

How Do You Invest in Innovation?

*Nasdaq-100 Index
2020 Year-End Update*

 **Nasdaq** | REWRITE TOMORROW

Nasdaq-100[®] Index

The Benchmark of the 21st
Century Industrials



Nasdaq-100 Index: Overview

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

- GE, Chicago Gas Company, American Sugar Company, and the other original Dow Industrials accelerated the growth of the US economy at the turn of the 20th century, and helped spur its transformation from agricultural to industrial.
- By mid-century, GE was still one of the nation's 10 largest companies by market cap, joined by the automakers (GM/Ford/Chrysler), Big Oil (Exxon Mobil, Texaco, Gulf Oil), and other large, diversified industrial companies like DuPont.
- At the turn of the 21st century, the Internet/Tech Bubble heralded the transformation of the economy from industrial to technological; from analog to digital; from hardware to software.
- Today, Apple, Amazon, Google, Facebook and Microsoft have become global leaders in the technology sector by creating products and services that are essential to both individual consumers and enterprise customers. From software, computing, and communications, to entertainment, advertising, and e-commerce, their platforms represent the new “diversified industrials” of the 21st century.
- Beyond the biggest names, companies like Intel and Netflix specialize in narrower applications of technology, while the rest of the Nasdaq-100 encompasses innovation-driven companies in other sectors, like Starbucks.

The Microsoft logo, consisting of four colored squares (red, green, blue, yellow) followed by the word "Microsoft" in a sans-serif font.The Netflix logo, featuring the word "NETFLIX" in white capital letters on a red rectangular background.The Intel logo, featuring the word "intel" in a blue, lowercase, sans-serif font with a blue swoosh above it.The Facebook logo, featuring the word "facebook" in white lowercase letters on a blue rectangular background.The Amazon.com logo, featuring the word "amazon.com" in a black, lowercase, sans-serif font with a yellow smile arrow below the "a".The Google logo, featuring the word "Google" in its multi-colored, sans-serif font.

The Nasdaq-100: History

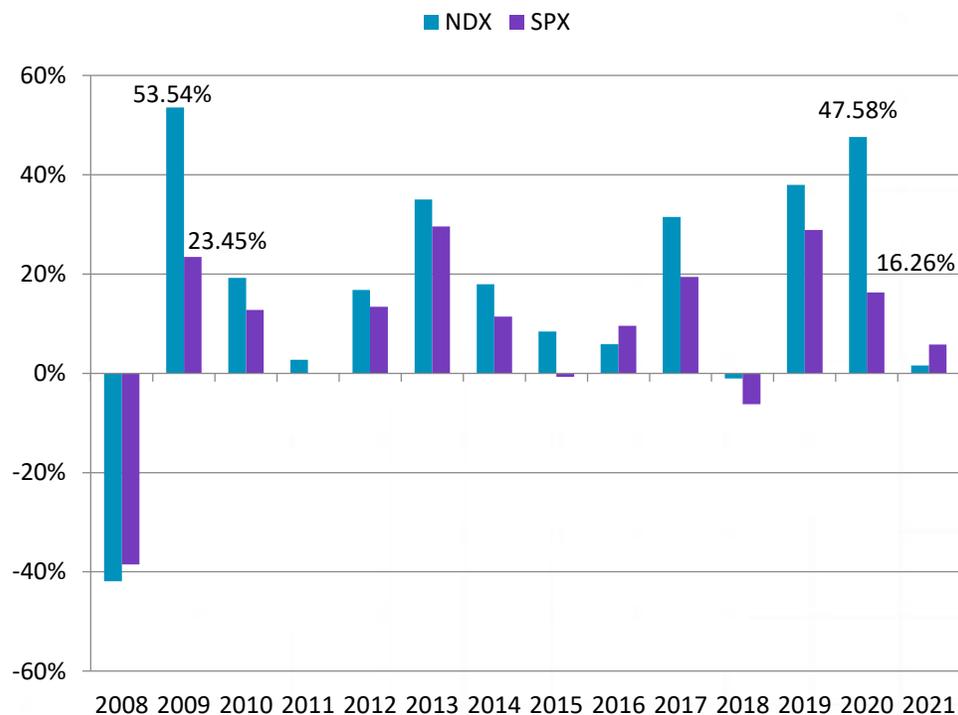
- The Nasdaq-100 Index (NDX) is comprised of the 100 largest, non-financial companies listed on The Nasdaq Stock Market®
- Launched on January 31, 1985
- Rebalanced to modified market cap index on December 21, 1998
- Special Rebalance effective May 2, 2011



Nasdaq-100 Index: Performance vs. S&P 500

INDEX ANNUAL PRICE RETURNS – 2021 DATA AS OF MARCH 31

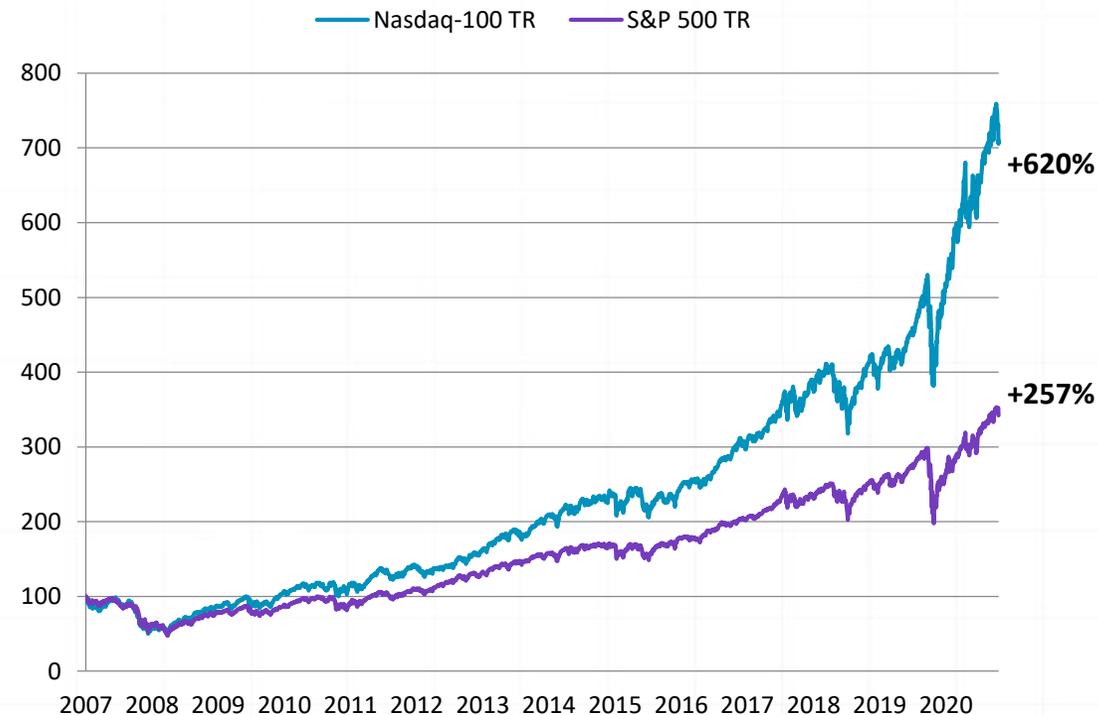
Annual Price Return Performance



- NDX has outperformed SPX in 11 of the past 12 years, including by more than 30% in 2020

INDEX PERFORMANCE FROM 2007 TO MARCH 31, 2021

Cumulative Total Return Performance



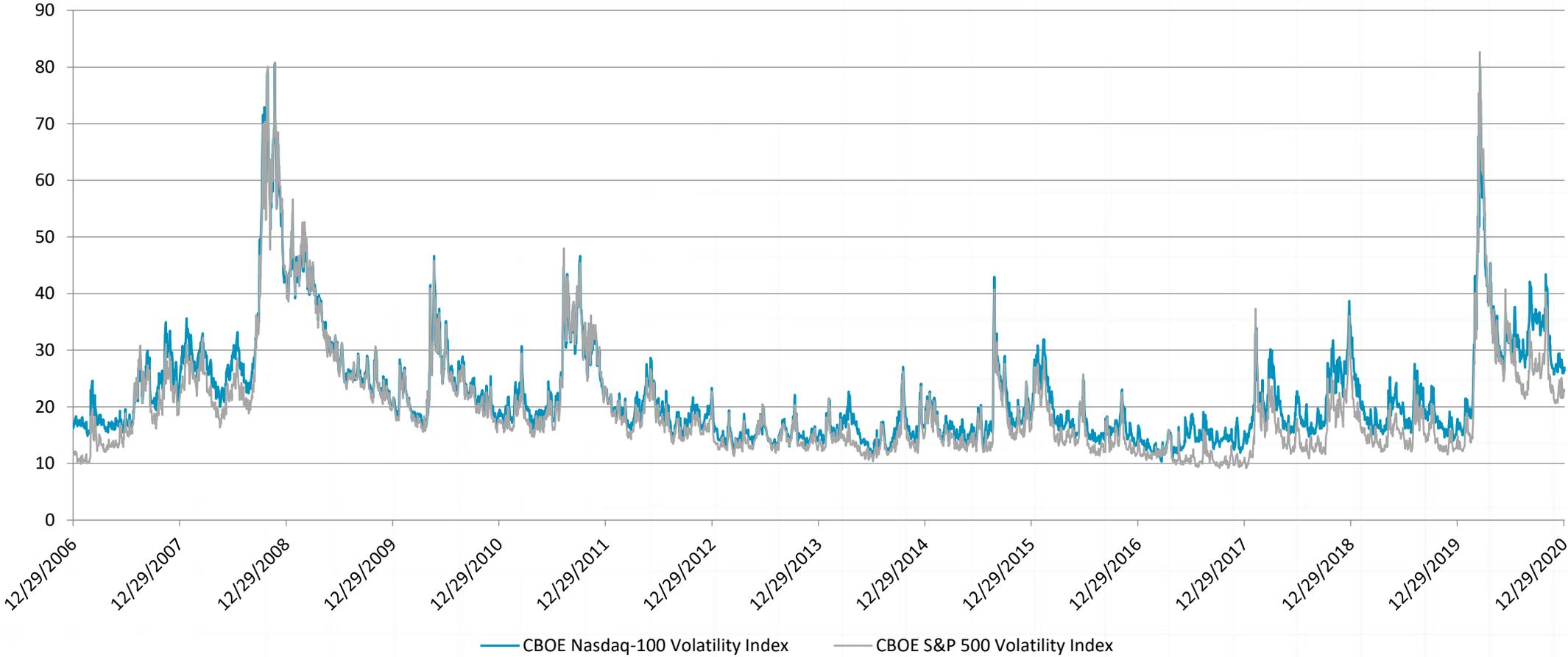
- Cumulative total returns through March 31, 2021 were 620% for NDX – approximately 2.5 times the returns of 257% for SPX.

Performance Data (Total Return)

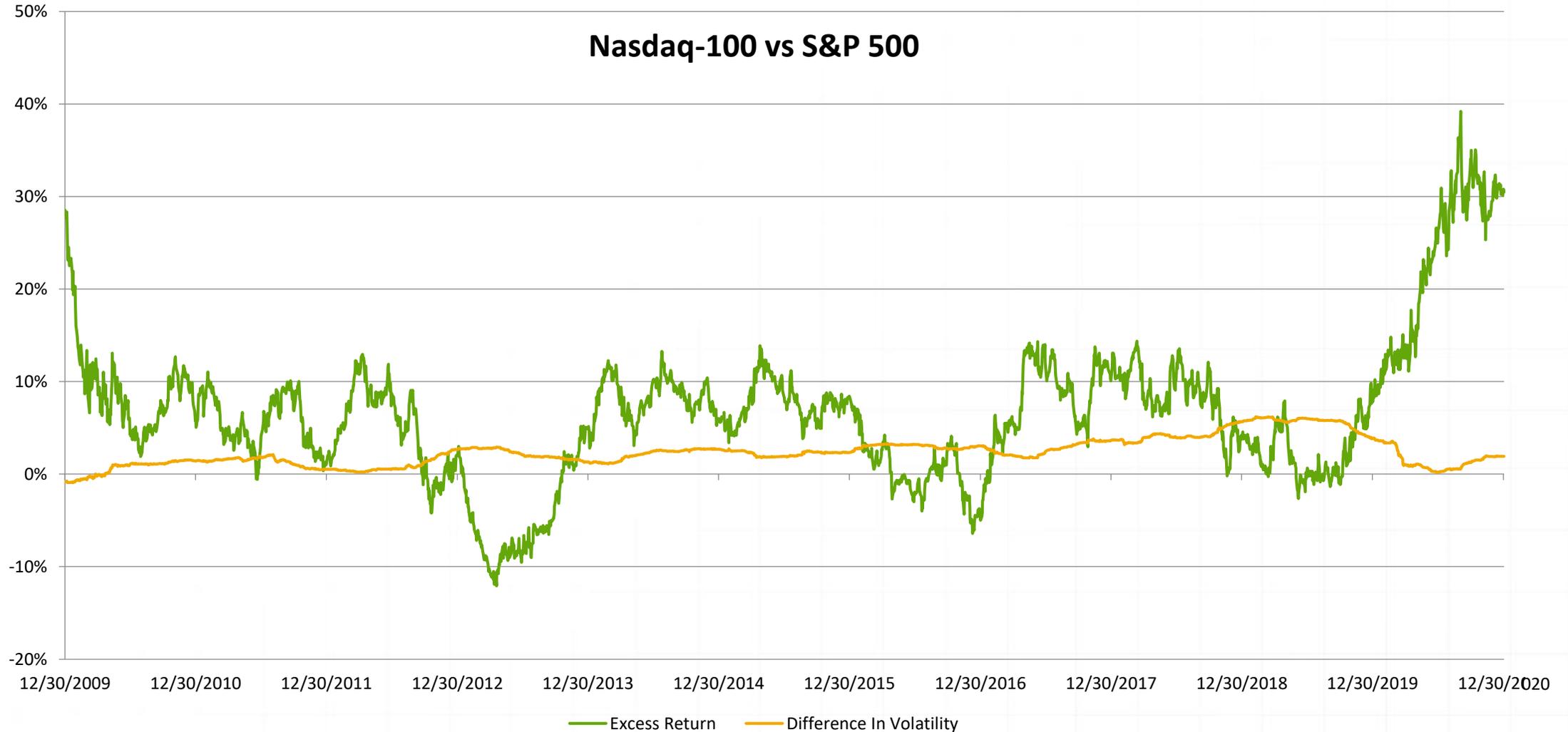
Year	Calendar Year Return		Correlation	Calendar Year Volatility	
	Nasdaq-100	S&P 500	NDX + SPX	Nasdaq-100	S&P 500
2007	19.24%	5.49%	0.890	18.68%	15.99%
2008	-41.57%	-37.00%	0.945	42.22%	40.89%
2009	54.61%	26.46%	0.935	26.47%	27.25%
2010	20.14%	15.06%	0.949	19.48%	18.06%
2011	3.66%	2.11%	0.948	23.75%	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%
2020	48.88%	18.40%	0.937	36.29%	34.37%

Historical Volatility

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



1-Year Excess Return vs. Volatility

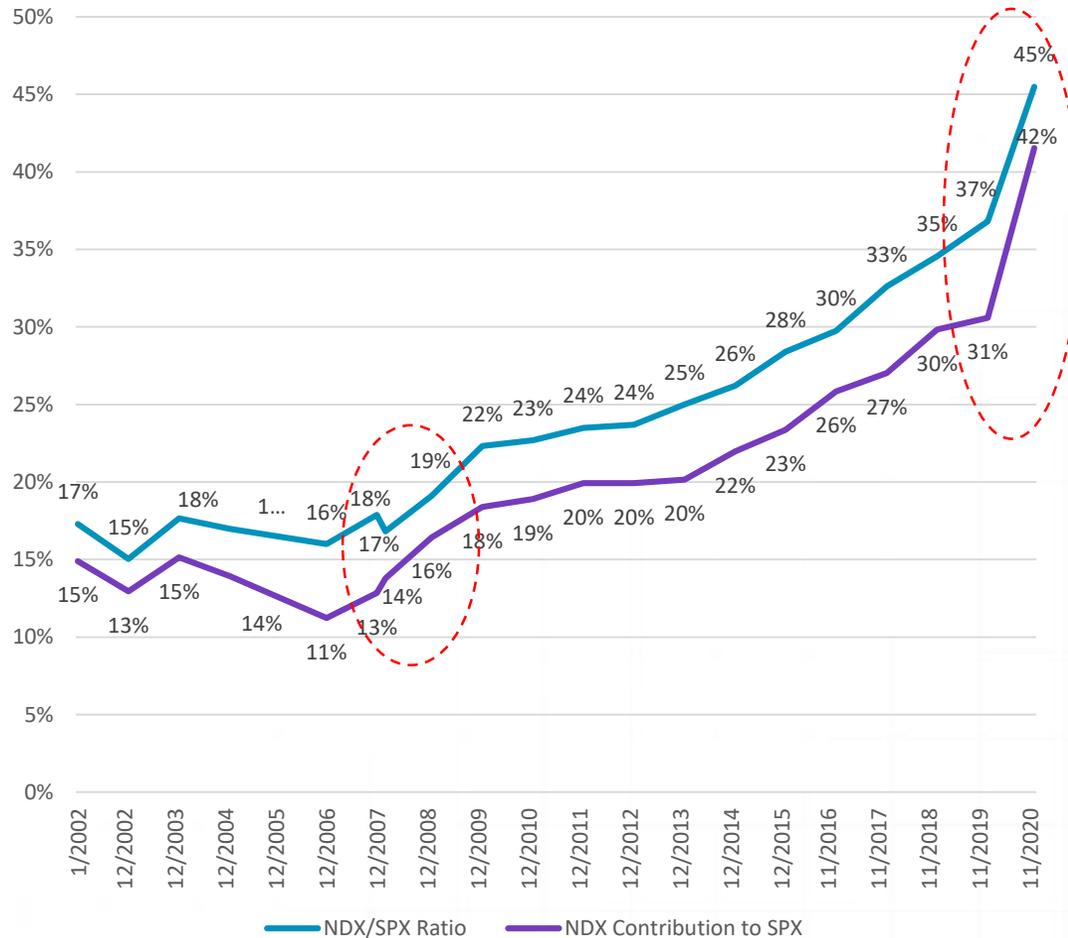


Coveted Placement

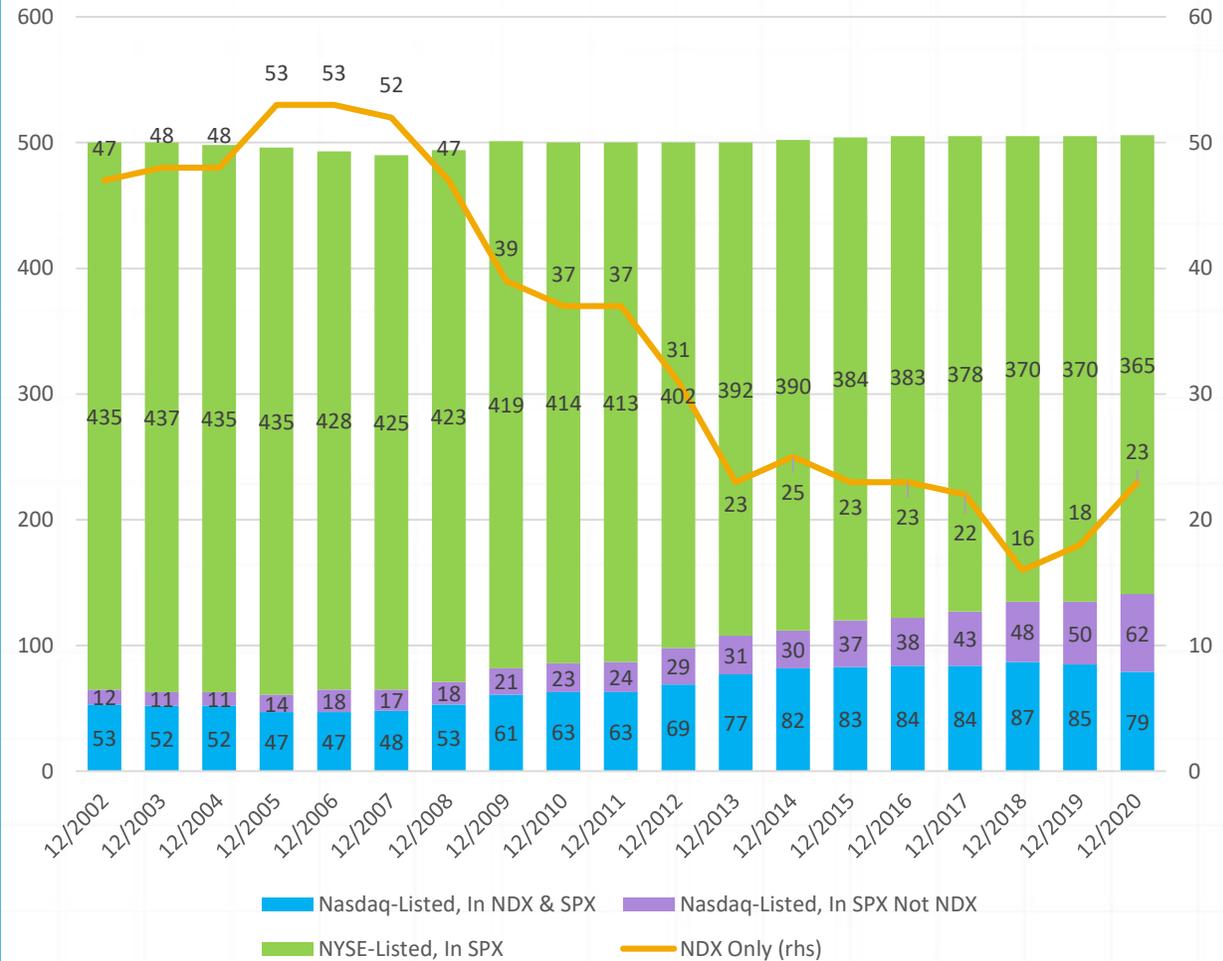
The 100 that Make the Index

Nasdaq-100 vs. S&P 500: Composition Over Time

NDX vs. SPX Market Capitalization



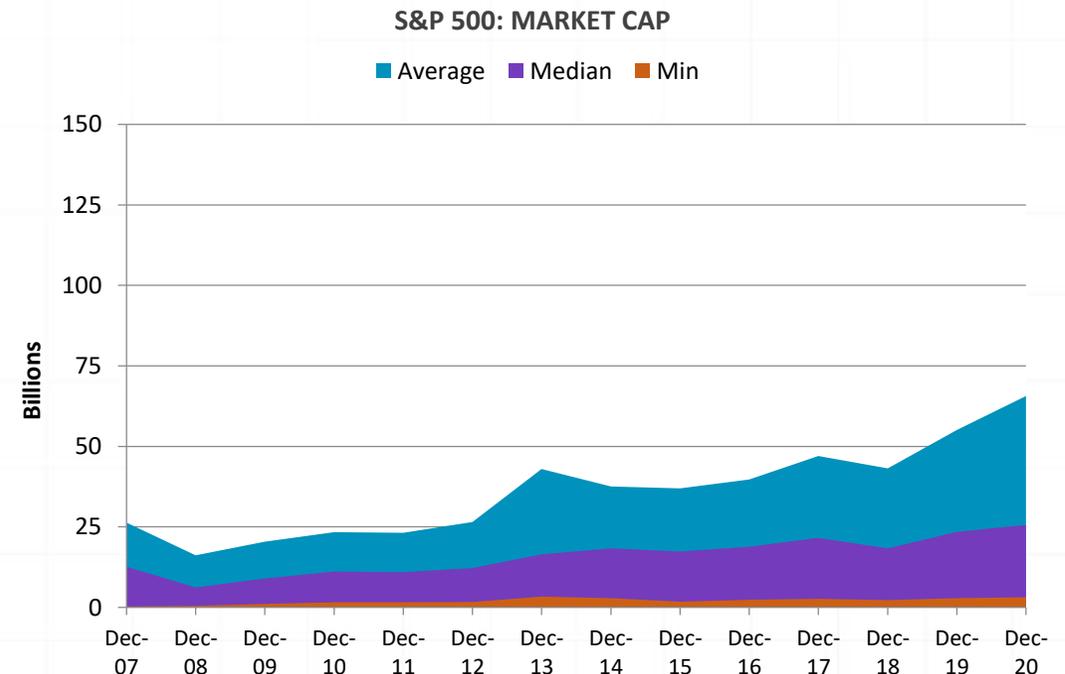
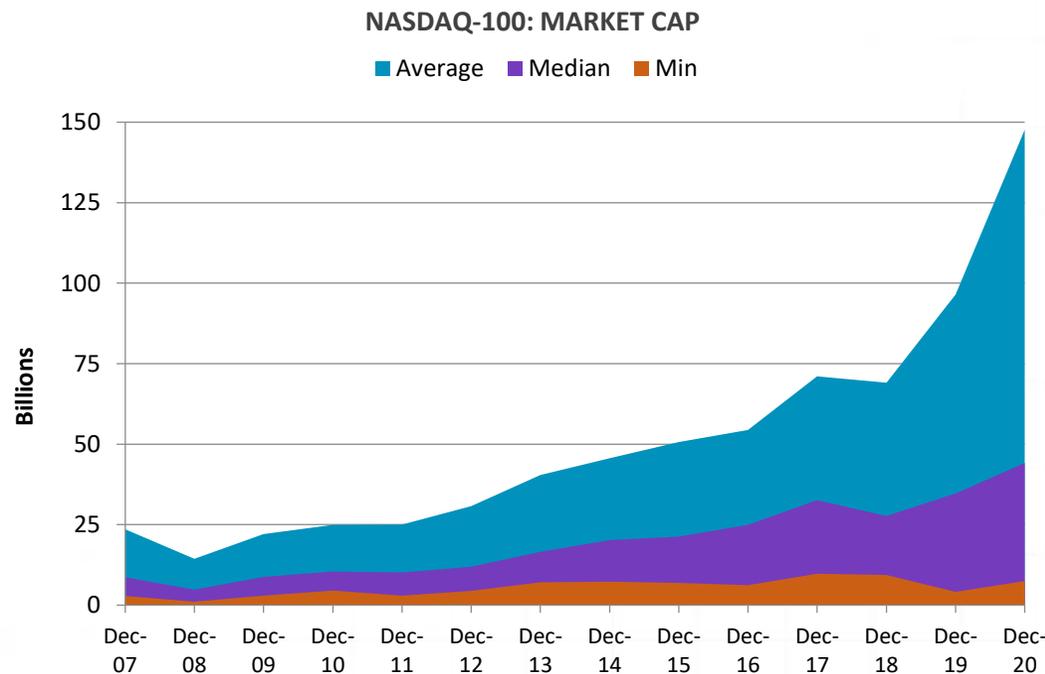
Number of Components in NDX and SPX by Exchange



Nasdaq-100 Index: Constituent Size vs. S&P500

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.
- Eleven of the last twelve years the average market cap has been higher in NDX than SPX. As of year-end 2020, NDX: \$148B, SPX: \$66B.
- The median market cap has been higher for NDX than SPX in each of the last eight years — as of year-end 2020 the medians were \$44.1B for NDX and \$25.6B 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 (\$17.3B) has been larger than the smallest company in SPX (\$3.1B) for the last twelve years.



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

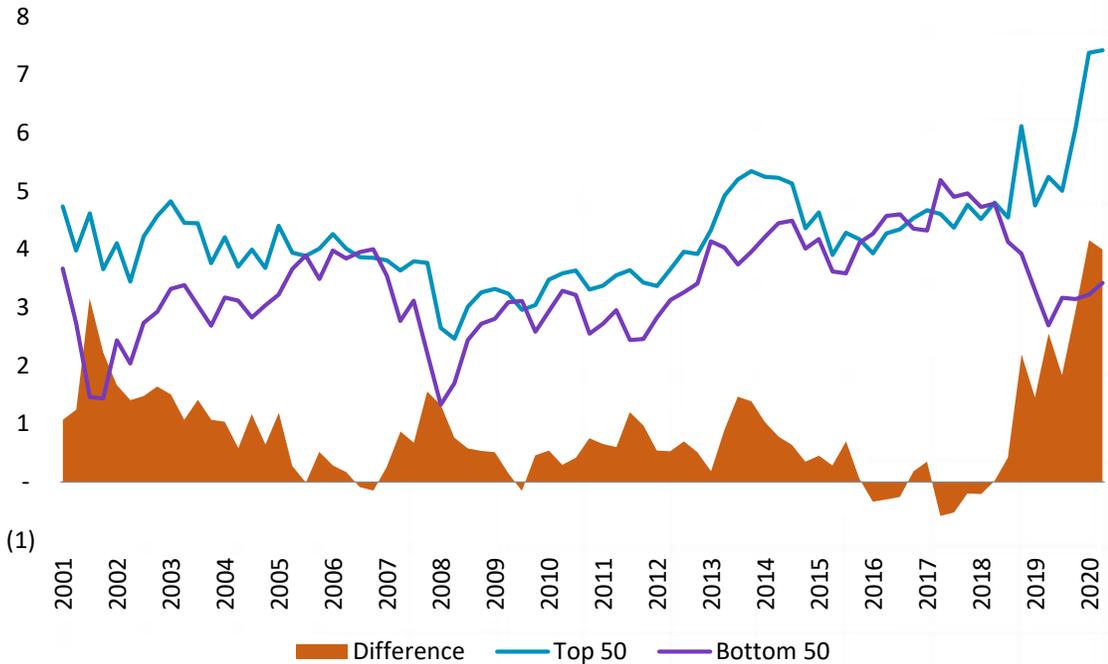
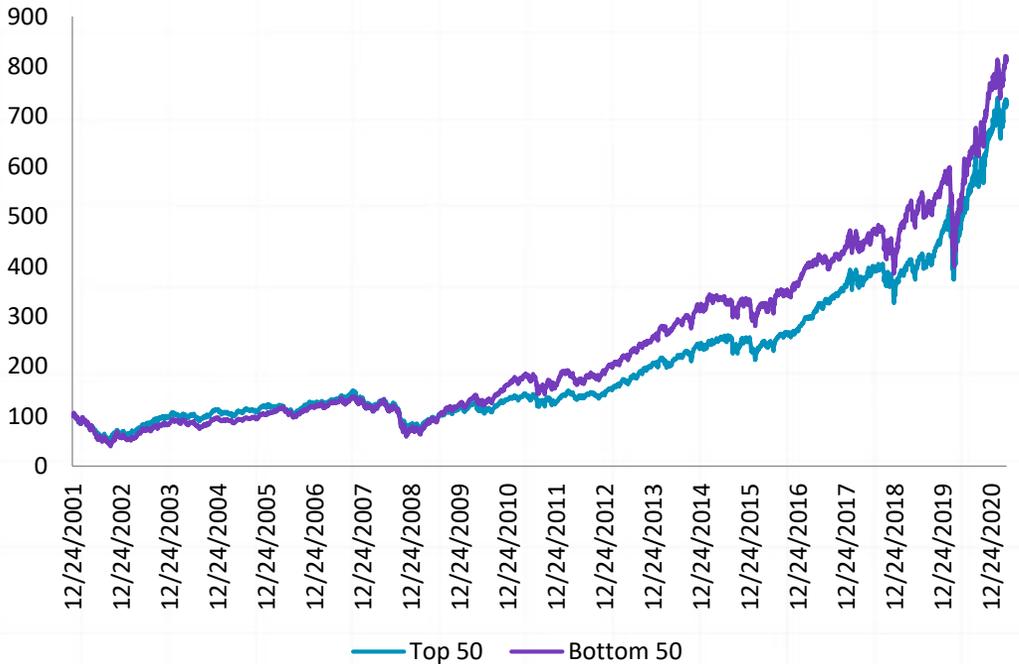


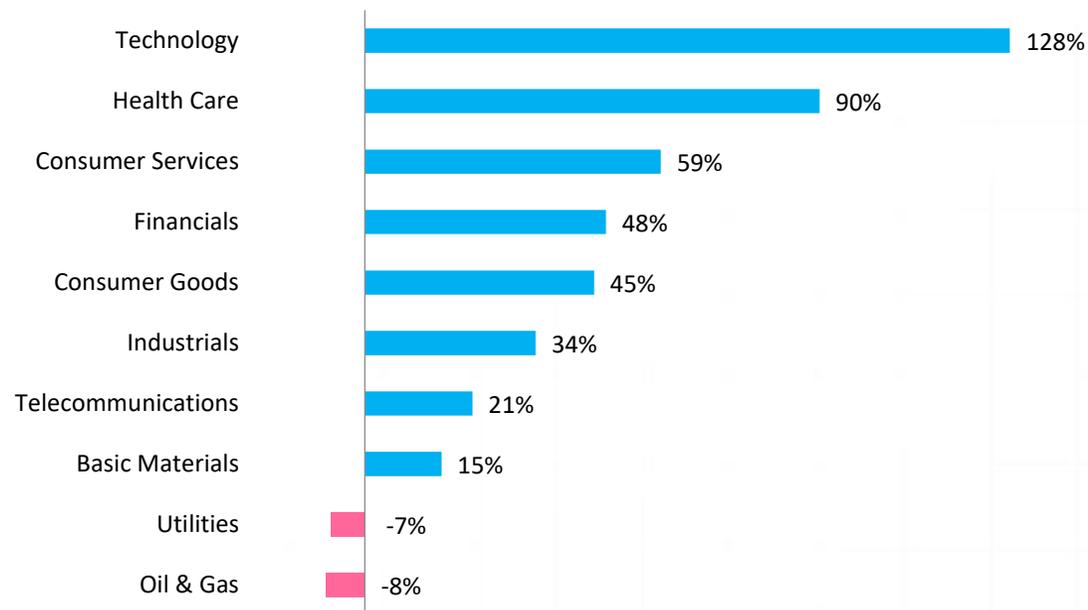
Figure 2: The Bottom 50 of Nasdaq-100 is outperforming



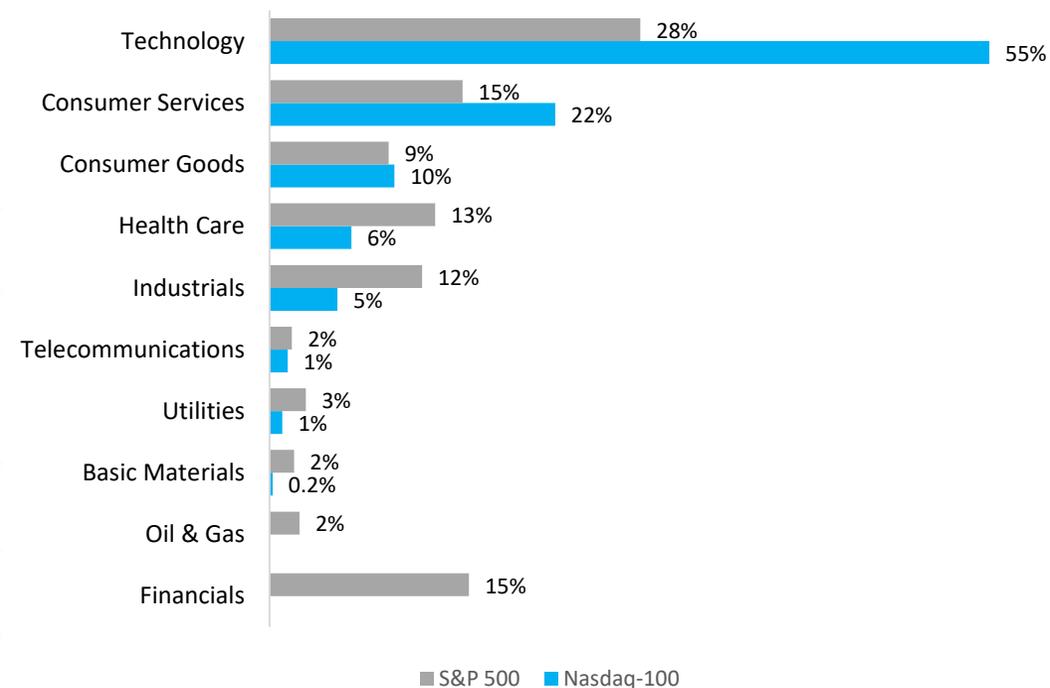
The Decade of the Nasdaq-100

The underlying story for the rise in the Nasdaq-100 is that the U.S.'s economic growth is shifting from capital-intensive, traditional industries (Basic Materials and Oil & Gas) to the “new-economy” sectors (Technology & Consumer Services).

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

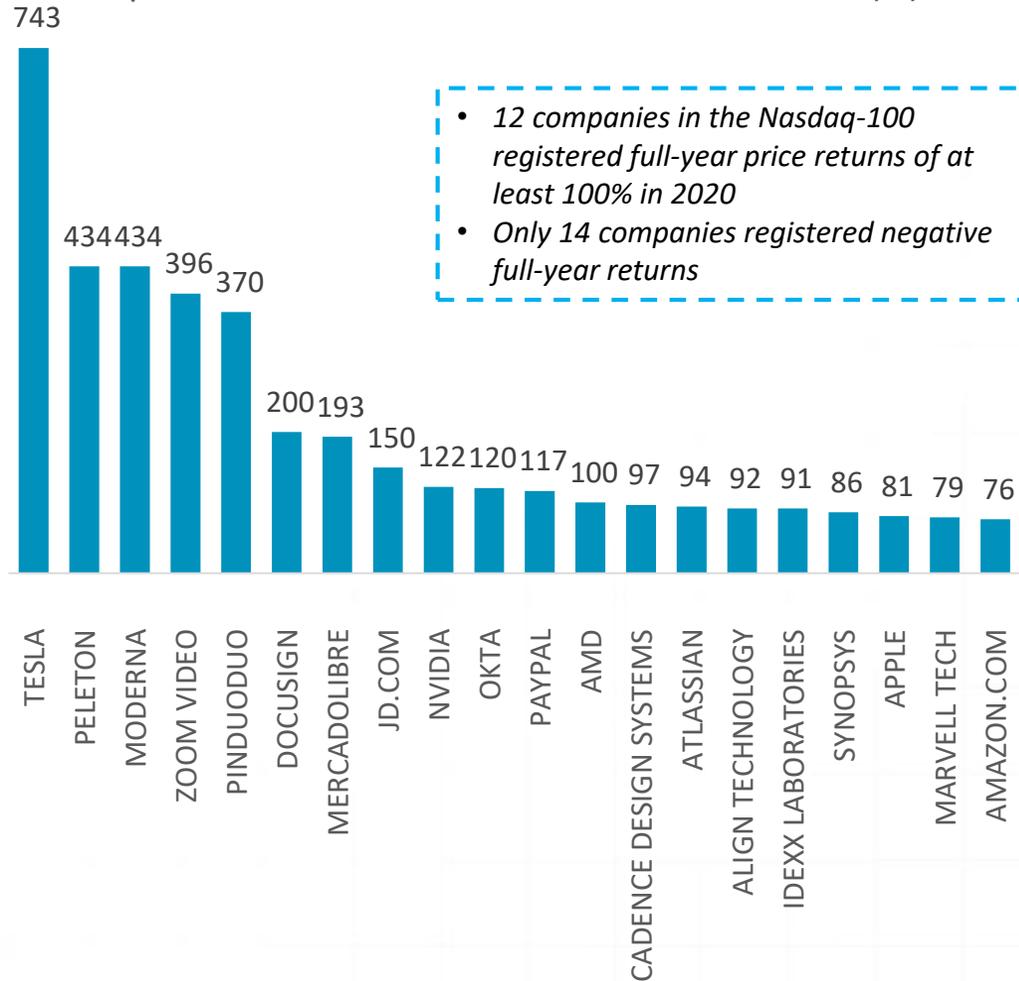


Industry (ICB) Breakdown in Nasdaq-100 and S&P 500 as of December 31, 2020



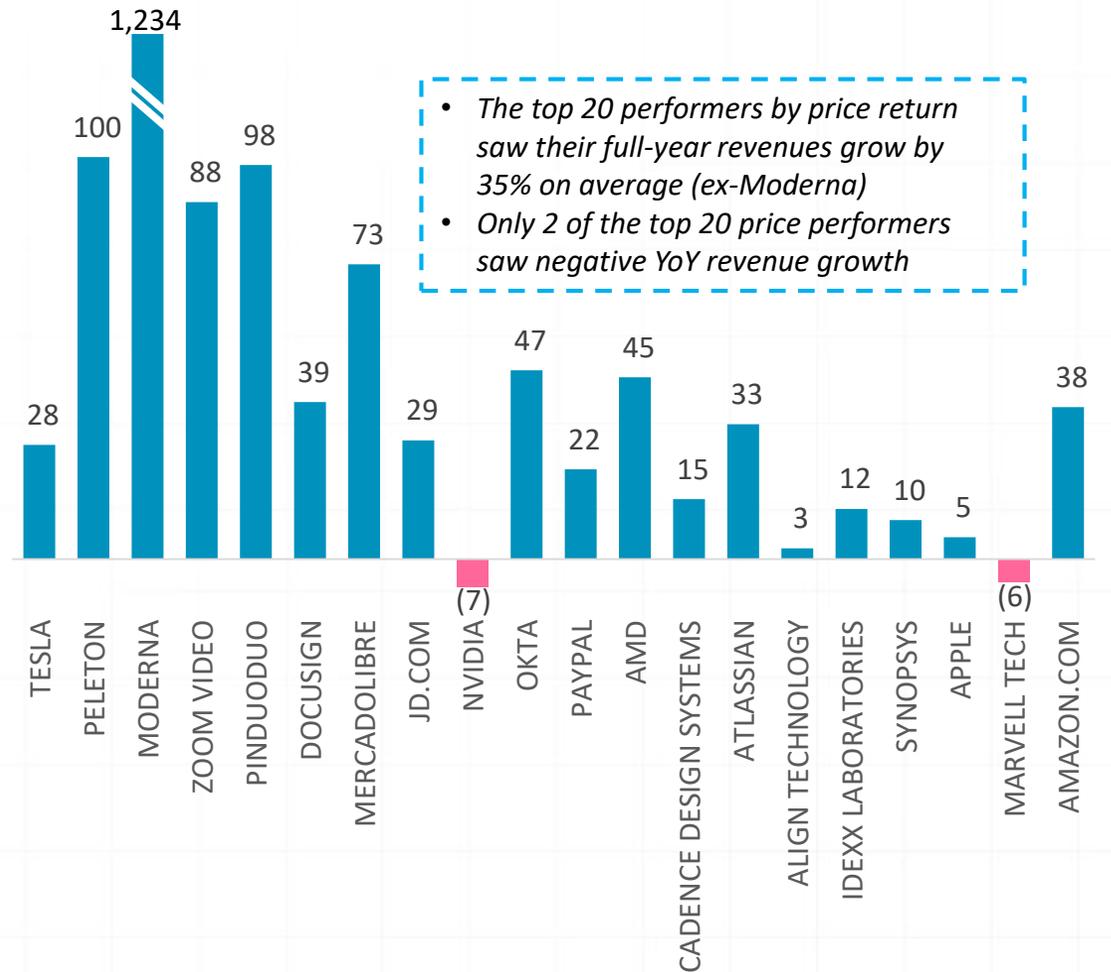
Nasdaq-100: Top Performing Constituents

Top 20 Performers: 2020 Full-Year Price Returns (%)



- 12 companies in the Nasdaq-100 registered full-year price returns of at least 100% in 2020
- Only 14 companies registered negative full-year returns

Top 20 Performers: 2020 Full-Year Revenue Growth (%)



- The top 20 performers by price return saw their full-year revenues grow by 35% on average (ex-Moderna)
- Only 2 of the top 20 price performers saw negative YoY revenue growth

Nasdaq-100: New Additions in 2020

No.	Effective Date	Ticker	Company Name	ICB Industry	ICB Sector	Market Cap, \$Bn	FY'20 Return
1	4/20/2020	DXCM	DexCom, Inc.	Health Care	Health Care Equipment & Services	35.5	69.0
2	4/30/2020	ZM	Zoom Video Communications, Inc.	Technology	Software & Computer Services	67.0	395.8
3	6/22/2020	DOCU	DocuSign, Inc.	Technology	Software & Computer Services	41.5	200.0
4	7/20/2020	MRNA	Moderna, Inc.	Health Care	Pharmaceuticals & Biotechnology	41.3	434.1
5	8/24/2020	PDD	Pinduoduo Inc.	Consumer Services	General Retailers	155.3	369.8
6	10/19/2020	KDP	Keurig Dr Pepper Inc.	Consumer Goods	Beverages	45.0	10.5
7	12/21/2020	AEP	American Electric Power Company, Inc.	Utilities	Electricity	41.3	(11.9)
8	12/21/2020	MRVL	Marvell Technology Group Ltd.	Technology	Technology Hardware & Equipment	31.9	79.0
9	12/21/2020	MTCH	Match Group, Inc.	Technology	Software & Computer Services	39.3	43.1
10	12/21/2020	OKTA	Okta, Inc.	Technology	Software & Computer Services	30.8	120.4
11	12/21/2020	PTON	Peloton Interactive, Inc.	Consumer Services	Travel & Leisure	38.8	434.2
12	12/21/2020	TEAM	Atlassian Corporation Plc	Technology	Software & Computer Services	30.9	94.3

Tesla added to S&P 500 in December 2020 – largest addition in the index’s history, approximately 7.5 years after being added to Nasdaq-100. Tesla price up ~2,500% in that period.

Nasdaq-100 by the Sectors

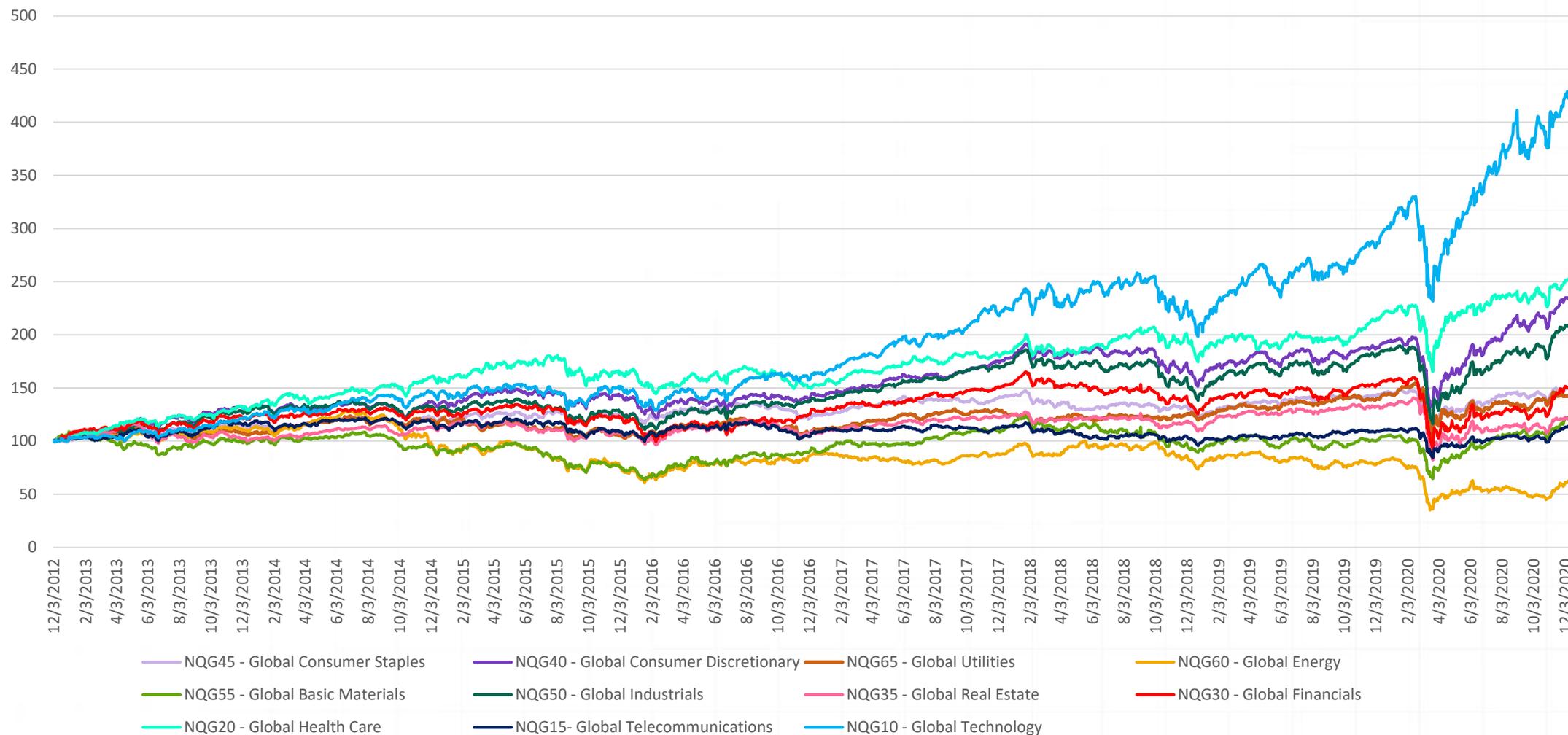
Nasdaq-100 Index: Sectors

Sector Breakdown

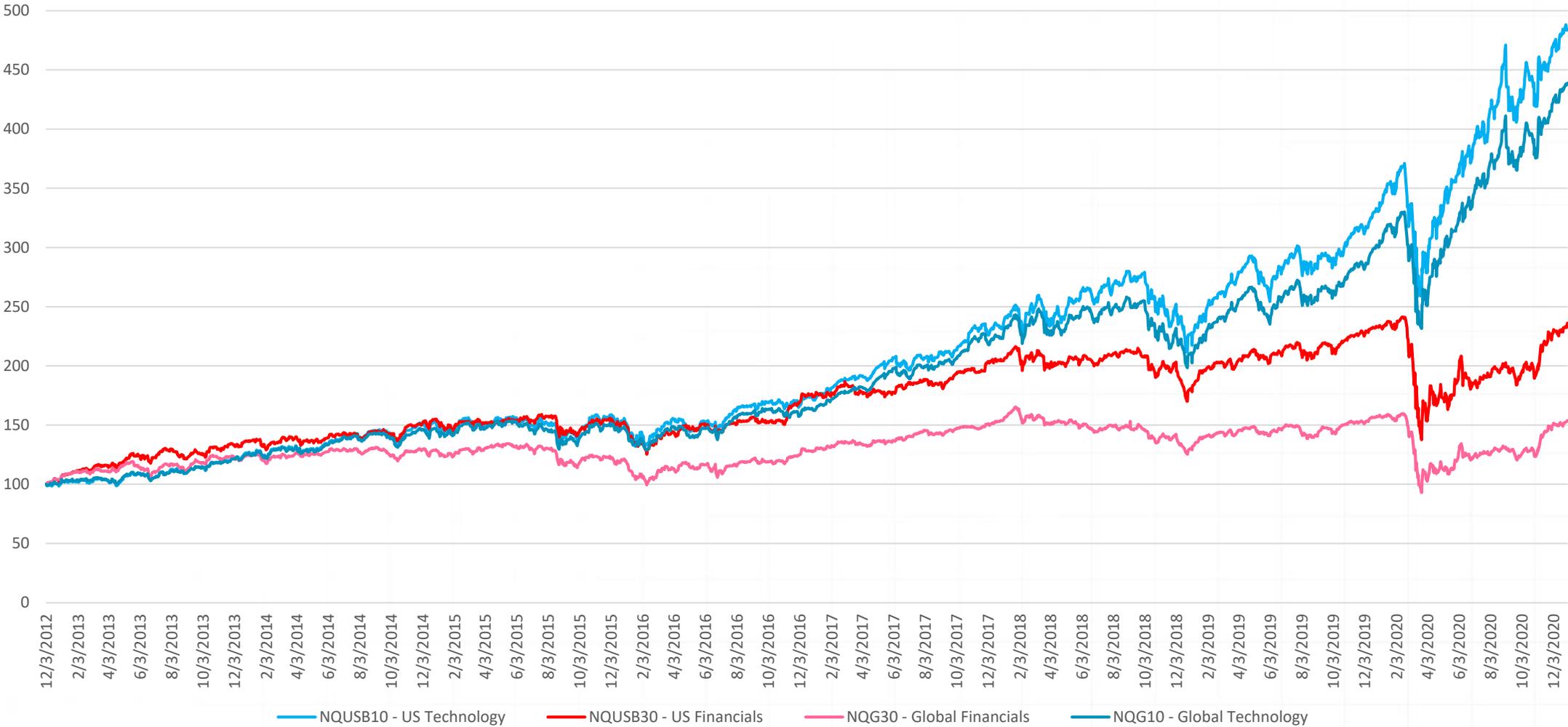
- While heavy in Technology, Consumer Discretionary and Health Care make up a substantial weight
- Consumer Discretionary includes companies like Amazon, Tesla, Netflix, Costco and Starbucks

Industry	Average Weight (FY 2020)	Contributed Return (FY 2020)	Pure Return (FY 2020)	Benchmark Return (FY 2020)
Technology	54.7%	26.5%	48.6%	46.0%
Consumer Discretionary	22.5%	17.2%	84.6%	25.0%
Health Care	6.8%	1.4%	17.1%	15.5%
Telecommunications	6.1%	1.6%	23.5%	2.8%
Industrials	4.8%	2.0%	43.3%	15.0%
Consumer Staples	3.8%	0.3%	8.9%	4.3%
Utilities	0.8%	(0.2)%	(6.8)%	0.7%
Basic Materials	0.2%	0.1%	36.6%	18.7%
Real Estate	0.1%	0.0%	18.0%	(8.8)%
Financials	0.1%	(0.1)%	(12.9)%	(2.3)%

Sector Exposure Matters



Technology or Financials

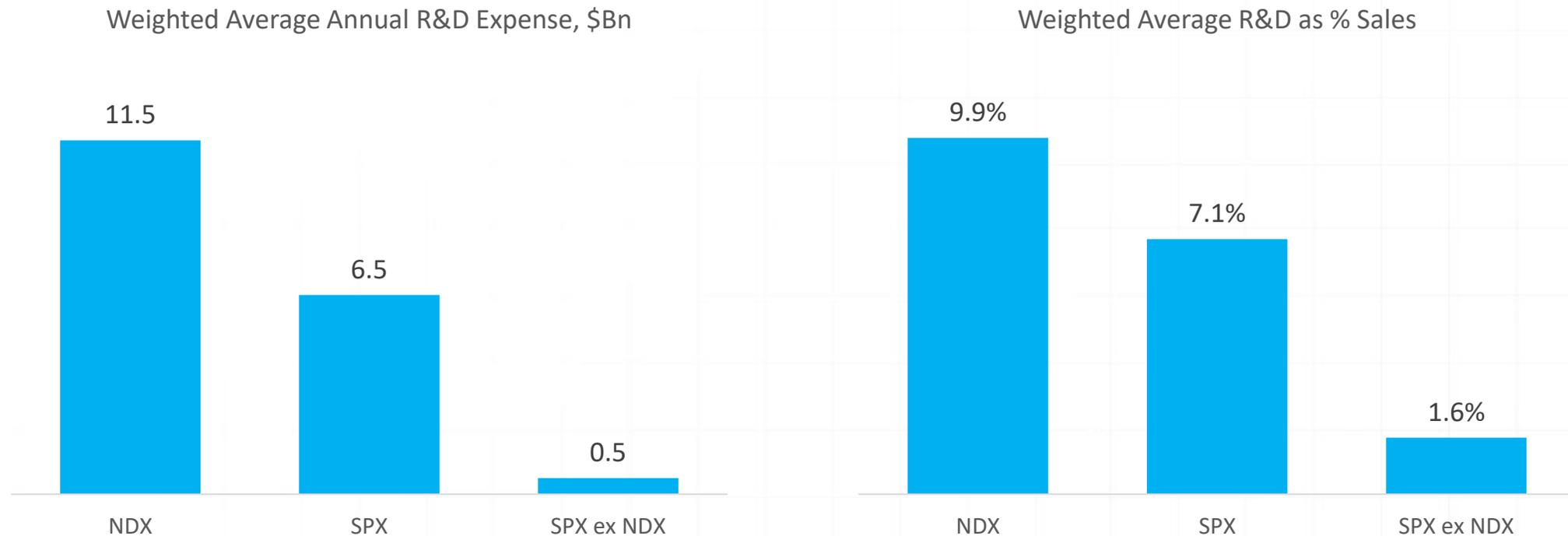


Source: Nasdaq. Data as of 12/31/2020.

Quantifying Innovation

Research and Development Powerhouse

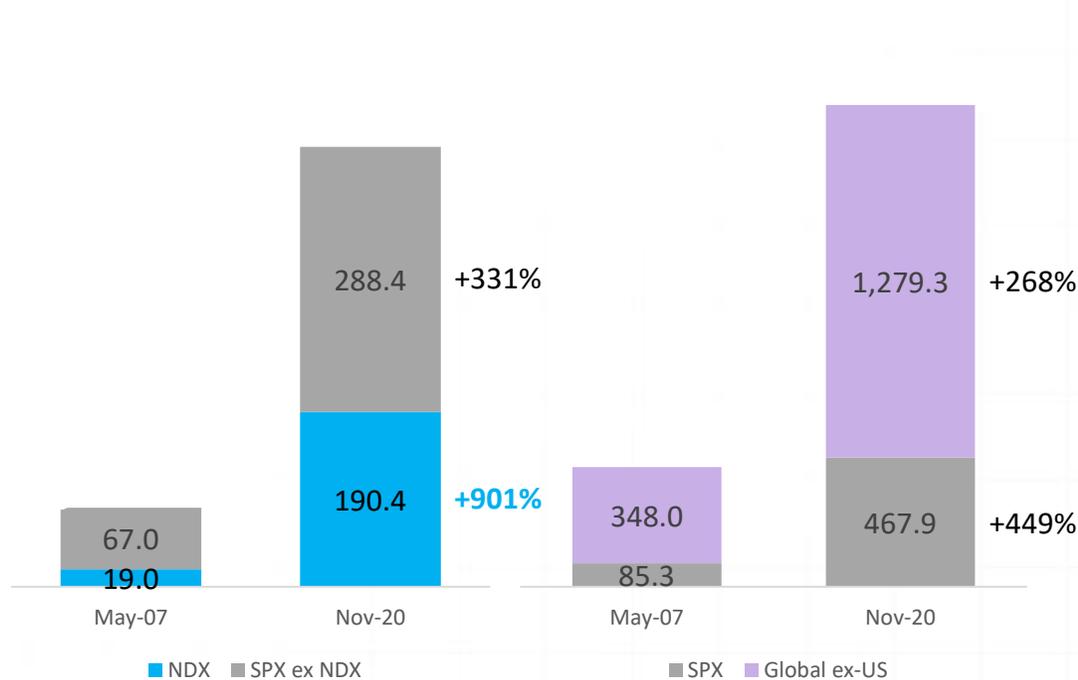
- R&D is a key driver of innovation and economic growth
- Companies in the Nasdaq-100 spend nearly twice as much in R&D, on average, compared to those in the S&P 500; 79 of the Nasdaq-100 are currently part of the S&P 500
- Calculating R&D as a percent of sales in the last 12 months, Nasdaq-100 companies averaged 40% higher than S&P 500



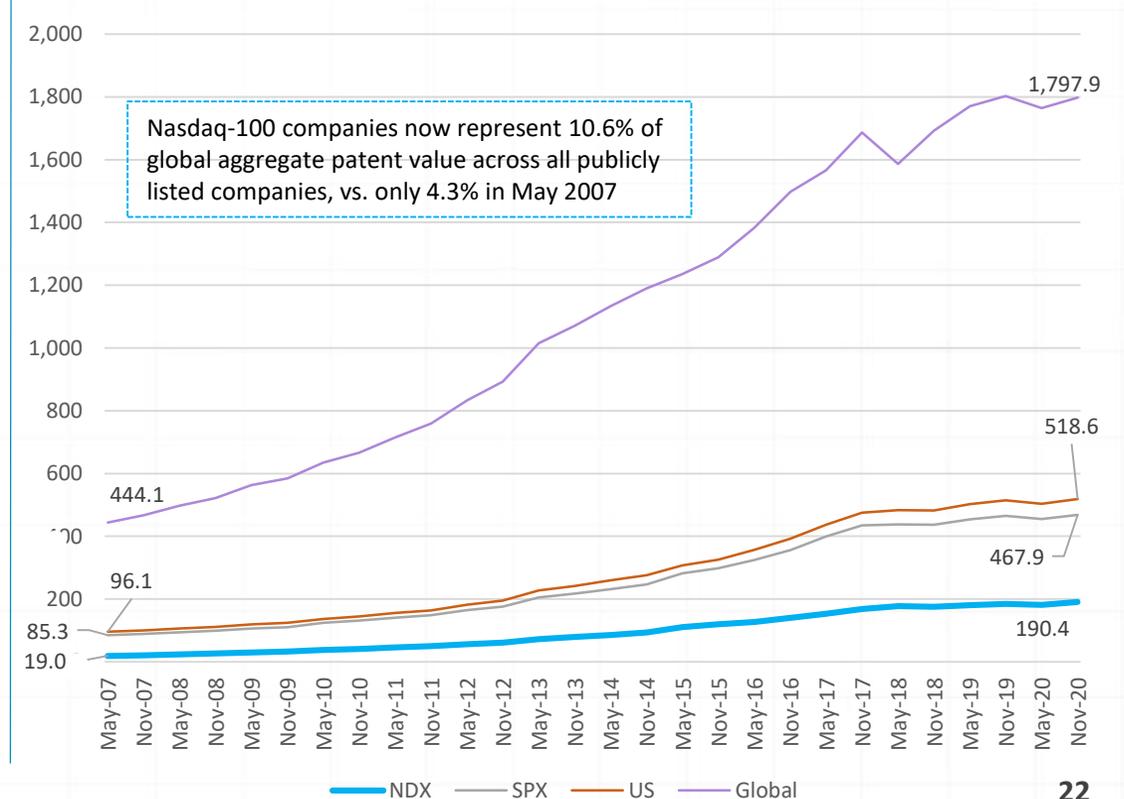
Accelerating Growth of Intangible Assets

The current crop of Nasdaq-100 constituents has grown the value of their patents by ~900% since May 2007, vs. ~300% across all publicly-listed, tracked companies globally. Growth for the S&P 500 overall was ~450%, but only 331% excluding the contribution of overlapping Nasdaq-100 firms. Global growth ex-US was only 268%

Growth in Value of Patents, Nasdaq-100 vs. S&P 500 ex-Nasdaq-100 Firms

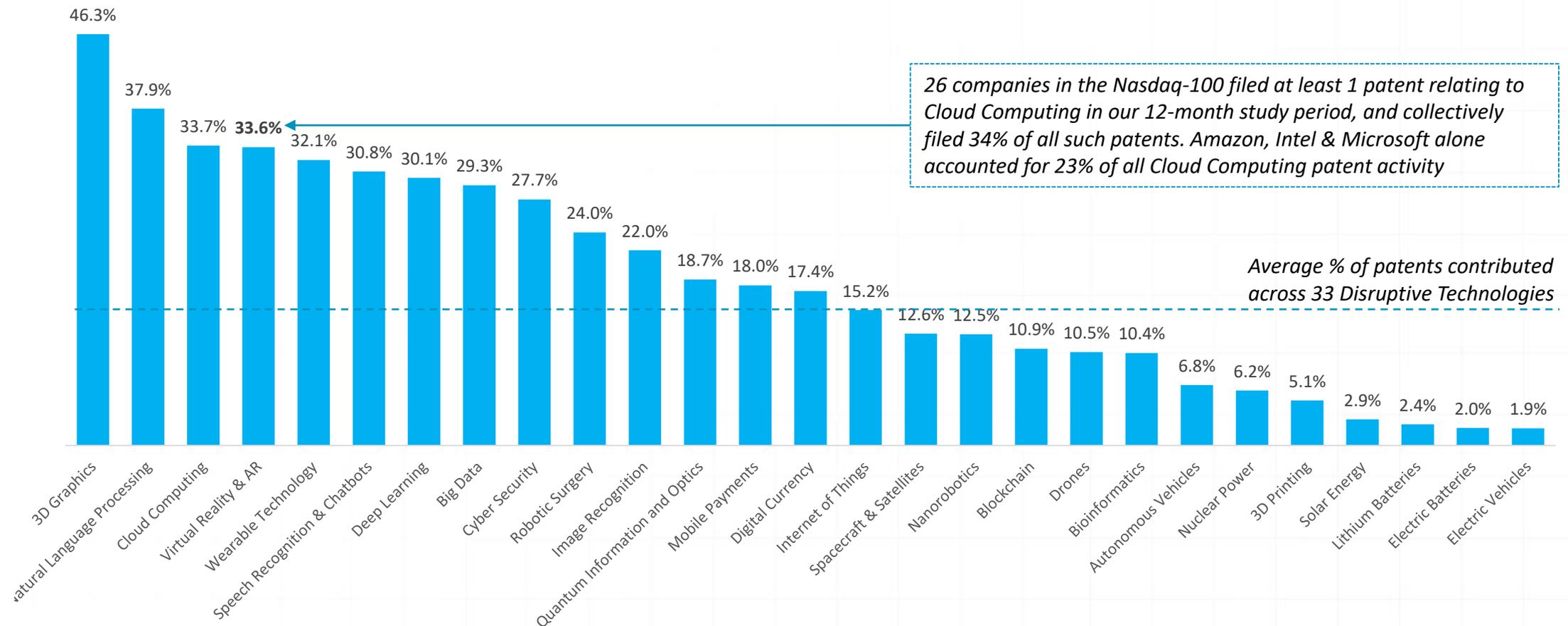


Growth in Global Aggregate Value of Patents Among Publicly Listed Companies, 2007-2020 (\$Bn)



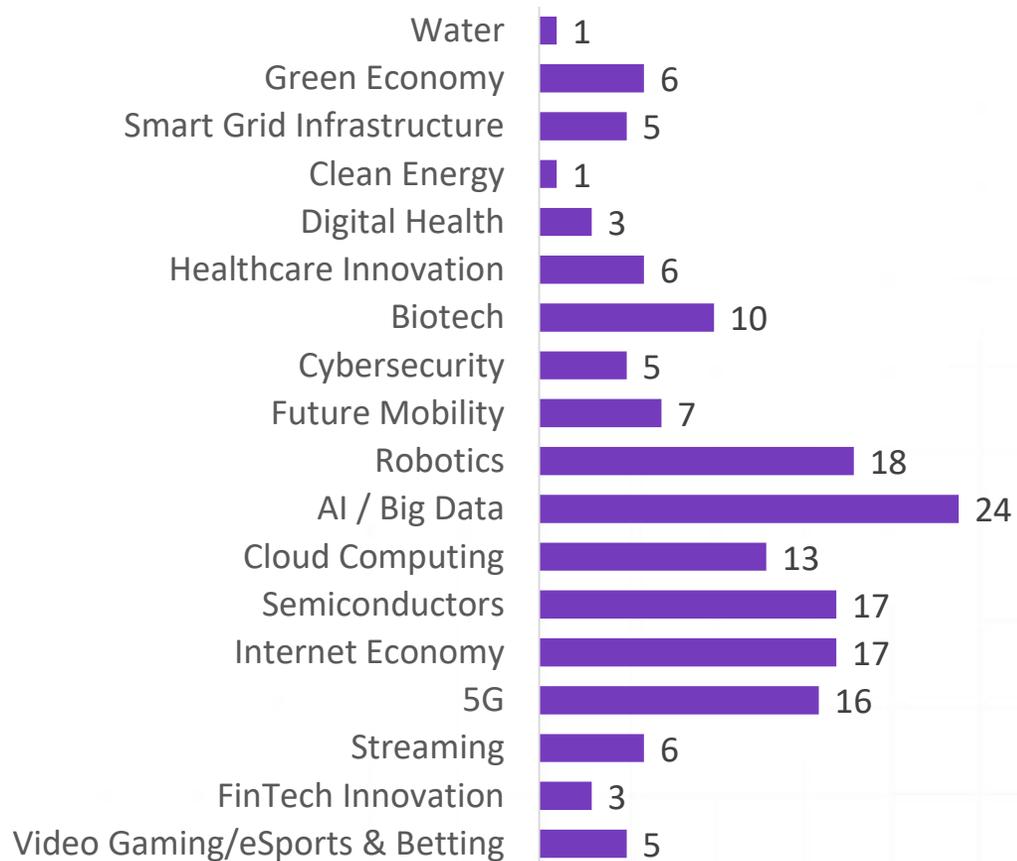
Disruptive Technology and R&D

- 58 companies in the Nasdaq-100 (representing 84% of index weight) recently filed patents across one or more of 35 key areas of Disruptive Technology such as Artificial Intelligence, Clean Energy, or Blockchain

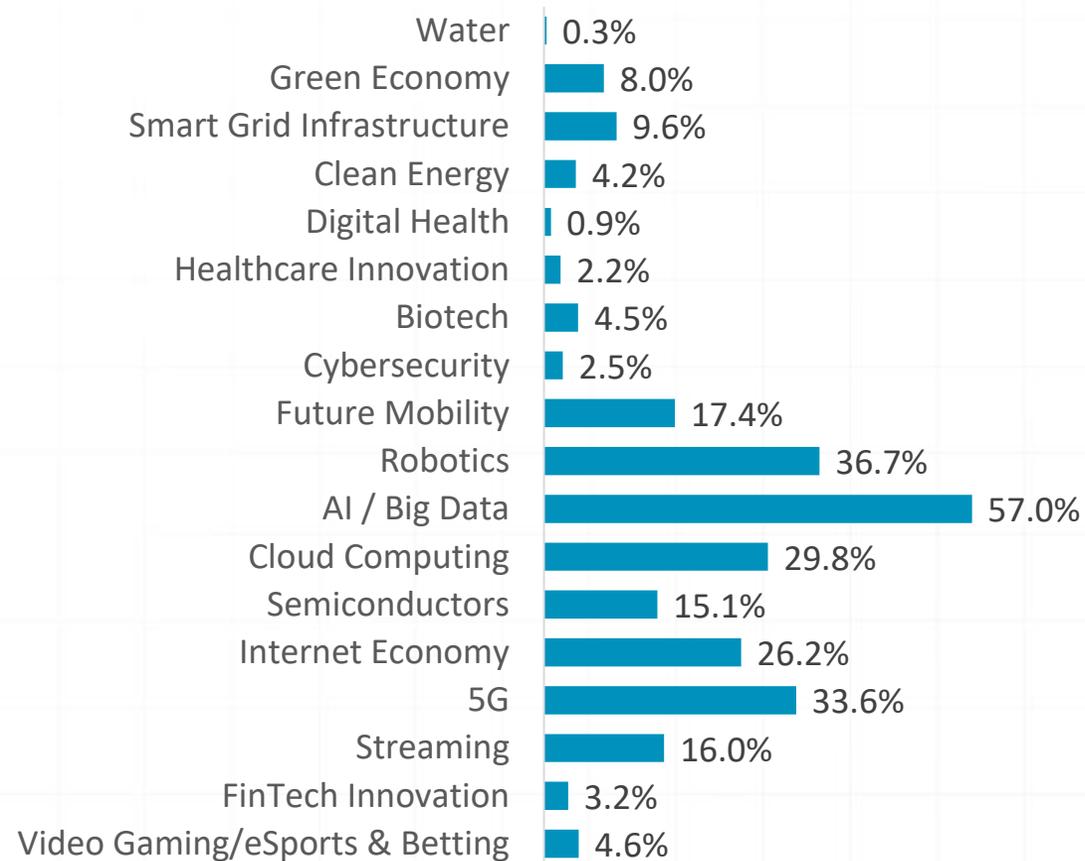


Nasdaq-100 by Thematic Exposures

of Constituents per Theme



Index Weight per Theme



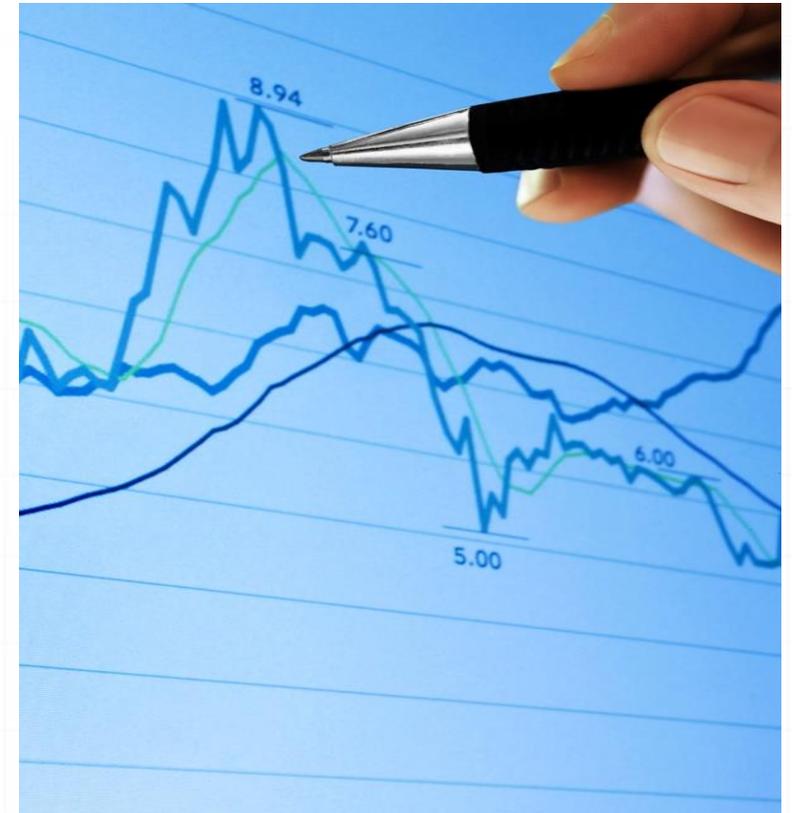
Source: Nasdaq, Bloomberg, FactSet. Data as of 3/31/2021.

Based on overlap with existing Nasdaq Thematic Indexes, except for Digital Health, Healthcare Innovation, 5G, Streaming, and Video Gaming/eSports & Betting where competitor products were analyzed.

The Fundamentals

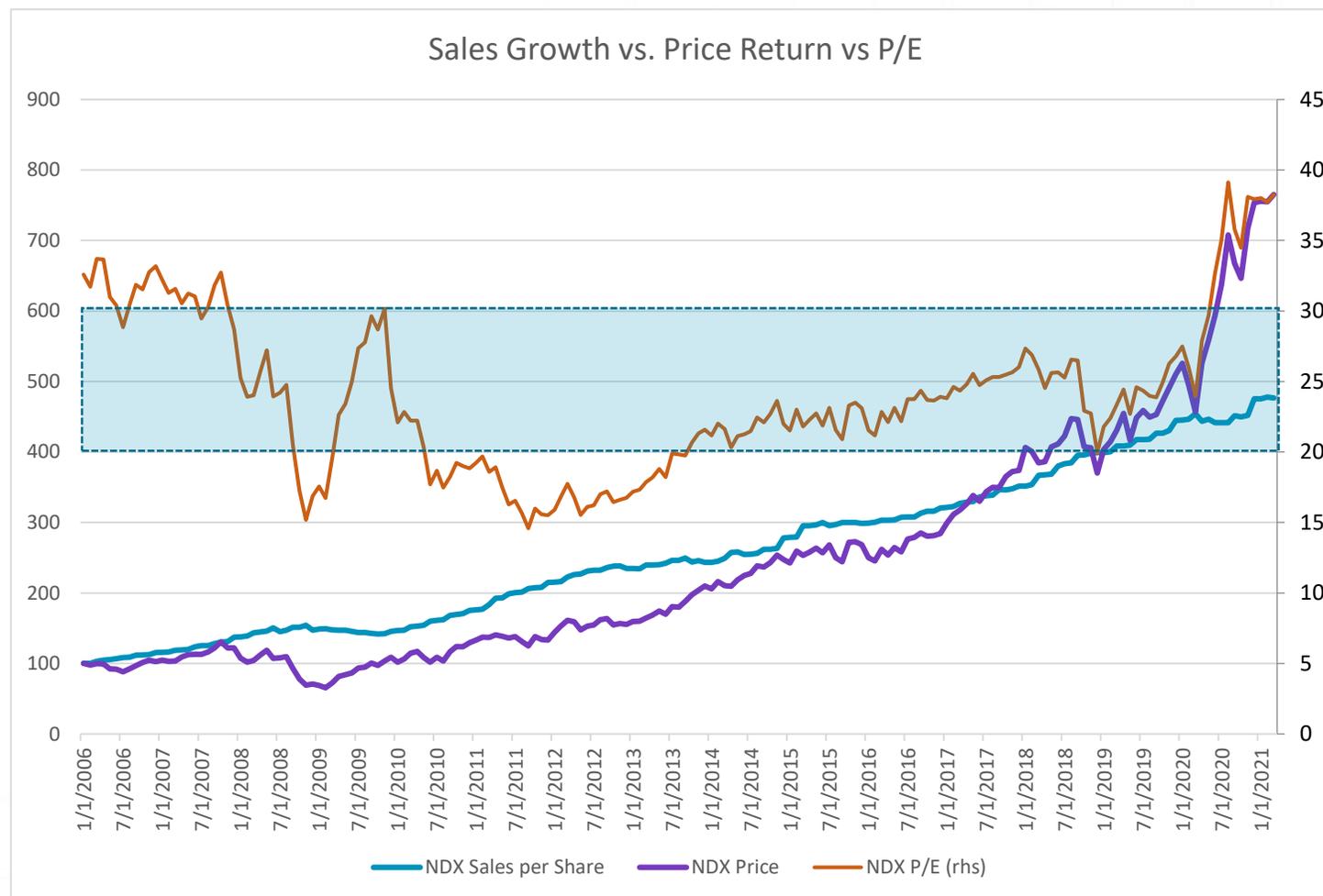
Nasdaq-100 Index: Fundamentals

- 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:
 - + 20% in earnings
 - + 12% in revenues
 - + 25% in dividend value
 - - 7% in P/E
- The shift in NDX fundamentals has resulted in significant outperformance over other US large cap indexes.



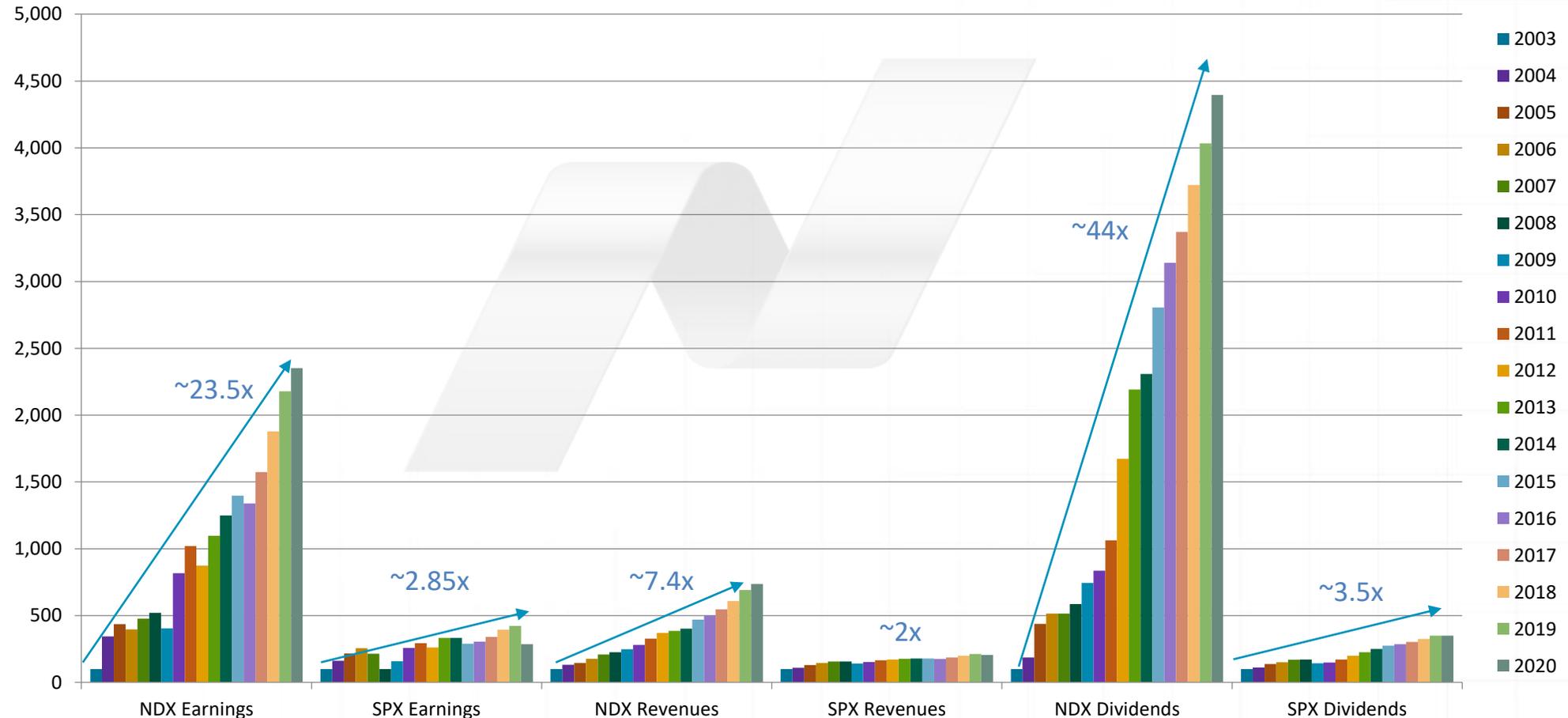
Nasdaq-100 Index: Valuation vs. Sales Growth

- From 2014-2019, NDX P/E ratio (TTM basis) had stabilized in the low-to-mid 20s, below where it was in the mid-2000s
- The trend broke during 2020, with P/E climbing to a range in the mid-to-upper 30s
- Fundamental story has been the main driver of long-run recovery, rewarding the growth of NDX companies
- Sales: +377%
Price: +665%
Valuation: 17%



Source: Nasdaq, FactSet, Bloomberg. Data as of 3/31/2021.

Nasdaq-100 vs. S&P 500: Fundamentals Over Time

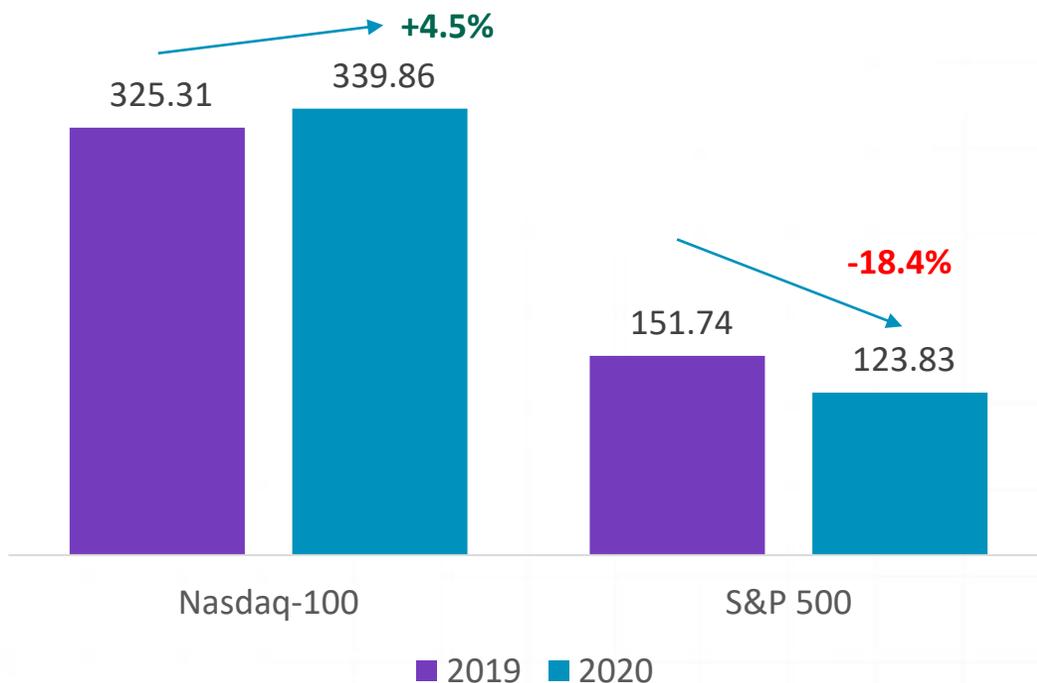


Current TTM Dividend Yield: 0.72% (NDX) vs. 1.42% (SPX)

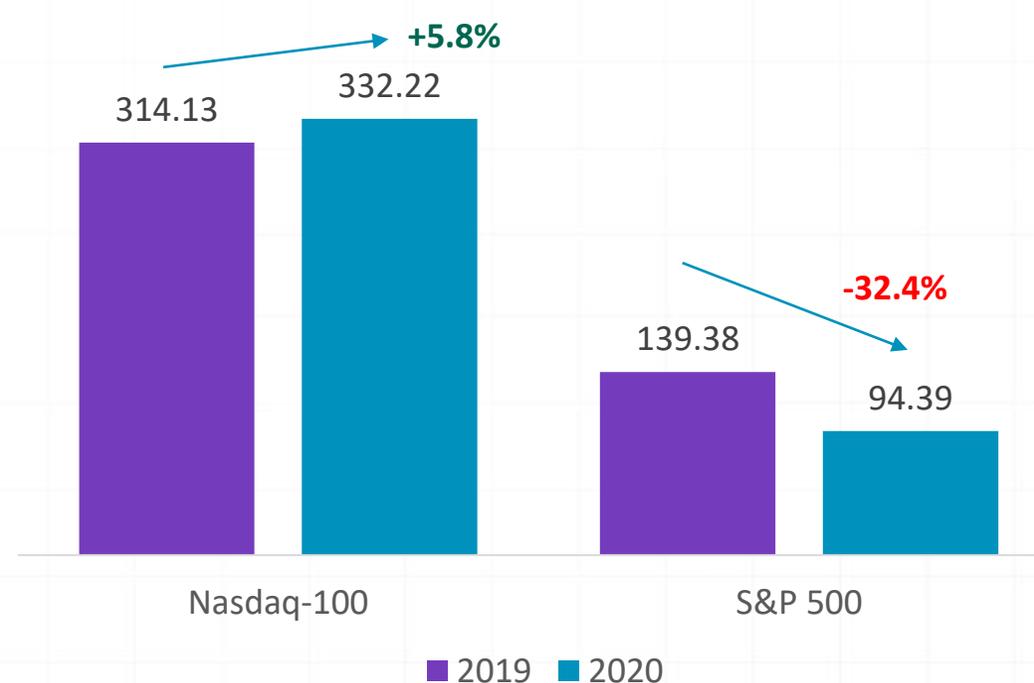
Full-Year 2020 Earnings Analysis

Driven by the global pandemic, 2020 saw an unusually high number of extraordinary (i.e. “one-time”) items impacting company full-year earnings, especially in the S&P 500. While headline (i.e. “recurring”) earnings were down 18% YoY, unadjusted earnings were down 32%. In the Nasdaq-100, the differences were marginal

Trailing One-Year EPS at Index Level
(“Headline” i.e. from Continuous Operations)



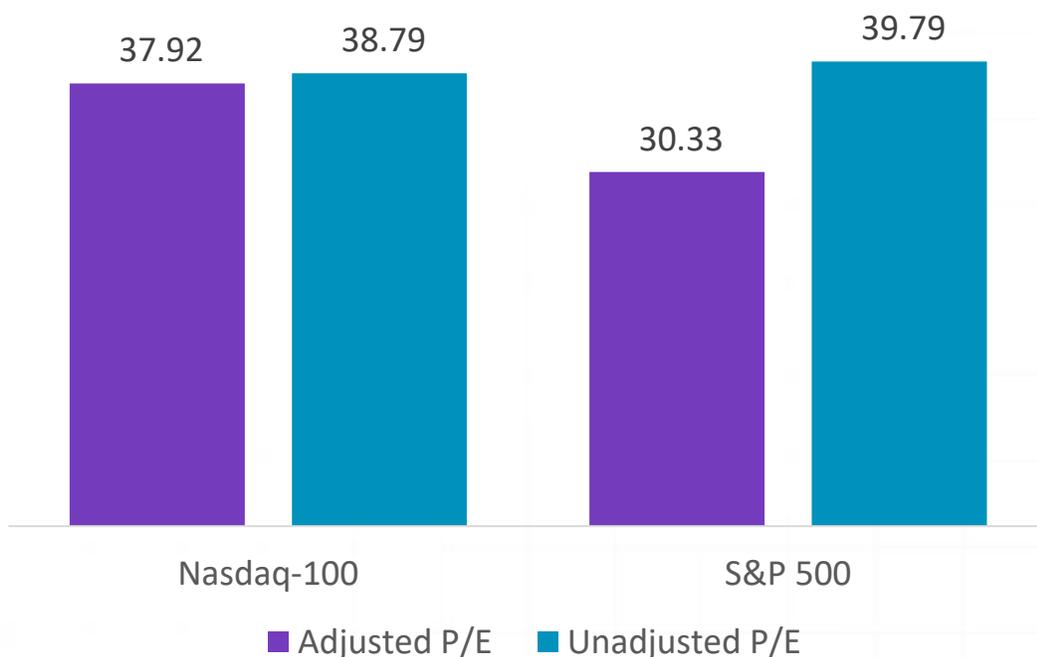
Unadjusted Trailing One-Year EPS at Index Level
(Before “Adjustments for Extraordinary Items”)



Full-Year 2020 Earnings Analysis

The impact to earnings for S&P 500 companies stemmed from a number of different sectors, including Energy, Telecommunications, Health Care, and Industrials. The 10 biggest single-company write-downs totaled \$113Bn alone, out of nearly \$270Bn in aggregate. On an unadjusted basis, this leads to a much higher P/E for SPX

Impact of 2020 Earnings Adjustments on Index P/E, Trailing One-Year as of 12/31/2020



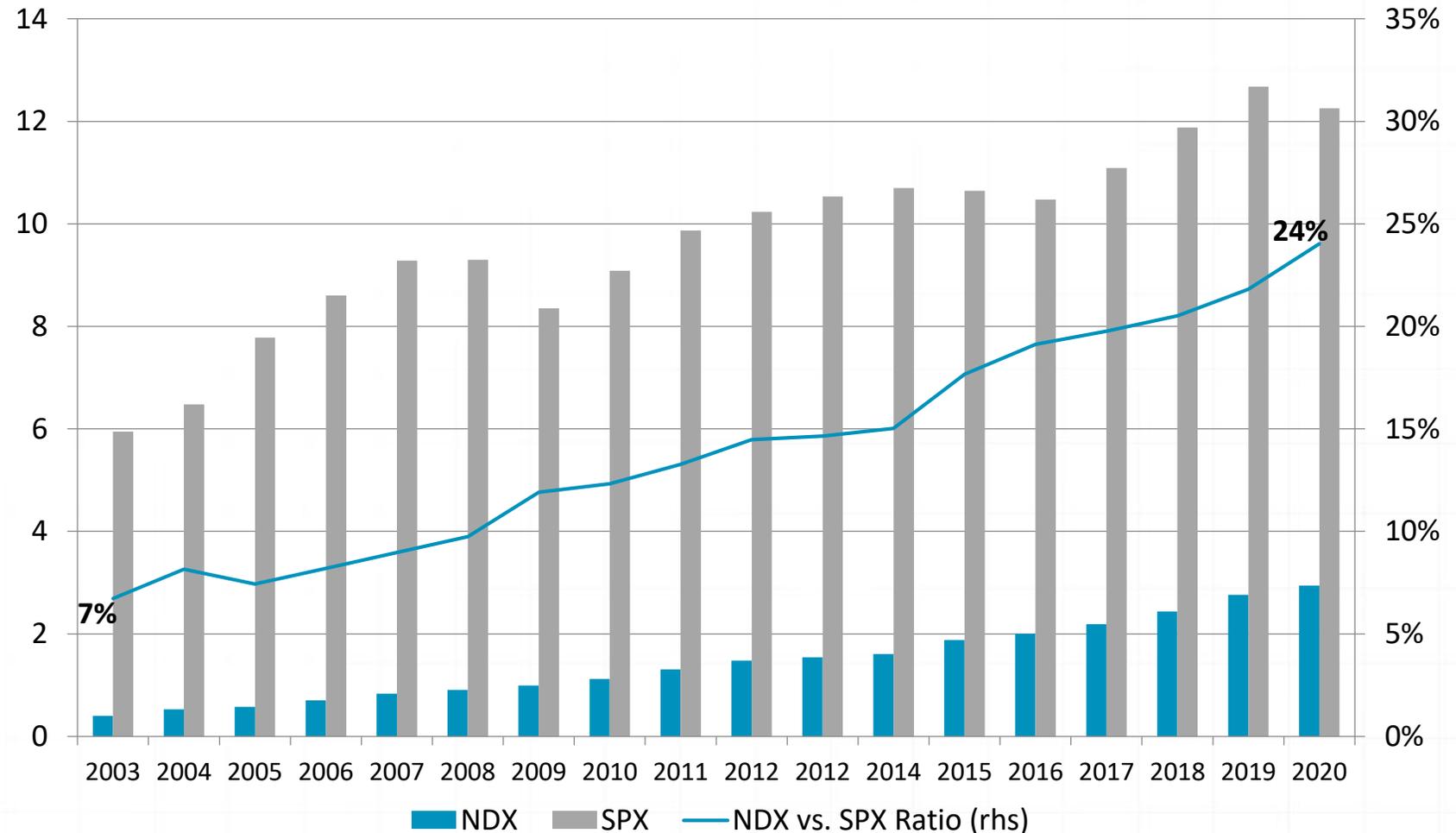
Company Name	Unadjusted 2020 Earnings (\$Bn)	Earnings from Continuing Operations	Unadjusted vs. "Recurring" Earnings
EXXON MOBIL CORP	-22.2	3.3	25.5
AT&T CORP	-5.3	13.2	18.5
OCCIDENTAL PETROLEUM CORP	-15.9	-4.9	11.0
BRISTOL MYERS SQUIBB	-9.0	1.9	10.9
BAKER HUGHES CO	-10.1	0.8	10.9
SCHLUMBERGER LTD	-10.5	-1.7	8.9
BOEING CO	-11.8	-4.5	7.3
MARATHON PETROLEUM CORP	-9.9	-2.6	7.3
DELTA AIR LINES INC	-12.4	-5.4	7.0
MERCK & CO	7.0	13.1	6.0

While these are not technically "recurring" items, they should not be ignored. S&P 500 companies also experienced material write-downs in prior market crises (e.g., Energy in 2014-15, Financial in 2008-9) during which Nasdaq-100 companies experienced marginal impacts

Nasdaq-100 Index: Aggregate Revenues vs. S&P500

NDX vs. SPX, Full-Year Revenues, \$T

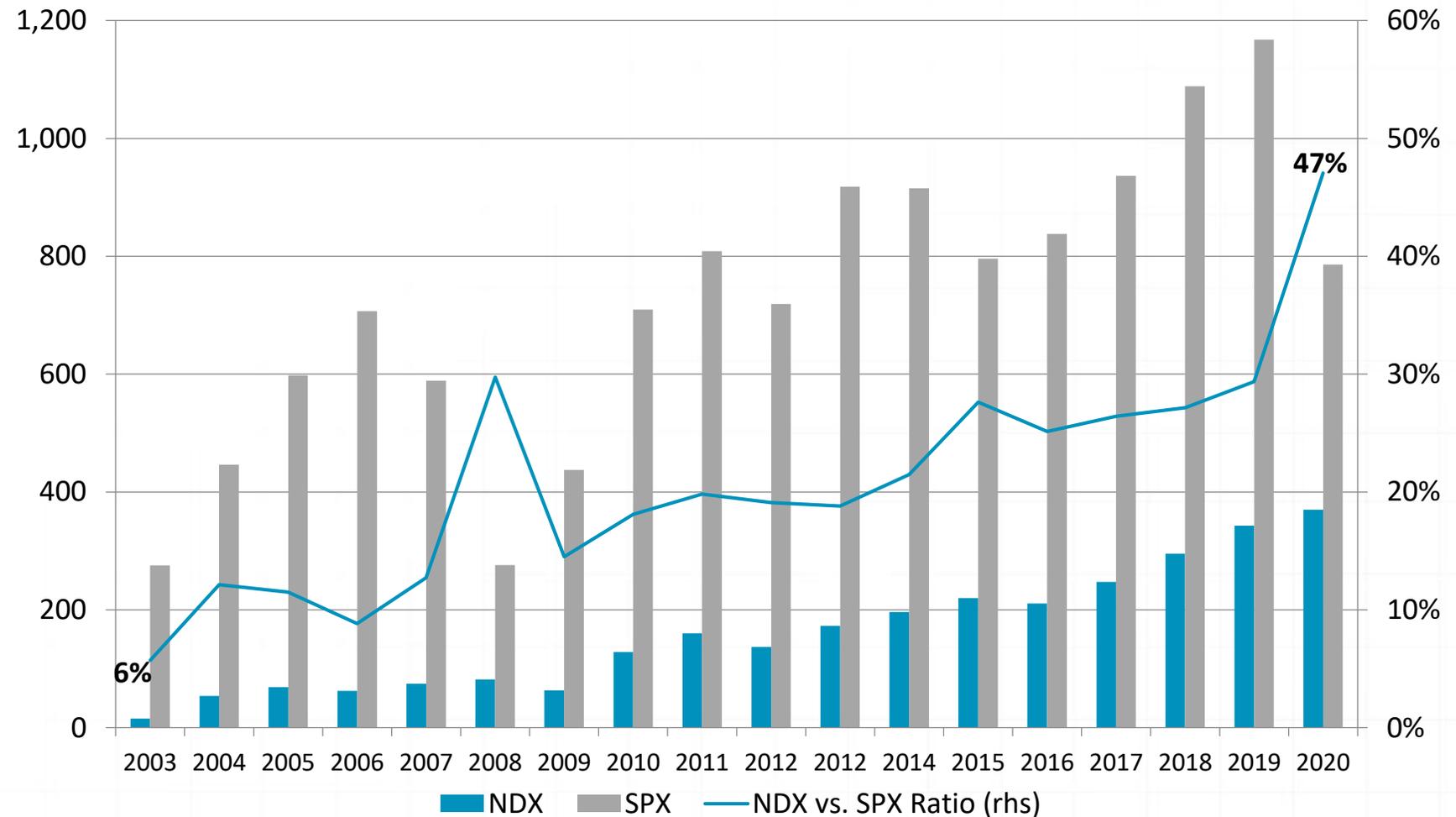
- The aggregate revenues of Nasdaq-100 companies reached 24% of the total reported by S&P 500 companies in 2020 (vs. only 7% in 2003)



Nasdaq-100 Index: Aggregate Earnings vs. S&P500

NDX vs. SPX, Full-Year Unadjusted Earnings, \$B

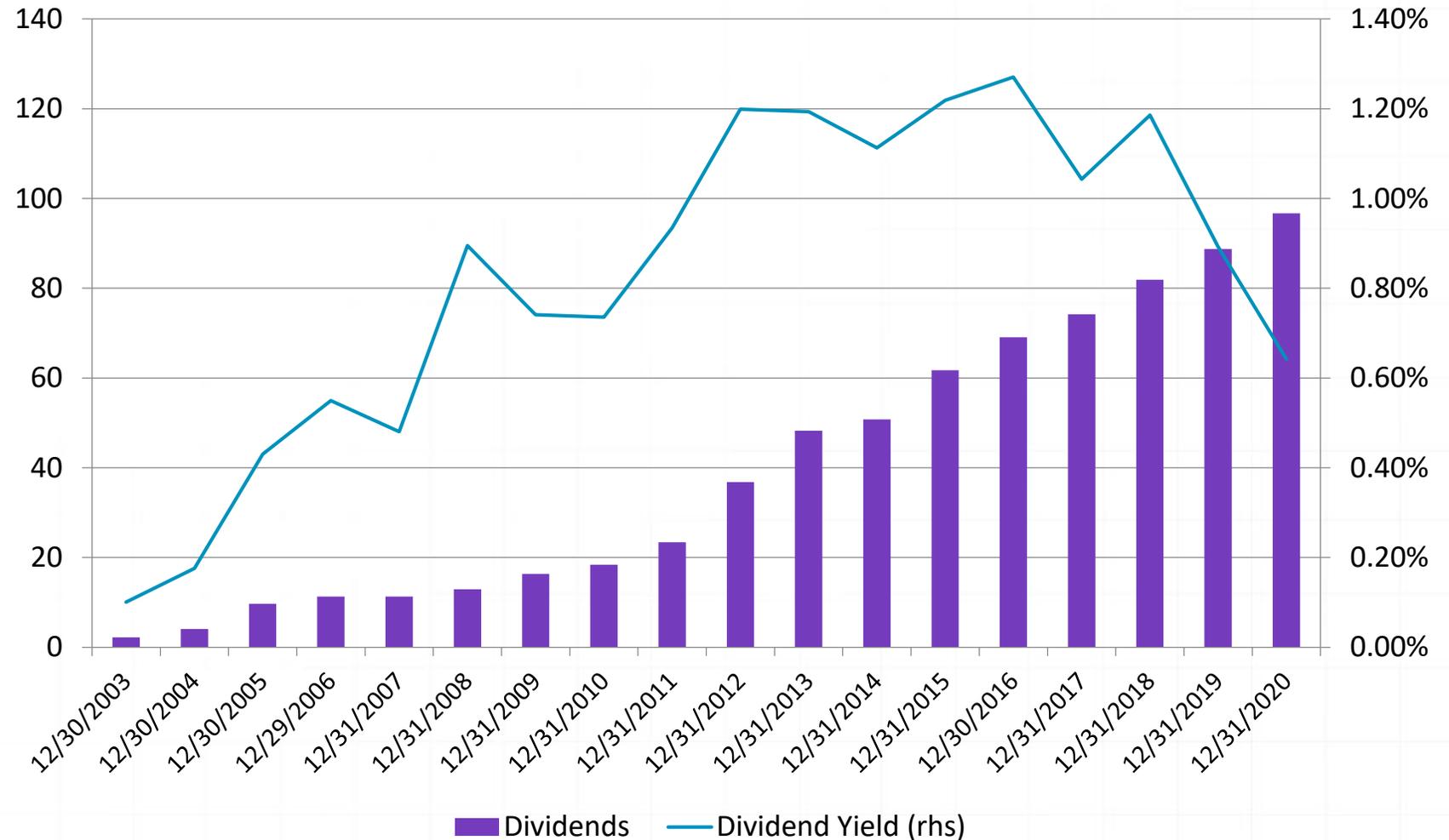
- On an unadjusted basis, the aggregate earnings of Nasdaq-100 companies reached 47% of the total reported by S&P 500 companies in 2020 (vs. only 6% in 2003)



Nasdaq-100 Index: Aggregate Dividends & Yield

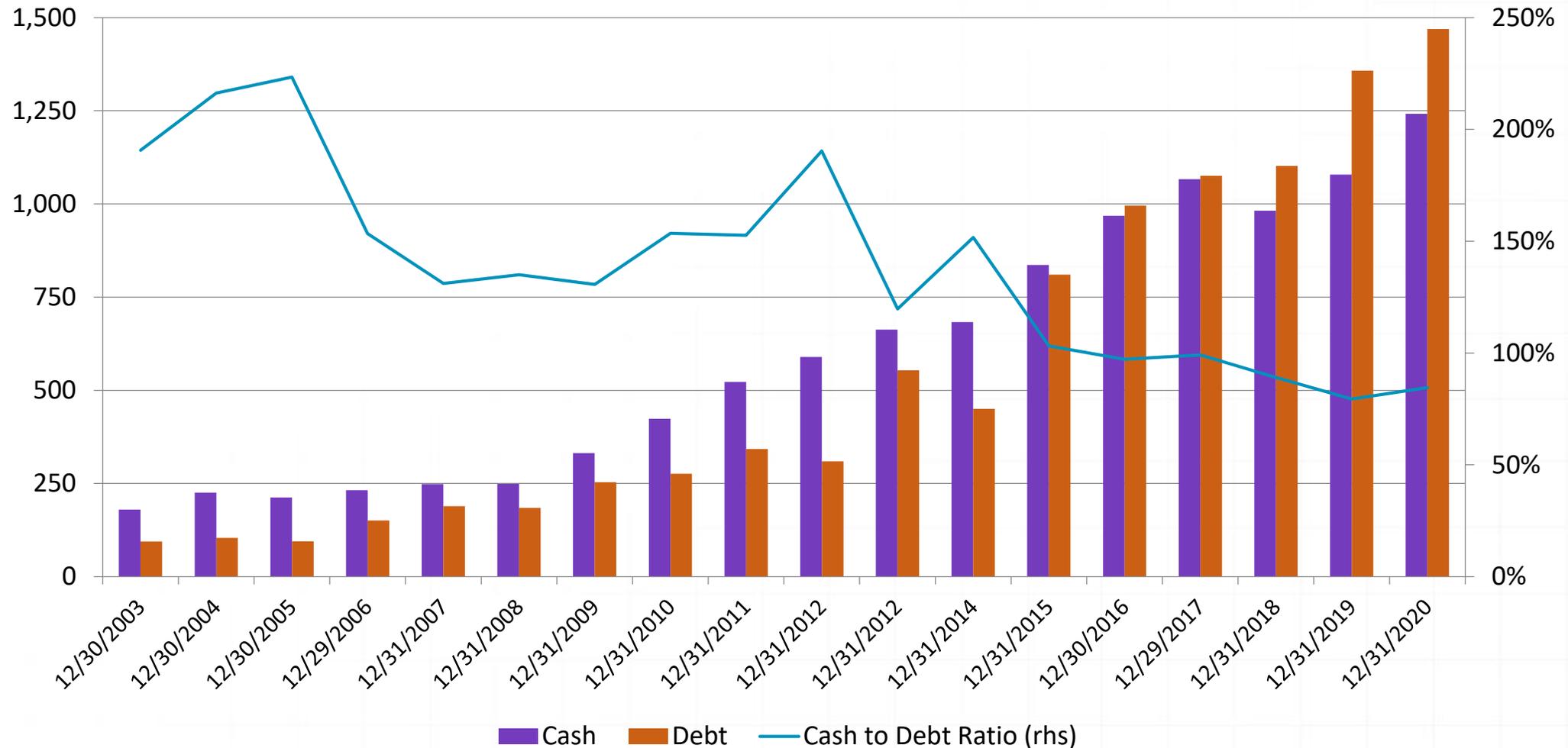
Full-Year Dividends Paid (\$B) vs. Index Dividend Yield as of Year-End

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



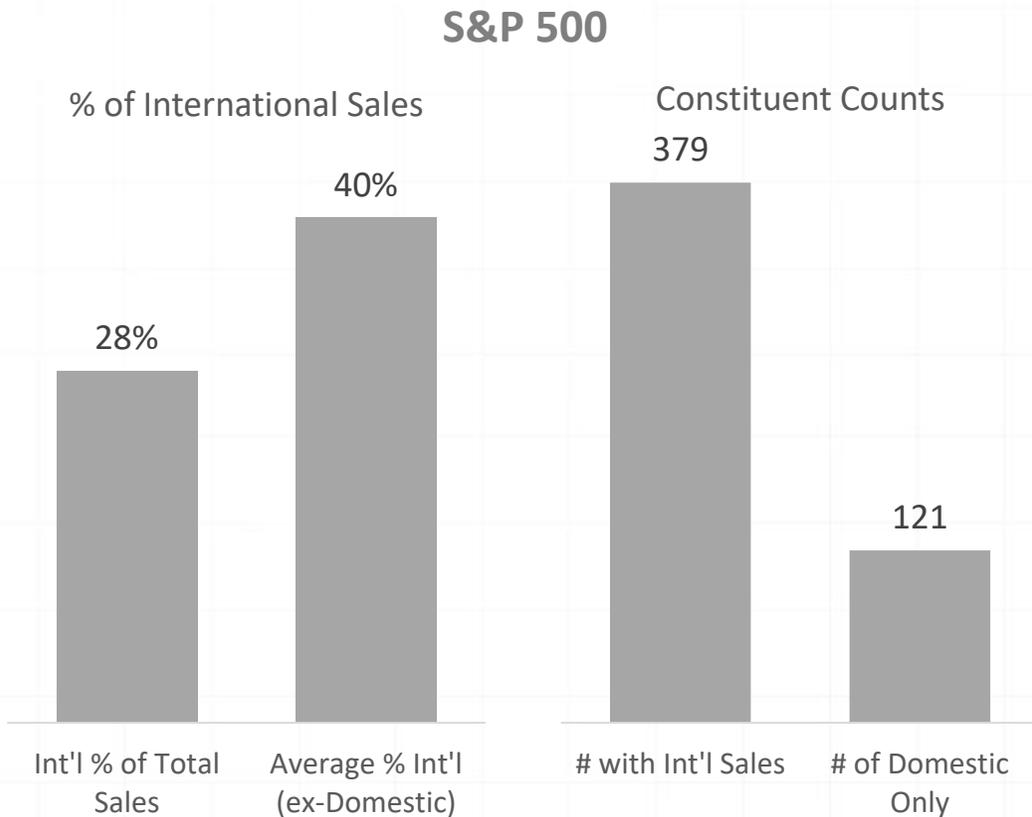
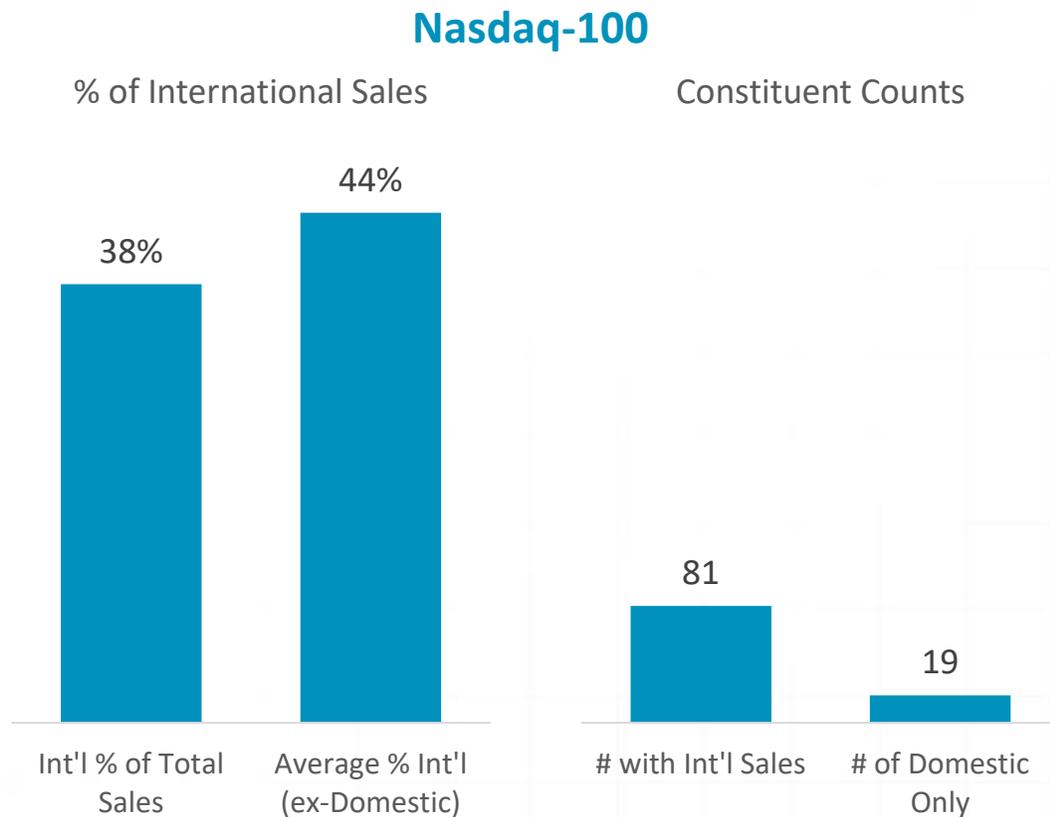
Nasdaq-100 Index: Aggregate Cash vs. Debt Levels

Total Cash vs. Total Debt at Year-End, \$B



A Truly Global Exposure

The Nasdaq-100 tracks a set of companies that tend to be more globally-oriented – by their percentage of internationally-derived revenue – than the S&P 500. In aggregate, 38% of NDX sales were international vs. 28% for SPX. The average NDX company is more international, and the index has a lower ratio of purely domestic firms



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