

Counterpoint Global Insights

ROIC and Intangible Assets

A Look at How Adjustments for Intangibles Affect ROIC

CONSILIENT OBSERVER | November 9, 2022

Introduction

Investors seek to buy partial stakes in businesses at a price less than value. The idea is to get more than what you pay for. The present value of the cash flows the business can distribute over its lifetime determines the ultimate value. The market's expectation for those cash flows sets the price.

You need to understand how a business works and what its prospects are to get a handle on future cash flows. Core to that understanding is an assessment of how much a company invests and the return those investments are likely to earn. Companies create value when the return on their investments exceeds the opportunity cost of the capital they deploy.

Return on invested capital (ROIC) is one way to measure whether a company's earnings are sufficient relative to the capital it has invested. ROIC measures net operating profit after taxes (NOPAT) as a percentage of invested capital. NOPAT is the cash earnings of the business independent of how it finances its operations. Invested capital is an estimate of how much capital the company is employing to generate those earnings. The spread between ROIC and the cost of capital provides insight into whether a company is generating value.

We recently wrote a report called "Return on Invested Capital: How to Calculate ROIC and Handle Common Issues" that covered calculations and other considerations.¹ We also showed empirical data for the Russell 3000 Index, which includes approximately 3,000 U.S. public companies. Data included the distribution of ROICs, aggregate ROICs over time, and ROICs by industry. We also showed a chart of the components of ROIC, NOPAT margin (NOPAT/sales) and invested capital turnover (sales/invested capital), for the top 500 companies in the index to highlight the potential source of competitive advantage.²

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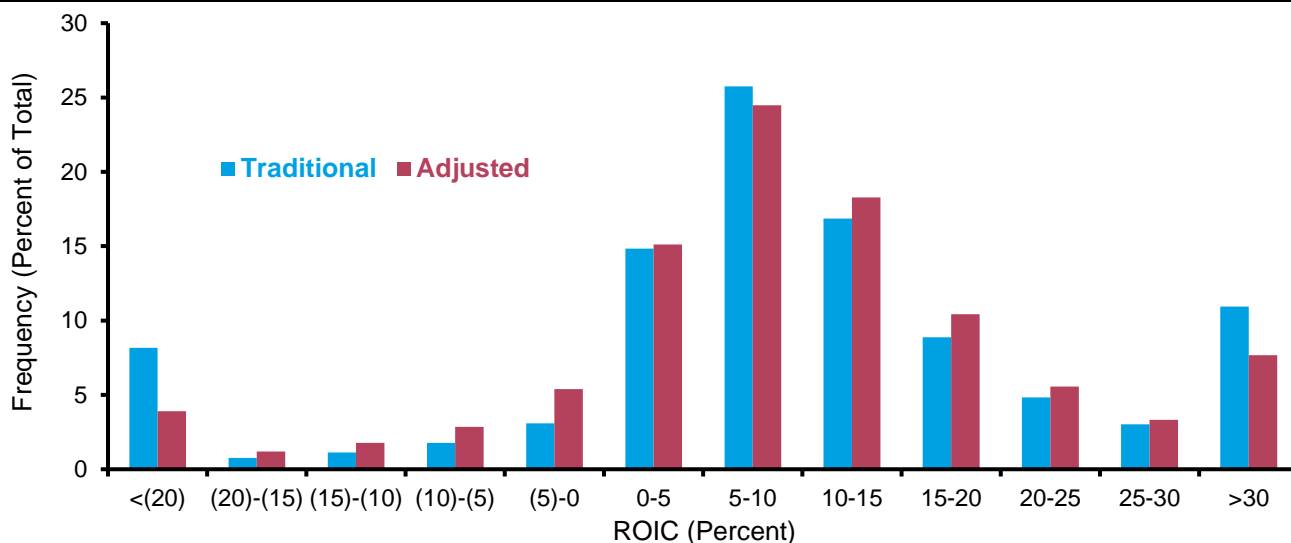
The report also discussed how capitalizing intangible investments affects ROIC. This adjustment takes part of selling, general, and administrative (SG&A) expense and reclassifies it as an investment. As a consequence, NOPAT and invested capital both increase. The reclassification does not affect free cash flow, the main driver of corporate value, but it does provide a more accurate view of profits and investments.

Our discussion of how to make this intangible adjustment was limited to a couple of case studies. In this short report, we extend the analysis by capitalizing intangible investments for the full universe. We explain the methodology in the appendix, but the percentage of SG&A that is deemed to be an intangible investment, and the assumptions about the appropriate asset lives, are tailored to each industry. This work allows us to place the traditional and adjusted figures side by side and see the impact the modification has on relevant financial metrics. The main result is that extremely high and low ROICs regress toward the mean.³

Empirical Data

Exhibit 1 shows the distributions of ROICs for the Russell 3000, excluding the financial and real estate sectors, using the traditional and adjusted approaches. The median ROIC in 2021 following the adjustment is 8.96 percent, which is only slightly higher than the traditional ROIC of 8.84 percent. The update doesn't move the median much.

Exhibit 1: Distributions of ROICs for the Russell 3000, 1990-2021



Source: FactSet and Counterpoint Global.

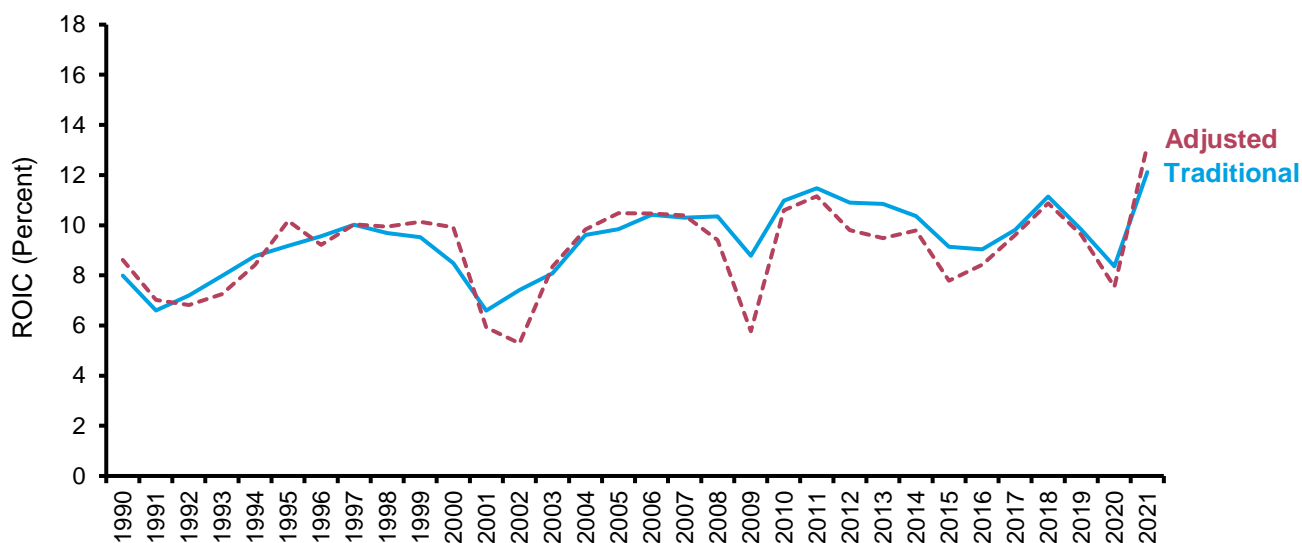
Note: Excludes financials and real estate.

But the bins with the lowest ROICs (far left) and highest ROICs (far right) have fewer companies in them after the adjustment. The low-return bin goes from 8 percent of the sample with the traditional calculation to 4 percent after the adjustment. Likewise, the high-return bin goes from 11 percent (traditional) to 8 percent (adjusted). This shows that the intangible adjustment pushes the outliers toward the average and reduces the dispersion relative to the traditional calculation.

For companies with high ROICs, the adjustment to NOPAT is less significant than that for invested capital. As a result, the revised ROIC is pulled down. The adjustment to NOPAT has more impact than that for invested capital for firms with low ROICs, which lifts the modified ROIC.

Exhibit 2 shows the traditional and adjusted aggregate ROICs from 1990 to 2021. The aggregate ROIC is total NOPAT divided by total average invested capital for the relevant companies in the Russell 3000 for each year. The series track one another quite closely. The traditional figures have an average annual return of 9.4 percent versus 9.1 percent for the adjusted calculation. The traditional ROICs are also less volatile, with a standard deviation of 1.4 compared to 1.7 for the adjusted ROICs.

Exhibit 2: Aggregate Traditional and Adjusted ROICs for the Russell 3000, 1990-2021



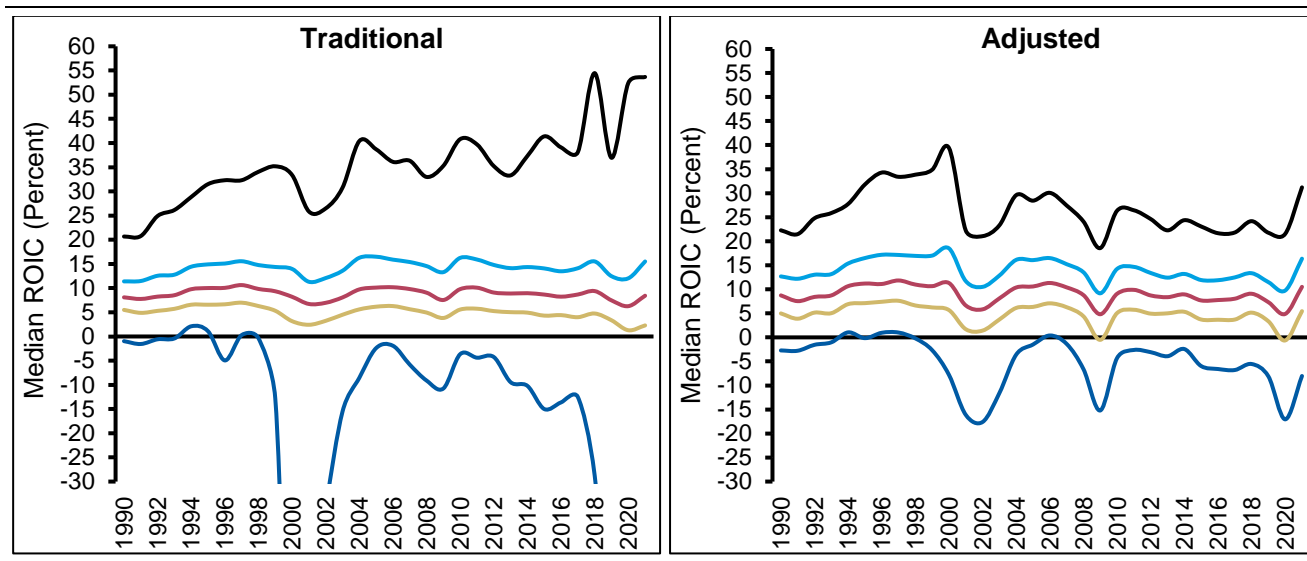
Source: FactSet and Counterpoint Global.

Note: Excludes financials and real estate.

Exhibit 3 breaks down annual ROICs by quintile using the traditional (left panel) and adjusted (right panel) calculations. We allow the universe to reshuffle each year. While the middle three quintiles appear similar, the highest and lowest quintiles have outcomes that are less extreme in the adjusted calculation. This is consistent with the reduction in dispersion after reflecting intangible investments.

Some academics have pointed out the emergence of “superstar” firms, which have distanced themselves from their industry peers in measures such as markups and ROIC.⁴ A markup captures the difference between the price a company can charge for a good or service and its marginal cost. A positive markup allows a company to earn an economic profit, measured as ROIC less the cost of capital multiplied by invested capital.

The distinction between the superstar firms and their peers shrinks significantly after reflecting intangible investments because the adjustment lowers markups and ROICs. This suggests the possibility that rather than being extreme outliers, as the traditional analysis of markups and ROIC indicates, superstar firms may earn a return on their tangible and intangible investments that is only modestly higher than that of their peers.⁵

Exhibit 3: Median ROIC by Quintile, Traditional and Adjusted, for the Russell 3000, 1990-2021

Source: FactSet and Counterpoint Global.

Note: Excludes financials and real estate; Axes truncated for visualization.

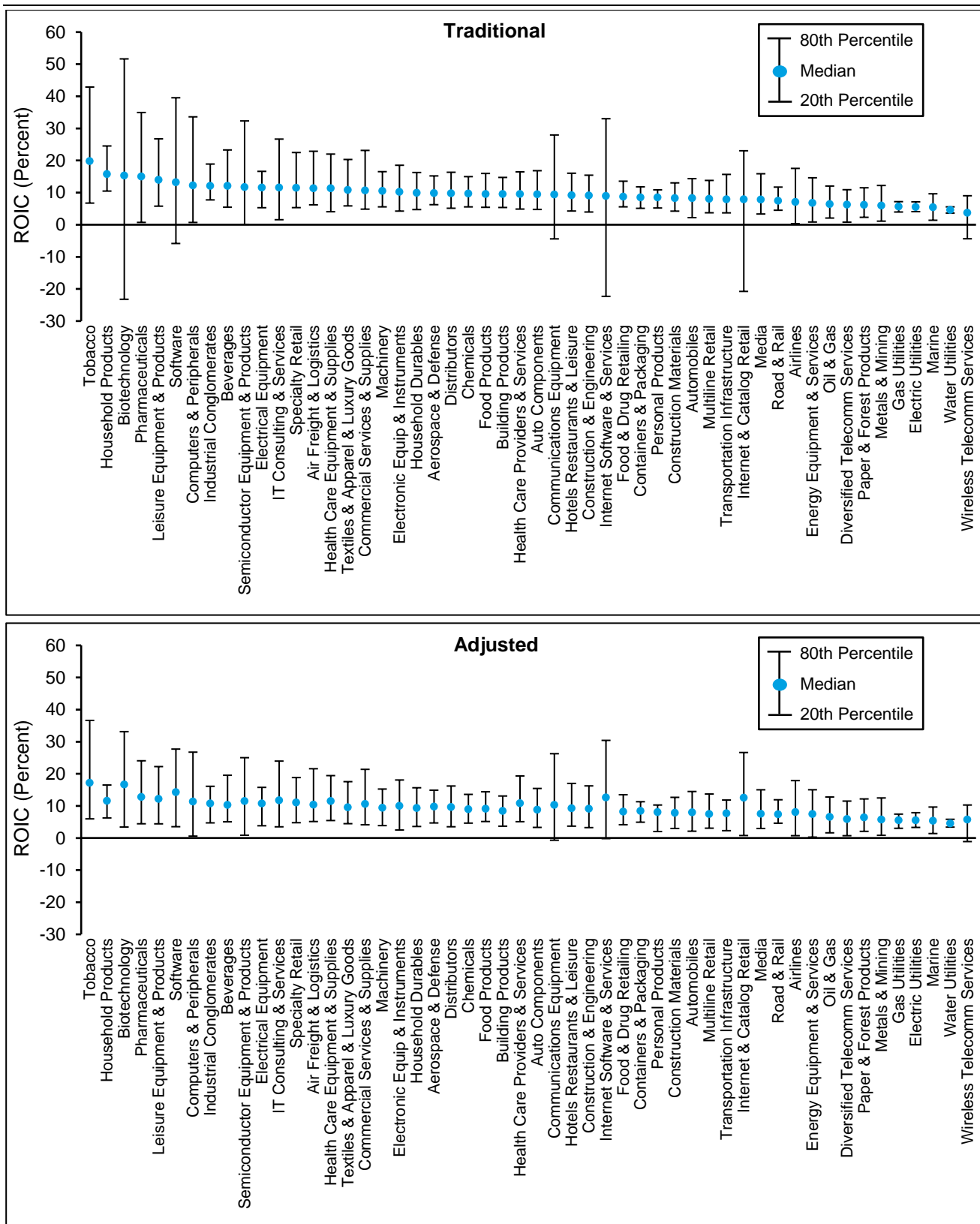
Adjusting for intangible investment has a larger effect on some industries than others. The mix between tangible and intangible investment determines the magnitude of the impact. Capitalizing intangible investments lifts the ROIC and reduces the range of outcomes for industries that rely heavily on intangible investments. The impact of the adjustment is modest for industries that do not spend much on intangibles.

Exhibit 4 shows the median ROIC for 52 non-financial industries, as defined by the Global Industry Classification Standard, calculated in the traditional fashion (top panel) and after adjusting for intangible investments (bottom panel). It also shows the ROICs for the companies in the 20th and 80th percentiles as an indication of dispersion. We maintained the order of the industries to show the contrast between results before and after the adjustment.

A comparison of the two calculations shows that the ROICs are higher after the adjustment for industries such as biotechnology, internet software & services, and internet & catalog retail. Other industries, such as utilities, see very little change.

The exhibit provides additional evidence that the adjustment shrinks dispersion. This effect is more pronounced in industries that rely heavily on intangible investments than it is for businesses based on tangible assets. For one half of the industries where the 20th percentile company had a negative ROIC using the traditional calculation, the result flipped to positive following the adjustment. The other half were just barely negative. Capitalizing intangible investments makes the highs lower and the lows higher.

Exhibit 4: ROICs by Industry, Traditional and Adjusted, for the Russell 3000, 1990-2021



Source: FactSet and Counterpoint Global.

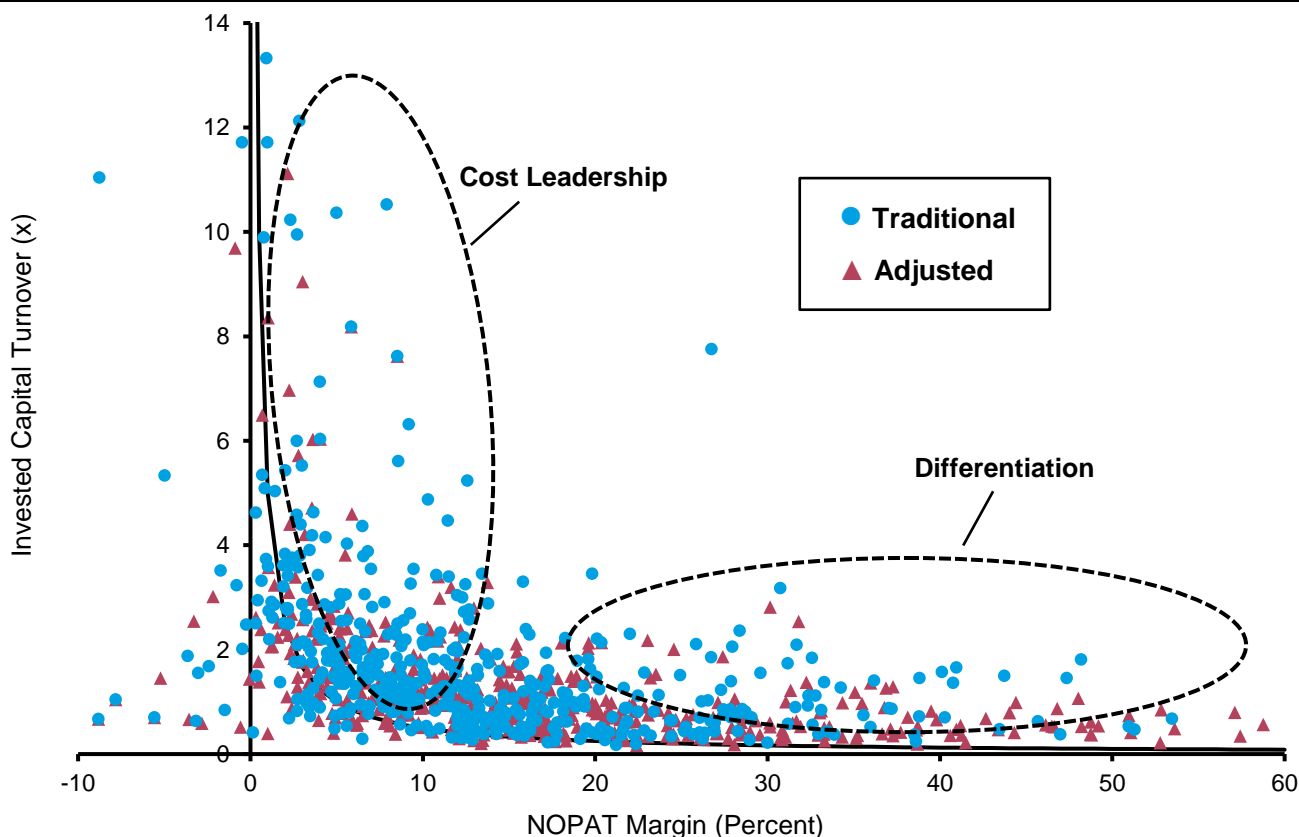
Note: Excludes financials and real estate; Minimum of 100 million of sales in 2021 U.S. dollars.

Decomposing ROIC can provide clues about the source of competitive advantage. A company that achieves an attractive level of ROIC by earning a high NOPAT margin often does so by pricing its good or service at a premium to competitors. This is a differentiation strategy. A firm that earns a high ROIC by having high invested capital turnover, a measure of capital efficiency, can provide its offering at a relatively low price. This is a cost-leadership strategy. The path a company takes to an attractive ROIC can guide analysis of competitive strategy.

Exhibit 5 shows a scatter plot of the top 500 companies in the Russell 3000 as measured by sales. The horizontal (x) axis is the NOPAT margin and the vertical (y) axis is the invested capital turnover. The product of these equals ROIC, which means that the ROICs are lower in the bottom left corner than they are in the top right corner. Companies in the bottom right section of the chart can be said to pursue a differentiation strategy and those in the top left a cost-leadership strategy.

The dots in the chart are the results calculated using the traditional approach. The triangles are the same universe but adjusted for intangibles. In general, the adjustment for intangible investment leads to higher NOPAT and higher invested capital. Since both are considered relative to sales, which does not change, the NOPAT margin goes up and the invested capital turnover goes down. Said differently, the adjustment pulls companies toward the bottom right of the chart. As a result, you see more circles in the upper left section of the chart and more triangles in the bottom right.

Exhibit 5: Traditional and Adjusted Drivers of ROIC, Top 500 Companies in Russell 3000, 2021

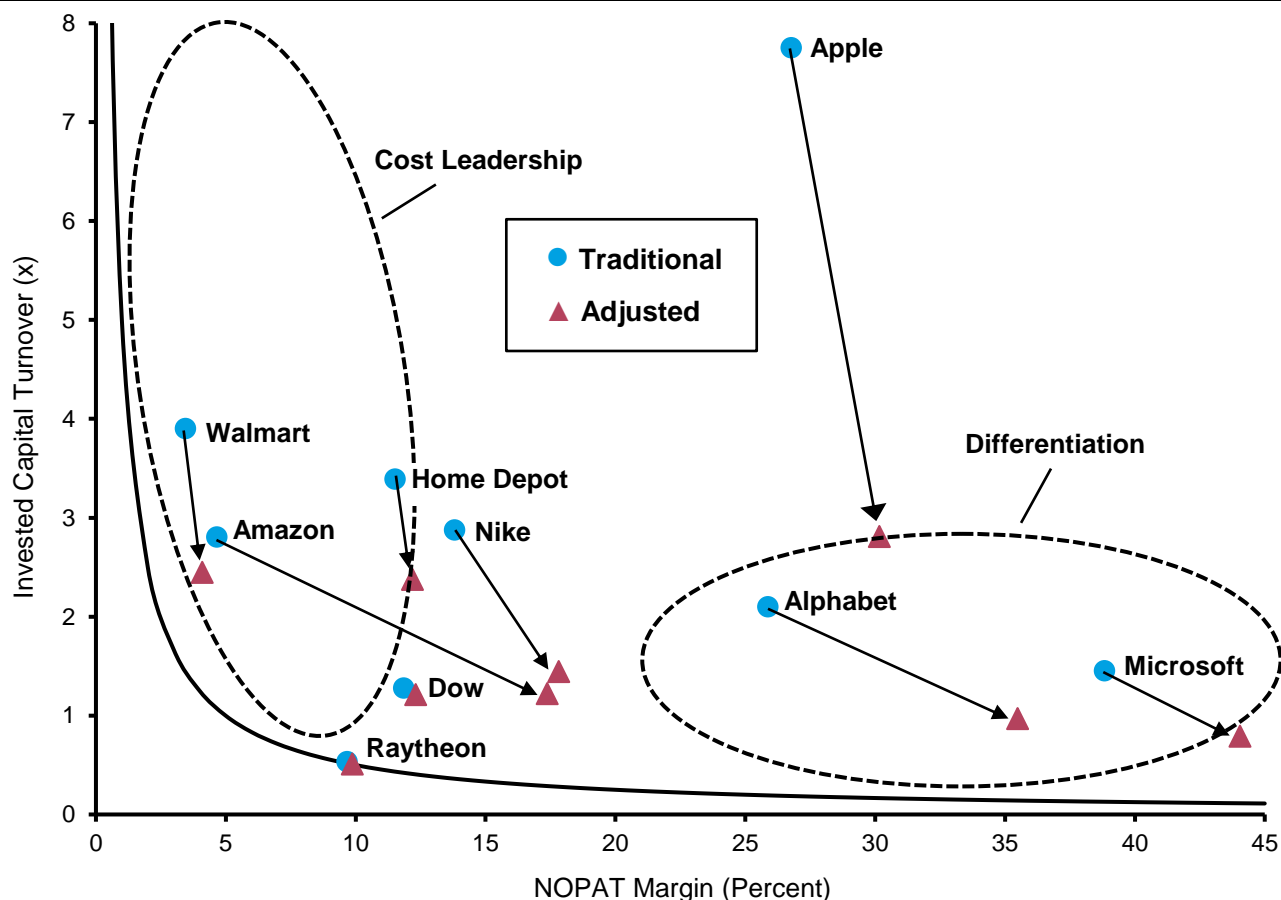


Source: FactSet and Counterpoint Global.

Note: Top 500 companies by 2021 sales; Excludes financials and real estate; Truncated axes for visualization.

Exhibit 6 zooms in on the traditional and adjusted drivers for nine large companies. We also include an isoquant curve that shows all of the combinations of NOPAT margin and invested capital turnover that produce an ROIC of five percent. The figure not only shows that firms migrate down and to the right, but also reveals the distance the companies travel following the adjustment. The journey is short for some companies such as Dow Inc., the materials science company. Others travel much farther, such as the technology company, Apple Inc.

Exhibit 6: Traditional and Adjusted Drivers of ROIC for Selected Companies, 2021



Source: FactSet and Counterpoint Global.

Conclusion

The main task of a business analyst is to understand the magnitude and return on investment. ROIC is a tool that helps with this assessment.

Over the last few decades, there has been a marked change in the nature of the investments that companies make. Tangible investments, which are physical, dominated in years past. Intangible investments, which are nonphysical, are much more prominent today.

The challenge is that accountants treat these investments differently. Tangible investments are recorded on the balance sheet and depreciated on the income statement over their estimated useful lives. This is consistent with the principle of matching sales and expenses.

Most intangible investments appear as an expense on the income statement. This is because accountants are uncertain about the sales that these investments may generate. So, in order to be conservative, they do not apply the matching principle and simply expense the outlays.

This difference in accounting treatment makes the business analyst's task more difficult. One way to get a more consistent view of investment and return on investment is to handle all investments in the same way. That means treating intangible investments the same as tangible investments.

This is easy to say but hard to implement. The reason is that it is a challenge to know what amount of SG&A reflects maintenance spending, which is required to sustain current sales, and what amount is a discretionary investment in pursuit of value-creating growth. Even after an analyst makes the judgment about the split between maintenance and discretionary spending, there is the issue of the appropriate asset life.

We recently wrote a report discussing how to calculate ROIC and some of the challenges in estimating NOPAT and invested capital. We also discussed how to capitalize intangible investments and shared two case studies.

This report goes a step further and adjusts ROIC to reflect intangible investment for all non-financial companies in the Russell 3000. While the median and aggregate ROICs for the adjusted figures are similar to the traditional ones, the big difference is that the adjusted figures have much less dispersion.

The adjustment for intangible investment lowers the ROIC for high-ROIC firms and raises the ROIC for low-ROIC companies. While the methods to implement these modifications remain a vibrant area of research, we believe they represent a step toward a more accurate view of the magnitude and return on investment.

Appendix: Methodology to Adjust for Intangible Investment

Here is how we adjust our calculations of ROIC to account for intangible investments.

The first step is to acknowledge that some percentage of SG&A expense is properly considered an intangible investment. These intangible investments are discretionary and are in pursuit of growth that creates value.

Specifically, there are two issues: determining how much of SG&A is an intangible investment and designating an appropriate asset life. Once these two parts are in place, we can reflect intangible investments on the balance sheet and amortize them over their useful lives. In other words, we account for intangible investments the same way as we do for capital expenditures.

Most academics make this adjustment by following the approach described by two professors of finance, Ryan Peters and Lucian Taylor.⁶ They suggest treating all of research and development (R&D) expense, and 30 percent of non-R&D SG&A expense, as an intangible investment.

There are two potential limitations to the Peters and Taylor approach. The first is that it does not recognize that some of R&D expense may actually be required to maintain current operations. The second is that it does not capture the possibility that the portion of the R&D expense and non-R&D SG&A expense that is an intangible investment may vary by industry.

To address those limitations, we use the approach described by Aneel Iqbal, a PhD candidate in accounting, and Shivaram Rajgopal, Anup Srivastava, and Rong Zhao, professors of accounting.⁷ They estimate capitalization rates and useful lives for R&D and non-R&D SG&A for each of the Fama-French industries. The amortization rate is then calculated as 1/useful life. For example, if R&D has an estimated useful life of 5 years, the investment amount is reflected on the balance sheet and 20 percent (1/5) is amortized each year over the asset's life.

We apply these estimates to companies in the Russell 3000 based on their Fama-French industry.⁸ We use the perpetual inventory method to estimate the net capitalized intangible assets for each year.⁹ This leads to an upward adjustment in invested capital.

The annual change in net capitalized intangible assets equals our estimate of net intangible investments. The result is an increase in NOPAT in most cases.

The formula for net capitalized intangible assets, the sum we add to invested capital, is:

$$\frac{\text{R\&D}_{\text{year-1}} \times \text{Capitalization rate of R\&D}}{\text{Growth rate of R\&D} + \text{Amortization rate of R\&D}} + \frac{\text{Non-R\&D SG\&A}_{\text{year-1}} \times \text{Capitalization rate of non-R\&D SG\&A}}{\text{Growth rate of non-R\&D SG\&A} + \text{Amortization rate of non-R\&D SG\&A}}$$

The formula for net intangible investments, the sum we add to traditional NOPAT, is:

$$\left[\frac{\text{R\&D}_{\text{year0}} \times \text{Capitalization rate of R\&D}}{\text{Growth rate of R\&D} + \text{Amortization rate of R\&D}} + \frac{\text{Non-R\&D SG\&A}_{\text{year0}} \times \text{Capitalization rate of non-R\&D SG\&A}}{\text{Growth rate of non-R\&D SG\&A} + \text{Amortization rate of non-R\&D SG\&A}} \right] - \left[\frac{\text{R\&D}_{\text{year-1}} \times \text{Capitalization rate of R\&D}}{\text{Growth rate of R\&D} + \text{Amortization rate of R\&D}} + \frac{\text{Non-R\&D SG\&A}_{\text{year-1}} \times \text{Capitalization rate of non-R\&D SG\&A}}{\text{Growth rate of non-R\&D SG\&A} + \text{Amortization rate of non-R\&D SG\&A}} \right]$$

We assume a 7 percent growth rate for R&D and non-R&D SG&A, which is the historical growth rate of both amounts within the Russell 3000 from 1990-2021. Varying the growth rate does not materially change our aggregate results.

Endnotes

¹ 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.

² NOPAT margin is defined as NOPAT/Sales and invested capital turnover is defined as Invested Capital/Sales. When you multiply the terms, sales cancel out and you are left with NOPAT/Invested Capital. A high margin and average invested capital turnover are associated with a differentiation strategy, while an average margin and high invested capital turnover are consistent with a cost leadership strategy.

³ Here's the intuition. For all companies, the adjustment increases NOPAT and investment, net of amortization, for any particular year by the same amount. But the calculation of invested capital also reflects the sum of past intangible investments net of amortization. For companies with ROICs that are high, the incremental increase in NOPAT is small relative to the increase in invested capital.

In our prior report we illustrated the point with numbers from Microsoft, a multinational technology company. The company's traditional ROIC for fiscal 2022 is 49 percent, or \$70 billion in NOPAT divided by \$143 billion of average invested capital. The adjustment adds an ROIC of 11 percent, or \$10 billion to NOPAT and \$90 billion to average invested capital. You can think about it as starting with the high-return part ($49\% = 70/143$) and adding a low-return part ($11\% = 10/90$) to get an adjusted total of 34 percent ($34\% = 80/233$).

Now take Snowflake, a cloud computing-based data warehousing company. The traditional ROIC for fiscal 2022 is -416 percent, or -\$704 million in NOPAT divided by \$169 million in average invested capital. This young company's heavy investment shows up on the income statement. The adjustment adds an ROIC of 51 percent. You can think about it as starting with a low-return part ($-416\% = -704/169$) and adding a high-return part ($51\% = 756/1,490$) to get an adjusted total of 3 percent ($3\% = 52/1,659$).

In both cases, the adjusted number is closer to the average than the traditional one.

⁴ David Autor, David Dorn, Lawrence F. Katz, Christina Patterson, and John Van Reenen, "The Fall of the Labor Share and the Rise of Superstar Firms," *Quarterly Journal of Economics*, Vol. 135, No. 2, May 2020, 645-709; Prasanna Tambe, Lorin Hitt, Daniel Rock, and Erik Brynjolfsson, "Digital Capital and Superstar Firms," *NBER Working Paper 28285*, December 2020; and Alexander Schiersch and Caroline Stiel, "Testing the Superstar Firm Hypothesis," *Journal of Applied Economics*, Vol. 25, No. 1, 2022, 583-603.

⁵ Meghana Ayyagari, Asli Demirguc-Kunt, Vojislav Maksimovic, "The Rise of Star Firms: Intangible Capital and Competition," *Working Paper*, October 2022.

⁶ 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.

⁷ Aneel Iqbal, Shivaram Rajgopal, Anup Srivastava, and Rong Zhao, "Value of Internally Generated Intangible Capital," *Working Paper*, February 2022.

⁸ For more information see Ken French's website: https://mba.tuck.dartmouth.edu/pages/faculty/ken.french/Data_Library/det_48_ind_port.html.

⁹ Michael Berleemann and Jan-Erik Wesselhöft, "Estimating Aggregate Capital Stocks Using the Perpetual Inventory Method: A Survey of Previous Implementations and New Empirical Evidence for 103 Countries," *Review of Economics*, Vol. 65, No. 1, 2014, 1-34 and Michael Berleemann and Jan-Erik Wesselhöft, "Aggregate Capital Stock Estimations for 122 Countries: An Update," *Review of Economics*, Vol. 68, No. 2, 2017, 75-92.

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