

# How Do You Invest In Innovation?

 Nasdaq | REWRITE TOMORROW

# Nasdaq-100<sup>®</sup> Index

The Benchmark of the 21<sup>st</sup>  
Century Industrials

# Innovation and Disruption

**Apple | Amazon | Xilinx | Intel | VeriSign**

- Technology continues to evolve and become more efficient each day. Creating products or services which continue to be in demand is essential to surviving in today's competitive world.
- Technology is the driver of the economic engine. Whether it is advancements in transportation, communication, media, medicine and investments – the driver of growth and innovation is the power of technology allowing for advancements in data analysis, testing and decisions.
- The technology industrials are the new drivers of the industry. Businesses around the world will continue to demand and use these highly efficient products to keep pace with their competitors.
- And now it is technology that is keeping the new economic ecosystem safe

# Nasdaq-100 Index: Overview

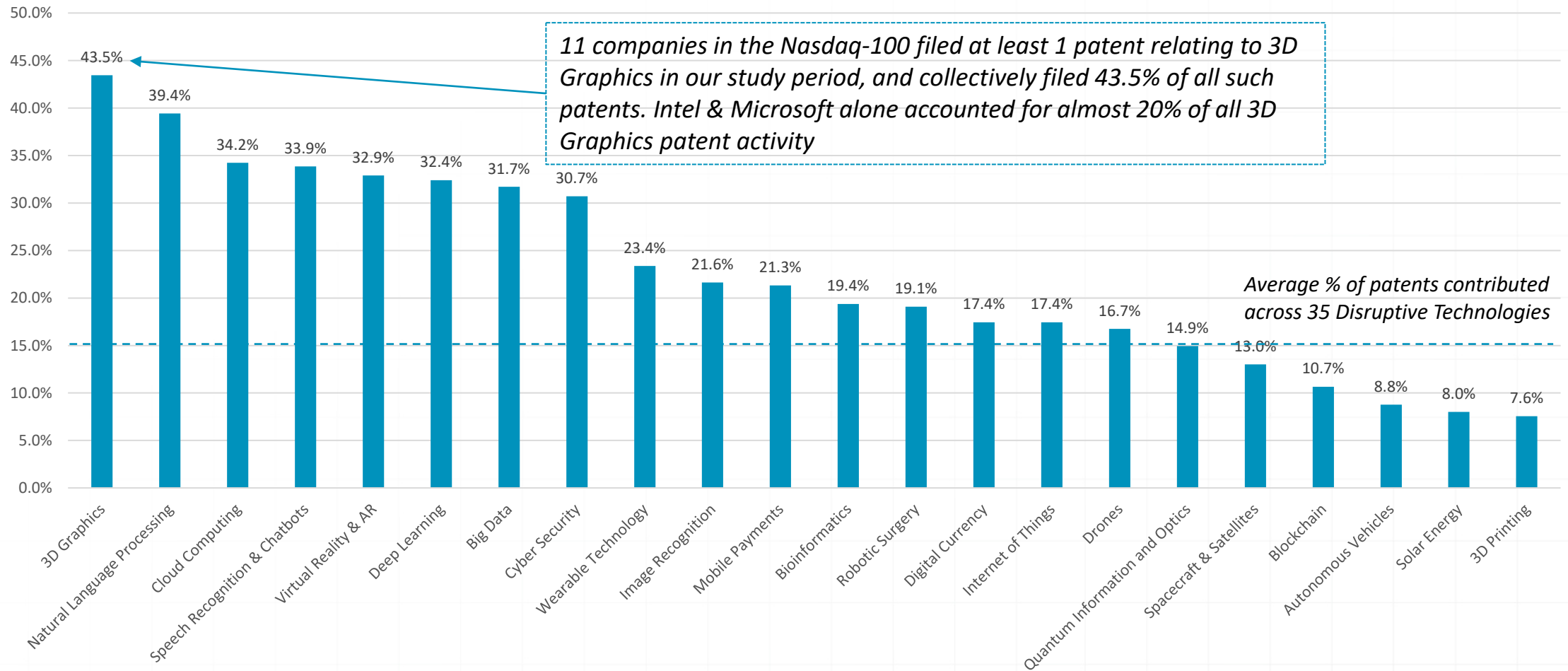
The disruptors; the game-changers; the forward-thinkers.  
Companies that influence our lives daily.

- Technology stocks that have evolved from creating consumer products to a group of companies upon which every industry and sector have become dependent. From day-to-day tasks to social interaction, each has an important influence on everyday life.
- GE, Chicago Gas Company, American Sugar Company, and the other original Dow Industrials helped spur the economic growth of the US economy in 1896.
- Today, Apple, Amazon, Intel, and Microsoft have become global leaders in the technology sector by helping create products which continue to be in high demand from consumers. From computers to cell phones, all of these products will continue to become more advanced in the future.
- From a social perspective, Facebook has become a quick and efficient way of interacting with friends around the globe. Starbucks also continues to improve its efficiency to customers by utilizing advanced technology.



# Technology and R&D

Patent Contribution of Nasdaq-100 Companies to Selected Disruptive Technologies (trailing 1 year as of 8/31/2019)



# What is Technology?

GICS (Global Industry Classification Standard)  
Changes and what they mean to you.

# S&P 500 Information Technology Index: Tracking Changes in GICS

<b>Industry</b>	<b>Pre-GICS Change - Sector Weight</b>	<b>Post-GICS Change - Sector Weight</b>
Information Technology	74.76%	100.00%
Communication Services	24.79%	0.00%
Consumer Discretionary	0.45%	0.00%

- The S&P 500 Information Technology Index tracks large and mid cap technology stocks according to the GICS industry classification
- Post GICS protocol update, about 25% of the weight in XLK was removed

Source: Nasdaq, FactSet. Data shown as of 9/21/2018 and 9/24/2018 to reflect pre-and-post GICS changes using XLK, the ETF that tracks the S&P 500 Information Technology Index.

# S&P 500 Information Technology Index: Names Removed

Company Name	Weight	Ticker	SEDOL	Industry
FACEBOOK INC-CLASS A	5.62%	FB	B7TL820	Communication Services
ALPHABET INC-CL C	5.10%	GOOG	BYY88Y7	Communication Services
ALPHABET INC-CL A	5.04%	GOOGL	BYVY8G0	Communication Services
AT&T INC	3.53%	T	2831811	Communication Services
VERIZON COMMUNICATIONS INC	3.24%	VZ	2090571	Communication Services
ACTIVISION BLIZZARD INC	0.88%	ATVI	2575818	Communication Services
ELECTRONIC ARTS INC	0.51%	EA	2310194	Communication Services
EBAY INC	0.45%	EBAY	2293819	Consumer Discretionary
CENTURYLINK INC	0.32%	CTL	2185046	Communication Services
TWITTER INC	0.27%	TWTR	BFLR866	Communication Services
TAKE-TWO INTERACTIVE SOFTWARE	0.22%	TTWO	2122117	Communication Services

- Some big companies removed include Facebook, Alphabet, and Twitter
- Investors looking to invest in technology are losing exposure to key companies

Source: Nasdaq, FactSet. Data shown as of 9/21/2018 and 9/24/2018 to reflect pre-and-post GICS changes using XLK, the ETF that tracks the S&P 500 Information Technology Index.



# Top 10: Nasdaq-100 vs S&P 500 Information Technology

S&P 500 Information Technology		
Company Name	Weight	GICS Sector
MICROSOFT CORP	20.34%	Information Technology
APPLE INC	19.22%	Information Technology
VISA INC-CLASS A SHARES	5.21%	Information Technology
MASTERCARD INC - A	4.28%	Information Technology
INTEL CORP	4.10%	Information Technology
CISCO SYSTEMS INC	2.86%	Information Technology
ADOBE INC	2.76%	Information Technology
NVIDIA CORP	2.61%	Information Technology
SALESFORCE.COM INC	2.58%	Information Technology
PAYPAL HOLDINGS INC	2.13%	Information Technology

Nasdaq-100		
Company Name	Weight	GICS Sector
APPLE INC.	11.87%	Information Technology
MICROSOFT CORP	11.21%	Information Technology
AMAZON.COM INC	8.60%	Consumer Discretionary
ALPHABET CL A CMN	4.25%	Communication Services
ALPHABET CL C CAP	4.25%	Communication Services
FACEBOOK INC	4.20%	Communication Services
INTEL CORP	3.06%	Information Technology
PEPSICO INC	2.18%	Consumer Staples
COMCAST CORP A	2.16%	Communication Services
CISCO SYSTEMS INC	2.15%	Information Technology

Notable names not shown above in the Nasdaq-100 that are excluded in the S&P 500 Information Technology Index: Netflix (1.67%), Intuitive Surgical (0.71%), Booking Holdings (0.84%), Tesla (1.29%), and Activision Blizzard (0.49%).

Source: Nasdaq, Factset as of 1/31/2020.

# Nasdaq-100: Tracking Changes in GICS

GICS Sector Name	Pre-GICS Change - Sector Weight	Post-GICS Change – CURRENT Sector Weight
Consumer Discretionary	10.89%	15.33%
Information Technology	71.25%	46.94%
Health Care	7.61%	7.05%
Industrials	2.34%	2.56%
Consumer Staples	6.15%	5.72%
Communication Services	0.00%	21.24%
Telecommunications	1.05%	0.00%
Financials	0.31%	0.28%
Utilities	0.40%	0.88%

- Nasdaq-100 did not lose any companies due to the GICS changes
- Weight shifted to different sectors, but the companies remained the same
- Capture exposure to innovative companies via Nasdaq listing

Source: Nasdaq, FactSet. Data shown as of 9/21/2018 and 02/28/2020 to reflect pre-and-post GICS changes.

Nasdaq-100

The true barometer for Technology

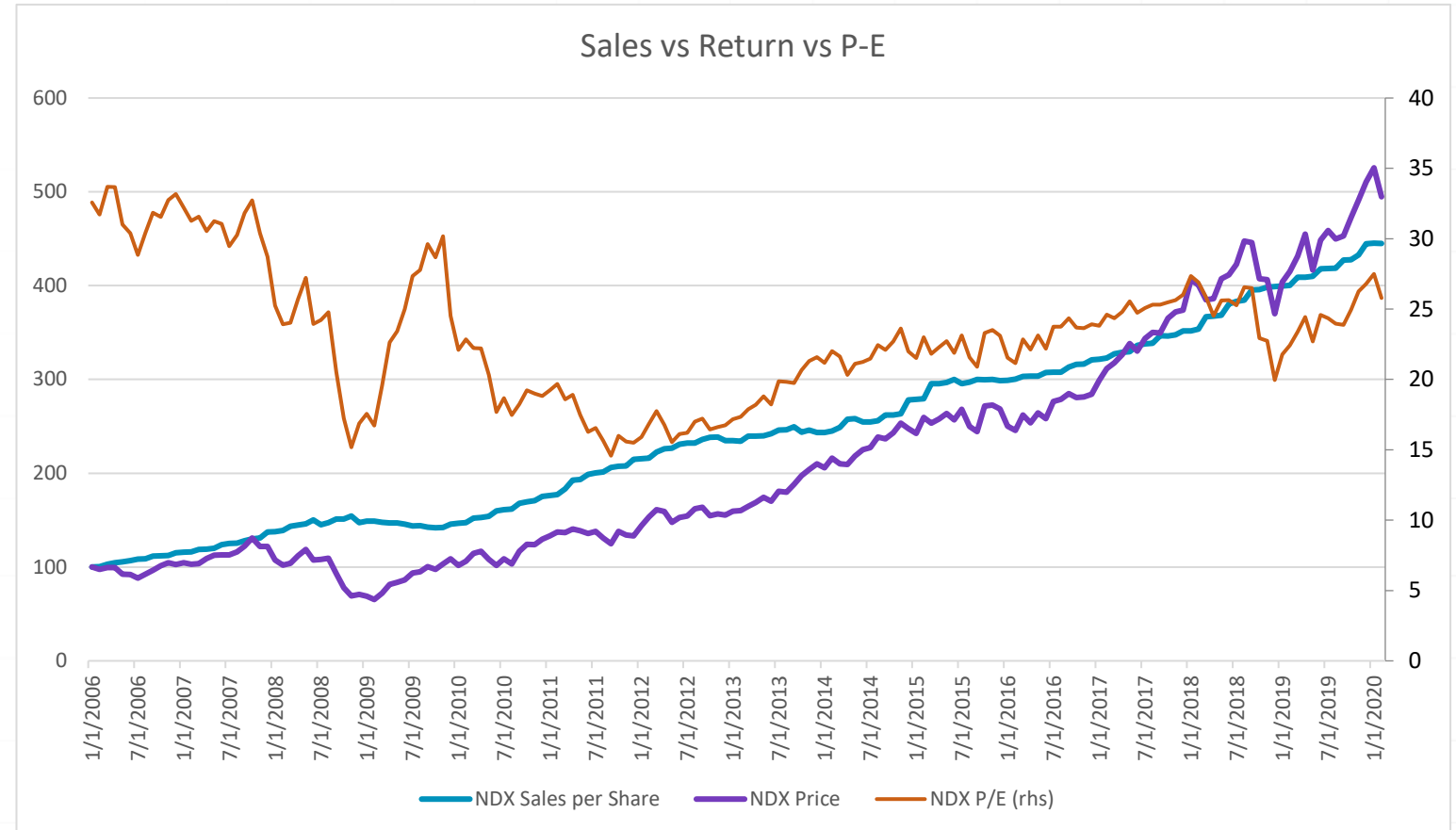
# The Nasdaq-100: History

- The Nasdaq-100 Index (NDX) is comprised of the 100 largest, non-financial companies listed on The Nasdaq Stock Market®
- Launched on January 31, 1985
- Rebalanced to modified market cap index on December 21, 1998
- Special Rebalance effective May 2, 2011



# Market Performance and Technology

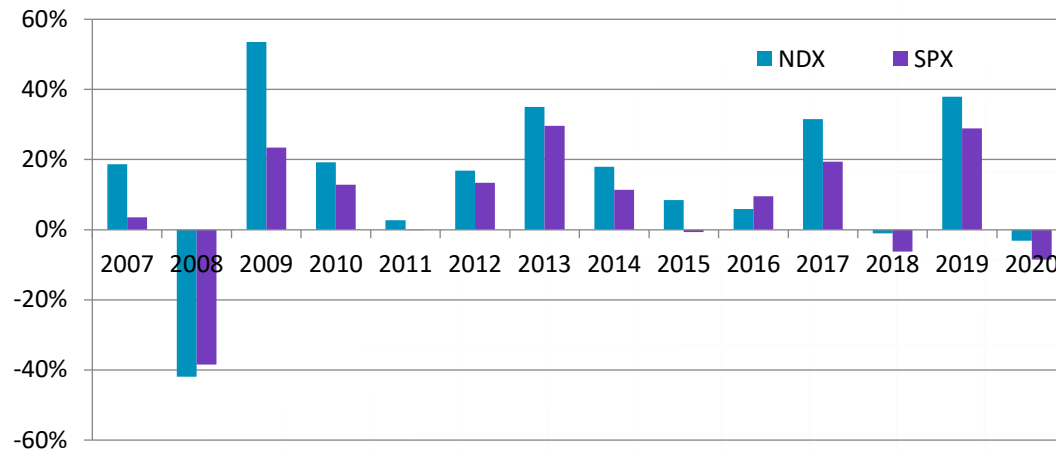
- P/E ratio has stabilized in the mid 20s over the past several years – substantially lower than even in the mid-2000s post-Tech bubble & crash
- Fundamental story drives recovery rewarding the growth of NDX companies
- Sales: +345%  
Price: +395%  
Valuation: -21%



Source: Nasdaq, Bloomberg. Data as of 2/28/2020.

# Nasdaq-100 Index: Performance

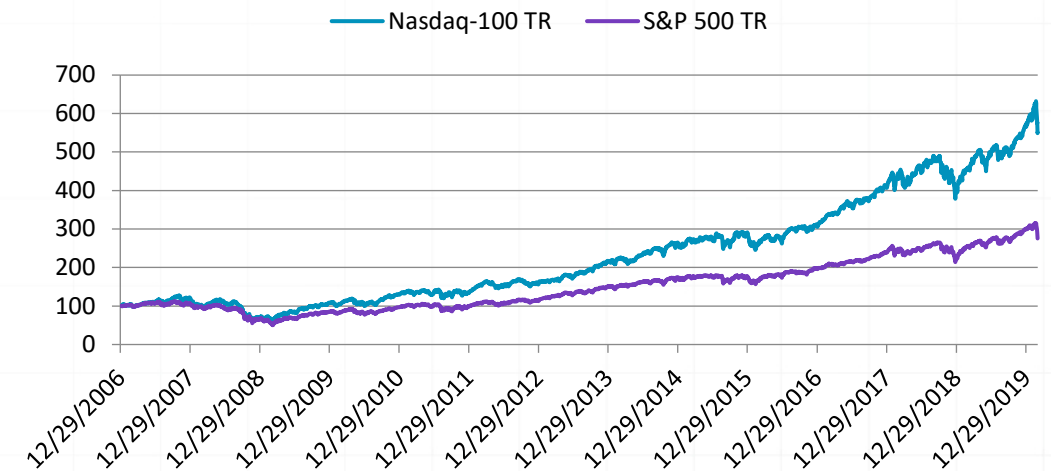
INDEX ANNUAL PRICE RETURNS – 2020 DATA AS OF FEBRUARY 28



- NDX has been marked by both the growth and maturation of the companies in the index over the years. Through the financial crisis, in the subsequent market rebound and the following bull market, NDX's P/E has stabilized. NDX's P/E as of year-end 2019 was 26.8— somewhat but not drastically higher than SPX's 21.4.
- There were substantial increases in market cap along with earnings in NDX from year-end 2009 to 2019 (from \$3.2T to \$9.8T in market cap and from \$145B in earnings to \$326B).

INDEX PERFORMANCE FROM 2007 TO FEBRUARY 28, 2020

## Cumulative Total Return Performance



- NDX realized volatilities over the past 13 full calendar years averaged 19.7% vs. 17.3% for SPX (the S&P 500 Index).
- Cumulative total returns through February 28, 2020 were 450% for NDX – more than doubling the returns of 175% for SPX.

Source: Nasdaq, FactSet. Data as of 2/28/2020

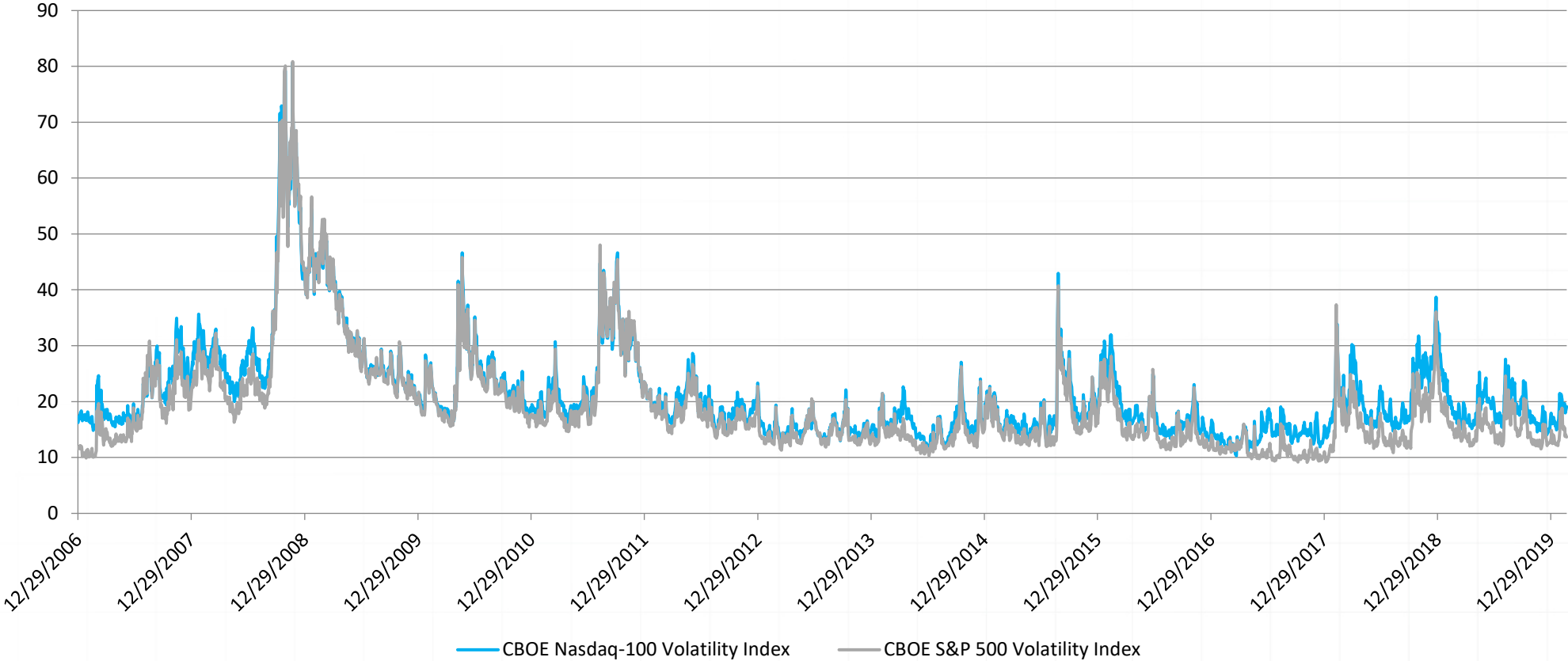
# Performance Data (Total Return)

Year	Calendar Year Return		Correlation	Calendar Year Volatility	
	Nasdaq-100	S&P 500	NDX + SPX	Nasdaq-100	S&P 500
2007	19.24%	5.49%	0.890	18.68%	15.99%
2008	-41.57%	-37.00%	0.945	42.22%	40.89%
2009	54.61%	26.46%	0.935	26.47%	27.25%
2010	20.14%	15.06%	0.949	19.48%	18.06%
2011	3.66%	2.11%	0.948	23.75%	23.24%
2012	18.35%	16.00%	0.920	15.44%	12.74%
2013	36.92%	32.39%	0.901	12.49%	11.16%
2014	19.40%	13.69%	0.924	14.06%	11.36%
2015	9.75%	1.38%	0.947	17.85%	15.50%
2016	7.27%	11.96%	0.916	16.17%	13.11%
2017	32.99%	21.83%	0.801	10.32%	6.69%
2018	0.04%	-4.38%	0.949	22.70%	17.04%
2019	39.46%	31.49%	0.950	16.31%	12.46%

Source: Nasdaq, FactSet. Data as of 12/31/2019.

# Historical Volatility

- Both the Nasdaq-100 and the S&P 500 have had very similar volatility over last 10+ years

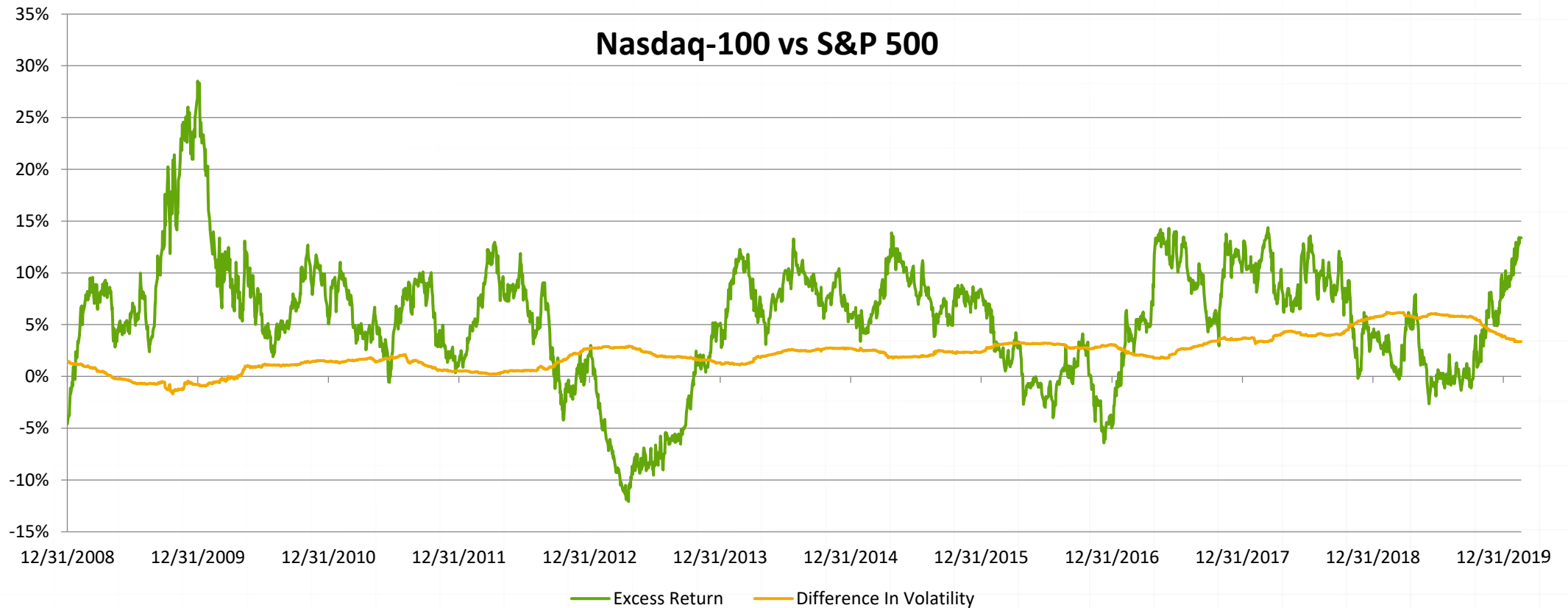


Source: Nasdaq, Bloomberg. Data as of 2/18/2020.



# 1-Year Excess Return vs. Volatility

From December 2008 through February 2020



Source: Nasdaq, Bloomberg. Data as of 2/18/2020.

# Coveted Placement: The 100 that Make the Index

# Top 50 vs Bottom 50

The top positions in market capitalization weighted indexes are often heavily focused on larger holdings while putting less emphasis on smaller holdings. We can visualize it with a sample test. Let's equally divide the stocks in the Nasdaq-100 into two segments based on market capitalization: the Top 50 and the Bottom 50. The average Price to Book ratio chart shows a consistent bias toward the Top 50 - they are highly valued (Figure 1). This means that great values exist in the bottom 50 of the Nasdaq-100. Our back-tests also verified that the equally weighted bottom 50 portfolio has outperformed the top 50 portfolio since 2001 (Figure 2).

Figure 1: Price to Book Ratios within Nasdaq-100

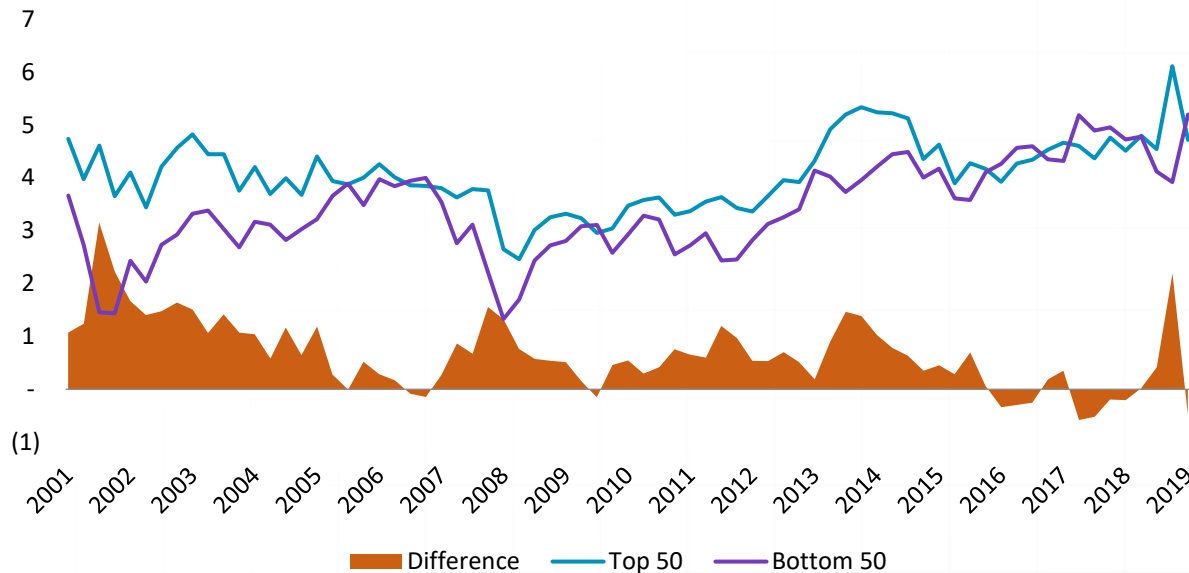
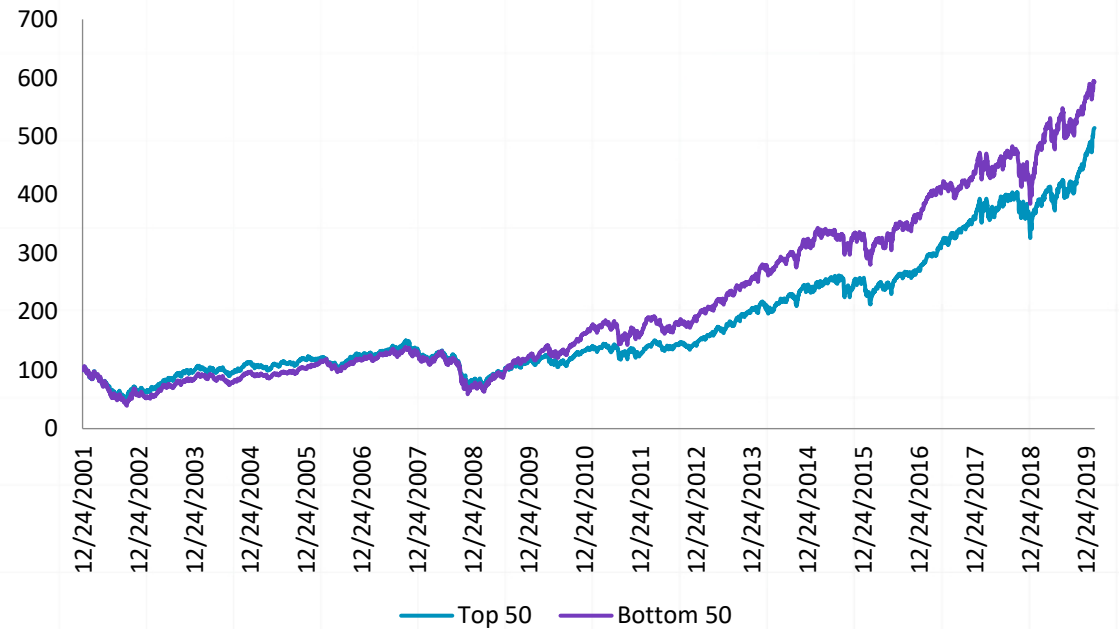


Figure 2: The Bottom 50 of Nasdaq-100 is outperforming

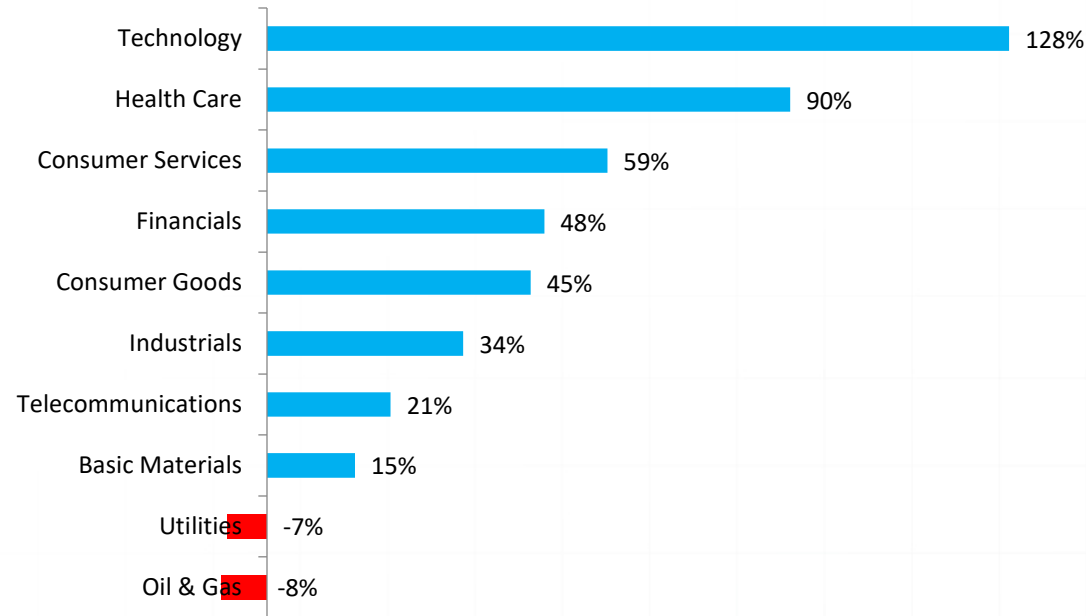


Source: Nasdaq, Bloomberg. Data as of 2/18/2020.

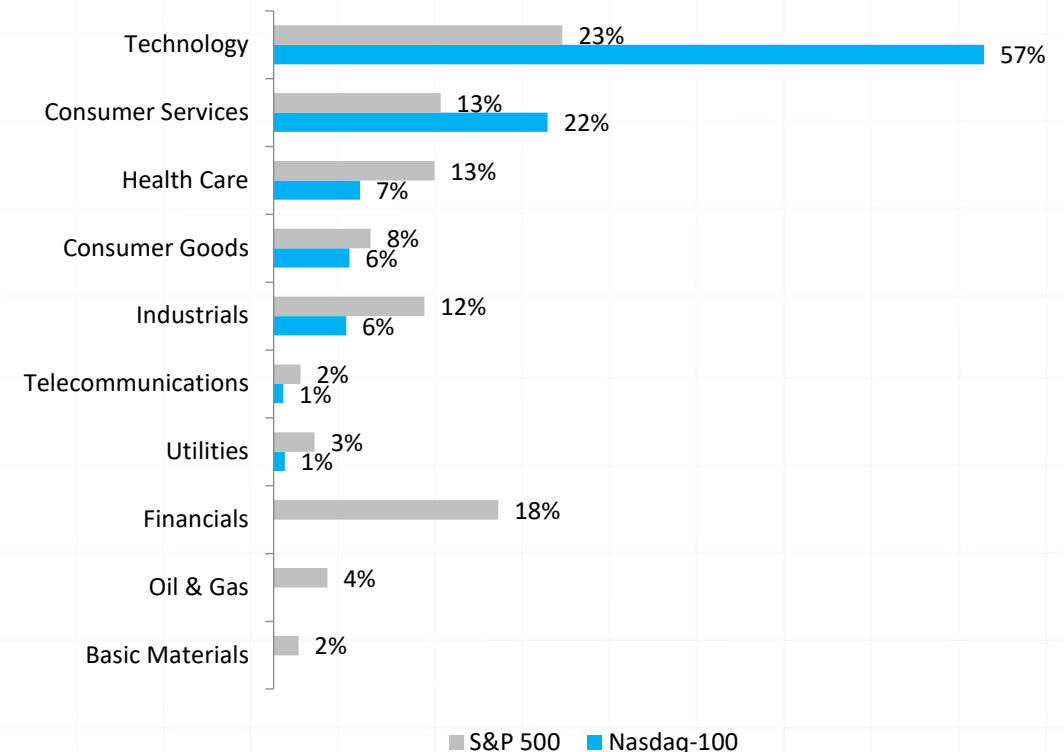
# The Decade of the Nasdaq-100

The underlying story for the rise in the Nasdaq-100 is that the U.S.'s economic growth is shifting from the traditional industries (Basic Materials and Oil & Gas) to the newer sectors (Health Care and Technology) (Figures 3 & 4).

**Figure 3: 10-Year Sales Growth Across Industries in the Nasdaq US Large Mid Benchmark as of December 31, 2019**



**Figure 4: Industry (ICB) Breakdown in Nasdaq-100 and S&P 500 as of December 31, 2019**



Source: Nasdaq, Factset. Data as of dates noted above.

# Nasdaq-100 Index: Components

## Top Performers – Full Year 2019

Ticker	Name	2019 Return	Index Weight EOY '19
AMD	ADVANCED MICRO DEVICES	148%	0.58%
LRCX	LAM RESEARCH CORP	115%	0.48%
SGEN	SEATTLE GENETICS INC	102%	0.22%
KLAC	KLA CORP	99%	0.32%
MELI	MERCADOLIBRE, INC	95%	0.32%
LULU	LULULEMON ATHLETICA	91%	0.32%
CPRT	COPART, INC	90%	0.24%
ASML	ASML HOLDING NV	90%	0.25%
AMAT	APPLIED MATERIALS	86%	0.64%
AAPL	APPLE INC	86%	11.60%

## Highest YOY Growth in Earnings

Ticker	Name	2019 Earnings Growth
ALXN	ALEXION PHARMACEUTICALS INC	2,994%
INCY	INCYTE CORPORATION	303%
CDNS	CADENCE DESIGN SYSTEMS	187%
QCOM	QUALCOMM INC	123%
EA	ELECTRONIC ARTS INC	107%
MCHP	MICROCHIP TECHNOLOGY	95%
LULU	LULULEMON ATHLETICA	74%
MU	MICRON TECHNOLOGY	68%
CTAS	CINTAS CORP	63%
CPRT	COPART, INC.	55%

Additional high performing components ( $\geq 50\%$  YoY) not in the top 10 include: Baidu, Adobe, Netflix, United Airlines and Willis Towers Watson

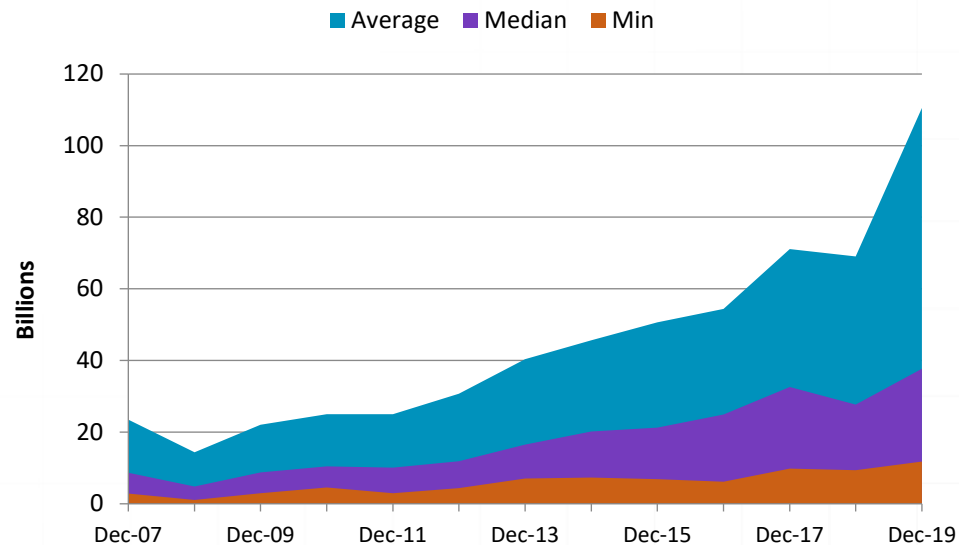
Source: Nasdaq, Factset. Data as of 12/31/2019. Earnings Growth defined as 2019 vs. 2018 Fully Diluted EPS.

# Nasdaq-100 Index: Components

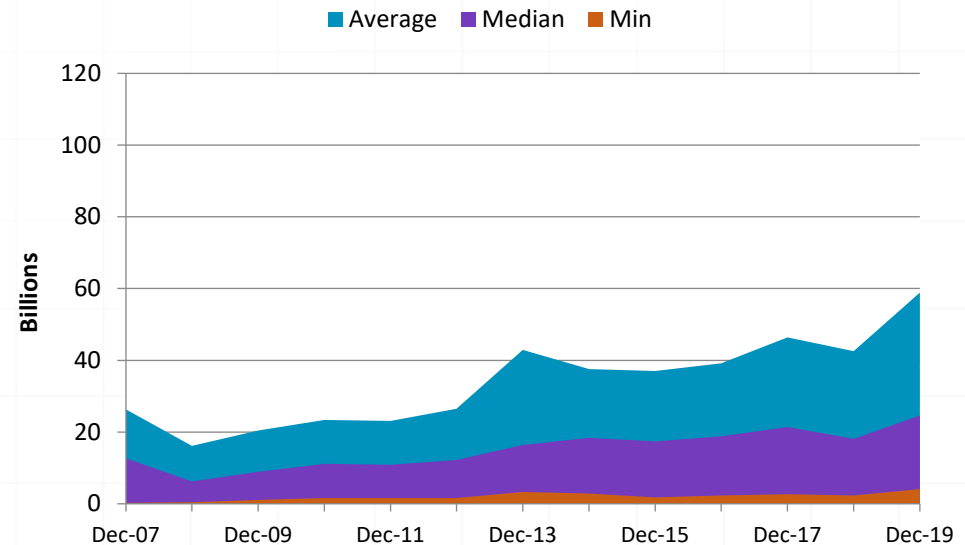
## Average, median and minimum market caps of the NASDAQ-100 and the S&P 500

- All figures dropped during the financial crisis and have been steadily rebounding until a brief pause during 2018's Q4 mini bear-market.
- Ten of the last eleven years the average market cap has been higher in NDX than SPX. As of Feb '20, NDX: \$117B, SPX: \$59B.
- The median market cap has been higher for NDX than SPX in each of the last five years — as of Feb '20 the medians were \$37.7B for NDX and \$24.6B for SPX. Despite any large companies, the market cap of NDX tends to be truer to large cap than SPX.
- The smallest company in NDX (\$11.8B) has been larger than the smallest company in SPX (\$4.1B) for the last eleven years.

NASDAQ-100: MARKET CAP



S&P 500: MARKET CAP



# Nasdaq-100 by the Sectors

# Nasdaq-100 Index: Sectors

## Sector Breakdown

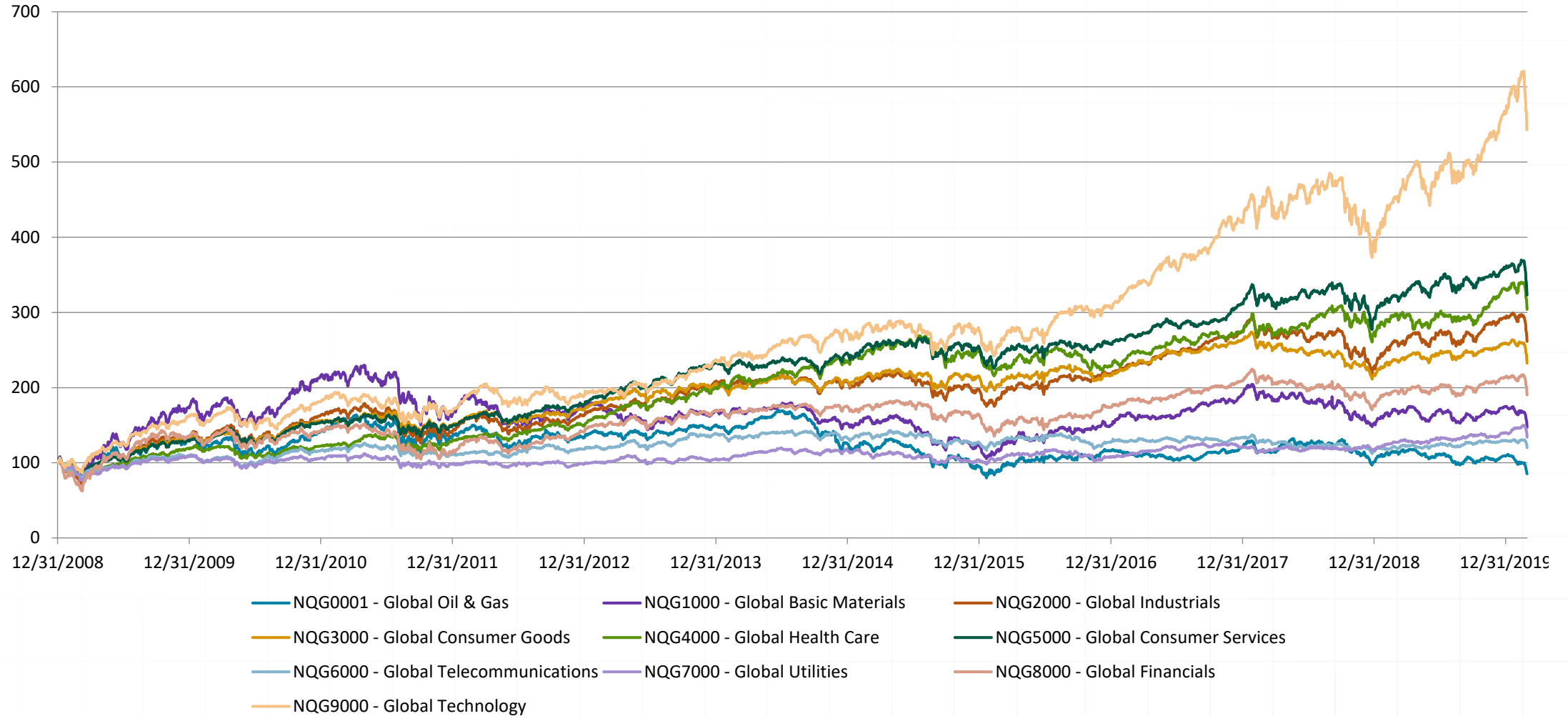
- While heavy in technology, consumer industries and healthcare make up a comparable weight
- Consumer Services contains companies like Amazon, Starbucks, Netflix, Sirius and Costco

Industry	Weight (12/31/2019)	Contributed Return (FY 2019)	Pure Return (FY 2019)	Benchmark return (FY 2019)
Technology	57.3%	27.1%	51.1%	42.5%
Consumer Services	22.1%	6.7%	26.0%	22.3%
Health Care	7.0%	1.7%	19.7%	20.6%
Consumer Goods	6.1%	1.7%	26.3%	18.9%
Industrials	5.8%	1.9%	34.7%	27.8%
Telecommunications	0.8%	0.2%	23.3%	12.4%
Utilities	0.9%	0.1%	30.1%	18.6%
Basic Materials	0.0%	0.0%	0.0%	14.4%
Oil & Gas	0.0%	0.0%	0.0%	8.0%
Financials	0.0%	0.0%	0.0%	20.9%

Source: Nasdaq, Bloomberg. Data as of 12/31/2019.

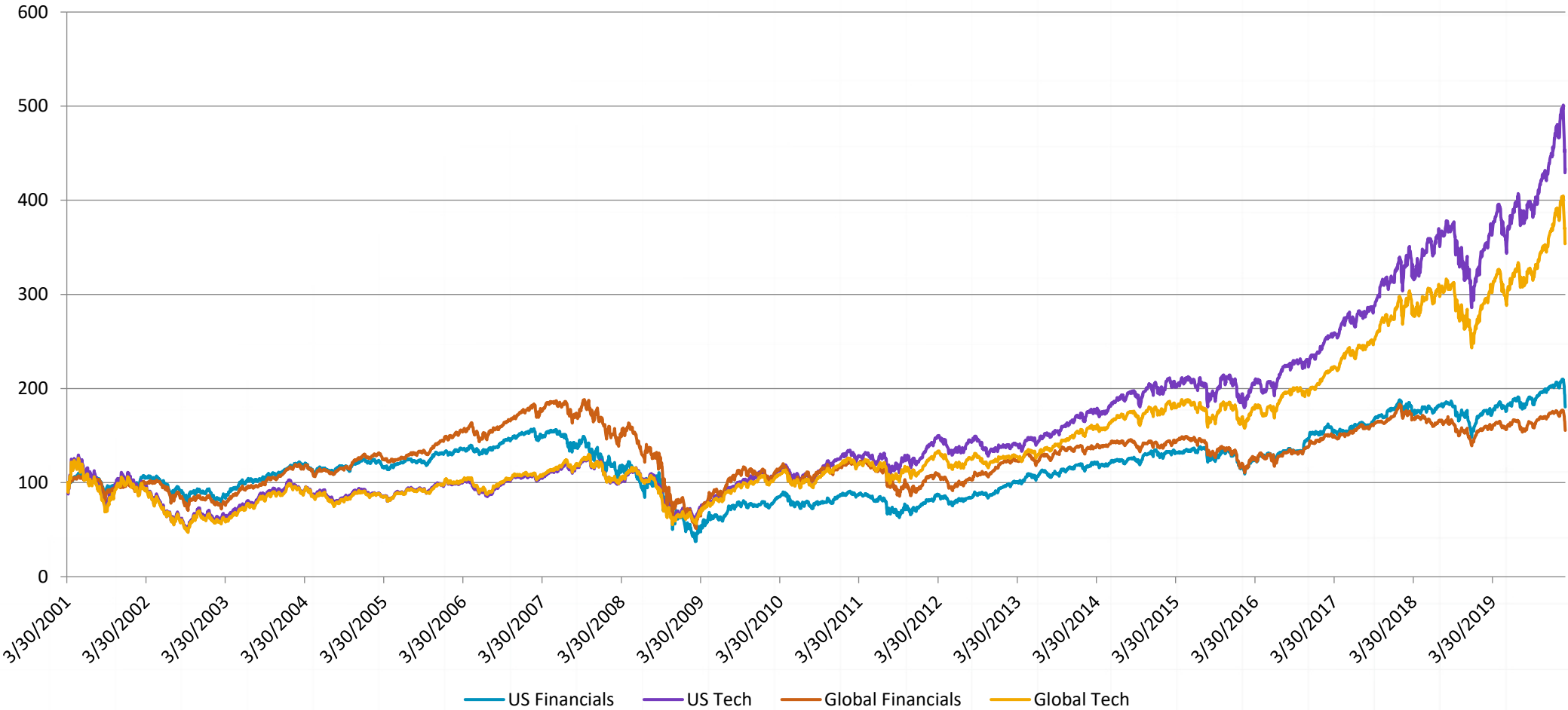


# Sector Exposure Matters



Source: Nasdaq. Data as of 02/28/2020.

# Technology or Financials



Source: Nasdaq. Data as of 02/28/2020.

# Industries and Dividends

- Industry exposure, when pursuing dividend growth, is extremely important
- Technology and Health Care, two industries dominated by Nasdaq-100 companies, have had tremendous dividend growth, and are poised for continued growth; Financials' dividends almost doubled in 2019, exceeding the industry's prior peak set in 2007 for the first time since the Financial Crisis

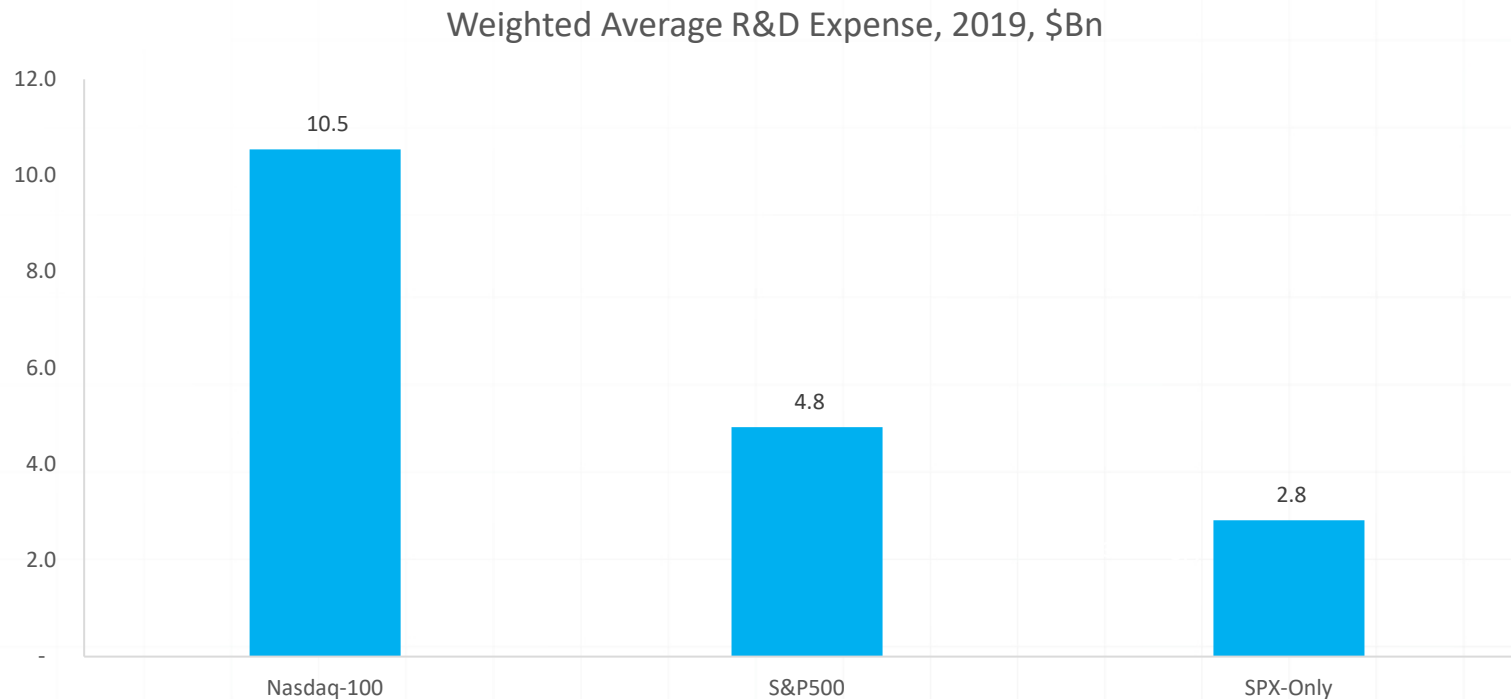
## Cumulative Dividend Growth Since 2009

	INDUSTRY	RETURN
1	Technology	430%
2	Financials	289%
3	Health Care	188%
4	Consumer Goods	152%
5	Consumer Services	138%
6	Utilities	121%
7	Telecommunications	119%
8	Industrials	117%
9	Oil & Gas	117%
10	Basic Materials	97%

# The Fundamentals

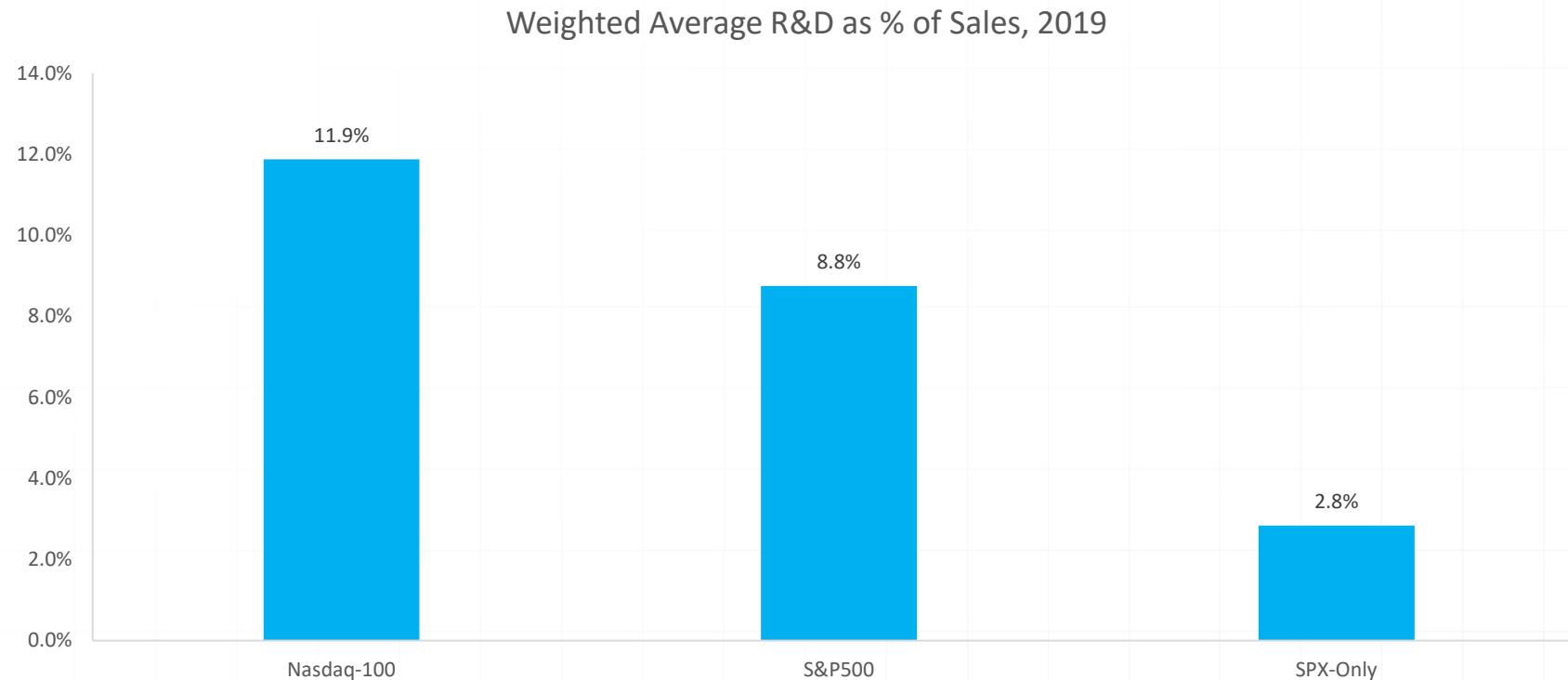
# Research and Development (R&D) Investment

- R&D is a key driver of innovation and economic growth
- Companies in the Nasdaq-100 spent more than twice as much in R&D when compared to those in the S&P 500 in 2019



# R&D to Sales

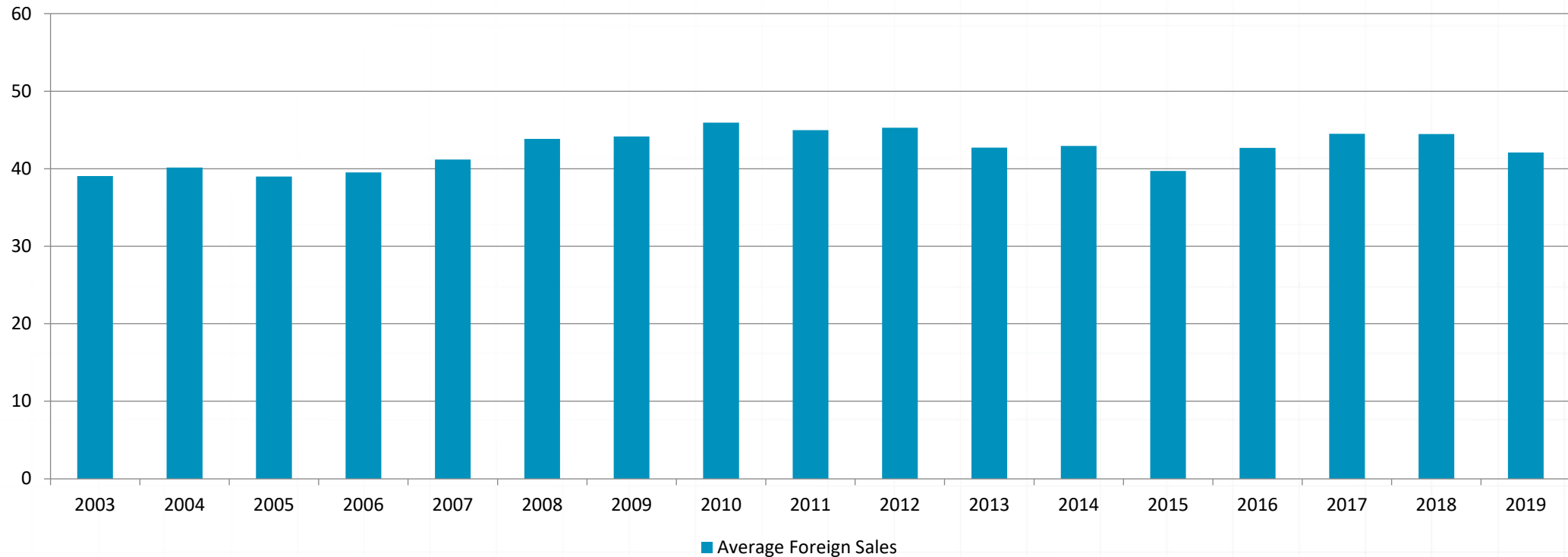
- Calculating R&D as a percent of sales in 2019, the Nasdaq-100 companies averaged 36% higher than the S&P 500 overall



# A Truly Global Exposure

- The average foreign sales of companies in the Nasdaq-100 have ranged between 40-45% since 2003

**Average Foreign Sales (%)**

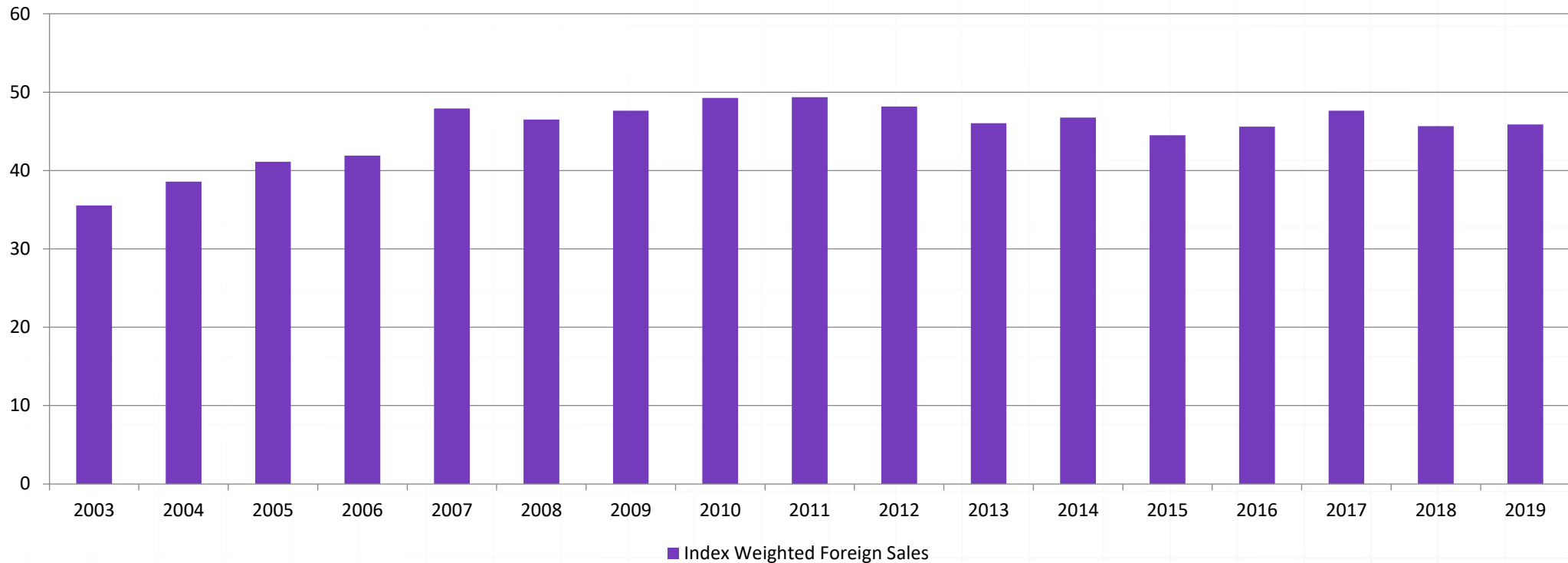


Source: Nasdaq, Bloomberg. Data as of 12/31/2019.

# A Truly Global Exposure

- From an Index weighted perspective, the change in the percentage of foreign sales has been more dramatic, increasing from 36% in 2003 to 46% in 2019.

**Index Weighted Foreign Sales (%)**



Source: Nasdaq, Bloomberg. Data as of 12/31/2019.



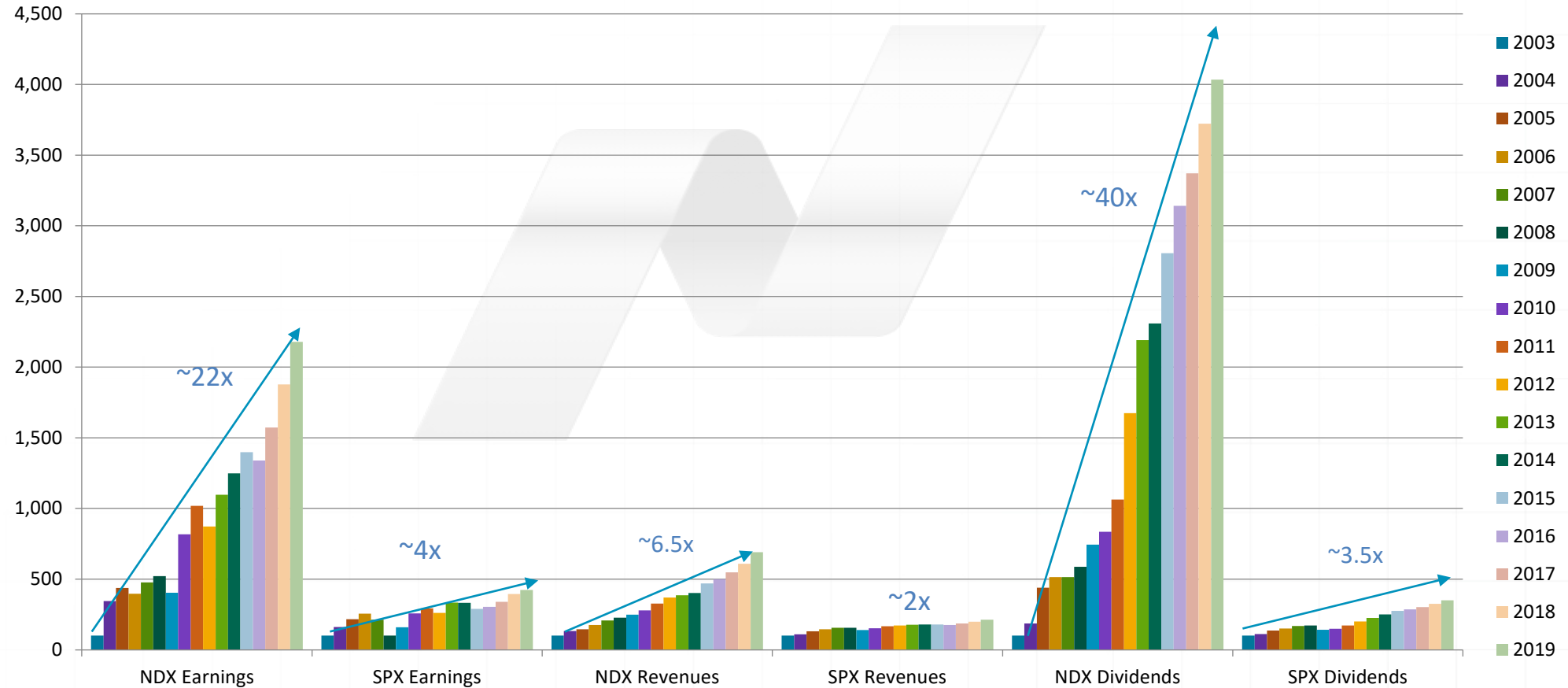
# Nasdaq-100 Index: Fundamentals

- The fundamental data behind the NASDAQ-100 has drastically improved over the past decade despite a volatile economy and the greatest financial market collapse since the Great Depression.
- Earnings, the most basic number to value a company, have skyrocketed, showing maturation of the companies as they increase revenues but reduce costs. Costs have been controlled, shares were bought back, dividends have increased and P/E has contracted.
- Since 2003, NDX has had a Compound Annual Growth Rate (CAGR) of:
  - + 21% in earnings
  - + 13% in revenues
  - + 26% in dividend value
  - - 9% in P/E
- The shift in NDX fundamentals has resulted in significant outperformance over other US large cap indexes.



# Nasdaq-100 Index: Fundamentals over time

## NDX VS SPX FUNDAMENTALS



Source: Nasdaq, Factset. Data as of 12/31/2019.

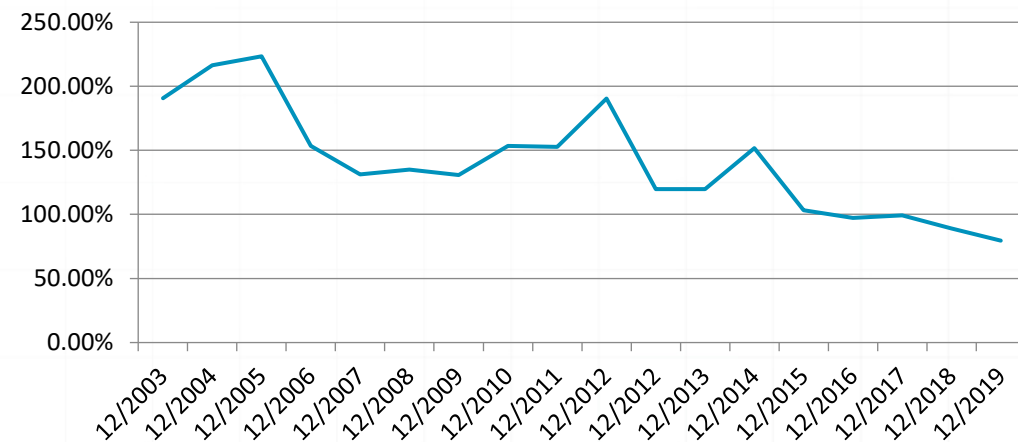
# Nasdaq-100 Index: Dividends and Cash/Debt

## NDX: DIVIDENDS

YEAR	DIVIDENDS PAID (\$B)	DIVIDEND YIELD
2003	2.20	0.10%
2004	4.10	0.18%
2005	9.65	0.43%
2006	11.32	0.55%
2007	11.31	0.48%
2008	12.90	0.89%
2009	16.37	0.74%
2010	18.38	0.74%
2011	23.38	0.93%
2012	36.83	1.20%
2013	48.22	1.19%
2014	50.79	1.11%
2015	61.72	1.22%
2016	69.08	1.27%
2017	74.16	1.04%
2018	81.88	1.19%
2019	88.73	0.89%

Apple, Cisco, Amgen, Comcast and others have increased dividends in the last couple of years, and the trend looks to continue with more names.

## NDX: CASH / DEBT RATIO



YEAR	CASH (\$B)	DEBT (\$B)
2003	180.08	94.47
2004	225.38	104.24
2005	212.32	95.06
2006	231.92	151.13
2007	248.20	189.28
2008	248.83	184.34
2009	331.33	253.63
2010	423.93	276.18
2011	522.79	342.45
2012	589.33	309.62
2013	663.08	553.96
2014	683.30	450.56
2015	836.56	810.63
2016	968.22	995.46
2017	1,066.62	1,075.69
2018	981.60	1,101.80
2019	1,078.58	1,357.32

Source: Nasdaq, Factset. Data as of 12/31/2019.

# Nasdaq-100 Index: Earnings

- In 2003, the Nasdaq-100 had total earnings of \$15.7B. S&P 500, on the other hand, had \$275B.
- Along with dividend growth, earnings have exploded in the Nasdaq-100 in the last 16 years.
- In 2019, the constituents of the Nasdaq-100 generated earnings of \$343B while the S&P 500 totaled almost \$1.2T.
- Nasdaq's proportional growth is more than six-fold that of the S&P 500.
  - Growth in earnings of the S&P 500 is quite high at 324% over that time, but the Nasdaq-100 growth in earnings was a staggering 2,079%, cumulatively.

## EARNINGS (Billions USD)

YEAR	Nasdaq-100	S&P 500
2003	15.7	275.4
2004	54.2	446.6
2005	68.7	598.0
2006	62.5	706.7
2007	75.0	589.0
2008	82.0	275.8
2009	63.5	437.4
2010	128.6	709.7
2011	160.3	808.5
2012	137.3	718.9
2013	172.7	918.2
2014	196.5	915.1
2015	219.9	796.0
2016	210.7	838.1
2017	247.4	936.7
2018	295.5	1,088.4
2019	342.8	1,167.4

Source: Nasdaq, Factset. Data as of 12/31/2019.

# Nasdaq-100 Index: Revenues

- A similar story to earnings and dividends, the Nasdaq-100 has far outpaced S&P on top-line growth.
- Every year since 2003, the components of the Nasdaq-100 have posted higher annual revenue figures, rebased.
- Revenues in the Nasdaq-100 totaled \$2.76T in 2019, a 591% increase from 2003. With S&P 500's revenues climbing to \$12.68T, it experienced a comparatively modest 113% increase over that same span.

## REVENUES (Billions USD)

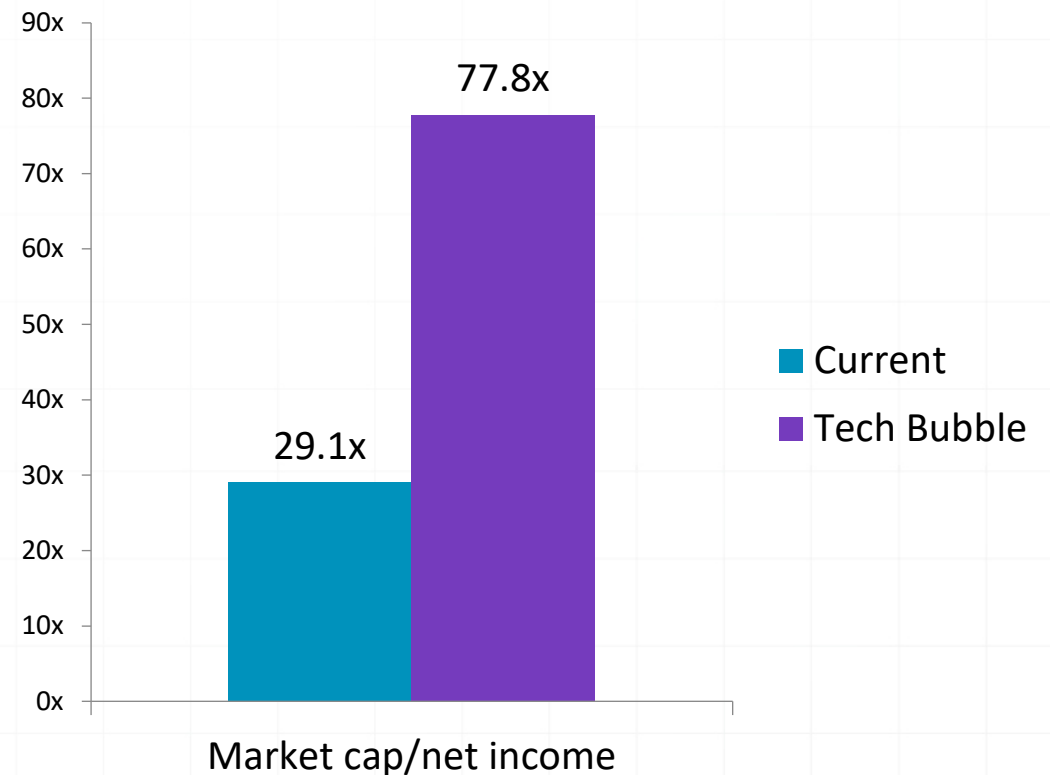
YEAR	Nasdaq-100	S&P 500
2003	400.07	5,950.22
2004	528.08	6,478.16
2005	578.07	7,781.78
2006	705.34	8,605.05
2007	832.62	9,280.21
2008	906.65	9,298.35
2009	994.85	8,353.35
2010	1,119.42	9,085.20
2011	1,309.27	9,868.67
2012	1,481.38	10,236.52
2013	1,542.42	10,532.81
2014	1,606.81	10,699.04
2015	1,881.31	10,648.13
2016	2,002.98	10,474.57
2017	2,191.71	11,090.06
2018	2,437.08	11,878.59
2019	2,764.69	12,675.98

Source: Nasdaq, Factset. Data as of 12/31/2019.

# Then and Now: A New Tech Bubble?!?

# A New Tech Bubble? Look at Valuations

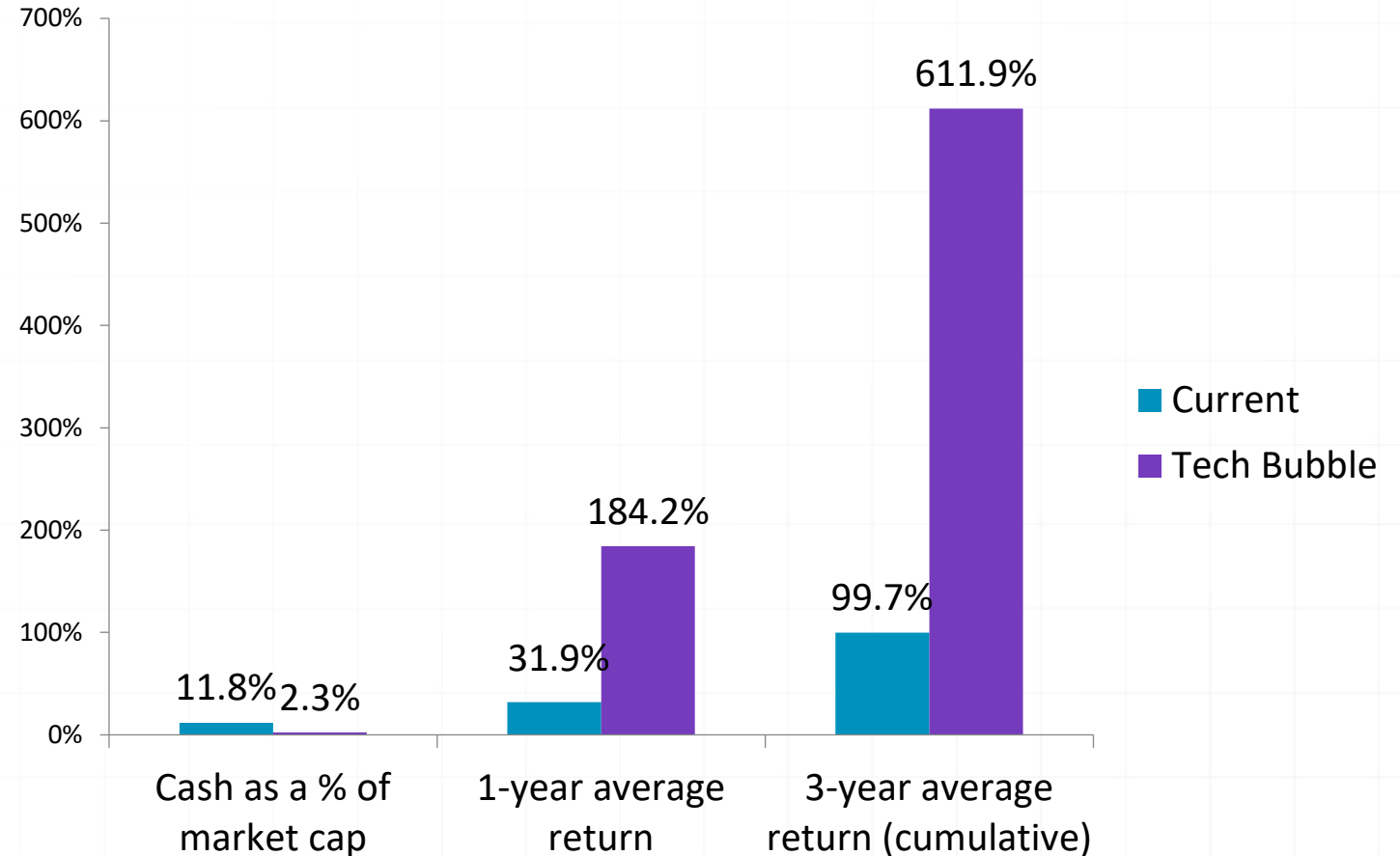
- A comparison of five largest tech holdings at height of tech bubble versus the end of February 2020
- Aggregate market cap divided by trailing net income results in five largest companies currently trading at 29.1x versus 77.8x during tech bubble
- If the five largest companies in the Nasdaq-100 at the end of February each increased in price by 150% in one day, they would be in-line with the tech bubble period



Source: Nasdaq, Bloomberg. Data as of 2/28/2020 for current; 3/24/2000 for tech bubble.

# A New Tech Bubble? Cash and Trailing Returns

- Again, using the five largest holdings for each time period we can compare how much cash these companies were holding as well as trailing returns over both the one- and three-year time periods
- Currently the five largest companies hold 11.8% of their market cap in cash, more than five times the amount of cash held at the height of the tech bubble
- One-year trailing returns for today's largest holdings are 31.0% on average versus 184.2% as of 3/24/2000. The three-year returns also show a stark difference, 99.7% versus 611.9%



Source: Nasdaq, Bloomberg. Data as of 2/28/2020 for current; 3/24/2000 for tech bubble.



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