INDEX INDUSTRY ASSOCIATION

Measuring Markets: The Origins and Benefits of Indexes (A Primer)

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About the Authors

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Summary and Highlights

IN THIS PRIMER

This primer explores the global financial index industry, including its history, current use cases, key benefits, emerging trends, and future outlook.

Highlights

The Value of Data as Seen From the Industrial Age to the AI Era:
The origins of global financial indexes date back to the 1880s, when they emerged in Paris, London, Hong Kong, New York, and elsewhere as statistical snapshots of economic activity during the industrial revolution to track key sectors such as railroads and manufacturing. Despite the passage of time, the fundamental purpose of indexes has endured. Today, indexes continue to function as precise, evolving measurements of financial markets. Using advanced models and data science, modern indexes capture the complexities of new asset classes and industries, offering investors critical information and insights in an increasingly intricate landscape.

Indexes as Independent Statistical Calculations for the Financial Ecosystem:
Financial indexes occupy an important place in the global financial ecosystem, providing critical statistical measurements of the performance of groups of financial assets such as stocks, bonds, and commodities. These measurements are typically calculated by independent firms that are unaffiliated with financial institutions such as asset managers or banks that design, manage and sell financial products such as exchange traded funds (ETFs) or mutual funds. With over three million financial indexes globally,[1] there are many use cases across both passive and active management, including benchmarking, financial product construction, asset allocation, research, regulatory compliance, and other purposes.

1 Index Industry Association Survey Reveals 3.7 Million Indexes Globally. *Index Industry Association, noting more than three million indexes (November 15, 2018)*

Key Benefits of Indexes

1. **Transparency and Independence:** Indexes are constructed using transparent, rules-based methodologies and governance procedures, ensuring objectivity and integrity, and reducing conflicts of interest. Independent index providers play a crucial role in providing markets with indexes covering an extensive variety of markets, asset classes, investment strategies and themes.

2. **Choice and Innovation:** The proliferation of indexes enables investors to target their specific investment preferences, including sectors, regions, styles, risk tolerances, values and unique investment themes and strategies. Thus, index tracking investment products can be created by financial institutions to support both broad diversification and targeted thematic investing.

3. **Cost Savings for Investors:** When used to underpin an investment product such as an ETF, indexes can significantly reduce costs for investors by lowering or eliminating many expenses incurred by actively managed funds.

Emerging Global Index Industry Trends

1. **Expanding Choice:** Indexes have been instrumental in providing investors with insight into new markets and asset classes as well as enabling innovative investment strategies by fund managers. The constant expansion of the number and types of indexes, coupled with significant growth in customization capabilities that allow users to design specialized indexes to meet their unique needs and strategies, have created seemingly "endless choice" for investors.

2. **Use of Derivatives to Manage Risk:** Derivatives linked to indexes – such as futures and options – are increasingly used to hedge risk and manage volatility, especially in uncertain markets.

3. **Value of Data:** Investors value data that provides greater transparency and insights into portfolios and markets. Indexes are an important and growing source of such transparency and insights. Index providers are responsible for ensuring their data is high quality and accurate.

4. **Index Use Across Passive and Active Strategies:** The use of indexes continues to be widespread by both passive and active asset managers. Whether underpinning a passive product such as an ETF or as a benchmark to evaluate the performance of an actively managed fund, indexes play a foundational role across the investment ecosystem.

5. **Integration of Technology into Index Construction:** Automation streamlines index construction, management, and customization, while blockchain is being explored for its potential to enhance transparency, data security, and operational efficiency.

6. **Growth and Competition:** In addition to established, large index providers who compete for clients, the industry also is seeing new entrants and smaller, specialized index providers who contribute to innovation and competition.

Future Outlook

The index industry is poised for continued growth as use cases and the number of indexes continue to expand, along with the need for more transparency and insights across financial asset classes and strategies.

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Introduction

Financial indexes are statistical measures that track the performance of groups of financial assets such as equities, bonds, or commodities. They are essential tools in modern financial markets.[2] This primer explores the evolution of indexes from simple measurements of market and sector performance to today's multi-purpose tool that can leverage advanced technologies including AI, blockchain, and other innovations. It clarifies what indexes are, how they differ from financial products, their role in the financial ecosystem, and emerging industry trends.

With over three million financial indexes globally, their use cases span benchmarking, research, asset allocation, and underpinning index-linked investment products, offering investors nearly endless choice and insights into markets and portfolios. Originating in the 1880s[3] alongside industrial innovation, financial indexes have consistently served to track market performance. Today, independent index providers offer precise measurements across sectors, geographies, and investment themes, powering investment innovation, insights and analysis.

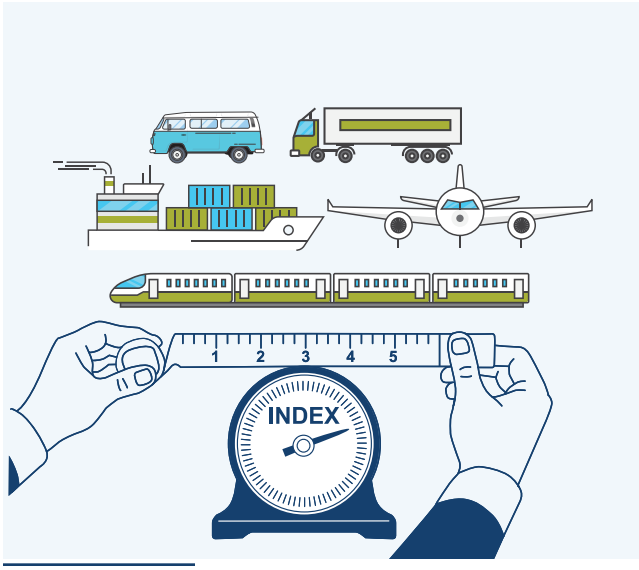
Definitions and Core Concepts

The following are foundational concepts helpful to understanding financial indexes and their ecosystem:

Financial Index: A statistical calculation that measures the performance of a specified group of financial assets, such as equities, bonds, commodities, or currencies.

Index Providers: These are typically independent firms – unaffiliated with investment firms or other financial institutions – that design, calculate, and maintain financial indexes. Index providers collectively create and administer millions of different indexes using proprietary methodologies. Index providers license their indexes to third party financial institutions who may use the indexes for many purposes, including performance benchmarking and to create and manage financial products such as ETFs. The independent index provider model mitigates conflicts of interest that exist for investment firms and other financial institutions that calculate indexes and manage or sell investment products such as ETFs that use their proprietary indexes. While there are asset managers, banks and other financial institutions that administer their own indexes, these firms are not considered index providers for the purposes of this primer because they may also manage or sell financial products linked to their proprietary indexes.

Index-Linked Investment Products: Financial institutions may obtain a license from an index provider in order to design and manage a fund or other product that seeks to replicate the composition or performance of the specific index, such as a mutual fund or ETF. These financial institutions determine which index best aligns with their investment objectives.



2 Foundations of Finance: Index Models, Prof. Alex Shapiro, NYU Stern School of Business at https://pages.stern.nyu.edu/~ashapiro/courses/B01.231103/FFL08.pdf (as of July 28, 2025).

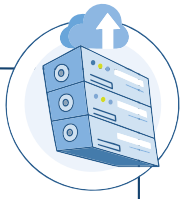
3 Pierre-Cyrille Hautcoeur, "The development of the Paris Bourse in the interwar period What old and new stock indexes tell us," Université Paris I image049.pngimage002.pngimage050.pngimage052.pngimage053.pngimage055.pngimage052.pngimage011.pngimage016.pngimage020.pngimage022.pngimage047.pngimage048.png(Matisse).

Index Methodologies: Index providers utilize rules-based methodologies, typically published on their websites, outlining eligibility criteria, calculation rules, rebalancing schedules, and governance structures. These methodologies vary by firm and index, and are used to construct, administer and maintain indexes. The range of methodologies reflects the diversity of the market and the different needs and goals of index providers' clients. Common factors for determining an asset's eligibility for inclusion in an index include a company's market capitalization, liquidity, domicile and sector.

Role of Indexes in the Financial Ecosystem: The below infographic illustrates the typical role of independent index providers within the broader financial ecosystem.

Market data

Market makers and traders facilitate trading of financial instruments on the market (on or off exchange) to determine the prices for financial instruments.



Data providers and exchanges

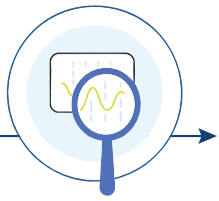
Regulated data providers (e.g., stock exchanges) distribute raw data such as stock prices and financial statements, which are used as input by index providers to create an index based on a pre-defined methodology.

Index providers

Index providers act as service providers developing an index methodology and administering the index. They do so transparently and independently from any investment product that uses an index (i.e., ETFs). In some markets index providers are regulated (under the EU Benchmark Regulation).

Index users

Asset managers, banks and product issuers, among others create index-linked investment products, such as Exchange-Traded Funds (ETFs), that are linked to a specific index.



Investors

Professional or retail investors purchase, sell, and trade investment products, (e.g. ETFs). Asset managers manage investment portfolios including such investment products based on investors' choices.

Historical Lens: Indexes as a Statistical Measurement

The emergence of indexes can be traced back to the late 19th century, a time of sweeping industrial, technological, and economic transformation.[4] As railroads, mechanized manufacturing, and early financial exchanges expanded rapidly, individuals and institutions alike faced challenges in interpreting the scale and direction of these sweeping changes. In response, financial indexes emerged as essential tools for measuring and communicating the performance of emerging industrial sectors during a time of accelerating invention.

Developed initially as statistical instruments, early indexes of the 1880s – such as Charles Dow's stock averages, the London Stock Exchange Index and the Paris Bourse Index,[5] and indexes published in Berlin, Amsterdam, and Hong Kong – served as barometers of sectoral activity.[6]

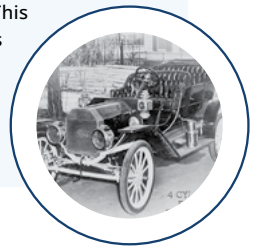
Timeline of the Indexes

1880s–1900: Indexing Begins with Railroads & Industry

The earliest stock indexes emerged to track leading sectors like railroads, steel, and oil, which dominated the U.S. economy. In 1884, Charles Dow published a stock average of 11 major stocks—mostly railroads. By 1896, this evolved into the Dow Jones Industrial Average, reflecting the broader industrial boom and laying the groundwork for modern index construction.

Early 1900s: Industrial Expansion

The surge in sectors like automobiles and steel led to more diverse company listings on stock exchanges. This made single-industry indexes insufficient and sparked the development of indexes that tracked broader markets and sectors.



Mid-1900s–Present: Globalization & Capital Flows

As global markets opened and economies became more interconnected, new indexes emerged to track international sectors and emerging markets. With capital flowing across borders, indexes now provide critical snapshots of performance across defined geographies, enhancing transparency, comparability, and investor access worldwide.

1920s–2020s: Growth in Stock Ownership

Global stock ownership expanded dramatically:

- 4.4 million+ shareholders in 1900[1]
- 18 million+ by 1928
- 29.8 million+ by 1980[2]
- 165 million+ individual investors globally by 2025[3]

As investing became more mainstream, demand grew for reliable performance benchmarks, fueling index innovation.

4 Pierre-Cyrille Hautcoeur, "The development of the Paris Bourse in the interwar period What old and new stock indexes tell us." Université Paris I (Matisse).

5 Global Stock Markets in the Twentieth Century, Philippe Jorion and William N. Goetzmann, Journal of Finance, 1999.

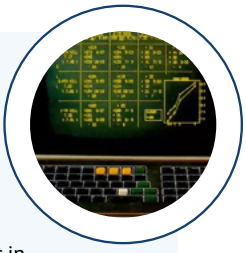
6 "The development of the Paris Bourse in the interwar period What old and new stock indexes tell us."
Pierre-Cyrille Hautcoeur, Université Paris I (Matisse).

1 History of U.S. Markets (1792-1929), The Price Group; See also Philippe Jorion and William Goetzmann, Global Stock Markets in the Twentieth Century, Journal of Finance, (1999).

2 Stock ownership up (Dec. 8, 1980)(29.8 million in US); Common Ownership: Europe v. US

3 Barry Elad, Retail Investing Statistics 2025: Key Trends Shaping the Market, Coinlaw, (July 15, 2025).

1960s–2000s: Industrial Expansion



Advances in data, trading platforms, and market transparency propelled index adoption:

Electronic trading in the '60s–'70s cut costs dramatically.

Trading costs fell from ~50–60 bps in the 1990s to <1 bps by 2010.[1]

ETF emergence revolutionized access to index-based strategies.

1976:

John Bogle's Vanguard 500 Index Fund launch marked a turning point, laying the foundation for modern passive investing.

Indexes today continue to serve as the statistical backbone of global markets, shaping investment strategy, enabling diversification, and translating economic change into measurable data.

1 Kirsten Wegner and Kevin Kang, A Report on Market Automation and Democratizing Markets: Lowered Bid-Ask Spreads and Investor Savings, (June 2021), Modern Markets Initiative.

Financial Indexes: Overview of Use Cases

The primary use cases of indexes include benchmarking investment performance, investment research, asset allocation, and serving to underpin index-linked investment products such as ETFs, mutual funds, and derivatives.

Index Use Cases: Benchmarking, Research, and More

The first and foremost use case of indexes is to measure and benchmark the market. This includes applications such as benchmarking performance, informing academic and market research, supporting regulatory compliance, and enabling analytical tools for risk assessment and economic forecasting. Additional examples are outlined in the matrix below.

	USE CASE	DESCRIPTION
	Performance Benchmarking	Indexes are used to evaluate the performance of portfolios, asset managers, or strategies.
	Academic and Market Research	Indexes are used as representative samples of markets or sectors in research.
	Regulatory Compliance	Indexes help financial institutions meet disclosure or reporting obligations.
	Reference Rates	Some indexes serve as benchmarks for interest rates or derivative pricing, helping investors and borrowers better understand costs and risks.
	Economic Indicators	Market indexes used as economic gauges help investors of all sizes interpret macroeconomic trends, leveling the playing field with tools once reserved for institutional analysts.

	USE CASE	DESCRIPTION
	**Listing Standards**	Exchanges use indexes to set listing or retention criteria, providing increased levels of transparency and public disclosure.
	**Custom Institutional Benchmarks**	Custom indexes provide institutional investors with the means to benchmark performance of unique or highly customized portfolios or investment strategies.
	**Corporate or Sector Analysis**	Analysts use indexes to evaluate the health or trends of specific industries or sectors.
	**Risk Management**	Indexes used in tools like derivatives (e.g., on equity indexes or credit default swaps) or volatility measures give all market participants a clearer view of systemic risk, fostering more resilient and inclusive investment environments.
	**Policy Setting and Monitoring**	Central banks using indexes to guide policy helps ensure financial system stability, which protects retail investors and encourages broader participation in markets.

Use Cases: Indexes Used by Investment Products

Indexes vary significantly in what they measure and how they're constructed. They can be based on a wide range of criteria, including asset class, issuer type, security characteristics, geographic region, industry sector, or investment strategy. In addition, use cases can include indexes that underlie tradable products, such as derivatives. They can also include many companies or only a few companies, depending on what they are measuring and their construction rules.

> *"As the basis for different passive investment vehicles, indexes have been instrumental to the rise of ETFs."*
>
> *—Index Industry Association (IIA)*

Financial indexes are not investments, and independent index providers do not manage or offer investment products that track their indexes. A financial index is simply a mathematical calculation, the statistical measurement of the performance of a defined group of assets. Indexes and independent index providers do not provide investment advice or recommend investments in any of the companies included in the index.

Any financial product such as an ETF or mutual fund that tracks an index is a separate and distinct offering that is constructed, managed, marketed and sold by an unaffiliated third party who allocates capital, makes investments and manages the holdings of the fund.

Key Benefits of Indexes

Indexes offer a range of valuable benefits, including: (1) enhanced transparency and independence; (2) expansion of investment choices and innovation, resulting in diversification of strategies; and (3) lower cost investing options for institutions and individuals.

Transparency and Independence

A core benefit of indexes is that they bring transparency and independence to measuring the performance of markets and other investment sets. By offering standardized, objective benchmarks across sectors and asset classes, indexes enable investors and analysts to assess market and investment performance with greater clarity and accuracy free from conflicts. Each index is built using a systematic, rules-based methodology that relies on clearly defined criteria, reducing the potential for manipulation and ensuring consistent, transparent administration.

Index providers disclose detailed methodologies, including eligibility criteria, rules of construction, and rebalancing schedules. This transparency helps ensure that users of financial products that seek to replicate indexes, such as ETFs and mutual funds, understand how the index functions.

Notably, indexes are regularly rebalanced (for example, quarterly or monthly) in accordance with their methodologies to reflect market changes, such as mergers or other corporate events and actions, to ensure that they continue to accurately represent the relevant market or segment. Index rebalancing results are communicated to clients to ensure transparency and accountability that the index is following its published methodology.

Frameworks, such as voluntary IOSCO Principles for Financial Benchmarks and the EU Benchmark Regulation, provide additional guidelines for administering indexes, reinforcing the credibility, integrity and reliability of indexes.

Research, such as the study by Rawson and Rowe (2024)[7], suggests that funds tracking indexes have the potential to improve corporate governance. The study concludes that such funds help reduce bias in financial reporting by lessening managerial incentives for earnings manipulation, with more straightforward, transparent disclosures than firms dominated by active fund ownership.[8]

Publishing an index methodology and applying it consistently help ensure that index design and calculation are rooted in systematic, transparent criteria rather than fluctuating and discretionary determinations. This transparency supports informed decision-making, making indexes invaluable tools to support informed investment decisions.

Choice and Innovation

Indexes have enabled greater investment choice and customization through the proliferation of investment products that track indexes. The ongoing expansion of technology and data capabilities has greatly broadened the scope of what can be measured by indexes. While traditional equity indexes remain most prevalent, new methodologies enable the construction of bespoke benchmarks based on customer-specified alternative criteria such as sustainability, thematic investing, or smart beta strategies. This proliferation of new and customized index designs reflects both investor demand and the technological capacity to deliver highly targeted, rules-based indexes at scale.[9,10]

This diversity of index choice provides tremendous flexibility, enabling investors to design customized indexes to support their unique strategies based on specific sectors, regions, risk/return objectives, or values or other bespoke criteria.[11]

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7 Rawson, C., Rowe, S.P. The power of not trading: Evidence from index fund ownership. Rev Account Stud 29, 388–422 (2024)(cost. See Fidelity "What is an Index Fund" - ("Relatively low costs and low fuss are 2 perks").

8 Rawson, C., Rowe, S.P. The power of not trading: Evidence from index fund ownership. Rev Account Stud 29, 388–422 (2024).

9 Blackrock. Index Investing Supports Vibrant Capital Markets (October 2017)

10 Rawson, C., Rowe, S.P. The power of not trading: Evidence from index fund ownership. Rev Account Stud 29, 388–422 (2024). https://doi.org/10.1007/s11142-022-09726-9 at https://link.springer.com/article/10.1007/s11142-022-09726-9

11 Besson, N., & Mittoo, U. R. (2022). "*From Niche to Mainstream: The Proliferation of Thematic ETFs and Their Impact on Investment Choices.*"

Cost Savings for Investors

Indexes have also enabled investment managers to innovate and develop lower cost investment products.[12] This cost advantage comes from managing portfolios that track or replicate an index, reducing the resources and costs required to actively manage funds.[13] Small differences in annual investment fees, when compounded over decades, are significant.[14]

In addition, investment products tracking indexes also frequently have reduced portfolio turnover. Because they are structured to track a benchmark with minimal deviation, they tend to engage in less frequent trading compared to actively managed strategies. This lower turnover can reduce trading-related costs. According to BlackRock (2017), "By definition, index funds generally have lower turnover since the stocks are traded almost exclusively to track the performance of the underlying index as closely as possible." This structural characteristic enhances their cost efficiency and contributes further to investor returns.[15]

12 Patrick J. Cotton, University of New Hampshire, Durham, Index Funds and ETFs: Simplifying Investing for Better Returns (Spring 2023).

13 Lo, Andrew W, MIT, "What Is an Index?" The Journal of Portfolio Management 42.2 (2016): 21–36; Publisher: Institutional Investor, Inc. (noting the rules based methodologies of index products as "systematic, i.e., entirely rules-based and contain no judgment or unique investment skill," supporting how index models lower operational complexity and enable vehicles for scalable portfolio management).

14 *ESMA report finds investment product performance highly impacted by charges,* ESMA50-165-731 (January 10, 2019).

15 Blackrock. Index Investing Supports Vibrant Capital Markets (October 2017)

Emerging Global Index Industry Trends

A close evaluation of the index industry in 2025 reveals six defining trends within the financial ecosystem:

#1 Expanding Choice: The Rise of Thematic Indexes and Customization Capabilities

A defining trend in the index industry in 2025 is the proliferation of new indexes and customization capabilities that seemingly create endless choice. Investors now have access to an expanding array of investment products that utilize this growing number and diversity of indexes, from thematic indexes reflecting specific investment trends, to fully customized indexes that reflect unique investment strategies or constraints. This proliferation of choice enhances diversification opportunities, allowing investors to manage and allocate resources across a wide spectrum of index tracking investment products.

As of 2025, the global thematic investment market is estimated to be in the range of $500–600 billion of investment products utilizing thematic indexes. Among the key thematics are AI, defense, healthcare, robots and sustainability.

Emerging Markets, Global Indexes: Indexes measure more than just large developed markets. Emerging markets are gaining traction as thematic investments, driven by their growth potential and dynamic economies. Data from Morgan Stanley finds that emerging markets now account for about 26% of global market cap, up from 19% in 2009, though still below their share of global GDP.[16] Financial products tracking global indexes blending developed and emerging markets offer diversification benefits and help mitigate regional or sector-specific risk.

16 Goldman Sachs, *Emerging stock markets projected to overtake the US by 2030* (June 22, 2023)
("Our economists project EMs' share of the global equity market will rise from around 27% currently to 35% in 2030, 47% in 2050, and 55% in 2075.")

Demand for tailored indexes is rising, driven by advances in data analytics and artificial intelligence. These technologies enable providers to create indexes based on specific criteria like sector or geography. For example, the direct indexing asset growth rate in 2024 was 22.4%, double industry forecasts, reflecting a broader shift toward customized investment strategies among institutional, high net worth, and retail investors.[17]

#2 Risk Management: The Development of Volatility and Risk Control Indexes

A key trend is the growing demand for tools to manage risk, particularly through the use of index-linked derivatives for hedging portfolio risk. Financial instruments such as options, futures, and swaps are increasingly used by market participants to manage portfolio risk, which is particularly important during periods of market stress. Indexes help enable standardization, liquidity, and broad exposure, qualities that make them ideal underlyings for derivatives. These products are used to provide tools for hedging, speculation, income strategies (such as dividend trading), and structured investment solutions across asset classes. Derivatives on indexes allow investors to efficiently gain exposure to the assets represented by a particular index, without holding each constituent. Tradable index derivatives are available in a broad range of contract sizes and expiration dates, providing investors with flexibility to match strategies to risk management needs. Index-linked futures are among the most liquid and widely traded instruments, facilitating efficient exposure to markets or sectors and playing a central role in institutional risk management.

As shown in the table below, a range of volatility index-linked derivatives are available to support risk mitigation strategies. A 2021 CFA Institute survey found that 80% of institutional investors use such instruments to manage portfolio risk.[18] The global derivatives market, including volatility-based derivatives, was estimated at about $28 billion in 2024; looking ahead, this market is projected to surpass $59 billion by 2033, at a projected 8.6% continual annual growth rate (CAGR), underscoring the growing demand for derivatives as essential tools for navigating market uncertainty.[19]

Examples of Index-Linked Derivatives Used for Managing Risk and Volatility

DERIVATIVE TYPE/ STRATEGY	INDEX PRODUCT/ APPLICATION	PURPOSE/ BENEFIT	KEY TREND/ DEVELOPMENT
Futures, Options, Swaps	Index funds, ETFs, structured notes	Hedging, volatility, risk transfer, margin efficiency, potential for tax efficiency	Mainstream use for risk management, liquidity
Volatility-based Derivatives (e.g., VIX, VSTOXX futures/ options)	Equity index overlays, volatility indexes	Downside protection, drawdown reduction	Growth in long volatility overlays, especially post-2020
Volatility-based Controlled Indexes (VCIs)	Risk control indexes, index-linked annuities	Target volatility, dynamic allocation, leverage/cash	Rapid adoption in insurance, retirement products
Structured Notes, Equity-linked Derivatives	Custom index-linked products	Customized risk/reward e.g., downside floors, capped upside	Customization for specific investor needs
VaR-based Derivative Limits	Mutual funds, ETFs	Regulatory risk caps, improved transparency	SEC Rule 18f-4 formalizes risk management[20]

17 The Case for Direct Indexing: Differentiation in a Competitive Marketplace (Dec1,2022)

18 CFA Institute, *Levels of Trust in Financial Services Reaches All-Time High (April 20, 2022)*

19 Global Growth Insights, *Derivatives Market Size, Share, Growth, and Industry Analysis, By Types (Financial, Commodity); Regional Insights and Forecast to 2033 (July 7, 2025)(noting that the global derivatives market, including volatility derivatives, was estimated at about $28 billion in 2024; looking ahead, this market is projected to surpass $59 billion by 2033, at projected 8.6% continual annual growth).*

20 SEC, *Use of Derivatives by Registered Investment Companies and Business Development Companies: A Small Entity Compliance Guide*.

#3 Value of Data

A third key trend in the index industry is the recognition of the value of data produced by index providers. This data is useful for its accuracy, quality, and comprehensive scope, spanning thousands of securities, across geographies, sectors, and asset classes, often updated in real time.

Index providers aggregate and curate complex datasets, including pricing information, fundamental data, corporate actions, free float information, ESG metrics, and more. These inputs are normalized, validated, and maintained under transparent, rules-based methodologies that ensure consistency and reliability.

As a result, index data serves as a trusted foundation across the financial ecosystem.

#4 Index Use Across Passive and Active Strategies

A key trend in the index industry is the widespread use of indexes in both passive and active investment management. Passive strategies have transformed investing by offering efficient, low-cost access to market exposures, driving broad adoption among investors; at the same time, indexes also play a critical role in active management. Active managers rely on indexes for benchmarking performance, constructing portfolios, and evaluating risk, highlighting the versatility and foundational role of indexes across the investment spectrum. It is reported that the active ETF space is growing,[21] with the role of the index in this use case as a point of comparison or reference for performance.

#5 New Technologies (AI, Blockchain, Defi) and Potential Future Impact on Efficiency and Construction of Indexes

New technologies, such as artificial intelligence, blockchain, and defi, yield the potential to provide for efficiencies in the operation and construction of indexes in the future.

Artificial Intelligence (AI)

At its core, an index requires extensive analysis of vast amounts of data, compiled in a robust and resilient database, supported by technology and tools that allow for back casting, testing, and forecasting across an extensive number of scenarios quickly and efficiently. AI has the potential to further enhance index creation, which involves an intricate process of accessing, normalizing, screening, and tracking large and complex financial data sets.[22]

Across the lifecycle of financial index development, AI could potentially be utilized for:

1. Design and Construction of Financial Indexes: AI has the potential to help in constructing smarter and more adaptive indexes:

- Factor Identification: Machine learning algorithms could be used to detect hidden factors or correlations across large datasets that traditional models may miss (e.g., momentum, value, sentiment).
- Feature Selection: AI could be used to automate the selection of relevant financial indicators (e.g., P/E ratios, volatility) based on predictive power.
- Optimization Models: Reinforcement learning and genetic algorithms could optimize index rules and constituent weighting (equal-weighted, cap-weighted, or smart beta).
- Sustainability and Thematic Indexes: NLP and sentiment analysis could help include companies based on environmental, social, or governance performance.
- Robo-Indexing: AI could be utilized to customize indexes for investors based on their preferences, goals, and risk appetite.

21 Steve Johnson, Asset managers launch active ETFs at record pace, Financial Times (July 22, 2025)(noting Such funds now exceed passive ones in number in the US in a big shift for the $17 trillion dollar ETF industry)

22 For example:
The New York Stock Exchange (NYSE), The Nasdaq Stock Market (Nasdaq), the Chicago Mercantile Exchange (CME), and the London Stock Exchange (LSE) alone generate more than 15 terabytes of raw data on a daily basis including quotes, trades, orders, and depth of market. According to the Bank for International Settlements (BIS), as of 2022 over $7.5 trillion USD worth of currency is traded globally on an annual basis including spot transactions, forwards, swaps, and options. The CME and Intercontinental Exchange (ICE) collectively trade over 30 million contracts on a daily basis. This is a subset of all the data generated by global financial markets.
The US Internal Revenue Code (IRC) is 6,500 pages long and with interpretations and guidance the number jumps to 70,000 pages. The US Securities and Exchange Commission (SEC) rules are primarily codified in Title 17 of the Code of Federal Regulations (CFR), specifically Parts 200 to 399. These rules can run to 5,000 pages (depending on annotations and formatting). If printed in full, the entire FINRA Rulebook (including all categories and interpretive guidance) would exceed 3,000 pages. The UCITS rules (Undertakings for Collective Investment in Transferable Securities) are a comprehensive body of European Union regulations that govern collective investment schemes aimed at retail investors. If you were to print all the core UCITS rules and related guidance, you're easily looking at over 1,000 pages of legal, regulatory, and technical content. This is small subset of US and European regulations, and they cover a fraction of the global regulatory framework for financial services and investments.

2. **Data Integration and Analysis: AI has the potential to enhance data processing and integration capabilities:**
    - Alternative Data Sources: Natural Language Processing (NLP) could be utilized to analyze unstructured data like earnings calls, social media, and news sentiment.
    - Real-Time Data Processing: AI-powered systems could process and update indexes in real-time with streaming data (e.g., for high-frequency trading indexes).
3. **Index Calculation and Rebalancing: AI has the potential to ensure dynamic and efficient rebalancing:**
    - Dynamic Rebalancing: Predictive models could trigger rebalancing based on market signals rather than fixed schedules.
    - Anomaly Detection: AI could detect and correct data anomalies that might otherwise skew index values.
    - Error Reduction: Machine learning has the potential to validate and back test index calculations to minimize human error.
4. **Back Testing and Performance Evaluation: AI could allow for more accurate and faster validation:**
    - Scenario Testing: AI could be utilized to simulate performance under various market conditions using historical and synthetic data.
    - Explainable AI (XAI): Could be utilized to help regulators and users understand why certain components were included or excluded from the index.
5. **Customization and Thematic Indexes: AI has the potential for further enabling customized and niche index creation:**
    - Sustainability and Thematic Indexes: NLP and sentiment analysis could help include companies based on environmental, social, or governance performance.
    - Robo-Indexing: AI could be utilized to customize indexes for investors based on their preferences, goals, and risk appetite.
6. **Risk Management and Compliance: AI has the potential to ensure robustness and adherence to regulations:**
    - Stress Testing: AI could be used to forecast the behavior of indexes under extreme market conditions.
    - Regulatory Monitoring: Automated checks could be used to ensure index methodologies comply with relevant standards (e.g., EU Benchmarks Regulation).

Blockchain and Financial Indexes

Blockchain technology also holds potential applications in the indexing space. Its integration could have applications regarding data security, transparency, and efficiency, potentially impacting how indexes are created and tracked in the future.

The integration of blockchain into financial indexes is still in its early stages, but several initiatives are underway, including exploring the potential of using distributed ledger technology (DLT) for creating more transparent and efficient index solutions as well as investigating blockchain's role in enabling more efficient index rebalancing processes.

These initiatives point to the growing recognition of blockchain's potential to address longstanding challenges in index management, such as reducing costs, improving transparency, and increasing operational efficiency.

INDEX PROVIDER / PROJECT	BLOCKCHAIN APPLICATION	DESCRIPTION / USE CASE	KEY BENEFITS
Vanguard + Symbiont + CRSP	Index data sharing and automation	Uses blockchain to automate and expedite index data delivery between providers and market participants	Faster, automated, lower risk, cost savings

INDEX PROVIDER / PROJECT	BLOCKCHAIN APPLICATION	DESCRIPTION / USE CASE	KEY BENEFITS
WisdomTree Blockchain UCITS Index	Index tracking blockchain/crypto companies	Index measures performance of companies involved in blockchain and crypto technologies	Thematic exposure, ESG screening
Index Blockchain Index	Index tracking blockchain-related companies	Tracks companies using, investing in, or developing blockchain technology	Thematic exposure
Nasdaq Blockchain Economy Index	Index tracking blockchain economy companies	Measures returns of companies materially investing in blockchain development	Thematic exposure
Tokenized Index Funds (TIFs)	Tokenization of index funds	Uses blockchain to tokenize index funds, allowing programmable, digital index fund securities	Liquidity, transparency, programmability

Looking ahead, it is anticipated that further use cases will be explored in the index industry to demonstrate both the operational and investment-focused applications of blockchain, including improving backend data processes. As blockchain technology matures and becomes more widely adopted, it is likely that its integration into the index industry may expand, driving further innovation.

#6 Growth and Competition

A sixth trend is the continued expansion of the industry and increased competition. In recent years, the industry has seen a notable rise in the number of index providers, which has introduced more competition and specialization to the market.[23] New entrants often focus on tailored, thematic, or alternative indexes that cater to specific investor needs.[24] Areas such as thematic investing, smart beta strategies, and emerging markets have become primary areas of focus for these firms, allowing them to differentiate themselves from the larger traditional index providers.

The presence of new entrants and specialized providers contributes to the imperative to innovate, leading to the development of more choices for index users.

Conclusion

The future of indexing holds considerable promise of continued growth and innovation to support investors' increasing needs for independent and objective transparency tools that facilitate greater investment insights and choice customization. Index providers are establishing new and varied indexes, competing against one another, and adapting to meet evolving investor needs. With further developments in technology, and the rapid rate of innovation, indexes can and will continue to play an important role in bringing greater transparency and critical tools to a changing investment landscape.

23 Michał Zaleśkiewicz & Katarzyna Sznajd-Weron, *"New Trends in the Stock Market: The Development of Index Providers and Index-Based Investment," Economics and Business Review 4(14), no. 1 (2018): 92–108. (This paper by researchers from the University of Łódź analyzes the evolution of index providers, including the growing specialization in the financial markets, which necessitates the creation of indexes for new, often niche, financial market segments and investment strategies.)*

24 Vibeka Mair, Little Fish Take a Bite Out of ESG Indices Market – Sustainable Investor, (March 15, 2023)(ESG indices are seeing breakneck speed growth, with smaller providers growing in influence.; Other' smaller providers, mostly based in the Asia-Pacific region, took US $117 million or 43.4% of global ESG index revenue in 2021).