

Counterpoint Global Insights

Trading Stages in the Company Life Cycle

CONSILIENT OBSERVER | September 26, 2023

Introduction

Understanding where a company is in its life cycle is helpful for assessing capital allocation, the cost of financing, corporate governance, and valuation.¹ The corporate life cycle captures the stages of a company's existence, from birth to growth to maturation to eventual decline. The way to manage and evaluate a new company that is expanding rapidly is very different than it is for an old company that serves a mature and saturated market.

Exhibit 1 is a classic picture of the company life cycle. Early on, the spread between return on invested capital (ROIC) and the weighted average cost of capital (WACC) is negative as the company invests to create a good or service that the market will demand.² The business then grows and the spread between ROIC and WACC turns positive and ultimately peaks. In the end, market saturation and competition lead to a decline in the spread until the firm's returns are equal to, or less than, the cost of capital. The magnitude and sustainability of the spread between ROIC and WACC are the defining features of competitive advantage.

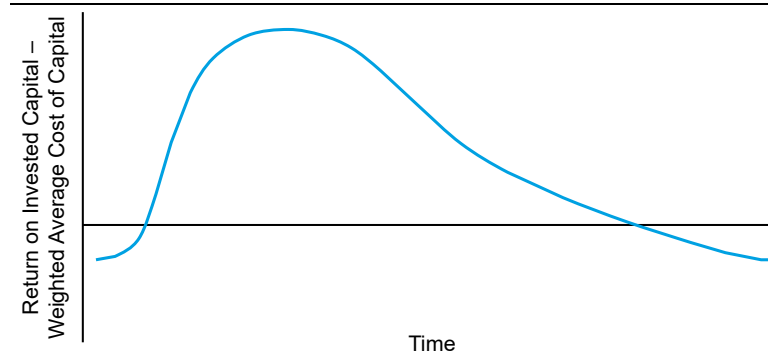
Properly placing a company within a life cycle is challenging because most firms offer multiple goods or services that are often at different points in their individual product life cycles. Further, companies transition from one stage to another.

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Exhibit 1: The Classic Company Life Cycle



Source: Counterpoint Global.

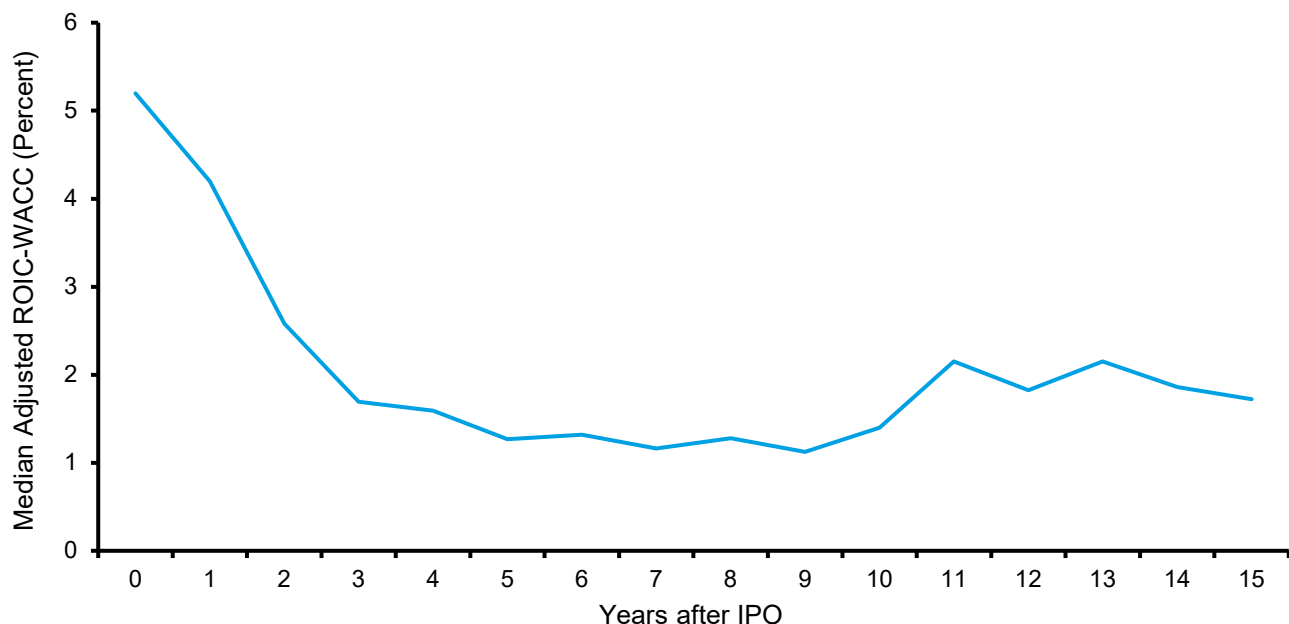
Researchers often default to proxies to classify companies because it is hard to locate their current spot in the life cycle. Age is a common proxy. This makes sense as it anthropomorphizes companies. We will see that the average age of companies in the middle and later stages is higher than that in the early stages. But age has limitations, including the fact that some industries move through the life cycle faster than others, some firms are quicker learners than their peers, and we can measure age in different ways, such as by listing or founding date.³

Other proxies include size and profitability. The notion of size is that small companies are early, and large companies late, in the life cycle. We find that size does not add much to the analysis. The correlation between age and size, while positive, is low. Profitability, measured by ROIC, helps place companies in stages when it is combined with investment opportunity.⁴

We examined the spread between ROIC and WACC for companies that did an initial public offering (IPO) from 1990 to 2022. We expected to see a pattern similar to that in exhibit 1: low or negative spreads between ROIC and WACC for companies newly listed, rising spreads as they mature, and a decline in senescence. But what we found was nearly the opposite. The spread at the date of the IPO was high and narrowed before stabilizing around year five (see exhibit 2).⁵

This report analyzes the corporate life cycle and its implications for investors. We start by building on a framework for establishing stages within the life cycle and describe how to use the statement of cash flows to place companies in the appropriate stage. We then show the aggregate results, by stage, following the process of sorting. These include the average ROIC, age, and growth of the companies in each stage. Next, we show the rate at which companies transition from one stage to another, noting that they can move back and forth in the cycle. We also show the historical total shareholder returns (TSRs) that investors have earned from the stocks of companies that have either transitioned between stages or stayed in the same stage. Finally, we create a list of relevant considerations for the stages within the life cycle.

Exhibit 2: Median ROIC – WACC Spread for Companies from IPO to Year 15, 1990 to 2022



Source: FactSet and Counterpoint Global.

Note: ROIC adjusted for intangible investment; Russell 3000 excluding the financial and real estate sectors.

Defining Stages in the Life Cycle

There are a lot of frameworks of the corporate life cycle.⁶ Most are descriptive and not based on empirical analysis. But all of them sketch a similar picture. Early on, companies have profitability that is below their ultimate potential and they have abundant investment opportunities. It is common for them to invest more than they earn. In the middle stages, companies reach their peak profitability and investment prospects are more limited. Earnings are greater than investments. Finally, in the later stages, companies see their profitability and investment options wane.

The economists Michael Gort and Steven Klepper developed a life cycle framework based on five stages. Victoria Dickinson, a professor of accounting at the University of Mississippi, named the stages introduction, growth, maturity, shake-out, and decline.⁷ (We change her “mature” stage to “maturity” for clarity.) Dickinson added rigor to the classification by linking the stages to results within the statement of cash flows.⁸ Her approach provides a way to place companies in the appropriate stage, which allows us to determine when companies transition between stages.⁹ These insights, complemented by data on shareholder returns, can help guide executives and investors.

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 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. The Financial Accounting Standards Board in the U.S. mandated that companies include the statement in its current form in 1988, making it a relatively new financial statement. Finance textbooks tend to focus more on the income statement and balance sheet than on the statement of cash flows.¹⁰

Dickinson's insight is that the combination of results from each part of the statement of cash flows indicates where a company is within its life cycle. Cash flow from operating activities reveals the cash in and out from customer activity and therefore indicates profitability. Cash flow from investing activities shows the magnitude of the company's investment in pursuit of growth that ostensibly creates value. Cash flow from financing activities reconciles the difference between the cash flows associated with operations and investments.

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 outcomes and three sections, which means that there are eight possible combinations (2³). The 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.** Companies in this stage launch a good or service they hope 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 prospects. Cash flow from financing is an inflow as the company must raise capital to fund its expansion.
- **Growth.** In this stage the marketplace has accepted the good or service but the threat of new entrants remains. 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 entrance 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 near maintenance levels. Cash flow from financing flips to an outflow, as the company has the resources to retire debt or pay shareholders through dividends or share buybacks.
- **Shake-out.** In this stage, the industry starts to contract and firms exit. It reflects three of the eight possible combinations for cash flows and is a catchall for companies that do not fall clearly 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.** In this stage the company, reflecting the markets it serves, is in decline reflecting either 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.

Exhibit 3 summarizes the link between the life cycle stages and the statement of cash flows. The combinations that Dickinson selects to define each stage are based on economic and finance theory, with the exception of the shake-out stage. The link between theory and financial statement results allows us to move beyond qualitative assessments and into data analysis. The introduction stage was about 6 percent of our sample, growth 38 percent, maturity 43 percent, shake-out 7 percent, and decline 6 percent.

Exhibit 3: Summary of Link Between Life Cycle Stage and Statement of Cash Flows

Cash Flow Type	Life Cycle Stage				
	Introduction	Growth	Maturity	Shake-Out	Decline
Operating	Outflow (-)	Inflow (+)	Inflow (+)	Inflow/inflow/outflow (+/-)	Outflow (-)
<i>Premise</i>	<i>Absorbing costs</i>	<i>Improving profitability</i>	<i>Improved efficiency</i>	<i>Declining growth and prices</i>	<i>Declining growth and prices</i>
Investing	Outflow (-)	Outflow (-)	Outflow (-)	Inflow/inflow/outflow (+/-)	Inflow (+)
<i>Premise</i>	<i>Substantial investment</i>	<i>Invest to deter entry</i>	<i>Maintenance spending</i>		<i>Liquidate assets</i>
Financing	Inflow (+)	Inflow (+)	Outflow (-)	Inflow/outflow/outflow (+/-)	Inflow/outflow (+/-)
<i>Premise</i>	<i>Raise capital for growth</i>	<i>Raise capital for growth</i>	<i>Return of capital</i>		<i>Debt repayment or renegotiation</i>

Source: Victoria Dickinson, "Cash Flow Patterns as a Proxy for Firm Life Cycle," Accounting Review, Vol. 86, No. 6, November 2011, 1969-1994 and Counterpoint Global.

We have argued that the statement of cash flows has become increasingly misleading in recent years.¹¹ As a result, we make three adjustments to the statement to better reflect the economics of businesses. We believe that these changes, which we apply to our full sample, align with life cycle theory.

The first adjustment moves stock-based compensation (SBC) from cash flow from operations to cash flow from financing. The rationale is that SBC is in effect one figure that captures both financing and compensation.¹² A firm issues shares (financing) and uses the proceeds to remunerate employees (compensation). For this reason, it makes sense to remove the benefit of adding back SBC to cash flow from operations. This adjustment has the largest impact on relatively small companies in the technology and health care sectors.¹³

The second adjustment moves intangible investment from cash flow from operations to cash flow from investing. An investment is an outlay today that is expected to generate future cash flows. Tangible assets, including new stores or distribution centers, are physical and accountants record them on the balance sheet as assets and on the statement of cash flows as cash flow from investing.

Intangible assets, such as advertising and software, are not physical, and companies expense them on the income statement. Cash flow from operations and investing are both understated as a result.

This is important because intangible investments now exceed tangible investments for public companies in the U.S. For example, we estimate that intangible SG&A investment was \$1.9 trillion, and capital expenditures \$1.1 trillion, for companies in the Russell 3000 in 2022, excluding companies in the financial and real estate sectors. The Russell 3000 is an index that tracks the largest stocks in the U.S. by market capitalization.

Making this adjustment requires judgment about how much of the selling, general, and administrative (SG&A) expense is necessary to support current operations and how much is an intangible investment that is discretionary. Further, the adjustment requires an estimate of the useful lives of these assets. This allows us to estimate amortization. Estimating the magnitude of intangible investment and appropriate asset lives is an active area of research in finance and accounting.¹⁴

The final adjustment is to remove the purchases and sales of marketable securities from cash flow from investing. We do this because we want to focus on investments in the business rather than changes in the holdings of liquid securities.

Exhibit 4 illustrates the point by showing all three adjustments for Amazon for their annual results in 2022. Cash flow from operations goes from a reported total of \$46.8 billion to an adjusted total of \$105.6 billion, more than doubling. The sharp increase is the result of substantial intangible investment, net of amortization, and is despite the \$19.6 billion reduction as the result of eliminating the benefit of adding back SBC. Cash flow from investing goes from a reported outflow of \$37.6 billion to an adjusted outflow of \$145.0 billion, underscoring the company's massive investment. Finally, cash flow from financing goes from a reported inflow of \$9.7 to an adjusted inflow of \$29.3 billion, with the greatest part of the increase coming from the restatement of SBC. Based on these adjusted figures, Amazon is in the growth stage of the life cycle.

Note these adjustments affect neither Amazon's free cash flow nor the ability of the statement of cash flows to reconcile the balance of cash and marketable securities from one year to the next. But they do reclassify items to gain better insight into Amazon's stage in the life cycle.

Exhibit 4: Summary of Adjustments to Amazon's Statement of Cash Flows, 2022

	Cash Flow Type		
	Operating Activities	Investing Activities	Financing Activities
Reported total	\$46.8 billion	-\$37.6 billion	\$9.7 billion
Stock-based compensation	-19.6		19.6
Intangible investments, net	78.4	-78.4	
Marketable securities		-29.0	
Adjusted total	\$105.6 billion	-\$145.0 billion	\$29.3 billion

Source: Amazon and Counterpoint Global estimates and adjustments.

Results for Life Cycle Stages

We categorize companies in stages by using Dickinson's method and including our adjustments. The analysis includes the companies of the stocks in the Russell 3000, excluding those in the financial and real estate sectors, from 1990 to 2022. The sample includes more than 65,000 observations. We then calculate other measures, including the ROIC, age since IPO, and the sales growth rate of the companies in each stage.

We start with ROIC, defined as net operating profit after taxes (NOPAT) divided by invested capital. NOPAT, a company's cash earnings assuming no financial leverage, is derived primarily from the income statement. Invested capital, equivalently the net assets necessary to generate NOPAT and how the company finances those assets, is calculated using the balance sheet.

The adjustment for intangible investment increases NOPAT and invested capital. The adjustment to NOPAT has less impact than that for invested capital for certain companies with high traditional ROICs. That means that the ROIC adjusted for intangibles is lower than the traditional one. For some firms with low traditional ROICs, the adjustment to NOPAT is more significant than that for invested capital, which makes the adjusted ROIC higher. Average ROICs are similar for the traditional and adjusted calculations, but the extremes regress toward the average when we consider intangible investments.¹⁵

Exhibit 5 shows the median, average, and aggregate adjusted ROICs by stage in the life cycle. Note the pattern is consistent with the traditional life cycle (exhibit 1). ROICs are negative in the introduction stage as companies seek to establish their good or service and absorb preproduction costs. ROICs then climb in the growth and maturity stages and again drift lower in the shake-out and decline stages. The average annual adjusted ROIC was 9.2 percent for companies in the Russell 3000 from 1990 to 2022, excluding financials and real estate.

Exhibit 5: Adjusted ROICs for Companies in Each Life Cycle Stage

Stage	Median	Average	Aggregate
Introduction	-7.6%	-10.1%	-3.2%
Growth	11.2	14.6	9.4
Maturity	10.3	12.7	11.5
Shake-Out	3.0	3.5	4.7
Decline	-13.8	-18.9	-9.4

Source: FactSet and Counterpoint Global.

Note: Median and average ROICs based on ROICs winsorized at 1st and 99th percentiles.

Exhibit 6 presents the median and average age, calculated as the age since IPO, for companies in each stage. There is a steady increase in age from introduction through maturity, followed by a decrease in the decline stage. Two points are worth emphasizing. First, companies transition from one stage to another. Second, some relatively young companies end up in the decline stage because the rate of change varies by industry.

Exhibit 6: Median and Average Age Since IPO for Companies in Each Life Cycle Stage

Stage	Median	Average
Introduction	6.4 Years	9.2 Years
Growth	7.7	10.6
Maturity	13.8	15.6
Shake-Out	13.6	15.4
Decline	10.1	12.4

Source: FactSet and Counterpoint Global.

We now look at the median one- and three-year annualized sales growth rates by stage (exhibit 7). We show the figures in nominal terms and adjusted for inflation (real). Growth rates over the one- and three-year periods decline consistently for each stage from introduction to shake-out. Investors seeking stocks of companies that grow at a rate above the median are well served to focus on the introduction and growth stages. Investors looking for slower growth and higher profitability can concentrate on the maturity stage.

Exhibit 7: Median Nominal and Real Sales Growth for Companies in Each Life Cycle Stage

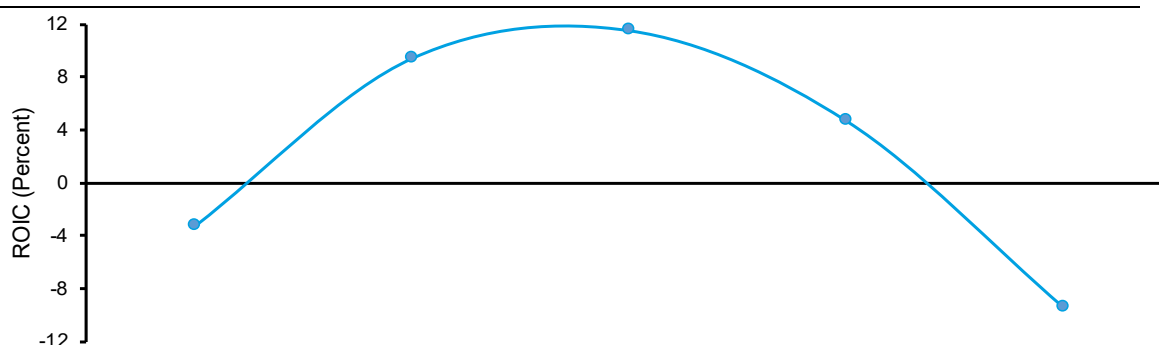
Stage	Nominal (Annualized)		Real (Annualized)	
	1-Year	3-Year	1-Year	3-Year
Introduction	14.7%	10.8%	11.9%	8.5%
Growth	13.3	9.9	10.9	7.7
Maturity	5.5	5.4	3.3	3.3
Shake-Out	3.1	3.6	0.9	1.5
Decline	3.1	4.1	0.9	2.0

Source: FactSet and Counterpoint Global.

Note: Growth rates reflect the years after entering each stage.

Exhibit 8 summarizes the analysis of the stages. Dickinson's approach to placing companies in the life cycle, honed by adjustments to SBC, intangible investment, and marketable securities, delivers results that align with theory and the perception of most investors. But to create this picture we need to allow companies to change stages freely rather than migrate sequentially from introduction to maturity.

Exhibit 8: Summary of Results for Life Cycle Stages



	Life Cycle Stage				
	Introduction	Growth	Maturity	Shake-Out	Decline
Statistic					
ROIC (%)	-3.2	9.4	11.5	4.7	-9.4
Age since IPO (years)	6.4	7.7	13.8	13.6	10.1
Sales growth (%)	10.8	9.9	5.4	3.6	4.1
Percent of sample	6.5	38.1	42.6	6.8	6.0
Cash Flow Type					
Operations	Outflow (-)	Inflow (+)	Inflow (+)	Inflow/inflow/outflow	Outflow (-)
Investing	Outflow (-)	Outflow (-)	Outflow (-)	Inflow/inflow/outflow	Inflow (+)
Financing	Inflow (+)	Inflow (+)	Outflow (-)	Inflow/outflow/outflow	Inflow/outflow

Source: FactSet and Counterpoint Global.

Note: ROIC=return on invested capital; IPO=initial public offering; aggregate ROIC; median age; nominal sales growth for next 3 years, annualized.

Transition Between Stages

Academics who study competitive strategy emphasize that the outcomes we see reflect in part the differences in capabilities and resources among companies.¹⁶ Dynamic capability, defined as “the capacity of an organization to purposefully create, extend, or modify its resource base,” explains how companies can migrate from one stage to another.¹⁷

Exhibit 9 shows the three-year transition rates for our sample. The rows show the beginning stage and the columns show the ending stage three years later. For example, 38 percent of the companies that start in the growth stage end up in the maturity stage. Firms in the introduction stage most frequently migrate to the growth stage. The most common outcome for firms in the growth or maturity stage is to stay put. More than five out of ten firms that start in the shake-out stage end up in the maturity stage. And companies that begin in the decline stage are most likely to migrate to the maturity or growth stage.

Exhibit 9: Three-Year Transition Rates from Beginning to Ending Life Cycle Stages, 1990-2022

Beginning Stage	Ending Stage				
	Introduction	Growth	Maturity	Shake-Out	Decline
Introduction	26%	35%	15%	6%	18%
Growth	5%	44%	38%	7%	6%
Maturity	2%	25%	62%	8%	4%
Shake-Out	4%	24%	51%	13%	7%
Decline	12%	29%	31%	10%	18%

Source: FactSet and Counterpoint Global.

To illustrate how a company transitions from one stage to another, exhibit 10 tracks Amazon's stages from 1998 to 2022. Over the 25-year period, the company spent more than two-thirds of the years in the growth stage, almost 30 percent of the time in the maturity stage, and one year in the decline stage. The appendix shows the transitions of a dozen large companies, as well as one recent failure, across a variety of sectors.

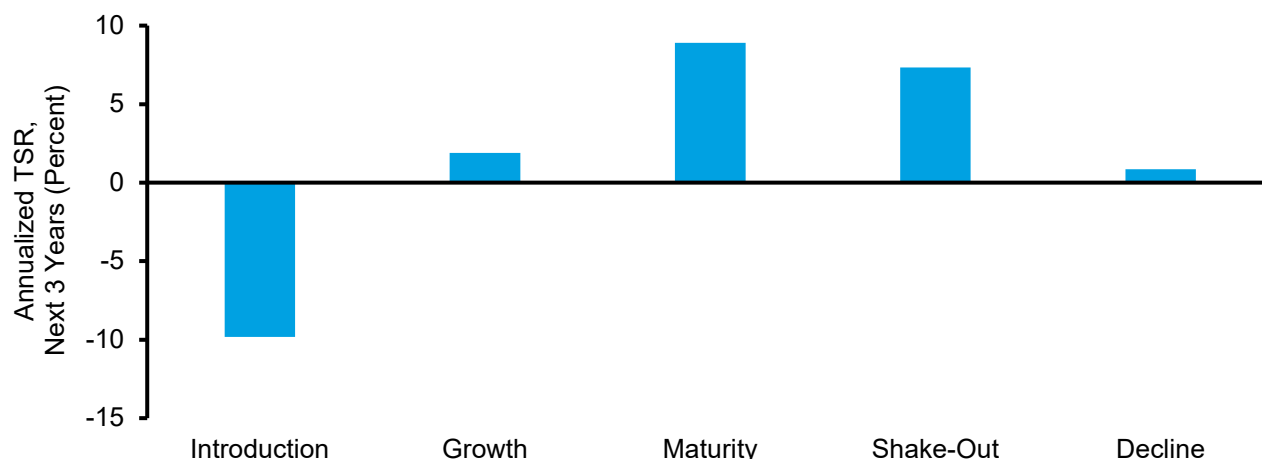
Exhibit 10: Amazon's Transition Between Life Cycle Stages, 1998-2022

Introduction	1998	1999	2000	2001	2002	2003	2004	2005	2006	2007	2008	2009	2010	2011	2012	2013	2014	2015	2016	2017	2018	2019	2020	2021	2022
Growth																									
Maturity																									
Shake-Out																									
Decline																									

Source: FactSet and Counterpoint Global.

We next examine the relationship between total shareholder returns (TSRs) and the stages as well as the transitions from one stage to another. Exhibit 11 shows the average annualized TSRs from buying all the stocks of the companies in each stage in a starting year and holding them for three years.

The stocks of the companies that started in the maturity stage provided the highest TSRs, followed by the shake-out and growth stages. Dickinson also found that companies in the maturity stage earned “positive future excess returns.”¹⁸ Note that the maturity and growth stages together are roughly 80 percent of the sample, 12 times as many firms as there are in the shake-out stage. TSRs for the stocks of companies in the decline stage were nearly zero, and the stocks of firms in the introduction phase delivered negative TSRs.

Exhibit 11: Three-Year Annualized TSRs Based on Beginning Life Cycle Stage, 1990-2022

Source: FactSet and Counterpoint Global.

Anticipating transitions between stages may be hard but offers an opportunity to generate distinctive TSRs (see exhibit 12). The stocks of companies that started in essentially any stage delivered solid to excellent TSRs if they transitioned to the growth or maturity stages. For instance, a portfolio of the stocks of companies that started in the decline stage and ended up in the growth stage three years later generated average annual TSRs of 20 percent and those that found their way to the maturity stage earned 16 percent.

Exhibit 12: Three-Year Annualized Average TSRs Based on Combinations of Life Cycle Stages, 1990-2022

		Ending Life Cycle Stage				
		Introduction	Growth	Maturity	Shake-Out	Decline
Beginning Life Cycle Stage	Introduction	3%	19%	8%	-6%	-17%
	Growth	-5%	14%	8%	-4%	-16%
	Maturity	-3%	14%	12%	3%	-5%
	Shake-Out	4%	15%	13%	5%	-3%
	Decline	4%	20%	16%	5%	-4%

Source: FactSet and Counterpoint Global.

Further, a portfolio of stocks of companies that ended up in the decline stage generated poor TSRs, from -17 to -3 percent, no matter their initial stage. Landing in either the introduction or the shake-out stage was associated with returns below of those of the Russell 3000 index overall.

These results are consistent with our analysis that shows that rising ROICs over a three-year period are associated with attractive TSRs and falling ROICs are related to poor TSRs.¹⁹ Research shows that a model based on the life cycle allows for better predictions of future growth and profitability than models based on industries or the overall economy.²⁰

Predicting a company's path from one stage to another is difficult, and substantial dispersion underlies the TSR figures. That said, few investors use the statement of cash flows to place companies in stages within the life cycle or consider how changes in the statement of cash flows may lead to potential transitions that can result in excess returns.

How the Life Cycle Provides a Framework to Understand Businesses

The life cycle framework puts companies in categories that can help executives and investors assess and value them. For example, life cycle theory is relevant for capital allocation, the cost of financing, corporate governance, and valuation. We briefly discuss each of these topics.

- **Capital allocation.** Introduction, growth, and maturity are the first three stages of the life cycle, and all have outflows from investments. Companies can find, fund, and execute only a finite amount of investment opportunities that promise to create value. Some companies run the risk of making investments that destroy value in the pursuit of sales or profit growth.

The retail industry offers a good illustration. Academics studied retailers that had reached the maturity stage. It made sense for these companies to slow growth in capital expenditures because the ROIC on incremental investments was subpar. They found that those retailers that curtailed growth generated substantially higher TSRs than those that proceeded with a growth strategy.²¹

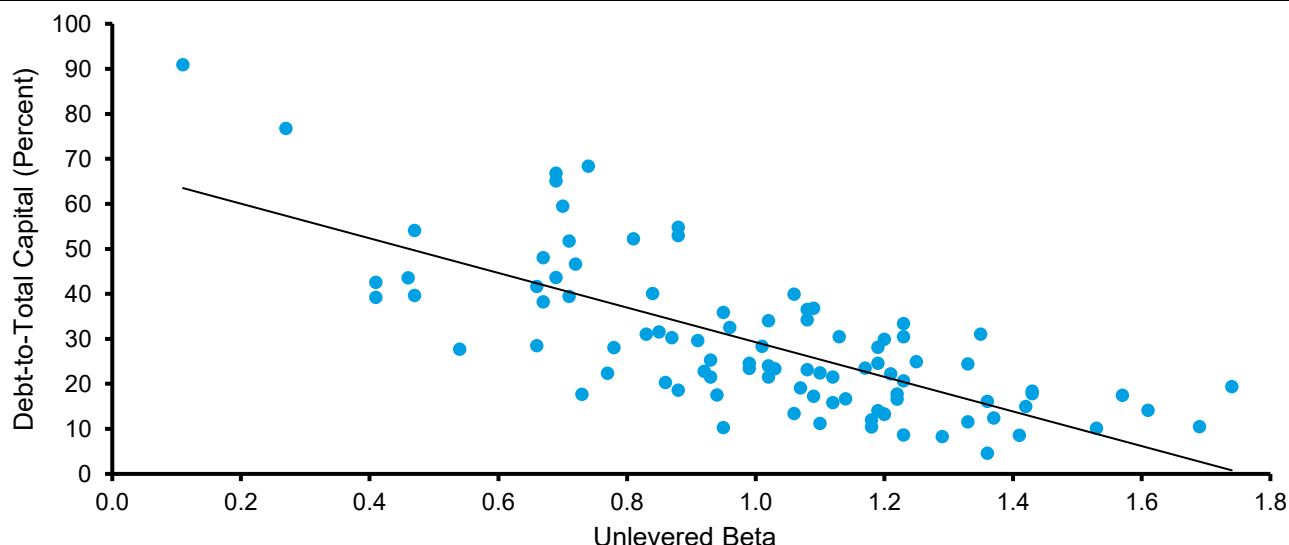
The retail case is clear because new stores are visible and measurable investments, but similar thinking applies to all investments. As noted, intangible investments now exceed tangible ones for public companies in the U.S., so executives and investors have to assess the return on those incremental investments with the same care.²²

The general story is that companies invest substantially in the early stages of the life cycle and return capital to debt and equity holders in the latter ones. Free cash flow, which equals NOPAT minus investment in future growth, is a measure of a company's ability to disburse capital to claimholders.

Companies commonly invest more than they earn when they are young and hence have negative free cash flow. They must finance the gap through the issuance of equity or debt. Companies generally earn more than they invest when they are mature and therefore generate positive free cash flow. This allows them to return capital. The pattern of cash holdings, as well as equity and debt issuance, are consistent with this sketch.²³

- **Financing costs.** The combination of underlying business risk and the mix of debt and equity financing determines a company's financing costs. Business risk is the perceived volatility of operating profits. Investors use unlevered beta, also known as asset beta, to measure business risk. Unlevered beta is a company's market risk excluding the effect of debt. The debt-to-total capital ratio, debt divided by the sum of debt and the market value of equity, captures the mix of debt and equity financing. Interest expense from debt financing is essentially a fixed cost. As a result, adding debt increases risk.²⁴

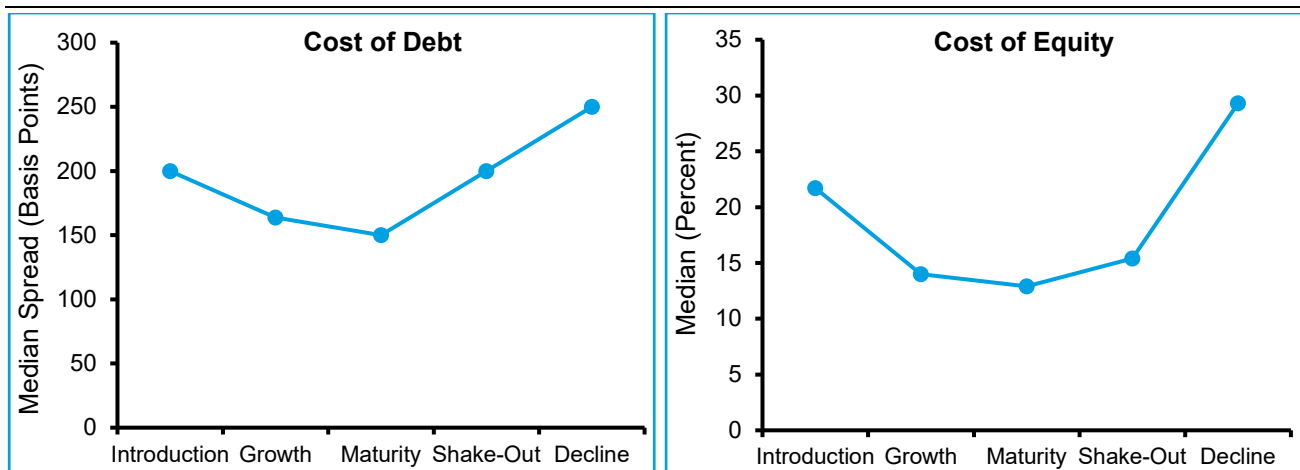
Exhibit 13 presents the association between unlevered beta and the debt-to-total capital ratio for nearly 100 industries using data provided by Aswath Damodaran, a professor of finance. In general, industries with high business risk have lower debt-to-total capital ratios than industries with low business risk do.

Exhibit 13: Unlevered Beta and Debt-to-Total Capital Ratios by Industry

Source: Aswath Damodaran and Counterpoint Global.

The cost of debt and equity reflect the opportunity costs of capital providers.²⁵ Intuitively, overall risk appears highest when a company is young and its prospects are unclear and when it is in decline and its prospects are waning. This is precisely what the research shows. Using Dickinson's life cycle categorization, the cost of equity and the cost of debt both follow a "U" shape: high in the introduction stage, low in the growth and maturity stages, and high again in the shake-out and decline stages.²⁶

Exhibit 14 shows these results based on academic studies. The cost of debt (left) is captured by the spread over the London Interbank Offered Rate (LIBOR) for in excess of 20,000 loans made to nearly 5,100 public companies in the U.S. in the 20 years ended in 2018. The cost of equity (right) is an average output of several models based on public equities in Australia for the 22 years ended 2012.

Exhibit 14: Estimates of the Cost of Debt and Equity by Stage in the Life Cycle

Source: Abu Amin, Blake Bowler, Mostafa Monzur Hasan, Gerald L. Lobo, and Jiri Tressl, "Firm Life Cycle and Cost of Debt," *Journal of Banking & Finance*, Vol. 154, September 2023, 106971 and Mostafa Monzur Hasan, Mahmud Hossain, Adrian (Wai-Kong) Cheung, and Ahsan Habib, "Corporate Life Cycle and Cost of Equity Capital," *Journal of Contemporary Accounting & Economics*, Vol. 11, No. 1, April 2015, 46-60.

Note: Cost of debt is the spread over the three-month London Interbank Offered Rate (LIBOR).

The mix of debt and equity that companies use varies a great deal within each stage. Exhibit 15 shows the debt-to-total capital ratio for companies by stage in the life cycle. The broad pattern that emerges is that the maturity stage tends to be the one with the lowest leverage, and leverage is higher in earlier and later stages.

Exhibit 15: Aggregate, Median, and Average Debt-to-Total Capital by Stage in the Life Cycle

Debt/Total Capital	Aggregate	Median	Average
Introduction	32.3%	8.6%	19.5%
Growth	22.1	12.9	19.4
Maturity	16.4	14.0	19.3
Shake-Out	27.3	20.3	25.4
Decline	28.9	11.9	21.5

Source: FactSet and Counterpoint Global.

- **Corporate governance.** One straightforward observation is that a company's incentives and the skills of its leaders should align with an assessment of the business's stage in the life cycle. As noted, companies have dynamic capabilities, which means that they can revert to an earlier stage with the appropriate investment. However, empirical research shows that there is a lot of inertia in the investment decisions that companies make and that most companies would be better off with more dynamic capital allocation.²⁷

Different skills are useful in the various stages of the life cycle. Aswath Damodaran attaches evocative names to the chief executive officers (CEOs) he deems to have the right skills by stage, including "Steve, the Visionary," "Bob, the Builder," "Donna, the Defender," and "Larry, the Liquidator."²⁸ Further, CEOs tend to seek less risk the longer they have been in the job.

Incentives matter, too. Companies appropriately focus on growth early on to meet market demand and achieve necessary economies of scale. But as the industry and business matures, executives need to shift their emphasis from growth to a balance between growth and ROIC. As we saw with the example of the retailers, a singular focus on growth can lead to investments in projects that destroy shareholder value.

Finally, there are appropriate strategies for declining businesses.²⁹ Few executives want to manage shrinking operations, but the ability to return cash from these operations to investors who can use the funds to invest in more promising parts of the economy is a vital component of the market system.

- **Valuation.** The value of a company is the present value of the cash flows it will generate in the future. However, the visibility, predictability, and growth of cash flows vary by stage. This creates different valuation challenges for each one. For example, companies in the introduction stage may not be profitable but have substantial potential for growth and value creation. Companies in the decline stage generate most of their cash from disinvestment, essentially extracting the remaining capital from the business.

The concept of duration is also relevant for valuation across all the stages. Duration measures the weighted average time investors expect to wait before they receive cash flows. For instance, the duration and maturity are the same for a zero-coupon bond because you get all your money back at the end. Credit investors use duration more often than equity investors do.

Academic research suggests that having substantial investment opportunities, which describes companies in the introduction stage, is linked to long duration. Firms with limited or no investment

prospects, such as those in the shake-out or decline stages, have short durations.³⁰ Duration also indicates the sensitivity of an asset price to changes in the opportunity cost of capital. The stocks of companies with long durations react more to changes in interest rates than those of companies with short durations.

A few concepts are useful in valuing companies in the introduction stage. The first is to focus intently on the basic unit of analysis, or how a company makes money. For brick-and-mortar retailers, for instance, it would be the return on investment from building a new store. For a subscription business, it is lifetime customer value, defined as the cash flows a customer will generate over his or her lifetime minus the cost to acquire the customer.³¹ When the basic unit of analysis indicates a company's investments create value, short-term losses and negative free cash flow are not only acceptable but generally desirable.

Because companies in the introduction stage need to raise capital to sustain their operations, having a CEO who tells a good story to stakeholders, including employees, customers, and capital providers, is often crucial.³² This skill becomes less important as the business establishes itself in the market.

Finally, companies in the introduction stage may have real options, the right but not the obligation to make investments in the business. The value of these options is difficult to capture using a discounted cash flow model based on current operations.³³ Real options analysis may be useful for companies that compete in businesses with high uncertainty, have management teams skilled at cultivating and exercising options, and are market leaders.

A classic approach to valuing a business is to add the steady-state value to the future opportunities for value creation.³⁴ The steady-state value assumes that today's earnings will continue indefinitely, and it can be readily translated into a multiple by dividing 1 by the cost of equity.

For example, the baseline price-earnings ratio today, assuming current earnings persist and that there are no opportunities to create value, is 11.1 times, or 1 divided by a current estimate of the cost of equity of 9 percent (1/.09).³⁵ Historically, we estimate that about two-thirds of the stock market's value is from the steady state and one-third from the prospect of future value creation.

You can think of valuation in the growth and maturity stages with this breakdown in mind. The value of growth businesses will rely more on future value creation, and the value of mature businesses will depend more on the steady state. In all cases, understanding the magnitude and return on incremental investment is crucial.

Multiples for businesses in decline can be valued with a variation of the Gordon Growth Model, $D/(k-g)$, where D is distributable cash, k is the weighted average cost of capital, and g is the growth in perpetuity.³⁶ In the case of businesses in decline, growth is a negative number. 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 6.7 times assuming that growth is -6 percent ($1/ [.09 + .06] = 6.7$).

The core concepts of valuation apply across all stages of the life cycle. But the points of emphasis shift, in terms of both cash flow patterns and the cost of capital, as companies move through the life cycle.

Conclusion

Investors commonly apply various frameworks to assess the characteristics and prospects of the businesses they are analyzing. One such framework is the corporate life cycle, the stages of a company's existence, which can provide insight into capital allocation, financing costs, governance, and valuation.

There are many models of the corporate life cycle, but few are grounded in theory. A simple approach based solely on age yields a pattern inconsistent with the concept. Victoria Dickinson, a professor of accounting, created a way to place companies in one of five stages of the life cycle based on results from the statement of cash flows. The stages are introduction, growth, maturity, shake-out, and decline. Dickinson melds theory and data.

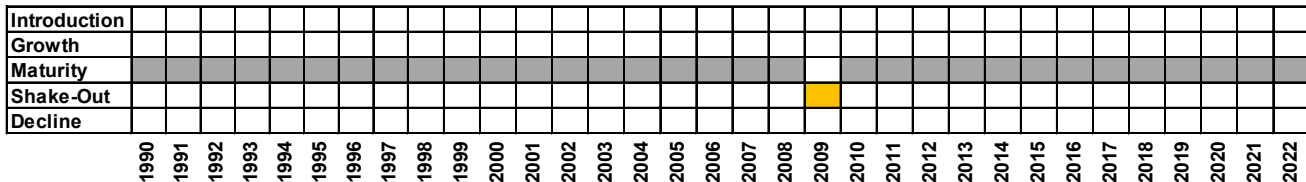
We use Dickinson's framework with three adjustments to the statement of cash flows. We move stock-based compensation from cash flow from operations to cash flow from financing, which decreases cash flow from operations and increases cash flow from financing. We also reflect intangible SG&A investments, which increases cash flow from operations and the outflow of cash flow from investing. And we remove the purchases and sales of marketable securities from cash flow from investing. These adjustments have no impact on free cash flow or the function of the cash flow statement to reconcile cash balances from one period to the next.

We apply this analysis to companies in the Russell 3000, excluding financials and real estate, from 1990 to 2022. We then examine the output of our categorization, including the ROIC, age, and sales growth by stage. About 80 percent of companies in our sample are in the growth or maturity stages. The patterns that emerge are consistent with the concept of the corporate life cycle and appear more informative than classification approaches that are qualitative.

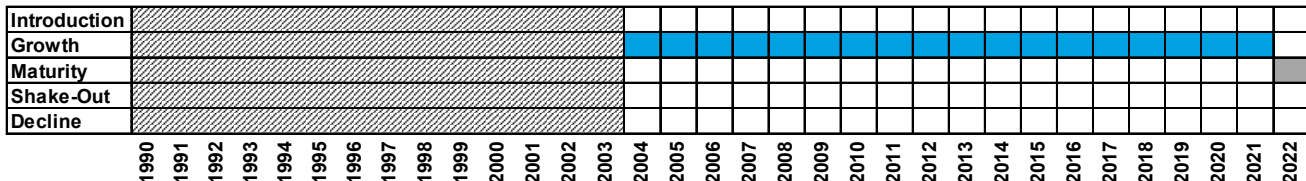
Firms do not pass through the stages linearly but rather transition between the stages. This reflects dynamic capabilities and competition. We analyze this pattern of transition and examine the TSRs that result from the various combinations of starting and ending stages over three years. The highest TSRs, on average, are for those companies that end up in the growth stage.

We finish by offering some thoughts on how the life cycle framework can assist executives and investors to assess and value companies. We focus on capital allocation, the cost of financing, corporate governance, and valuation. In each case, the needs and emphasis for a company shift, which means that the mindset and skills of managers must align with a company's priorities.

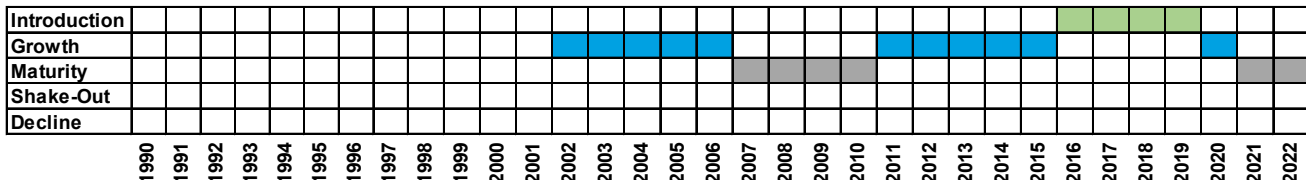
Johnson & Johnson



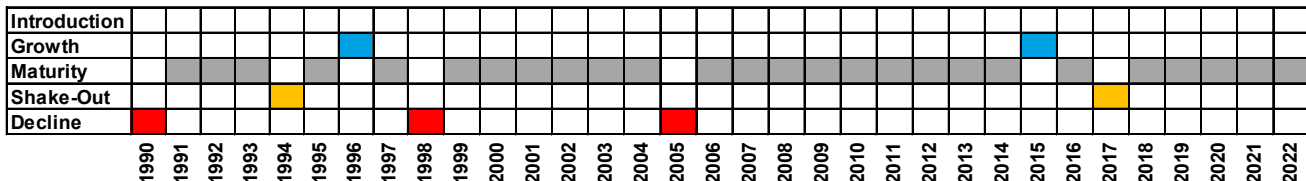
Salesforce



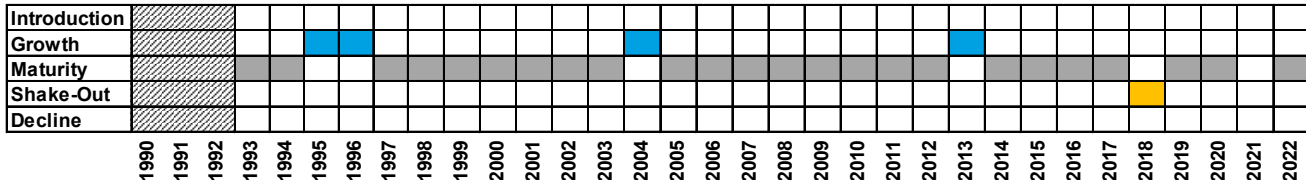
Netflix



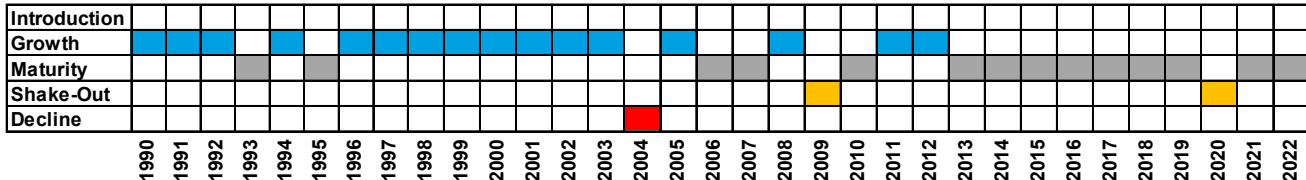
McDonald's



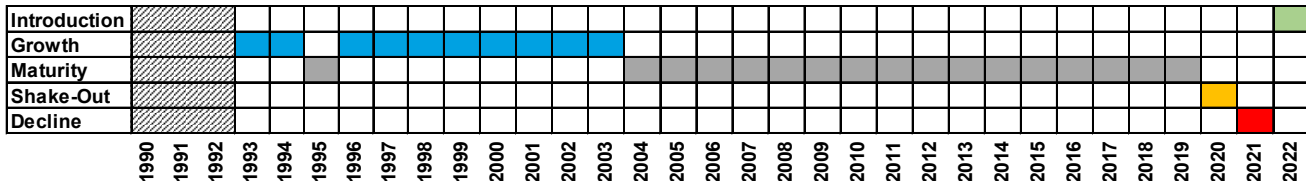
Linde



Caterpillar



Bed Bath & Beyond



Source: FactSet and Counterpoint Global.

Note: Diagonal shading indicates data not available.

Endnotes

- ¹ Ahsan Habib and Mostafa Monzur Hasan, "Corporate Life Cycle Research in Accounting, Finance and Corporate Governance: A Survey, and Directions for Future Research," *International Review of Financial Analysis*, Vol. 61, January 2019, 188-201 and Aswath Damodaran, *The Corporate Life Cycle: Business, Investment, and Management Implications* (New York: Portfolio, 2024).
- ² Michael J. Mauboussin and Dan Callahan, "Return on Invested Capital: How to Calculate ROIC and Handle Common Issues," *Consilient Observer: Counterpoint Global Insights*, October 6, 2022.
- ³ Habib and Hasan, "Corporate Life Cycle Research in Accounting, Finance and Corporate Governance."
- ⁴ Harry DeAngelo, Linda DeAngelo, and René M. Stulz, "Dividend Policy and the Earned/Contributed Capital Mix: A Test of the Life-Cycle Theory," *Journal of Financial Economics*, Vol. 81, No. 2, August 2006, 227-254.
- ⁵ In personal correspondence, Bryant Matthews, Global Director of Research at Credit Suisse, HOLT, did analysis that showed a similar pattern for the first 5-10 years. (Credit Suisse has been acquired by UBS.)
- ⁶ A sample includes Michael E. Porter, *Competitive Strategy: Techniques for Analyzing Industries and Competitors* (New York: The Free Press, 1980); Ichak Adizes, *Corporate Lifecycles: How and Why Corporations Grow and Die and What to Do About It* (Englewood Cliffs, NJ: Prentice Hall, 1988); Boyan Jovanovic and Glenn M. MacDonald, "The Life Cycle of a Competitive Industry," *Journal of Political Economy*, Vol. 102, No. 2, April 1994, 322-347; Steven Klepper, "Industry Life Cycles," *Industrial and Corporate Change*, Vol. 6, No. 1, January 1997, 145-182; Danny Miller and Peter H. Friesen, "A Longitudinal Study of the Corporate Life Cycle," *Management Science*, Vol. 30, No. 10, October 1984, 1161-1183; James M. Utterback, *Mastering the Dynamics of Innovation: How Companies Can Seize Opportunities in the Face of Technological Change* (Boston, MA: Harvard Business School Press, 1994); and Damodaran, *The Corporate Life Cycle*.
- ⁷ Michael Gort and Steven Klepper, "Time Paths in the Diffusion of Product Innovations," *The Economic Journal*, Vol. 92, No. 367, September 1982, 630-653.
- ⁸ Victoria Dickinson, "Cash Flow Patterns as a Proxy for Firm Life Cycle," *Accounting Review*, Vol. 86, No. 6, November 2011, 1969-1994.
- ⁹ Joshua Livnat and Paul Zarowin, "The Incremental Information Content of Cash-Flow Components," *Journal of Accounting and Economics*, Vol. 13, No. 1, May 1990, 25-46.
- ¹⁰ Allen G. Arnold, R. Barry Ellis, V. Sivarama Krishnan, "Toward Effective Use of the Statement of Cash Flows," *Journal of Business and Behavioral Sciences*, Vol. 30, No. 2, Fall 2018, 46-62.
- ¹¹ Michael J. Mauboussin and Dan Callahan, "Categorizing for Clarity: Cash Flow Statement Adjustments to Improve Insight," *Consilient Observer: Counterpoint Global Insights*, October 6, 2021.
- ¹² Sanjeev Bhojraj, "Stock Compensation Expense, Cash Flows, and Inflated Valuations," *Review of Accounting Studies*, Vol. 25, No. 3, September 2020, 1078-1097.
- ¹³ Michael J. Mauboussin and Dan Callahan, "Stock-Based Compensation: Unpacking the Issues," *Consilient Observer: Counterpoint Global Insights*, April 18, 2023.
- ¹⁴ Michael J. Mauboussin and Dan Callahan, "ROIC and Intangible Assets: A Look at How Adjustments for Intangibles Affect ROIC," *Consilient Observer: Counterpoint Global Insights*, November 9, 2022. For examples of research in this area, see Ryan H. Peters and Lucian A. Taylor, "Intangible Capital and the Investment-q Relation," *Journal of Financial Economics*, Vol. 123, No. 2, February 2017, 251-272 and Aneel Iqbal, Shivaram Rajgopal, Anup Srivastava, and Rong Zhao, "A Better Estimate of Internally Generated Intangible Capital," *Management Science*, forthcoming.
- ¹⁵ Mauboussin and Callahan, "ROIC and Intangible Assets."
- ¹⁶ Constance E. Helfat and Margaret A. Peteraf, "The Dynamic Resource-Based View: Capability Lifecycles," *Strategic Management Journal*, Vol. 24, No. 10, October 2003, 997-1010.
- ¹⁷ Constance E. Helfat, Sydney Finkelstein, Will Mitchell, Margaret A. Peteraf, Harbir Singh, David J. Teece, and Sidney G. Winter, *Dynamic Capabilities: Understanding Strategic Change in Organizations* (Malden, MA: Blackwell Publishing, 2007), 4. Also see Gerard Hoberg and Vojislav Maksimovic, "Product Life Cycles in Corporate Finance," *Review of Financial Studies*, Vol. 35, No. 9, September 2022, 4249-4299.
- ¹⁸ Dickinson, "Cash Flow Patterns as a Proxy for Firm Life Cycle."

¹⁹ Michael J. Mauboussin and Dan Callahan, "ROIC and the Investment Process: ROICs, How They Change, and Shareholder Returns," *Consilient Observer: Counterpoint Global Insights*, June 6, 2023 and Brett W. Cantrell and Victoria Dickinson, "Conditional Life Cycle: An Examination of Operating Performance for Leaders and Laggards," *Management Science*, Vol. 66, No. 1, January 2020, 433-451.

²⁰ Patrick Vorst and Teri Lombardi Yohn, "Life Cycle Models and Forecasting Growth and Profitability," *Accounting Review*, Vol. 93, No. 6, November 2018, 357-381.

²¹ Marshall Fisher, Vishal Gaur, and Herb Kleinberger, "Curing the Addiction to Growth," *Harvard Business Review*, Vol. 95, No. 1, January-February 2017, 66-74.

²² For example, Anne Marie Knott, a professor of strategy at Washington University in St. Louis, developed a metric she calls "research quotient" that uses a production function to measure the percentage increase in revenue (output) from a one percent increase in R&D (input), holding other variables constant. Her analysis suggests that nearly two-thirds spend too much and can cut costs without jeopardizing value. See Anne Marie Knott, "The Trillion-Dollar R&D Fix," *Harvard Business Review*, Vol. 90, No. 5, May 2012, 76-82 and Anne Marie Knott, *How Innovation Really Works: Using the Trillion-Dollar R&D Fix to Drive Growth* (New York: McGraw Hill, 2017).

²³ Robert Faff, Wing Chun Kwok, Edward J. Podolski, and George Wong, "Do Corporate Policies Follow a Life-Cycle?" *Journal of Banking & Finance*, Vol. 69, August 2016, 95-107.

²⁴ In a pathbreaking paper, Franco Modigliani and Merton Miller, economists who would go on to win the Nobel Memorial Prize in Economic Sciences, showed that a change in the capital structure does not change risk overall but rather simply transfers risk from one stakeholder to another. Their theorem holds under very stringent assumptions, and when those assumptions are relaxed we can conclude that capital structure does matter. See Franco Modigliani and Merton H. Miller, "The Cost of Capital, Corporation Finance and the Theory of Investment," *American Economic Review*, Vol. 48, No. 3, June 1958, 261-297.

²⁵ Michael J. Mauboussin and Dan Callahan, "Cost of Capital: A Practical Guide to Measuring Opportunity Cost," *Consilient Observer: Counterpoint Global Insights*, February 15, 2023.

²⁶ Abu Amin, Blake Bowler, Mostafa Monzur Hasan, Gerald L. Lobo, and Jiri Tresl, "Firm Life Cycle and Cost of Debt," *Journal of Banking & Finance*, Vol. 154, September 2023, 106971. And Mostafa Monzur Hasan, Mahmud Hossain, Adrian (Wai-Kong) Cheung, and Ahsan Habib, "Corporate Life Cycle and Cost of Equity Capital," *Journal of Contemporary Accounting & Economics*, Vol. 11, No. 1, April 2015, 46-60.

²⁷ Dan Lovullo, Alexander L. Brown, David J. Teece, David Bardolet, "Resource Re-Allocation Capabilities in Internal Capital Markets: The Value of Overcoming Inertia," *Strategic Management Journal*, Vol. 41, No. 8, August 2020, 1365-1380.

²⁸ Aswath Damodaran, "Managing Across the Corporate Life Cycle: CEOs and Stock Prices!" *Musings on Markets*, December 10, 2021 and *The Corporate Life Cycle*.

²⁹ Kathryn Rudie Harrigan, *Strategies for Declining Businesses* (Lexington, MA: Lexington Books, 1980).

³⁰ Hannes Mohrschladt and Sven Nolte, "A New Risk Factor Based on Equity Duration," *Journal of Banking and Finance*, Vol. 96, November 2018, 126-135.

³¹ Michael J. Mauboussin and Dan Callahan, "The Economics of Customer Businesses: Calculating Customer-Based Corporate Valuation," *Consilient Observer: Counterpoint Global Insights*, May 19, 2021.

³² Aswath Damodaran, *Narrative and Numbers: The Value of Stories in Business* (New York: Columbia Business School Publishing, 2017).

³³ Michael J. Mauboussin and Alfred Rappaport, *Expectations Investing: Reading Stock Prices for Better Returns—Revised and Updated* (New York: Columbia Business School Publishing, 2021), 132-151.

³⁴ Merton H. Miller and Franco Modigliani, "Dividend Policy, Growth, and the Valuation of Shares," *Journal of Business*, Vol. 34, No. 4, October 1961, 411-433.

³⁵ We use an estimate of the market risk premium as calculated by Aswath Damodaran. See <https://pages.stern.nyu.edu/~adamodar/>.

³⁶ M. J. Gordon, "Dividends, Earnings, and Stock Prices," *Review of Economics and Statistics*, Vol. 41, No. 2, May 1959, 99-105.

References

- Abernathy, William J., and James M. Utterback, "Patterns of Industrial Innovation," *Technology Review*, Vol. 80, No. 7, June/July 1978, 40-47.
- Adizes, Ichak, *Corporate Lifecycles: How and Why Corporations Grow and Die and What to Do About It* (Englewood Cliffs, NJ: Prentice Hall, 1988).
- _____, *Managing Corporate Lifecycles* (Paramus, NJ: Prentice Hall Press, 1999).
- Amin, Abu, Blake Bowler, Mostafa Monzur Hasan, Gerald L. Lobo, and Jiri Tresl, "Firm Life Cycle and Cost of Debt," *Journal of Banking & Finance*, Vol. 154, September 2023, 106971.
- Arnold, Allen G., R. Barry Ellis, V. Sivarama Krishnan, "Toward Effective Use of the Statement of Cash Flows," *Journal of Business and Behavioral Sciences*, Vol. 30, No. 2, Fall 2018, 46-62.
- Bhojraj, Sanjeev, "Stock Compensation Expense, Cash Flows, and Inflated Valuations," *Review of Accounting Studies*, Vol. 25, No. 3, September 2020, 1078-1097.
- Cantrell, Brett W., and Victoria Dickinson, "Conditional Life Cycle: An Examination of Operating Performance for Leaders and Laggards," *Management Science*, Vol. 66, No. 1, January 2020, 433-451.
- Damodaran, Aswath, *Narrative and Numbers: The Value of Stories in Business* (New York: Columbia Business School Publishing, 2017).
- _____, "Managing Across the Corporate Life Cycle: CEOs and Stock Prices!" *Musings on Markets*, December 10, 2021.
- _____, *The Corporate Life Cycle: Business, Investment, and Management Implications* (New York: Portfolio, 2024).
- DeAngelo, Harry, Linda DeAngelo, and René M. Stulz, "Dividend Policy and the Earned/Contributed Capital Mix: A Test of the Life-Cycle Theory," *Journal of Financial Economics*, Vol. 81, No. 2, August 2006, 227-254.
- _____, "Seasoned Equity Offerings, Market Timing, and the Corporate Life Cycle," *Journal of Financial Economics*, Vol. 95, No. 3, March 2010, 275-295.
- Dickinson, Victoria, "Cash Flow Patterns as a Proxy for Firm Life Cycle," *Accounting Review*, Vol. 86, No. 6, November 2011, 1969-1994.
- Dickinson, Victoria, and Gregory A. Sommers, "Which Competitive Efforts Lead to Future Abnormal Economic Rents? Using Accounting Ratios to Assess Competitive Advantage," *Journal of Business Finance & Accounting*, Vol. 39, Nos. 3-4, April/May 2012, 360-398.
- Faff, Robert, Wing Chun Kwok, Edward J. Podolski, and George Wong, "Do Corporate Policies Follow a Life-Cycle?" *Journal of Banking & Finance*, Vol. 69, August 2016, 95-107.
- Fisher, Marshall, Vishal Gaur, and Herb Kleinberger, "Curing the Addiction to Growth," *Harvard Business Review*, Vol. 95, No. 1, January-February 2017, 66-74.
- Gordon, M. J., "Dividends, Earnings, and Stock Prices," *Review of Economics and Statistics*, Vol. 41, No. 2, May 1959, 99-105.
- Gort, Michael, and Steven Klepper, "Time Paths in the Diffusion of Product Innovations," *The Economic Journal*, Vol. 92, No. 367, September 1982, 630-653.
- Harrigan, Kathryn Rudie, *Strategies for Declining Businesses* (Lexington, MA: Lexington Books, 1980).

Habib, Ahsan, and Mostafa Monzur Hasan, "Corporate Life Cycle Research in Accounting, Finance and Corporate Governance: A Survey, and Directions for Future Research," *International Review of Financial Analysis*, Vol. 61, January 2019, 188-201.

Hasan, Mostafa Monzur, Mahmud Hossain, Adrian (Wai-Kong) Cheung, and Ahsan Habib, "Corporate Life Cycle and Cost of Equity Capital," *Journal of Contemporary Accounting & Economics*, Vol. 11, No. 1, April 2015, 46-60.

Helfat, Constance E., and Margaret A. Peteraf, "The Dynamic Resource-Based View: Capability Life Cycles," *Strategic Management Journal*, Vol. 24, No. 10, October 2003, 997-1010.

Helfat, Constance E., Sydney Finkelstein, Will Mitchell, Margaret A. Peteraf, Harbir Singh, David J. Teece, and Sidney G. Winter, *Dynamic Capabilities: Understanding Strategic Change in Organizations* (Malden, MA: Blackwell Publishing, 2007).

Hoberg, Gerard, and Vojislav Maksimovic, "Product Life Cycles in Corporate Finance," *Review of Financial Studies*, Vol. 35, No. 9, September 2022, 4249-4299.

Iqbal, Aneel, Shivaram Rajgopal, Anup Srivastava, and Rong Zhao, "A Better Estimate of Internally Generated Intangible Capital," *Management Science*, forthcoming.

Jovanovic, Boyan, and Glenn M. MacDonald, "The Life Cycle of a Competitive Industry," *Journal of Political Economy*, Vol. 102, No. 2, April 1994, 322-347.

Klepper, Steven, "Entry, Exit, Growth, and Innovation over the Product Life Cycle," *American Economic Review*, Vol. 86, No. 3, June 1996, 562-583.

_____, "Industry Life Cycles," *Industrial and Corporate Change*, Vol. 6, No. 1, January 1997, 145-182.

Knott, Anne Marie, "The Trillion-Dollar R&D Fix," *Harvard Business Review*, Vol. 90, No. 5, May 2012, 76-82.

_____, *How Innovation Really Works: Using the Trillion-Dollar R&D Fix to Drive Growth* (New York: McGraw Hill, 2017).

Livnat, Joshua, and Paul Zarowin, "The Incremental Information Content of Cash-Flow Components," *Journal of Accounting and Economics*, Vol. 13, No. 1, May 1990, 25-46.

Lovallo, Dan, Alexander L. Brown, David J. Teece, David Bardolet, "Resource Re-Allocation Capabilities in Internal Capital Markets: The Value of Overcoming Inertia," *Strategic Management Journal*, Vol. 41, No. 8, August 2020, 1365-1380.

Maksimovic, Vojislav, Gordon M. Phillips, and Liu Yang, "Are Public Firms Really Myopic? Evidence from Matching IPO Firms at Birth," *Tuck School of Business Working Paper No. 3554768*, April 9, 2020.

Mauboussin, Michael J., and Dan Callahan, "The Economics of Customer Businesses: Calculating Customer-Based Corporate Valuation," *Consilient Observer: Counterpoint Global Insights*, May 19, 2021.

_____, "Categorizing for Clarity: Cash Flow Statement Adjustments to Improve Insight," *Consilient Observer: Counterpoint Global Insights*, October 6, 2021.

_____, "Return on Invested Capital: How to Calculate ROIC and Handle Common Issues," *Consilient Observer: Counterpoint Global Insights*, October 6, 2022.

_____, "ROIC and Intangible Assets: A Look at How Adjustments for Intangibles Affect ROIC," *Consilient Observer: Counterpoint Global Insights*, November 9, 2022.

_____, "ROIC and the Investment Process: ROICs, How They Change, and Shareholder Returns," *Consilient Observer: Counterpoint Global Insights*, June 6, 2023.

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

Miller, Danny, and Peter H. Friesen, "A Longitudinal Study of the Corporate Life Cycle," *Management Science*, Vol. 30, No. 10, October 1984, 1161-1183.

Miller, Merton H., and Franco Modigliani, "Dividend Policy, Growth, and the Valuation of Shares," *Journal of Business*, Vol. 34, No. 4, October 1961, 411-433.

Modigliani, Franco, and Merton H. Miller, "The Cost of Capital, Corporation Finance and the Theory of Investment," *American Economic Review*, Vol. 48, No. 3, June 1958, 261-297.

Mohrschladt, Hannes, and Sven Nolte, "A New Risk Factor Based on Equity Duration," *Journal of Banking and Finance*, Vol. 96, November 2018, 126-135.

Nadeem, Muhammad, Rashid Zaman, Tahir Suleman, and Nader Atawnah, "CEO Ability, Career Concerns, Firms' Lifecycle and Investments in Intellectual Capital," *International Review of Economics and Finance*, Vol. 75, September 2021, 237-251.

Porter, Michael E., *Competitive Strategy: Techniques for Analyzing Industries and Competitors* (New York: Free Press, 1980).

Utterback, James M., *Mastering the Dynamics of Innovation: How Companies Can Seize Opportunities in the Face of Technological Change* (Boston, MA: Harvard Business School Press, 1994).

Vorst, Patrick, and Teri Lombardi Yohn, "Life Cycle Models and Forecasting Growth and Profitability," *Accounting Review*, Vol. 93, No. 6, November 2018, 357-381.

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