

## Counterpoint Global Insights

# The Impact of Intangibles on Base Rates

CONSILIENT OBSERVER | June 23, 2021

### Introduction

The cover of the *Economist* newspaper on March 25, 2017 showed a city landscape beneath a menacing spacecraft marked by the Amazon logo. The headline was, “Amazon’s empire.” An article in the issue had a title that asked, “Are investors too optimistic about Amazon?”<sup>1</sup> The stock would go on to appreciate 37.8 percent annually in the next four years versus a total shareholder return of 15.8 percent for the S&P 500 Index. That growth translated into an increase in market capitalization of more than \$1 trillion.

The body of the article cites an analyst who forecasted that Amazon would grow its sales at a 16 percent compound annual rate through 2025. Of note, Amazon’s total sales were \$136 billion in 2016, suggesting the company’s sales at the end of the period would be \$517 billion.

The same paragraph mentions work that we did in 2016 revealing that no company with \$100 billion or more in base year sales had ever grown at that mid-teens rate for that long.<sup>2</sup> Our data were from 1950-2015 and reflected sales figures unadjusted for acquisitions and divestitures but adjusted for inflation. The analysis was not specific to any particular business, but the clear implication was that it was improbable that a company that big could grow that fast.

Amazon will be at a \$515 billion-plus sales run rate by the second quarter of 2022 and will have a 6-year sales growth rate ended 2022 of 27.6 percent, if the consensus estimates are accurate. That growth rate is more than 11 percentage points above the analyst’s seemingly “too optimistic” view. If achieved, Amazon’s results will recast the base rate data.

### AUTHORS

Michael J. Mauboussin  
michael.mauboussin@morganstanley.com

Dan Callahan, CFA  
dan.callahan1@morganstanley.com

## Two Ways to Make a Forecast

There are broadly two ways to make a forecast, which is really a judgment about the future.<sup>3</sup> The first method is to think causally, which is called taking the inside view. You gather lots of information about what is of interest, combine it with your own input and experience, and project into the future. Analyst models are a good example of this approach. The analyst studies a company's businesses and projects sales and operating profit margins based on a combination of macroeconomic factors, industry trends, and the company's competitive position.

Causal thinking is a form of storytelling that comes naturally. It is a compelling way to anticipate the future and a convincing way to explain the past. Our minds are great at creating facile narratives to explain what happens in the world around us.

The second method is to think statistically, commonly referred to as the outside view. Rather than weaving a story based on causal links, the statistical approach examines what happened to an appropriate reference class of cases in the past. The results of the reference class are called base rates. Now the analyst builds her model not by seeking causal links but rather by asking, "how did other companies perform that were in a similar position to the one I am studying?" Instead of relying on your own experience, you tap the experience of others.

This type of thinking is unnatural because it features statistics rather than stories. Further, base rates may not be readily available. But research shows that a thoughtful combination of the inside and outside views leads to more accurate forecasts.<sup>4</sup>

One of the keys to using base rates effectively is finding an appropriate reference class. In many instances, the distribution of outcomes is straightforward. In these cases, the outcomes don't fall too far from the average, and outliers are rare. Measures of corporate results, such as sales growth rates, generally fit into this camp. Base rates are very effective for assessing outcomes that follow, or resemble, a bell-shaped distribution.

In other instances, the distribution of outcomes has a variance that is large, the concept of an average is meaningless, and outliers skew the results.<sup>5</sup> For example, most books, songs, and movies have very modest sales while only a handful are blockbusters. Base rates are more difficult to apply, but knowledge of the distribution itself is very useful. In our experience, underutilization of base rates is a bigger problem than overutilization of them.

One important point to bear in mind is that outcomes of a proper reference class can change over time.<sup>6</sup> That Amazon's sales growth is on pace to be greater than anything we have seen in the past 70 years proves the point. That means that base rates can be very instructive but are not the final word. Indeed, there is reason to believe that some measures of corporate performance are shifting because the nature of business has changed.

## Growth Rates in a World of Intangible Assets

The basic way that companies grow is by earning a return on investments. Return is measured by profits, which are the product of sales and margins. Investments can be tangible or intangible assets. Tangible assets are things you can touch and feel, such as factories, trucks, and machines. Intangible assets lack a physical existence and include software, the secret recipe for Coca-Cola, and the formulation of a life-saving drug.

One important distinction between corporate tangible and intangible assets is access. Only one company can use a tangible asset at a time, whereas many can use an intangible asset at the same time.<sup>7</sup> In reality, the

distinction is less stark as assets fall on a continuum. But the main point is that the marginal cost of sharing an intangible asset can be very low.

Intangible assets have two characteristics that are important for considering corporate growth rates.<sup>8</sup> The first is that they can enjoy strong economies of scale because they are commonly cheap to reproduce and share. Economies of scale are a measure of cost per unit as a function of output. Think of software as an example. The original code may be very expensive to produce but the cost per unit sold drops rapidly because it is inexpensive to share. That is the good news.

The second is obsolescence and the related concept of sunkness. The value of intangible assets can drop precipitously when a new and better version comes along and makes the old version obsolete. And because the old version has very limited value, the investment cost is sunk. Let's continue with our example of software. Once a company introduces a new operating system for a computer or mobile phone, the old one is of little relevance or value. That is the bad news.

These characteristics highlight the contrast between tangible and intangible assets that are relevant for growth rates. Intangible assets are more scalable than tangible assets. That means successful companies that rely on intangible assets can grow faster than companies built on tangible assets. As the overall mix of investments shifts from tangible to intangible, we should expect to see faster growth rates for the winners than we have seen in the base rate data.

On the other hand, obsolescence means that companies that rely on intangible assets can decline more rapidly than those built on tangible assets. Intangible assets are rarely standard, unlike tangible assets, which means they have limited salvage value. A company with obsolete software cannot get much for it while a company with a failed store can recoup some value by selling inventory and furnishings. This means that we should also expect to see slower growth rates, or a greater rate of decline, for the losers than the base rate data reflect.

These observations about growth rates are important because overall investment spending has shifted in recent decades from being predominately tangible to intangible. We estimate that intangible investments for companies in the Russell 3000, which captures the vast majority of the investable U.S. equity market, was around \$1.8 trillion in 2020. This is more than double the \$800 billion those companies spent on capital expenditures.

This discussion suggests two hypotheses that we can test. The first is that intangible-based businesses can grow faster than what the base rate data show. In essence, the right tail of the distribution of growth rates is extending outward from the average. Amazon's results provide anecdotal evidence for this.

The second is that we should observe greater variance in the distribution of growth rates for intangible-based businesses. That means that the left tail of the distribution of growth rates is also spreading further from the average. BlackBerry's 26.7 percent average annual revenue decline in the past decade through February 2021 is a case in point.

This provides investors with good and bad news. The good news is there will be some businesses that grow in excess of what history would suggest, creating opportunity. The bad news is some businesses will lose their positions of prominence and decline more rapidly than their predecessors did. Base rates remain extremely informative, but we must have the mental flexibility to acknowledge how the population of companies has changed over time.

## Base Rates Based on Intangible Asset Intensity

To test these ideas, we first need to sort the companies based on their intangible asset intensity. In a recent paper, three finance professors built a model to infer the value of intangible assets by examining market prices and merger and acquisition (M&A) deals.<sup>9</sup> High market prices relative to stated book values suggest a failure to recognize some intangible assets. When one company acquires another, the acquirer's accountants have to record the difference between the purchase price and tangible assets as goodwill or intangible assets. Using popular measures of knowledge and organizational capital as a benchmark, they found that the M&A data did a better job of estimating the value of intangible assets than did the market price technique.

The professors applied the M&A method to a large sample of companies from 1978-2017 to figure out where intangible asset intensity was highest. They found that the order of ranking from highest to lowest by industry was healthcare, technology, consumer, and manufacturing. They also placed about one-third of the companies into an "other" category because they didn't fit neatly into one of the industries.

We calculated the median sales growth rate for companies in each of those categories using the constituents of the Russell 3000 from 1984-2020. We also examined the standard deviation, a measure of the dispersion, of the distributions. Exhibit 1 shows the results for the full sample.

### Exhibit 1: Base Rates for Sales Growth by Industry, 1984-2020

Industry	Median CAGR				Mean CAGR				Standard Deviation			
	1-yr	3-yr	5-yr	10-yr	1-yr	3-yr	5-yr	10-yr	1-yr	3-yr	5-yr	10-yr
Healthcare	11.5%	10.8%	10.4%	9.3%	52.6%	16.8%	12.6%	9.3%	406.3%	45.9%	30.6%	22.5%
Technology	9.7%	8.4%	7.9%	7.2%	15.4%	10.6%	9.0%	7.3%	49.0%	21.9%	16.5%	13.0%
All	7.4%	6.9%	6.5%	6.2%	16.6%	9.5%	8.0%	6.7%	177.3%	23.2%	16.4%	12.0%
Consumer	6.9%	6.4%	6.0%	5.9%	13.5%	8.9%	7.7%	6.6%	164.7%	18.8%	13.9%	9.5%
Manufacturing	5.4%	5.1%	5.0%	5.5%	9.3%	6.8%	6.1%	6.0%	50.4%	17.5%	13.1%	9.4%
Other	7.6%	7.3%	6.9%	6.3%	16.2%	9.6%	8.1%	6.6%	194.5%	22.5%	15.8%	12.2%

Source: FactSet.

Note: Constituents of the Russell 3000 Index as of year-end; growth rates are based on nominal sales; CAGR=compound annual growth rate.

The sales growth rates, measured either as the median or average, consistently go from highest for companies that are most intangible-asset intensive to lowest for those that are least intensive. While the short-term numbers are noisy, the relationship holds true over 1-, 3-, 5-, and 10-year periods. Consider the median compound annual sales growth rates over five-year periods. Growth was 10.4 percent for healthcare, 7.9 percent for technology, 6.0 percent for consumer, and 5.0 percent for manufacturing. The median across all companies was 6.5 percent. This supports the first hypothesis.

The standard deviation of the growth rates follows the same pattern. Where intangible asset intensity is high, the standard deviation is also high. Assuming these distributions are normally distributed, an imperfect but illustrative assumption, about two-thirds of healthcare companies had 5-year sales growth rates between -18.0 and 43.2 percent. The comparable figures for manufacturing companies were -7.0 and 19.2 percent. This is consistent with the second thesis.

To capture the potential impact of size, we broke the universe into seven bins based on starting year sales. A couple of patterns emerge. The first is that the average and median sales growth rates and standard deviations tend to decline as companies get bigger. This replicates a finding that has been established empirically.<sup>10</sup> The

second is that the basic relationship between high intangible asset intensity and high growth rates tends to hold across all size bins. (See the appendix for more detail.)

The global pandemic in 2020 was a substantial challenge for global health and economic growth. One silver lining was the ability of digital companies, built largely on intangible assets, to thrive in the chaos. We examined the sales growth rates of the companies in the Russell 1000, the largest one thousand companies in the U.S., to see which companies fared well. Healthcare and technology, the industries with the highest intangible asset intensity, represented over 60 percent of the top 20, 50, and 100 growers despite being only 29 percent of the universe (see exhibit 2).

### Exhibit 2: Intangible Asset-Intense Industries Among the Fastest Growers in 2020

Industry	Top 20	Top 50	Top 100	Full Index
Healthcare	8	12	22	81
Technology	5	19	42	203
Consumer	4	8	15	189
Manufacturing	1	2	3	192
Other	2	9	18	327
Total	20	50	100	992
Healthcare + Technology, Number	13	31	64	284
Healthcare + Technology, Percent of Total	65%	62%	64%	29%

Source: FactSet.

Note: Includes companies with sales data for calendar years 2019 and 2020.

### Conclusion

Accurate forecasts combine causal and statistical thinking in proper measure. Statistical thinking relies on identifying an appropriate reference class of past outcomes. An overreliance on base rates can lead to faulty forecasts if the statistical properties of a reference class change over time. That said, we believe that forecasters don't use base rates as frequently as they should.

Companies grow by generating a return on investment. The nature of investment has changed markedly in recent decades, from one dominated by tangible assets to one mostly in the form of intangible assets. Intangible assets have some characteristics that distinguish them from tangible assets, including greater potential economies of scale and higher risk of obsolescence. The good news is that intangible-intensive companies can grow faster than their tangible counterparts. The bad news is they can also become irrelevant and shrink fast.

As a consequence, we should see two effects in the data: higher growth and more dispersion in the outcomes. Our analysis of the results from companies in the Russell 3000 from 1984-2020 reveals both of these. The base rate of sales growth is getting stretched from the average in both the positive and negative direction.

There are two main lessons for investors. First, it is important to be mindful of the potential shift in the base rate as the result of the rise of intangibles. Second, skillful investors may be able to identify the companies that will grow faster than expected, hence providing the potential for attractive returns.

Appendix A

When sorting the companies into bins, we translate the starting year sales into 2020 dollars. When calculating the growth rates, we keep all figures in nominal terms. We exclude companies with base year sales of less than \$1 million in 2020 dollars.

Exhibit 3: Base Rates for Sales Growth by Size and Industry, 1984-2020

<b>Full Universe</b>	<b>Median CAGR</b>				<b>Mean CAGR</b>				<b>Standard Deviation</b>			
<b>Industry</b>	<b>1-yr</b>	<b>3-yr</b>	<b>5-yr</b>	<b>10-yr</b>	<b>1-yr</b>	<b>3-yr</b>	<b>5-yr</b>	<b>10-yr</b>	<b>1-yr</b>	<b>3-yr</b>	<b>5-yr</b>	<b>10-yr</b>
Healthcare	11.5%	10.8%	10.4%	9.3%	52.6%	16.8%	12.6%	9.3%	406.3%	45.9%	30.6%	22.5%
Technology	9.7%	8.4%	7.9%	7.2%	15.4%	10.6%	9.0%	7.3%	49.0%	21.9%	16.5%	13.0%
All	7.4%	6.9%	6.5%	6.2%	16.6%	9.5%	8.0%	6.7%	177.3%	23.2%	16.4%	12.0%
Consumer	6.9%	6.4%	6.0%	5.9%	13.5%	8.9%	7.7%	6.6%	164.7%	18.8%	13.9%	9.5%
Manufacturing	5.4%	5.1%	5.0%	5.5%	9.3%	6.8%	6.1%	6.0%	50.4%	17.5%	13.1%	9.4%
Other	7.6%	7.3%	6.9%	6.3%	16.2%	9.6%	8.1%	6.6%	194.5%	22.5%	15.8%	12.2%
	<b>Count</b>											
<b>Industry</b>	<b>1-yr</b>	<b>3-yr</b>	<b>5-yr</b>	<b>10-yr</b>								
Healthcare	6,493	5,278	4,282	2,511								
Technology	14,491	12,009	9,874	6,012								
All	90,725	76,369	64,252	41,145								
Consumer	19,568	16,798	14,318	9,329								
Manufacturing	19,659	17,333	15,139	10,544								
Other	30,514	24,951	20,639	12,749								

  

<b>Sales: \$0-1 Billion</b>	<b>Median CAGR</b>				<b>Mean CAGR</b>				<b>Standard Deviation</b>			
<b>Industry</b>	<b>1-yr</b>	<b>3-yr</b>	<b>5-yr</b>	<b>10-yr</b>	<b>1-yr</b>	<b>3-yr</b>	<b>5-yr</b>	<b>10-yr</b>	<b>1-yr</b>	<b>3-yr</b>	<b>5-yr</b>	<b>10-yr</b>
Healthcare	14.7%	13.4%	12.6%	11.9%	66.5%	19.6%	14.2%	10.1%	465.4%	52.4%	35.1%	26.5%
Technology	11.6%	10.2%	9.4%	8.4%	18.4%	12.3%	10.5%	8.5%	56.5%	24.0%	17.5%	13.6%
All	9.7%	9.0%	8.4%	7.8%	24.3%	12.5%	10.3%	8.3%	237.7%	28.6%	19.8%	14.4%
Consumer	9.5%	8.4%	7.8%	7.4%	22.2%	12.5%	10.2%	8.2%	256.3%	25.2%	18.1%	12.1%
Manufacturing	7.3%	7.2%	6.9%	7.2%	13.9%	9.9%	8.5%	8.0%	66.5%	21.5%	15.8%	11.1%
Other	9.2%	8.9%	8.4%	7.6%	21.8%	12.0%	10.0%	8.0%	248.9%	26.2%	17.8%	13.4%
	<b>Count</b>											
<b>Industry</b>	<b>1-yr</b>	<b>3-yr</b>	<b>5-yr</b>	<b>10-yr</b>								
Healthcare	4,930	3,945	3,151	1,748								
Technology	10,157	8,346	6,795	4,062								
All	49,819	41,290	34,214	21,125								
Consumer	7,992	6,811	5,744	3,603								
Manufacturing	8,274	7,262	6,268	4,259								
Other	18,466	14,926	12,256	7,453								

<b>Sales: \$1-5 Billion</b>	<b>Median CAGR</b>				<b>Mean CAGR</b>				<b>Standard Deviation</b>			
<b>Industry</b>	<b>1-yr</b>	<b>3-yr</b>	<b>5-yr</b>	<b>10-yr</b>	<b>1-yr</b>	<b>3-yr</b>	<b>5-yr</b>	<b>10-yr</b>	<b>1-yr</b>	<b>3-yr</b>	<b>5-yr</b>	<b>10-yr</b>
<b>Healthcare</b>	8.3%	8.3%	8.1%	7.7%	9.7%	9.2%	9.3%	8.6%	18.7%	12.2%	9.8%	7.0%
<b>Technology</b>	7.2%	6.2%	6.0%	5.7%	8.8%	6.8%	6.0%	5.3%	22.9%	15.9%	14.1%	12.0%
<b>All</b>	6.1%	5.7%	5.6%	5.6%	8.2%	6.7%	6.2%	5.8%	30.1%	14.2%	11.4%	9.1%
<b>Consumer</b>	6.3%	6.1%	5.9%	5.9%	8.4%	7.2%	6.8%	6.3%	21.7%	13.1%	10.4%	7.8%
<b>Manufacturing</b>	4.7%	4.5%	4.6%	5.1%	6.9%	5.4%	5.2%	5.5%	39.0%	13.8%	10.7%	8.1%
<b>Other</b>	6.5%	6.4%	6.1%	5.6%	8.6%	7.0%	6.3%	5.4%	30.8%	14.8%	11.9%	10.1%
	<b>Count</b>											
<b>Industry</b>	<b>1-yr</b>	<b>3-yr</b>	<b>5-yr</b>	<b>10-yr</b>								
<b>Healthcare</b>	915	765	637	409								
<b>Technology</b>	3,103	2,606	2,177	1,348								
<b>All</b>	26,234	22,253	18,888	12,403								
<b>Consumer</b>	6,940	5,938	5,053	3,343								
<b>Manufacturing</b>	7,166	6,289	5,506	3,885								
<b>Other</b>	8,110	6,655	5,515	3,418								

<b>Sales: \$5-10 Billion</b>	<b>Median CAGR</b>				<b>Mean CAGR</b>				<b>Standard Deviation</b>			
<b>Industry</b>	<b>1-yr</b>	<b>3-yr</b>	<b>5-yr</b>	<b>10-yr</b>	<b>1-yr</b>	<b>3-yr</b>	<b>5-yr</b>	<b>10-yr</b>	<b>1-yr</b>	<b>3-yr</b>	<b>5-yr</b>	<b>10-yr</b>
<b>Healthcare</b>	7.9%	8.6%	8.2%	8.3%	8.6%	9.0%	8.7%	8.2%	12.1%	9.5%	7.9%	5.0%
<b>Technology</b>	5.3%	4.9%	3.9%	2.5%	7.4%	6.5%	5.4%	4.4%	22.1%	15.4%	13.1%	10.4%
<b>All</b>	4.9%	4.5%	4.5%	4.5%	6.0%	5.1%	4.7%	4.4%	20.9%	13.3%	10.8%	8.5%
<b>Consumer</b>	5.5%	5.4%	5.1%	5.2%	6.8%	5.8%	5.4%	5.2%	19.5%	10.9%	8.6%	6.1%
<b>Manufacturing</b>	3.7%	3.6%	3.9%	4.5%	5.1%	4.2%	4.2%	4.5%	22.1%	13.2%	9.7%	6.2%
<b>Other</b>	4.9%	4.5%	4.4%	3.7%	5.6%	4.4%	3.9%	3.1%	21.2%	15.2%	13.4%	12.0%
	<b>Count</b>											
<b>Industry</b>	<b>1-yr</b>	<b>3-yr</b>	<b>5-yr</b>	<b>10-yr</b>								
<b>Healthcare</b>	194	166	138	79								
<b>Technology</b>	519	441	367	232								
<b>All</b>	6,453	5,573	4,764	3,155								
<b>Consumer</b>	1,936	1,673	1,432	950								
<b>Manufacturing</b>	1,933	1,710	1,494	1,045								
<b>Other</b>	1,871	1,583	1,333	849								

<b>Sales: \$10-25 Billion</b>	<b>Median CAGR</b>				<b>Mean CAGR</b>				<b>Standard Deviation</b>			
<b>Industry</b>	<b>1-yr</b>	<b>3-yr</b>	<b>5-yr</b>	<b>10-yr</b>	<b>1-yr</b>	<b>3-yr</b>	<b>5-yr</b>	<b>10-yr</b>	<b>1-yr</b>	<b>3-yr</b>	<b>5-yr</b>	<b>10-yr</b>
<b>Healthcare</b>	7.3%	7.2%	6.9%	6.3%	7.9%	7.5%	7.1%	6.5%	14.7%	9.0%	7.0%	6.1%
<b>Technology</b>	5.7%	5.2%	4.9%	4.4%	6.4%	5.4%	5.0%	4.7%	17.3%	11.4%	9.6%	7.2%
<b>All</b>	4.8%	4.0%	3.8%	3.6%	5.4%	4.3%	3.9%	4.0%	20.0%	11.5%	9.1%	6.5%
<b>Consumer</b>	5.1%	4.6%	4.4%	4.5%	5.9%	5.2%	4.9%	5.0%	16.9%	10.6%	8.7%	6.6%
<b>Manufacturing</b>	3.2%	2.5%	2.4%	2.7%	4.0%	2.8%	2.4%	2.5%	21.0%	11.5%	8.8%	6.1%
<b>Other</b>	4.9%	4.0%	3.8%	3.2%	5.7%	4.2%	3.6%	3.8%	23.5%	12.6%	9.7%	6.5%
	<b>Count</b>											
<b>Industry</b>	<b>1-yr</b>	<b>3-yr</b>	<b>5-yr</b>	<b>10-yr</b>								
<b>Healthcare</b>	284	252	223	175								
<b>Technology</b>	431	370	320	228								
<b>All</b>	5,226	4,597	4,031	2,834								
<b>Consumer</b>	1,582	1,383	1,208	819								
<b>Manufacturing</b>	1,577	1,434	1,296	960								
<b>Other</b>	1,352	1,158	984	652								

<b>Sales: \$25-50 Billion</b>	<b>Median CAGR</b>				<b>Mean CAGR</b>				<b>Standard Deviation</b>			
<b>Industry</b>	<b>1-yr</b>	<b>3-yr</b>	<b>5-yr</b>	<b>10-yr</b>	<b>1-yr</b>	<b>3-yr</b>	<b>5-yr</b>	<b>10-yr</b>	<b>1-yr</b>	<b>3-yr</b>	<b>5-yr</b>	<b>10-yr</b>
<b>Healthcare</b>	5.5%	5.2%	4.4%	5.3%	7.6%	6.2%	5.4%	4.7%	15.8%	9.7%	7.9%	4.6%
<b>Technology</b>	5.2%	4.0%	3.2%	4.9%	6.4%	5.1%	4.3%	4.1%	14.7%	12.7%	11.4%	8.5%
<b>All</b>	4.6%	3.7%	3.4%	3.7%	5.2%	4.2%	3.6%	3.7%	17.6%	12.2%	9.6%	6.6%
<b>Consumer</b>	4.7%	4.0%	3.7%	4.3%	5.2%	4.4%	4.1%	4.1%	15.7%	10.1%	8.2%	6.3%
<b>Manufacturing</b>	3.7%	2.4%	2.2%	2.2%	4.0%	1.7%	1.0%	1.9%	21.9%	14.7%	11.2%	7.1%
<b>Other</b>	4.6%	4.1%	3.5%	3.5%	5.4%	5.4%	4.6%	4.5%	17.0%	12.2%	8.9%	6.0%
	<b>Count</b>											
<b>Industry</b>	<b>1-yr</b>	<b>3-yr</b>	<b>5-yr</b>	<b>10-yr</b>								
<b>Healthcare</b>	93	80	71	60								
<b>Technology</b>	145	130	118	86								
<b>All</b>	1,714	1,524	1,359	976								
<b>Consumer</b>	614	544	486	360								
<b>Manufacturing</b>	414	369	332	224								
<b>Other</b>	448	401	352	246								

  

<b>Sales: \$50-100 Billion</b>	<b>Median CAGR</b>				<b>Mean CAGR</b>				<b>Standard Deviation</b>			
<b>Industry</b>	<b>1-yr</b>	<b>3-yr</b>	<b>5-yr</b>	<b>10-yr</b>	<b>1-yr</b>	<b>3-yr</b>	<b>5-yr</b>	<b>10-yr</b>	<b>1-yr</b>	<b>3-yr</b>	<b>5-yr</b>	<b>10-yr</b>
<b>Healthcare</b>	3.5%	1.7%	2.0%	1.6%	2.6%	1.0%	1.3%	2.2%	17.1%	10.4%	7.4%	4.4%
<b>Technology</b>	5.5%	5.5%	6.1%	8.8%	6.6%	5.9%	5.9%	6.9%	16.3%	12.3%	10.4%	7.3%
<b>All</b>	4.3%	3.5%	3.3%	3.9%	5.1%	3.1%	2.9%	2.9%	21.7%	12.3%	9.7%	7.0%
<b>Consumer</b>	4.7%	4.2%	4.4%	4.0%	5.2%	4.0%	3.7%	3.0%	14.8%	9.9%	8.3%	6.0%
<b>Manufacturing</b>	3.3%	2.2%	1.5%	2.8%	1.7%	-0.1%	0.0%	0.8%	28.9%	15.1%	12.0%	9.6%
<b>Other</b>	5.0%	3.3%	3.7%	5.2%	8.4%	4.6%	4.1%	4.3%	25.8%	12.8%	9.1%	5.2%
	<b>Count</b>											
<b>Industry</b>	<b>1-yr</b>	<b>3-yr</b>	<b>5-yr</b>	<b>10-yr</b>								
<b>Healthcare</b>	61	56	50	33								
<b>Technology</b>	77	63	48	22								
<b>All</b>	797	712	629	416								
<b>Consumer</b>	298	274	250	169								
<b>Manufacturing</b>	177	163	145	99								
<b>Other</b>	184	156	136	93								

  

<b>Sales: &gt;\$100 Billion</b>	<b>Median CAGR</b>				<b>Mean CAGR</b>				<b>Standard Deviation</b>			
<b>Industry</b>	<b>1-yr</b>	<b>3-yr</b>	<b>5-yr</b>	<b>10-yr</b>	<b>1-yr</b>	<b>3-yr</b>	<b>5-yr</b>	<b>10-yr</b>	<b>1-yr</b>	<b>3-yr</b>	<b>5-yr</b>	<b>10-yr</b>
<b>Healthcare</b>	5.5%	5.7%	6.1%	7.9%	7.4%	7.3%	7.4%	7.8%	7.5%	4.1%	2.9%	0.4%
<b>Technology</b>	5.1%	3.0%	1.8%	2.0%	3.7%	2.1%	0.9%	0.3%	11.1%	7.9%	6.3%	3.6%
<b>All</b>	4.1%	3.4%	2.9%	2.2%	3.2%	2.6%	2.1%	1.5%	13.8%	9.0%	7.4%	5.9%
<b>Consumer</b>	4.5%	4.0%	3.6%	3.4%	4.9%	4.4%	4.0%	3.5%	9.1%	6.6%	5.4%	4.8%
<b>Manufacturing</b>	0.4%	0.6%	0.8%	1.0%	-0.2%	-0.1%	0.1%	0.4%	20.7%	12.2%	9.9%	7.6%
<b>Other</b>	4.4%	0.4%	0.7%	-1.3%	2.4%	1.4%	0.9%	-1.2%	13.1%	8.7%	7.0%	4.4%
	<b>Count</b>											
<b>Industry</b>	<b>1-yr</b>	<b>3-yr</b>	<b>5-yr</b>	<b>10-yr</b>								
<b>Healthcare</b>	16	14	12	7								
<b>Technology</b>	59	53	49	34								
<b>All</b>	482	420	367	236								
<b>Consumer</b>	206	175	145	85								
<b>Manufacturing</b>	118	106	98	72								
<b>Other</b>	83	72	63	38								

Source: FactSet.

Note: Constituents of the Russell 3000 Index as of year-end; growth rates are based on nominal sales.

## Appendix B

We sort companies into five groups using a slightly modified version of the five-industry classification of Eugene Fama and Kenneth French. Fama and French assign companies based on their Standard Industrial Classification (SIC) codes. We follow the minor modifications of Michael Ewens, who reassigns hospitals from healthcare to consumer, as well as radio and TV providers from technology to consumer.<sup>11</sup> The table below shows the main sub-industries included in the five primary industries.

<b><u>Industry Name</u></b>	<b><u>Sub-Industries</u></b>
<b>Consumer</b>	Consumer durables, nondurables, wholesale, retail, hospitals, some services
<b>Manufacturing</b>	Manufacturing, energy, utilities
<b>Technology</b>	Electronics, computer hardware and software, telecommunications
<b>Healthcare</b>	Healthcare, medical equipment, pharmaceuticals
<b>Other</b>	Everything else, including mines, construction, building materials, transportation, hotels, business services, entertainment, finance

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

## Endnotes

<sup>1</sup> “Are investors too optimistic about Amazon?” *Economist*, March 25, 2017.

<sup>2</sup> Michael J. Mauboussin, Dan Callahan, and Darius Majd, “The Base Rate Book: Integrating the Past to Better Anticipate the Future,” *Credit Suisse Global Financial Strategies*, September 26, 2016.

<sup>3</sup> Daniel Kahneman, Olivier Sibony, and Cass R. Sunstein, *Noise: A Flaw in Human Judgment* (New York: Little, Brown Spark, 2021), 156-158.

<sup>4</sup> Mauboussin, Callahan, and Majd, “The Base Rate Book,” 7-9.

<sup>5</sup> This can also be understood as mild, slow, and wild randomness. See Benoit B. Mandelbrot, *Fractals and Scaling in Finance: Discontinuity, Concentration, and Risk* (New York: Springer, 1997), 117-125.

<sup>6</sup> This means that the process that generates the distribution is not stationary. In a stationary series, the statistical properties such as the mean and standard deviation do not change over time. The distributions we are discussing are not stationary but stable enough to be beneficial.

<sup>7</sup> The technical term for this is a rivalrous good.

<sup>8</sup> For a more thorough review of the characteristics of intangible assets, see Jonathan Haskel and Stian Westlake, *Capitalism Without Capital: The Rise of the Intangible Economy* (Princeton, NJ: Princeton University Press, 2017), 56-88.

<sup>9</sup> Michael Ewens, Ryan H. Peters, and Sean Wang, “Measuring Intangible Capital with Market Prices,” *Working Paper*, October 2020.

<sup>10</sup> Michael H. R. Stanley, Luís A. N. Amaral, Sergey V. Buldyrev, Shlomo Havlin, Heiko Leschhorn, Philipp Maass, Michael A. Salinger, and H. Eugene Stanley, “Scaling Behaviour in the Growth of Companies,” *Nature*, Vol. 379, February 29, 1996, 804-806. Also, Rich Perline, Robert Axtell, and Daniel Teitelbaum, “Volatility and Asymmetry of Small Firm Growth Rates Over Increasing Time Frames,” *Small Business Research Summary*, No. 285, December 2006.

<sup>11</sup> Michael Ewens. See <https://github.com/michaelewens/Intangible-capital-stocks>.

## DEFINITIONS OF TERMS

**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.

The **Russell 3000® Index** measures the performance of the largest 3,000 U.S. companies, representing approximately 98% of the investable U.S. equity market. The Russell 3000 Index is constructed to provide a comprehensive, unbiased, and stable barometer of the broad market and is completely reconstituted annually to ensure new and growing equities are reflected.

The **Russell 1000® Index** measures the performance of the 1,000 largest companies in the Russell 3000® Index.

The **S&P 500® Index** measures the performance of the large cap segment of the U.S. equities market, covering approximately 80% of the U.S. equities market. The Index includes 500 leading companies in leading industries of the U.S. economy.

**Total shareholder return** reflects the change in stock price plus reinvested dividends.

**IMPORTANT INFORMATION**

The views and opinions and/or analysis expressed are those of the author as of the date of preparation of this material and are subject to change at any time due to market or economic conditions and may not necessarily come to pass. Furthermore, the views will not be updated or otherwise revised to reflect information that subsequently becomes available or circumstances existing, or changes occurring, after the date of publication. The views expressed do not reflect the opinions of all investment personnel at Morgan Stanley Investment Management (MSIM) and its subsidiaries and affiliates (collectively "the Firm"), and may not be reflected in all the strategies and products that the Firm offers.

Forecasts and/or estimates provided herein are subject to change and may not actually come to pass. Information regarding expected market returns and market outlooks is based on the research, analysis and opinions of the authors or the investment team. These conclusions are speculative in nature, may not come to pass and are not intended to predict the future performance of any specific strategy or product the Firm offers. Future results may differ significantly depending on factors such as changes in securities or financial markets or general economic conditions.

Past performance is no guarantee of future results. This material has been prepared on the basis of publicly available information, internally developed data and other third-party sources believed to be reliable. However, no assurances are provided regarding the reliability of such information and the Firm has not sought to independently verify information taken from public and third-party sources. The views expressed in the books and articles referenced in this whitepaper are not necessarily endorsed by the Firm.

This material is a general communications which is not impartial and has been prepared solely for information and educational purposes and does not constitute an offer or a recommendation to buy or sell any particular security or to adopt any specific investment strategy. The material contained herein has not been based on a consideration of any individual client circumstances and is not investment advice, nor should it be construed in any way as tax, accounting, legal or regulatory advice. To that end, investors should seek independent legal and financial advice, including advice as to tax consequences, before making any investment decision.

Charts and graphs provided herein are for illustrative purposes only. Any securities referenced herein are solely for illustrative purposes only and should not be construed as a recommendation for investment.

The S&P 500® Index measures the performance of the large cap segment of the U.S. equities market, covering approximately 80% of the U.S. equities market. The Index includes 500 leading companies in leading industries of the U.S. economy. The Russell 3000® Index measures the performance of the largest 3,000 U.S. companies representing approximately 98% of the investable U.S. equity market. The Russell 3000 Index is constructed to provide a comprehensive, unbiased, and stable barometer of the broad market and is completely reconstituted annually to ensure new and growing equities are reflected. The index is unmanaged and does not include any expenses, fees or sales charges. It is not possible to invest directly in an index. The index referred to herein is the intellectual property (including registered trademarks) of the applicable licensor. Any product based on an index is in no way sponsored, endorsed, sold or promoted by the applicable licensor and it shall not have any liability with respect thereto.

This material is not a product of Morgan Stanley's Research Department and should not be regarded as a research material or a recommendation.

The Firm has not authorised financial intermediaries to use and to distribute this material, unless such use and distribution is made in accordance with applicable law and regulation. Additionally, financial intermediaries are required to satisfy themselves that the information in this material is appropriate for any person to whom they provide this material in view of that person's circumstances and purpose. The Firm shall not be liable for, and accepts no liability for, the use or misuse of this material by any such financial intermediary.

The whole or any part of this work may not be directly or indirectly reproduced, copied, modified, used to create a derivative work, performed, displayed, published, posted, licensed, framed, distributed or transmitted or any of its contents disclosed to third parties without MSIM's express written consent. This work may not be linked to unless such hyperlink is for personal and non-commercial use. All information contained herein is proprietary and is protected under copyright and other applicable law.

Eaton Vance is part of Morgan Stanley Investment Management. Morgan Stanley Investment Management is the asset management division of Morgan Stanley.

This material may be translated into other languages. Where such a translation is made this English version remains definitive. If there are any discrepancies between the English version and any version of this material in another language, the English version shall prevail.

## **DISTRIBUTION**

**This communication is only intended for and will only be distributed to persons resident in jurisdictions where such distribution or availability would not be contrary to local laws or regulations.**

**MSIM, the asset management division of Morgan Stanley (NYSE: MS), and its affiliates have arrangements in place to market each other's products and services. Each MSIM affiliate is regulated as appropriate in the jurisdiction it operates. MSIM's affiliates are: Eaton Vance Management (International) Limited, Eaton Vance Advisers International Ltd, Calvert Research and Management, Eaton Vance Management, Parametric Portfolio Associates LLC, and Atlanta Capital Management LLC.**

This material has been issued by any one or more of the following entities:

### **EMEA**

This material is for Professional Clients/Accredited Investors only.

In the EU, MSIM and Eaton Vance materials are issued by MSIM Fund Management (Ireland) Limited ("FMIL"). FMIL is regulated by the Central Bank of Ireland and is incorporated in Ireland as a private company limited by shares with company registration number 616661 and has its registered address at 24-26 City Quay, Dublin 2, D02 NY19, Ireland.

Outside the EU, MSIM materials are issued by Morgan Stanley Investment Management Limited (MSIM Ltd) is authorised and regulated by the Financial Conduct Authority. Registered in England. Registered No. 1981121. Registered Office: 25 Cabot Square, Canary Wharf, London E14 4QA.

In Switzerland, MSIM materials are issued by Morgan Stanley & Co. International plc, London (Zurich Branch) Authorised and regulated by the Eidgenössische Finanzmarktaufsicht ("FINMA"). Registered Office: Beethovenstrasse 33, 8002 Zurich, Switzerland.

Outside the US and EU, Eaton Vance materials are issued by Eaton Vance Management (International) Limited ("EVM") 125 Old Broad Street, London, EC2N 1AR, UK, which is authorised and regulated in the United Kingdom by the Financial Conduct Authority.

**Italy:** MSIM FMIL (Milan Branch), (Sede Secondaria di Milano) Palazzo Serbelloni Corso Venezia, 16 20121 Milano, Italy. **The Netherlands:** MSIM FMIL (Amsterdam Branch), Rembrandt Tower, 11th Floor Amstelplein 1 1096HA, Netherlands. **France:** MSIM FMIL (Paris Branch), 61 rue de Monceau 75008 Paris, France. **Spain:** MSIM FMIL (Madrid Branch), Calle Serrano 55, 28006, Madrid, Spain. **Germany:** MSIM FMIL Frankfurt Branch, Große Gallusstraße 18, 60312 Frankfurt am Main, Germany (Gattung: Zweigniederlassung (FDI) gem. § 53b KWG). **Denmark:** MSIM FMIL (Copenhagen Branch), Gorrissen Federspiel, Axel Towers, Axeltorv2, 1609 Copenhagen V, Denmark.

### **MIDDLE EAST**

**Dubai:** MSIM Ltd (Representative Office, Unit Precinct 3-7th Floor-Unit 701 and 702, Level 7, Gate Precinct Building 3, Dubai International Financial Centre, Dubai, 506501, United Arab Emirates. Telephone: +97 (0)14 709 7158).

This document is distributed in the Dubai International Financial Centre by Morgan Stanley Investment Management Limited (Representative Office), an entity regulated by the Dubai Financial Services Authority ("DFSA"). It is intended for use by professional clients and market counterparties only. This document is not intended for distribution to retail clients, and retail clients should not act upon the information contained in this document.

**U.S.**

**NOT FDIC INSURED | OFFER NO BANK GUARANTEE | MAY LOSE VALUE | NOT INSURED BY ANY FEDERAL GOVERNMENT AGENCY | NOT A DEPOSIT**

**ASIA PACIFIC**

**Hong Kong:** This material is disseminated by Morgan Stanley Asia Limited for use in Hong Kong and shall only be made available to “professional investors” as defined under the Securities and Futures Ordinance of Hong Kong (Cap 571). The contents of this material have not been reviewed nor approved by any regulatory authority including the Securities and Futures Commission in Hong Kong. Accordingly, save where an exemption is available under the relevant law, this material shall not be issued, circulated, distributed, directed at, or made available to, the public in Hong Kong. **Singapore:** This material is disseminated by Morgan Stanley Investment Management Company and should not be considered to be the subject of an invitation for subscription or purchase, whether directly or indirectly, to the public or any member of the public in Singapore other than (i) to an institutional investor under section 304 of the Securities and Futures Act, Chapter 289 of Singapore (“SFA”); (ii) to a “relevant person” (which includes an accredited investor) pursuant to section 305 of the SFA, and such distribution is in accordance with the conditions specified in section 305 of the SFA; or (iii) otherwise pursuant to, and in accordance with the conditions of, any other applicable provision of the SFA. This publication has not been reviewed by the Monetary Authority of Singapore. **Australia:** This material is provided by Morgan Stanley Investment Management (Australia) Pty Ltd ABN 22122040037, AFSL No. 314182 and its affiliates and does not constitute an offer of interests. Morgan Stanley Investment Management (Australia) Pty Limited arranges for MSIM affiliates to provide financial services to Australian wholesale clients. Interests will only be offered in circumstances under which no disclosure is required under the Corporations Act 2001 (Cth) (the “Corporations Act”). Any offer of interests will not purport to be an offer of interests in circumstances under which disclosure is required under the Corporations Act and will only be made to persons who qualify as a “wholesale client” (as defined in the Corporations Act). This material will not be lodged with the Australian Securities and Investments Commission.

**Japan**

This material may not be circulated or distributed, whether directly or indirectly, to persons in Japan other than to (i) a professional investor as defined in Article 2 of the Financial Instruments and Exchange Act (“FIEA”) or (ii) otherwise pursuant to, and in accordance with the conditions of, any other allocable provision of the FIEA. This material is disseminated in Japan by Morgan Stanley Investment Management (Japan) Co., Ltd., Registered No. 410 (Director of Kanto Local Finance Bureau (Financial Instruments Firms)), Membership: the Japan Securities Dealers Association, The Investment Trusts Association, Japan, the Japan Investment Advisers Association and the Type II Financial Instruments Firms Association.