

THE NASDAQ-100 TURNS 30

Tracking Innovation in Large-Cap Growth

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HIGHLIGHTS

- ▶ Since its inception 30 years ago, the Nasdaq-100 index has become the world's preeminent large-cap growth index.
- ▶ While the Nasdaq-100 is home to some of the most well-known names in technology— including Apple, Microsoft, Google, Intel, and Facebook—the index also includes category-defining companies on the forefront of innovation in other key industries such as Amgen, Starbucks, and Tesla.
- ▶ Since the introduction of index options in 1994, a wide assortment of financial products that track the Nasdaq-100 have been made available to investors. In total, notional value of all financial instruments that follow the index exceeds \$1 trillion.
- ▶ The Nasdaq-100 also serves as the basis for many investable securities, including the BetaShares Nasdaq 100 ETF (ASX: NDQ). The current value of exchange-traded products linked to the Nasdaq-100 currently exceeds \$50 billion, making this Index one of the most widely tracked indices in the world.

INTRODUCTION

On January 31, 1985, the Nasdaq-100 index launched. Since that time, it has become one of the most widely followed stock indexes in the world. The Nasdaq-100 helps guide the investment community on general trends in share prices. Beyond this important informational role, the index has two primary objectives: 1) to focus investor attention on the index's 100 companies and, 2) to provide a basis for investable products. Today, we can say with confidence that Nasdaq has achieved these objectives with remarkable speed and success. Products tied to the Nasdaq-100 are now available in 29 countries, more than \$50 billion of investments in exchange-traded products are tied to the index and derivatives tied to the index have a notional value of over \$1 trillion.

In recognition of the 30th anniversary of the Nasdaq-100, this paper will provide a broad overview of the index, its methodology, its components and its spectacular success in generating tradable products.

GENERAL OVERVIEW

The Nasdaq-100 index was one of two that launched in 1985. One index was launched to focus on the financial companies listed on Nasdaq (Nasdaq Financial-100) and the other to focus on the non-financial companies (Nasdaq-100). These indexes were intended to serve as the basis for possible index futures contracts to be traded on the Chicago Board of Trade. At that time, interest was more centered on the financial companies listed on Nasdaq, so the initial focus was on the Nasdaq Financial-100. However, the non-financial Nasdaq-100 index has garnered the greater attention over the years, and while both indexes currently exist, this paper will deal only with the non-financial index.

The Nasdaq-100 should not be confused with the Nasdaq Composite index. The latter was launched in conjunction with the launch of the Nasdaq Stock Market in February 1971. The Composite is made up of all Nasdaq-listed common stocks, the number of which has varied substantially over the years.¹ Interestingly, it is the Nasdaq Composite—often referred to as

“the Nasdaq”—that receives greater prominence in the media, alongside the Dow-Jones Industrial Index and the S&P 500. However, it is the Nasdaq-100 that has become the basis for investable products, a point that will be covered extensively in this paper.

At its inception, the Nasdaq-100 was designed as a market capitalization-weighted index.² This means that the importance or “weight” of a given component was proportional to its market cap (current price multiplied by total shares outstanding). The index was priced by continually updating the sum of the market caps of the 100 components and dividing this sum by a divisor. The divisor was set at launch so that the index had an initial value of 250, and was periodically updated to account for changes to the index composition in line with standard practice. At the end of 1993, the index was reset to one half its current value—in essence a two-for-one split. Thus, the split-adjusted initial value of the index is now 125.

In November 1998, in order to make the Nasdaq-100 suitable for the basis of an exchange-traded fund (ETF), the index weights were modified away from market cap weights in a special rebalance. These modifications were needed to ensure that the ETF would meet the diversification standards required by the IRS for registered investment companies. In May 2011, the index underwent a second special rebalance that resulted in the index share multipliers being set to one. Greater detail on the index’s modified market cap method will be presented below.

As indicated by the index name, the companies are fixed in number to 100. The fundamental determinant of inclusion is that the issuer be a non-financial company listed on the Nasdaq Stock Market. Whether the issuer is domestic or foreign is not a factor.³ Since inclusion is based on rankings tied to ever-changing market capitalization, the components are periodically reconstituted. In its early years, the addition and removal of components were carried out at various points. However, since 1998 the rebalancing has been carried out annually, on the third Friday in December. The additions and deletions are wholly determined by the market cap rankings. There is no committee making membership determinations, as is the case with other well-known indexes. Indeed, investors determine the membership of the Nasdaq-100.

The Nasdaq-100 employs a rebalancing buffering rule. This rule reduces the number of stocks going into and out of the indexes, thereby avoiding associated transactional costs of rebalancing. If, at the time of rebalance, the market cap of a component is ranked among the top 125 eligible components (not top 100), it will remain in the index for another year; preventing another company from entering. By the following year, the stock must be in the top 100 to remain in the index. In effect, components may be granted a one-year “probation” prior to being removed from the index.

Interim index component changes can occur between the annual December events. A component can be removed due to a corporate event such as a merger or a delisting. The market cap ranking of an eligible replacement is used to determine the additions. In the case of an initial public offering (IPO), a three-month “seasoning” period is required before the issue is eligible to be in the index. Neither large IPOs nor other new listings can join the index before the annual re-ranking, regardless of their market cap, unless there is an interim vacancy.

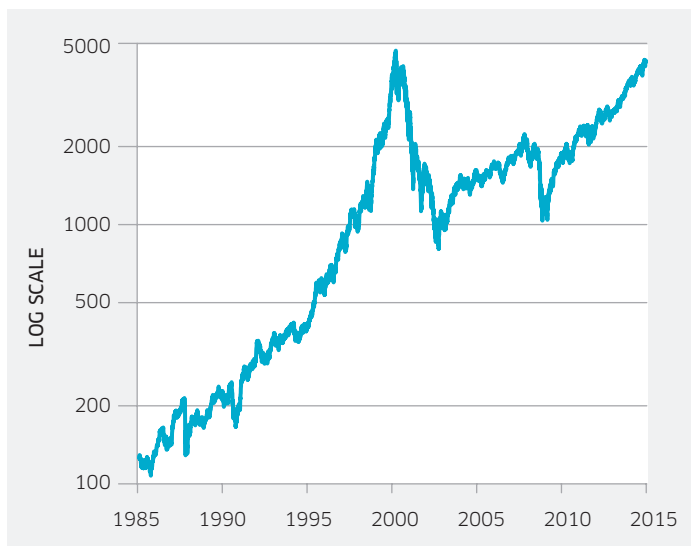
Since inception, the Nasdaq-100 has had 448 members. Some of these companies exited then later rejoined the index. Of the original members at launch, seven are in the current index.⁴ In recent years, between seven and 15 component changes have been made per year, though in the December 2014 rebalance only three components were changed.

In April 2014, Nasdaq changed its policy concerning the number of components. Traditionally, the index has been limited to 100 common-stock issues, with only one issue allowed per issuer. Now, the index is limited to 100 issuers, some of which may have multiple issues as index components. The most prominent current example involves Google, which in spring 2014 essentially executed a two-for-one stock split by issuing a new class of common shares. Both issues are in the current index. At the December 2014 rebalance, all eligible issues from the top 100 issuers became fully represented in the index. This event resulted in the current index containing 107 component stocks, representing 100 issuers.

INDEX PERFORMANCE

It is useful to revisit the trajectory of the Nasdaq-100 over the past 30 years, which is represented in the following graph. Note that the graph presents the index value in logarithmic scale.

NASDAQ-100 Index: Launch to Present



A key feature of the logarithmic scale is that the slope of the line indicates the percentage change in the index value, an indication of the returns achieved by investors. The graph shows solid and steady growth from launch to 1995, when the index increased about 12% per year. This growth accelerated through the remainder of the 1990s to an astounding average rate in excess of 40% per year. The peak occurred on March 27, 2000, with an index value of 4705. During the next few years, the index fell as fast as it had grown, bottoming out at a value of 805 in October 2002.

After its October 2002 nadir, the index began a long recovery, but again suffered serious losses with the financial crisis of 2008, when it dropped to almost 1000. By 2011, these losses had been recovered. Since the start of 2012 the index has increased fairly steadily at an annual rate of about 21%. Though current levels of the index are about 10% below the all-time peak, it is likely that new record highs for the Nasdaq-100 will be set in the near future.

THE NATURE OF THE INDEX COMPONENTS

Interest in the Nasdaq-100 index stems from the special nature of its components. This section reviews the characteristics of the components in a variety of dimensions.

Size

Today's Nasdaq-100 is rightly considered a large cap index. However, this was not always the case. It is interesting to look back at the market cap of the index's components over time. The aggregate market cap of Nasdaq-100 components at launch and at selected points in time is shown in the following table. Also in the table, for purposes of comparison, is the ratio of the Nasdaq-100 total market cap to the total market cap of all NYSE-listed domestic stocks.⁵ This comparison allows one to see the remarkable relative growth in the size of the Nasdaq-100 components.

Aggregate Market Cap of Nasdaq-100 Index Components

DATE	TOTAL NQ-100 MKT CAP (\$BILLIONS)	AS PCT OF TOTAL NYSE MKT CAP
Launch Feb 1985	\$58	3.0%
Dec 1990	\$109	4.0%
Dec 1995	\$409	7.2%
Dec 2000	\$2,218	19.4%
Dec 2005	\$1,932	14.5%
Dec 2010	\$2,498	18.7%
Dec 2014	\$4,822	21.9%

Since the index is made up of 100 components, it is easy to calculate the average size of the components. At the 1985 launch, the average component size was only about \$580 million, compared with a current value of about \$48 billion; an 80-fold increase. In its early days, Nasdaq was in the process of moving beyond a trading utility for non-listed, over-the-counter (OTC) stocks into a distinctly recognized and branded stock market. Companies listed on Nasdaq tended to be either fairly new, or chose not to list on the New York Stock Exchange (NYSE) or American Stock Exchange (Amex). In any case, these companies were not large. Nasdaq's largest company, Intel, was relatively new (IPO in 1980) with a market cap of \$3.5 billion. MCI was the second largest and Apple the third largest, with market caps of \$2.3 billion and \$1.8 billion, respectively. The smallest index components had market caps in the range of \$200 million. (By contrast, the smallest issuers in the current index have market caps exceeding \$7 billion.)

This situation would change in two fundamental ways, which can be seen by comparing changes in the market cap of the components with changes in the Nasdaq-100 index. From launch to the end of 1995, the aggregate market cap rose by a factor of 7.0. The price index, however, rose by a factor of 4.6 (125 to 576, split adjusted). The difference is a factor of 1.5, which is due to additional issuances of shares by existing components and by replacing larger companies for smaller ones at index rebalances. The early growth in the size of the Nasdaq-100 components is due to both pure price appreciation and these other factors. Since the end of the tech bubble, increases in the market cap of the index have been driven primarily by price appreciation, with the other factors only contributing about 5% to the growth in market cap.

The table indicates that, at launch, the total size of the Nasdaq-100 components was only about 3% of the value of NYSE-listed stocks. This percentage grew substantially during the 1990s, reaching 19% at the peak of the tech bubble. After falling during the 2000s, it has since rebounded to a level of about 21%, demonstrating from index launch to present, the size of the top 100 Nasdaq-listed stocks relative to the size of the entire NYSE list has grown by a factor of seven.

For reference, the current average size of the S&P 500 is \$38 billion and the Dow Jones Industrial Average has an average size of \$170 billion. To reiterate, the current average size of Nasdaq-100 is \$48 billion. These data points help solidly establish the Nasdaq-100 as a large cap, though not a “mega cap”, index.

Technology Orientation

The Nasdaq-100 is commonly viewed as a “technology” index. This section examines how this came to be, and specifically how technology stocks drove the evolution of the index and vice versa. The most reliable way to gauge this evolution is through the Industry Classification Benchmark (ICB) scheme for categorizing index components. Since the ICB system was not implemented until 2001, older Nasdaq-100 components were manually categorized into one of the 10 ICB top-level industries for the purposes of classification.

In 1985, Technology was the largest single ICB industry in the Nasdaq-100, but the 23 Technology components only made up 25% of the market cap of the index. Technology was followed by Consumer Services at 21% and Industrials at 15%. The largest stock was Intel, followed by Telecommunications firm MCI, then by Apple Computer. Other components of

interest from the launch date include Adolph Coors, Chi Chi’s Restaurants, HBO, Liz Claiborne, Mack Trucks, and McCormick Spices. These components illustrate the sector diversity of the Nasdaq list in the mid-1980s. The following table shows, for selected dates, the percentage of index weight made up by Technology stocks. Also shown is the second largest industry (and its corresponding weight).

Technology Weighting in the Nasdaq-100

DATE	INDEX WEIGHT IN TECHNOLOGY	NO. 2 INDUSTRY	NO. 2 WEIGHT
Launch 1985	25.1%	Consumer Services	20.6%
End 1990	30.6%	Consumer Services	18.8%
End 1995 (tech boom)	56.7%	Telecommunications	14.6%
Nov 1998 (modified mkt cap)	61.0%	Telecommunications	11.4%
Jan 2003 (market trough)	68.7%	Health Care	15.1%
Sept 2007 (market peak)	58.5%	Consumer Services	17.6%
Feb 2009 (market trough)	53.5%	Health Care	20.3%
May 2011 (special rebalance)	61.6%	Consumer Services	18.3%
End 2014	55.5%	Consumer Services	21.9%

At the dawn of the 1990s, the Technology weight had increased to 31%, and by the middle of the decade, when the tech boom was well underway, it was up to 57%. November 1998 is noteworthy for two reasons: the continued acceleration of the bull market and the special rebalance of index weights mentioned above. At that time, Technology stocks accounted for 70% of the market cap of the index. The rebalancing reduced that weight to 61%, the value shown in the table.

It is also important to note that the 1990s witnessed a boom in Telecom stocks, which represented a distant but solid second place in terms of index weightings.

The next table presents weighting for the start of 2003, by which time the market bubble had fully disappeared.

While the weight of Technology stocks remained high, the Telecommunications industry was represented by only two companies with combined weight of 2%. The largest casualty in the Telecommunications industry was WorldCom, though other telecom firms such as Global Crossing and Sycamore Networks saw much of their value disappear.

September 2007 indicated the market peak prior to the financial crisis. Also shown is the post-crisis trough in February 2009. During both periods, the index weight in technology stocks had declined somewhat from the peak, but still represented a clear majority of index weight.

May 2011 marked the special rebalance that restored the index back to market cap weights. At the rebalance, Technology represented 61.6% of market cap, a comparatively small increase from the 59.2% of the index weight prior to the rebalance.

The current index is still solidly technology weighted, led by issuers such as Apple, Microsoft, Google, Intel and Facebook. Still, the Nasdaq-100 is by no means a pure technology index. In fact, the current technology weight is comparatively low by historical standards. The top non-technology components include:

- **Biotech:** Gilead Sciences, Amgen, Celgene
- **Retail:** Amazon, Starbucks
- **Media:** Comcast, Twenty-First Century Fox
- **Industrials:** Tesla

These components clearly represent growing, category-defining companies that are on the forefront of innovation in their respective industries.

COMPARATIVE ANALYSIS OF COMPONENT CHARACTERISTICS

In this section we compare the components of the Nasdaq-100 with those of two other widely followed indexes, the S&P 500 (SP500) and Dow-Jones Industrial Average (DJIA).

Industry

The technology orientation of the Nasdaq-100 was discussed above. It is interesting to contrast the complete industry breakdown for the three major indexes. The following table shows the breakdown of index weight into the 10 ICB Industries. Recall that the DJIA is price, not market cap weighted.

Breakdown of Index Weight by ICB Industry

INDUSTRY	NQ-100	SP500	DJIA
BASIC MATERIALS	0.3%	2.6%	2.7%
CONSUMER GOODS	4.3%	10.5%	8.3%
CONSUMER SERVICES	21.9%	14.1%	13.6%
FINANCIALS	0.0%	17.6%	25.9%
HEALTH CARE	14.1%	13.3%	10.6%
INDUSTRIALS	3.2%	11.5%	19.0%
OIL & GAS	0.0%	7.9%	7.4%
TECHNOLOGY	55.5%	17.1%	9.8%
TELECOMMUNICATIONS	0.8%	2.2%	2.9%
UTILITIES	0.0%	3.3%	0.0%

Again, the Nasdaq-100 clearly stands out for its high Technology weighting. It is also heavily weighted in Consumer Services and Health Care, the latter being due primarily to the presence of bio-tech companies. Also noteworthy is what the Nasdaq-100 does not contain. Financials, of course, are not included by design, but they make up a substantial portion of the weight of the other indexes. In addition, there are no or very few Utilities, Oil & Gas, and Basic Materials stocks in the Nasdaq-100.

Age

Nasdaq, itself a relatively new market, is generally thought of as the home for younger companies. The following table reinforces this point, and reflects the fact that the Nasdaq-100 (launched 1985) is comparatively a much newer index than the S&P 500 (1957) and the DJIA (1896). For each index component, the incorporation date was determined along with its weight within the index.⁶ The table shows the percentiles of year of incorporation, weighted by the index weight. For example, 25% of the index weight for the Nasdaq-100 is from components incorporated before 1985. Half the index weight is from components incorporated after 1993, and 25% of the weight from companies incorporated after 2000.

Company Age

PERCENTILES OF YEAR OF INCORPORATION

INDEX	25TH	50TH	75TH
Nq-100	1985	1993	2000
SP500	1966	1986	1998
DJIA	1919	1968	1993

The table indicates that even the oldest of the Nasdaq-100 components are much younger than the older components of the other indexes.

Growth

Nasdaq also has a reputation as a home to growth-oriented companies. The following table shows summary statistics for the three-year average revenue growth of the index components.⁷ Shown are both the index-weighted average growth rates, as well as the 25th and 75th percentiles of the average growth rates.

Three-Year Average Sales Growth Rates

	NQ-100	SP500	DJIA
Index-weighted Average	20.5%	8.5%	4.9%
25th Percentile	3.5%	1.5%	1.2%
75th Percentile	21.1%	11.9%	6.9%

The sales growth of the Nasdaq-100 components is much higher on average than that of the other indexes. The Nasdaq-100 contains eight components whose sales growth has averaged more than 50% over the last three years. The DJIA has no components with this level of growth and the S&P 500 has only six.

Dividend Yield

The dividend yield of a company is useful for measuring growth prospects. Companies with substantial internal growth opportunities tend to retain more earnings, paying little or no dividends. The following table shows the fraction of index components that currently pay a dividend, and the index-weighted dividend yield; including the companies with no dividend.⁸

Current Dividend Yields

	NQ-100	SP500	DJIA
Pct of Components with Dividend	50%	83%	100%
Weighted Div. Yield	1.1%	1.9%	2.2%

Only half of Nasdaq-100 index components pay dividends. By contrast, all of the 30 DJIA components do, as do 419 of the SP500 components (83%). Correspondingly, the aggregate dividend yield of the Nasdaq-100 is about half that of the DJIA. It is worth noting that while the dividend yield of the Nasdaq-100 is lower than that of the other indexes, it has been growing. For example, ten years ago the dividend yield was only 0.18%; one-sixth of today's level. The last ten years have seen steady growth in the dividend yield to today's level.

Trends in Dividend Yields

YEAR	NQ-100	SP500
2003	0.10%	1.25%
2004	0.18%	1.30%
2005	0.43%	1.61%
2006	0.55%	1.67%
2007	0.48%	1.82%
2008	0.89%	3.00%
2009	0.74%	1.97%
2010	0.74%	1.81%
2011	0.93%	2.10%
2012	1.20%	2.14%
2013	1.19%	1.48%
2014	1.11%	1.90%

The top Nasdaq stocks, while solidly growth oriented, are in fact substantially more mature and profitable than they were at the height of the tech bubble, and far more likely to pay a dividend. Of note are Microsoft's special dividend in 2004 and the recent initiation of dividend payments by Apple in 2012.

Collectively, the comparative metrics shown above paint a consistent picture: the Nasdaq-100, compared to the other broad indexes, is much more oriented towards younger, growth-oriented companies, particularly technology companies. Indeed, the Nasdaq-100 may aptly be characterized as the world's leading large cap growth index.

NASDAQ-100 ETF NOW AVAILABLE IN AUSTRALIA

With the launch of the BetaShares NASDAQ 100 ETF (ASX: NDQ), Australian investors are now able to access the Nasdaq-100 Index on the Australian Securities Exchange (ASX). The product launched in May 2015 and provides low-cost, transparent exposure to this exciting index.

SUMMARY

Thirty years ago, Nasdaq set out to create a liquid, tradable version of the Nasdaq Composite Index for use in the financial markets. The Nasdaq-100 index, made up of the top 100, non-financial companies listed on the Nasdaq Stock Market, has since become the world's preeminent large cap growth index. In addition to serving as an indicator of the value of its components, the index has been highly successful as the basis for tradable products. With offerings in 29 countries worldwide, derivatives tied to the index having notional value in excess of \$1 trillion, and exchange-traded products having value in excess of \$50 billion, it is clear that Nasdaq has succeeded spectacularly in its mission.

Dara Ades contributed to this paper.

ENDNOTES

1. For more information on the Nasdaq Composite Index, see the white paper. <https://indexes.nasdaqomx.com/IndexBlog/Post/NASDAQ-Composite-How-Today's-4000-is-Different-from-1999>
2. A complete discussion of the index methodology for the Nasdaq-100 is available on the Nasdaq index website: https://indexes.nasdaqomx.com/docs/methodology_NDX.pdf
3. There are a number of additional technical requirements that each component must satisfy. For example, each issue must have average daily volume of 200,000 shares per day or more. In addition, its index weight must be greater than 0.1%.
4. The seven are Apple, Micron Technology, Intel, KLA-Tencor, PACCAR, Costco, and Seagate Technology. Costco is on this list because of the index membership of Price Club, one of the companies that merged to create the current Costco. Of this group, Apple, Intel, PACCAR and Costco/Price Club have been index members continuously during the entire 30-year period.
5. Source: World Federation of Exchanges statistics archive.
6. Source Bloomberg. It is worth noting that the date of incorporation may be reflective of recent corporate actions such as mergers or restructuring. Therefore, the date of incorporation may be much later than the founding date of the parent company. A good example is Visa, the youngest company in the DJIA. Though the parent company was founded in 1958, the current company, formed from four geographical divisions, was incorporated in 2007.
7. Source of revenue growth rates: Bloomberg
8. Dividend yield sources: Bloomberg, FactSet.

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