Morgan Stanley

INVESTMENT MANAGEMENT

Counterpoint Global Insights

Market-Expected Return on Investment

Bridging Accounting and Valuation

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Introduction

Corporate executives and active investors are both in the business of allocating capital. The goal for each is to generate an attractive return on investment. Companies create value when their investments earn a return in excess of the opportunity cost of capital. Investors add value when their portfolios generate a return higher than an appropriate market benchmark.

Executives make investments in tangible and intangible assets over time. Equity investors buy and sell stocks, which are essentially claims on a company's cash flows after it pays all of its bills and makes all of its investments. A company's stock price reflects the expectations for future cash flows based on past, present, and prospective investments.

Companies generally earn higher returns than investors do because they are making different investments. Companies continually invest in assets in order to create value in the business, while investors buy a stock at a point in time in anticipation of revisions in expectations. In an efficient market, a company's valuation accurately reflects the expectations for value creation. Valuation differences equilibrate the expected returns for companies of similar risk.

For example, imagine that one company invests $1,000 that allows it to earn and distribute $100 annually into perpetuity. The cost of capital is 10 percent. That business is worth $1,000 ($100/0.10). Consider a second company with the same cost of capital that invests $1,000 but earns $200 in distributable cash. That business has a value of $2,000 ($200/0.10). The company earns a 20 percent return on its investment, but the shareholder still earns 10 percent. The market places a high value on invested capital for businesses that generate attractive returns, which lowers the expected return for investors.

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Executives should learn to read the expectations that their company's stock price reflects for a number of reasons.[1] To begin, most senior managers are shareholders, and excess returns are tied to revisions in expectations. Executives must also be aware that making investments that create value may be insufficient to sustain the stock price if the market's expectations are for either a larger amount of investment or a higher return on investment. In addition, an appreciation for what's priced in can guide management's communication with the financial community. Finally, expectations can inform certain capital allocation decisions. For instance, executives who believe their company's stock price reflects expectations that are too pessimistic can advantageously repurchase shares. They can also issue shares when expectations are too optimistic.

Investors earn excess returns when they correctly anticipate revisions in expectations for future cash flows. To find mispriced expectations, investors must understand the potential magnitude and return on investment.

This report seeks to help executives and investors in three ways. First, we describe market-expected return on investment (MEROI), which measures the return at which the present value of a company's profits equals the present value of the investments a company makes.[2] An understanding of MEROI allows us to understand how high the bar is set for corporate performance.

Second, we note that measuring returns has become more difficult as corporate investments have shifted from being primarily tangible to intangible. Because intangible investments are recorded as expenses, the categorization of expenses and investments is blurred.[3] We seek to gain a more accurate view of returns, and hence expectations, by separating expenses and investments properly.

Finally, we discuss the shortcomings of common measures of corporate returns, including return on equity (ROE), return on invested capital (ROIC), return on incremental invested capital (ROIIC), and internal rate of return (IRR). While these measures have some utility, they are commonly used without full acknowledgment of their limitations.

The connection between valuation (MEROI) and accounting (properly measuring intangible investment) is what makes this report novel. Some of the following discussion is technical, but the underlying concepts are straightforward and are illustrated with examples and a case study.

Market-Expected Return on Investment

Frequent readers know that we start a lot of discussions about valuation with the 60-year-old paper by the economists Merton Miller and Franco Modigliani (M&M) called, "Dividend Policy, Growth, and the Valuation of Shares."[4] In the paper, which launched modern valuation, M&M discuss an "approach to valuation which would seem most natural from the standpoint of an investor."

They suggest that you can think about corporate value in two parts: the current earning power of the business plus "the opportunities, if any, that the firm offers for making additional investments in real assets that will yield more than the 'normal' (market) rate of return." The earning power, or steady-state value, is commonly represented as the current net operating profit after taxes (NOPAT) capitalized by the cost of capital. The opportunities for investments that create value, often called the "present value of growth opportunities" (PVGO), reflect the spread between the return on investment and the cost of capital, how much a company can invest, and how long a company can find value-creating opportunities.[5]

Corporate value = steady-state value + present value of growth opportunities (PVGO)

Note that if the return on incremental investment equals the cost of capital, the PVGO collapses to zero and the value of the firm is simply the steady-state value. Our task is to measure the PVGO accurately. You can do that only if you understand the difference between expenses and investments, which our current accounting rules obscure.

The best way to walk through this analysis is with a case. Exhibit 1 shows a simple discounted cash flow (DCF) model. This model calculates corporate value by taking the sum of the present value of future free cash flows (NOPAT - Investment) and adding the present value of the continuing value. Later we will suggest that you create a DCF model that solves for the market's expectations based on today's stock price. But for now we focus on the mechanics of the model.

NOPAT is $100 in year 1 and it grows 8 percent per year. Investment is determined by assuming the change in NOPAT from one year to the next divided by the initial year's investment equals 25 percent. For example, the change in NOPAT from year 1 to 2 is $8, and the investment in year 1 is $32, so the ratio is $8/$32, or 25 percent. The continuing value is NOPAT from year 11 capitalized by the cost of capital ($215.9/0.07 = $3,084.2).[6]

Corporate value is $2,230.8 given these assumptions. We can now go back to M&M and break down the value into a steady-state and a PVGO. The steady-state is $1,428.6, or NOPAT in year 1 of $100 capitalized by the cost of capital of 7 percent ($100/0.07 = $1,428.6). By definition, the PVGO is $802.2, or $2,230.8 - $1,428.6.

Exhibit 1: Simple Discounted Cash Flow Model

Year	1	2	3	4	5	6	7	8	9	10	11
NOPAT	100.0	108.0	116.6	126.0	136.0	146.9	158.7	171.4	185.1	199.9	215.9
Investment	32.0	34.6	37.3	40.3	43.5	47.0	50.8	54.8	59.2	64.0	
Free cash flow	68.0	73.4	79.3	85.7	92.5	99.9	107.9	116.5	125.9	135.9	
PV of free cash flow	63.6	64.1	64.7	65.3	66.0	66.6	67.2	67.8	68.5	69.1	
Σ PV of free cash flow										662.9	
Continuing value										3,084.2	
Σ PV of free cash flow										662.9	
PV of continuing value										1,567.8	
Corporate value										**2,230.8**	

Source: Counterpoint Global.
Note: Assumes 8% NOPAT growth, 25% ROIIC, and 7% cost of capital; Σ=sum of.

Alfred Rappaport, a professor emeritus at Kellogg School of Management, shows how to calculate the PVGO through a measure he calls shareholder value added (SVA).[7] The PVGO is the sum of the SVAs in the model.

The value a company creates in a particular year comes from the cash flows it generates and the change in its continuing value. Take a look at year 1 in exhibit 2. SVA is $76.9, the sum of the present value of free cash flow of $63.6 plus the change in the present value of the continuing value of $13.4 ($76.9 = $63.6 + $13.4). If you add up the SVAs from each year you get a total PVGO of $802.2.

Exhibit 2: Calculation of Shareholder Value Added (SVA)

Year	Base	1	2	3	4	5	6	7	8	9	10	11
Free cash flow		68.0	73.4	79.3	85.7	92.5	99.9	107.9	116.5	125.9	135.9	
PV of free cash flow		63.6	64.1	64.7	65.3	66.0	66.6	67.2	67.8	68.5	69.1	
Continuing value		1,542.9	1,666.3	1,799.6	1,943.6	2,099.0	2,267.0	2,448.3	2,644.2	2,855.7	3,084.2	
PV of continuing value	1,428.6	1,441.9	1,455.4	1,469.0	1,482.7	1,496.6	1,510.6	1,524.7	1,538.9	1,553.3	1,567.8	
Change in PV of continuing value		13.4	13.5	13.6	13.7	13.9	14.0	14.1	14.2	14.4	14.5	**Total SVA**
Shareholder value added		76.9	77.6	78.3	79.1	79.8	80.6	81.3	82.1	82.8	83.6	**802.2**

Source: Counterpoint Global.
Note: Assumes 8% NOPAT growth, 25% ROIIC, and 7% cost of capital.

There's another way to calculate SVA that is the key to calculating the MEROI. Recall that the PVGO is determined by how much, at what return, and for how long a company can find value creating opportunities. And the PVGO is just the sum of the SVAs. We can calculate total SVA as the present value of the incremental NOPATs minus the present value of the investments. The SVA and PVGO are positive if a company earns returns on its investments that exceed the cost of capital. This is exactly what M&M had in mind when they described the PVGO as "the opportunities . . . for making additional investments. . . that will yield more than the . . . (market) rate of return."

If a company earns exactly its cost of capital on its investments, the present value of incremental NOPAT and the present value of investment will be equal. SVA and PVGO are both zero.

Exhibit 3 shows this calculation for our case. The present value of the incremental NOPATs sum to $1,114.1, and the total present value of the investments equal $312.0. The difference between the two is $802.2 ($1,114.1 - $312.0 = $802.2).

Exhibit 3: Alternative Calculation of Shareholder Value Added (SVA)

Year	Base	1	2	3	4	5	6	7	8	9	10	11
NOPAT	100.0	108.0	116.6	126.0	136.0	146.9	158.7	171.4	185.1	199.9	215.9	
Δ NOPAT		8.0	8.6	9.3	10.1	10.9	11.8	12.7	13.7	14.8	16.0	Sum
Δ NOPAT capitalized		114.3	123.4	133.3	144.0	155.5	167.9	181.4	195.9	211.5	228.5	Inflows
PV Δ NOPAT capitalized		106.8	107.8	108.8	109.8	110.9	111.9	112.9	114.0	115.1	116.1	1,114.1
Σ PV of Δ NOPAT capitalized												
												Sum
Investment		32.0	34.6	37.3	40.3	43.5	47.0	50.8	54.8	59.2	64.0	Outflows
PV of investment		29.9	30.2	30.5	30.8	31.0	31.3	31.6	31.9	32.2	32.5	312.0
												Inflows - Outflows =Total SVA
Shareholder value added		76.9	77.6	78.3	79.1	79.8	80.6	81.3	82.1	82.8	83.6	**802.2**

Source: Counterpoint Global.
Note: Assumes 8% NOPAT growth, 25% ROIIC, and 7% cost of capital; Δ=change in; Σ=sum of.

We are now ready to solve for MEROI, which is the discount rate at which the present value of the incremental NOPAT inflows equals the present value of the investment outflows discounted at the cost of capital. Exhibit 4 shows that we need a 16.2 percent rate in order for the present value of incremental NOPATs to equal the present value of investments. Since 16.2 percent is well above the cost of capital of 7 percent, we know that the PVGO is positive.

Exhibit 4: Calculation of Market-Expected Return on Investment (MEROI)

Year	Base	1	2	3	4	5	6	7	8	9	10
Present value of investments (outflows) discounted at the cost of capital											
Investment		32.0	34.6	37.3	40.3	43.5	47.0	50.8	54.8	59.2	64.0
PV of investment		29.9	30.2	30.5	30.8	31.0	31.3	31.6	31.9	32.2	32.5
Σ PV of Investment		312.0									
Present value of NOPAT (inflows) discounted at the MEROI											
NOPAT	100.0	108.0	116.6	126.0	136.0	146.9	158.7	171.4	185.1	199.9	215.9
Δ NOPAT		8.0	8.6	9.3	10.1	10.9	11.8	12.7	13.7	14.8	16.0
Δ NOPAT capitalized		49.3	53.3	57.5	62.1	67.1	72.5	78.3	84.5	91.3	98.6
PV Δ NOPAT capitalized		42.4	39.4	36.7	34.1	31.7	29.4	27.3	25.4	23.6	21.9
Σ PV of Δ NOPAT capitalized		312.0									
Market expected return on investment		**16.2%**									

Source: Counterpoint Global.
Note: Assumes 8% NOPAT growth, 25% ROIIC, and 7% cost of capital; Σ=sum of; Δ=change in.

There are three steps in estimating MEROI in practice. First, you create a discounted cash flow model that reflects the expectations embedded in the company's stock price.[8] Second, you calculate the present value of investments discounted at the cost of capital. And finally, you solve for the breakeven rate that equates the present value of the capitalized annual NOPAT changes to the present value of the investments.

Our next challenge is to measure investment properly.

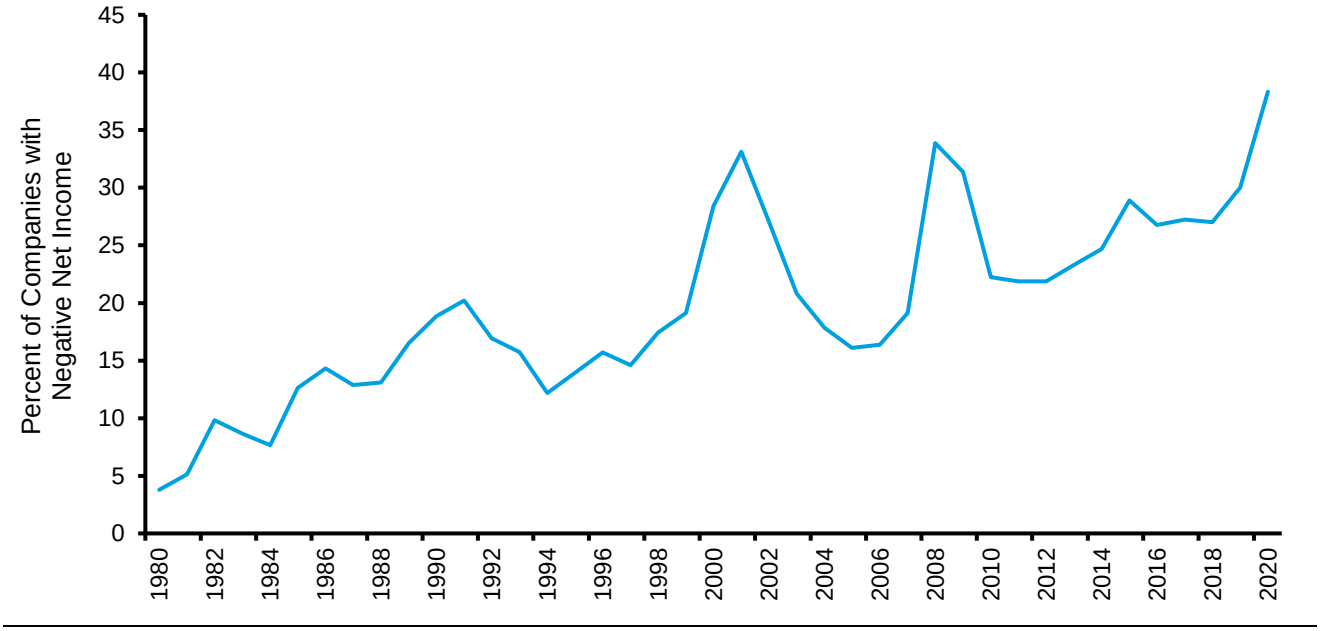
The Importance of the Rise of Intangible Investments

There has been a substantial transformation in the way companies invest over the past half century. An investment is an outlay today that creates an asset that is expected to have positive economic value based on future cash flows. Tangible assets, such as factories, machines, and inventory, were the dominant form of investment in the 1970s. Intangible assets, including research and development (R&D), brand building, and employee training, are the dominant form today.[9]

This is important because investments in tangible assets are recorded on the balance sheet and intangible investments commonly show up on the income statement. Sorting expenses and investments was easy when most of the expenses were on the income statement and most of the assets were on the balance sheet. But categorization is a challenge today because income statements conflate expenses and investments.

One consequence of the shift to intangible investments is that more companies are reporting negative net income than what we have seen in the past (see exhibit 5). To be clear, companies can report losses because their expensed investments exceed current earnings, which is good if the investments promise attractive economic returns. Companies can also report losses when their expenses exceed their sales, which is bad if the business is fundamentally unprofitable. Separating expenses from investments has never been so important.

Exhibit 5: Percentage of Companies in the Russell 3000 with Negative Net Income, 1980-2020



Source: FactSet.
Note: Constituents of the Russell 3000 Index as of year-end.

Luminita Enache and Anup Srivastava, professors of accounting, developed a technique to measure intangible investments.[10] They separate reported operating expenses into two groups. The first is intangible investments that include R&D and advertising. The second is selling, general, and administrative (SG&A) expenses excluding R&D and advertising, which they call Main SG&A. They further break Main SG&A into investment and maintenance parts. You can think of investment Main SG&A as the discretionary investments a company makes in pursuit of growth that creates value. Maintenance Main SG&A are the expenses that support current operations.

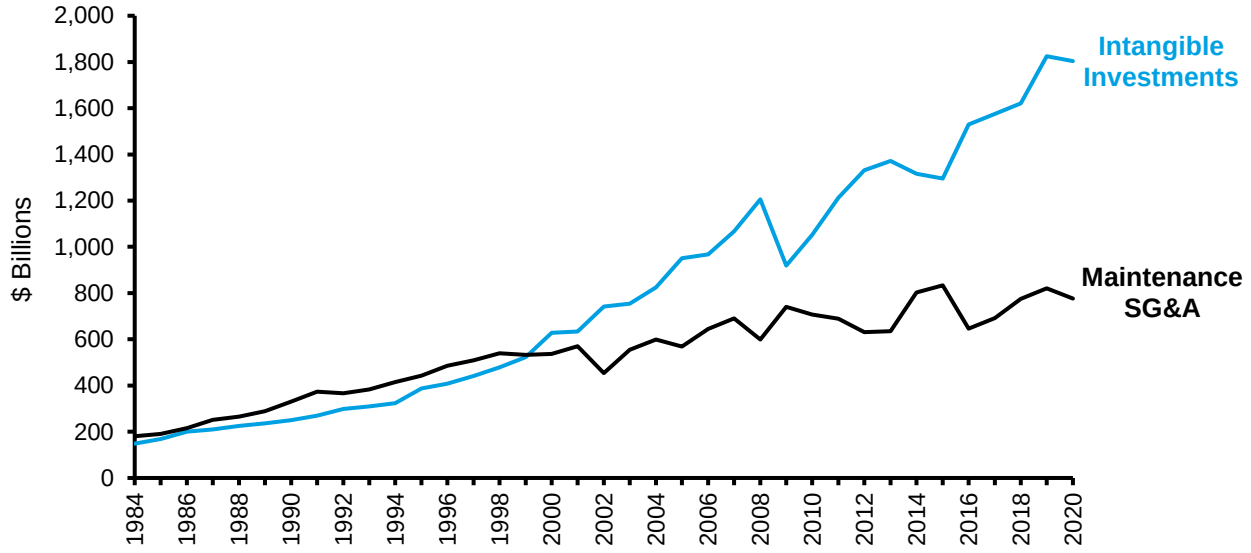
In exhibit 6, we use Enache and Srivastava's breakdown to estimate the amount companies in the Russell 3000 spent on intangible investment and maintenance SG&A (we exclude companies in the financial services industry).

For example, Enache and Srivastava estimate that nearly 40 percent of Main SG&A went to investments in the mid-1980s and that in recent years the ratio rose to roughly 60 percent. Conversely, about 60 percent of Main SG&A went to maintenance in the mid-1980s and in recent years the ratio has fallen to roughly 40 percent. To calculate the annual dollar amount of investment Main SG&A and maintenance SG&A, we apply the applicable rate for each year times the aggregate dollar amount of SG&A for each year. Intangible investments are the sum of investment Main SG&A, R&D, and advertising.

Intangible investment has been in a steady uptrend, with a brief interruption during the financial crisis, and passed maintenance spending in 2000. To put this figure in context, investments in intangible assets were roughly $1.8 trillion in 2020, more than double the $800 billion in capital expenditures. These data put the lie to the assertion that companies are investing less than they used to.

This work shows clearly that investments in intangible assets are rising relative to those in tangible assets. As a result, the failure to measure the magnitude and return on intangible investments is a large and growing problem.

Exhibit 6: Components of Selling, General, and Administrative (SG&A) Costs, 1984-2020



Source: Analysis for Russell 3000 based on Luminita Enache and Anup Srivastava, "Should Intangible Investments Be Reported Separately or Commingled with Operating Expenses? New Evidence," Management Science*, Vol. 64, No. 7, July 2018, 3446-3468. Data extended through 2018 by Anup Srivastava. Includes Counterpoint Global estimates.*
Note: Intangible investments=R&D + Advertising + Investment Main SG&A; Maintenance SG&A=Maintenance Main SG&A.

Not surprisingly, the magnitude of intangible investment varies a great deal by industry. Exhibit 7 shows a ranking of intangible intensity over the past quarter century as calculated by Amitabh Dugar and Jacob Pozharny, investors at Bridgeway Capital Management.[11] Where industries land in the ranking makes sense. Healthcare, software, and media are at the top of the list, and energy, real estate, and utilities are at the bottom. Measuring intangible investments is more important in some industries than in others.

Exhibit 7: Ranks of Average Composite Intangible Intensity, 1994-2018

Industry	Intangible Intensity Rank
Pharmaceuticals, Biotechnology, & Life Sciences	19.9
Software & Services	18.7
Media & Entertainment	18.6
Telecommunication Services	16.6
Health Care Equipment & Services	16.3
Household & Personal Products	14.6
Technology Hardware & Equipment	13.4
Semiconductor & Semiconductor Equipment	12.3
Consumer Services	11.5
Commercial & Professional Services	11.5
Retailing	10.8
Consumer Durables & Apparel	10.1
Food, Beverage, & Tobacco	9.9
Capital Goods	9.0
Automobiles & Components	7.4
Food & Staples Retailing	6.1
Materials	5.9
Transportation	4.8
Energy	4.5
Real Estate	4.1
Utilities	3.8

Source: Amitabh Dugar and Jacob Pozharny, "Equity Investing in the Age of Intangibles," Financial Analysts Journal*, Vol. 77, No. 2, Second Quarter 2021.*
Note: An average ranking of U.S. industries over a 25-year period based on several measures of intangible intensity.

We now illustrate how MEROI changes when we capitalize intangible investments. Capitalization moves an expense from the income statement to an asset on the balance sheet. That asset is then amortized over a period, which shows up as an amortization expense on the income statement. In cases where intangible investments are growing, NOPAT and investments are adjusted up by the same amount, leaving free cash flow unchanged.

We use Microsoft as a case study. We start the analysis at the beginning of fiscal year 2004 (the company's fiscal year ends on June 30) and use actual results through fiscal year 2020. While MEROI measures the breakeven return based on the future cash flows that are priced into a stock, you might imagine that we had a crystal ball for our Microsoft figures.

Exhibit 8 is a discounted cash flow model based on the numbers as reported. We assume a cost of equity of 9.5 percent, an estimate of what it was at that time, and a continuing value based on the perpetuity method.[12] If you add excess cash to the corporate value and divide by shares outstanding, the value per share is within 10 percent of the stock price at the time. Corporate value is $248.7 billion.

Exhibit 8: Discounted Cash Flow Model for Microsoft, Fiscal Years 2004-2020

Year	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18
NOPAT	5.8	10.8	11.3	13.0	16.9	15.6	18.7	23.2	17.4	23.0	23.8	23.6	22.2	23.6	32.9	34.7	47.9	59.5
Investment	-0.4	-0.5	-0.2	3.0	6.7	5.4	1.4	0.2	7.5	2.8	3.1	4.9	1.2	34.3	4.4	6.3	10.2	
Free cash flow	6.2	11.3	11.5	10.0	10.2	10.2	17.3	23.0	9.9	20.2	20.7	18.7	21.0	-10.7	28.5	28.4	37.7	
PV of free cash flow	5.7	9.4	8.8	6.9	6.5	5.9	9.2	11.1	4.4	8.2	7.6	6.3	6.4	-3.0	7.3	6.6	8.0	
Σ PV of free cash flow																	115.3	
Continuing value																	625.4	
Σ PV of free cash flow																	115.3	
PV of continuing value																	133.4	
Corporate value																	**248.7**	
Plus: cash																	62.1	
Minus: debt																	0.0	
Shareholder value																	**310.8**	
Shareholder value per share																	$28.56	
Closing price on July 1, 2003																	$26.15	

Source: Microsoft and Counterpoint Global.
Note: In billions of U.S. dollars; Σ=sum of.

We can now calculate the MEROI. Corporate value of $248.7 billion equals the steady-state value of $61.0 billion ($5.8/0.095) plus the PVGO of $187.7 billion. The PVGO is the difference between the present value of the NOPAT inflows ($218.9 billion) minus the present value of the investment outflows ($31.2 billion). MEROI, the discount rate that equates the present value of the inflows with the present value of the outflows, is 27.1 percent (exhibit 9).

Exhibit 9: MEROI for Microsoft as of Beginning of Fiscal 2004

Year	Base	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18
NOPAT	5.8	10.8	11.3	13.0	16.9	15.6	18.7	23.2	17.4	23.0	23.8	23.6	22.2	23.6	32.9	34.7	47.9	59.5	
Δ NOPAT		5.0	0.5	1.7	3.9	-1.3	3.1	4.4	-5.8	5.6	0.8	-0.2	-1.4	1.4	9.3	1.8	13.2	11.6	Sum
Δ NOPAT capitalized		52.1	5.6	17.6	41.5	-13.9	33.0	46.6	-60.7	58.9	8.4	-1.9	-15.1	14.7	97.6	19.3	138.4	122.3	Inflows
PV Δ NOPAT capitalized		47.5	4.7	13.4	28.8	-8.8	19.1	24.7	-29.3	26.0	3.4	-0.7	-5.1	4.5	27.4	4.9	32.3	26.1	218.9
																			Sum
Investment		-0.4	-0.5	-0.2	3.0	6.7	5.4	1.4	0.2	7.5	2.8	3.1	4.9	1.2	34.3	4.4	6.3	10.2	Outflows
PV of investment		-0.4	-0.5	-0.2	2.1	4.3	3.1	0.8	0.1	3.3	1.1	1.1	1.6	0.4	9.6	1.1	1.5	2.2	31.2
																			Inflows - Outflows =Total SVA
Shareholder value added		47.9	5.1	13.6	26.8	-13.1	16.0	23.9	-29.4	22.7	2.3	-1.8	-6.7	4.1	17.7	3.8	30.9	23.9	**187.7**
Present value of investments (outflows) discounted at the cost of capital																			
Investment		-0.4	-0.5	-0.2	3.0	6.7	5.4	1.4	0.2	7.5	2.8	3.1	4.9	1.2	34.3	4.4	6.3	10.2	
PV of investment		-0.4	-0.5	-0.2	2.1	4.3	3.1	0.8	0.1	3.3	1.1	1.1	1.6	0.4	9.6	1.1	1.5	2.2	
Σ PV of investment	31.2																		
Present value of NOPAT (inflows) discounted at the MEROI																			
NOPAT	5.8	10.8	11.3	13.0	16.9	15.6	18.7	23.2	17.4	23.0	23.8	23.6	22.2	23.6	32.9	34.7	47.9	59.5	
Δ NOPAT		5.0	0.5	1.7	3.9	-1.3	3.1	4.4	-5.8	5.6	0.8	-0.2	-1.4	1.4	9.3	1.8	13.2	11.6	
Δ NOPAT capitalized		18.3	2.0	6.2	14.6	-4.9	11.6	16.4	-21.3	20.7	3.0	-0.7	-5.3	5.2	34.3	6.8	48.7	43.0	
PV Δ NOPAT capitalized		14.4	1.2	3.0	5.6	-1.5	2.8	3.1	-3.1	2.4	0.3	0.0	-0.3	0.2	1.2	0.2	1.1	0.7	
Σ PV of Δ NOPAT capitalized	31.2																		
Market expected return on investment	**27.1%**																		

Source: Microsoft and Counterpoint Global.
Note: In billions of U.S. dollars; Δ=change in; Σ=sum of.

We now calculate the MEROI for Microsoft after we reflect some of its expenses as investments. There are two big decisions. The first is which expenses are properly considered investments, and the second is the amortization period for the intangible asset. We defer to the work of Charles Hulten, a prominent academic in the study of intangible assets, to answer these questions.[13] This allows us to calculate the intangible investment and amortization expense for each year.

For example, consider Microsoft's results for fiscal 2020 (year 17 in exhibit 8). NOPAT without adjustments was $48 billion and investment was $10 billion for free cash flow of $38 billion. Hulten's method designates $34 billion of the $44 billion in operating expenses as investment. Based on his assumptions, the amortization for fiscal 2020 comes out to $27 billion. This means that we add $7 billion ($34 - $27 billion) to NOPAT and investment. As a result, NOPAT goes from $48 to $55 billion, investment goes from $10 to $17 billion, and free cash flow of $38 billion remains unchanged.

Exhibit 10 shows the adjusted numbers for the full period. Neither the free cash flow nor corporate value change. What is different is the path to free cash flow. We can now measure the investment, and ultimately the MEROI, more accurately.[14]

Exhibit 10: Adjusted Discounted Cash Flow Model for Microsoft, Fiscal Years 2004-2020

Year	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18
NOPAT	10.6	12.2	12.8	15.3	20.5	17.8	20.0	25.3	19.4	25.9	26.8	26.0	23.1	26.0	37.9	40.6	55.1	59.5
Investment	4.4	0.9	1.3	5.3	10.3	7.6	2.7	2.3	9.5	5.6	6.1	7.3	2.2	36.7	9.4	12.2	17.4	
Free cash flow	6.2	11.3	11.5	10.0	10.2	10.2	17.3	23.0	9.9	20.2	20.7	18.7	21.0	-10.7	28.5	28.4	37.7	
PV of free cash flow	5.7	9.4	8.8	6.9	6.5	5.9	9.2	11.1	4.4	8.2	7.6	6.3	6.4	-3.0	7.3	6.6	8.0	
Σ PV of free cash flow																	115.3	
Continuing value																	625.4	
Σ PV of free cash flow																	115.3	
PV of continuing value																	133.4	
Corporate value																	**248.7**	

Source: Microsoft and Counterpoint Global.
Note: In billions of U.S. dollars; Σ=sum of.

Exhibit 11 shows the updated MEROI calculation. The composition of corporate value shifts, with a steady-state value of $111.8 billion ($10.6/0.095) plus the PVGO of $136.9 billion. The PVGO is the difference between the present value of the NOPAT inflows ($190.9 billion) minus the present value of the investment outflows ($54.0 billion). MEROI is now 18.1 percent, a full 9 percentage points lower than it was with the unadjusted figures.

Exhibit 11: MEROI Based on Adjustments for Microsoft as of Beginning of Fiscal 2004

Year	Base	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18
NOPAT	10.6	12.2	12.8	15.3	20.5	17.8	20.0	25.3	19.4	25.9	26.8	26.0	23.1	26.0	37.9	40.6	55.1	59.5	
Δ NOPAT		1.5	0.7	2.4	5.2	-2.6	2.1	5.3	-5.9	6.5	1.0	-0.8	-2.9	2.9	11.9	2.7	14.5	4.4	Sum
Δ NOPAT capitalized		16.2	6.9	25.7	54.4	-27.5	22.6	55.4	-61.8	68.0	10.3	-8.7	-30.3	30.3	124.8	28.4	152.4	46.4	Inflows
PV Δ NOPAT capitalized		14.8	5.8	19.6	37.8	-17.5	13.1	29.3	-29.8	30.0	4.2	-3.2	-10.2	9.3	35.0	7.3	35.6	9.9	190.9
																			Sum
Investment		4.4	0.9	1.3	5.3	10.3	7.6	2.7	2.3	9.5	5.6	6.1	7.3	2.2	36.7	9.4	12.2	17.4	Outflows
PV of investment		4.1	0.7	1.0	3.7	6.5	4.4	1.4	1.1	4.2	2.3	2.3	2.4	0.7	10.3	2.4	2.9	3.7	54.0
																			Inflows - Outflows =Total SVA
Shareholder value added		10.8	5.0	18.6	34.1	-24.0	8.7	27.9	-31.0	25.8	1.9	-5.4	-12.6	8.6	24.7	4.9	32.7	6.2	**136.9**
Present value of investments (outflows) discounted at the cost of capital																			
Investment		4.4	0.9	1.3	5.3	10.3	7.6	2.7	2.3	9.5	5.6	6.1	7.3	2.2	36.7	9.4	12.2	17.4	
PV of investment		4.1	0.7	1.0	3.7	6.5	4.4	1.4	1.1	4.2	2.3	2.3	2.4	0.7	10.3	2.4	2.9	3.7	
Σ PV of investment		54.0																	
Present value of NOPAT (inflows) discounted at the MEROI																			
NOPAT	10.6	12.2	12.8	15.3	20.5	17.8	20.0	25.3	19.4	25.9	26.8	26.0	23.1	26.0	37.9	40.6	55.1	59.5	
Δ NOPAT		1.5	0.7	2.4	5.2	-2.6	2.1	5.3	-5.9	6.5	1.0	-0.8	-2.9	2.9	11.9	2.7	14.5	4.4	
Δ NOPAT capitalized		8.5	3.6	13.5	28.6	-14.5	11.9	29.1	-32.5	35.7	5.4	-4.6	-15.9	15.9	65.6	14.9	80.1	24.4	
PV Δ NOPAT capitalized		7.2	2.6	8.2	14.7	-6.3	4.4	9.1	-8.6	8.0	1.0	-0.7	-2.2	1.8	6.4	1.2	5.6	1.4	
Σ PV of Δ NOPAT capitalized		54.0																	
Market expected return on investment		**18.1%**																	

Source: Microsoft and Counterpoint Global.
Note: In billions of U.S. dollars; Δ=change in; Σ=sum of.

Note that in both cases, the company's breakeven rates of return of 27.1 and 18.1 percent are materially higher than the expected rate of return of investors of 9.5 percent. Businesses with high returns often fetch lofty valuations, which is why great businesses are not always great stocks.

Let's slow down and make sure that the implication of this adjustment is clear. We can use the M&M framework, corporate value equals the steady-state value plus the PVGO, to guide our thinking. We are reclassifying an expense as an investment, an adjustment that reflects the fact that a company's steady-state value would be higher if it elected to reduce discretionary intangible investments. This increases the value of

the steady-state and reduces the value of the PVGO, hence lowering the onus on incremental return on investment. Naturally, companies should invest in intangible investments if they create value. The data show this to be the case.[15]

The difference between the unadjusted and the adjusted MEROI is a function of what percentage of SG&A is reclassified and the assigned amortization period. (See the appendix for a more detailed discussion.) If no SG&A is considered to be an investment, no adjustments are necessary. The higher the percentage of SG&A that is capitalized, the lower the adjusted MEROI is relative to the unadjusted MEROI. For intangible intensive businesses, this difference is substantial enough to reframe an understanding of the underlying economics of the business.

Taking Measure of Measures of Return (ROE, ROIC, ROIIC, IRR)

MEROI is an accurate, if involved, calculation of expected returns for a business. The question is how it stacks up to other more mainstream measures of returns. These include return on equity (ROE), return on invested capital (ROIC), return on incremental invested capital (ROIIC), and internal rate of return (IRR).

ROE, defined as net income divided by shareholders' equity, is massively distorted by the rise of intangibles. Net income has always been unreliable because of the considerable discretion management has in reporting expenses within accepted accounting principles. Shareholders' equity has also lost relevance because of the vagaries of accounting, including share repurchases. For instance, Home Depot's shareholders' equity was negative $3.1 billion at the end of fiscal 2020 as the result of the company's share buyback program.

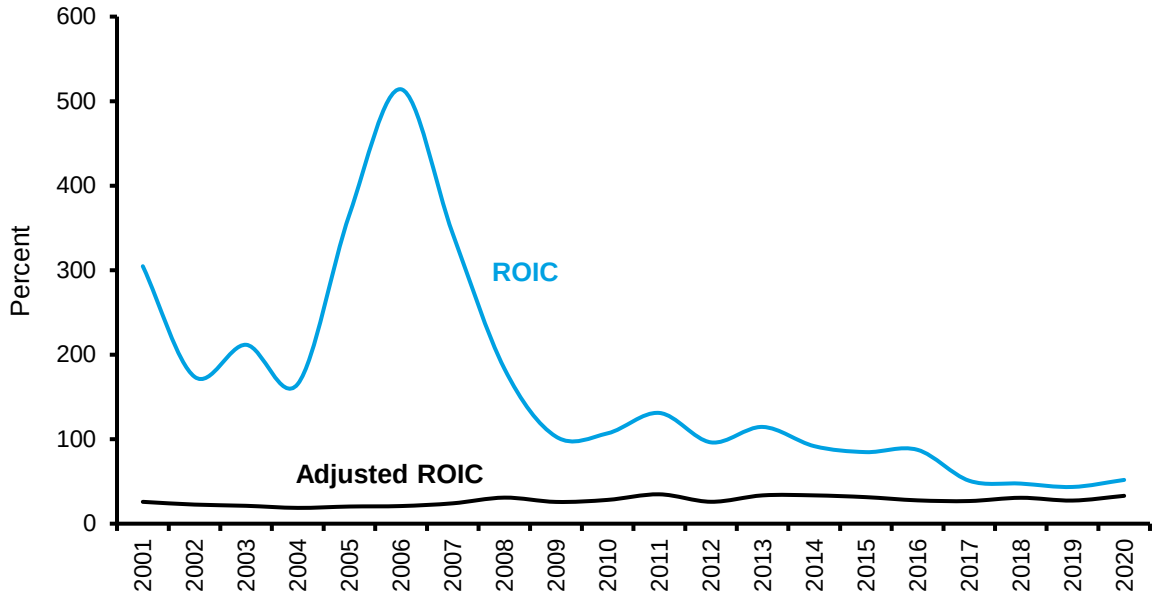
ROE has an additional flaw in that it is not financing neutral. Changes in a company's capital structure can influence the level of ROE. After considering all of these limitations, ROE is at best a very crude indicator of returns on investment. Further, adjusting for intangibles does not provide a simple and consistent improvement in the measure.[16]

ROIC, which is NOPAT divided by invested capital, is a step in the correct direction and is one of the best of the accounting measures because it has a sound numerator.[17] The concept has been around for a long time. For example, General Motors used a version of ROIC more than a century ago.[18]

NOPAT and invested capital are unaffected by financial leverage. However, both NOPAT and invested capital change substantially as intangible investments are converted to assets on the balance sheet.

Let's go back to our example of Microsoft. We have already seen that the adjustments lift NOPAT from $48 to $55 billion. The invested capital goes from $96 to $174 billion.[19] As a result, the return on average invested capital goes from 52 percent ($48 billion / average of $89 billion and $96 billion) when unadjusted to 33 percent ($55 billion / average of $160 billion and $174 billion) when adjusted. Exhibit 12 shows the difference between these figures over time. Just as MEROI is lower after making adjustments, so is ROIC.

Exhibit 12: Return on Average Invested Capital With and Without Adjustments, 2001-2020



Source: Microsoft and Counterpoint Global.
Note: Invested capital is the average of the current and prior year.

The primary way that ROIC is linked to valuation is through a residual income model, which calculates corporate value as invested capital plus the present value of economic profit. Economic profit is defined as follows:

Economic profit = (ROIC - cost of capital) x invested capital

The concept of residual income is also old.[20] In the 1990s, Stern Stewart & Company, the consulting firm, popularized the idea through Economic Value Added (EVA™).[21] The main contribution of EVA is the introduction of a slew of adjustments to invested capital in an attempt to more accurately reflect the capital invested in the business.

All things being equal, a higher ROIC is better than a lower one. But as we have seen, a failure to account for intangible investment can lead to distorted, or even nonsensical, ROICs.

There are a couple of points to consider with ROIC and valuation. First, models based on free cash flow and economic profit yield identical values. The top panel of exhibit 13 is identical to exhibit 1, and the bottom panel is an economic profit model. They come to the same value because they have the same cash flows.

However, the allocation of value is different. The first model is consistent with the M&M formula by specifying the steady-state value and the PVGO, a measure of future value creation. The economic profit model does not separate the components of value as neatly.

For example, beginning capital can be any number without affecting corporate value. We use $1,000 in exhibit 13, but we could have plugged in any number and not changed corporate value. For a given set of future cash flows, one company might show substantial value creation because of a modest beginning capital figure and another might reflect large value destruction as the result of a large beginning capital total. The allocation of corporate value is the same for a free cash flow and economic profit model only if the beginning capital happens to be identical to the steady-state value. This is very rarely the case.

Exhibit 13: Equivalence of Free Cash Flow and Economic Profit Models

Free cash flow model											
Year	1	2	3	4	5	6	7	8	9	10	11
NOPAT	100.0	108.0	116.6	126.0	136.0	146.9	158.7	171.4	185.1	199.9	215.9
Investment	32.0	34.6	37.3	40.3	43.5	47.0	50.8	54.8	59.2	64.0	
Free cash flow	68.0	73.4	79.3	85.7	92.5	99.9	107.9	116.5	125.9	135.9	
PV of free cash flow	63.6	64.1	64.7	65.3	66.0	66.6	67.2	67.8	68.5	69.1	
Σ PV of free cash flow										662.9	
Continuing value										3,084.2	
Σ PV of free cash flow										662.9	
PV of continuing value										1,567.8	
Corporate value										**2,230.8**	

Economic profit model											
Year	1	2	3	4	5	6	7	8	9	10	11
Beginning capital	1,000.0	1,032.0	1,066.6	1,103.9	1,144.2	1,187.7	1,234.7	1,285.5	1,340.4	1,399.6	1,463.6
Investment	32.0	34.6	37.3	40.3	43.5	47.0	50.8	54.8	59.2	64.0	
NOPAT	100.0	108.0	116.6	126.0	136.0	146.9	158.7	171.4	185.1	199.9	215.9
Capital charge	70.0	72.2	74.7	77.3	80.1	83.1	86.4	90.0	93.8	98.0	
Economic profit	30.0	35.8	42.0	48.7	56.0	63.8	72.3	81.4	91.3	101.9	
PV of EP	28.0	31.2	34.3	37.2	39.9	42.5	45.0	47.4	49.6	51.8	
Σ PV of economic profit	28.0	59.3	93.5	130.7	170.6	213.1	258.1	305.5	355.1	406.9	
Continuing value										1,620.6	
Σ PV of economic profit										406.9	
PV of continuing value										823.8	
Plus: Beginning capital										1,000.0	
Corporate value										**2,230.8**	

Source: Counterpoint Global.
*Note: Assumes 8% NOPAT growth, 25% ROIIC, and 7% cost of capital; **Σ**=sum of.*

A number of companies and investors now look at ROIIC, which measures the change in NOPAT from the base year to year one divided by investment in the base year.[22] For example, in exhibit 1 the change in NOPAT from year 1 to 2 is $8, the investment in year 1 is $32, and so ROIIC equals 25 percent. One-year ROIICs can be noisy, especially for companies that have an uneven pattern of investment spending. It often makes sense to use rolling three- or five-year ROIICs because they are more stable.

The allure of ROIIC is that it is incremental and therefore avoids the issue of sunk costs. The problem with ROIIC is that it overstates economic returns for businesses earning above the cost of capital and understates returns for those earning below the cost of capital. This problem becomes more acute as the competitive advantage period (CAP), the period it is assumed a company can generate excess returns on new investments, lengthens. CAP is an important part of the calculation of the PVGO.

As we saw when we defined SVA, the value a company creates in a specific year comes from the cash flows it generates and the change in its continuing value. If SVA were a stock, you could think of the cash flows as the dividend and the change in continuing value as the capital gain. ROIIC fails to measure economic returns because it captures only the dividends. To explain expectations, ROIIC has to vary more than MEROI.

Exhibit 14 quantifies this shortcoming. The rows are various CAPs and the columns are ROIICs. We assume eight percent NOPAT growth and a seven percent cost of capital. In the body are the MEROIs that are consistent with the assumptions. Note that when the ROIIC is equal to the cost of capital, ROIIC and MEROI are the same. As ROIIC increases, the amount by which ROIIC exceeds MEROI grows. That ratio rises as the assumed CAP gets longer. Finally, when ROIIC is below the cost of capital, the ROIIC is lower than the MEROI.

Exhibit 14: MEROIs with Various ROIICs and Competitive Advantage Periods

		Return on Incremental Invested Capital				
	MEROI	**5%**	**7%**	**15%**	**25%**	**50%**
Competitive Advantage Period (Years)	**5**	*5.3%*	*7.0%*	*12.8%*	*18.5%*	*29.3%*
	10	*5.4%*	*7.0%*	*11.8%*	*16.2%*	*24.0%*
	15	*5.6%*	*7.0%*	*11.1%*	*14.8%*	*21.0%*
	20	*5.7%*	*7.0%*	*10.6%*	*13.7%*	*19.0%*

MEROI: Market-expected return on investment

Source: Counterpoint Global.
Note: Assumes 8% NOPAT growth and a 7% cost of capital.

Internal rate of return (IRR) remains a very popular measure of return yet is fraught with limitations.[23] IRR, the discount rate that equates future cash flow to current investment outlay, works well when there is one outflow and one inflow. But the measure quickly becomes misleading when there are interim cash flows.

The best way to illustrate this is with a simple example. Panel A of exhibit 15 shows an investment of $75 in year zero and a return of $185.5 in year 5 for an IRR of 20 percent. In this case, IRR is a reasonable measure.

Panel B shows the same $75 million outflow but with annual cash flows of $25 per year for 5 years. That, too, solves for an IRR of 20 percent. If you were to receive those interim cash flows in reality, you would need to reinvest them at the IRR in order to get $185.5 in year 5.[24]

Exhibit 15: The Limitation of Internal Rate of Return (IRR)

A. Simple IRR (One Outflow, One Inflow)						
Year	0	1	2	3	4	5
	-75.0	0.0	0.0	0.0	0.0	185.5
IRR = 20%						

B. IRR with Annual Inflows						
Year	0	1	2	3	4	5
	-75.0	25.0	25.0	25.0	25.0	25.0
IRR = 20%						

C. IRR Assuming Annual Inflows Earn the Cost of Capital						
Year	0	1	2	3	4	5
	-75.0	0.0	0.0	0.0	0.0	143.8
IRR = 14%						

Source: Counterpoint Global.

Panel C makes the more sensible assumption that the interim cash flows are reinvested at the cost of capital of 7 percent. So rather than ending up with $185.5, the new sum is $143.8. This drops the IRR to 14 percent.

Assessing the corporate rate of return is a great deal more challenging than measuring a single outflow and a single inflow. Companies generally make investments continually. MEROI is closer in principle to modified IRR, where investment outflows are discounted at the cost of capital and inflows are discounted at the rate that equates their present value to the present value of the outflows.[25]

Academics have developed return metrics that are more accurate than those based on traditional accounting results.[26] What sets MEROI apart from all of the other measures is that it is an estimate based on the expectations for all of the investments and cash flows reflected in a company's stock price.

Conclusion

Investors generate excess returns when they buy the shares of companies prior to a revision in expectations about future cash flows. A key determinant of cash flows is a company's ability to allocate capital to investments that create value. The current principles of accounting do a poor job of separating investments and expenses, creating a veil that obscures the magnitude and return on investment.[27] A key job as an executive or investor is to adjust financial statements so as to lift the veil and understand the economics of the business.

This report fills the gap between accounting and valuation by defining MEROI, providing guidance about how to separate SG&A costs into investment and expenses, and reviewing the limitations of popular measures of return. None of this changes a company's cash flow, of course, but clarity into investment and return on investment provides a sound basis for assessing expectations.

The global economy has undergone a substantial change in the past few decades, with intangible investments now dominating tangible ones. But our financial statements and traditional valuation techniques struggle to capture these changes. Thoughtful investors go the extra step to understand what expectations are priced into a stock and whether the company is likely to meet those expectations.

Appendix: Interaction Between SG&A Capitalization and MEROI

According to one definition, '[a]ccounting seeks to measure the results of an organization's economic activities and convey this information to management, investors, creditors, regulatory agencies, consumers, and employees."[28] The world has changed, with intangible investments becoming more important than tangible ones, and the principles of accounting have not kept up. The result is a large and growing gap between economic reality and accounting results.[29]

Here we show the impact on MEROI as the assumed percentage of SG&A allocated to intangible investment rises. To set the stage, we need to make two points.

First, Miller and Modigliani established that corporate value equals steady-state value plus the present value of growth opportunities. The steady-state is defined as base year NOPAT divided by the cost of capital. When we capitalize intangible investments as an asset, we reclassify an expense as an investment. That means that the NOPAT and investment increase by the exact same amount, leaving free cash flow unchanged.

The more expenses that are capitalized, the more that the base year NOPAT rises. Because corporate value doesn't change, the steady-state value goes up and the PVGO goes down. In other words, if a company that relies on intangible investments decides it doesn't want to pursue value-creating growth, its NOPAT will rise.

Second, we calibrated our simple example to have an income statement similar to that of the S&P 500 (excluding financial companies). We assume 6 percent growth in sales and NOPAT, a 20 percent tax rate, 40 percent ROIIC, a 7 percent cost of capital, a 5-year amortization period, and a 10-year forecast horizon (see exhibit 16). SG&A for the S&P 500 is about 20 percent of sales.

Exhibit 16: Assumptions in SG&A Capitalization Model

Baseline Assumptions	
Sales and NOPAT growth	6.0%
COGS as a percent of sales	67.5%
SG&A as a percent of sales	20.0%
Tax rate	20.0%
Return on incremental invested capital	40.0%
Cost of capital	7.0%
SG&A annual amortization rate	20% (5 years)
Competitive advantage period	10 years

Source: Counterpoint Global.
Note: NOPAT=net operating profit after taxes; COGS=cost of goods sold; SG&A=selling, general, and administrative costs.

Most academic papers suggest an SG&A capitalization rate of about 30 percent.[30] Given these parameters, a 30 percent capitalization rate results in a 10 percent MEROI (see exhibit 17). As the percentage falls, MEROI rises. And as the percentage rises, MEROI falls. This is precisely what we saw with our Microsoft example. In this particular setup, MEROI equals the cost of capital at approximately 42 percent of capitalized SG&A.

Exhibit 17: Relationship Between Percentage of SG&A Capitalized and MEROI

Percent of SG&A Capitalized	Market-Expected Return on Investment
15%	14.9%
20%	13.1%
25%	11.5%
30%	10.0%
40%	7.4%
45%	6.3%
50%	5.1%

Source: Counterpoint Global.

There is a natural limit on what percentage of SG&A can reasonably be assumed to be an intangible investment. For instance, investment opportunities are limited, and companies must spend money just to maintain their current operations. Further, where a company is in its life cycle also plays a role in the ratio of investment to maintenance spending.

Endnotes

[1] Alfred Rappaport, *Creating Shareholder Value: A Guide for Managers and Investors–Revised and Updated* (New York: Free Press, 1998), 100-111.
[2] Ibid., 103-109 and Michael J. Mauboussin and Alexander Schay, "Where's the Bar? Introducing Market-Expected Return on Investment (MEROI)," *Credit Suisse First Boston: Frontiers of Finance*, Vol. 12, June 12, 2001.
[3] Michael J. Mauboussin and Dan Callahan, "One Job: Expectations and the Role of Intangible Investments," *Consilient Observer: Counterpoint Global Insights*, September 15, 2020.
[4] 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.
[5] Stewart C. Myers, "Still Searching for Optimal Capital Structure," *Journal of Applied Corporate Finance,* Vol. 6, No. 1, Spring 1993, 4-14. For a breakdown of steady state versus future growth for 24 companies from early 2020, see Bartley J. Madden, *Value Creation Principles: The Pragmatic Theory of the Firm Begins with Purpose and Ends with Sustainable Capitalism* (Hoboken, NJ: John Wiley & Sons, 2020), 101.
[6] We use a perpetuity assumption to estimate the continuing value. There are alternative ways to do so. For example, see Tim Koller, Mark Goedhart, and David Wessels, *Valuation: Measuring and Managing the Value of Companies–Seventh Edition* (Hoboken, NJ: John Wiley & Sons, 2020), 299-317.
[7] Rappaport, 49-51.
[8] Michael J. Mauboussin and Alfred Rappaport, *Expectations Investing: Reading Stock Prices for Better Returns–Revised and Updated* (New York: Columbia Business School Publishing, 2021).
[9] Baruch Lev, *Intangibles: Management, Measurement, and Reporting* (Washington, DC: Brookings Institution, 2001); John Hand and Baruch Lev, eds., *Intangible Assets: Values, Measures, and Risks* (New York: Oxford University Press, 2003); Carol A. Corrado, Charles Hulten, and Daniel Sichel, "Measuring Capital and Technology: An Expanded Framework," in Carol A. Corrado, John Haltiwanger, and Daniel Sichel, eds. *Measuring Capital in the New Economy* (Chicago: University of Chicago Press, 2005); Carol A. Corrado, Charles Hulten, and Daniel Sichel, "Intangible Capital and U.S. Economic Growth," *Review of Income and Wealth*, Vol. 55, No. 3, September 2009, 661-685; and presentation by Carol Corrado available at www.wilsoncenter.org/sites/default/files/media/documents/event/Corrado%20Presentation.pdf.
[10] Luminita Enache and Anup Srivastava, "Should Intangible Investments Be Reported Separately or Commingled with Operating Expenses? New Evidence," *Management Science*, Vol. 64, No. 7, July 2018, 3446-3468.
[11] Amitabh Dugar and Jacob Pozharny, "Equity Investing in the Age of Intangibles," *Financial Analysts Journal*, Vol. 77, No. 2, Second Quarter 2021.
[12] Note that the total shareholder return was in excess of 9.5 percent from July 1, 2002 until now. That is because the model only recognized value creating investments for 17 years, after which it assumed that incremental investments would earn the cost of capital. Over this time, it has become clear that Microsoft would create value beyond the original period, which is tantamount to an upward revision in expectations.
[13] Charles R. Hulten, "Decoding Microsoft: Intangible Capital as a Source of Company Growth," *NBER Working Paper 15799*, March 2010. For expenses, Hulten writes, "Following the general guidance of the CHS [Corrado, Hulten, Sichel] and macro research, adjusted to reflect the high-technology nature of the company, the fractions selected were 100 percent (R&D), 70 percent (S&M), and 20 percent (G&A)." For the period of amortization, we follow the guidelines in a paper by Carol Corrado, an economist who has contributed substantially to this research, and Hulten. The amortization period is six years for R&D and two years for both S&M and G&A. See Carol A. Corrado and Charles R. Hulten, "Innovation Accounting," in Dale W. Jorgenson, J. Steven Landefeld, and Paul Schreyer, eds., *Measuring Economic Sustainability and Progress* (Chicago: University of Chicago Press, 2014), 614.
[14] Note that the NOPAT assumption for fiscal 2021 is the same in both models. That makes sense because we want a steady-state level of NOPAT that assumes no return on investment. That figure is the same whether or not we make adjustments.
[15] Rajiv D. Banker, Rong Huang, Ram Natarajan, and Sha Zhao, "Market Valuation of Intangible Asset: Evidence on SG&A Expenditure," *Accounting Review*, Vol. 94, No. 6, November 2019, 61-90; Nicolas Crouzet

and Janice C. Eberly, “Understanding Weak Capital Investment: The Role of Market Concentration and Intangibles,” *NBER Working Paper 25869*, May 2019; and Matthias Regier and Ethan Rouen, “The Stock Market Valuation of Human Capital Creation,” *Harvard Business School Working Paper 21-047*, October 2, 2020.

[16] Baruch Lev and Feng Gu, *The End of Accounting and the Path Forward for Investors and Managers* (Hoboken, NJ: John Wiley & Sons, 2016), 84-86.

[17] NOPAT is operating income minus the cash taxes attributable to that income. Invested capital can be calculated from the left or right side of the balance sheet. From the left side it is current assets minus non-interest-bearing current liabilities, plus net property, plant, and equipment, goodwill, intangible assets, and any other operating assets. From the right side it is total debt plus equity plus equity equivalents, which includes items such as deferred taxes.

[18] Alfred P. Sloan Jr., *My Years With General Motors* (New York: Doubleday & Company, 1964).

[19] We assume that necessary cash equals two percent of sales.

[20] David Solomons, *Divisional Performance: Measurement and Control* (New York: Financial Executives Research Foundation, 1965), 60-71.

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[22] For example, see John Huber, “Calculating the Return on Incremental Capital Investments,” *Saber Capital Management*, June 6, 2016 and McDonald’s Corporation, *Form 10-K*, December 31, 2020.

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Please see Important Disclosures on pages 21- 23

DEFINITIONS OF TERMS

The **continuing (also residual or terminal) value** is the value of all future cash flows at the point of time in which growth is expected to become stable.

The **cost of capital** is the rate at which you discount future cash flows in order to determine the value today. The weighted average cost of capital blends the opportunity cost of the sources of capital, typically debt or equity, with the relative contribution of those sources.

The **discount rate** is the rate at which you discount future cash flows in order to determine the value today.

Free cash flow (FCF) is a measure of financial performance calculated as net operating profit after taxes (NOPAT) minus investment in growth. FCF represents the cash that a company is able generate after laying out the money required to maintain or expand its asset base.

Net present value is a measure of the value of estimated future cash flows discounted back to the present.

Return on invested capital represents the rate of return a company makes on the cash it invests in its business.

Return on investment is a performance measure used to evaluate the efficiency of an investment or to compare the efficiency of a number of different investments.

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