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INVESTMENT MANAGEMENT

Counterpoint Global Insights

Competitive Advantage Period

The Neglected Value Driver

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Introduction

Long-term fundamental investing lies at the intersection of finance and competitive strategy analysis. A central principle in finance is that the value of an asset equals future cash flows discounted to the present at an appropriate opportunity cost of capital. A corollary is that companies should seek to make investments that have a present value greater than their cost.

A core idea in microeconomics is that the price of a good or service eventually equals its marginal cost. In other words, businesses ultimately earn their cost of capital as the result of competition, market maturation, and senescence.

The goal of a company is to identify and execute a strategy that gives it a competitive advantage that is sustainable. A company's anticipated value creation is measured by how much its return on invested capital (ROIC) exceeds its cost of capital as well as how long it can maintain a positive spread, a reflection of its sustainable competitive advantage (see exhibit 1).[1] ROIC is defined as net operating profit after taxes (NOPAT) divided by invested capital, the net assets a company needs to generate NOPAT.

This report is about the "how long" part. The measure is called "competitive advantage period" (CAP), defined as the amount of time a company can earn returns above the cost of capital on new investments.[2] The concept of CAP has been around for decades, and has gone by the names "value growth duration," "fade," and, more prosaically, "T."[3]

Executives commonly strive to achieve a competitive advantage, and investors widely acknowledge its importance. But the tools used to quantify CAP are wanting.

Specifically, market participants generally assess value using multiples of earnings or cash flow that obfuscate the contributions of growth, return on invested capital, opportunity cost, and CAP. A smaller number of practitioners use discounted cash flow models, but they limit the model's utility by making ungrounded assumptions for the terminal value that often makes up the vast majority of the worth.

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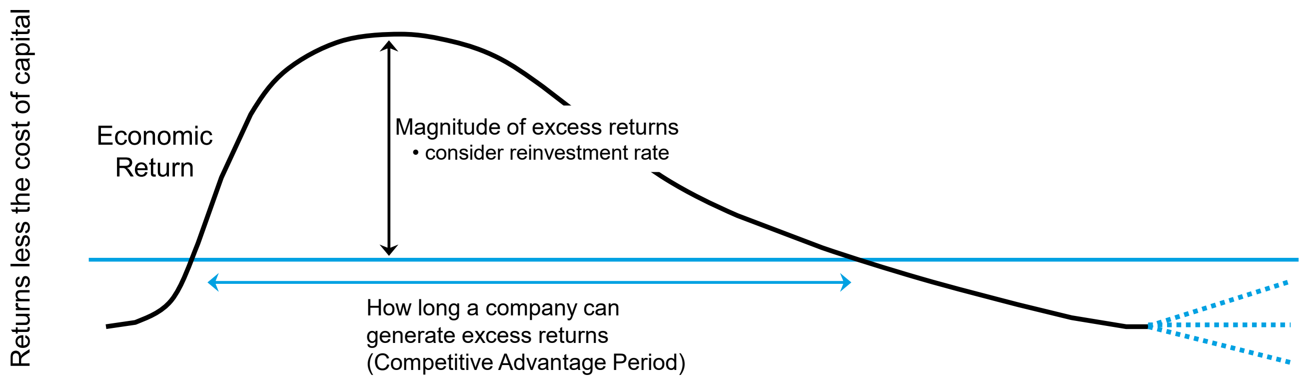
Exhibit 1: Competitive Advantage Period Reflects the Sustainability of Returns



Source: Counterpoint Global.

We start with a brief history of valuation, discuss what we consider to be the seminal paper on valuation, and review the latest work on how valuation is done in practice.

We then turn to the evolution of competitive strategy analysis, followed by a look at what actually happens to public companies, and assess the relevance of CAP over the life cycle. Next, we consider how to model future growth as well as methods to estimate terminal value, including a fade model that reflects regression toward the mean.

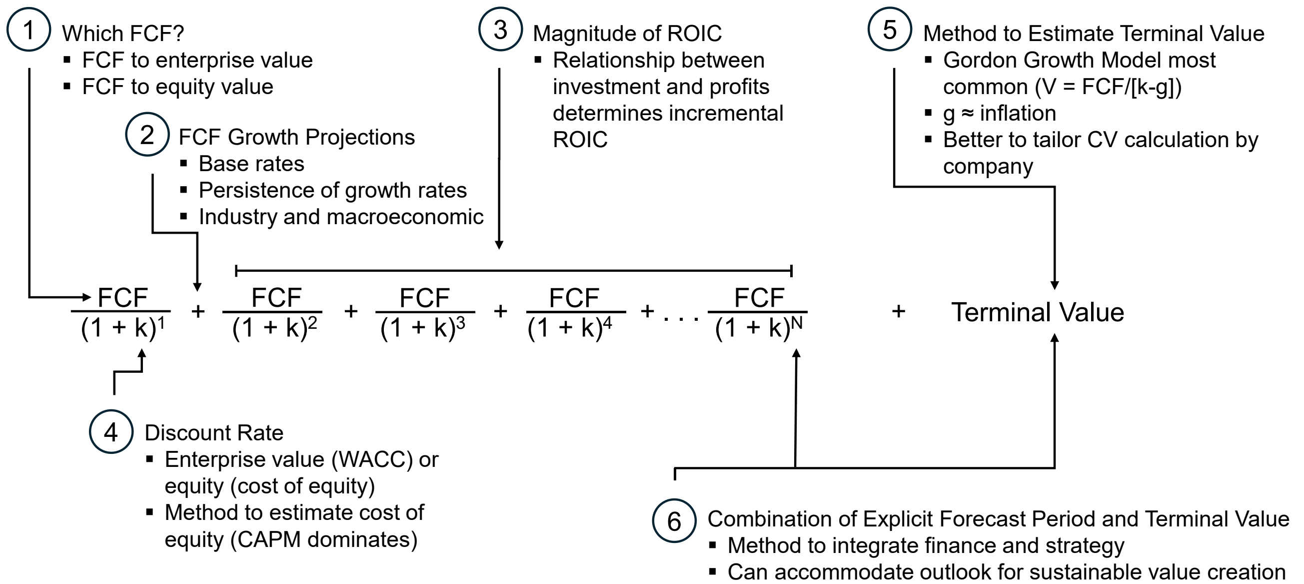
We next lay out the analytical steps to measure market-implied CAP. These include:

- Identify the stage a company is in within the life cycle
  - Roughly two out of three U.S. public companies are in the growth or maturity stages
- Use consensus forecasts for value drivers and a sensible estimate of the cost of capital
  - Build in a reality check by measuring incremental ROIC
  - Calculate the cost of capital based on market prices for risk
- Determine a suitable method to estimate the terminal value using appropriate estimates of ROIC, growth, and fade rate
  - Incorporate a fade based on empirical data for the sector or industry
- Expand the explicit forecast period as necessary to solve for today's stock price to determine the market-implied CAP
  - Most companies will be in the range of 5 to 20 years
- Assess plausibility by checking assumptions, evaluating similar companies, and referring to analysis of the company's competitive position
  - The market tends to value similar businesses in similar ways
  - Consider expectations for value creation in the context of strategic circumstances

Exhibit 2 summarizes the issues to consider when bringing together finance and competitive strategy in a valuation model. The product of this analysis is a grounded sense of what financial results the market has priced into a stock. The next step is to do financial and strategic analysis to assess whether those expectations are too low (buy the stock), too high (sell the stock), or about right (move on to the next potential opportunity).

We finish with a simplified case study to make the ideas more concrete.

Exhibit 2: Connecting Finance and Strategy in Valuation



Source: Counterpoint Global.

Valuation

A brief history. Boiled down to the basics, valuation is about two principles: A dollar today is worth more than a dollar tomorrow, and a dollar that is less risky is worth more than a dollar that is more risky. The rate of return reflects the riskiness of the cash flow stream. Valuation, therefore, seeks to quantify the magnitude of the cash flows an owner may receive, when they may be received, and what return is justified given the risk of those cash flows.

Practitioners apply these principles to corporate investments, bonds, and equities.

The concepts of loans, interest rates, and compound interest go back at least as far as the Babylonians in Mesopotamia in 2000-1700 B.C.[4] For example, a clay tablet from that era, now held in the collection of the Louvre Museum in Paris, offers a problem in compound interest.[5]

Many religious traditions historically condemned usury and, at times, prohibited charging interest on loans. In practice, merchants and jurists developed workarounds and justifications, including the concept of *lucrum cessans* (“foregone profit”). The notion is that compensation is justified because the lender gave up the chance to invest elsewhere. This acknowledges opportunity cost.[6]

Fibonacci discussed compound interest in his book, *Liber Abaci*, published in 1202, and compound interest tables were printed in the 16th century.[7] A Dutch water board, Hoogheemraadschap Lekdijk Bovendams, issued a perpetual bond (2.5 percent annual interest) in 1624 that is still making payments 400 years later. The interest is about €15 per year.[8]

Railroad companies were among the first to explicitly apply the criterion that the benefit from the present value of future cash flows should exceed the cost of the investment.[9] Other industries were quick to follow, including telecommunications (AT&T), energy (Atlantic Refining), industrials (DuPont), and automotive manufacturing (General Motors).[10]

Notably, the concept of "residual value," the value of an asset at the end of its useful life, became important in this analysis.[11] But the idea focused narrowly on specific investments, rather than looking at a firm overall.

Equity investors lagged companies in adopting valuation techniques based on cash flow. In the eighteenth and nineteenth centuries, equity valuation generally focused on dividend yields and asset value.[12] This makes sense: equity investors wanted a higher yield than bondholders because equity is riskier than debt. One researcher captured the idea that stocks are more uncertain versions of bonds when he wrote, "common stock is a bond which promises future payments indefinite in number and amount."[13]

Irving Fisher, a renowned professor of economics at Yale University, argued that the value of any financial asset is the "rate of interest to be realized" and the "series of sums" the investment is going to return to the investor.[14] While stocks were considered more speculative than bonds, there was a growing view they could provide solid returns in the long term.[15]

Professionalism in equity analysis took a large step forward with *Security Analysis*, a book written by Benjamin Graham and David Dodd that was published in 1934.[16] Graham and Dodd stressed the distinction between investing and speculating. Investing is buying a partial stake in a business at a price below intrinsic value. Speculating is buying a stock in the hope that it goes up.

Graham and Dodd relied on conservative metrics, including liquidation value and multiples of normalized earnings. They later introduced equations to solve for an appropriate price-earnings ratio, including one in a chapter called "Newer Methods for Valuing Growth Stocks" in the fourth edition of *Security Analysis.*[17] That edition, released in 1962 (which included the finance researcher Sidney Cottle as an additional author), was the last one Graham worked on. Still, Graham was wary of placing too much value on the future.

Dividend yield remained a popular measure of equity valuation for most of the 20th century. In fact, when the dividend yield on stocks dipped below that of investment grade bonds in 1958, market veterans sounded the alarm that stocks were overvalued.[18] An article in *Fortune* magazine in early 1959 captured the tone: "It has been practically an article of faith in the U.S. that good stocks must yield more income than good bonds, and that when they do not, their prices will promptly fall."[19] With rare exception, stocks have yielded less than bonds since then.

John Burr Williams, an economist, published *The Theory of Investment Value* in 1938.[20] Williams formally laid out the dividend discount model, which calculates the value of a stock as the present value of future dividends. Williams moved valuation from a practice based mostly on heuristics to one grounded in theory.

As an interesting aside, Ben Graham reviewed *The Theory of Investment Value* and was generally favorable ("his formulas . . . are unimpeachable"). But he had major quibbles with the assumptions Williams makes about rates of growth, interest rates, and "the 'terminal value' when growth ceases."[21] Specifically, he noted that the terminal value, calculated by the "quite conventional method of multiplying expected normal earnings by 20," was 95 percent of the total value in Williams's case study of Phoenix Insurance.

Joel Dean, a professor at Columbia Business School and a consultant, introduced the term "discounted cash flow" (DCF) in 1953.[22] His focus was primarily on the capital budgeting decisions of companies, but the logic extended readily to investors evaluating companies overall.

Enterprise value to earnings before interest taxes depreciation and amortization (EV/EBITDA) is a relatively new measure in valuation. John Malone, a successful businessman, is often credited with popularizing EBITDA when he was the chief executive officer of Tele-Communications Inc. in the 1970s. EBITDA also became a widespread measure in the buyout industry in the 1980s.[23] Of EBITDA, Malone said, "Some people say I all but invented the term. I can't swear to it, though it is true that I helped make it a whole new form of currency on Wall Street."[24]

As we will see, investors continue to rely primarily on multiples, most prominently price-earnings (P/E). Earnings yield (E/P) is the inverse of P/E and has been used historically to compare stocks to bonds. This includes the "Fed Model," which compares the earnings yield on the S&P 500 to the yield on the 10-year U.S. Treasury note.[25] The S&P 500 is an index of approximately 500 U.S. stocks with the largest market capitalizations.

Multiples have utility but are ultimately shorthands for the actual process of discounting cash flows. To understand CAP, we have to go analytically deeper than multiples can take us.

Credit and real estate investors explicitly use DCF models, but many equity investors do not. The likely reason is that the magnitude and timing of cash flows are better specified in these other asset classes (contractually, in the case of credit). For equities, we know neither the cash flows nor the discount rate.

As Graham highlighted in his review of *The Theory of Investment Value*, the terminal value (also known as continuing, horizon, or residual value), or value assigned beyond the explicit forecast period in a multi-stage discounted cash flow model, is a major challenge to using a DCF model effectively. How this is done is fundamental to understanding CAP.

The original application of residual value was on specific physical investments. For example, assume a company buys a machine with an assumed life of five years. The residual value seeks to assess what the machine is worth after five years. The extension of residual value to reflect the terminal value of a firm, which is a bundle of projects, is vastly more difficult.

We will discuss terminal value in more detail in a moment. Myron Gordon, an economist, developed a technique, commonly called the Gordon Growth Model, that remains widely used today.[26] In a simple form, the model says:

$$\text{Value} = \frac{\text{Distributable cash}}{\text{Cost of capital} - \text{Long-term growth rate}}$$

For instance, a company with distributable cash of $2, a cost of capital of 7 percent, and a growth rate of 3 percent would be worth $50 ($50 = $2 ÷ [0.07 – 0.03]).

The foundation of the Gordon Growth Model is sound, but it is easy to abuse. In particular, growth rates well above the rate of inflation can lead to values that fail to reflect likely outcomes.

Miller & Modigliani. Mark Rubinstein, a financial economist, referred to pre-1950 as "The Ancient Period" in his book, *A History of The Theory of Investments*.[27] We would argue that our understanding of modern valuation started with the paper, "Dividend Policy, Growth, and the Valuation of Shares" written by Merton Miller and Franco Modigliani (M&M), both Nobel Prize winning economists, and published in 1961.[28]

Approaches to valuation up to that point relied on various measures including earnings, cash flow, and dividends. M&M set out to answer the question: "What does the market 'really' capitalize?" They found that when treated properly, the approaches all provide the same answer. One implication, which was not obvious at that time, is that a firm's dividend policy is irrelevant.[29] Many investors today remain confused about the role of dividends.[30]

One method M&M advocate is what they call the "current earnings plus future investment opportunities approach." We can simplify their math into the following formula:

$$\text{Value} = \frac{\text{NOPAT}}{\text{Cost of capital}} + \frac{\text{Investment x (ROIC – Cost of capital) x CAP}}{\text{Cost of capital x (1 + Cost of capital)}}$$

NOPAT stands for "net operating profit after taxes" and is a measure of unlevered cash earnings. Investment includes capital expenditures (less depreciation), working capital changes, and acquisitions. ROIC is a measure of return on investment. The cost of capital reflects opportunity cost. CAP, which M&M designate as "T," is the competitive advantage period.

This formula divides the value of a firm into two parts. The first term on the right side, NOPAT divided by the cost of capital, is the steady-state value of the firm assuming that the level of NOPAT remains stable. This is also called the "pre-strategy value" or the value of "assets in place."

The second term on the right, commonly called "present value of growth opportunities" (PVGO), reflects future value creation. The value of PVGO is a function of how much a company can invest (investment), at what spread versus the cost of capital (ROIC – cost of capital), and for how long (CAP).[31]

M&M write that the formula "has a number of revealing features and deserves to be more widely used in discussions of valuation." We agree. Here are some ways it can inform analysis:

- The formula allows you to disaggregate a price-earnings multiple into a commodity component (the first term on the right) and a franchise component (the second term). Assuming a business that is financed entirely with equity, the commodity P/E multiple is 1 ÷ cost of equity. If the cost of equity is 8 percent, the commodity P/E is 12.5 (12.5 = 1 ÷ 0.08). While more involved, we can do a similar calculation for the commodity EV/EBITDA multiple.[32] Any premium to that multiple reflects future value creation.[33]
- The significance of the return on incremental invested capital becomes immediately obvious. If the ROIC on new investment is equal to the cost of capital, the value of the equation's second term is zero. Even an ROIC that is initially high but declining can reveal a trajectory that ends with earning the cost of capital or less.
- The formula shows that the effect of growth is qualified by the incremental return. Rapid growth adds a lot of value for firms with a large spread between the ROIC and the cost of capital. Growth subtracts value for companies with negative spreads.
- M&M note that, "the essence of 'growth,' in short, is not expansion, but the existence of opportunities to invest significant quantities of funds at higher than 'normal' rates." That "normal" rate is the cost of capital.
- The equation reveals why relative valuation techniques can be misleading. Companies in the same industry with different economic characteristics may not be comparable. We find there is more dispersion in ROIC within industries than there is across industries.[34]
- The equation provides a quick sense of the expectations for future value creation embedded in the share price. For instance, the steady-state value for the S&P 500 has been two-thirds of the price and the PVGO the other one-third, on average, from 1961 to 2025.[35]
- There is research that shows the ratio of PVGO to price helps predict stock returns over the next ten years. Low ratios, which imply modest expectations about future value creation, precede above-average 10-year returns, on average. High ratios, which anticipate a lot of growth that creates value, suggest below-average returns.[36] As of the beginning of 2026, the percentages for steady state and anticipated value creation were close to equal.

In his book, *Creating Shareholder Value*, Alfred Rappaport, a professor emeritus at the Kellogg School of Management at Northwestern University, was ahead of his time in highlighting the importance of CAP (he called it “value growth duration”). He urged executives and investors to consider competitive strategy analysis in assessing CAP and demonstrated the power of reading CAP from stock prices.[37]

Rappaport showed that the length of the CAP is not just an interesting theoretical concept, but it can be estimated to understand the expectations a stock price reflects. This approach, based on market signals, shifts the focus from what a particular investor thinks to what the market, a collection of investors, thinks.

Competitive strategy analysis is a structured approach to understand how and why a company can produce an ROIC above the cost of capital for an extended period. Investors often refer to the magnitude of competitive advantage as a “moat.”[38]

Warren Buffett, chairman of Berkshire Hathaway and one of the greatest investors of all time, popularized the metaphor. He repeatedly discussed his desire to buy businesses that are castles with economic moats around them that are wide, deep, and filled with alligators so as to keep the competition at bay.

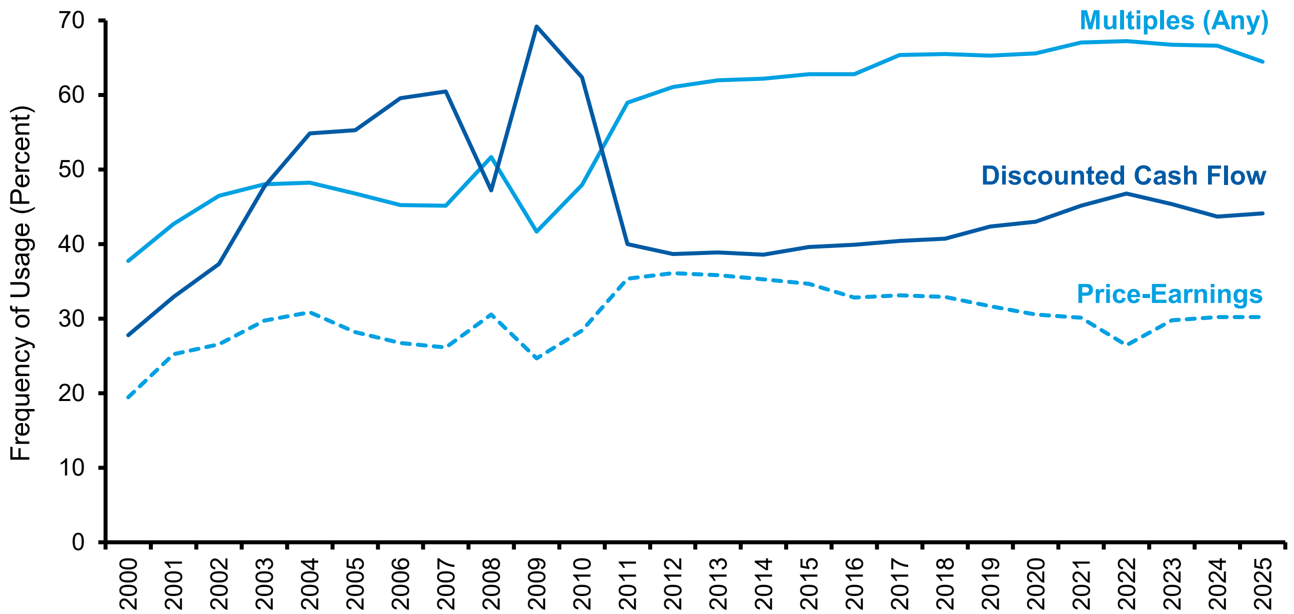
Buffett has also underscored that economic moats are rarely stable. Competitive advantage is generally strengthening or weakening, which means the moat is getting wider or narrower. When a business decision in the short term comes into conflict with the competitive position in the long term, he argues that “widening the moat *must* take precedence.”[39]

In 2002, the Securities and Exchange Commission approved a rule that required the recommendations and price targets of analysts to have a “reasonable basis” and come with “a clear explanation of any valuation method.”[40] As a result, the rate of disclosure of the valuation approach analysts used in their reports went from about 50 percent to essentially 100 percent.[41] We now examine how they satisfied that rule.

In practice. Francesca Bastianello, Paul Décaire, and Marius Guenzel, professors of finance, created a breakdown of valuation approaches for more than one million reports by sell-side analysts from around the world from 2000 to 2025 (exhibit 3).[42] Sell-side analysts are financial professionals who issue stock recommendations and often work for investment banks or brokerage firms. Buy-side analysts work for investment management firms such as mutual funds or hedge funds. The use of multiples in general, and the P/E multiple in particular, has generally dominated the discounted cash flow model.

That said, the valuation approaches that analysts employ vary a great deal by geography. For instance, multiples are much more popular than DCF models in North America and Asia, while DCF models are more prevalent in Europe, South America, and Australia. Further, you can see a spike in the use of DCF models in 2009 because a lot of companies were losing money as a result of the Great Recession, making multiples of near-term earnings nonviable.

Exhibit 3: Breakdown of the Valuation Methods of Analysts, 2000-2025



Source: Francesca Bastianello, Paul H. Décaire, and Marius Guenzel, "Valuation Models," Working Paper*, November 2025.*

The use of DCF models is higher in 2025 than it was at the turn of this century, but well off of its peak. The researchers used the size of errors in prior forecasts as a proxy for skill and found that skilled analysts were more accurate when they used a DCF model than when they used multiples, especially for firms that are hard to value.[43] By contrast, the less-skilled analysts were worse off using a DCF model.

This underscores that it is not the model that matters per se but rather the expertise and judgment with which analysts utilize it. Careful studies of how analysts apply DCF models show a consistent set of errors and misjudgments, including incorrect derivations of free cash flow, improper terminal value assumptions, and sloppy calculations of the cost of capital.[44]

Multiples are generally not helpful in thinking carefully about CAP because they are the product of a lot of variables, including ROIC, growth, risk, and competitive advantage, that are nearly impossible to untangle. We can say that companies trading at a commodity multiple reflect no value creation (or a deteriorating core business) and that high valuations generally align with high expectations. But the core assumptions are implicit.[45]

To understand CAP we need to narrow our focus to the two main components of cash flow forecasts in a multi-stage DCF model: the explicit forecast period and the terminal value. Many investors believe the explicit forecast period should be relatively short because forecasts that are too far in the future are inherently difficult to make.

But it is routine for most of a firm's value to be attributable to cash flows beyond the explicit forecast horizon that most executives and investors use. That has to be lumped into the terminal value, which commonly represents 70 percent or more of total firm value in models with explicit horizons of ten years or less. As a result, it is important to recognize the assumptions embedded in the terminal value.[46] More specifically, we want to understand the link between the terminal value and sustainable value creation.

One of the first, if not the first, discussions of terminal value was published in 1849 for the valuation of timberland.[47] The idea was that it was necessary to value the land beyond the current potential harvest period to assess its worth.

John Burr Williams discussed the terminal value for equities in 1938. He suggested an analyst "may reasonably be expected to form some fairly definite opinion" on the value once a company is of "the character of a stable, non-growing enterprise at the end of the period in question." He suggested various approaches to estimating terminal value, including multiples of price-book value and price-earnings, as well as dividend yield.[48]

One question to ask is why we use terminal values at all. At the time these methods were suggested, it was computationally difficult and costly to forecast years into the future and to run simulations of various scenarios.

Today, long-term forecasts are easy and cheap to produce. Note that the goal is not pinpoint accuracy but rather to get a sense of what expectations are priced into a stock. Indeed, some valuation experts have argued it is time to "terminate" the terminal value.[49]

We will provide concrete suggestions for estimating forecast periods and terminal values. Before we get there, we will finish this section with a review of what analysts and companies actually do in their DCF models.

Studies and surveys show that the most common explicit forecast horizon is three years for sell-side analysts, five years for buy-side analysts and corporations, and ten years for investment bankers. The next most common is two years for sell-side analysts, ten years for buy-side analysts and corporations, and five years for investment bankers (exhibit 4). That said, you can find a variety of horizons among each group of professionals.

Exhibit 4: Explicit Forecast Horizons

	Most Common Explicit Forecast Period (Years)	Next Most Common Explicit Forecast Period (Years)
Sell-Side Analysts	3	2
Buy-Side Analysts	5	10
Corporate Executives	5	10
Investment Bankers	10	5

Source: For sell-side analysts, see Paul H. Décaire and John R. Graham, "Valuation Fundamentals," HKU Jockey Club Enterprise Sustainability Global Research Institute Paper*, October 14, 2024. For buy-side analysts and investment bankers, see Lilia Mukhlynina and Kjell G. Nyborg, "The Choice of Valuation Techniques in Practice: Education Versus Profession,"* Critical Finance Review*, Vol. 9, Nos. 1-2, June 2020, 201-265. For corporate executives, see Michael T. Jacobs and Anil Shivdasani, "Do You Know Your Cost of Capital?"* Harvard Business Review*, Vol. 90, No. 7/8, July-August 2012, 118-125.*

Five- and ten-year horizons are particularly popular. This likely reflects dactylonomy, the practice of counting on one's fingers. Buyout firms also tend to use five-year periods, as the average fund life has been around 10 years and the average holding period of an investment in a company has been about 6 years.[50]

The weighted average cost of capital (WACC) combines the opportunity cost of the sources of capital with the relative contribution of those sources based on target weights. Public companies in the U.S. funded their businesses with about 15 percent debt to total capitalization as of the end of 2025.[51]

The cost of debt is relatively straightforward to estimate. The cost of equity is more difficult to assess. Financial economists studied the decisions of mutual fund managers and concluded that they are most consistent with use of the capital asset pricing model (CAPM).[52] This aligns with what professionals in the asset management community report when surveyed.[53]

To estimate the expected return of a stock, the CAPM starts with a risk-free rate and adds the product of the stock's beta (β) times the equity risk premium (ERP). Beta measures a stock's covariance with the overall market, and the ERP equals the difference between the expected return for the market and the risk-free rate.

We have written about estimating the cost of capital and will not dwell on it here.[54] Suffice it to say we believe it is possible to come up with a sensible opportunity cost, which allows one to focus on the cash flows and competitive advantage.

Assumptions for growth, both during the explicit forecast period and in the terminal value, are key. The short-term growth expectations that are in the explicit forecast period closely track recent performance, macroeconomic conditions, and quarterly earnings trends. They tend to be more reactive than long-term expectations.[55]

The Gordon Growth Model is the most common approach to modeling the terminal value.[56] Recall the equation, value = Distributable cash ÷ (cost of capital – long-term growth rate). Both the numerator and denominator are sensitive to assumptions.

The numerator, distributable cash, D, is generally defined as free cash flow (FCF), which is equal to NOPAT minus investment.[57] FCF is the cash the company can pay to debt and equity claimholders.

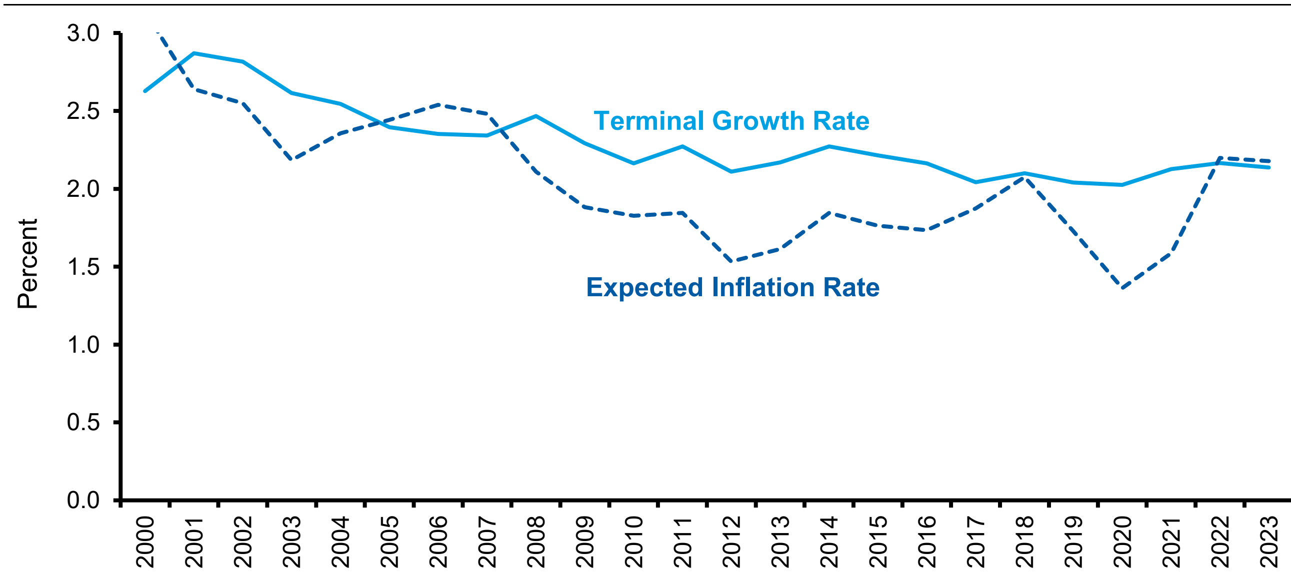
The denominator is the cost of capital (k) minus long-term growth (g). The growth rate, g, assumes cash flows will increase at this constant rate forever. This can be an optimistic assumption for many businesses.[58]

It is easy to change estimates of firm value a lot by tweaking the terminal growth rate. For example, assuming a cost of capital of 7 percent, going from a 3 to a 5 percent growth rate doubles the terminal value. And since the terminal value is often a large percentage of the estimate of firm value, this can increase it by a third or more.[59]

In theory, the assumed growth should be consistent with the rate the company can afford.[60] In practice, research finds that expected inflation provides the most accurate prediction of actual growth.[61]

Exhibit 5 shows the average terminal growth rates that sell-side analysts used (solid line), along with a measure of the expected rate of annual inflation over the next 10 years (dashed line), from 2000 to 2023. Both series drift lower, and the terminal growth rate is consistently higher than the expected inflation rate, averaging 25 basis points over the full period.

Exhibit 5: Terminal Growth and Expected Inflation Rates, 2000-2023



Source: Paul H. Décaire and Marius Guenzel, "What Drives Very Long-Run Cash Flow Growth Expectations?" Working Paper*, April 1, 2025 and Federal Reserve Bank of Cleveland via FRED, Federal Reserve Bank of St. Louis (10-Year Expected Inflation [EXPINF10YR]).*

We now turn to how the literature on competitive strategy can help us assess sustainable value creation before examining what the empirical data on corporate results tell us about the patterns of value creation.

Competitive Strategy Analysis

A brief history. Companies have long pursued strategies they perceived to be in their interest, but for most of that time the approaches were based on metaphors from warfare and were often ad hoc. Professional management was not commonplace. Alfred Chandler, a professor of business history, argued that as late as the 1840s, “owners managed and managers owned.”[62]

This began to change in the mid-1800s with the rise of railroads and later the energy and telecommunications sectors. Managerial sophistication increased, as we saw earlier with the adoption of more advanced financial management. Following World War I, the dispersion of corporate ownership took off and created demand for managers skilled in operations, marketing, and finance.

Professors at Harvard University, most notably Edward H. Chamberlin and Edward S. Mason, who both received their PhD degrees in the 1920s, launched what can be considered modern competitive analysis based on industrial organization economics. Chamberlin’s book, *The Theory of Monopolistic Competition*, published in 1933, described a world between perfect competition and pure monopoly. Mason introduced ideas that contributed to what came to be known as the “Structure–Conduct–Performance” (SCP) model, a foundational framework within industrial organization economics.

The SCP model held that the economic and technical characteristics of an industry (structure) shaped the behavior of the firms in the industry (conduct), which led to their results (performance).

Joe S. Bain, whose advisors in his PhD program included Chamberlin and Mason as well as Joseph Schumpeter, an economist known for his work on innovation, did a great deal to advance the SCP model empirically.[63] Bain’s books, *Barriers to New Competition*, published in 1956, and *Industrial Organization*, published in 1959, revealed his focus on the limits to competition. Part of the motivation for the SCP model was to inform policy, leading to “an adequate degree of competition for good performance.”[64]

George Stigler was a professor at the University of Chicago and a leader of the “Chicago school of economics.” This group of scholars believed in the virtues of markets and competition and thought that government was often the problem rather than the solution.

The Chicago school reckoned that the SCP model had it backwards. Rather than structure leading to performance, they believed that performance led to structure. In other words, successful companies gained market share because of the efficiencies that came from economies of scale. Winners and losers reflected the quality of the competition.

These economists also believed that returns above the cost of capital were fleeting. Any CAPs that existed were ephemeral and destined to shrink over time. Stigler wrote, “There is no more important proposition in economic theory than that, under competition, the rate of return on investment tends toward equality in all industries.”[65] This theory is not borne out in practice. Some companies do, in fact, sustain high ROICs.

While economists focused on the results of companies in the market, other researchers approached strategy from the point of view of corporate planning. Robert Stewart, an interdisciplinary thinker, was hired to run the Theory and Practice of Planning research group at the Stanford Research Institute (now known as SRI International) in the early 1960s.[66]

Stewart and his colleagues studied planning practices among companies in the U.S. and Europe and came up with what they called the "SOFT" approach to help managers. (Safeguard the satisfactory; Open the door to opportunity; Fix current faults; and Thwart threats to operations.) These four considerations showed up in a 2 × 2 matrix with "good" and "bad" in the rows and "existing operations" and "future operations" in the columns.

Around the same time, Edmund Learned, C. Roland Christensen, Kenneth Andrews, and William Guth (LCAG), professors at Harvard Business School, developed a strategy framework that focused on matches between a firm's internal resources and capabilities and external opportunities and risks. They published this work in the book *Business Policy: Text and Cases*.[67]

The LCAG framework eventually led to SWOT Analysis (Strengths, Weaknesses, Opportunities, and Threats), which remains popular today. Parallel to SOFT, SWOT is also presented in a 2 × 2 matrix, with "internal" and "external" origins in the rows and "good" and "bad" in the columns.

In 1944, John von Neumann, a mathematician, and Oskar Morgenstern, an economist, published the *Theory of Games and Economic Behavior.*[68] This book formalized many elements of game theory, the mathematical study of strategic interactions. Game theory is highly relevant for competitive strategy, including actions such as pricing and capacity additions. There is a rich literature in this area, including the role of cooperation and "complementors," companies that sell a good or service that complement the good or service of another firm.[69]

Michael Porter, a professor at Harvard Business School, has likely done more to formalize competitive strategy analysis than any other researcher. Porter took Business Policy, a course taught by Christensen (the "C" of LCAG), while a student at Harvard Business School.[70] He recalls that he "found this guy and this subject so compelling."[71]

He later took a class in industrial organization as part of his PhD program and would take the question of why industries varied in their competitiveness and "turn it on its head" to identify opportunities companies could use to gain a competitive advantage.[72]

Porter developed and popularized widely-used strategy frameworks, including the five forces to analyze industry structure and the value chain to analyze the sequence of activities a firm selects in order to compete. He also introduced generic strategies for competitive advantage. The two that are best known are cost leadership and differentiation.[73]

A company that pursues cost leadership seeks to have the lowest marginal cost in an industry, often achieved through economies of scale. This allows for lower prices than the competition while maintaining profitability. A firm following a differentiation strategy tries to provide goods or services that are sufficiently distinct to command a premium price versus the competition.

Industrial organization economics focused largely on the industry and assumed either that competitors were homogeneous or that differences between companies would be short-lived because resources were mobile.

To address these unrealistic assumptions, professors of strategy developed the resource-based view (RBV) in the 1980s, shifting the focus from the industry to heterogeneous corporate resources and capabilities.[74] Subsequent research on the decomposition of corporate performance suggests the industry factor has become less important, and the corporate factor more important, since 1978.[75]

In the 1990s, Adam Brandenburger and Harborne Stuart, professors of strategy, developed a model of how a firm creates value for itself as well as how it creates value for its customers and suppliers.[76] The model is built on four fundamental concepts: willingness to pay (the price a consumer is willing to pay for a good or service at which they are indifferent between the offering and the cash); price (what the company charges its consumers for its good or service); cost (how much a company has to spend to acquire the inputs to provide an offering); and willingness to sell (the price at which a supplier is indifferent between withholding their product or service and cash).

There is consumer surplus when the price of a good or service is below the willingness to pay. There is supplier surplus when suppliers, most notably employees, receive more for their good or service than their willingness to sell. Value creation for the firm is the difference between its price and cost, including the opportunity cost of capital.

The Brandenburger and Stuart model effectively combines the industrial organization and resource-based approaches to strategy.[77]

Clayton Christensen, who was also a professor at Harvard Business School, developed the theory of "disruptive innovation" to explain how incumbents with sizable resources were unsuccessful in fending off upstarts with relatively modest resources.[78]

Christensen distinguishes between sustaining and disruptive innovation. Incumbents commonly pursue sustaining innovation, which can be meaningful. The key is that it is within a defined business model. Challengers introduce disruptive innovation, often simpler and cheaper offerings that improve over time. The essential insight is that the disruptive technology adopts a different business model.[79]

Disruptive innovation is especially important for CAP because it explains how companies can go quickly from a competitive advantage to none.

Our report, "Measuring the Moat," provides a structured approach to assessing sustainable value creation.[80] We open with a rubric for how to analyze an industry to get a sense of the backdrop for competition. Porter's five forces framework guides this study, and we focus on two forces in particular: the threat of new entrants (and the barriers to entry that thwart them) and rivalry among competitors.

The report then turns to how to analyze a firm. Here, Porter's value chain helps identify which activities a company has chosen to do differently than its peers. Trade-offs are implicit in those differences.

We solidify the concepts with the Brandenburger and Stuart framework to pinpoint how companies create value. We conclude with a review of pricing decisions, the impact of government action, and how to think about brands.

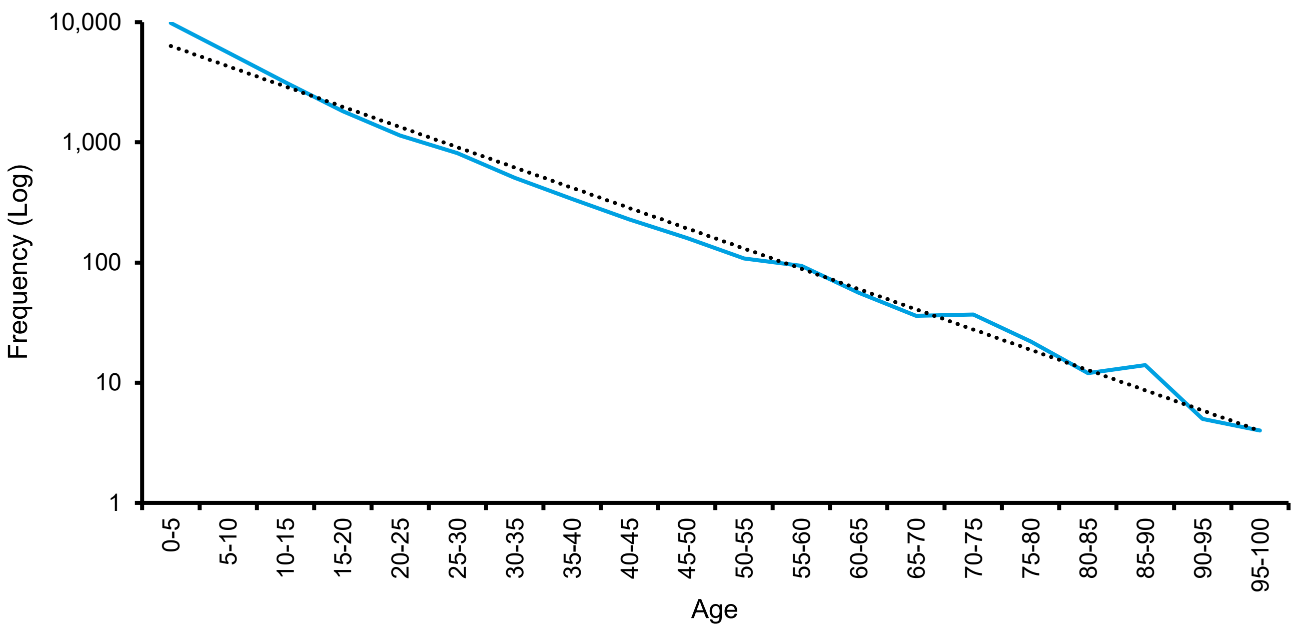
Competitive strategy analysis is crucial because it provides a way to assess the magnitude and sustainability of excess returns. We now turn to empirical observations about how companies live, die, and perform.

Empirical Observations

Corporate longevity. The most popular method to estimate the terminal value assumes that a company can grow at a constant rate forever. This prompts the question of how long public companies live. For the purpose of this analysis, a company is "born" when it is listed as a public company and "dies" when it is delisted.

Exhibit 6 shows the longevity of nearly 24,000 companies that were public in the U.S. from 1926 to 2025. These data come from Hendrik Bessembinder, a professor of finance at Arizona State University. The horizontal axis reflects age at death, and the vertical axis is frequency. The vertical axis is on a logarithmic scale, which means that the percentage change between tick marks is the same.

Exhibit 6: Longevity of Companies, 1926-2025



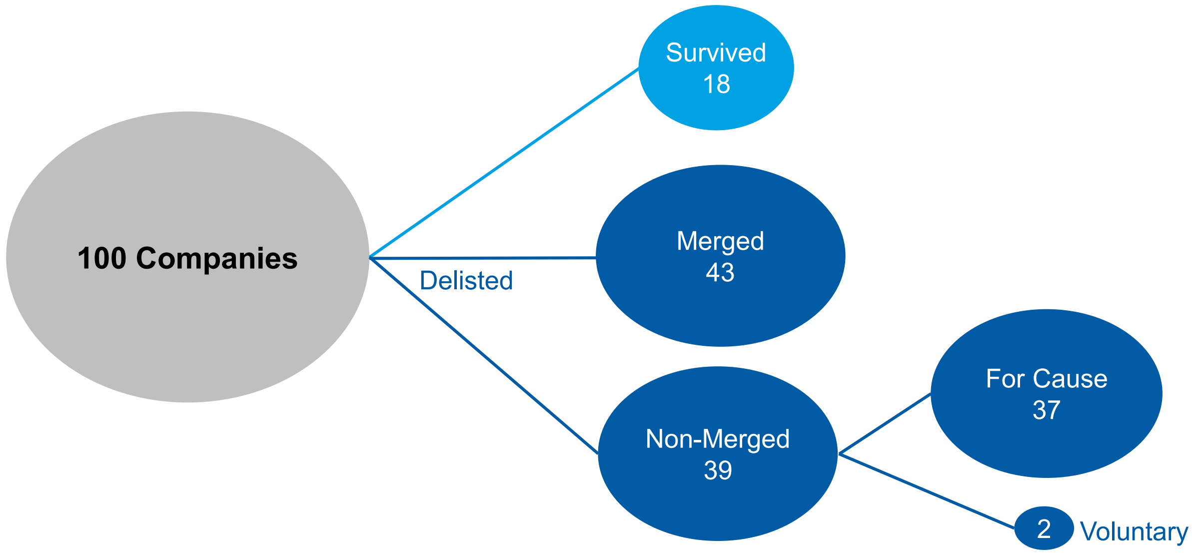
Source: Hendrik Bessembinder and Counterpoint Global.
Note: Initial listing date unknown for the 430 delisted companies with a starting date of January 1926.

The data closely fit an exponential function, where a constant change in age, the independent variable, has the same percentage change in the frequency, the dependent variable. A similar function appears in biological systems, suggesting commonality between adaptive systems that face competition.[81]

From 1926 to 2025, the average listing time for a public company in Bessembinder's database was 11.7 years, and the median listing time was 6.8 years.[82] About 9 percent of listed companies at the beginning of 2026 were more than 50 years old. Modeling perpetual growth without considering mortality can create a mismatch.

Exhibit 7 shows what happened to about 13,800 U.S. public firms that started trading between 1976 and 2019, excluding financial firms.[83] For every 100 companies, 18 survived and 82 died. Of those that died, 43 were the result of mergers and acquisitions (M&A). The other 39 were delisted for reasons other than M&A, with the majority of those for "cause." This happens when a company files for bankruptcy or fails to meet certain requirements set by an exchange.

Exhibit 7: Survival Rates for U.S. Public Companies, 1976-2019



Source: Counterpoint Global and Sanjeev Bhojraj, Ashish Ochani, and Shiva Rajgopal, "Firms' Stock Prices, Stock Returns, and Remaining Lifetime Earnings," Management Science*, forthcoming.*

For surviving companies, modeling value with an explicit forecast period and terminal value is relevant. For companies that are acquired, the buyer takes on the problem of assessing value and has to offer the target's shareholders a sufficient price to sell. Delisted companies are often economic failures.

Three professors of accounting, Sanjeev Bhojraj, Ashish Ochani, and Shiva Rajgopal, calculated the present value of future earnings for those companies and compared it to the stock price at which the company first came public. They called the ratio "remaining lifetime earnings to price," or RLTEP.[84]

They find that about 70 percent of all companies had an RLTEP of less than one, which means they failed to produce earnings sufficient to justify the initial stock price. But nearly 95 percent of companies that delisted had an RLTEP below one, whereas a modest majority of merged companies had an RLTEP above one.

More bluntly, the actual earnings that 70 percent of the companies produced were less than the market's DCF value of their stocks on the day they started trading. This excessive optimism for the many is offset by excessive pessimism for the few: 0.7 percent of the more than 29,000 listed companies in the U.S. from 1926 to 2025 created more than 75 percent of the aggregate wealth of $91 trillion, measured as the wealth attained from investing in shares relative to Treasury bills.[85]

Our bet is that the next 50 years will look different than the last 50 because the composition of public companies has changed. The number of public companies rose from about 4,800 in 1976 to 7,300 in 1996 before retreating to roughly 3,500 at the beginning of 2026.[86]

The main culprit is the decline in the number of initial public offerings (IPOs), which averaged 282 from 1976 to 2000 but dropped to 118 from 2001 to 2025. Births are down and deaths have maintained a relatively higher level. This leads to a shrinking population.

Nearly three-quarters of the 3,800 stocks that vanished from 1996 to 2025 had micro market capitalizations, defined as companies that make up the bottom two percent of the aggregate value of the U.S. stock market.

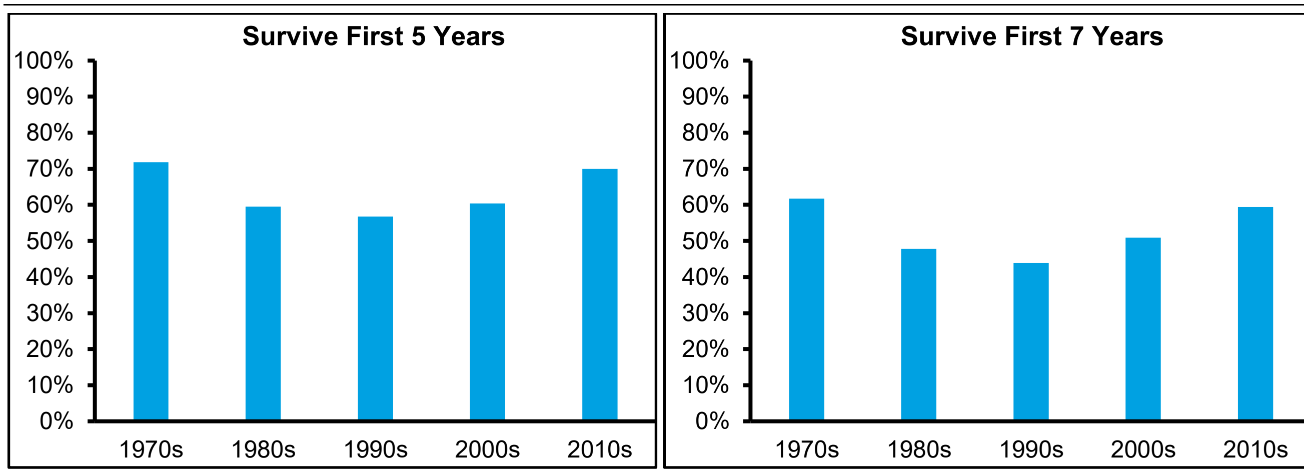
These companies do not have much of an impact on the overall market or major stock market indexes, which are generally weighted by market capitalization.

As a result of the departure of these small companies, the average size and age of U.S. public companies have increased. The mean market capitalization for companies in the S&P 500 went from $24 billion in 1996 to $121 billion in 2025 (in 2025 dollars). The median market capitalization rose from $11 billion to $39 billion over the same period. We estimate the average age of a listed company went from 12 years in 1996 to about 18 years in 2025.

The increase in the average size and age of companies suggests the rate of delisting for cause and M&A may go down. Since 1970, annual U.S. M&A volume has averaged 6.3 percent of equity market capitalization. But that percentage has been drifting lower consistently for most of this century and was 3.4 percent in 2025, despite a very strong year for M&A.

There have been studies based on index turnover that suggest corporate longevity has shortened over time.[87] Exhibit 8 shows the percentage of companies that survived 5 years (left side) and 7 years (right side) following their IPOs in each decade from the 1970s through the 2010s. The survival rates in fact declined from the 1970s through the 1990s but rebounded in the 2000s and 2010s. The longevity of public companies is the longest it has been since the 1970s.

Exhibit 8: Percentage of Companies That Survive 5 and 7 Years by Decade, 1970s-2010s



Source: Hendrik Bessembinder and Counterpoint Global.
Note: Companies are grouped into decades based on their date of listing; Through 2025.

Part of the explanation for the rising rate of survival is that companies today are coming public at an older age than in prior IPOs. For instance, the average age of a company that went public from 1976 to 2000 was 8.1 years. From 2001 to 2025, that figure was 11.3 years.

The average market capitalization of companies after coming public is substantially larger today than it was in the past. For instance, the average market capitalization of companies after their IPO was $338 million in 1980 (measured in 2025 dollars) and $4.9 billion in 2025. Median figures tell a similar story.[88]

The rise in age and size is the result of the higher costs of going public and increased availability of capital in private markets. Companies can today access private capital both for growth and liquidity, allowing them to go public later than companies did a generation or two ago. Scholars weighed the costs and benefits of going public and concluded that the propensity to go public today is roughly one-half of what it was in the mid-1990s.[89]

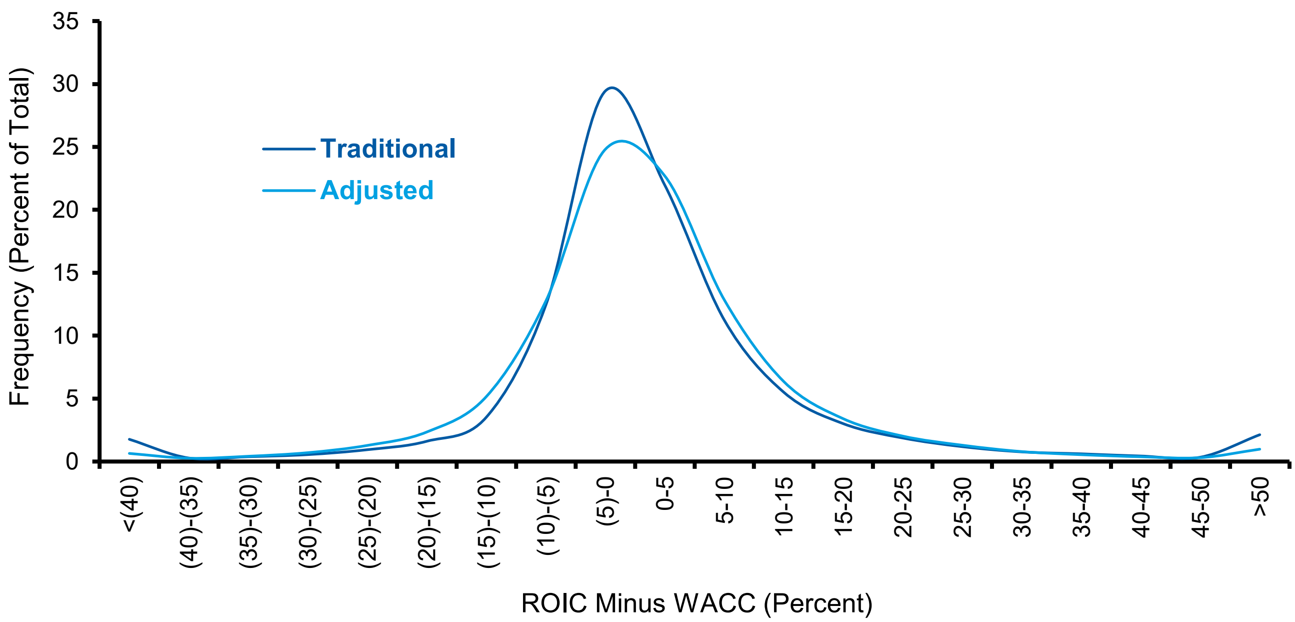
Distribution of ROICs. We want to understand the patterns of ROICs because the spread between ROIC and WACC, both in magnitude and sustainability, is the quantitative way to measure competitive advantage. Data to investigate include the distribution of ROIC for all companies and patterns of regression toward the mean.

Exhibit 9 shows the distribution of the spread between ROIC and WACC for all U.S. public companies, excluding financials, from 1970 to 2024. The exhibit reflects spreads with both traditional ROIC and ROIC adjusted for internally-generated intangible assets.

For the full period, the average spread using traditional ROIC was -0.8 percentage points, and the companies at the 25th and 75th percentiles were -4.3 percentage points and 5.7 percentage points, respectively. Using adjusted ROIC, the average spread was 1.9 percentage points, the company at the 25th percentile was -4.7 percentage points, and the company at the 75th percentile was 6.2 percentage points.

The average annual aggregate adjusted ROIC from 1970 to 2024 was 9.2 percent, and about one-half of firm-year observations showed an ROIC above the cost of capital.

Exhibit 9: Distribution of ROICs, 1970-2024



Source: Counterpoint Global, Compustat, and FactSet.
Note: Includes companies with minimum sales of $250 million in 2024 USD.

Regression toward the mean. Regression toward the mean is the idea that observations that are far from the average will be followed by observations with an expected value closer to the average. Rapid rates of regression are associated with shorter CAPs, and slow rates of regression indicate longer CAPs.

The correlation coefficient, *r*, a measure of the linear relationship between two variables, is one way to measure the rate of regression toward the mean. In this case, the two variables are ROIC today and ROIC at some point in the future. The mean is either the cost of capital or the average ROIC for a sector or industry.

There is no regression toward the mean if *r* is 1.0. The best estimate of ROIC in the future is ROIC today. There is complete regression if *r* is zero. The most reliable estimate of ROIC in the future is the average ROIC for the sector or industry.

Correlation coefficients of 1.0 are rare because they reflect deterministic systems. The correlation between the S&P 500 and the SPDR S&P 500 ETF Trust, an exchange-traded fund that tracks the S&P 500, is essentially 1.0.

One analysis of the heights of fathers and sons found an *r* of 0.50.[90] If the father is 74 inches tall and the average height of all adult men is 70 inches, then the expected value of the son's height is 72 inches. (Expected value of son's height = 0.50 [father's height – average height] + average height.)

The correlation of the total returns for the S&P 500, or a proxy, from one year to the next, from 1928 to 2025, is zero. The best estimate of the market's return in any given year is simply the arithmetic average of the annual returns over the whole period.

We can integrate *r* into a simple formula to estimate the rate of regression, or fade rate:[91]

Expected ROIC = *r*(current ROIC – average ROIC) + average ROIC

In this case, *r* is a measure of how persistent differences from the average are likely to be.

Exhibit 10 shows the correlation coefficients by sector (excluding financials) for U.S. public companies over one- and five-year measurement periods from 1970 to 2024. It also includes the aggregate ROIC (sum of all NOPAT divided by all invested capital) and median ROIC by sector. We rank the sectors based on five-year correlations. The results of the same analyses by industry group are in appendix A.

Exhibit 10: Regression toward the Mean in ROIC by Sector, 1970-2024

	How Much Regression?		Toward What Mean?	
	Correlation Coefficient		Aggregate	Median
Sector	**1-Yr**	**5-Yr**	**(%)**	**(%)**
Consumer Staples	0.79	0.59	12.7	10.1
Health Care	0.72	0.37	14.6	10.5
Consumer Discretionary	0.72	0.37	8.5	9.0
Information Technology	0.69	0.33	19.0	10.8
Materials	0.70	0.31	8.2	8.4
Industrials	0.68	0.31	8.4	9.3
Communication Services	0.65	0.28	8.5	6.8
Energy	0.62	0.18	8.3	7.1
Utilities	0.49	0.16	5.6	6.0

Source: Counterpoint Global, Compustat, and FactSet.
Note: Includes companies with minimum sales of $250 million in 2024 USD; Correlations reflect winsorization at the 2nd and 98th percentiles.

A few points are worth highlighting. First, the ranking appears reasonable to most business analysts. It makes sense that firms in the consumer staples sector have more stable ROICs than those in the energy sector. Many staples companies offer differentiated brands, while energy companies deal with commodities.

Second, note that sectors have different ROICs. The aggregate ROIC tends to represent the results of larger companies because they contribute disproportionately to the total whereas the median considers all companies equally and removes the impact of outliers. (See appendix B for historical trends by sector.)

Finally, the formula for estimating the expected ROIC is based on an autoregressive process. This statistical model allows you to anticipate future values based on a linear extrapolation of the current value.

However, the regression results for five years do not follow from those of one year for any of the sectors. Were it a simple process, you would expect the five-year correlation to equal the one-year correlation raised to the fifth power ([1-year r]^5 = 5-yr r).

Take the consumer discretionary sector as an example: a basic model would suggest a 5-year r of 0.19 (0.72^5 = 0.19) whereas the observed 5-year r is 0.37. The one-year correlations overstate the fade rate.

One interpretation is that the results combine a component of noise and sector returns. The one-year correlations include a lot of noise, but the five-year correlations are a better reflection of the sector characteristics.

Our practical recommendation is to use the five-year correlations as a basis for the fade rate, which equals 1 minus the implied annual persistence factor. You can tailor your analysis by sector or industry (appendix A).

A fade rate of zero suggests that current ROICs will persist. A fade rate of 1.0 means that results will revert to the average in the next period. A fade rate of 0.20 says that 80 percent of differential returns will persist from one period to the next.

Exhibit 11 shows the implied persistence factor and fade rate by sector. The average persistence factor is 0.79, and the range is from 0.70 to 0.90. These imply fade rates of 0.10 to 0.30, with an average of 0.21. These figures will be central to establishing a terminal value.

Exhibit 11: Implied Fade Rate in ROIC by Sector, 1970-2024

Sector	Empirical 5-Year Correlations	Implied Persistence Based on 5-Year Correlations	Implied Fade Rate Based on 5-Year Correlations
Consumer Staples	0.59	0.90	0.10
Health Care	0.37	0.82	0.18
Consumer Discretionary	0.37	0.82	0.18
Information Technology	0.33	0.80	0.20
Materials	0.31	0.79	0.21
Industrials	0.31	0.79	0.21
Communication Services	0.28	0.78	0.22
Energy	0.18	0.71	0.29
Utilities	0.16	0.70	0.30
Average		**0.79**	**0.21**

Source: Counterpoint Global, Compustat, and FactSet.
Note: Includes companies with minimum sales of $250 million in 2024 USD; Correlations reflect winsorization at the 2nd and 98th percentiles.

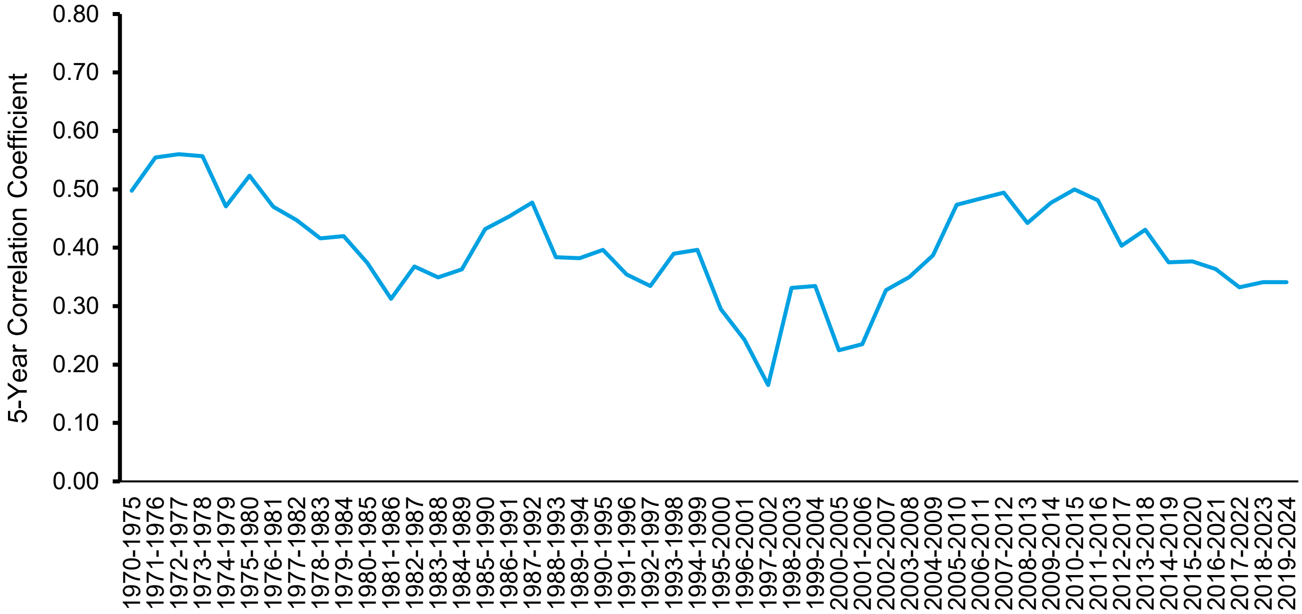
Some Companies Have Long CAPs. ROICs regress toward the mean as the result of competition, changing market conditions, and luck. But there is a substantial body of research that shows some companies produce high ROICs for sustained periods, often measured in decades.[92]

This reality highlights the fact that a simple valuation model, such as a price-earnings multiple, will fail to capture explicitly the essential features of a business. And it underscores the importance of competitive strategy analysis. A grasp of the sources of a competitive advantage is critical to assessing the sustainability of excess returns.

Some research has focused on how the persistence of ROIC, essentially the fade rate, has changed over time. The broad picture suggests that persistence dropped from 1950 through the end of the century, meaning that competition increased during that time.[93] But there is evidence that it reversed in the 21st century and that persistence has bounced off of its lows.[94]

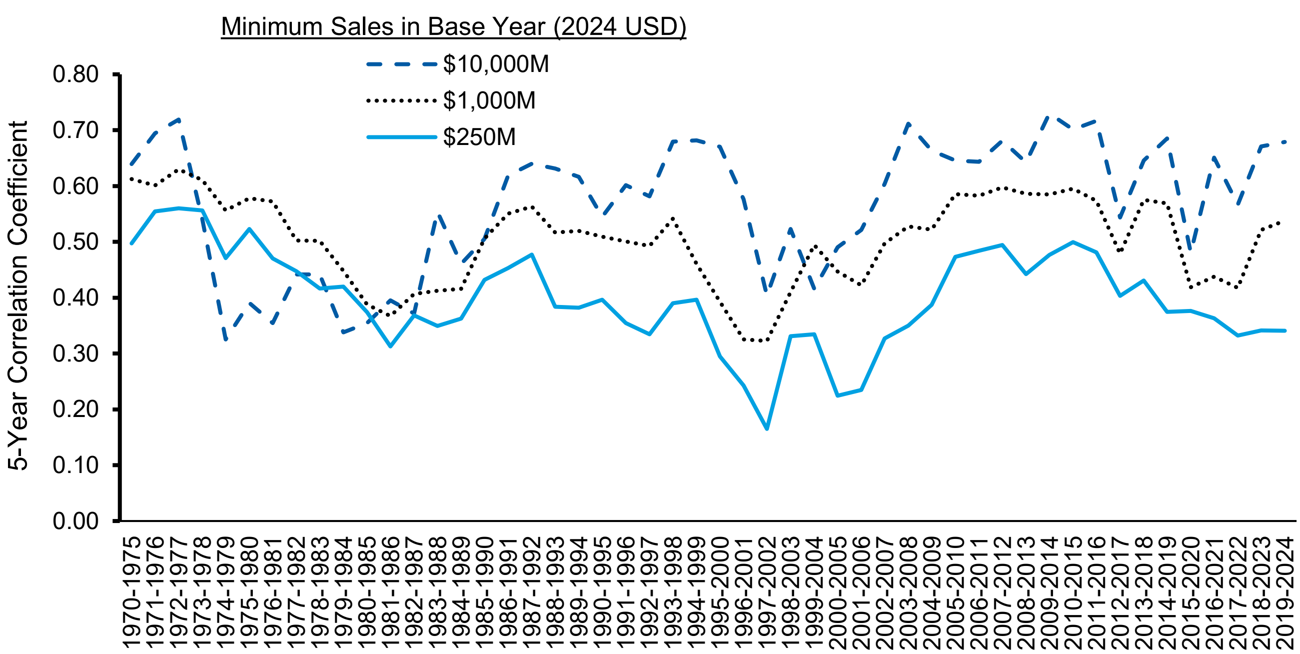
Exhibit 12 shows our analysis. Five-year correlation coefficients went from 0.45 in the 1970s, to 0.39 in the 1980s, to 0.31 in the 1990s. The coefficient then rebounded to 0.38 in the 2000s and 0.37 in the 2010s. Note that this analysis treats all companies the same but that large companies have consistently had higher persistence than smaller ones since the mid-1980s (exhibit 13).

Exhibit 12: Persistence in ROIC as Measured by 5-Year Correlation Coefficients, 1970-2024



Source: Counterpoint Global, Compustat, and FactSet.
Note: Includes companies with minimum sales of $250 million in 2024 USD; Correlations reflect winsorization at the 2nd and 98th percentiles.

Exhibit 13: Persistence in ROIC by Company Revenue, 1970-2025



Source: Counterpoint Global, Compustat, and FactSet.
Note: Correlations reflect winsorization at the 2nd and 98th percentiles.

There are a few plausible explanations for this rebound. To begin, the rate of entry has declined. Research by Germán Gutiérrez and Thomas Philippon, professors of finance, shows that industries with high ROIC enticed entrants from the mid-1970s through about the year 2000. Since then, however, the positive correlation between high returns and entry has dissipated.

The scholars conclude that neither economies of scale for the incumbents nor higher entry costs explain this decline in entry, but that the main reason is the rise of regulation.[95] In particular, the increase has been in public choice regulation, which primarily benefits incumbents, rather than public interest regulation, which seeks to protect consumers and reduce negative externalities.

The combination of regulation and substantial investments in intangible assets by big firms has created substantial fixed costs that have increased barriers to entry and lowered the growth of small firms.

Consistent with these entry data, mobility for public companies has declined. From 1980 to 2000, 15-20 percent of small public companies, defined as the bottom 30 percent of market capitalization, became medium or large companies. Since 2000, that figure has been one-half of the prior period. Over the same two periods, the percentage of large companies, the top 30 percent of market capitalization, that remained large went from 75-80 percent to closer to 90 percent.[96]

Finally, there has been a rise of what academics call “superstar” firms.[97] The case is “that industries are increasingly characterized by a ‘winner takes most’ feature where a small number of firms gain a large share of the market.”[98]

James Bessen, an economist, points to some developments that allow superstar firms to differentiate themselves from their peers to sustain a competitive advantage.[99] First, these companies invest heavily in proprietary software that allows them to both capture economies of scale and provide differentiated offerings. This has allowed them to gain from two of Porter’s most important generic strategies for competitive advantage.

Further, diffusion of technology is slower today than in prior generations because of the complexity of proprietary software and the absence of incentives to share. As a result, competitors struggle to close the productivity gap with the leader, and the minimum efficient scale, the level of output at which a firm reaches its long-term average cost, for potential challengers to be competitive is on the rise.[100]

A roundup of the empirical analysis includes the fact that about one-half of U.S. public companies have a positive spread between their ROIC and WACC in all of the firm years from 1970 to 2024, that we can estimate the rate of regression toward the mean by measuring persistence, and that some companies have produced high and sustainable spreads between ROIC and WACC (indicating long CAPs).

The data also suggest that persistence in ROIC is up since 2000 and that large companies are the main beneficiaries of the implied expansion in CAPs.

To illustrate the point, the aggregate ROIC for the information technology sector was 19.0 percent versus the median of 10.8 percent from 1970 to 2024 (exhibit 10). As striking, the aggregate ROIC for the sector has been greater on average than the ROIC for the 75th-percentile company (i.e., the ROIC below which 75 percent of data fall), since the Great Recession. This means a small number of large companies are determining the aggregate figure for the sector.

The Basis for Sustainable Value Creation. It is interesting to ask whether the firms that delivered high and sustained ROICs pursued a strategy of cost leadership or differentiation. While both strategies led to enduring results that are attractive, academic work suggests that a differentiation approach is more common.[101]

We can use basic financial statement analysis to connect NOPAT margins and capital velocity to generic strategies. Recall that ROIC equals NOPAT divided by invested capital. We can further analyze ROIC by breaking down the terms as NOPAT/Sales (NOPAT margin) times Sales/Invested Capital (invested capital turnover). When you multiply these terms, the sales cancel out and you are left with NOPAT/Invested Capital.

This decomposition lets us see how a company achieves its ROIC. Broadly, there are two approaches: low margins and high invested capital turnover (cost leadership) and high margins and low invested capital turnover (differentiation).

We screened our universe to find those companies that had ROICs in the top quintile for ten straight years over the span of 1970 to 2024. This produced 2,790 occurrences (some companies appeared multiple times). We then looked at whether high NOPAT margin, or high invested capital turnover, set apart the firms from the population overall.

In fact, the companies are above the average in both determinants of ROIC. But the contribution of NOPAT margin was substantially more important than invested capital turnover. For example, the median NOPAT margin for the stars was 2.8 times the median of the universe, whereas the median invested capital turnover was 1.4 times. This squares with the prior research on sustainable excess returns.[102]

Life Cycle and Competitive Advantage Period

Knowing where a company is in its life cycle is essential to a thoughtful approach to valuation. The challenge is that most discussions of the life cycle are either descriptive or based on proxies such as age that are ill-suited to capture the connection to valuation.[103]

We now turn to an approach to placing companies in the proper stage within the life cycle. One essential takeaway from this discussion is that the discounted cash flow model, including CAP, is the proper way to value most companies. But we believe that other tools are more appropriate for assessing value at certain stages.

The corporate life cycle depicts the stages of a company's existence, from introduction to growth to maturity to ultimate decline. Valuation for a company that is expanding rapidly with uncertain prospects is very different than that for an established company serving a mature and saturated market.

The classic picture of a company's ROIC through its life cycle appears as an inverted "U" (∩), as depicted in exhibit 1. When a company is young, the spread between ROIC and WACC is often negative as the company invests to create a good or service that the market will demand and its costs are greater than its revenues. As the company grows and matures, the spread becomes positive and ultimately peaks. Later, market saturation and competition lead to a declining spread until the firm's ROIC drops to a level equal to or below the WACC.

Our analysis of life cycle started naively with an assessment of the relationship between corporate age and ROIC. Assuming that birth occurs when a company does an IPO, we examined the spread between ROIC and WACC for companies that had an initial public offering from 1990 to 2022. Rather than the classic picture, we found that the spread was wide at the date of the IPO and then narrowed before stabilizing around year five.[104]

Victoria Dickinson, a professor of accounting at the University of Mississippi, combines two sets of ideas to do robust analysis of the life cycle.[105] First, she leverages the life cycle framework of the economists Michael Gort and Steven Klepper. Grounded in substantial empirical work, Gort and Klepper identified five stages of the life cycle that have become known as: introduction, growth, maturity, shake-out, and decline.[106]

Dickinson makes this classification both practical and rigorous by linking each stage to results from the statement of cash flows. The statement of cash flows has three parts: cash flow from operating activities, cash flow from investing activities, and cash flow from financing activities. The net inflow or outflow of these categories explains the change in a company's cash and cash equivalents from a prior period to the end of the reporting period.

Her important insight is that the results from each part of the statement of cash flows, when combined, indicate where a company is within its life cycle. Cash flow from operating activities reflects profitability by capturing the cash in and out from customer activity. Cash flow from investing activities shows the magnitude of the company's investment in pursuit of growth. Cash flow from financing activities reconciles the difference between the cash flows associated with operations and investments.

Young companies commonly invest more than they earn, which means financing activities are dedicated to raising capital. Mature companies earn more than they invest, and financing activities normally include returning capital to claimholders in the form of dividends, share buybacks, and debt retirement.

Each part of the statement can either be an inflow (cash coming into the firm) or an outflow (cash going out of the firm). There are two possible outcomes in each section and three sections, which means there are eight potential combinations (2^3). Her framework folds the eight possibilities into the five stages. Here is a brief discussion of the stages and how the inflows or outflows on the statement of cash flows help identify them:

- **Introduction.** A company in this stage seeks to introduce a good or service it hopes will be commercially viable. For promising industries, lots of competitors tend to enter at the same time. How long a company stays in this stage is often related to the rate of diffusion for the technology. Cash flow from operations is an outflow, as the company must absorb pre-production costs and is below efficient economies of scale. Cash flow from investing is also an outflow because there are substantial investment needs. Cash flow from financing is an inflow as the company must raise capital to fund its expansion.
- **Growth.** In this stage, the market has accepted the company's good or service, yet the threat of new entrants continues. Cash flow from operations is an inflow, as the company reaches profitability. Cash flow from investing remains an outflow because the company continues to invest to sustain growth and deter entry. Cash flow from financing is also an inflow, albeit to a lesser degree than in the introduction stage, as the company still needs capital to support growth.
- **Maturity.** Here the company reaches scale, and entry and exit in the industry are in rough balance. Cash flow from operations is an inflow as the company maximizes profits. Cash flow from investing is an outflow, although spending is closer to maintenance levels. Cash flow from financing flips to an outflow, as the company has the resources to pay shareholders through dividends or share buybacks and is in a position to retire debt.
- **Shake-Out.** In this stage, the industry contracts and firms exit. It reflects three of the eight possible combinations for cash flows and is a catchall for a company that does not fall squarely in another stage. Cash flow from operations may be an inflow or outflow and is an inflow in two of the three combinations. Cash flow from investing can also be an inflow or an outflow, with the same ratio. Cash flow from financing is also split between an inflow and outflow, with two of the three combinations being outflows.

- **Decline.** A company in this stage is in decline, either because of market saturation or product obsolescence. Cash flow from operations is an outflow as profitability is elusive. Cash flow from investing is an inflow as the company disinvests. Cash flow from financing can be either an inflow or outflow depending on profitability and proceeds from asset liquidation.

We argue that the statement of cash flows has become increasingly misleading in recent years. As a result, we make three adjustments to the statement to better reflect the economics of businesses.[107] We believe these changes are aligned with life cycle theory.

The first moves stock-based compensation (SBC) to cash flow from financing from cash flow from operations. The rationale is that SBC is in effect one figure that captures both financing and compensation: a company issues shares (financing) and uses the proceeds to remunerate employees (compensation).[108] Consistent with the income statement, SBC is treated as an expense and therefore lowers reported cash flow from operations.

The second moves internally-generated intangible investment, net of amortization, to cash flow from investing from cash flow from operations. An investment is an outlay today that is expected to generate future cash flows. Intangible assets, such as advertising and software, are not physical, and companies expense them on the income statement. As a result, cash flow from investing and operations are both understated.

We estimate that internally-generated intangible investment was $2.2 trillion for U.S. public companies in 2025, and $400 billion net of amortization. Developing methods to estimate the magnitude of intangible investment and the requisite amortization (which requires an estimate of asset lives) is an active area of research in finance and accounting.[109]

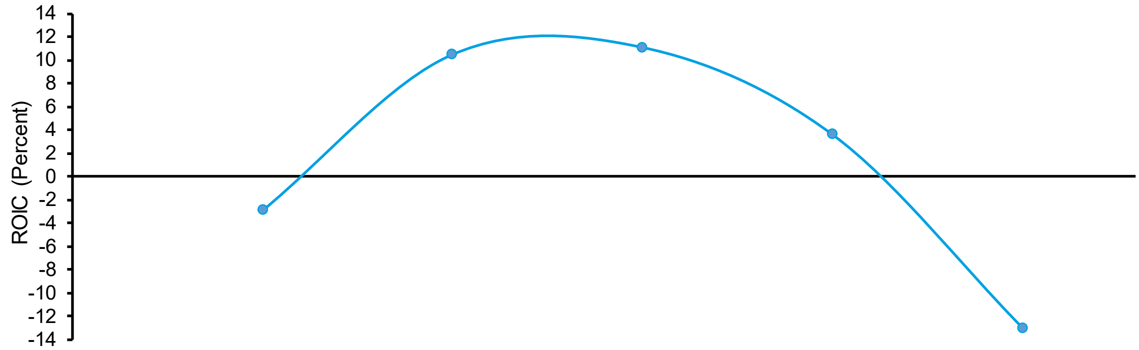
The last adjustment is removing the purchases and sales of marketable securities from cash flow from investing. We want to feature investments in the operations rather than changes in the holdings of liquid securities.

Exhibit 14 summarizes the results for U.S. public companies, excluding financials, from 1971 to 2024. Dickinson's mapping of the cash flow combinations to the stages is in the bottom rows. The pattern of a rising and falling ROIC is clear in the exhibit.

This analysis reveals a handful of useful insights. The first is that approximately 68 percent of the full sample are in the growth or maturity stage. Valuation using a DCF model that integrates CAP is relevant for this population. Another 26 percent are in the introduction (9 percent) and decline (17 percent) stages. Other approaches, including the application of real options theory, may be more useful than a standard DCF for these companies. More on this in a moment.

Some sectors are noticeably over- or underweighted by stage (bottom panel of exhibit 15). We measure this as the weight of the sector in the stage relative to its weight in the full sample. For example, health care is substantially overweight in the introduction and decline stages as well as underweight in the maturity stage. Information technology is underweight in the introduction stage but overweight in decline. And industrials are underweight in introduction and overweight in maturity.

Exhibit 14: Summary of Results for Life Cycle Stages, 1971-2024

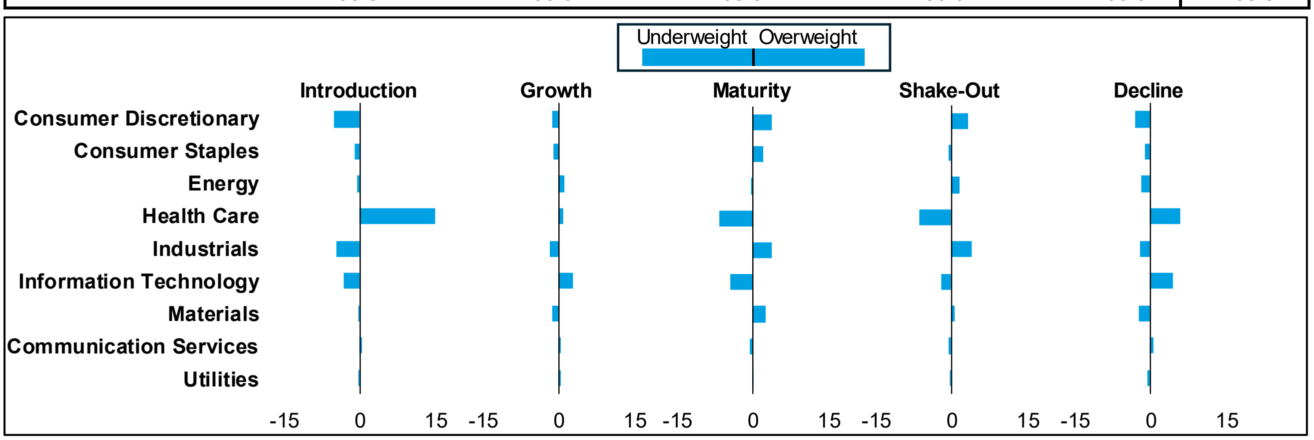


	Life Cycle Stage							
	Introduction	Growth	Maturity	Shake-Out			Decline	
Statistic								
ROIC (%)	-2.9	10.5	11.1	3.6			-13.0	
Percent of sample	8.7	36.4	31.8	6.2			16.9	
Age since founding (years)	14	17	37	30			17	
Median sales $2024 MM	10	172	653	240			15	
Average sales $2024 MM	472	1,788	5,149	2,696			565	
Sales growth (%)	9.0	11.2	6.8	4.0			2.4	
Cash Flow Type								
Operations	Outflow -	Inflow +	Inflow +	Inflow +	Inflow +	Outflow	Outflow -	Outflow -
Investing	Outflow -	Outflow -	Outflow -	Inflow +	Inflow +	Outflow	Inflow +	Inflow +
Financing	Inflow +	Inflow +	Outflow -	Inflow +	Outflow -	Outflow	Inflow +	Outflow -

Source: FactSet and Counterpoint Global.
Note: U.S. companies excluding financials; Aggregate ROIC; Median age; Sales growth: next 3-years, nominal, annualized.

Exhibit 15: Sector Weights by Life Cycle Stage and for Full Sample, 1971-2024

	Sector Weight					Full
Sector	**Introduction**	**Growth**	**Maturity**	**Shake-Out**	**Decline**	**Sample**
Consumer Discretionary	14.3%	18.2%	23.2%	22.7%	16.4%	19.4%
Consumer Staples	5.1%	5.2%	8.4%	5.8%	5.3%	6.3%
Energy	5.7%	7.4%	6.0%	7.9%	4.7%	6.4%
Health Care	30.7%	16.5%	9.0%	9.4%	21.6%	15.7%
Industrials	16.2%	19.0%	24.5%	24.9%	18.7%	20.8%
Information Technology	15.8%	21.8%	14.6%	16.9%	23.6%	19.0%
Materials	7.4%	6.2%	10.0%	8.0%	5.1%	7.5%
Communication Services	3.7%	3.7%	2.8%	2.9%	4.0%	3.4%
Utilities	1.0%	1.9%	1.5%	1.4%	0.8%	1.5%
	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%



Source: FactSet and Counterpoint Global.

Third, both the age and size of companies generally rise from introduction to maturity, where they peak, and then fall in the shake-out and decline stages. But vital to this framework is that companies can change stages based on their economic opportunities.

Scholars of competitive strategy underscore that corporate outcomes reflect, in part, the differences in capabilities and resources between companies.[110] Dynamic capability, defined as "the capacity of an organization to purposefully create, extend, or modify its resource base," explains how firms can migrate to an earlier stage from a later one.[111]

Exhibit 16 shows the three-year transition rates for our sample, which reflects results from 1971 to 2024. The rows show the beginning stage and the columns show the ending stage three years later.

Exhibit 16: Three-Year Transition Rates in Life Cycle Stages, 1971-2024

	Ending Stage				
Beginning Stage	**Introduction**	**Growth**	**Maturity**	**Shake-Out**	**Decline**
Introduction	**22%**	29%	12%	5%	32%
Growth	7%	**40%**	29%	6%	17%
Maturity	3%	27%	**54%**	8%	9%
Shake-Out	6%	25%	42%	**13%**	15%
Decline	14%	29%	19%	6%	**32%**

Source: FactSet and Counterpoint Global.

A majority of the companies in the maturity stage stay put three years later. But there is plenty of mobility. For instance, 29 percent of the companies that start in the introduction stage end up in the growth stage, and the same percentage of companies migrate from decline to growth.

Valuation approach by stage. The visibility, predictability, and growth of cash flows vary by stage. This creates different challenges when valuing companies in the various stages. Research shows that the value of companies in the growth and maturity stages, the bulk of companies, relies on forecasts for sales and profits.[112] This is the domain of the DCF model. But assessing value for the introduction and decline stages requires some additional tools.

The first critical concept in valuing companies in the introduction stage is an intense focus on the basic unit of analysis, or how a company makes money. For instance, for a brick-and-mortar retailer it would be the estimated return on investment from building a new store. For a subscription business, it is customer lifetime value, which is the estimated cash flows a customer will generate over his or her lifetime minus the cost to acquire the customer.

Short-term losses and negative free cash flow are not only acceptable, but generally desirable, when the basic unit of analysis indicates a company's investments create value.

Getting a sense of the total addressable market (TAM) is also important. We define TAM as a company's potential sales assuming it had 100 percent share of a market it could serve while creating shareholder value. TAM is not about size per se but rather how much growth a firm can achieve while adding value.

Analysis of TAM commonly starts with population, product, and conversion. Population measures the potential buyers of a good or service. Product assesses a company's offering versus those of competitors. Conversion considers what percentage of the buyers will select a particular company's offering. Considering relevant base rates can serve as a reality check for optimistic estimates for projected TAM.[113]

Companies in the introduction stage need to raise capital to sustain their operations, so having a CEO who tells a good story to stakeholders, including employees, customers, and capital providers, is often crucial.[114] This skill becomes less important as the business establishes itself in the market.

Finally, you can often think of companies in the introduction stage as a bundle of real options. A real option gives management the right, but not the obligation, to make non-financial, or real, investments in the business. The value of these options is difficult to capture using a discounted cash flow model that is based on current operations.[115] Biotechnology companies, many of which are in the introduction stage, are a good example of where options theory makes sense.[116]

Real options analysis may be useful for companies that compete in industries with high uncertainty, have management teams with a history of cultivating and exercising options, and are market leaders.

Valuing companies in the decline stage requires somewhat different tools. Academics describe the value of a firm as coming from continuing operations as well as "adaptation value," which exists when managers can adapt firm resources to alternative uses.[117] For example, firms in this stage often have abandonment options, which confer the right but not the obligation to discontinue unprofitable projects or investments, that are valuable.[118]

Companies in the decline stage generate most of their cash from disinvestment, whereby they extract the remaining capital from the business.[119] We can model this with the Gordon Growth Model.

In this model, the numerator is distributable cash, and the denominator is still the cost of capital minus the long-term growth rate. For businesses in decline, growth is negative. That means that distributable cash is divided by a higher number (subtracting a negative number is equivalent to adding its positive counterpart). This lowers the value. For example, the appropriate multiple is 7.7 times assuming that the cost of capital is 7 percent and growth is −6 percent (1/[.07 + .06] = 7.7).

Researchers examined the total shareholder returns based on the stage of life cycle. Exhibit 17 shows that a value-weighted portfolio of stocks of the companies in the maturity stage provided the highest excess returns over Treasury bills and returns adjusted for volatility from 1990 to 2024.[120] Stocks of companies in the introduction stage had the lowest excess returns and the second highest volatility. In many ways, these companies behave similarly to those in a venture capital portfolio. Stocks of companies in the decline stage had good excess returns but the highest volatility.

Exhibit 17: Value-Weighted Portfolio Performance by Life Cycle Stage, 1990-2024

	Introduction	Growth	Maturity	Shake-Out	Decline
Annualized excess return	1.8%	9.0%	9.7%	9.4%	10.5%
Annualized standard deviation	26.7	17.7	13.7	17.4	27.4
Sharpe ratio	0.07	0.51	0.71	0.54	0.38

Source: Tatjana Puhan, Wolfgang Drobetz, Jiri Tresl, and Zhe Li, "Value Creation and Firm Life Cycle," Working Paper*, January 2026.*
Note: These results do not reflect the adjustments that we make to our data.

Before we put all of the pieces together, we will briefly discuss some useful concepts to bear in mind when assessing the cash flows during the explicit forecast period.

Assessing the Market's Expectations for Free Cash Flow

An estimate of the market-implied CAP requires an assessment of expectations for free cash flow during the explicit forecast period. Free cash flow is the product of value drivers, including the sales growth rate, operating profit margin, incremental investment rate, and tax rate.

One approach to establishing the market's consensus is to consult sources such as Bloomberg, FactSet, LSEG Data & Analytics, Morningstar, S&P Capital IQ Pro, Value Line Investment Survey, Estimize, Wall Street reports, and guidance that executives provide to investors. You should consider these figures in the context of the competitive circumstances that your analysis reveals and the historical results for the value drivers.

We recommend conducting three reality checks of your free cash flow forecasts for the explicit forecast period.

The first check is to ground your expectations for sales growth in base rates. Sales growth is the most important value driver for a majority of companies. The insight is that sales growth rates have historically shown limited persistence and therefore a strong pattern of regression toward the mean.[121] We found the correlations (*r*) for sales growth rates to be 0.16 over three-year periods and 0.14 over five-year periods for U.S. public companies from 1950 to 2025.[122]

From a practical point of view, this means that extrapolating growth rates can produce expectations that are too optimistic or pessimistic. Further, empirical research shows that the average and median growth rates, as well as the standard deviation of the growth rates, decline as company size increases.[123]

Exhibit 18 shows the base rates for sales growth for the following three years based on the sales growth in the prior three years from 1950 to 2025 (all figures are nominal). An examination of the data reveals considerable regression toward the mean. For instance, of the companies that grew sales at a rate of 44 percent or more in the prior 3 years, roughly 1 in 5 companies sustained that rate of growth in the subsequent 3 years.

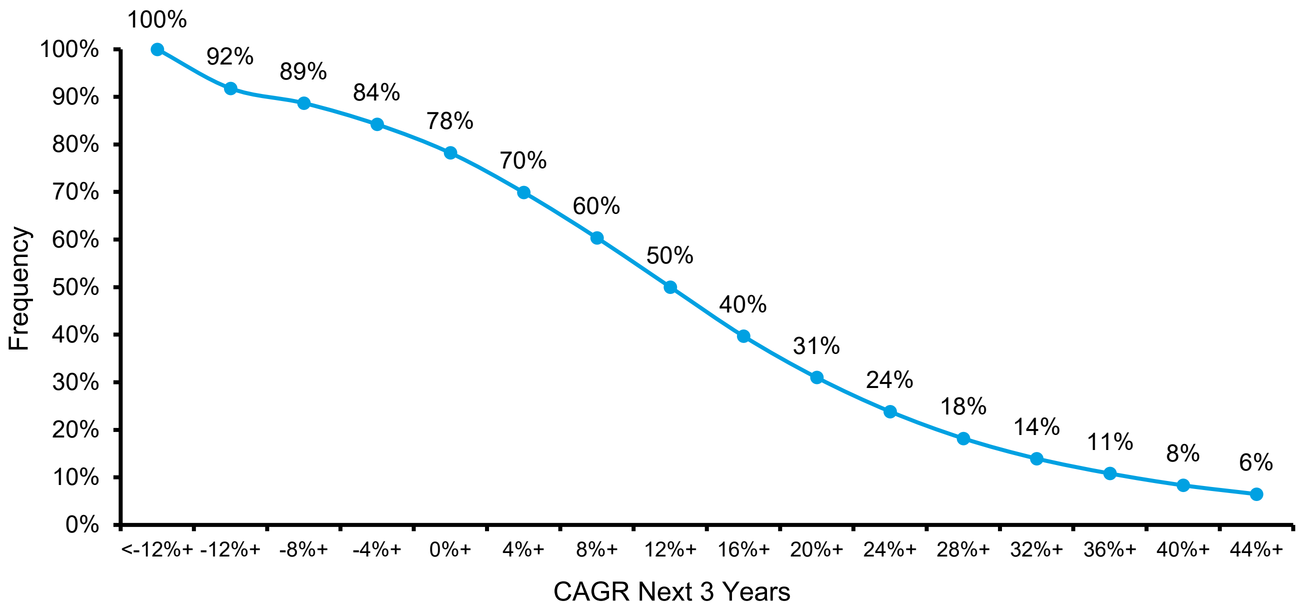
Exhibit 18: Base Rates for Three-Year Sales Growth Rates, 1950-2025

	Next 3 Years Sales CAGR																		
	Frequency																		
Prior 3 Years Sales CAGR	**<(12)**	**(12)-(8)**	**(8)-(4)**	**(4)-0**	**0-4**	**4 8-**	**8-12**	**12-16**	**16-20**	**20-24**	**24-28**	**28-32**	**32-36**	**36-40**	**40-44**	**>44**	**Mean**	**Median**	**StDev**
<(12)	12%	9%	7%	6%	4%	3%	3%	4%	4%	5%	5%	6%	7%	7%	7%	12%	9.6%	5.0%	31.2%
(12)-(8)	5%	5%	4%	3%	3%	2%	2%	2%	2%	2%	2%	2%	2%	3%	3%	3%	5.4%	3.8%	19.7%
(8)-(4)	7%	7%	7%	6%	5%	4%	4%	3%	4%	3%	3%	3%	3%	3%	3%	4%	5.3%	3.9%	18.4%
(4)-0	9%	11%	11%	12%	10%	8%	7%	6%	5%	5%	5%	5%	5%	5%	5%	5%	5.4%	3.9%	17.5%
0-4	10%	12%	13%	16%	17%	15%	12%	9%	8%	8%	7%	7%	6%	6%	5%	6%	6.1%	4.9%	14.5%
4-8	9%	11%	14%	15%	18%	21%	17%	13%	12%	10%	9%	8%	8%	8%	6%	7%	7.2%	6.3%	14.0%
8-12	8%	10%	11%	12%	13%	15%	17%	16%	13%	12%	11%	10%	9%	8%	8%	7%	8.6%	7.9%	13.9%
12-16	7%	8%	8%	9%	9%	10%	13%	14%	14%	11%	11%	8%	8%	8%	8%	6%	9.7%	9.3%	14.5%
16-20	6%	6%	6%	6%	6%	7%	8%	10%	10%	10%	9%	9%	7%	8%	8%	6%	10.8%	10.2%	16.4%
20-24	5%	5%	5%	4%	4%	4%	5%	6%	7%	8%	8%	7%	8%	7%	8%	5%	11.4%	10.9%	17.0%
24-28	4%	3%	3%	3%	3%	3%	3%	5%	5%	6%	7%	6%	7%	6%	6%	5%	12.5%	11.7%	18.6%
28-32	3%	2%	2%	2%	2%	2%	2%	3%	4%	5%	5%	5%	5%	5%	5%	4%	12.6%	11.7%	19.2%
32-36	2%	2%	2%	1%	1%	1%	2%	2%	3%	4%	4%	4%	4%	4%	3%	4%	13.6%	12.5%	20.8%
36-40	2%	1%	1%	1%	1%	1%	1%	1%	2%	2%	3%	4%	4%	4%	4%	3%	14.1%	12.4%	22.2%
40-44	2%	1%	1%	1%	1%	1%	1%	1%	1%	2%	3%	3%	3%	3%	3%	3%	14.8%	13.2%	22.5%
>44	10%	6%	4%	3%	3%	3%	3%	5%	5%	7%	9%	12%	15%	16%	18%	21%	15.8%	13.3%	27.6%

Source: FactSet and Counterpoint Global.
Note: Includes companies with minimum sales of $10 million in 2025 USD.

Exhibit 19 zooms in on companies that posted compound annual sales growth of 20 percent or more in the prior three years and shows the distribution of sales growth for the following three years. Just over 30 percent of the companies that grew at that rate sustained that growth rate, or higher, in the following three years. But that means that nearly 70 percent advanced at a slower rate, including 22 percent that realized negative sales growth.

Exhibit 19: Base Rates for Three-Year Sales Growth Rate for Companies with 20 Percent+ Growth in the Prior Three Years, 1950-2025



Source: FactSet and Counterpoint Global.
Note: Includes companies with minimum sales of $10 million in 2025 USD.

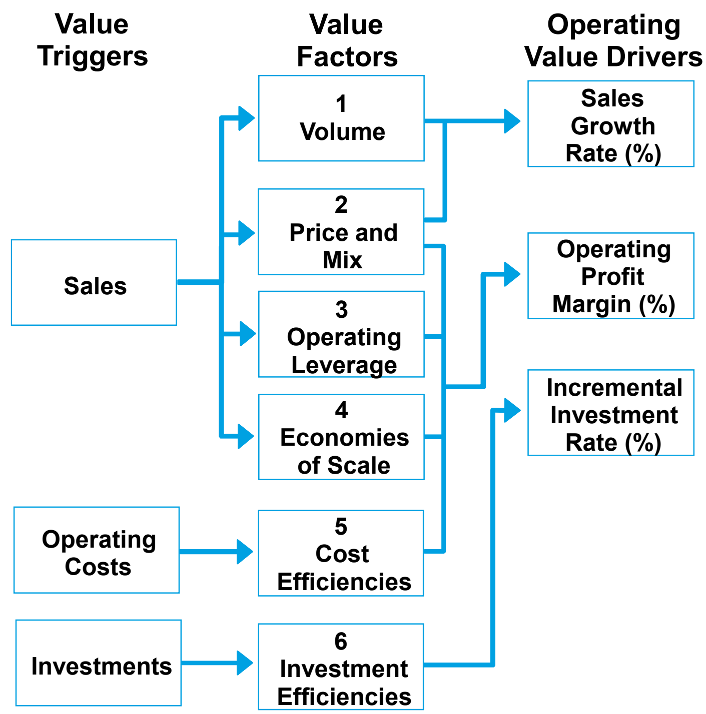
The takeaway from this check is to consider consensus sales growth rates in the context of base rates. But base rates are not set in stone and evolve to reflect a changing world. As a result, it is important to think in terms of distributions of potential outcomes.[124] An assessment of the market-implied competitive advantage period provides a foundation upon which you can build scenario analysis.

This leads to the second check, making sure your sensitivity analysis is proper. Analysts and executives often create scenarios, including one that is optimistic ("bull"), one that is pessimistic ("bear"), and one that is most likely ("base"). Less than 10 percent of analysts vary the fundamentals while leaving valuation multiples intact. A majority change assumptions about both fundamentals and multiples.[125] Most sensitivity analysis fails to properly account for sources of the revisions in expectations.

A more thoughtful and rigorous approach starts with what is common to all businesses: sales, operating costs, and investments.[126] The problem is these measures are too broad and therefore do not map directly to the operating value drivers. As a result, they must be filtered by "value factors," which include volume, price and mix, operating leverage, economies of scale, cost efficiencies, and investment efficiencies.

The expectations infrastructure guides robust scenario analysis. You start with potential changes in the value triggers, consider how they affect the value factors, and finish with revisions to the value drivers to see how that affects shareholder value (exhibit 20).

Exhibit 20: The Expectations Infrastructure



Source: Michael J. Mauboussin and Alfred Rappaport, Expectations Investing: Reading Stock Prices for Better Returns—Revised and Updated *(New York: Columbia Business School Publishing, 2021), 46.*

Derived from established microeconomic principles, the expectations infrastructure offers a structured way to assess past and prospective performance. It also provides investors with a solid and grounded framework to debate fundamentals because it separates cause and effect. The vast majority of sensitivity analyses do not capture these dynamics.

The final check is to calculate return on incremental invested capital (ROIIC). ROIIC captures the relationship between the change in invested capital, or investment, and the subsequent change in NOPAT.

ROIIC ignores sunk costs but assumes that the return on the existing invested capital remains stable.[127]

The calculation for ROIIC is:

$$\text{ROIIC} = \frac{\text{Year}_1\ \text{NOPAT} - \text{Year}_0\ \text{NOPAT}}{\text{Year}_0\ \text{Invested Capital} - \text{Year}_{-1}\ \text{Invested Capital}}$$

Here is a simple example. Assume a company's year_{-1} invested capital is \$10,000 and it invests \$1,000 during the year. Year_0 invested capital increases to \$11,000. Further, NOPAT goes from \$2,000 in year_0 to \$2,150 in year_1. In this case, ROIIC is 15 percent [(\$2,150 – \$2,000)/(\$11,000 - \$10,000) = 0.15].

The check is to add a line to your DCF model that calculates ROIIC. You should revisit your assumptions when you see that number deviate from what you expect based on your strategic analysis.

Terminal Value: Combining Finance and Competitive Strategy

We now consider four approaches to estimating the terminal value. We first show their equivalence under the assumption of competitive equilibrium, and we then introduce differences based on judgments about sustainable competitive advantage.

Terminal growth models. Here is a brief summary of the four approaches:

Gordon Growth Model. We have already discussed this one. We will use FCF, or free cash flow, for distributable cash, *k* for the cost of capital, and *g* for the long-term growth rate. The formula is:

$$\text{Value} = \frac{\text{FCF}}{\text{k} - \text{g}}$$

Value Driver Model. The Value Driver Model produces the same value because the numerator solves for reinvestment, making FCF and the denominator identical to the Gordon Growth Model. The symbol *r* stands for ROIIC. Here is the formula.[128]

$$\text{Value} = \frac{\text{NOPAT x } (1 - \frac{\text{g}}{\text{r}})}{\text{k} - \text{g}}$$

Perpetuity Model. The Perpetuity Model applies when ROIIC equals the cost of capital ($r = k$). Because incremental investments have a net present value of zero, we can simply capitalize NOPAT at the cost of capital. This is tantamount to the steady-state value when the PVGO is zero.

$$\text{Value} = \frac{\text{NOPAT}}{\text{k}}$$

Note that the Perpetuity Model does not say the company will not grow in the terminal period. Rather, it says that growth will not create value. This underscores the important point that not all growth creates value.

Fade Model. This model is a simplification of one developed by David Holland, a co-founder of Fractal Value Advisors, former adjunct Professor at the University of Cape Town Graduate School of Business, and past advisor to Credit Suisse HOLT (now UBS HOLT).[129]

Holland's contribution is to introduce a fade rate, *f*. The idea is that if *r* is either greater than, or less than, *k* at the end of the explicit forecast period, economic theory suggests that it should fade toward the cost of capital over time. Our discussion of regression toward the mean, persistence, and fade rates, captured in exhibits 10 and 11, provides a basis for assessing *f*.

The perpetuity is the foundation of this equation, and it uses the Value Driver Model to reflect value creation. The essential addition is the fade term (second part of the first term on the right). An *f* of zero means there is no fade, and an *f* of 1 means that $r = k$ immediately.

Here is the formula:

$$\text{Value} = \left(\frac{\text{NOPAT x } \left(1 - \frac{\text{g}}{\text{r}}\right)}{\text{k} - \text{g}} - \frac{\text{NOPAT}}{\text{k}}\right)\frac{(1 - \text{f})(\text{k} - \text{g})}{1 + \text{k} - (1 - \text{f})(1 + \text{g})} + \frac{\text{NOPAT}}{\text{k}}$$

The intuition is that the fade term captures the persistence of the excess returns.

Holland's model demonstrates that value is the same whether the excess spread of $r - k$ fades exponentially or goes to zero at time $1/f$. In other words, a fade rate of 0.20 is equivalent to differential returns for 5 years followed by r equal to k. This formula approximates that result.[130]

Terminal model equivalence assuming equilibrium. The first important point is that all four models produce the same value when the ROIIC (r) is equal to the cost of capital (k). In effect, they all become a perpetuity.

Let's assume the cost of capital is 7 percent, the ROIIC is 7 percent, and the long-term growth rate is 2.5 percent. In the Fade Model, the fade rate does not matter because there is no excess spread to fade. For simplicity, we use zero. We start with NOPAT of \$100 in the base year and it grows to \$102.5 (\$102.5 = \$100 × 1.025) in the following year. Each formula generates identical output with these assumptions:

Gordon Growth Model

$$\$1{,}464.3 = \frac{\$65.9}{0.07 - 0.025}$$

Value Driver Model

$$\$1{,}464.3 = \frac{\$102.5 \text{ x } (1 - \frac{0.025}{0.07})}{0.07 - 0.025}$$

Perpetuity Model

$$\$1{,}464.3 = \frac{\$102.5}{0.07}$$

Fade Model

$$\$1{,}464.3 = \left(\frac{\$102.5 \text{ x } \left(1 - \frac{0.025}{0.07}\right)}{0.07 - 0.025} - \frac{\$102.5}{0.07}\right)\frac{(1 - 0)(0.07 - 0.025)}{(1 + 0.07) - (1 - 0)(1 + 0.025)} + \frac{\$102.5}{0.07}$$

In the fade equation, the assumption that r equals k means there is no excess return and that the value driver and perpetuity models produce the same value. Therefore, the first term on the right side is zero. As a result, all of the value is in the second term on the right side, the perpetuity model.

Terminal model differences with the assumption of sustained excess returns. We now assume that ROIIC is 15 percent, well above the cost of capital. We leave the fade rate at zero. All of the models except the perpetuity treat the $r - k$ spread as permanent. This is a sustainable moat, which is an optimistic assumption.

Gordon Growth Model

$$\$1{,}898.1 = \frac{\$85.4}{0.07 - 0.025}$$

Value Driver Model

$$\$1{,}898.1 = \frac{\$102.5 \text{ x } (1 - \frac{0.025}{0.15})}{0.07 - 0.025}$$

Perpetuity Model

$$\$1{,}464.3 = \frac{\$102.5}{0.07}$$

Fade Model

$$\$1{,}898.1 = \left(\frac{\$102.5 \times \left(1 - \frac{0.025}{0.15}\right)}{0.07 - 0.025} - \frac{\$102.5}{0.07}\right)\frac{(1-0)(0.07-0.025)}{(1+0.07)-(1-0)(1+0.025)} + \frac{\$102.5}{0.07}$$

The important point here is the range of value between the Perpetuity Model, which assumes no value creation in the terminal period, and the Gordon Growth and Value Driver models, which assume value creation forever. In this case, the difference is \$433.8 (\$1,898.1 – \$1,464.3 = \$433.8), or about 30 percent of the perpetuity value. The magnitude of the difference is a function of *r* in relation to *k,* as well as the rate of growth.

The Fade Model still agrees with the Gordon Growth and Value Driver models because we have assumed a fade of zero. Introducing fade allows us to calculate terminal values that are between the extremes of “value creation forever” (*f* = 0) and “no value creation ever again” (*f* = 1.0).

Think of the components of the terminal value this way:

$$\text{Terminal value} = \underbrace{\text{Steady-state (no moat)}}_{\text{Perpetuity}} + \underbrace{\text{Moat value}}_{\text{Spread } (r\text{ - }k)} \times \underbrace{\text{Persistence}}_{\text{Fade rate } (f)}$$

Exhibit 21 shows the terminal values associated with the same assumptions about *r*, *k*, and *g* but varied assumptions about the fade rate. You can now refer back to exhibit 11, which estimated fade rates by sectors, for calibration. Recall that the average fade rate for all sectors is about 0.20, with a range of 0.10 to 0.30.

Exhibit 21: Fade Rates: Range, Interpretation, and Value

Fade rate	Interpretation	Increase versus perpetuity	Terminal value
0.0	No fade, perpetual value creation	\$433.8	\$1,898.1
0.1	Above average sustainability	\$119.1	\$1,583.4
0.2	Average sustainability	\$62.5	\$1,526.8
0.3	Below average sustainability	\$38.8	\$1,503.1
1.0	No value creation in terminal value	\$0.0	\$1,464.3

Source: Counterpoint Global.
Note: Assumes r = 15.0%, k = 7.0%, and g = 2.5%.

Bringing It All Together

We are now ready to bring all of these ideas together to provide a roadmap to do a proper analysis grounded in empirical results.

A brief review of models is necessary before turning to the steps. There are two broad approaches to valuing equity with a DCF model. The first is free cash flow to the firm (FCFF), which values the enterprise and then subtracts debt and other claims to calculate equity. This is the method we use in this report.

The other approach is free cash flow to equity (FCFE), which projects and discounts cash flows directly attributable to equity holders. Done properly, FCFF and FCFE produce the same equity value. When surveyed, investors say they use the FCFF model nearly twice as often as the FCFE model.[131]

Notwithstanding what investors suggest they use, the most common definition of free cash flow that companies and investors employ does not agree with the one used in finance. Specifically, one popular definition of FCF is cash flow from operating activities minus capital expenditures.[132] This is at best a rough proxy for FCFE.

One reason for the gap between practice and theory is the treatment of stock-based compensation (SBC) in the definition of FCF. SBC is expensed on the income statement but added back in cash flow from operating activities. In some extreme cases, SBC is greater than reported "free cash flow."[133]

Consistent with our adjustments to the statement of cash flows for assigning companies to appropriate stages in the life cycle, we do not believe that SBC should be added back in cash flow from operating activities. At the same time, we have shown that it is equivalent to treat SBC as an expense or as a form of dilution.[134]

Most sell-side analysts add back SBC expense to calculate FCFE for their DCF models. Researchers found that the analysts who did not expense SBC in their DCF models had higher and more optimistic price targets, as well as greater bias, than the analysts who expensed SBC.[135] They also found that the market prices SBC as a genuine expense and reacts to unexpected changes in SBC.[136]

FCFF works well if you anticipate that a company's capital structure will be consistent over time. Adjusted Present Value (APV) is preferable for companies with dynamic capital structures. APV first values the firm as if it were financed solely with equity and adds to it the value that debt creates. The primary benefit of debt is that it shields income from tax.[137]

We now go through the analytical steps.

The first is to determine the stage a company is in within the life cycle framework. More than two-thirds of public companies are in the growth or maturity stages, where analysis of market-implied CAP is appropriate.

Two points are worth reiterating. First, companies move between stages over time, including going from later to earlier stages (exhibit 16).

Apple Inc. is a good example. For years following its IPO in 1980, the company was mostly in the growth and maturity stages. But the firm found itself in the decline stage in 1997 and 1998 after stumbling in the mid-1990s. The successful launch of the iPod in 2001 returned the company to the growth stage, where it remained for about a decade. It then settled into the maturity stage from 2012 to 2025.

The second point is that the valuation approach should differ by stage. For instance, the cost of debt and the cost of equity each follow a "U" shape through the life cycle: high in the introduction stage, low in the growth and maturity stages, and high again in the shake-out and decline stages.[138] Cash holdings by stage trace the same pattern.[139]

Ultimately, as we have written, “everything is a DCF model” in valuation.[140] But for companies in the introduction and decline stages, understanding and valuing viability is important. This suggests applying techniques for the valuation of real options.

The next step is collecting a sense of the market’s expectations for value drivers as well as a reasonable estimate for the cost of capital.

Value drivers include sales growth, operating profit margins, working capital needs, and capital expenditures. Understanding consensus expectations is a good starting point, although there is some art in assessing what is priced in.

One useful technique is to measure the incremental ROIC that the combination of value drivers produce. This creates a reality check and provides a foundation for the terminal value ROIIC if it differs from the cost of capital.

There is a lot of hand-wringing about the proper way to estimate the cost of capital. Yet there are observable market prices for risk, including credit spreads and implied options volatility. We have found the equity risk premium estimate from Aswath Damodaran, a professor of finance at the Stern School at New York University, to be useful. He updates it monthly.

The following step is an important one: deciding the appropriate inputs to estimate the terminal value. We have three specific recommendations. First, use the ROIIC at the end of the explicit forecast period as the input into the Fade Model. This will be a product of the value driver estimates.

Next, expected inflation is a sensible way to model long-term growth. Few companies live long enough, or grow sufficiently, to justify growth rates that are much higher.[141] The Federal Reserve Bank of St. Louis updates the 10-Year Expected Inflation Rate monthly on its website.

Finally, start with a fade rate from exhibit 11 (by sector) or appendix A (by industry).

With estimates for value drivers and terminal value in hand, the next move is to expand the explicit forecast period as necessary to solve for today’s stock price. This determines the market-implied CAP.[142]

Most companies in the growth or maturity stages will be in a range of 5 to 20 years. The assessment of market-implied CAP does not provide an answer. Rather, it gives a sense of where the market has set the bar for corporate performance.

Excess returns are the result of revisions in expectations. Anticipating whether expectations are too high or low requires some sense of the baseline that the market price implies.

Within this step it is also important to revisit assumptions, making sure they are consistent with historical results and the outlook for relevant industries. Evaluating similar companies is also informative so as to make sure the results make sense.

The final step considers scenarios and base rates in the context of rigorous competitive strategy analysis to assess whether the market’s expectations are too high, too low, or about right.

Scenario analysis, guided by the expectations infrastructure (exhibit 20), allows for a sense of the range of possible outcomes for value. Earnings estimates by analysts tend to be too optimistic, and they are especially challenged when fixed costs are high or when a business is in decline.[143]

Base rates offer context for forecasts. Seeing how businesses have performed in the past provides a valuable point of view for understanding the probability of potential outcomes.

Competitive strategy analysis gives context for understanding the conditions for the industry or industries in which a company competes, its risk of being disrupted, and the sources of competitive advantage should they exist. We know that some companies beat the market-implied fade by producing attractive ROICs for longer than what the market had reflected in past prices. But we know also that sustaining high ROICs is difficult and that disruption always lurks.

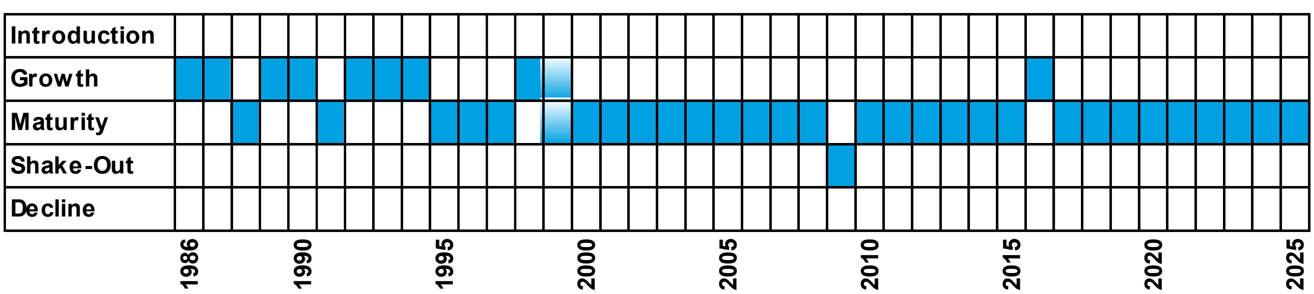
We will now try to make these ideas more tangible with a case study of Microsoft, the software company. This analysis is not investment advice but rather an illustration of the methodology.

Simplified Case Study—Microsoft

We apply these steps to Microsoft. We will use the free cash flow to the firm for our discounted cash flow model.

Microsoft spent most of its first decade following its IPO in 1986 in the growth stage, but it has been largely in the maturity stage since 1995. Exhibit 22 shows the stage the company has been in by year from 1986 to 2025. Market-implied CAP analysis is appropriate for the stocks of companies in the maturity stage.

Exhibit 22: Microsoft Life Cycle Stages, 1986-2025



Source: Counterpoint Global.

We use consensus estimates for the next few years of sales, operating profit, and investment needs. Beyond that, we assume compound annual growth of 11 percent for NOPAT, which puts it in the top 20 percent of companies with comparable levels of sales, and 9 percent for investment. We estimate the cost of capital to be 9.1 percent.[144]

For the terminal value, we assume long-term growth of 2.5 percent (slightly above the current reading) and a fade rate of 0.20, consistent with the information technology sector in exhibit 11. We calculate the return on incremental invested capital dynamically, reflecting the relationship between NOPAT and investment growth. It is close to 17 percent at the end of the period we measured.

The stock was around $370 per share at the time of our analysis (March 31, 2026). This implies a CAP of about 17-18 years (exhibit 23). We use mid-year discounting because the company has already reported the first two quarters of fiscal 2026.

Exhibit 23: Market-Implied CAP for Microsoft

	2025	2026	2027	2028	2029	2030	2031	2032	2033	2034	2035	2036	2037	2038	2039	2040	2041	2042	2043
Sales	282	328	378	440	489	542	602	668	742	823	914	1,014	1,126	1,250	1,387	1,540	1,709	1,897	2,106
Sales growth		16.3%	15.4%	16.4%	11.0%	11.0%	11.0%	11.0%	11.0%	11.0%	11.0%	11.0%	11.0%	11.0%	11.0%	11.0%	11.0%	11.0%	11.0%
EBITA	139	147	170	198	220	244	271	301	334	371	411	456	507	562	624	693	769	854	948
EBITA margin	49.5%	45.0%	45.0%	45.0%	45.0%	45.0%	45.0%	45.0%	45.0%	45.0%	45.0%	45.0%	45.0%	45.0%	45.0%	45.0%	45.0%	45.0%	45.0%
Tax rate	21.1%	20.0%	20.0%	20.0%	20.0%	20.0%	20.0%	20.0%	20.0%	20.0%	20.0%	20.0%	20.0%	20.0%	20.0%	20.0%	20.0%	20.0%	20.0%
NOPAT	**110**	**118**	**136**	**158**	**176**	**195**	**217**	**241**	**267**	**296**	**329**	**365**	**405**	**450**	**499**	**554**	**615**	**683**	**758**
Investment in future	**57**	**100**	**115**	**130**	**142**	**154**	**168**	**184**	**200**	**218**	**238**	**259**	**282**	**308**	**335**	**366**	**399**	**434**	**474**
Free Cash Flow	**53**	**18**	**21**	**28**	**34**	**41**	**48**	**57**	**67**	**78**	**91**	**106**	**123**	**142**	**164**	**189**	**217**	**249**	**285**
PV of FCF		17	19	23	25	28	30	32	35	37	40	43	45	48	51	54	56	59	62
Cumulative PV of FCF		17	36	59	84	111	141	174	209	246	286	329	374	422	473	527	583	642	705
Terminal value		1,574	1,811	2,015	2,203	2,447	2,719	3,021	3,356	3,728	4,141	4,600	5,110	5,677	6,306	7,005	7,781	8,643	9,600
PV of terminal Value		1,507	1,590	1,621	1,625	1,656	1,686	1,717	1,749	1,782	1,814	1,848	1,882	1,917	1,952	1,988	2,024	2,062	2,099
Corporate Value		1,524	1,625	1,680	1,709	1,767	1,828	1,891	1,958	2,028	2,101	2,177	2,256	2,339	2,425	2,514	2,607	2,704	2,804
Cash	89	89	89	89	89	89	89	89	89	89	89	89	89	89	89	89	89	89	89
Debt	112	112	112	112	112	112	112	112	112	112	112	112	112	112	112	112	112	112	112
Shareholder value		**1,501**	**1,602**	**1,657**	**1,686**	**1,744**	**1,804**	**1,868**	**1,935**	**2,005**	**2,077**	**2,154**	**2,233**	**2,316**	**2,402**	**2,491**	**2,584**	**2,681**	**2,781**
Shares outstanding	7.508	7.508	7.508	7.508	7.508	7.508	7.508	7.508	7.508	7.508	7.508	7.508	7.508	7.508	7.508	7.508	7.508	7.508	7.508
Shareholder value per share		**$200**	**$213**	**$221**	**$225**	**$232**	**$240**	**$249**	**$258**	**$267**	**$277**	**$287**	**$297**	**$308**	**$320**	**$332**	**$344**	**$357**	**$370**
Year		0.5	1.5	2.5	3.5	4.5	5.5	6.5	7.5	8.5	9.5	10.5	11.5	12.5	13.5	14.5	15.5	16.5	17.5
ROIIC			18.2%	19.5%	13.4%	13.7%	13.9%	14.2%	14.4%	14.7%	15.0%	15.2%	15.5%	15.8%	16.1%	16.4%	16.7%	17.0%	17.3%

Source: Counterpoint Global.
Note: Amounts in billions, excluding per share values.

We do not show scenario analysis, but here is a quick discussion of one approach to do it.[145] Sales growth is the most important value trigger (exhibit 20) for Microsoft. The next step is to assess possible ranges of sales growth outcomes, based on the fundamentals of the business and guided by base rates. With those scenarios in hand, consider which of the value factors come into play. This will lead to the final value drivers, which serve as inputs into the DCF model. All other assumptions, including the cost of capital, components of the terminal value, and market-implied CAP, can be held constant.

Summary

The value of a financial asset is the present value of future distributable cash flows. A company creates shareholder value when it makes investments that earn returns in excess of the opportunity cost of capital. To evaluate a firm's prospects, investors have to assess how much a company can invest, at what spread between ROIC and the cost of capital, and for how long it can find investment opportunities that create value. This report is about how to measure the aspect of "how long" through the concept of market-implied competitive advantage period (CAP).

While nearly all companies seek to create value, factors such as competition, industry maturation, and corporate bureaucracy can conspire to drive returns toward the cost of capital. Competitive strategy analysis provides a framework for assessing how a company can make trade-offs that allow it to distinguish itself from its competitors through either cost leadership or by offering a differentiated product or service.

Valuation combines finance and competitive strategy analysis. The challenge is that the most common approach to valuation, application of multiples, fails to reveal key determinants of value, including growth, return on invested capital, opportunity cost, and CAP.

In this report, we provided a brief history of valuation and reviewed how analysts value stocks in practice. We then examined the evolution of strategy, with an eye toward understanding which types of advantages appear more durable.

Next we reviewed empirical observations about U.S. public companies, including the topics of longevity, the distribution of ROICs, and the rate at which ROIC regresses toward the mean by sector. We showed that some companies have indeed sustained excess returns for an extended period (well beyond what chance would dictate).

Understanding a company's stage within the life cycle helps inform the proper valuation approach. In particular, the majority of companies fall in the growth and maturity stages, where analysis using CAP is appropriate. Real options analysis may be more appropriate for companies in the introduction and decline stages.

We offered some guidelines for forecasting free cash flow in the explicit forecast period of a multi-stage DCF model. These include being aware of base rates, doing rigorous sensitivity analysis, and measuring return on incremental invested capital to make sure the inputs portray an accurate picture of the company's likely results.

We described four approaches to modeling the terminal value, which commonly makes up 70 percent or more of corporate value. These models include Gordon Growth, Value Driver, Perpetuity, and Fade. We showed that these all provide the same answer when ROIIC is equal to the cost of capital in the terminal period, and all but the perpetuity agree if ROIIC is different than the cost of capital but deemed to be permanent.

These two scenarios revealed two boundary values, one that assumes no excess returns and one that assumes excess returns persist forever. The Fade Model fades the ROIIC toward the cost of capital using empirical regression patterns to provide a value between those extremes.

We argued that long-term inflation expectations are a good proxy for long-term growth.

Bringing it all together, we suggested first establishing a terminal value approach grounded in empirical findings and then using sources of company-specific forecasts to estimate the market's view of value drivers such as sales growth, operating profit margin, and investment needs. The model also requires a sensible estimate of the cost of capital.

The goal is to then solve for the stock price by extending the explicit forecast period as many years as necessary to match today's price. This is the market-implied CAP. Financial and strategic analysis allows for an assessment as to whether those expectations are too low, too high, or about right.

We applied this approach to the stock of Microsoft (as of March 31, 2026) and found a market-implied CAP of 17-18 years. This exercise is not investment advice but rather an illustration of the mechanics.

Appendix A: Persistence Factors, Fade Rates, and Mean ROICs by Industry

Exhibit 10 showed correlation coefficients for ROIC by sector (excluding financials) for U.S. public companies over one- and five-year measurement periods, as well as aggregate ROIC and median ROIC. The data reflect results from 1970 to 2024.

Exhibit 24 provides the same data by industry. The industries are ranked from highest to lowest based on five-year correlations. Consumer staples are at the top of the list and utilities are at the bottom.

Exhibit 24: Regression toward the Mean in ROIC by Industry Group, 1970-2024

	How Much Regression?		Toward What Mean?	
	Correlation Coefficient		Aggregate	Median
Industry Group	**1-Yr**	**5-Yr**	**(%)**	**(%)**
Consumer Staples Distribution & Retail	0.49	0.60	11.4	10.1
Food Beverage & Tobacco	0.78	0.59	13.3	10.1
Household & Personal Products	0.84	0.56	14.2	13.1
Hotels Restaurants & Leisure	0.72	0.50	6.7	7.9
Consumer Services	0.72	0.50	9.7	9.6
Health Care Equipment & Services	0.76	0.45	10.8	9.6
Technology Hardware & Equipment	0.73	0.40	18.4	10.1
Consumer Durables & Apparel	0.77	0.38	11.1	9.5
Media	0.68	0.36	9.9	8.5
Commercial Services & Supplies	0.65	0.35	9.1	10.1
Retailing	0.75	0.35	8.5	8.4
Automobiles & Components	0.82	0.32	5.5	9.0
Materials	0.70	0.31	8.2	8.4
Transportation	0.76	0.30	6.8	7.2
Software & Services	0.68	0.29	18.9	11.6
Pharmaceuticals & Biotechnology	0.69	0.29	17.8	14.1
Capital Goods	0.67	0.24	8.8	9.6
Semiconductors & Semiconductor Equipment	0.63	0.24	20.3	14.8
Consumer Discretionary Distribution & Retail	0.60	0.22	13.7	11.0
Energy	0.62	0.18	8.3	7.1
Telecommunication Services	0.68	0.18	7.0	6.1
Utilities	0.49	0.16	5.3	6.0

Source: Counterpoint Global, Compustat, and FactSet.
Note: Includes companies with minimum sales of $250 million in 2024 USD; Correlations reflect winsorization at the 2nd and 98th percentiles.

Exhibit 11 provided the implied persistence factor and fade rate by sector from 1970 to 2024. Fade rate is one minus the persistence factor. Exhibit 25 includes the same data by industry. Note that the average persistence factor, 0.80, and hence fade rate, 0.20, for the industries is nearly the same as it is for the sectors. Further, fade rates for both sectors and industries fall in the range of 0.10 to 0.30.

Exhibit 25: Implied Fade Rate in ROIC by Industry Group, 1970-2024

Industry Group	Empirical 5-Year Correlations	Implied Persistence Factor Based on 5-Year Correlations	Implied Fade Rate Based on 5-Year Correlations
Consumer Staples Distribution & Retail	0.60	0.90	0.10
Food Beverage & Tobacco	0.59	0.90	0.10
Household & Personal Products	0.56	0.89	0.11
Hotels Restaurants & Leisure	0.50	0.87	0.13
Consumer Services	0.50	0.87	0.13
Health Care Equipment & Services	0.45	0.85	0.15
Technology Hardware & Equipment	0.40	0.83	0.17
Consumer Durables & Apparel	0.38	0.83	0.17
Media	0.36	0.81	0.19
Commercial Services & Supplies	0.35	0.81	0.19
Retailing	0.35	0.81	0.19
Automobiles & Components	0.32	0.79	0.21
Materials	0.31	0.79	0.21
Transportation	0.30	0.79	0.21
Software & Services	0.29	0.78	0.22
Pharmaceuticals & Biotechnology	0.29	0.78	0.22
Capital Goods	0.24	0.75	0.25
Semiconductors & Semiconductor Equipment	0.24	0.75	0.25
Consumer Discretionary Distribution & Retail	0.22	0.74	0.26
Energy	0.18	0.71	0.29
Telecommunication Services	0.18	0.71	0.29
Utilities	0.16	0.70	0.30
Average		**0.80**	**0.20**

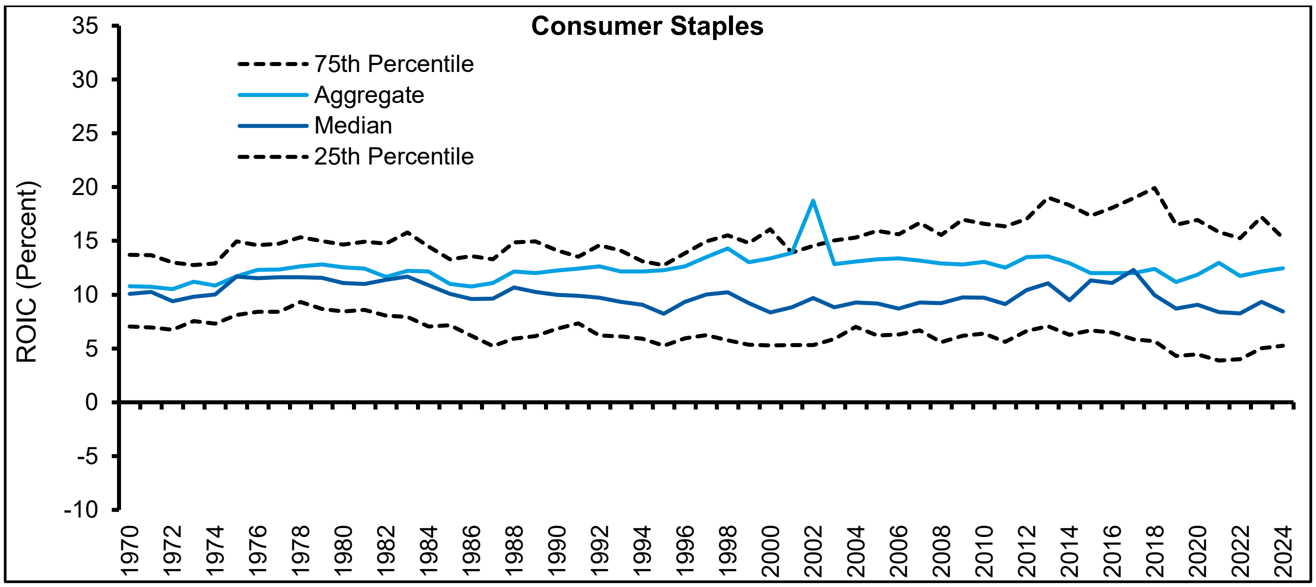
Source: Counterpoint Global, Compustat, and FactSet.
Note: Includes companies with minimum sales of $250 million in 2024 USD; Correlations reflect winsorization at the 2nd and 98th percentiles.

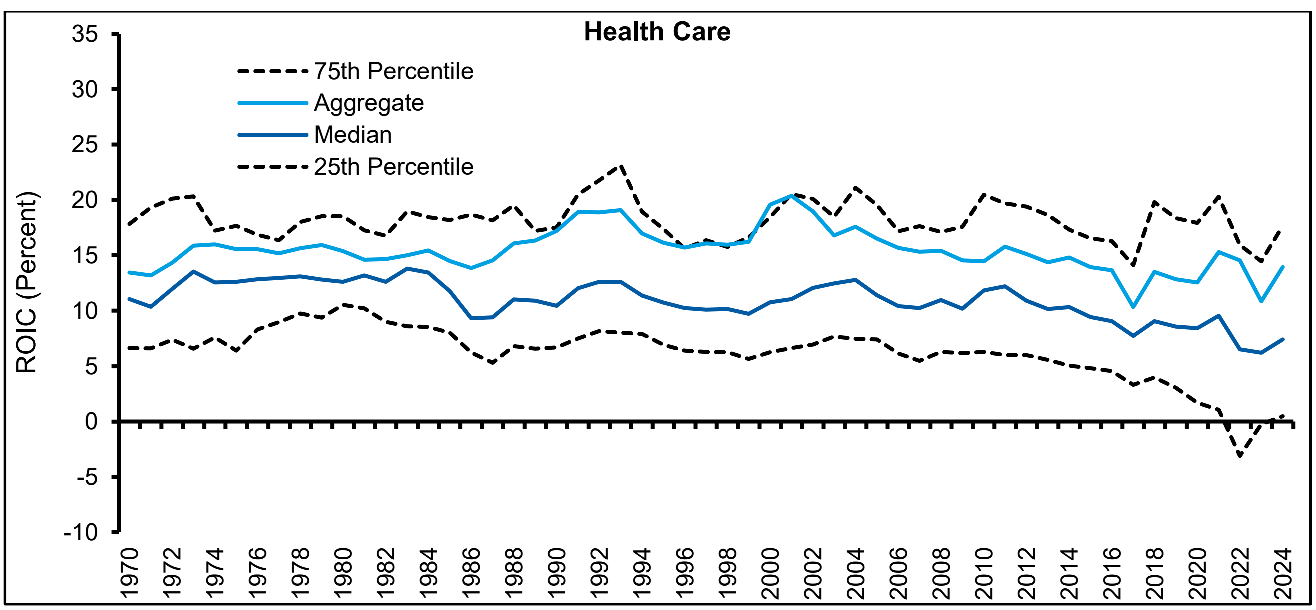
Appendix B: ROIC Trend by Sector

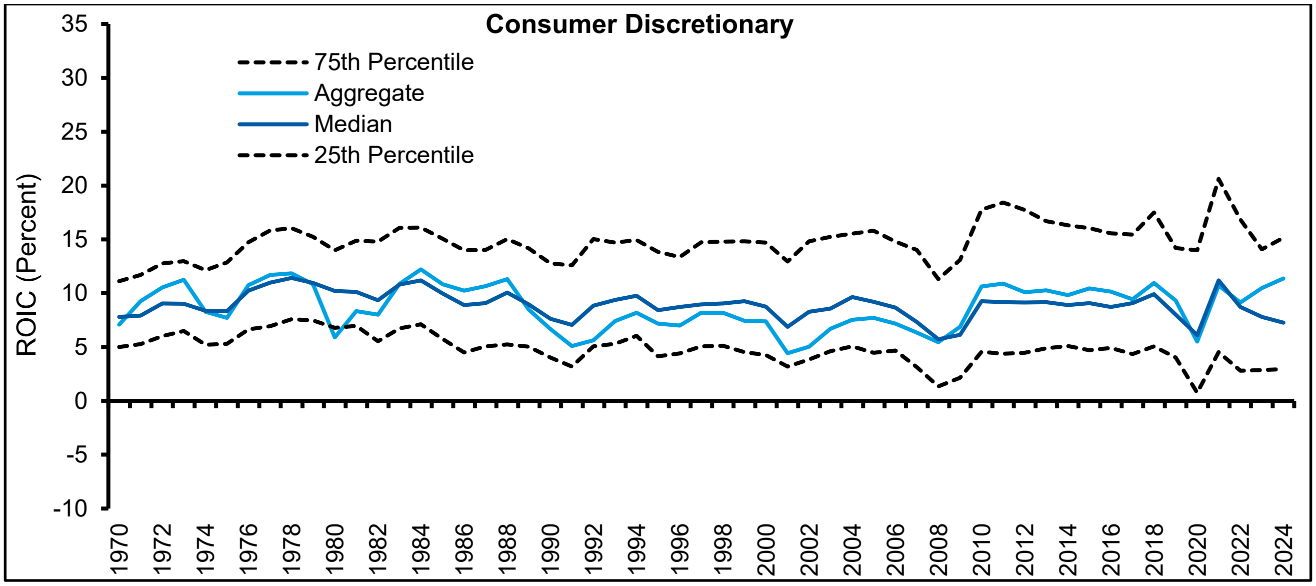
Exhibit 26 shows trends in ROIC by sector from 1970 to 2024. Note that the vertical scale (y-axis) is the same for each. The chart shows the median, 25th percentile, 75th percentile, and aggregate ROIC. The aggregate is the sum of the NOPAT for all companies divided by the sum of all invested capital.

These charts give insight into the level, stability, and dispersion of ROIC. One noteworthy comparison is the median versus the aggregate. If the aggregate meaningfully exceeds the median, such as with information technology and communication services, you know that large companies have a disproportionate impact on ROICs.

Exhibit 26: ROIC Trend by Sector, 1970-2024






Consumer Discretionary
75th Percentile
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25th Percentile
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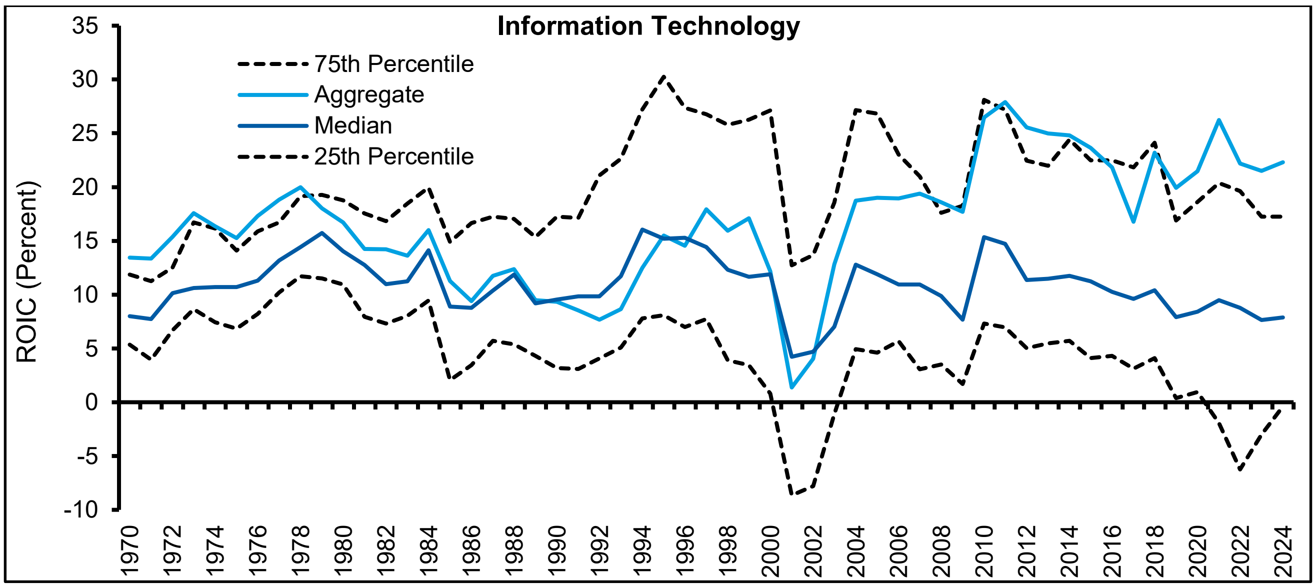
Information Technology
75th Percentile
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ROIC (Percent)
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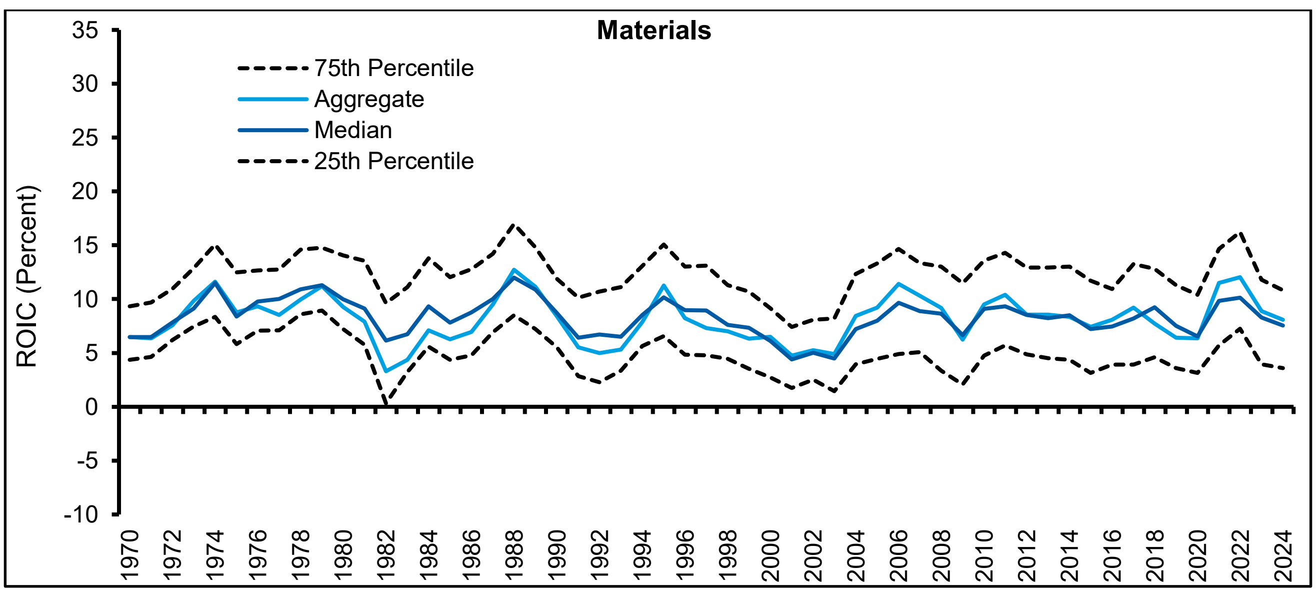
Materials
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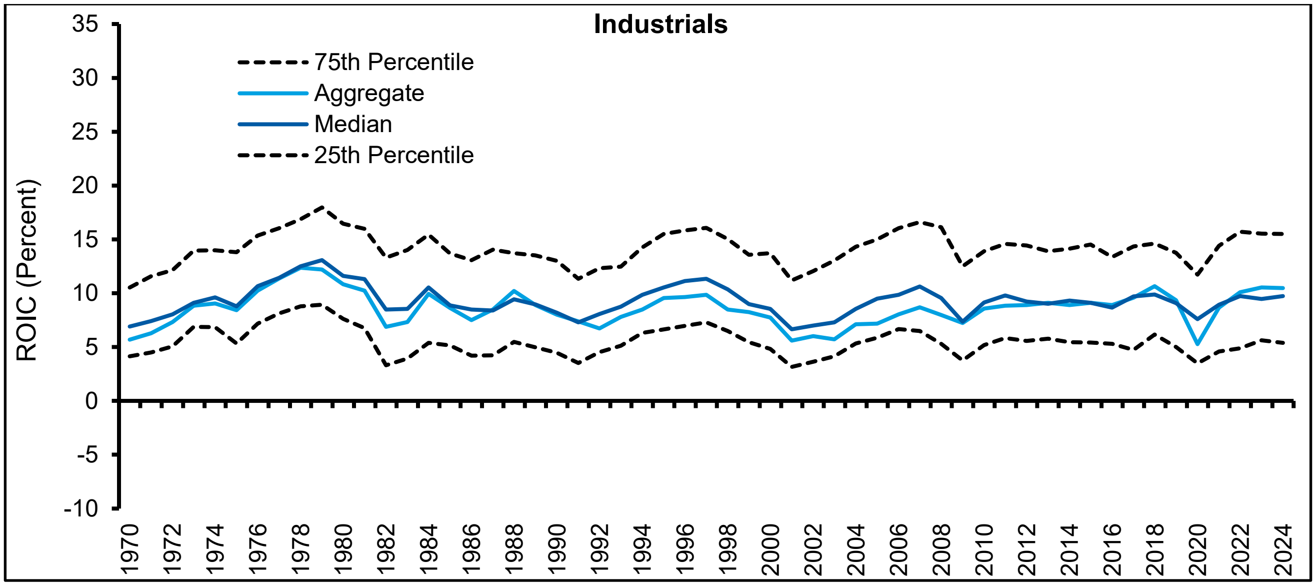
Industrials
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ROIC (Percent)
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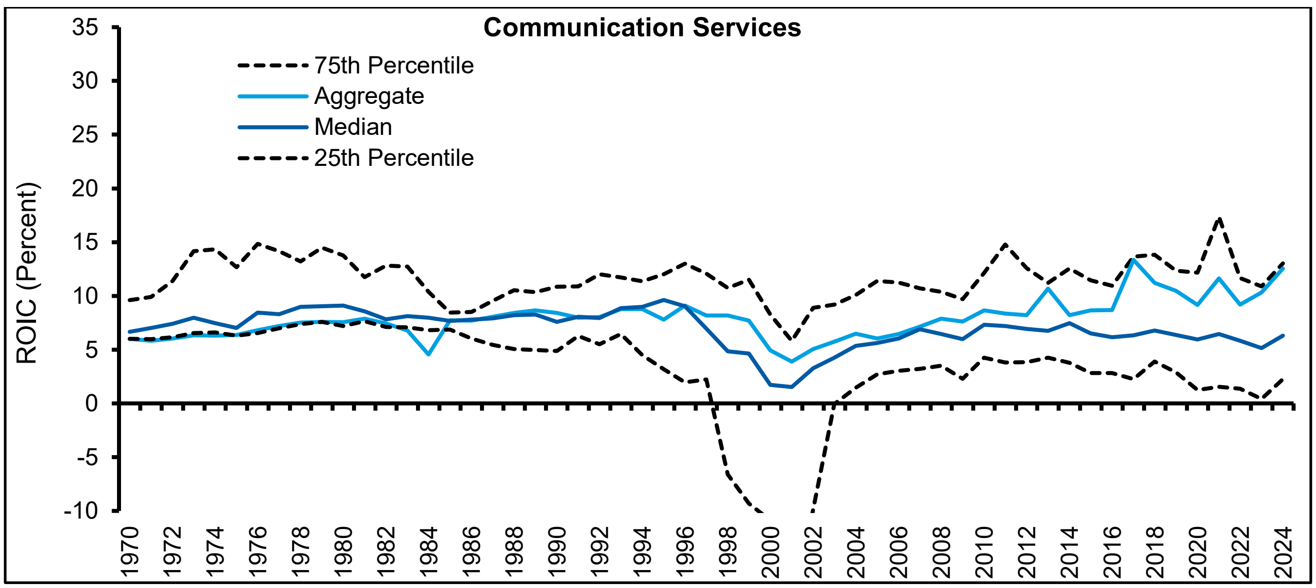
Communication Services
75th Percentile
Aggregate
Median
25th Percentile
ROIC (Percent)
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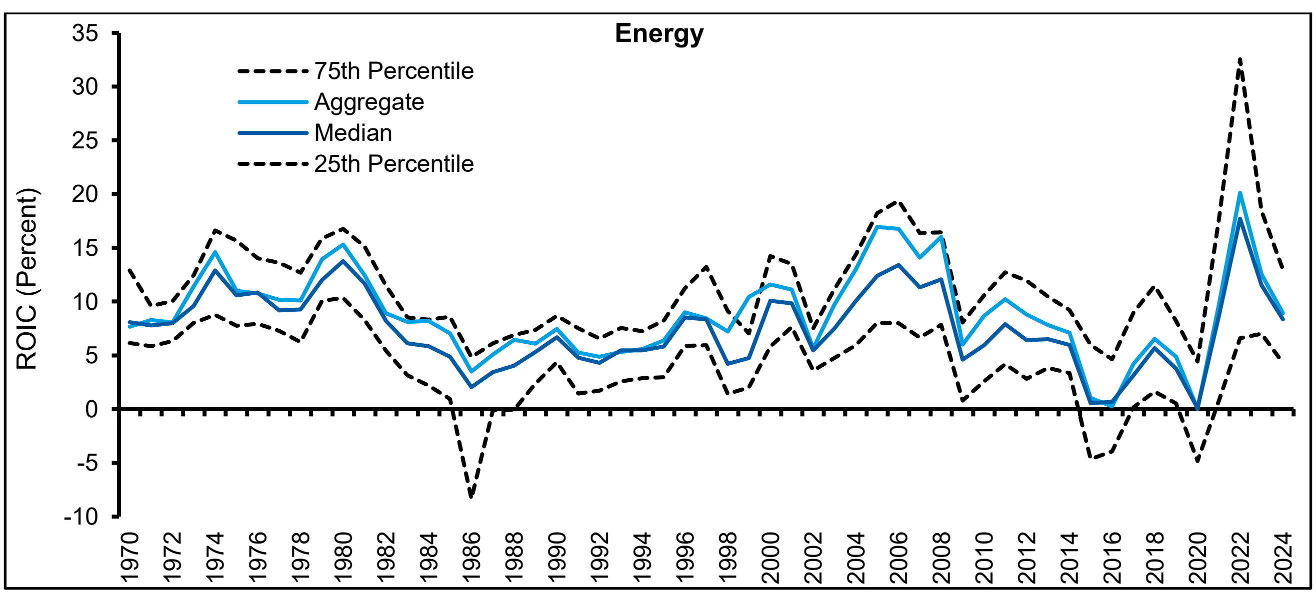
Energy
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ROIC (Percent)
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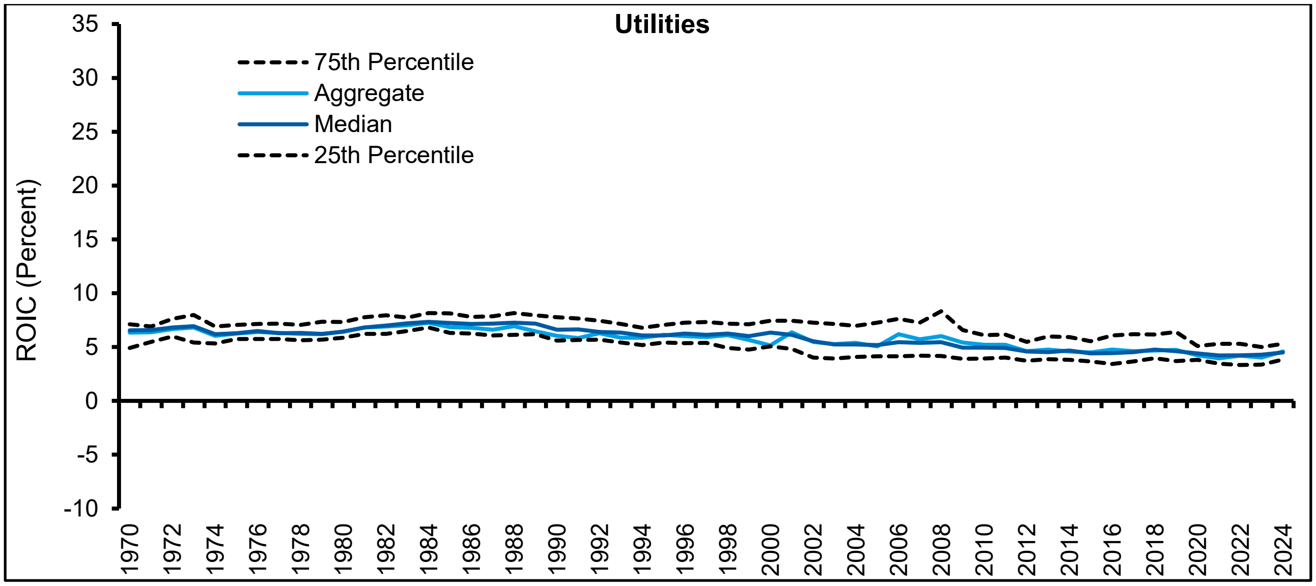

Source: Counterpoint Global, Compustat, and FactSet.
Note: Includes companies with minimum sales of $250 million in 2024 USD.

Endnotes

[1] Technically, there is a distinction between "sustainable value creation" and "sustainable competitive advantage." A company meets the criterion of sustainable value creation if it earns a return on investment above the cost of capital. A company must meet two criteria to have a sustainable competitive advantage: earn a return on investment above the cost of capital (an absolute criterion) and earn a return higher than its competitors (relative criterion). See Joan Magretta, *Understanding Michael Porter: The Essential Guide to Competition and Strategy* (Boston, MA: Harvard Business Review Press, 2012), 64-69.
[2] Michael Mauboussin and Paul Johnson, "Competitive Advantage Period (CAP): The Neglected Value Driver," *Financial Management*, Vol. 26, No. 2, Summer 1997, 67-74.
[3] For "value growth duration," see Alfred Rappaport, *Creating Shareholder Value: A Guide for Managers and Investors–Revised and Updated* (New York: Free Press, 1998). For "fade," see Bartley J. Madden, CFROI Valuation: A Total System Approach to Valuing the Firm (New York: Butterworth-Heinemann, 1999) and David A. Holland and Bryant A. Matthews, *Beyond Earnings: Applying the HOLT CFROI and Economic Profit Framework* (Hoboken, NJ: John Wiley & Sons, 2018). For "T," see Merton H. Miller and Franco Modigliani, "Dividend Policy, Growth, and the Valuation of Shares," *The Journal of Business*, Vol. 34, No. 4, October 1961, 411-433; G. Bennett Stewart, III, *The Quest for Value: A Guide for Senior Managers* (New York: HarperCollins, 1991); and James A. Ohlson and Xiao-Jun Zhang, "On the Theory of Forecast Horizon in Equity Valuation," *Journal of Accounting Research*, Vol. 37, No. 2, Autumn 1999, 437-449. The concept is also discussed in William E. Fruhan, Jr., *Financial Strategy: Studies in the Creation, Transfer, and Destruction of Shareholder Value* (Homewood, IL: Richard D. Irwin, Inc., 1979).
[4] William N. Goetzmann and K. Geert Rouwenhorst, eds. *The Origins of Value: The Financial Innovations That Created Modern Capital Markets* (Oxford: Oxford University Press, 2005), 17-30 and R. H. Parker, "Discounted Cash Flow in Historical Perspective," *Journal of Accounting Research*, Vol. 6, No. 1, Spring 1968, 58-71.
[5] C. G. Lewin, "The Emergence of Compound Interest," *British Actuarial Journal,* Vol. 24, e34, 2019, 1-27.
[6] Giuseppe Franco and Peter Nickl, "A Certain Seminal Character of Profit which We Commonly Call 'Capital': Peter of John Olivi and the *Tractatus de contractibus*," *Journal for Markets and Ethics*, Vol. 6, No. 1, 2018, 11-20.
[7] Parker, "Discounted Cash Flow in Historical Perspective."
[8] www.guinnessworldrecords.com/world-records/549529-oldest-active-bond#. For details of a related security, see https://som.yale.edu/story/2026/prof-rouwenhorst-discusses-yales-378-year-old-perpetual-bond-bbc.
[9] Arthur Mellen Wellington, *The Economic Theory of the Location of Railways: An Analysis of the Conditions Controlling the Laying Out of Railroads to Effect the Most Judicious Expenditure of Capital—Revised and Enlarged Edition* (New York: J. Wiley & Sons, 1887). There is evidence that companies used the discounted cash flow in the late 1800s. See John Richard Edwards and Alison Warman, "Discounted Cash Flow and Business Valuation in a Nineteenth Century Merger: A Note," *Accounting Historians Journal*, Vol. 8, No. 2, Fall 1981, 37-50.
[10] Scott P. Dulman, "The Development of Discounted Cash Flow Techniques in U.S. Industry," *Business History Review*, Vol. 63, No. 3, Autumn 1989, 555-587.
[11] Gordon Shillinglaw, "Residual Values in Investment Analysis," *The Journal of Business*, Vol. 28, No. 4, October 1955, 275-284.
[12] Janette Rutterford, "From Dividend Yield to Discounted Cash Flow: A History of UK and US Equity Valuation Techniques," *Accounting, Business & Financial History*, Vol. 14, No. 2, July 2004, 115-149.
[13] Gabriel A. D. Preinreich, "Stock Yields, Stock Dividends and Inflation," *Accounting Review*, Vol. 7, No. 4, December 1932, 273-289.
[14] Irving Fisher, *The Theory of Interest: As Determined by Impatience to Spend Income and Opportunity to Invest It* (New York: The Macmillan Company, 1930).
[15] Edgar Lawrence Smith, *Common Stocks as Long Term Investments* (New York: The Macmillan Company, 1924).
[16] Benjamin Graham and David L. Dodd, *Security Analysis* (New York: McGraw-Hill, 1934).
[17] Benjamin Graham, David L. Dodd, and Sidney Cottle, *Security Analysis: Principles and Techniques—Fourth Edition* (New York: McGraw-Hill, 1962). This chapter is sometimes called the "lost chapter" because it appears

only in the fourth edition. The equation, on page 537, is Value ≈ P/E ≈ 8.5 + 2g, where g is the expected annual earnings growth rate over the next 7-10 years. For example, the stock of a company with expected annual earnings growth of 7 percent should trade at 22.5 times earnings (22.5 = 8.5 + [2 × 7]).
Graham later modified the equation to Value ≈ P/E ≈ (2g + 8.5) × (Treasury bond yield ÷ AAA bond yield). Assuming a yield of 4.9 percent on the 30-year U.S. Treasury bond, a AAA spread of 50 basis points and the same growth, the stock should trade at 20.4 times earnings (20.4 = (8.5 + [2 × 7]) × [4.9 ÷ 5.4]). See Victor F. Morris, "A Proposed Revision of Benjamin Graham's 1974 Valuation Formula," *Financial Analysts Journal*, Vol. 32, No. 6, November/December 1976, 21-26.
[18] Valeriy Zakamulin and John A. Hunnes, "Stock Earnings and Bond Yields in the US 1871-2017: The Story of A Changing Relationship," *Quarterly Review of Economics and Finance*, Vol. 79, February 2021, 182-197.
[19] Gilbert Burck, "A New Kind of Stock Market," *Fortune*, March 1959, 120-121, 199-201.
[20] John Burr Williams, *The Theory of Investment Value* (Cambridge, MA: Harvard University Press, 1938).
[21] Benjamin Graham, "Reviewed Work: *The Theory of Investment Value* by John Burr Williams," *Journal of Political Economy*, Vol. 47, No. 2, April 1939, 276-278.
[22] Joel Dean, "Better Management of Capital Expenditures Through Research," *Journal of Finance*, Vol. 8, No. 2, May 1953, 119-128. There is also a literature on "residual income" models, which explicitly reflect the fact that a company creates value only when it produces a return on investment above the cost of capital. Alfred Marshall, a prominent 19th century economist, wrote, "What remains of his profits after deducting interest on his capital at the current rate may be called his earnings of undertaking or management" in Alfred Marshall, *Principles of Economics* (London: Macmillan and Co., 1890), 142. Academics who addressed residual income include Preinreich, Edwards and Bell, Peasnell, and most prominently Ohlson. See Gabriel A. D. Preinreich, "Annual Survey of Economic Theory: The Theory of Depreciation," *Econometrica*, Vol. 6, No. 3, July 1938, 219-241; Edgar O. Edwards and Philip W. Bell, *The Theory and Measurement of Business Income* (Berkeley, CA: University of California Press, 1961); K.V. Peasnell, "Some Formal Connections Between Economic Values and Yields and Accounting Numbers," *Journal of Business Finance and Accounting*, Vol. 9, No. 3, September 1982, 361-381; and James A. Ohlson, "Earnings, Book Values, and Dividends in Equity Valuation," *Contemporary Accounting Research*, Vol. 11, No. 2, Spring 1995, 661-687. The concept was also taken up by practitioners and consultants, including DuPont and General Motors, as well as consultants Stern Stewart & Company and Marakon Associates. See Alfred P. Sloan, Jr., *My Years With General Motors* (Garden City, NY: Doubleday, 1963); Stephen F. O'Byrne, "Three Versions of Perfect Pay for Performance (Or The Rebirth of Partnership Concepts in Executive Pay)" *Journal of Applied Corporate Finance*, Vol. 26, No. 1, Winter 2014, 29-38; Stewart, *The Quest for Value*; and James M. McTaggart, Peter W. Kontes, and Michael C. Mankins, *The Value Imperative: Managing for Superior Shareholder Returns* (New York: Free Press, 1994). Note that residual income and free cash flow models produce equivalent values when the assumptions are the same. See Michael J. Mauboussin and Dan Callahan, "Market-Expected Return on Investment: Bridging Accounting and Valuation," *Consilient Observer: Counterpoint Global Insights*, April 14, 2021, 13.
[23] Mark Robichaux, *Cable Cowboy: John Malone and the Rise of the Modern Cable Business* (Hoboken, N.J: John Wiley & Sons, 2002); William N. Thorndike, Jr., *The Outsiders: Eight Unconventional CEOs and Their Radically Rational Blueprint for Success* (Boston, MA: Harvard Business Review Press, 2012), 91; and Steven N. Kaplan, "Campeau's Acquisition of Federated: Value Destroyed or Value Added," *Journal of Financial Economics*, Vol. 25, No. 2, December 1989, 191-212.
[24] John Malone, *Born to Be Wired: Lessons From a Lifetime Transforming Television, Wiring America for the Internet, and Growing Formula One, Discovery, SiriusXM, and the Atlanta Braves* (New York: Simon & Schuster, 2025), 7.
[25] Despite its popularity, this model does not do a good job forecasting equity returns. See Clifford Asness, "Fight the Fed Model," *Journal of Portfolio Management*, Vol. 30, No. 1, Fall 2003, 11-24.
[26] Myron J. Gordon and Eli Shapiro, "Capital Equipment Analysis: The Required Rate of Profit," *Management Science*, Vol. 3, No. 1, October 1956, 102-110; M. J. Gordon, "Dividends, Earnings, and Stock Prices," *Review of Economics and Statistics*, Vol. 41, No. 2, Part 1, May 1959, 99-105; and Myron J. Gordon, *The Investment, Financing, and Valuation of the Corporation* (Homewood, IL: Richard D. Irwin, Inc., 1962).
[27] Mark Rubinstein, *A History of the Theory of Investments: My Annotated Bibliography* (Hoboken, NJ: John Wiley & Sons, 2006), 3-97.

[28] Merton H. Miller and Franco Modigliani, "Dividend Policy, Growth, and the Valuation of Shares," *The Journal of Business*, Vol. 34, No. 4, October 1961, 411-433.
[29] This is true only under restrictive assumptions. See Harry DeAngelo and Linda DeAngelo, "The Irrelevance of the MM Dividend Irrelevance Theorem," *Journal of Financial Economics*, Vol. 79, No. 2, February 2006, 293-315.
[30] Samuel M. Hartzmark and David H. Solomon, "The Dividend Disconnect," *Journal of Finance*, Vol. 74, No. 5, October 2019, 2153-2199.
[31] This formula is a simplified version of a traditional discounted cash flow model with a perpetuity residual value in the case when growth during the explicit forecast period equals the cost of capital.
[32] Michael J. Mauboussin and Dan Callahan, "Valuation Multiples: What They Miss, Why They Differ, and the Link to Fundamentals," *Consilient Observer: Counterpoint Global Insights*, April 23, 2024.
[33] This is discussed in Martin L. Leibowitz, "Franchise Valuation under Q-Type Competition," *Financial Analysts Journal*, Vol. 54, No. 6, November/December 1998, 62-74; Martin L. Leibowitz, *Franchise Value: A Modern Approach to Security Analysis* (Hoboken, NJ: John Wiley & Sons, 2004); and Martin L. Leibowitz and Stanley Kogelman, "Franchise Value and the Price/Earnings Ratio," *The Research Foundation of the Association for Investment Management and Research*, 1994. The caveat to this statement is that current earnings may be unsustainable.
[34] Michael J. Mauboussin and Dan Callahan, "Measuring the Moat: Assessing the Magnitude and Sustainability of Value Creation," *Consilient Observer: Counterpoint Global Insights*, October 15, 2024, 70-71.
[35] We estimate the steady-state value by taking the S&P 500's operating earnings for the trailing four quarters and dividing them by an estimate of the cost of equity capital. The estimate for the equity risk premium comes from Aswath Damodaran, a professor of finance at the Stern School at New York University. We then subtract the steady-state price from the price of the S&P 500 Index to assess the amount ascribed to value creation. The exhibit shows the percentage of the index that the value creation component represents.
[36] Javier Estrada, "PVGO and Expected Stock Returns," *Journal of Applied Corporate Finance*, Vol. 34, No. 4, Fall 2022, 109-112.
[37] Alfred Rappaport, *Creating Shareholder Value: A Guide for Managers and Investors–Revised and Updated* (New York: Free Press, 1998).
[38] Mauboussin and Callahan, "Measuring the Moat."
[39] Warren E. Buffett, "Letter to Shareholders," *Berkshire Hathaway Annual Report*, 2005.
[40] The original rule, NASD Rule 2711, was implemented in 2002. It was superseded by FINRA Rule 2241, which took effect in 2015.
[41] Shengzhong Huang, Hongping Tan, Xiongyuan Wang, and Changqiu Yu, "Valuation Uncertainty and Analysts' Use of DCF Models," *Review of Accounting Studies*, Vol. 28, No. 2, June 2023, 827-861.
[42] Francesca Bastianello, Paul H. Décaire, and Marius Guenzel, "Valuation Models," *Working Paper*, November 2025.
[43] Both Bastianello, Décaire, and Guenzel, "Valuation Models" and Huang, Tan, Wang, and Yu, "Valuation Uncertainty and Analysts' Use of DCF Models" find this.
[44] Jeremiah Green, John R. M. Hand, and X. Frank Zhang, "Errors and Questionable Judgments in Analysts' DCF Models," *Review of Accounting Studies*, Vol. 21, No. 2, June 2016, 596-632.
[45] John Burr Williams has "A Chapter For Skeptics" where he writes: "the old-fashioned methods of appraisal in reality took cognizance of all the factors which gave such intricacy to the new formulas, but the old methods did so implicitly, whereas the new methods do so explicitly." See Williams, *The Theory of Investment Value*, 186.
[46] David A. Holland, "An Improved Method for Valuing Mature Companies and Estimating Terminal Value," *Journal of Applied Corporate Finance*, Vol. 30, No. 1, Winter 2018, 70-77 and Tim Koller, Mark Goedhart, and David Wessels, *Valuation: Measuring and Managing the Value of Companies—Eighth Edition* (Hoboken, NJ: John Wiley & Sons, 2025), 283-284.
[47] A common early reference for terminal value is from Martin Faustmann, "Calculation of the Value Which Forest Land and Immature Stands Possess for Forestry," in *Martin Faustmann and the Evolution of Discounted Cash Flow: Two Articles from the Original German of 1849*, William Linnard, trans., Michael Gane, ed. (Oxford: Commonwealth Forestry Institute, 1968), 27-55 and Bruno Kanieski da Silva, Fatemeh Rezaei, Shaun Tanger, Jesse Henderson, Eric McConnell, and Changyou Sun, "Terminal Value: A Crucial and Yet Often Forgotten

Element in Timber Harvest Scheduling and Timberland Valuation," *Forest Policy and Economics*, Vol. 162, May 2024, 103188. Perhaps not surprising, the formula was brought to the attention of the economics community by Paul Samuelson, one of the most influential economists of the 20th century: Paul A. Samuelson, "Economics of Forestry in an Evolving Society," *Journal of Natural Resources Policy Research*, Vol. 4, No. 3, July 2012, 173-195. Others suggest the Faustmann formula was predated by John Richards, *The Gentleman's Steward and Tenants of Manors Instructed: Containing Rational, Easy, and Familiar Rules and Tables for Finding the Value of Estates of Freehold, Copyhold, or Leasehold, as Well on Lives as for Years Absolute, &c.* (London: Printed for John Senex and William Innys, 1730). See Esa-Jussi Viitala, "Faustmann Formula before Faustmann in German Territorial States," *Forest Policy and Economics*, Vol. 65, April 2016, 47-58.
[48] Williams, *The Theory of Investment Value*, 142-146.
[49] Bradford Cornell and Richard Gerger, "Is It Time to Terminate the Traditional Terminal Value?" *Business Valuation Review*, Vol. 40, No. 1, January 2021, 13-19.
[50] Madeline Shi, "As the Window Widens, PE firms Rush to Exit," *PitchBook*, December 18, 2025.
[51] Debt to total capitalization measured as book value of debt divided by book value of debt plus market value of equity.
[52] Jonathan B. Berk and Jules H. van Binsbergen, "How Do Investors Compute the Discount Rate? They Use the CAPM," *Financial Analysts Journal*, Vol. 73, No. 2, Second Quarter 2017, 25-32.
[53] Mukhlynina and Nyborg, "The Choice of Valuation Techniques in Practice," 232. See Table 9, Panel B.
[54] Michael J. Mauboussin and Dan Callahan, "Cost of Capital: A Practical Guide to Measuring Opportunity Cost," *Consilient Observer: Counterpoint Global Insights*, February 15, 2023.
[55] Discoveries: Marius Guenzel, "What Shapes Analysts' Long-Term Forecasts?" *Finance Centers at the Wharton School*, March 26, 2025 and Pedro Bordalo, Nicola Gennaioli, Rafael La Porta, and Andrei Shleifer, "Belief Overreaction and Stock Market Puzzles," *Journal of Political Economy*, Vol. 132, No. 5, May 2024, 1450-1484.
[56] Lilia Mukhlynina and Kjell G. Nyborg, "The Choice of Valuation Techniques in Practice: Education Versus Profession," *Critical Finance Review*, Vol. 9, Nos. 1-2, June 2020, 201-265.
[57] This is free cash flow to firm (FCFF). An alternative is free cash flow to equity (FCFE), which projects FCF after financing costs and discounts them at the cost of equity capital. We demonstrate that they are theoretically equivalent. We also show that treating stock-based compensation as an expense or as dilution is also equivalent. See Michael J. Mauboussin and Dan Callahan, "Stock-Based Compensation: Unpacking the Issues," *Consilient Observer: Counterpoint Global Insights*, April 18, 2023, 21-22.
[58] James R. Morris, "Life and Death of Businesses: A Review of Research on Firm Mortality," *Journal of Business Valuation and Economic Loss Analysis*, Vol. 4, No. 1, 2009, Article 3.
[59] The value of $1 at 3 percent terminal growth is $25 ($1 ÷ [0.07 – 0.03] = $25) and at 5 percent is $50 ($1 ÷ [0.07 – 0.05] = $50). Since the terminal value is commonly 70 percent of total value, a 50 percent increase in its value can lift firm value by 35 percent. (If explicit value is $30 and terminal value is $70 for a total value of $100, the terminal value goes to $105 with a 50 percent increase, making the total firm value $135.)
[60] Robert C. Higgins, ''How Much Growth Can a Firm Afford?'' *Financial Management*, Vol. 6, No. 3, Fall 1977, 7-16.
[61] Gene A. Trevino, "Is Expected Inflation the Best Long-term Sustainable Growth Rate?" *Business Valuation Review*, Vol. 41, No. 3, June 2022, 84-90.
[62] Alfred D. Chandler, "The Emergence of Managerial Capitalism," *Business History Review*, Vol. 58, No. 4, Winter 1984, 473-503.
[63] Matthew T. Panhans, "The Rise, Fall, and Legacy of the Structure-Conduct-Performance Paradigm," *Journal of the History of Economic Thought*, Vol. 46, No. 3, September 2024, 337-357.
[64] Joe S. Bain, *Barriers to New Competition* (Cambridge, MA: Harvard University Press, 1956) and Joe S. Bain, *Industrial Organization* (New York: John Wiley & Sons, 1959). The quotation comes from *Industrial Organization*, 460.
[65] George J. Stigler, *Capital and Rates of Return in Manufacturing Industries* (Princeton, NJ: Princeton University Press, 1963), 54. In 1933, Horace Secrist, a statistician at Northwestern University, published a book called *The Triumph of Mediocrity in Business*. The title accurately reveals the content. Secrist summarized his argument,

by writing, "Mediocrity tends to prevail in the conduct of competitive business." See Horace Secrist, *The Triumph of Mediocrity in Business* (Evanston, IL: Bureau of Business Research, Northwestern University, 1933).
[66] Richard W. Puyt, Finn Birger Lie, and Celeste P.M. Wilderom, "The Origins of SWOT Analysis," *Long Range Planning*, Vol. 56, Issue 3, June 2023, 102304.
[67] Edmund P. Learned, C. Roland Christensen, Kenneth R. Andrews, and William D. Guth, *Business Policy: Text and Cases* (Homewood, IL: Richard D. Irwin, 1965).
[68] John von Neumann and Oskar Morgenstern, *Theory of Games and Economic Behavior* (Princeton, NJ: Princeton University Press, 1944).
[69] Avinash K. Dixit and Barry J. Nalebuff, *Thinking Strategically: The Competitive Edge in Business, Politics, and Everyday Life* (New York: W. W. Norton & Company, 1991); Avinash K. Dixit and Barry J. Nalebuff, *The Art of Strategy: A Game Theorist's Guide to Success in Business and Life* (New York: W. W. Norton & Company, 2008); and Adam M. Brandenburger and Barry J. Nalebuff, *Co-opetition: 1. A Revolutionary Mindset That Combines Competition and Cooperation. 2. The Game Theory Strategy That's Changing the Game of Business* (New York: Doubleday, 1996).
[70] Porter took Christensen's course but Ken Andrews may be the best known of the faculty members who taught Business Policy. His work in the areas is summarized in Kenneth R. Andrews, *The Concept of Corporate Strategy—Revised Edition* (Homewood, IL: Richard D. Irwin, 1980).
[71] Walter Kiechel III, *The Lords of Strategy: The Secret Intellectual History of the New Corporate World* (Boston, MA: Harvard Business Press, 2010), 122.
[72] Ibid., 124.
[73] Michael E. Porter, *Competitive Strategy: Techniques for Analyzing Industries and Competitors* (New York: The Free Press, 1980); Michael E. Porter, *Competitive Advantage: Creating and Sustaining Superior Performance* (New York: Simon & Schuster, 1985); and Magretta, *Understanding Michael Porter*.
[74] Jay Barney, "Firm Resources and Sustained Competitive Advantage," *Journal of Management*, Vol. 17, No. 1, March 1991, 99-120 and Birger Wernerfelt, "A Resource-Based View of the Firm," *Strategic Management Journal*, Vol. 5, No. 2, April-June 1984, 171-180.
[75] Ming zhu Wang, "Changes in Industry and Corporate Effects in the United States, 1978-2019," *Strategic Management Journal*, Vol. 44, No. 2, February 2023, 477-490.
[76] Adam M. Brandenburger and Harborne W. Stuart, Jr., "Value-Based Business Strategy," *Journal of Economics & Management Strategy*, Vol. 5, No.1, Spring 1996, 5-24. Also see Harborne W. Stuart, Jr., *The Profitability Test: Does Your Strategy Make Sense?* (Cambridge, MA: MIT Press, 2016) and Felix Oberholzer-Gee, *Better, Simpler Strategy: A Value-Based Guide to Exceptional* Performance (Boston, MA: Harvard Business Review Press), 2021.
[77] Jay B. Barney, David J. Ketchen, Jr., and Mike Wright, "Resource-Based Theory and the Value Creation Framework," *Journal of Management*, Vol. 47, No. 7, September 2021, 1936-1955.
[78] Clayton M. Christensen, *The Innovator's Dilemma: When New Technologies Cause Great Firms to Fail* (Boston, MA: Harvard Business School Press, 1997). Hamilton Helmer, a business strategist, enumerates seven powers, including one he calls "counter-positioning." We consider disruptive innovation and counter-positioning to be similar. Helmer says counter-positioning is relevant when: "A newcomer adopts a new, superior business model which the incumbent does not mimic due to the anticipated damage to their existing business." See Hamilton Helmer, *7 Powers: The Foundations of Business Strategy* (Los Altos, CA: Deep Strategy, 2016), 57-58.
[79] Joan Magretta, "Why Business Models Matter," *Harvard Business Review*, Vol. 80, No. 5, May 2002, 86-91, 133 and David J. Teece, "Business Models, Business Strategy and Innovation," *Long Range Planning*, Vol. 43, Nos. 2-3, April-June 2010, 172-194. Some research suggests that business model has the same impact on business performance as industry does. See Timo Sohl, Govert Vroom, and Markus A. Fitza, "How Much Does Business Model Matter for Firm Performance? A Variance Decomposition Analysis," *Academy of Management Discoveries*, Vol. 6, No. 1, March 2020, 61-80.
[80] Mauboussin and Callahan, "Measuring the Moat."
[81] Leigh Van Valen, "A New Evolutionary Law," *Evolutionary Theory*, Vol. 1, No. 1, July 1973, 1-30.
[82] Hendrik Bessembinder, "One Hundred Years in the U.S. Stock Markets," *Working Paper*, March 21, 2026; Madeleine I. G. Daepp, Marcus J. Hamilton, Geoffrey B. West, and Luís M. A. Bettencourt, "The Mortality of

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[86] Craig Doidge, G. Andrew Karolyi, and René Stulz, "The U.S. Listing Gap," *Journal of Financial Economics*, Vol. 123, No. 3, March 2017, 464-487; Center for Research in Security Prices; Counterpoint Global.
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https://site.warrington.ufl.edu/ritter/files/IPO-Statistics.pdf.
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