

## Counterpoint Global Insights

# Intangibles and Earnings

## Improving the Usefulness of Financial Statements

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### Introduction

The goal of accounting, the language of business, is to provide financial information to allow managers and other claimholders to make informed decisions about a company. The Sarbanes-Oxley Act of 2002 requires the chief executive officer and chief financial officer of a U.S. public company to certify that the firm's financial statements are true and without material omissions, and to present fairly the operations and financial condition. The executives must also certify that the necessary internal controls are in place to make sure that that they receive material information.

In recent decades, the ability to interpret financial statements has been complicated by the shift from tangible to intangible investments.<sup>1</sup> Tangible assets are physical, such as factories or trucks. Intangible assets are non-physical and include brand-building or employee training.

This is a problem because accountants primarily reflect tangible investments on the balance sheet and intangible investments on the income statement.<sup>2</sup> Tangible assets are depreciated over their useful lives, which shows up as an expense on the income statement. And intangibles are recorded on the balance sheet and amortized only following an acquisition. But that today's investments do not show up in the same spots as in the past means that financial statements do not provide the same information.

A sensible solution to this challenge is to capitalize the investments that appear on the income statement and amortize them over their useful lives. This means treating an intangible investment the same as a tangible investment. But this raises two big questions: which income statement items are appropriately considered investments and what is a proper useful life for those assets?

This report takes up those questions by leveraging recent academic research. The main finding is that one size does not fit all. These adjustments recast profitability for some companies and are inconsequential for others.<sup>3</sup> Overall, we estimate that earnings for the S&P 500 would be about 12 percent higher with consideration of these changes.

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## Accounting and Approaches to Valuation

A simple way to think about approaches to valuation is to separate a company's results into two piles: earnings and investments. Earnings on the income statement are what accountants call a "flow," which measures a result over time. Investment on the balance sheet is a "stock," which is a snapshot at a period of time. Some valuation techniques rely more on flow, including multiples of price-to-earnings (P/E) and enterprise value-to-earnings before interest taxes depreciation and amortization (EV/EBITDA). Others are based on stock, such as the ratio of price-to-book value (P/B).

Earnings equal revenues minus expenses for a particular period. Companies and investors commonly fiddle with expenses, for example excluding certain items in the hope of adding clarity. But the idea is reasonably straightforward.<sup>4</sup>

Investments are outlays in the present that are expected to generate earnings in the future. An investment is worthwhile if the present value of the future earnings is higher than the cost. Tangible investments for a particular period show up on the statement of cash flows, and the cumulative amount shows up as assets on the balance sheet. Companies record depreciation as a cost on the income statement to match the use of the asset with its expense. The amount of annual depreciation reflects the asset's estimated life.

Intangible investments appear as an expense in the selling, general, and administrative (SG&A) section of the income statement. Intangible investments are also recorded on the balance sheet but only when they are acquired. Accountants amortize acquired intangible assets over their estimated useful lives in the same way that they depreciate tangible assets. Absent an acquisition, intangible investments are recorded solely as an expense.

These accounting conventions mean that figuring out what goes into the earnings and investment piles can be tricky and misleading. This is especially relevant when investors rely on shorthands to do their valuation work. We now look at how this sorting affects the metrics that practitioners use to value businesses.

**Discounted Cash Flow.** In theory, the value of a financial asset is the present value of future free cash flows. Because free cash flow considers earnings and investments, moving items from one pile to the other does not affect the outcome. For example, assume you examined a company and calculated that its earnings were \$250 and its investment was \$100. Free cash flow would be \$150 ( $\$250 - \$100$ ).

In studying the company further, you conclude that \$100 of investments were recorded on the income statement. You move \$100 from one pile to the other as a result. Earnings are now \$350 and the investment is \$200. Free cash flow remains \$150 ( $\$350 - \$200$ ), but the path to get there is different.

Sorting the earnings and investment may not appear to be worthwhile if you come up with the same answer. But, in fact, understanding the magnitude and return on investment provides vital clues about a business's capital intensity and future earnings.

This adjustment can also have an impact on a discounted cash flow model that uses a continuing value to estimate the contribution of the cash flows beyond an explicit forecast period. Estimates of continuing value are generally based on earnings. Common approaches include capitalizing net operating profit after taxes or applying a multiple of EBITDA. Continuing value increases to the degree to which the adjusted earnings are higher than the unadjusted earnings.<sup>5</sup>

**Multiples of Earnings.** A survey of nearly 2,000 professional fundamental investors revealed that nearly 93 percent use multiples to value businesses.<sup>6</sup> The most popular multiples are P/E and EV/EBITDA. Earnings can be misrepresented for businesses that invest heavily via the income statement.

Take Amazon as an example.<sup>7</sup> The company's enterprise value at the end of 2021 was approximately \$1.725 trillion, and its EBITDA was \$59.2 billion (\$24.9 billion in EBIT and \$34.3 billion in DA). Reclassifying \$60.1 billion in expenses as investments increases net income from \$33.4 billion to \$61.5 billion, effectively doubles EBITDA, and lifts investments by almost 90 percent.<sup>8</sup> Provided these adjustments present a more accurate portrait of the company's financial situation, the P/E and EV/EBITDA multiples are substantially lower than the traditional calculations suggest.

In a moment, we will show that the consequence of this adjustment varies widely. But it should be clear that a simplistic comparison of multiples from one company to the next is fraught with the danger of false conclusions.<sup>9</sup>

Research shows that earnings are less relevant and informative today than they were in the past.<sup>10</sup> That means that multiples, which seek to serve as a shorthand for the proper valuation process, are often not up to the task of discerning value and value creation.

**Multiples of Investment (via Book Value).** Over the last six decades, academics have worked on models to explain risk and returns for asset prices. The capital asset pricing model (CAPM) is the best known of these and posits a linear relationship between risk and expected return.<sup>11</sup> Risk in this case is defined as the standard deviation of returns.

Shortly after the CAPM was specified, it became clear that the model had a limited ability to explain returns. In the early 1990s, the finance professors Eugene Fama and Kenneth French developed a better model to explain returns that included the CAPM but added a size premium and a value premium.<sup>12</sup> The size premium reflects the observation that small-capitalization stocks have delivered higher returns than what the CAPM predicts. The value premium captures the fact that the returns of cheap stocks have been higher, and the returns of expensive stocks have been lower, than the estimates generated by the CAPM.<sup>13</sup>

The value factor seeks to harvest the value premium.<sup>14</sup> The classic setup is to create a portfolio that is long the cheapest stocks and short the most expensive ones. There are various ways to define value, but Fama and French used the P/B ratio. One of the benefits of this ratio is that it is more stable than multiples of earnings.<sup>15</sup>

There is a direct link between the investment pile and book value. Tangible investments are recorded on the asset side of the balance sheet. For instance, a new machine for manufacturing shows up as property, plant, and equipment (PP&E). Assets minus liabilities equal shareholders' equity. Liabilities are predominately debt. Divide shareholders' equity by the shares outstanding and you get book value per share.

The ratio of price to book value reflects the level at which shareholders are willing to buy or sell their shares divided by the value on the balance sheet that is attributable to shareholders. The problem with this method of valuation is that book value will be lower than it should be if the investment pile is understated. In turn, that will affect ratios of price to book and distort the results of this metric.

If the shift from tangible to intangible investment is meaningful, we would expect a weakening of the signal from the value factor. This is what we have seen.<sup>16</sup> As important, the signal from the value factor improves when intangibles are reflected as investments.<sup>17</sup> This result is well understood by academics and practitioners. In other words, accurately sorting the earnings and investment piles improves this approach to valuation.

The analytical issue should now be clear. The shift from tangible to intangible investment has left shorthand valuation methods less useful because the earnings and investment piles are not sorted as well as they could be. The accounting conventions we now follow, which are understandably conservative, fail to provide the information that managers and investors need to make knowledgeable choices about a company.

## How to Sort Earnings and Investments

The solution to the problem of how to sort the earnings and investment piles more accurately is to record investments that are part of SG&A on the balance sheet and then amortize them over their useful lives. This treats the intangible investments that a company expenses the same as the tangible investments that it capitalizes.

Here's an illustration to make the idea more concrete. Company A buys a machine for \$1,000 that has an estimated useful life of 5 years. The present value of expected cash flows is \$1,500. Company B spends \$1,000 to acquire a subscriber who is expected to remain a customer for 5 years. The present value of the customer's expected cash flows is \$1,500.

The economic profile of these investments is identical but their accounting treatment is different. Company A records the machine as PP&E and depreciates \$200 a year for 5 years. Company B immediately reflects the \$1,000 customer acquisition as an expense in SG&A. Note that Company B will "lose" more in earnings the faster it grows, even though acquiring customers creates value. We want a solution that sorts the earnings and investment piles in the same way.

Academics who study this topic seek to understand the impact of capitalizing investments from the income statement for a large sample of companies. As a result, they frequently use 100 percent of research and development (R&D), and 30 percent of non-R&D SG&A, to estimate investment. They also assume a standard asset life.<sup>18</sup> This is a step in the right direction but is a blunt tool. Business analysts recognize that the investment component of SG&A varies widely by industry and company. Investors buying and selling companies based on their fundamental outlooks must reflect these differences in their assessments.

In 2018, Luminita Enache and Anup Srivastava, professors of accounting, published a paper that posed the question at hand in the title: "Should Intangible Investments Be Reported Separately or Commingled with Operating Expenses?"<sup>19</sup> They show the significance of the rise of intangible investments over time and develop a method for estimating the magnitude of intangible investment. Their analysis reveals that the relevance of this accounting issue varies widely.

A straightforward description of their approach is that they figured out a way to separate SG&A expenses into maintenance and investment parts. Maintenance SG&A expenses are necessary for the company to sustain its current operations. Investment SG&A expenses are in pursuit of growth that creates value. In effect, they provide a method to make the earnings and investment piles more accurate than standard financial statements do.

## The Impact of Intangibles on Earnings and Book Value

We now discuss a framework to measure the impact of these adjustments on earnings. But before we do that, we need to address the nature of the adjustments in more detail. This requires judgment about what percentage of SG&A expense is an investment and what are the appropriate asset lives.

Aneel Iqbal, a doctoral candidate in accounting, and Shivaram Rajgopal, Anup Srivastava, and Rong Zhao, professors of accounting, developed a method to guide these assumptions.<sup>20</sup> Using a regression methodology, they examined 42 industries and specified the investment portion of SG&A expenses. They separated SG&A into two parts: Main SG&A, which is the SG&A expense less R&D, and R&D expense. Note that most researchers have historically deemed all of R&D expense to be a discretionary intangible investment.<sup>21</sup> Consistent with prior work, they find large variance across industries (see Appendix A).<sup>22</sup> Specifically, they answer two questions:

- **What percentage of SG&A expense is an investment?** Their analysis finds that between 0 and 80 percent of Main SG&A is an investment across the range of industries, with an average of 54 percent. They estimate that a range of 7 to 98 percent of R&D expense is an investment, with a mean of 76 percent. Note that many executives struggle to answer the question of how their SG&A expense breaks down between maintenance and investment spending.
- **What is an appropriate asset life?** Tangible assets have an average life of around ten years. Because we are capitalizing SG&A as we would a tangible investment, we must have a sense of asset lives to properly amortize them. Iqbal et al. judge the useful life of Main SG&A investments to be 0.25 to 5 years, with an average of 3.3 years. The useful lives for R&D investments range from 0.5 to 7 years, with a mean of 4.4 years.

Finally, we need to estimate the growth in investment SG&A in order to measure the impact of the adjustments. Growth affects the difference in the timing between the removed expense and added amortization. Consider a case where 30 percent of \$1,000 of SG&A is deemed to be an intangible investment with a 3-year life, and that amount of SG&A does not grow. Eventually, the company will be capitalizing \$300, hence removing it from SG&A expense, and amortizing \$300 (the last 3 years of investment with \$100 of annual amortization expense for each), adding to SG&A expense. The net effect on SG&A and earnings is therefore zero.

If you assume SG&A expense grows at 10 percent and all else remains the same, the net effect is a 5.1 percent reduction in annual SG&A expense and an increase in investment in the same amount. Growth opens the gap between the current investment expensed and the amortization of past investments. Note that it does not matter if the growth is the result of inflation.

Earnings that are reclassified as an investment also increase book value. The adjustment increases assets, liabilities remain the same, and shareholders' equity has to be revised up to maintain the balance on the balance sheet. Iqbal et al. estimate that the change in book value by industry ranges from 4 to 95 percent, with an average increase of 49 percent (see Appendix B).

## Two Case Studies and the S&P 500

Here are two case studies to illustrate the impact that capitalizing and amortizing part of SG&A have on earnings. We selected actual companies that represent industries at the extremes. One is in the pharmaceutical products industry, where the investment portion of SG&A is high, and the other is in the business supplies industry, where the investment portion of SG&A is low. We then look at the S&P 500 using a weighted average of all industries.

We start with pharmaceutical products. Iqbal et al. find that 68 percent of Main SG&A and 89 percent of R&D are investments and that asset lives are 4.2 years for Main SG&A and 4.5 years for R&D. Based on the company's mix of Main SG&A and R&D, we estimate that 75 percent of SG&A should be capitalized with a useful life of 4 years. We assume the growth rate will be 30 percent.

Exhibit 1 summarizes how these adjustments affect margins. The operating profit margin goes from -0.9 percent to 14.6 percent, a huge 1550 basis point swing. Applying these changes takes operating profit from a modest loss to a solid gain.

### Exhibit 1: Impact of Capitalizing SG&A on the Margins of a Pharmaceutical Company

Earnings Measure	Unadjusted Margin	Adjusted Margin
EBITDA	9.1%	24.6%
Operating Profit	-0.9%	14.6%
Net Income	-16.8%	-1.3%

Source: Counterpoint Global estimates for fiscal year 2021.

Next we turn to business supplies. Iqbal et al. find that only 11 percent of Main SG&A and 83 percent of R&D are investments and that asset lives are 4.9 years for both Main SG&A and R&D. Based on the company's mix of Main SG&A and R&D, we estimate that 15 percent of SG&A should be capitalized with a useful life of 5 years. R&D is a modest percentage of overall SG&A, unlike pharmaceuticals. We assume the growth rate will be 5 percent.

Exhibit 2 shows that these adjustments lift the operating profit margin by about 50 basis points, from 3.4 to 4.0 percent (there is a tiny amount of rounding). If accurate, these modifications have an immaterial impact on how earnings and investments are sorted.

### Exhibit 2: Impact of Capitalizing SG&A on the Margins of a Business Supplies Company

Earnings Measure	Unadjusted Margin	Adjusted Margin
EBITDA	6.7%	7.2%
Operating Profit	3.4%	4.0%
Net Income	1.0%	1.5%

Source: Counterpoint Global estimates for fiscal year 2021.

The effect of these modifications for the S&P 500 falls between these extremes. We assume that 60 percent of SG&A should be capitalized with a useful life of 4 years and that the growth rate will be 6 percent.

The operating profit margin increases 145 basis points, from 15.2 to 16.7 percent (see exhibit 3). There is a proportionate lift in net income of 11.8 percent, which comes out to about \$170 billion. Applying the S&P 500's P/E ratio to this sum yields \$3.0-3.5 trillion, about one-tenth of the index's market capitalization.

**Exhibit 3: Impact of Capitalizing SG&A on the Margins of the S&P 500**

Earnings Measure	Unadjusted Margin	Adjusted Margin
EBITDA	21.0%	22.5%
Operating Profit	15.2%	16.7%
Net Income	12.2%	13.7%

Source: Counterpoint Global estimates for calendar year 2021.

**Conclusion**

The global economy continues to shift from one built on tangible assets to one built on intangible assets. Accounting, the means by which financial information is presented, treats tangible and intangible investments differently. This introduces bias into common metrics such as earnings.

Investors often use a multiple of earnings or book value as a shorthand for measuring the present value of future free cash flows. As a result, sorting earnings from investments is useful. Most intangible investments appear on the income statement. Capitalizing those investments treats them in a fashion similar to capital expenditures. The result is that earnings and investments increase the same amount. This leaves free cash flow unchanged but provides a more accurate picture of a company's operations.

Academics and practitioners are aware of this accounting quirk and make adjustments to improve the usefulness of financial data. But it is common to capitalize a similar percentage of SG&A for all companies, which obscures important differences between industries and the companies within them.

In this report, we apply a framework for categorizing earnings and investments based on recent academic research. We show that there is significant variance between industries, which is important for investors who rely predominately on multiples for valuation. Adjustments to the financial statements of a pair of companies showed a huge operating profit margin expansion for the one that is intangible intensive and an insignificant change for the one that is tangible intensive.

Given the assumptions we use, the capitalization of intangible investments would lead to net income for the S&P 500 that is about 12 percent higher than what is reported. These figures suggest great caution in comparing earnings or multiples over time.

**Please see Important Disclosures on pages 12-14**

## Appendix A: Investment Portion of SG&amp;A and Asset Lives

Industry	Investment Portions		Useful Lives	
	MainSG&A	R&D	MainSG&A	R&D
Precious Metals	80%	85%	3.3	6.9
Shipbuilding	79%	31%	4.1	1.7
Medical Equipment	78%	88%	2.7	6.1
Coal	75%	20%	1.7	5.5
Petroleum and Natural Gas	73%	57%	3.6	4.2
Food Products	73%	61%	0.9	4.1
Mining	72%	96%	3.6	6.9
Wholesale	69%	80%	3.6	4.0
Pharmaceutical Products	68%	89%	4.2	4.5
Automobiles and Trucks	67%	82%	2.8	5.7
Computers	66%	80%	3.3	4.4
Steel Works Etc.	66%	82%	5.0	3.2
Construction	65%	64%	3.6	5.8
Meals	63%	89%	4.8	5.3
Electronic Equipment	59%	77%	2.8	4.5
Communication	59%	56%	2.9	5.2
Machinery	58%	81%	4.3	3.7
Electrical Equipment	56%	77%	2.0	6.7
Business Services	54%	62%	4.4	6.7
Construction Materials	53%	72%	3.9	4.1
Rubber and Plastic Products	52%	80%	1.4	5.6
Fabricated Products	52%	73%	0.3	4.9
Measuring and Control Equipment	51%	72%	2.4	1.9
Candy & Soda	49%	93%	4.2	2.6
Apparel	49%	64%	2.9	4.5
Consumer Goods	42%	91%	4.8	6.4
Healthcare	41%	85%	2.8	2.9
Entertainment	38%	89%	4.5	6.0
Retail	38%	91%	2.4	3.9
Printing and Publishing	38%	91%	4.0	3.0
Textiles	35%	45%	2.1	4.1
Recreation	34%	70%	4.3	1.2
Chemicals	32%	61%	3.0	2.8
Agriculture	31%	88%	4.5	2.3
Aircraft	29%	80%	4.8	0.5
Personal Services	23%	31%	2.4	4.6
Tobacco Products	18%	86%	4.3	5.0
Defense	12%	7%	4.1	0.8
Business Supplies	11%	83%	4.9	4.9
Shipping Containers	9%	88%	0.6	1.3
Beer & Liquor	9%	98%	1.5	5.3
Transportation	0%	96%	2.6	3.5
<b>Weighted Average</b>	<b>54%</b>	<b>76%</b>	<b>3.3</b>	<b>4.4</b>

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



## Appendix B: As-Reported and Modified Book Values

Industry	Book Value		
	As-Reported	Modified	Difference
Wholesale	8.55	16.67	95.0%
Candy & Soda	7.45	14.53	95.0%
Medical Equipment	4.67	8.73	87.1%
Pharmaceutical Products	3.87	7.16	85.2%
Computers	5.01	9.27	85.2%
Consumer Goods	9.02	15.91	76.5%
Apparel	9.26	15.80	70.7%
Business Services	4.96	8.25	66.3%
Machinery	9.97	16.40	64.5%
Retail	9.75	15.59	60.0%
Printing and Publishing	10.02	15.89	58.7%
Automobiles and Trucks	11.38	17.69	55.5%
Measuring and Control Equipment	6.30	9.45	50.0%
Electronic Equipment	6.16	9.05	47.0%
Tobacco Products	10.64	15.59	46.6%
Construction Materials	11.92	17.30	45.2%
Recreation	6.38	9.06	41.9%
Construction	10.46	14.77	41.2%
Electrical Equipment	8.18	11.47	40.3%
Meals	8.86	12.41	40.2%
Shipbuilding	11.31	15.82	39.9%
Steel Works Etc.	14.74	20.02	35.9%
Communication	8.09	10.81	33.7%
Chemicals	12.42	16.23	30.7%
Rubber and Plastic Products	8.37	10.92	30.4%
Entertainment	5.53	7.13	29.0%
Coal	12.60	16.16	28.3%
Aircraft	16.16	20.63	27.6%
Food Products	12.12	15.18	25.2%
Personal Services	7.76	9.69	24.9%
Healthcare	6.41	7.78	21.4%
Petroleum and Natural Gas	9.05	10.97	21.3%
Agriculture	8.77	10.31	17.6%
Textiles	11.89	13.96	17.4%
Business Supplies	14.35	16.59	15.6%
Mining	9.70	11.09	14.3%
Fabricated Products	9.88	11.10	12.3%
Defense	9.72	10.62	9.3%
Beer & Liquor	13.57	14.74	8.6%
Precious Metals	5.80	6.20	6.9%
Shipping Containers	12.77	13.49	5.6%
Transportation	14.36	14.90	3.7%
<b>Weighted Average</b>	<b>8.01</b>	<b>11.90</b>	<b>48.6%</b>

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

## Endnotes

<sup>1</sup> 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. For more on the rise of intangibles, see 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; Jonathan Haskel and Stian Westlake, *Capitalism Without Capital: The Rise of the Intangible Economy* (Princeton, NJ: Princeton University Press, 2017); and presentation by Carol Corrado available at [www.wilsoncenter.org/sites/default/files/media/documents/event/Corrado%20Presentation.pdf](http://www.wilsoncenter.org/sites/default/files/media/documents/event/Corrado%20Presentation.pdf).

<sup>2</sup> For a detailed discussion of accounting for intangibles, see Thomas A. King, *More Than a Numbers Game: A Brief History of Accounting* (Hoboken, NJ: John Wiley & Sons, 2006), 131-143.

<sup>3</sup> Feng Gu and Baruch Lev, "How to Distinguish Between GAAP Losers and Real Losers," *Lev End of Accounting Blog*, February 6, 2020 and Masako Darrough and Jianming Ye, "Valuation of Loss Firms in a Knowledge-Based Economy," *Review of Accounting Studies*, Vol. 12, No. 1, March 2007, 61-93.

<sup>4</sup> Asher Curtis, Valerie Li, and Paige H. Patrick, "The Use of Adjusted Earnings in Performance Evaluation," *Review of Accounting Studies*, Vol. 26, No. 4, December 2021, 1290-1322.

<sup>5</sup> Doron Nissim, "Terminal Value," *Columbia Business School Research Paper No. 18-12*, April 2019. For a more detailed discussion of continuing value, see Michael J. Mauboussin and Alfred Rappaport, *Expectations Investing: Reading Stock Prices for Better Returns—Revised and Updated* (New York: Columbia Business School Publishing, 2021), 38-43.

<sup>6</sup> Frank J. Fabozzi, Sergio M. Focardi, and Caroline Jonas, "Equity Valuation: Science, Art, or Craft?" *CFA Institute Research Foundation*, 2017.

<sup>7</sup> This is an update to the figures here: Michael J. Mauboussin and Dan Callahan, "Categorizing for Clarity: Cash Flow Statement Adjustments to Improve Insight," *Consilient Observer: Counterpoint Global Insights*, October 6, 2021.

<sup>8</sup> The net income calculation is as follows: \$33.4 billion (reported) + \$60.1 billion in capitalized expenses - \$32.1 billion in amortization = \$61.3 billion.

<sup>9</sup> Gus De Franco, Ole-Kristian Hope, and Stephannie Larocque, "Analysts' Choice of Peer Companies," *Review of Accounting Studies*, Vol. 20, No. 1, March 2015, 82-109.

<sup>10</sup> Baruch Lev, "Ending the Accounting-for-Intangibles Status Quo," *European Accounting Review*, Vol. 28, No. 4, September 2019, 713-736.

<sup>11</sup> William F. Sharpe, "Capital Asset Prices: A Theory of Market Equilibrium Under Conditions of Risk," *Journal of Finance*, Vol. 19, No. 3, September 1964, 425-442.

<sup>12</sup> Eugene F. Fama and Kenneth R. French, "The Cross-Section of Expected Stock Returns," *Journal of Finance*, Vol. 47, No. 2, June 1992, 427-465.

<sup>13</sup> A neat line of research uses sports betting markets to determine whether investor behavior reflects beliefs or preferences. See Tobias J. Moskowitz and Kaushik Vasudevan, "What Can Betting Markets Tell Us About Investor Preferences and Beliefs? Implications for Low Risk Anomalies," *Working Paper*, May 13, 2021.

<sup>14</sup> We believe there is an important distinction between value investing and the application of the value factor. See Michael Mauboussin, "Why Value Investing Still Works in Markets," *Financial Times*, November 18, 2020.

<sup>15</sup> Fama and French actually used book-to-price, so that high multiples reflect statistically cheap stocks and low multiples capture expensive ones. The factor is shortened as "HML" (high minus low).

<sup>16</sup> Eugene F. Fama and Kenneth R. French, "The Value Premium," *Review of Asset Pricing Studies*, Vol. 11, No. 1, March 2021, 105-121 and Dion Bongaerts, Xiaowei Kang, and Mathijs van Dijk, "Intangible Assets and the Cross-Section of Stock Returns," *Working Paper*, September 2021.

<sup>17</sup> Baruch Lev and Anup Srivastava, "Explaining the Recent Failure of Value Investing," *NYU Stern School of Business Working Paper*, September 24, 2021; Feifei Li, "Intangibles: The Missing Ingredient in Book Value," *Journal of Portfolio Management*, Vol. 48, No. 3, February 2022, 164-184; Robert D. Arnott, Campbell R. Harvey, Vitali Kalesnik, and Juhani T. Linnainmaa, "Reports of Value's Death May Be Greatly Exaggerated," *Research*

*Affiliates Publications*, October 2020; and Noël Amenc, Felix Goltz, and Ben Luyten, “Intangible Capital and the Value Factor: Has Your Value Definition Just Expired?” *Journal of Portfolio Management*, Vol. 46, No. 7, July 2020, 83-99. Most quantitative firms do not rely solely on price-to-book ratios to capture the value premium, but rather use a blend of multiples. For a contrarian view, see Savina Rizova and Namiko Saito, “Internally Developed Intangibles and Expected Stock Returns,” *SSRN Working Paper*, July 27, 2021.

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