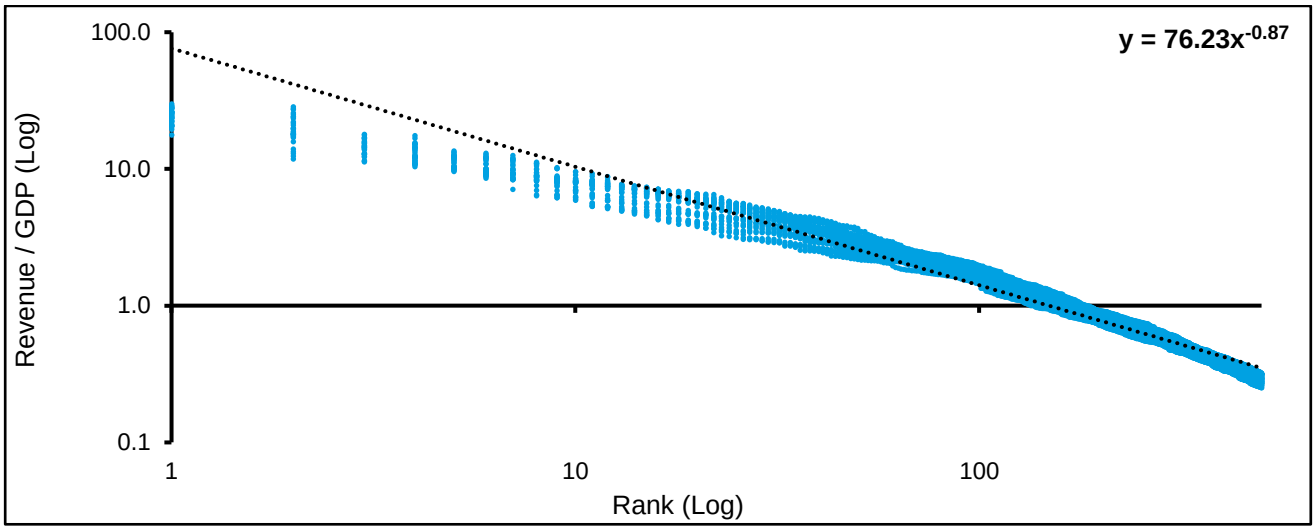
Exhibit 7: Fortune 500 Companies, Rank and Revenue-to-GDP, 1955-1994



Source: Counterpoint Global and Fortune*.*

Exhibit 8 shows the results for the last 30 years. Following the changes, the exponent drops to -0.87 and the correlation is -0.91. Still, a simple equation does a good job explaining the results.

Exhibit 8: Fortune 500 Companies, Rank and Revenue-to-GDP, 1995-2024



Source: Counterpoint Global and Fortune.

Whereas scientists have figured out what explains Kleiber's Law, there is no consensus on why outcomes in social systems follow power laws. To be sure, there are models that generate power law distributions, but they often come with underlying assumptions that are not grounded empirically.

In 1973, Leigh Van Valen, an evolutionary biologist, published a paper showing that the probability of a species going extinct is independent of how long it has existed.[11] He found that an exponential function, where a constant change in age has the same percentage change in frequency, accurately fit the data on survival. He attributed this constant rate of extinction to changes in the environment and ongoing competition with other species.

This has become known as the "Red Queen hypothesis," based on the character in *Through the Looking-Glass*, a novel by Lewis Carroll, who says, "Now, *here*, you see, it takes all the running *you* can do, to keep in the same place."[12] The idea is that species have to adapt in the face of change and competition, and there is a constant risk of dying out.

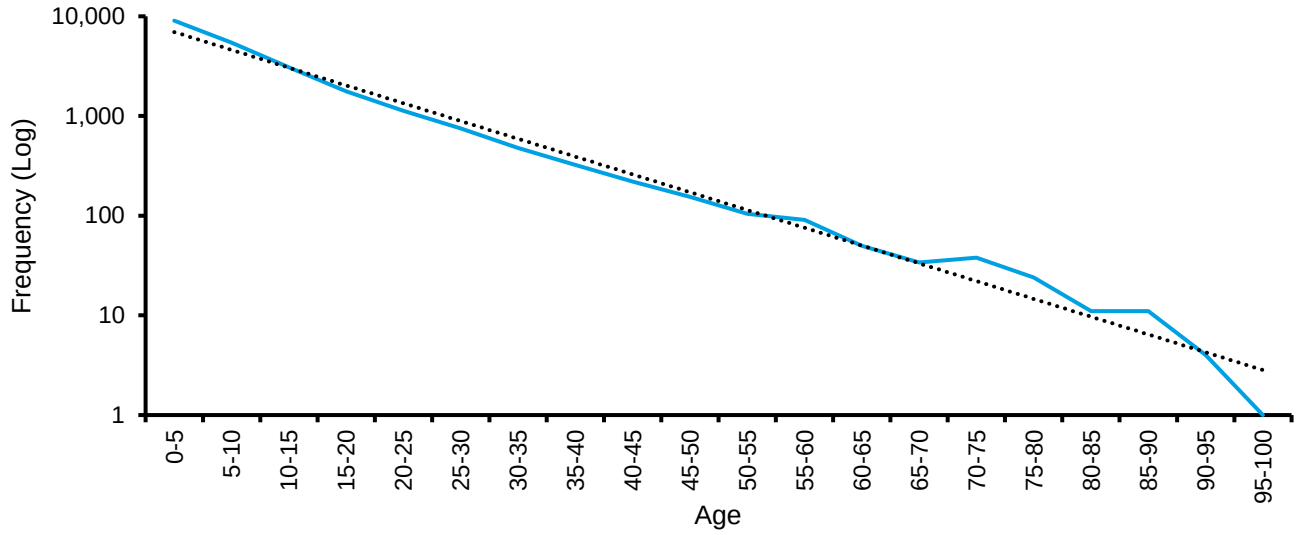
Companies are not species, but they also need to adapt and compete. Remarkably, the relationship between company age and delistings also follows an exponential function for public companies in the U.S.

Exhibit 9 shows the empirical regularity for close to 23,000 companies that were public from 1926 to 2022. The data come from Hendrik Bessembinder, a professor of finance at Arizona State University.[13] A company is "born" when it is listed on an exchange and "dies" when it is delisted. The x-axis is age at death and the y-axis is frequency, measured on a log scale.

About 60 percent of public companies "die" because they are involved in a merger or acquisition. The vast majority of the rest are delisted for cause, for example when a company files for bankruptcy or fails to meet certain requirements set by an exchange. The small remainder are voluntary delistings.

Empirical regularities show up in lots of places in the social sciences. But scientists are still working on persuasive theories of the mechanisms that cause them. Nonetheless, practitioners benefit from knowing of their existence and by making sure their views and expectations reflect their existence.

Exhibit 9: Longevity of Companies, 1926-2022



Source: Counterpoint Global and Hendrik Bessembinder.
Note: Initial listing date unknown for the 470 delisted companies with a starting date of July 1926.

Capital Intensity of Big Energy versus Big Technology

For a long time, the conventional wisdom was that energy companies were substantially more capital intensive than technology companies. This made sense because energy companies need a lot of tangible capital to extract, refine, and distribute fossil fuels whereas technology companies tend to spend more on intangible capital, such as research and development (R&D) and writing software code. The facts supported the conventional wisdom: the capital expenditures of a handful of top energy companies were about five times those of the top technology companies in 2003.[14]

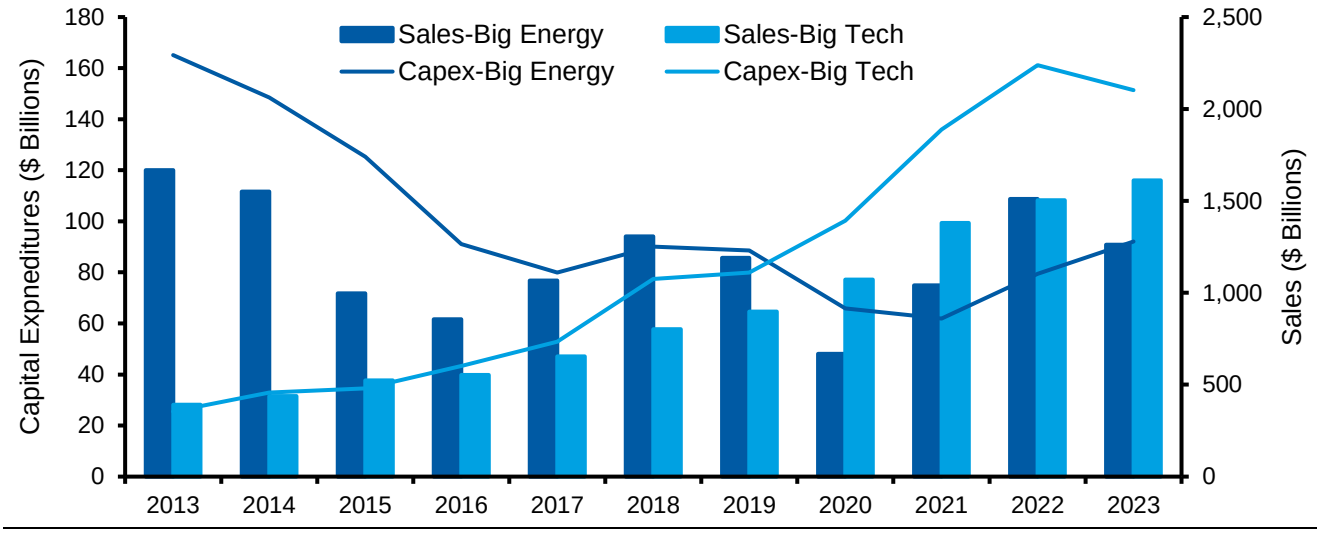
The rise of cloud computing and generative artificial intelligence (gen AI) has turned the conventional wisdom on its head. Cloud computing allows providers to offer customers the information technology they require over the internet, eliminating the need for the customers to own and operate their own servers and data centers. Gen AI is a subset of artificial intelligence that uses human prompts to create novel content such as text, images, and audio. Cloud computing and gen AI demand a lot of computational resources.

The rate of growth of these technologies requires substantial investment in tangible assets. This means that technology companies, which used to be light on physical assets, are spending large sums on tangible capital.

Exhibit 10 shows the trends in sales and capital expenditures for five large energy and technology companies from 2013 to 2023. Sales for these energy companies, which are in part determined by oil prices, were more than four times those for these technology companies in 2013. The sales for the two groups were roughly equal in 2022, and sales for the tech companies exceeded those of the energy companies by 28 percent in 2023. The compound annual growth rate (CAGR) for sales in the 10 years was -2.7 percent for the energy companies and 15.2 percent for the technology companies.

Capital expenditures for the energy companies were 6.5 times those of the technology companies in 2013. By 2019, the capital expenditures were at rough parity, and in 2022 the technology companies spent twice as much as the energy companies. In a decade, the ratio of energy versus technology capital expenditures went from 6.5 to 1 to 0.6 to 1.

Exhibit 10: Sales and Capital Expenditures: Big Energy versus Big Tech, 2013-2023

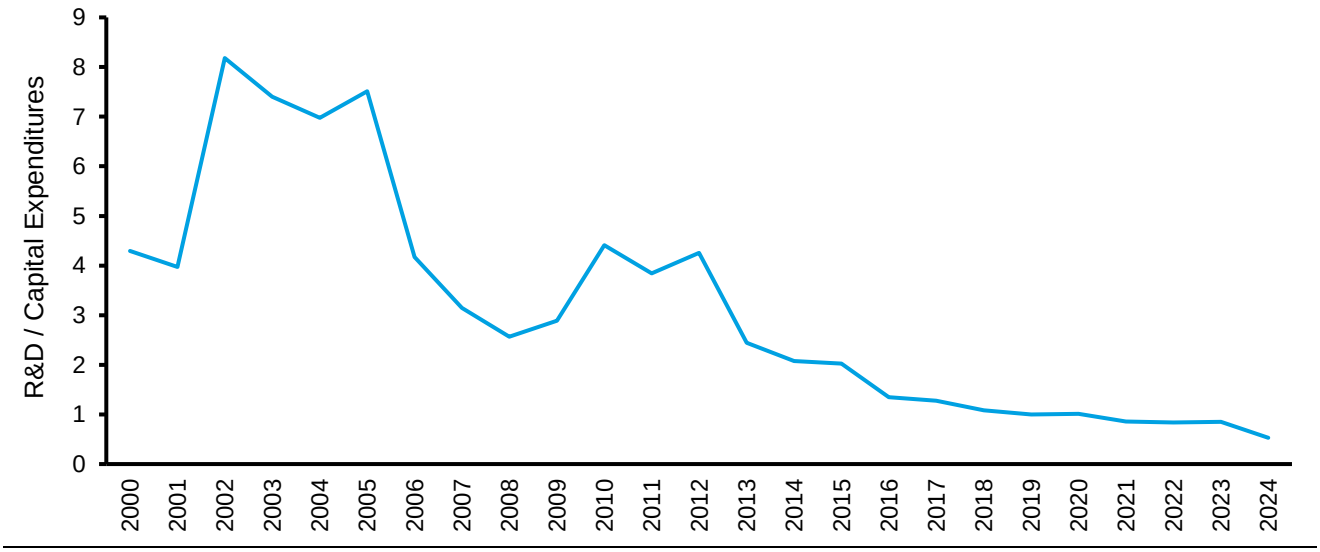


Source: Counterpoint Global and FactSet.
Notes: Energy companies include Exxon Mobil, Shell, Total, BP, and Chevron; technology companies include Amazon, Apple, Alphabet, Microsoft, and Meta Platforms; based on calendar years.

The energy companies are less profitable than the technology companies. For example, their earnings before interest, taxes, depreciation, and amortization divided by sales, or EBITDA margin, was 20 percent in 2023 versus 29 percent for the technology companies. Further, the energy companies have lower returns on invested capital (ROIC), on average, than do the technology companies. The differences in sales growth, profitability, and ROIC largely explain why energy companies have lower valuation multiples than technology companies do.

Exhibit 11 brings the broader picture into sharper view by looking at the change in the mix of investment spending at Microsoft from 2000 to 2024. Microsoft is a leading multinational technology company, historically best known for selling software. The exhibit shows the ratio of R&D spending, a classic intangible investment, to capital expenditures. That ratio declined from a peak of 8.2 in 2002 to 0.5 in 2024.

Exhibit 11: Ratio of R&D to Capital Expenditures for Microsoft, 2000-2024



Source: Counterpoint Global and Microsoft.
Note: Capital expenditures for 2016-2024 includes assets acquired under capital leases.

An investment that creates value is an outlay today that generates future cash flows, discounted to the present, that are greater than the expenditure. Investments can be in tangible or intangible assets. But the main job of executives and investors is to understand the magnitude and return on investment.

In 1975, corporate tangible investment was roughly double that of intangible investment in the U.S. Based on our research, we expect that ratio to nearly flip by 2025. The evolving mix of investment spending for large technology companies, which runs counter to the overall trend, is a noteworthy development in this context.

Corporate Performance

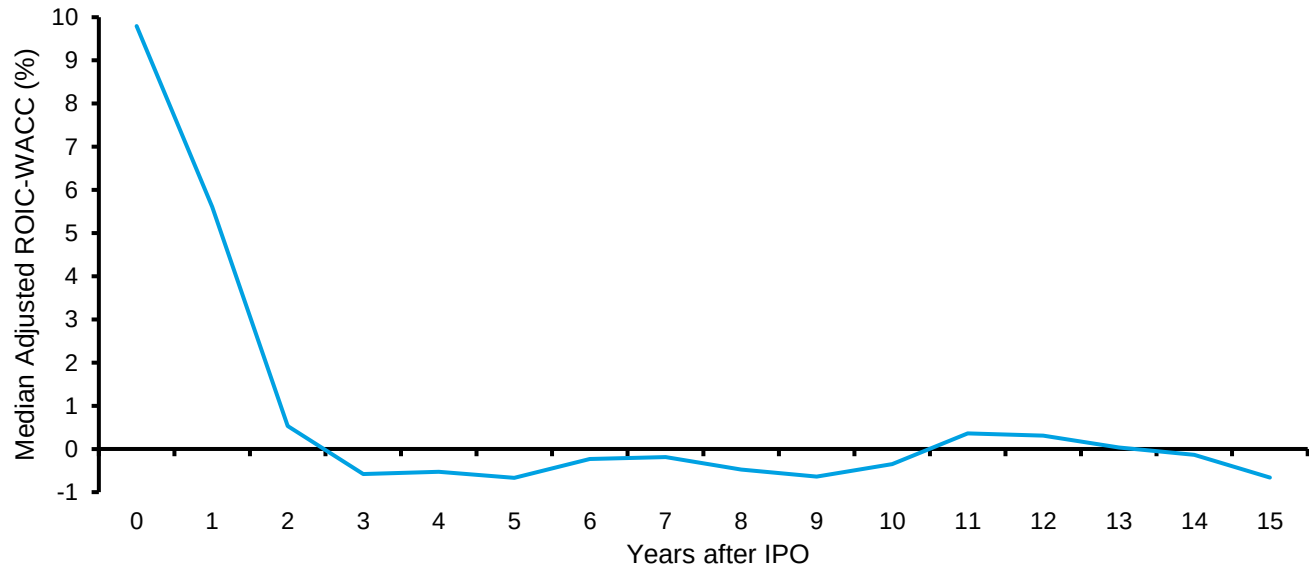
It is useful to have a sense of where a company is in its life cycle. Firms in the introduction or growth stages face very different issues than those in the maturity or decline stages, including how they deal with capital allocation, alternatives for financing, corporate governance, and inputs for valuation.

Academics and practitioners regularly describe how a company goes through stages. Early on, the company invests in anticipation of offering its good or service and earns a poor ROIC as it has yet to absorb those pre-production costs. Then companies grow and mature, reaching scale that allows for attractive ROICs. Finally, category maturation and competition push ROICs back toward the cost of capital. So ROICs follow an arc from low to high back to low. Age is a common proxy for assessing where a company falls in its life cycle.

We were surprised when we tested this description with data. Exhibit 12 shows what we found. At the time of an initial public offering (IPO), when companies are typically younger than most public firms, the median ROIC-to-WACC spread is actually high, and it drifts lower until stabilizing around year three.

One plausible explanation for this outcome is that companies are not newborns, using the year of founding as the date of birth, when they go public. The median age of the companies at the time of their IPO was, on average, about 10 years over this period. But the median age of all public companies is about 25 years old.[15] The empirical pattern does not line up with the common story of the life cycle.

Exhibit 12: Median ROIC – WACC Spread for U.S. Companies from IPO to Year 15, 1985 to 2023



Source: Counterpoint Global, Compustat, and FactSet.
Note: Includes companies listed on the New York Stock Exchange, NASDAQ, and NYSE American; Excludes ADRs and the finance sector; ROICs are based on the calendar year and winsorized at the 1st and 99th percentiles.

Victoria Dickinson, a professor of accounting, combined two good ideas to address the challenge of placing companies in the stages of the life cycle.[16] The first is the definition of stages based on the empirical work of the economists Michael Gort and Steven Klepper.[17] The classic stages are introduction, growth, maturity, shake-out, and decline.

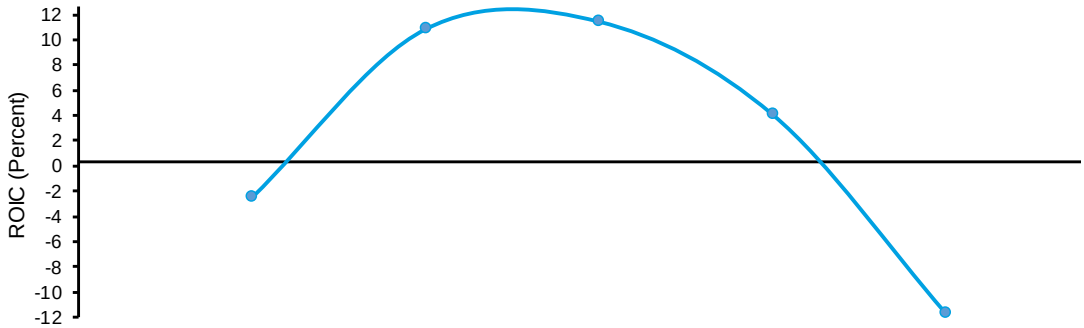
The second is an approach that she developed to place companies in the appropriate stage based on the statement of cash flows. The notion is that the specific patterns of inflows or outflows from operating, investing, and financing activities are consistent with various stages.[18]

One virtue of Dickinson's approach is that companies need not go from one stage to the next in linear fashion but can move around to reflect their operations and opportunities. This allows us to track the rate of transition from one stage to another and to calculate the total shareholder return (TSR) associated with those transitions.[19]

Exhibit 13 shows a summary of our analysis of U.S. public companies from 1985 to 2023, including ROIC, age, and sales growth by stage. A few points are noteworthy. First, the placement of companies in stages recovers the arc that the traditional theory suggests. Second, age since founding does tend to rise from the introduction to the maturity stage. Finally, about three-quarters of the sample are either in the growth or maturity stages.

To the degree that understanding a company's life cycle is useful, there is a better way to place companies in stages than to rely on age or qualitative descriptions. Further, we found the stocks of companies that went from any starting stage and transitioned to the growth or maturity stages produced good to great TSRs, on average.

Exhibit 13: Results of Dynamic Life Cycle Analysis, 1985 to 2023



	Life Cycle Stage				
	Introduction	**Growth**	**Maturity**	**Shake-Out**	**Decline**
Statistic					
ROIC (%)	-2.8	10.6	11.2	3.8	-12.0
Age since founding (years)	15.0	19.0	37.0	33.0	19.0
Age since IPO (years)	5.2	5.1	9.2	10.1	8.1
Sales growth (%)	12.7	12.0	6.3	4.6	5.6
Percent of sample	7.4	38.2	36.1	6.6	11.7
Cash Flow Type					
Operations	Outflow (-)	Inflow (+)	Inflow (+)	Inflow/inflow/outflow	Outflow (-)
Investing	Outflow (-)	Outflow (-)	Outflow (-)	Inflow/inflow/outflow	Inflow (+)
Financing	Inflow (+)	Inflow (+)	Outflow (-)	Inflow/outflow/outflow	Inflow/outflow

Source: Counterpoint Global, Compustat, and FactSet.
Note: Excludes the finance sector; Ages are medians, Sales growth is nominal for next 3 years, annualized; ROICs are based on aggregate amounts and adjusted for internally-generated intangible assets; IPO=initial public offering.

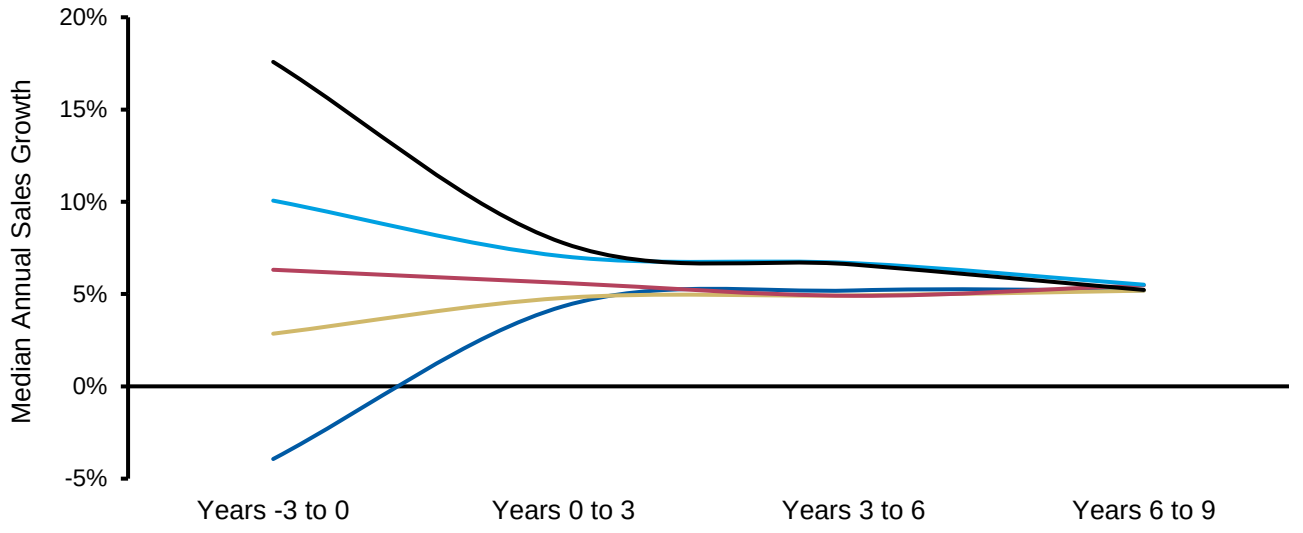
Sales growth is generally the most important value driver for a company because it is the primary source of cash coming in the door. Perpetually selling goods or services below their cost is bad, of course. But sales growth is significant for companies that have positive economic profits or are on their way to profitability.

As a result, finding companies that can sustain high sales growth is a worthy task. The challenge is that sales growth rates, similar to most data in a time series, regress toward the mean. Regression toward the mean says that an outcome that is far from average will be followed by an outcome with an expected value closer to average.

Exhibit 14 shows what regression toward the mean looks like. We took 3-year sales growth rates for U.S. public companies on major exchanges from 1962 to 2022. The question is: how likely is it that a company that has grown rapidly in the past will continue to grow at the same, or a similar, rate in the future?

The quintiles in the exhibit are based on the compound annual growth rate of sales for all companies for the three years before the starting point (year 0). We hold constant the population of companies in each quintile and examine the pattern of the median sales growth for each over time.

Exhibit 14: Regression Toward the Mean in Sales Growth, 1962 to 2022



Source: Counterpoint Global, Compustat, and FactSet.
Note: Minimum of $1 million of sales in 1962 dollars.

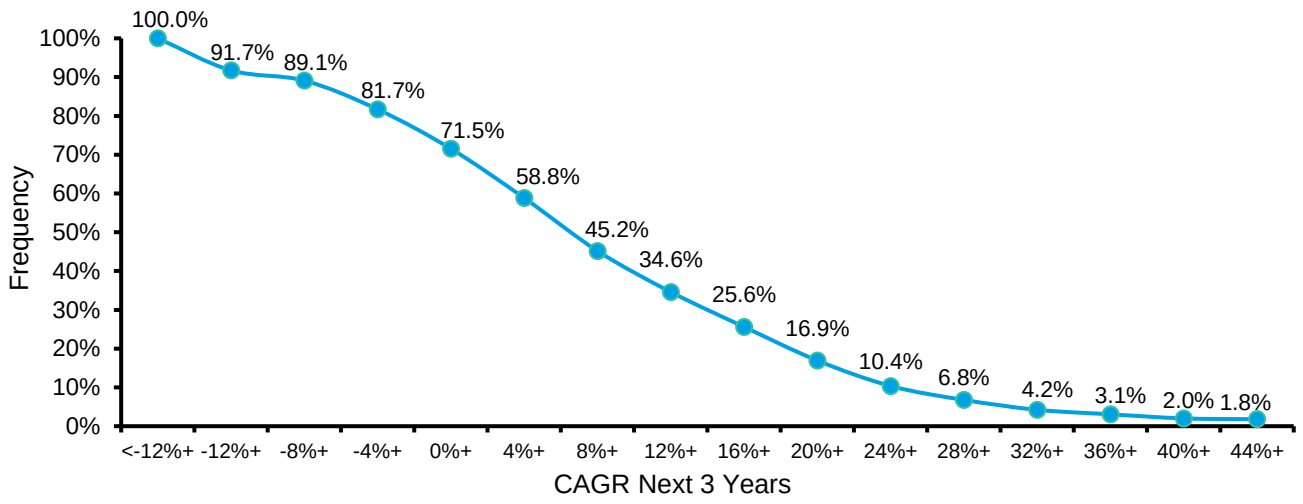
The main thing to note is that the median growth rates for all of the quintiles rapidly regress toward the mean by years 0 to 3 and essentially fully converge by years 6 to 9.

We can narrow our question and ask: what if we looked only at companies that grew sales annually at a rate of 20 percent or more in the past 3 years? How did they do? Exhibit 15 helps to visualize the answer.

The way to use the exhibit is to pick a level of growth and see the frequency of companies that met or exceeded that level in the next three years. For example, go to the 12%+ label on the x-axis and you will see the frequency is 34.6 percent. That says that 34.6 percent of the companies that grew 20 percent or more in the past 3 years grew 12 percent or more in the next 3 years.

The average growth rate for this cohort in years 0 to 3 was 7.0 percent (1.5 percentage points above the median of the total population), and the standard deviation was 15.6 percent. Standard deviation is a measure of how much results deviate from the average for a distribution. That means that about 68 percent of the observations were between -8.6 and 22.6 percent.

Exhibit 15: How Fast The 20%-Plus Growers of the Past Grew in the Future

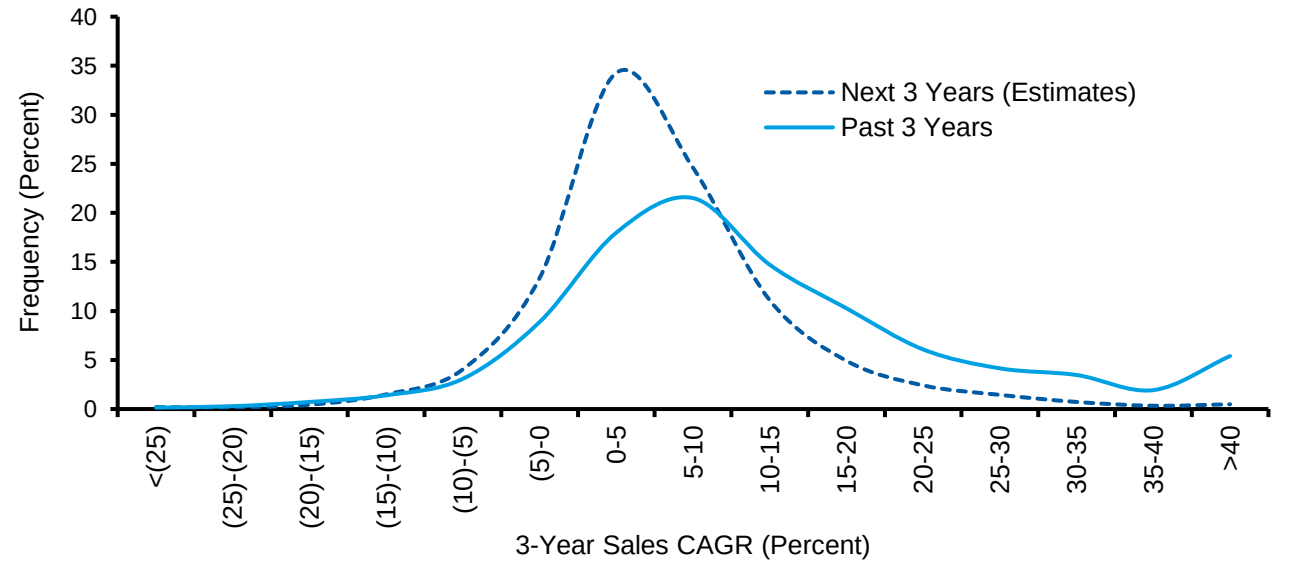


Source: Counterpoint Global, Compustat, and FactSet.
Note: Minimum of 1 million of sales in 1962 U.S. dollars; CAGR=compound annual growth rate.

Exhibit 16 shows the distributions of sales growth rates based on the past 3 years and estimates for the next 3 years for companies in the Russell 3000 with sales of at least $100 million. The estimates are the consensus of analysts as compiled by FactSet, a financial data provider. The Russell 3000 is an index that tracks the largest stocks by market capitalization in the U.S.

You can see that the expected sales growth has a higher peak and a narrower dispersion than the actual results. More specifically, the average expected sales growth rate over the next 3 years is 5.5 percent with a standard deviation of 8.6 percent while the past sales growth was 12.5 percent with a standard deviation of 16.4 percent. That inflation was higher in the past three years than it is expected to be in the next three years in part explains the difference between the growth rates. The narrow range of the forecasts is consistent with what psychologists call “overprecision,” when individuals are excessively sure they know how things will turn out.[20]

Exhibit 16: Past 3-Year versus Expected 3-Year Sales Growth Rates for Russell 3000



Source: Counterpoint Global and FactSet.
Note: Russell 3000 as of 12/13/23, minimum of $100M sales, and must have sales figures for 3 years ago and latest year.

Investment Management

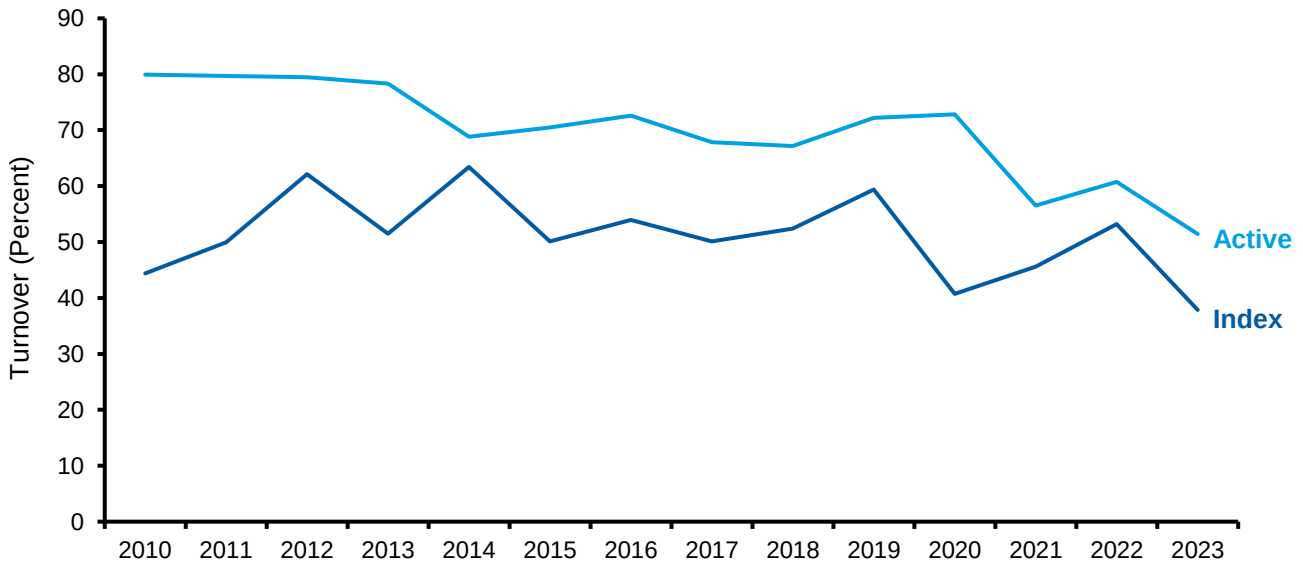
One common complaint we hear is that investors suffer from "short-termism," the inclination to make decisions that appear beneficial in the short term at the expense of decisions that have a higher payoff in the long term. One way this purportedly shows up for mutual funds is in shortening holding periods, which are the result of higher portfolio turnover.[21]

Equity index mutual funds have had lower turnover than active mutual funds on average. The assets under management of mutual funds that own large capitalization stocks and are managed actively or indexed are about 20 percent of the total U.S. equity market capitalization. The total is close to 30 percent including exchange-traded funds (ETFs).[22]

This line of thinking prompts two questions. The first is: what is the trend in turnover for actively managed funds? And the second is: how does that turnover compare to that of index funds?

Exhibit 17 answers those questions by examining the average portfolio turnover for large capitalization active mutual funds and index funds. The first observation is that mutual fund turnover has declined since 2010, implying a longer time horizon. This is counter to the conventional wisdom that mutual fund managers are increasingly myopic.

Exhibit 17: Average Portfolio Turnover: Active versus Index Mutual Funds

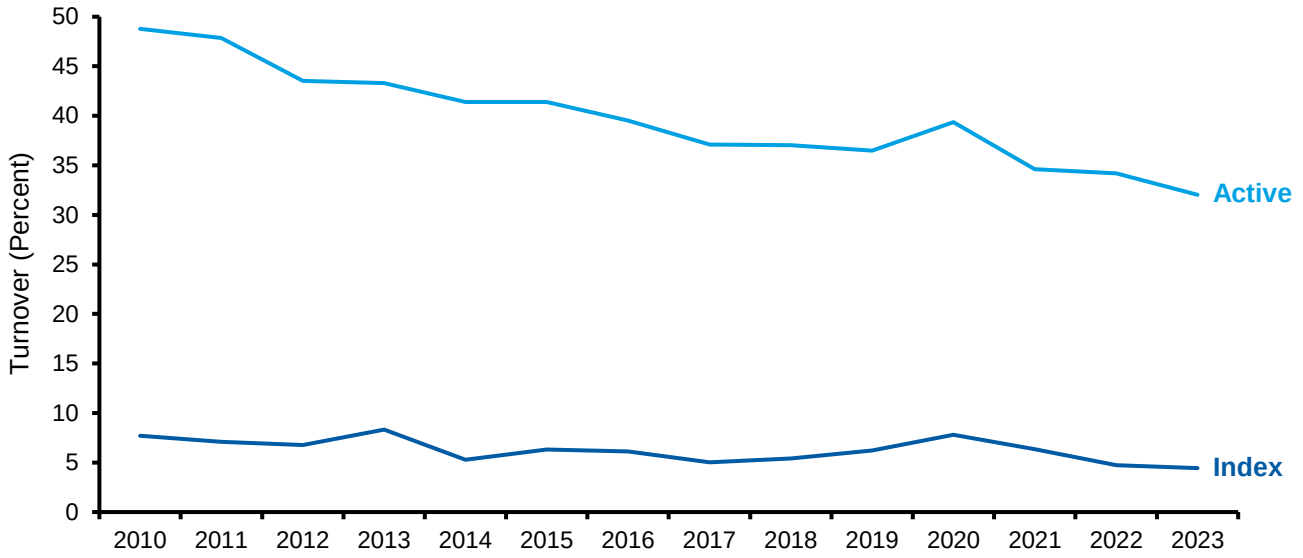


Source: Counterpoint Global and Morningstar Direct.
Note: U.S.-domiciled large capitalization mutual funds.

The second insight is that while turnover for index funds is indeed lower than that for active funds, that gap was narrower in 2023 than it was in 2010.

In this case, averages may be misleading because the assets under management are heavily skewed, with a small percentage of funds managing a large percentage of the assets. Exhibit 18 considers this by showing portfolio turnover weighted by assets under management.

Exhibit 18: Asset-Weighted Portfolio Turnover: Active versus Index Mutual Funds



Source: Counterpoint Global and Morningstar Direct.
Note: U.S.-domiciled large capitalization mutual funds.

Here again, we see that turnover for active funds drifted lower from 49 percent in 2010 to 32 percent in 2023. The holding period equals one divided by the turnover rate, which means the recent figure implies a time horizon of about three years (1 ÷ .32 = 3.1). In a survey, company executives suggest that "long-term" investors have an investment horizon of 2.8 years or longer.[23] Accepting this definition means that actively-managed mutual funds, based on invested assets, are long-term oriented.

The gap between active and index funds has also narrowed, although the asset-weighted turnover for index funds is substantially lower than the average turnover. This is because a large percentage of these assets are indexed against benchmarks with relatively low turnover, such as the S&P 500.

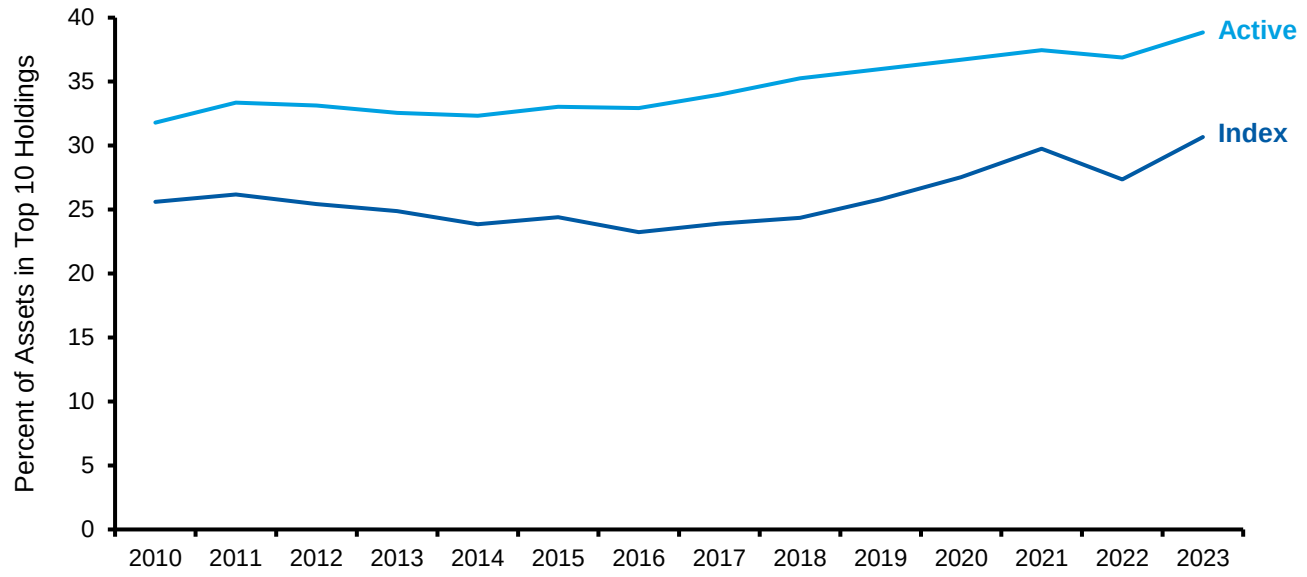
Markets are similar to ecologies in that participants pursue lots of strategies to survive.[24] Some strategies do have short, and perhaps shortening, time horizons. But the time horizon has been steady, or has lengthened, for active and indexed mutual funds and associated ETFs over the past decade or so.

Stock market concentration, which measures what percentage of total market capitalization is held in a specific number of stocks, has also been a point of concern for many investors. In the U.S., the 10 largest stocks went from about 14 percent of the total stock market in 2014 to 27 percent by the end of 2023.[25]

Rising concentration makes it difficult to beat the benchmark, triggers concern about diminished diversification, introduces worry about the valuation of the stock market, and fans fear that the inflows into index funds have led to the rise of a few very large capitalization stocks.[26] The level of concentration in the U.S. in 2023 was last reached in 1963, although concentration in the U.S. remains below that of most of the largest equity markets around the world.

Exhibit 19 shows the average percent of assets held in the top 10 holdings for U.S. large capitalization mutual funds—both active and index—from 2010 to 2023. The percentage of assets held in the top 10 positions was 39 percent for active mutual funds and 31 percent for index funds as of the end of 2023. The increase in concentration from 2010 to 2023 was greater for active funds than for index funds.

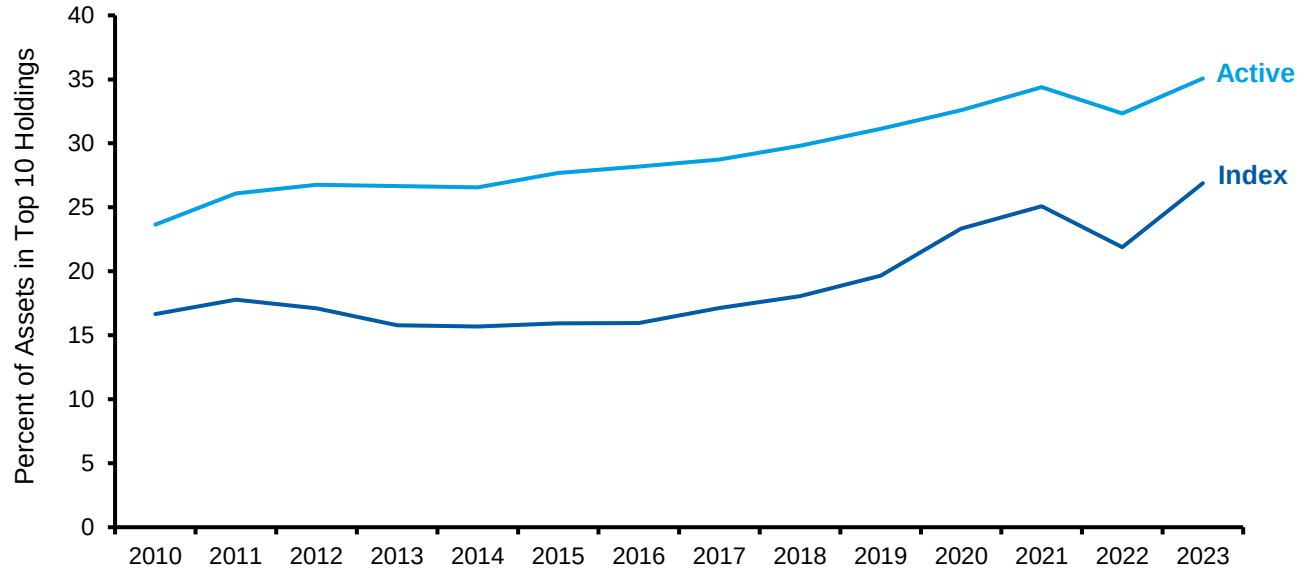
Exhibit 19: Average % of Assets in Top 10 Holdings: Active versus Index Mutual Funds



Source: Counterpoint Global and Morningstar Direct.
Note: U.S.-domiciled large cap mutual funds.

Exhibit 20 compares concentration for the same universe but weights the funds based on assets under management rather than taking a simple average. The weighted average percentage of assets held in the top 10 positions was 35 percent for active mutual funds and 27 percent for index funds as of the end of 2023. Here again, the percentages for active and index funds increased from 2010 to 2023 and the changes were even more dramatic than the simple averages.

Exhibit 20: Asset-Weighted % of Assets in Top 10 Holdings: Active versus Index Mutual Funds



Source: Counterpoint Global and Morningstar Direct.
Note: U.S.-domiciled large cap mutual funds.

We noted that rising concentration makes it difficult to beat the benchmark. The reason is that it is common for the average market capitalization of the stocks that active mutual funds own to be less than that of their benchmarks. The most popular benchmarks are indexes such as the S&P 500 that are weighted by market capitalization. Concentration goes up when large capitalization stocks do well, which leads active funds to struggle to deliver good relative returns because they tend to own stocks with smaller market capitalizations.

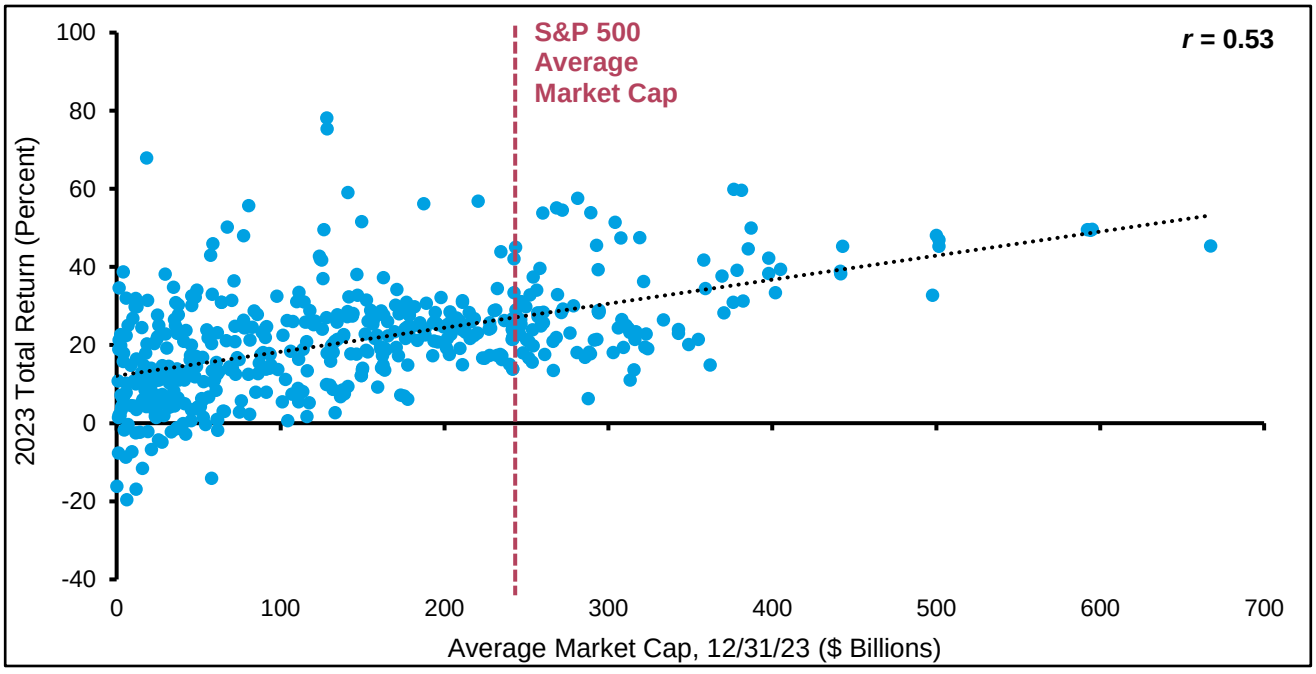
The concentration in the top 10 stocks in the U.S. rose sharply in 2023. Using data from Morningstar Direct, we identified more than 500 active mutual funds based in the U.S. that state the S&P 500 as their primary benchmark in their prospectus.

In the aggregate, those funds held stocks with an average market capitalization of $146 billion versus $242 billion for the S&P 500 Index. Further, nearly 80 percent of the funds had an average market capitalization below that of the benchmark.[27]

Exhibit 21 summarizes the returns for the funds that had average market capitalizations below, and above, that of the benchmark. The funds that were below had lower returns than the S&P 500 and negative alpha. The S&P 500 had a total return of 26.3 percent in 2023. Alpha is a measure of risk-adjusted excess return.

Exhibit 21: Performance of Active Mutual Funds with Average Market Capitalizations Below and Above That of The S&P 500, 2023

Average Market Cap	2023 Returns (%)		2023 Alpha (%)	
	Average	Median	Average	Median
Below	18.5	18.8	-6.9	-5.8
Above	30.9	28.3	4.0	2.2



Source: Counterpoint Global and Morningstar Direct.
Notes: ***Past performance is no guarantee of future results.*** *Average market cap based on the geometric mean as of 12/31/23; Universe = 507 active mutual funds that are domiciled in the U.S. and state the S&P 500 as their primary prospectus benchmark; 78% have a lower average market capitalization.*

The funds that had market capitalizations above the benchmark delivered strong returns and alpha on average. Many of these funds had large positions in the seven stocks, often called the “Magnificent Seven,” that generated more than one-half of the gains for the S&P 500 in 2023.[28] Note this relationship has been a two-way street: when small capitalization stocks have generated higher returns than large ones, active managers have enjoyed much better relative results on average.

Conclusion

So that ends our short tour of charts from the vault. We hope you found some of the pictures interesting, surprising, and provocative. Some were a challenge to conventional wisdom, including the capital intensity for energy versus technology companies, the ROIC-to-WACC spread by company age, and the time horizons for mutual funds. Others addressed empirical observations that remain unexplained, among them the charts on scaling laws. And a handful compelled a nuanced view, such as the market capitalization-to-GDP ratio and sales growth rates.

Endnotes

[1] Warren E. Buffett, "Warren Buffett on the Stock Market," *Fortune*, December 10, 2001. Gross domestic product (GDP) measures the total value of goods and services a country produces within its borders.
[2] Martin Feldstein, "Underestimating the Real Growth of GDP, Personal Income, and Productivity," *Journal of Economic Perspectives*, Vol. 31, No. 2, Spring 2017, 145-164.
[3] For more details on how we adjust ROIC for intangible investments, see the appendix of Michael J. Mauboussin and Dan Callahan, "ROIC and Intangible Assets: A Look at How Adjustments for Intangibles Affect ROIC," *Consilient Observer: Counterpoint Global Insights*, November 9, 2022.
[4] For example, Warren Buffett writes, "Unrestricted earnings should be retained only when there is a reasonable prospect - backed preferably by historical evidence or, when appropriate, by a thoughtful analysis of the future - that *for every dollar retained by the corporation, at least one dollar of market value will be created for owners*. This will happen only if the capital retained produces incremental earnings equal to, or above, those generally available to investors." See Warren E. Buffett, "Letter to Shareholders," *Berkshire Hathaway Annual Report*, 1984. See www.berkshirehathaway.com /letters/1984.html.
[5] Geoffrey West, *Scale: The Universal Laws of Growth, Innovation, Sustainability, and the Pace of Life in Organisms, Cities, Economies, and Companies* (New York: Penguin Press, 2017).
[6] The core concepts are that energy has to get to all of the cells (space filling) and the geometry of networks determined by natural selection (fractals). See Geoffrey B. West, James H. Brown and Brian J. Enquist, "A General Model for the Origin of Allometric Scaling Laws in Biology," *Science*, Vol. 276, No. 5309, April 4, 1997, 122-126.
[7] George Kingsley Zipf, *Human Behavior and the Principle of Least Effort* (Cambridge, MA: Addison-Wesley Press, 1949).
[8] M. E. J. Newman, "Power Laws, Pareto Distributions and Zipf's Law," *Contemporary Physics*, Vol. 46, No. 5, September-October 2005, 323-351 and Xavier Gabaix, "Power Laws in Economics: An Introduction," *Journal of Economic Perspectives*, Vol. 30, No. 1, Winter 2016, 185-206.
[9] The correlation coefficient, *r*, takes a value from 1.00 to -1.00. When *r* is 1.00, a plot of each point from both distributions falls on a straight line. Values from each distribution need not be the same, but the differences are identical. If *r* = -1.00, there is a perfect inverse correlation: an increase in one variable leads to a decrease in the other. Results are random when *r* = 0.
[10] Lydia Belanger, "How a Change to the Fortune 500 in 1995 Shaped the List of 2024," *Fortune*, July 2, 2024.
[11] Leigh Van Valen, "A New Evolutionary Law," *Evolutionary Theory*, Vol. 1, No. 1, July 1973.
[12] Lewis Carroll and John Tenniel, *Through the Looking-Glass and What Alice Found There* (London: Macmillan and Co., 1872), 42.
[13] Hendrik Bessembinder, "Shareholder Wealth Enhancement Outcomes, 1926 to 2022," *Working Paper*, June 2023.
[14] The relative capital expenditure figure for 2003 compares Exxon Mobil, Shell, Total, BP, Chevron to the five largest technology companies, by market capitalization at the end of 2003. These included Microsoft, Intel, Cisco, IBM, and Dell.
[15] Jay R. Ritter, "Initial Public Offerings: Median Age of IPOs Through 2023," *Working Paper*, February 2, 2024.
[16] Victoria Dickinson, "Cash Flow Patterns as a Proxy for Firm Life Cycle," *Accounting Review*, Vol. 86, No. 6, November 2011, 1969-1994.
[17] Gort and Klepper developed a theory of life cycle by studying the stages nearly four dozen industries go through following the launch of a new product. See Michael Gort and Steven Klepper, "Time Paths in the Diffusion of Product Innovations," *The Economic Journal*, Vol. 92, No. 367, September 1982, 630-653.
[18] We make three additional adjustments to the statement of cash flows. First, we move stock-based compensation from cash flow from operating activities to cash flow from financing activities. Second, we move internally-generated intangible asset investment from cash flow from operating activities to cash flow from investing activities. Finally, we remove the net change in cash and short-term investments from cash flow from investing activities to isolate investments in the business.
[19] Michael J. Mauboussin and Dan Callahan, "Trading Stages in the Company Life Cycle," *Consilient Observer: Counterpoint Global Insights*, September 26, 2023.

[20] Don A. Moore, *Perfectly Confident: How to Calibrate Your Decisions Wisely* (New York: Harper Business, 2020).
[21] "Short-Termism," *CFA Institute Research & Policy Center Issue Brief,* October 29, 2019; John C. Bogle, "The Mutual Fund Industry 60 Years Later: For Better or Worse?" *Financial Analysts Journal*, Vol. 61, No. 1, January/February 2005, 15-24; and Anne M. Tucker, "The Long and the Short: Portfolio Turnover Ratios and Mutual Fund Investment Time Horizons," *Georgia State University College of Law, Legal Studies Research Paper No. 2018-23*, 2018.
[22] Recent academic research, which looks beyond funds and ETFs to estimate the percentage of asset ownership that is passive, put that figure at 33.5 percent as of 2021. See Alex Chinco and Marco Sammon, "The Passive Ownership Share is Double What You Think It Is," *Journal of Financial Economics*, Vol. 157, July 2024, 103860.
[23] Anne Beyer, David F. Larcker, and Brian Tayan, "2014 Study on How Investment Horizon and Expectations of Shareholder Base Impact Corporate Decision-Making," *Rock Center for Corporate Governance at Stanford University and NIRI*, 2014.
[24] Maarten P. Scholl, Anisoara Calinescu, and J. Doyne Farmer, "How Market Ecology Explains Market Malfunction," *PNAS*, Vol. 118, No. 26, June 25, 2021.
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[26] Gerald P. Madden, Kenneth P. Nunn Jr., and Alan Wiemann, "Mutual Fund Performance and Market Capitalization," *Financial Analysts Journal*, Vol. 42, No. 4, July-August 1986, 67-70.
[27] Morningstar's definition of average market capitalization is the geometric mean of the market capitalizations of all the stocks a fund owns.
[28] Chris Banse, "Market Concentration and the Magnificent Seven: Where Next?" *Russell Investment*s, February 21, 2024. The Magnificent Seven includes Apple, Amazon, Alphabet, Meta Platforms, Microsoft, Nvidia, and Tesla.

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