How do you invest in innovation?

Nasdaq-100 Index: 2019 Update

Nasdaq | REWRITE TOMORROW

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

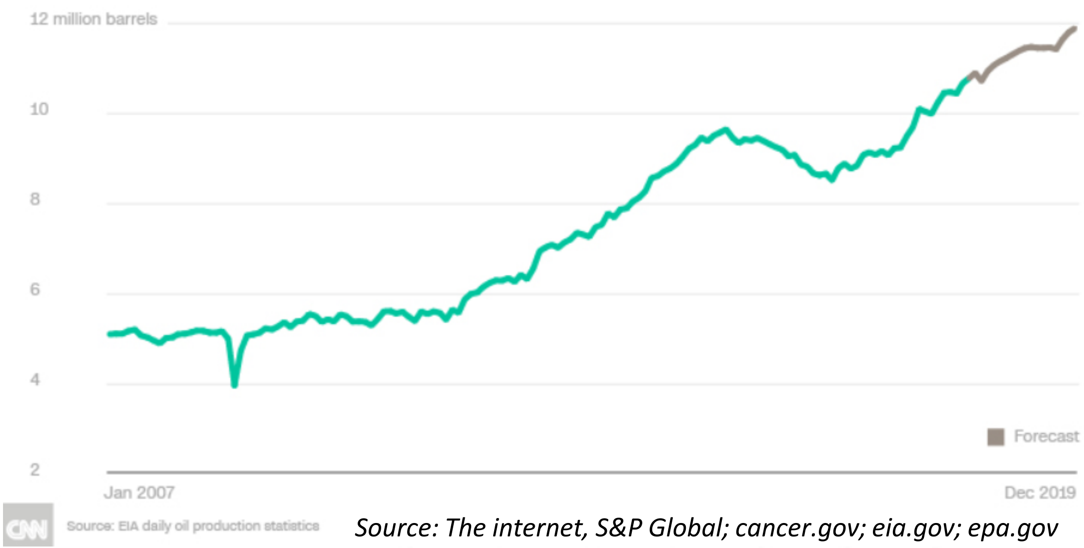
Contains the household names leading the new economy forward

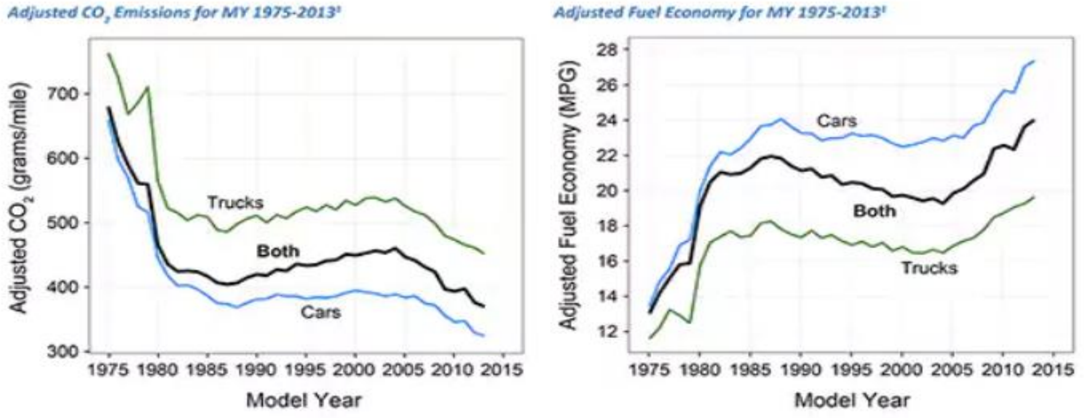
- Technology stocks have evolved from creating new and niche consumer products to a group of companies upon which every industry and sector have become dependent. From day-to-day tasks to social interaction, each has an important influence on everyday life.
- GE, Chicago Gas Company, American Sugar Company, 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 Life

Report 1: Percentage of U.S. Equity Funds Outperformed by Benchmarks						
FUND CATEGORY	COMPARISON INDEX	1-YEAR (%)	3-YEAR (%)	5-YEAR (%)	10-YEAR (%)	15-YEAR (%)
All Domestic Funds	S&P Composite 1500	63.43	83.40	86.72	86.65	83.74
All Large-Cap Funds	S&P 500	63.08	80.56	84.23	89.51	92.33
All Mid-Cap Funds	S&P MidCap 400	44.41	86.34	85.06	96.48	94.81
All Small-Cap Funds	S&P SmallCap 600	47.70	88.83	91.17	95.71	95.73

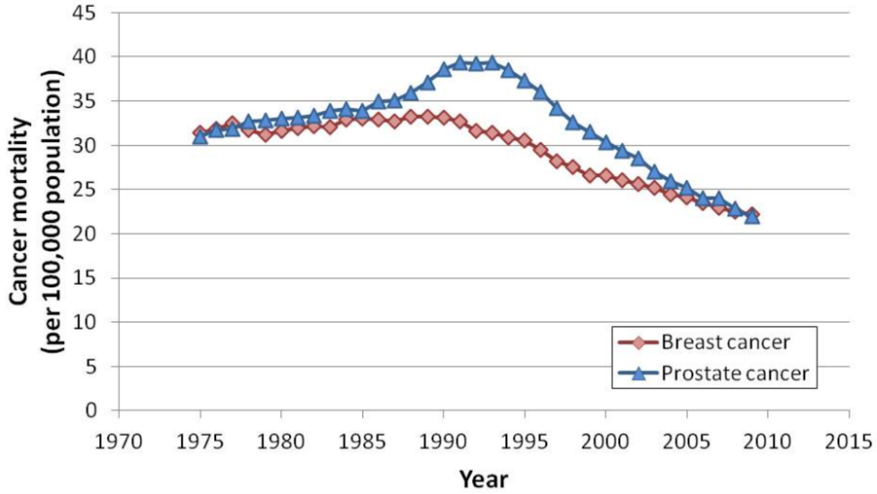
U.S. oil production soars





[1] Adjusted CO_2 and fuel economy values reflect real world estimates and are not comparable to automaker standards compliance levels. Adjusted CO_2 values are, on average, about 25% higher than the unadjusted laboratory CO_2 values that form the starting point for GHG standards compliance, and adjusted fuel economy values are about 20% lower, on average, than unadjusted fuel economy values.

Change in mortality from cancer over time



Source: The internet, S&P Global; cancer.gov; eia.gov; epa.gov

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Nasdaq-100

The Benchmark of the 21st Century Industrials

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Nasdaq-100 Index: History

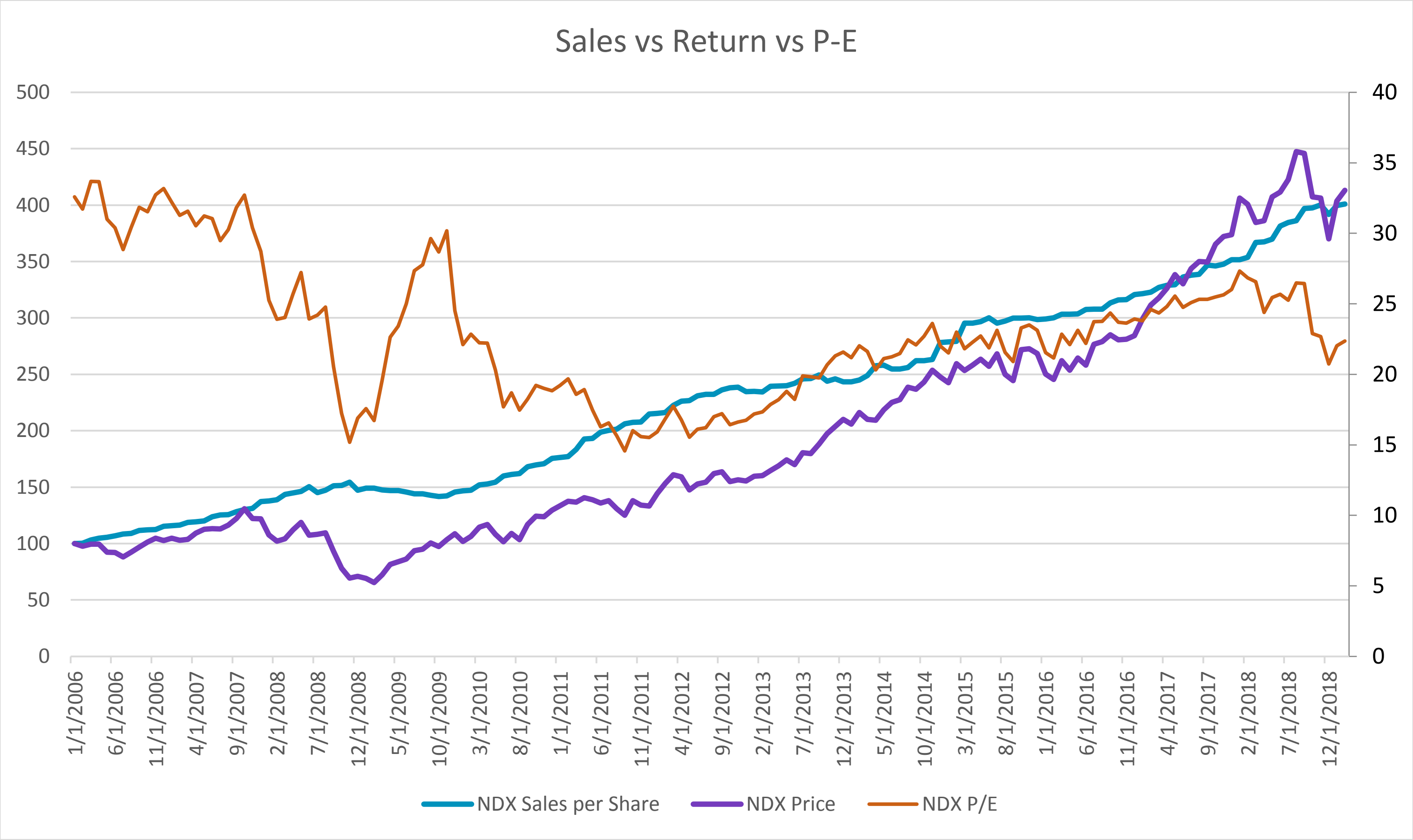
- The Nasdaq-100® (NDX) is comprised of the 100 largest, non-financial companies listed on The Nasdaq Stock Market®
- Launched on January 31, 1985
- Rebalanced to modified market cap index on December 21, 1998
- Special Rebalance effective May 2, 2011

Market Performance and Technology

- Recent market declines from historical highs have been seen in the past several years

- Fundamental story drives recovery rewarding the growth of the companies

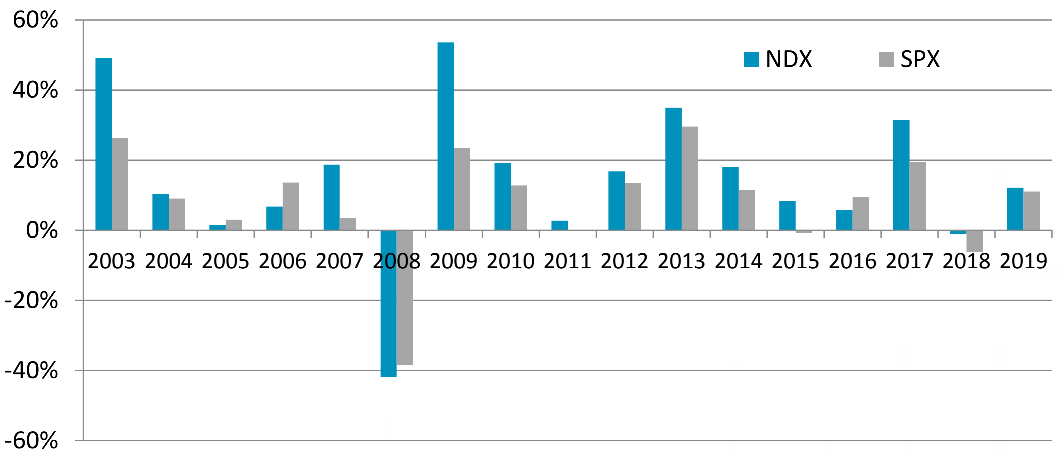
- Sales: +301%
  Price: +313%
  Valuation: -31%



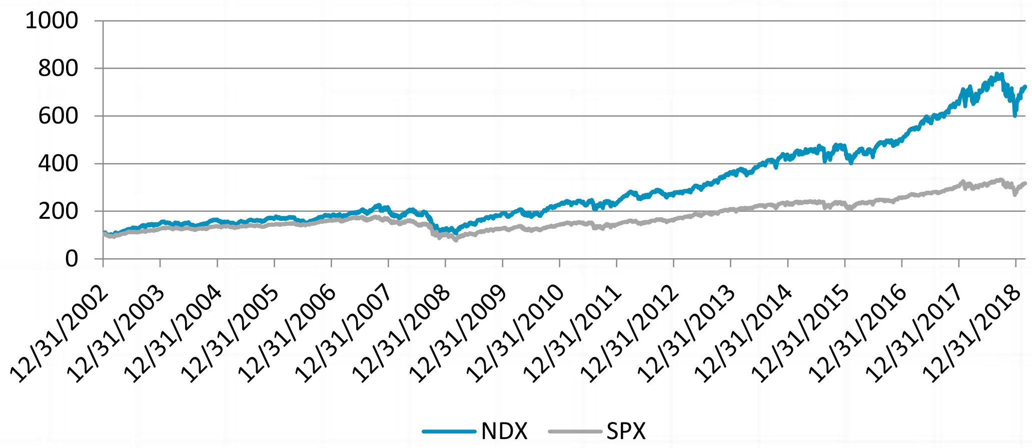
Source: Nasdaq, Bloomberg. Data as of 2/28/2019.

Nasdaq-100 Index: Performance

INDEX ANNUAL RETURNS – 2019 DATA AS OF END OF FEBRUARY



INDEX PERFORMANCE FROM 2003 TO FEBRUARY 28, 2019



- 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 2018 was 23.4—slightly higher than SPX's 19.8.

- There were substantial increases in market cap along with earnings in NDX from year-end 2012 to 2018 (from $3.1T to $7.2T in market cap and from $137B in earnings to $295.5B).

- NDX realized volatilities for 2014, 2015, 2016, 2017 and 2018 were 14.0%, 17.9%, 16.2%, 10.3% and 22.7% respectively.

- NDX yield increased most years between 2003 and 2018, and finished 2018 with a yield of 1.19%.

The NASDAQ-100 Index's price return performance versus the S&P 500 on both an annual basis (left) and cumulative basis (above)

Source: Nasdaq, Bloomberg. Data as of 2/28/2019.

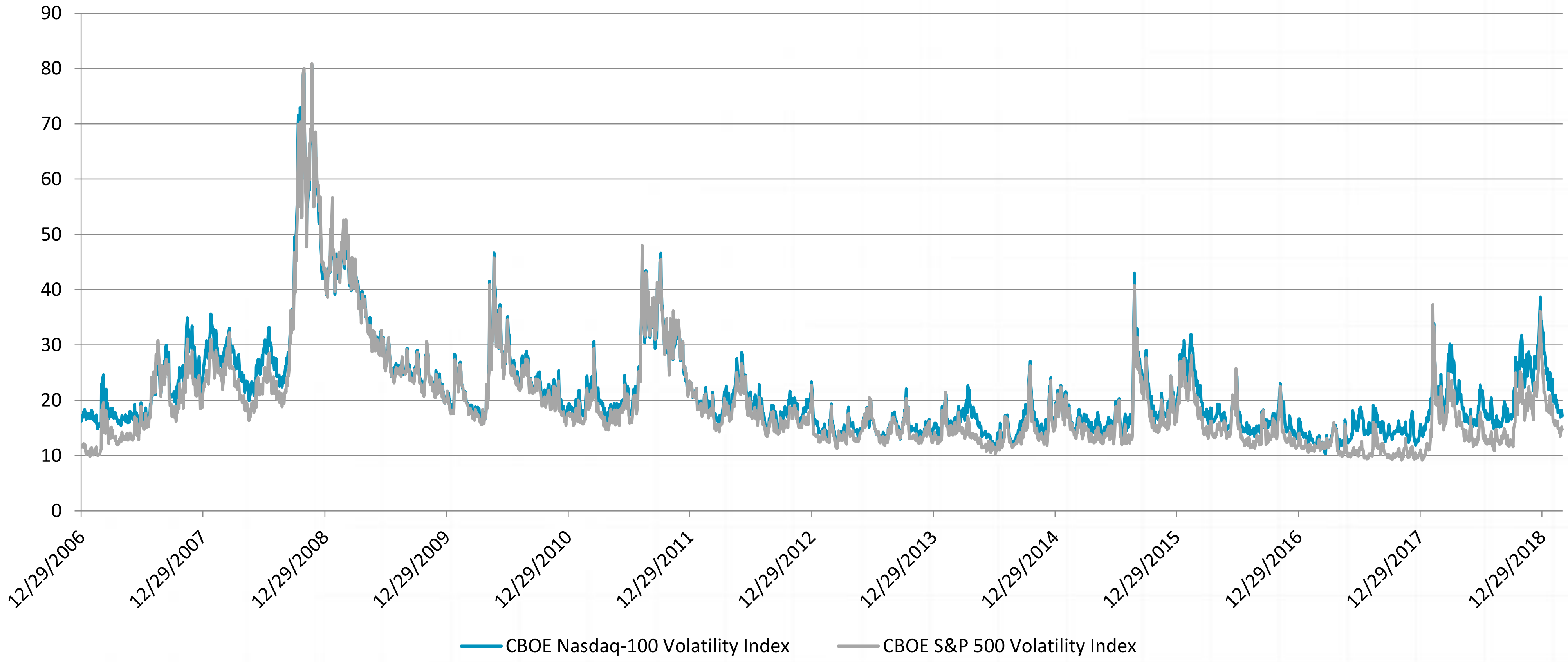
Performance Data (Total Return)

	Calendar Year Return		Correlation	Calendar Year Volatility	
Year	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	12.36%	11.48%	0.960	19.93%	14.35%

Source: Nasdaq, Bloomberg. Data as of 2/28/2019.

Historical Volatility

- Both NDX-100 and SPX 500 have very similar volatility over last 10+ years



Source: Nasdaq, Bloomberg. Data as of 2/28/2019.

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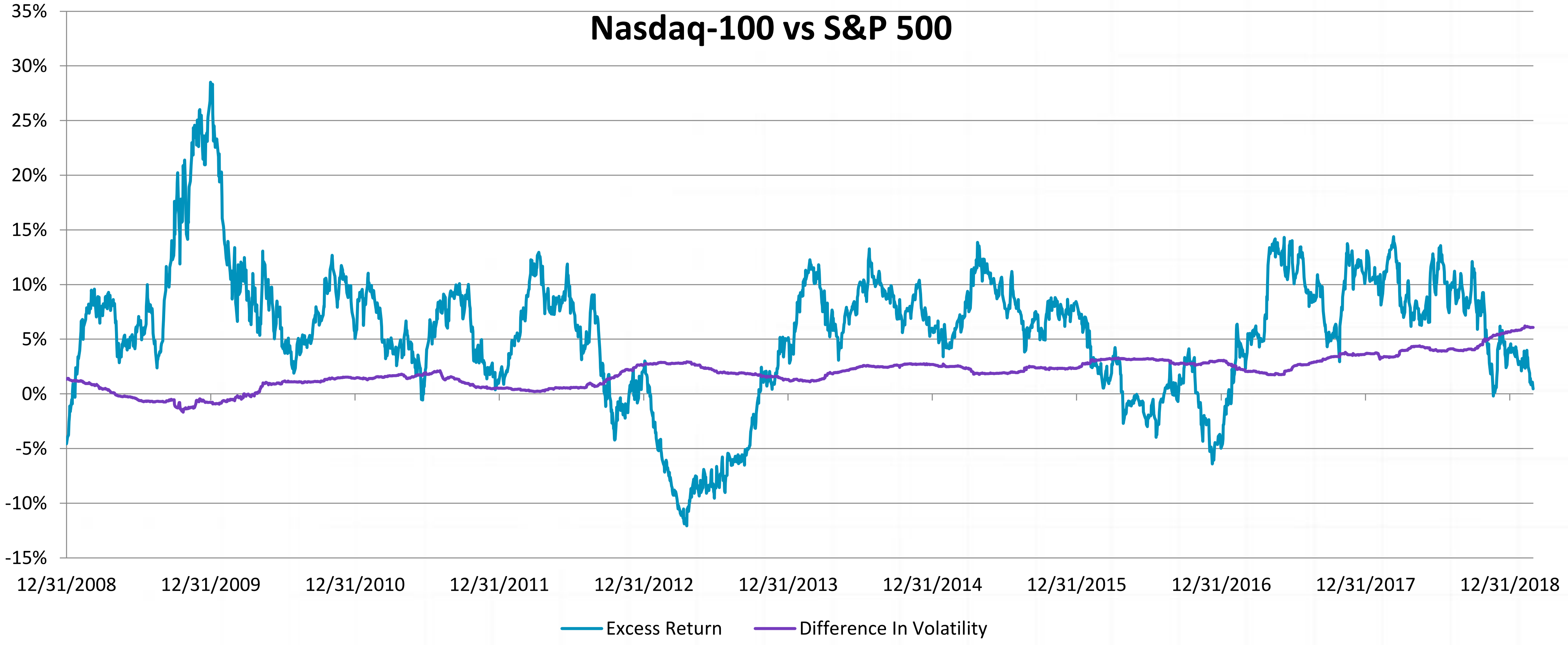
1-Year Excess Return vs. Volatility

From December 2008 through February 2019



Source: Nasdaq, Bloomberg. Data as of 2/28/2019.

The 100 That Make the Index

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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

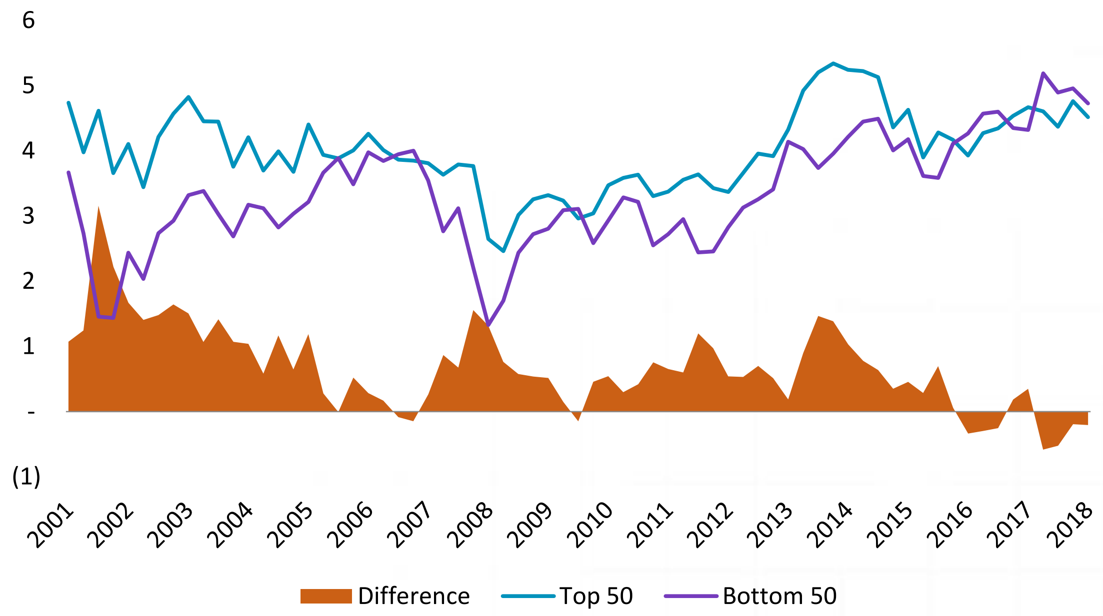
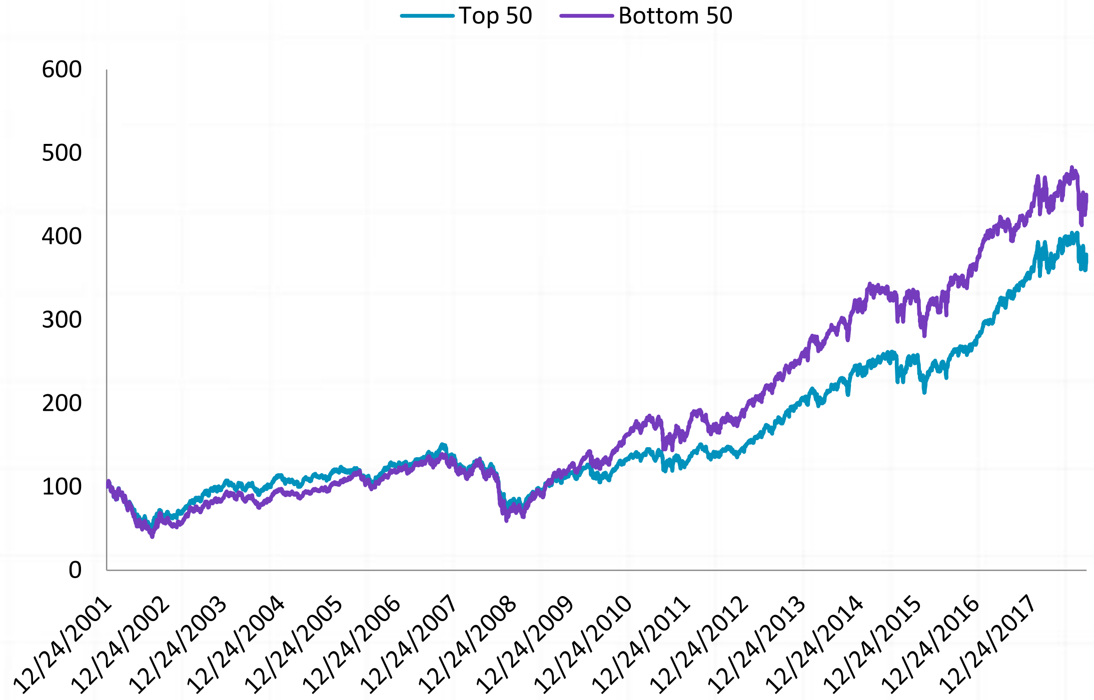


Figure 2: The Bottom 50 of Nasdaq-100 is outperforming



Source: Nasdaq, Bloomberg. Data as of 2/28/2019.

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, 2018

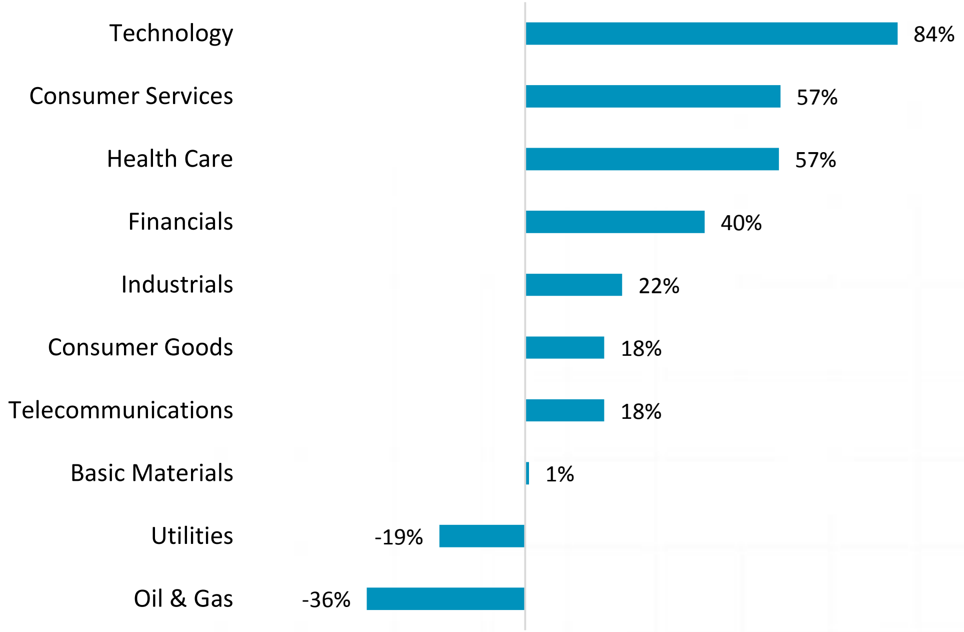
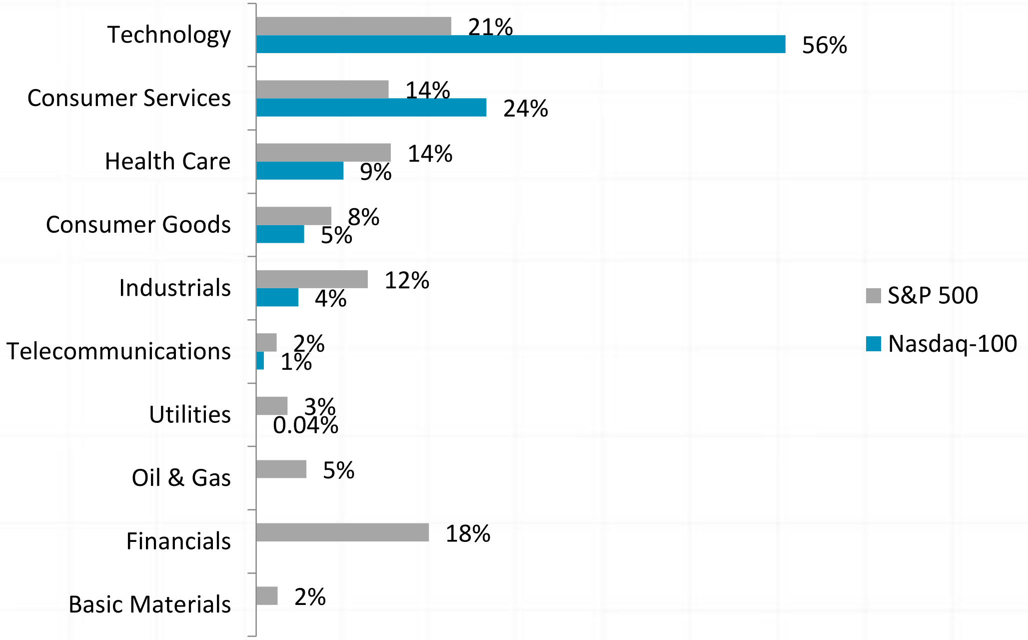


Figure 4: Industry Breakdown in Nasdaq-100 and S&P 500 as of December 31, 2018



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

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Nasdaq-100 Index: Components

Top Performers - 2018

Ticker	Name	2018 Return	12/31/2018 Weight
AMD	ADV MICRO DEVICES	80%	0.27%
WDAY	WORKDAY, INC.	57%	0.34%
LULU	LULULEMON ATHLETICA	55%	0.22%
ORLY	O'REILLY AUTOMOTIVE	43%	0.40%
FOX	21ST CENTRY FOX B CM	40%	0.55%
NFLX	NETFLIX, INC.	39%	1.68%
FOXA	21ST CENTRY FOX A CM	39%	0.73%
ILMN	ILLUMINA, INC.	37%	0.64%
ISRG	INTUITIVE SURG, INC.	31%	0.79%
VRSN	VERISIGN, INC.	30%	0.26%

Highest 2018 YOY Growth in Earnings

Ticker	Name	2018 Earnings Growth
VRTX	VERTEX PHARMACEUTIC	686%
AVGO	BROADCOM INC.	598%
ATVI	ACTIVISION BLIZZARD	559%
AMGN	AMGEN	307%
AMZN	AMAZON.COM INC	234%
SNPS	SYNOPSYS, INC.	222%
MU	MICRON TECHNOLOGY	153%
GOOGL	ALPHABET CL A CMN	143%
INTC	INTEL CORP	120%
NFLX	NETFLIX, INC.	116%

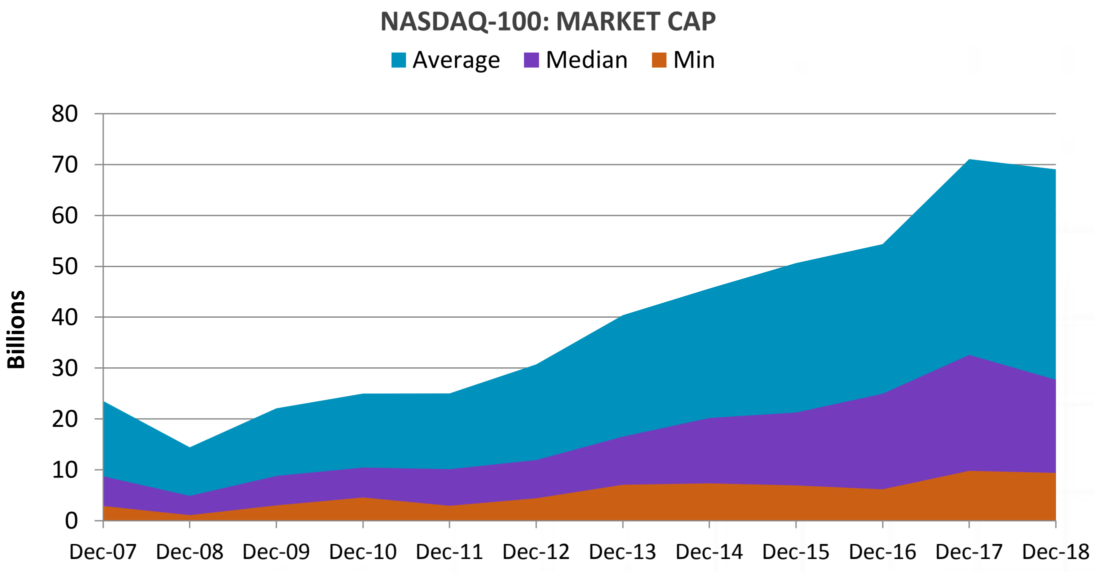
Additional select, high performing components not in the top 10 include: Baidu, Adobe and Nvidia

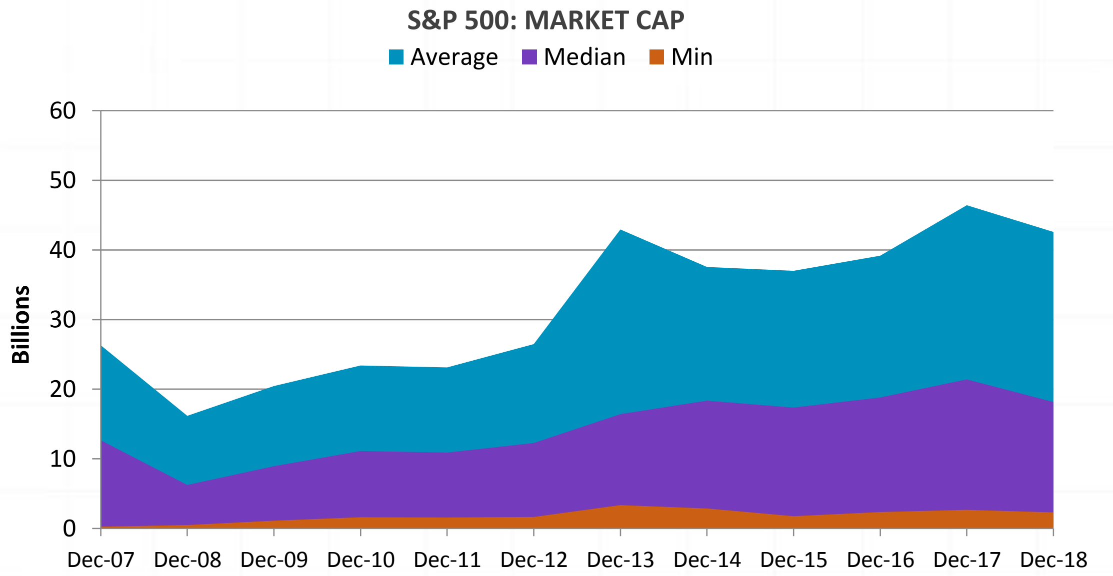
Source: Nasdaq, Bloomberg. Data as of 12/31/2018.

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 rebounded until 2017, followed by a slight dip in 2018 due to the October and December market downturns.
- Nine of the last ten years the average market cap has been higher in NDX than SPX including 2018 – as of October 31 (NDX: $69.07, SPX: $42.59B).
- The median market cap has been higher for NDX than SPX in each of the last five years — in 2018 the medians were $27.69B for NDX and $18.16B 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 (2018: $9.4B) has been larger than the smallest company in SPX (2018: $2.3B) for the last ten years.





Source: Nasdaq, Bloomberg. Data as of 12/31/2018.

Nasdaq-100 by the Sectors

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Nasdaq-100 Index: Sectors

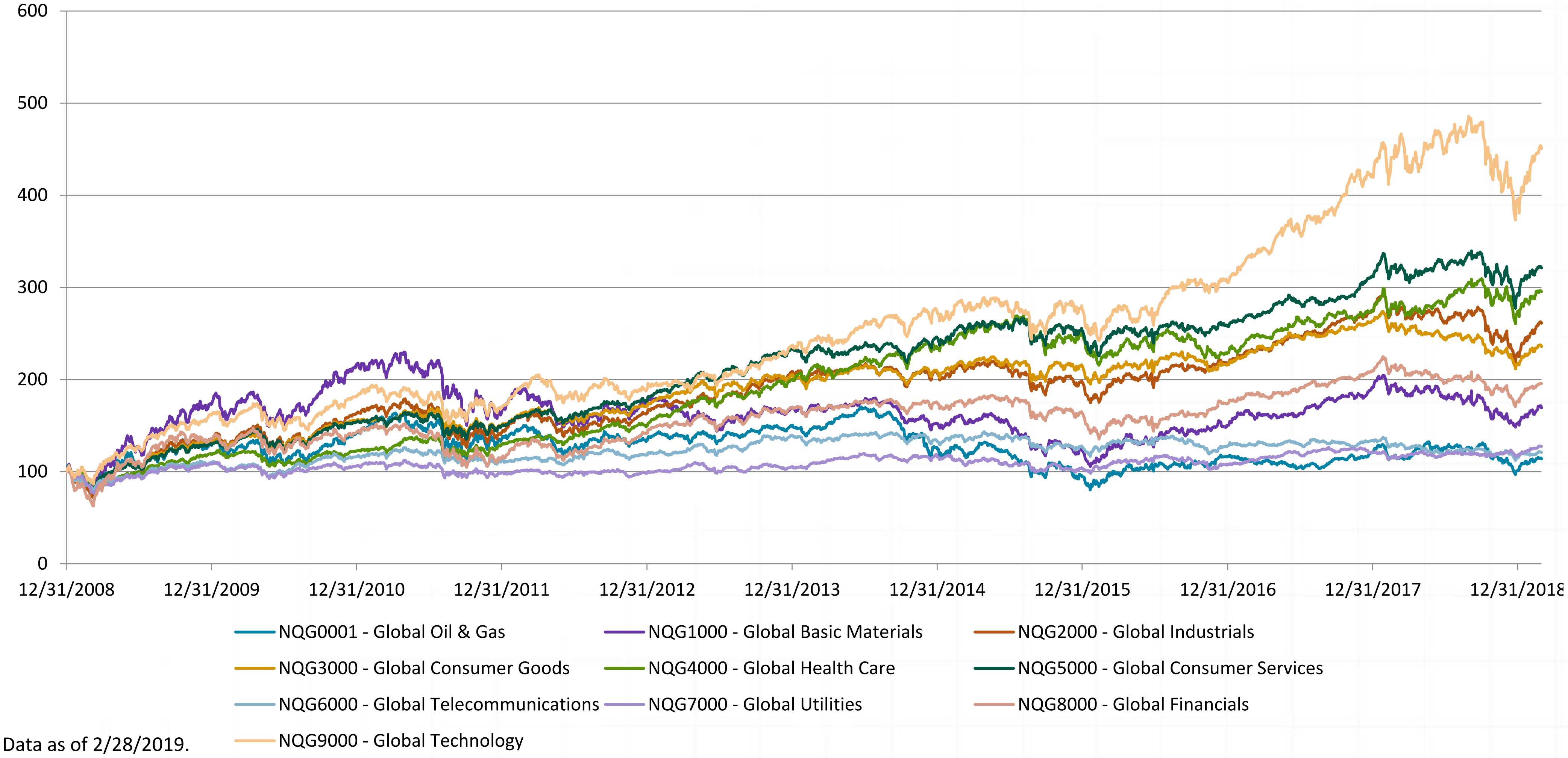
Sector Breakdown

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

Industry	Weight (12/31/2018)	Contributed Return (Full Year 2018)	Pure Return (Full Year 2018)	Benchmark return (Full Year 2018)
Technology	55.96%	-0.68%	-1.95%	-1.74%
Consumer Services	24.36%	1.48%	7.27%	0.13%
Health Care	9.24%	-0.15%	-1.29%	4.46%
Consumer Goods	5.09%	-0.91%	-13.64%	-15.64%
Industrials	4.48%	0.37%	8.29%	-12.71%
Telecommunications	0.82%	-0.08%	-6.93%	-11.36%
Utilities	0.04%	-0.01%	-2.77%	1.48%
Basic Materials	0.00%	0.00%	0.00%	-20.09%
Oil & Gas	0.00%	0.00%	0.00%	-21.59%
Financials	0.00%	0.00%	0.00%	-11.52%

Source: Nasdaq, Bloomberg. Data as of 12/31/2018.

Sector Exposure Matters



Source: Nasdaq. Data as of 2/28/2019.

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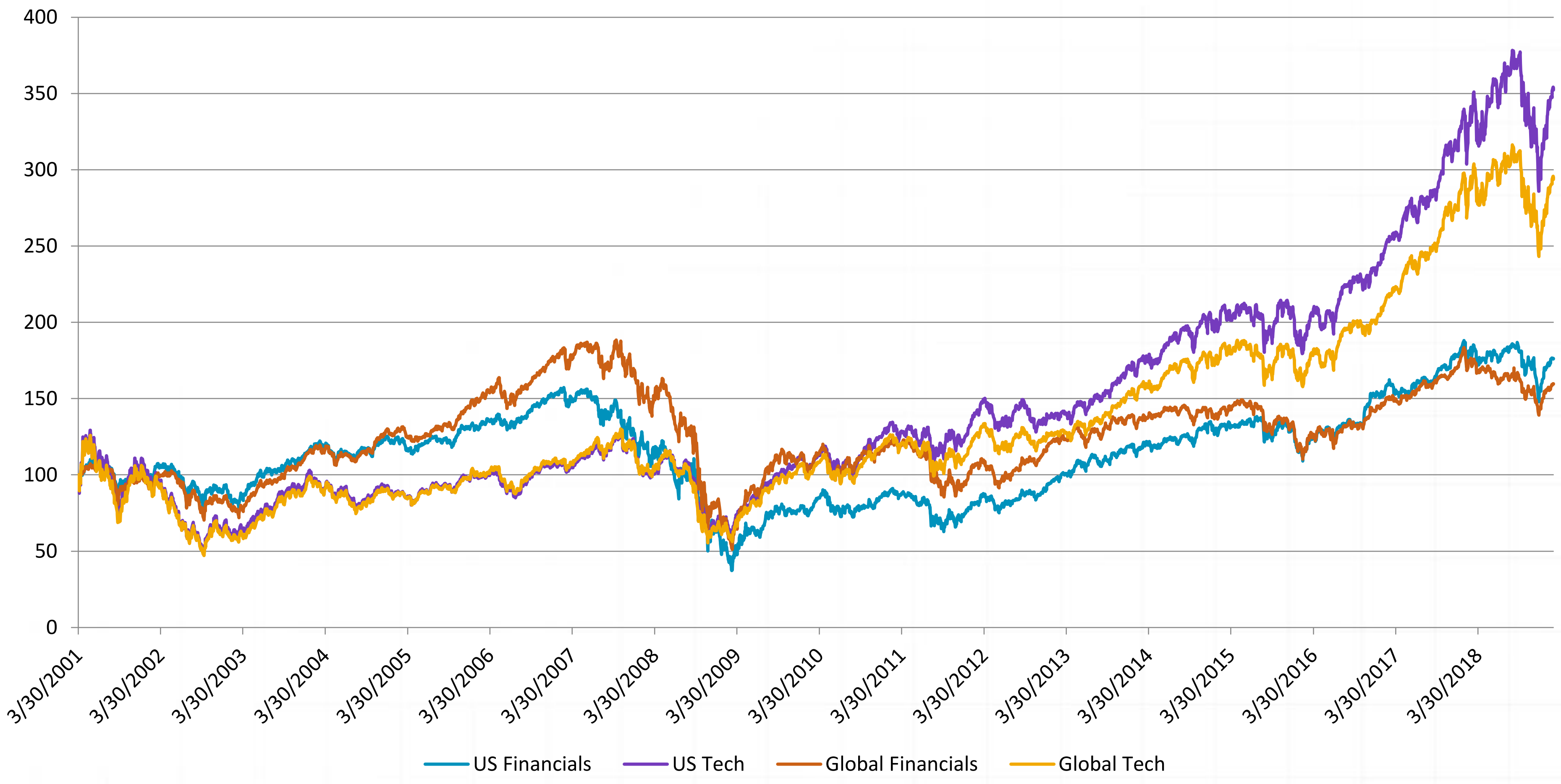
Technology or Financials



Source: Nasdaq. Data as of 2/28/2019.

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

Cumulative Dividend Growth Since 2008		
	INDUSTRY	RETURN
1	Technology	242.14%
2	Health Care	54.31%
3	Telecommunications	33.72%
4	Financials	32.29%
5	Oil & Gas	27.81%
6	Utilities	25.54%
7	Industrials	19.60%
8	Consumer Services	8.42%
9	Basic Materials	-7.13%
10	Consumer Goods	-62.10%

Source: Nasdaq. Data as of 12/31/2018.

The Fundamentals

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Nasdaq-100 Index: Fundamental Data

- 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.

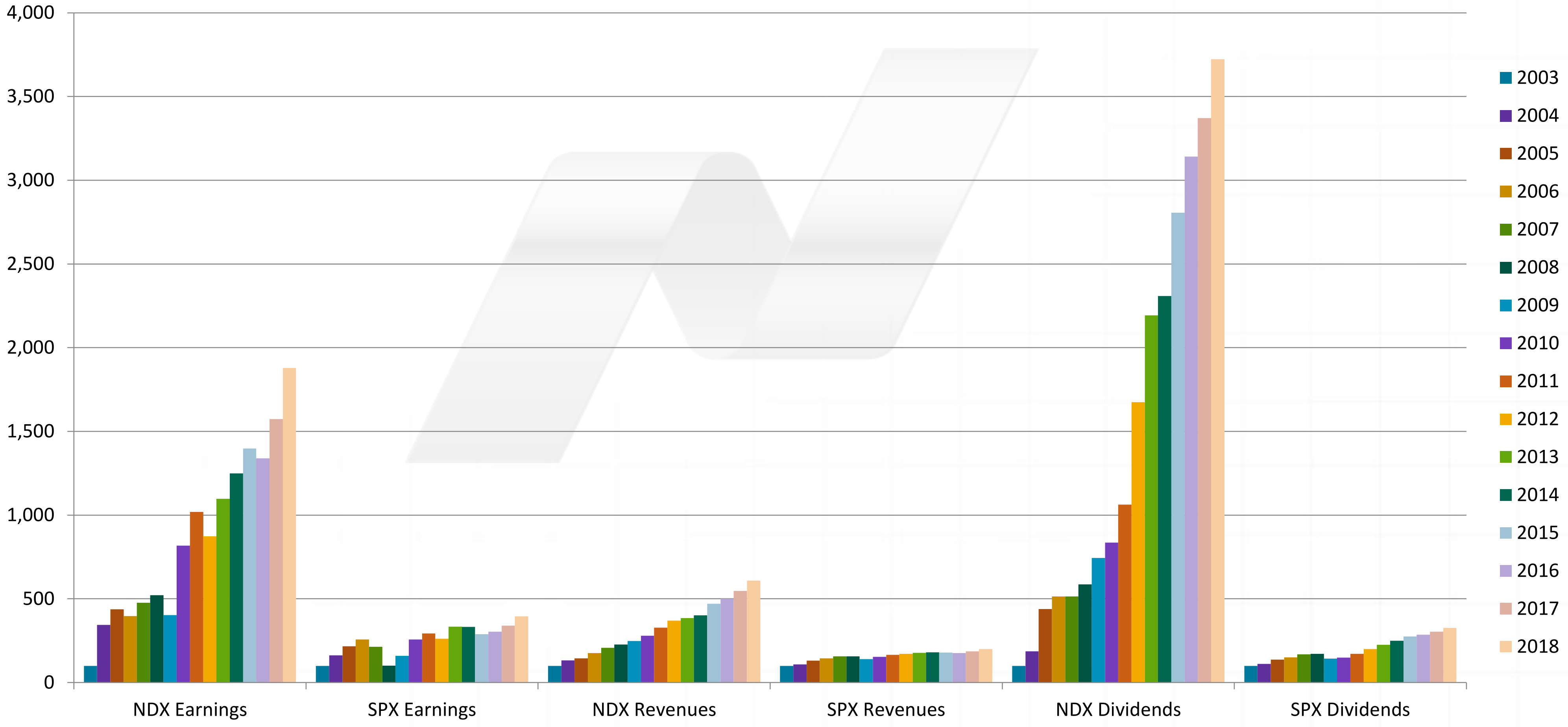
- Since 2003, NDX has had a Compound Annual Growth Rate (CAGR) of:
  - + 20% in earnings
  - + 12% in revenue
  - + 25% in dividend value
  - - 11% in P/E

- The shift in fundamentals of the NASDAQ-100 has resulted in significant outperformance over other US large cap indexes.

Source: Nasdaq, Bloomberg. Data as of 12/31/2018.

Nasdaq-100 Index: Fundamentals over time

NDX VS SPX FUNDAMENTALS



Source: Nasdaq, Bloomberg. Data as of 12/31/2018.

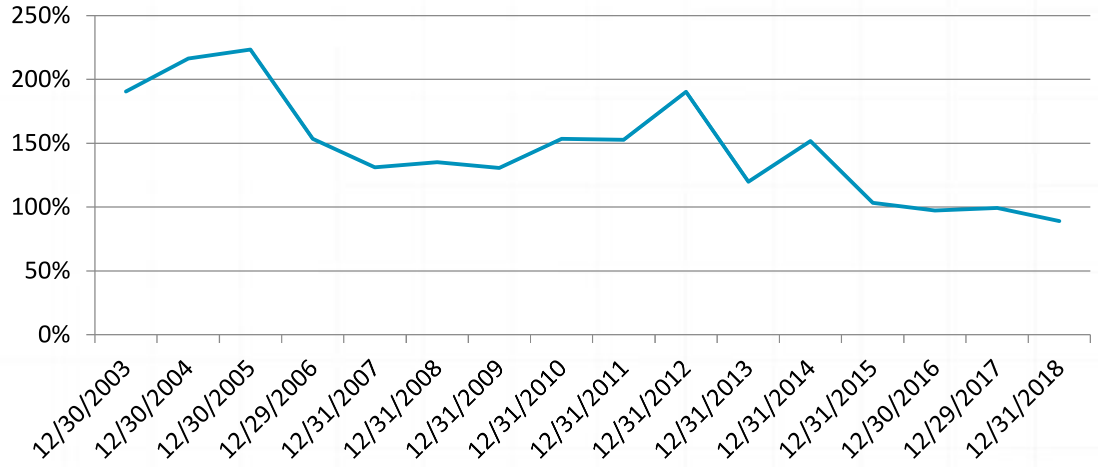
Nasdaq-100 Index: Dividends

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%

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

Source: Nasdaq, Bloomberg. Data as of 12/31/2018.

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 exploded in the Nasdaq-100 in the last 15 years.
- In 2018, the earnings of the Nasdaq-100 ended at $295.5B while the S&P 500 ended up at $1,088.4B.
- 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 295% over that time, but the Nasdaq-100 growth in earnings was a staggering 1,779%, 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

Source: Nasdaq, Bloomberg. Data as of 12/31/2018.

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 were $2.44T in 2018, a 509% increase from 2003. With S&P 500's figures ending at $11.88T, it experienced a 100% increase over that same span.

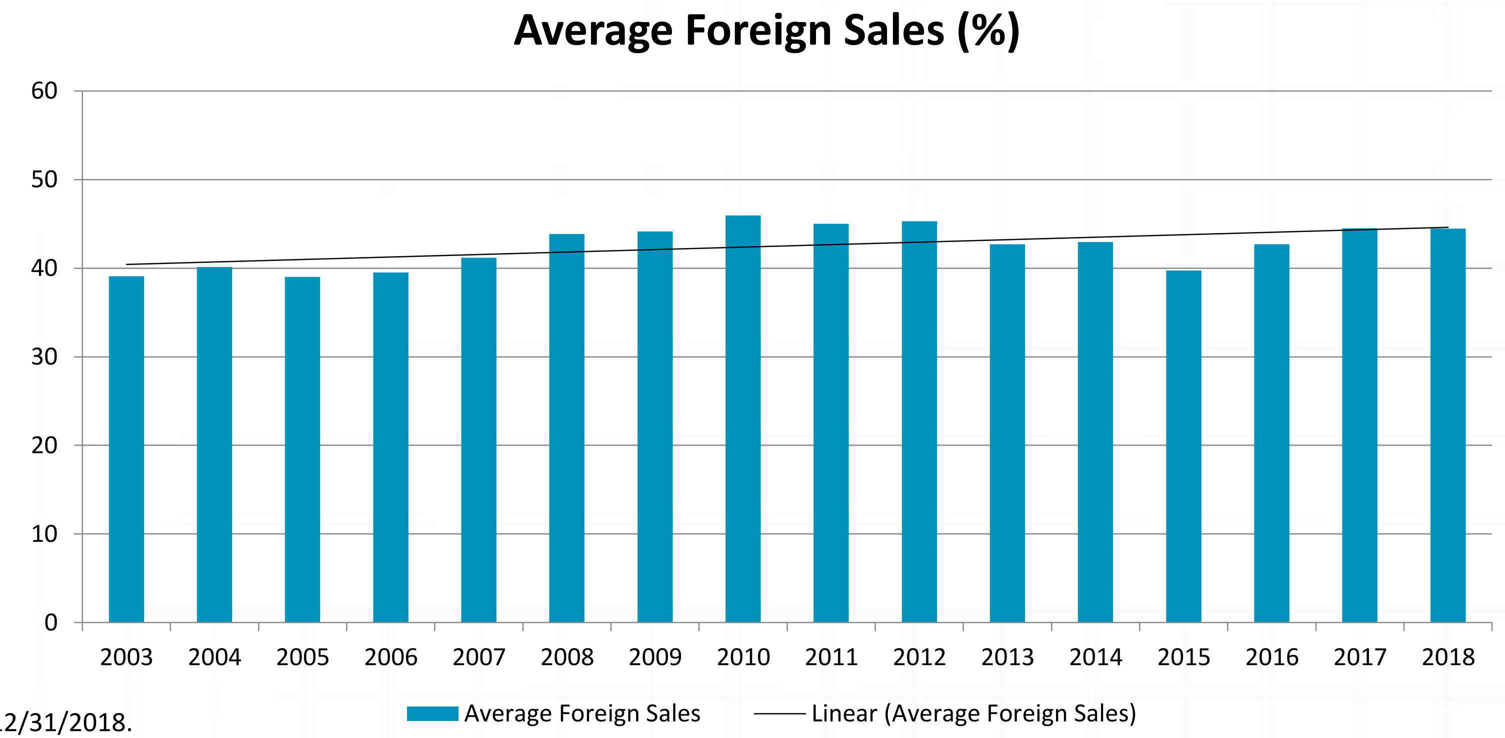
REVENUES (Billions USD)

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

Source: Nasdaq, Bloomberg. Data as of 12/31/2018.

A Truly Global Exposure

- The average foreign sales of companies in the Nasdaq-100 show an upward sloping trend line that started at 39% in 2003 and ended at 45% in 2018.



Source: Nasdaq, Bloomberg. Data as of 12/31/2018.

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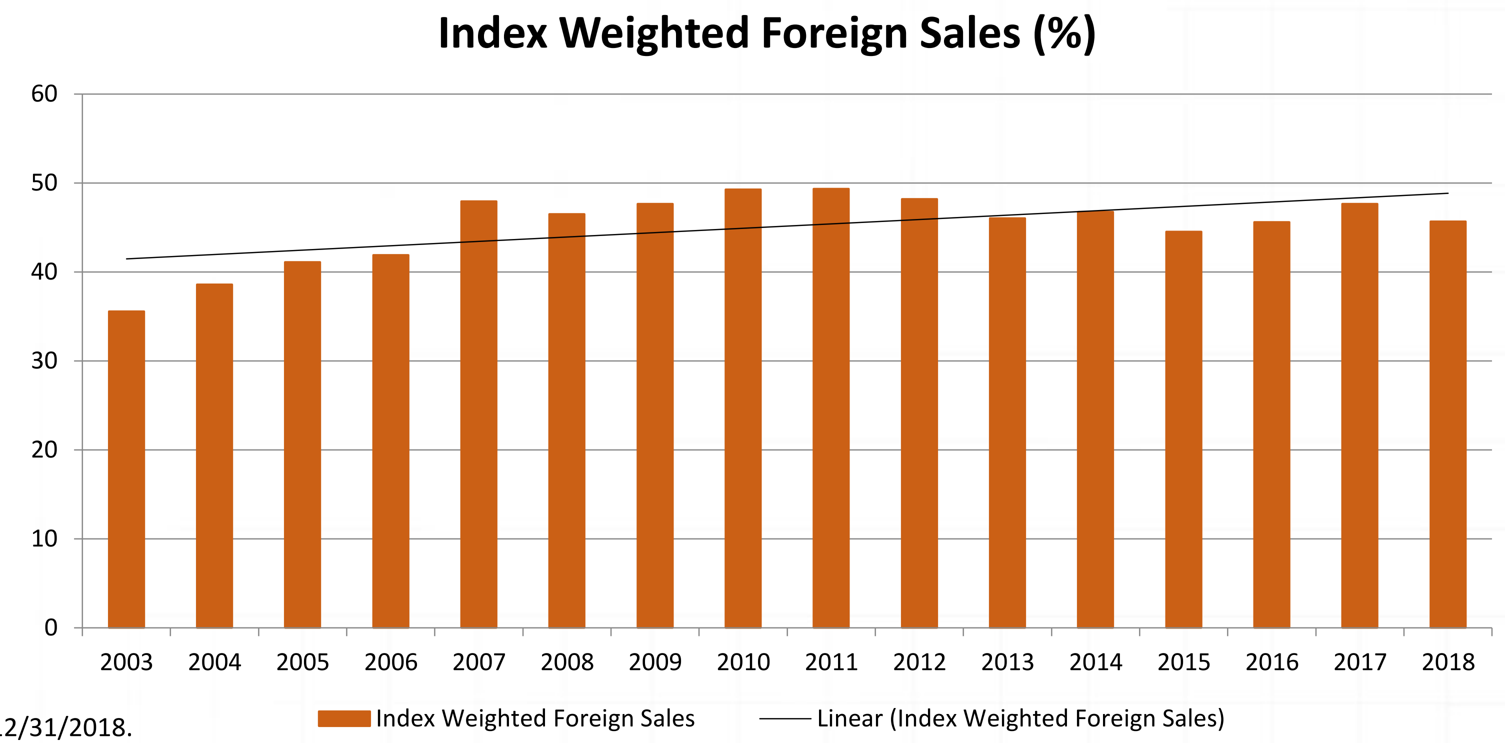
A Truly Global Exposure

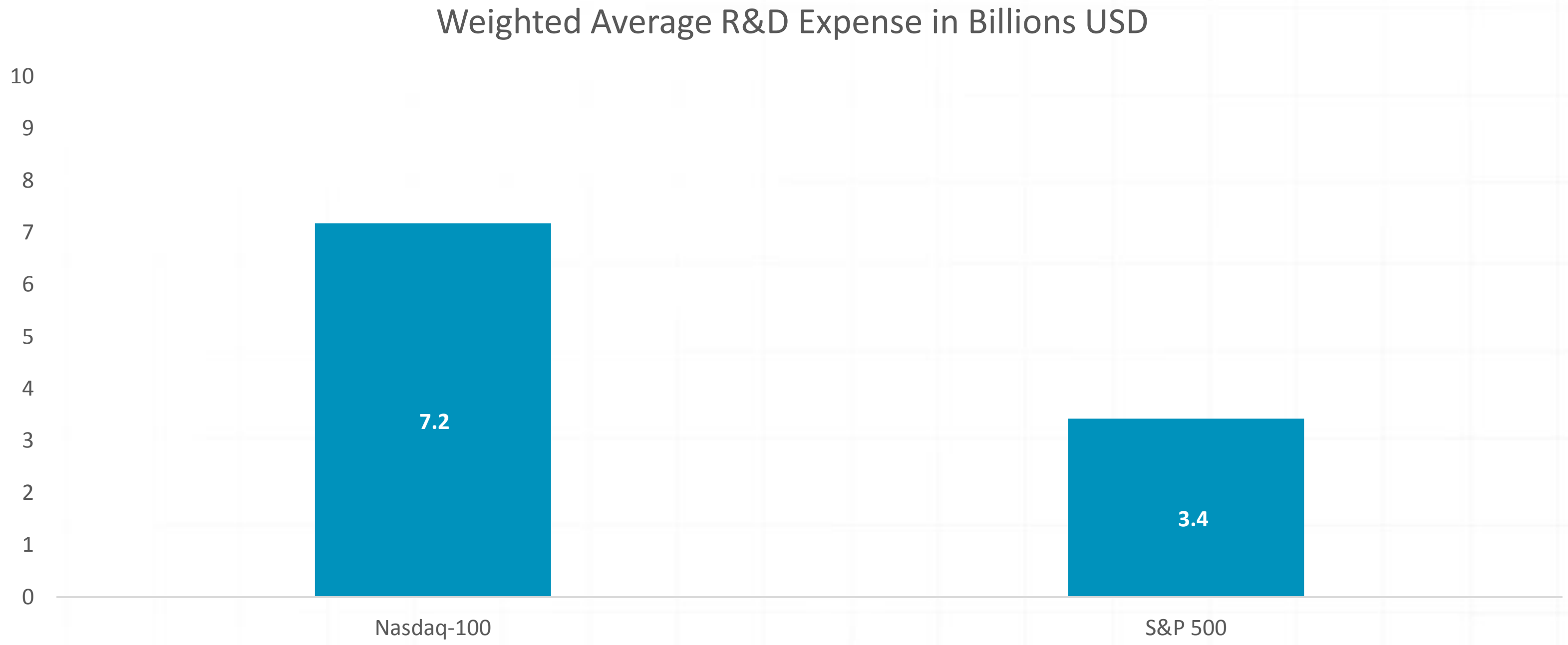
- From an Index weighted perspective, the percentage of foreign sales has been slightly higher on average, increasing from 36% in 2003 to 46% in 2018.



Source: Nasdaq, Bloomberg. Data as of 12/31/2018.

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 2018



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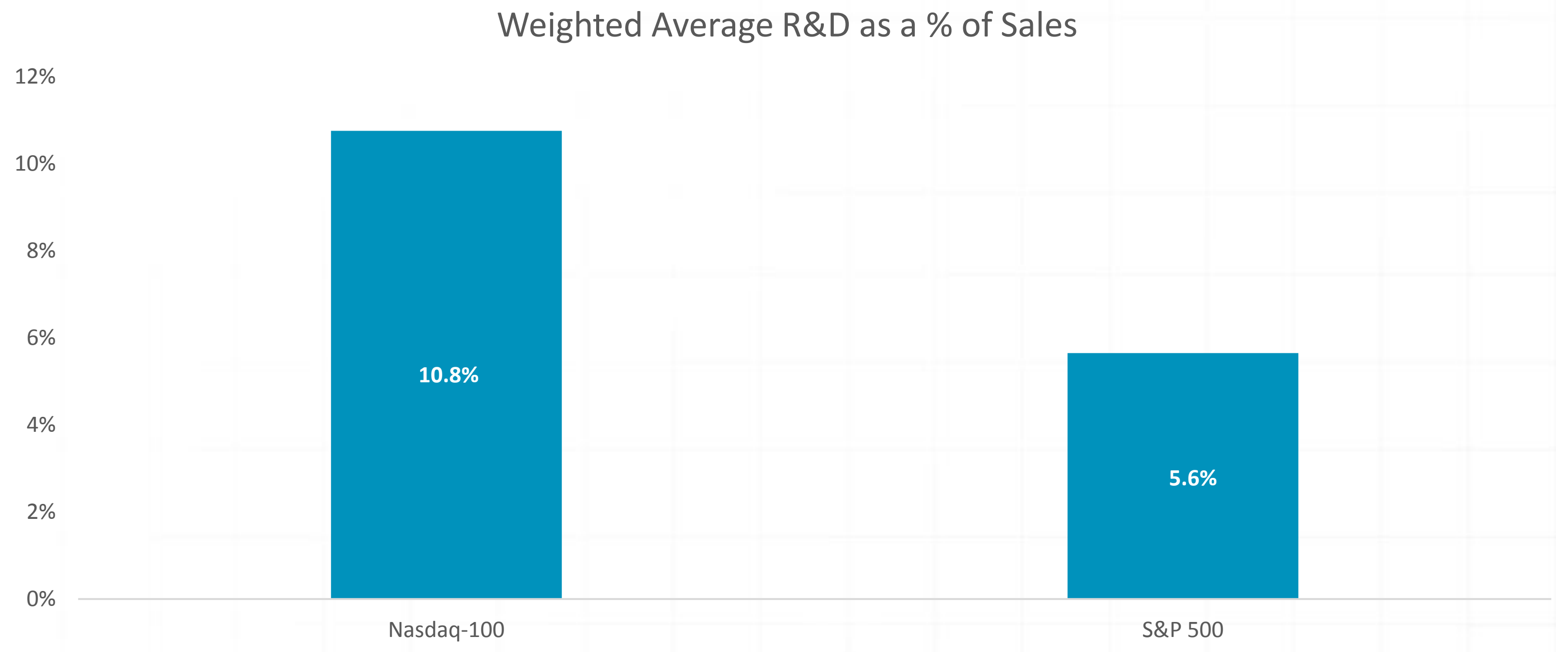
Source: Nasdaq, Bloomberg. Data as of 12/31/2018.

R&D to Sales

- Calculating R&D as a percent of sales in 2018, the Nasdaq-100 nearly doubled the percentage of the S&P 500



Source: Nasdaq, Bloomberg. Data as of 12/31/2018.

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