The Life Cycle of Market Champions

Throughout history, certain companies have dominated the equity market, but the process of creative destruction makes staying on top for long periods of time very difficult.

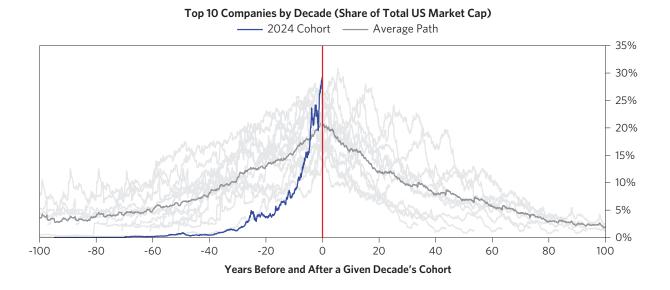
JUNE 18, 2024

BOB PRINCE
KHIA KURTENBACH
THOMAS MAISONNEUVE



ne of the defining characteristics of the current market environment is the extent to which a few companies are dominating the top of the stack. The 10 largest US companies account for almost one-third of the US equities market cap—a degree of concentration we haven't seen in decades. These champion companies are such a large share of the market because they have done amazing things and the markets are discounting that this will continue. Throughout history, there have always been market champions: railroads once accounted for over a third of the market, but their inability to adapt to structural changes eventually destined them to lose. The same can be said of chemical conglomerates, which rose to the top with the invention of plastic but slowly succumbed as they failed to innovate and as patterns in demand shifted.

In this report, we take a historical look at how market champions of the past have risen and fallen in significance to shed light on how those mechanics may play out today. We looked back over the last 120 years at the champions of the past, how long their reign lasted, and the tendencies that led to their decline. The chart below illustrates the rise and fall of the largest companies by market cap across different decades (each gray line represents the market cap share of the champions at the start of each decade).



Some market champions have managed to stay at the top for decades, while others were dethroned not long after their initial rise to the top. While the timeline of each cycle is highly uncertain, the vast majority have eventually succumbed to new entrants. Some have gone to zero; some are still relevant today but have underperformed the broader market. Every company is slightly different and today's champions might be here to stay for the time being (especially given their strong competitive moats and strong balance sheets, allowing them the opportunity to both invest in new innovation and to buy up potential competitors), but the same could be said about others of the past. What we can say with a high degree of certainty is that the forces of creative destruction, whose effects are captured in the chart above, will make staying on top very difficult, and over a long enough period, very few will succeed.

Below, we show in tabular form the outcomes embedded in the chart above. Starting from the beginning of each decade, we show the change in market share for each cohort of champions in the years ahead. Over a subsequent decade or two, about half of the market champions underperform the market and fall out of the top 15 champions group. And over long periods of time, almost all champions are dethroned.

Relative Change in Market Share Years After Cohort 0 10 20 30 40 50 60 70 80 90 100 110 120 72% 34% 1900 100% 22% 15% 14% 16% 9% 12% 9% 8% 11% 3% 1910 100% 54% 40% 42% 35% 42% 26% 26% 16% 12% 11% 4% 1920 100% 74% 85% 102% 63% 38% 21% 21% 11% 61% 1930 100% 121% 99% 126% 64% 55% 43% 36% 22% 7% 1940 100% 78% 84% 42% 36% 26% 23% 14% 4% 1950 100% 108% 58% 49% 36% 30% 21% 8% 1960 100% 65% 52% 36% 28% 18% 6% 1970 100% 64% 34% 21% 15% 6% 57% 1980 100% 40% 29% 9% 1990 100% 74% 51% 21% 2000 100% 63% 47% 2010 100% 111% 2020 100% 2024 100%

Note: Market champions' share can exceed 100% when the group of companies that were top 10 in a given decade end up accounting for a larger share of the total market a few years later. This is possible since we are not selecting cohorts based on when they peaked, but at the point in time at the start of each decade. For instance, if big tech were to become an even larger share of the total market relative to today without new disruptors changing who the champions are, we would likely see a value above 100% for the 2024 cohort in a few years.

28%

22%

32%

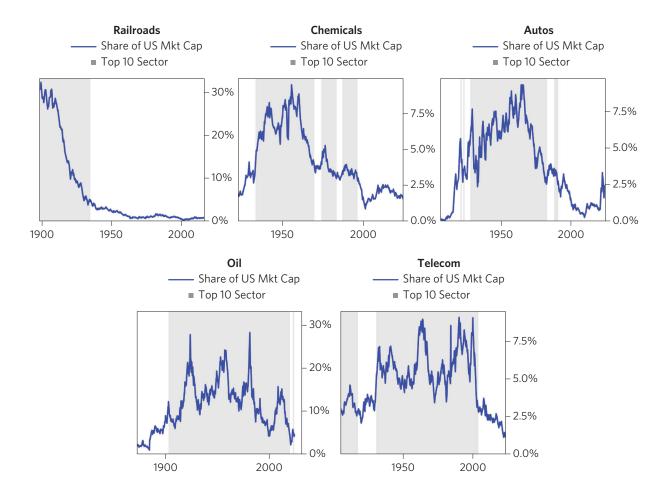
38%

Among these champions, on the way to the top, you tend to see a **first-mover advantage in a high secular growth industry benefiting from rapid innovation**, with the **ability to stay there influenced by a strong competitive moat** that slows the rate of erosion of market share over time. The erosion of either of these two drivers is usually responsible for the eventual demise of a champion, as new, faster-growing companies take its place on the backbone of faster, industry-level secular sales growth and intra-industry market share gains. Among the cohort of champions, there are many examples of companies staying on top for decades, largely because of their ability to keep innovating, tap into new pools of secular spending growth as they emerge, and keep competitive barriers in place over time. Regulation also plays a role and can make or (literally) break a champion. Below, we go through some key examples from history, highlighting the dynamics that were key in each champion's lifecycle.

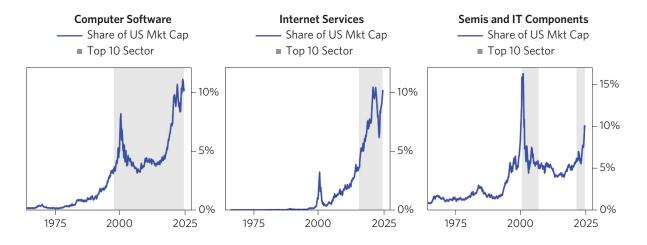
Average

100%

- Railroad monopoly champions of the 1900s to the 1930s (Penn Central, Union Pacific, New York Central, etc.). Railroads were a key contributor to the rapid industrialization of farmland around the turn of the 20th century, providing the only reliable means of transporting materials and manufactured goods across the United States. Yet starting in the 1920s, competition from other new forms of transportation (mostly trucking, and to a secondary extent airplanes) started eroding railroad revenues, as the government invested in the interstate network and as cars became more reliable and affordable. This erased railroads' competitive moat: not only was there now an alternative way of transporting goods across the US, but trucking also faced fewer regulatory headwinds on pricing and route-setting compared to railroads.
- Chemical conglomerate champions of the 1930s to the 1960s (DuPont and Union Carbide). DuPont and Union Carbide rose to prominence in the 1930s as leaders in the new technology of plastic manufacturing. Use cases for plastic grew exponentially over the following years, due to substitution from more expensive alternatives, booming demand for mass-produced goods, and some tailwinds from wartime demand for nylon and neoprene. DuPont and Union Carbide were able to keep their champion positions for decades, thanks to their large exposure to secular growth for their category of products. But as the economy shifted away from manufactured goods toward services and as demand growth flattened, they were eventually dethroned by faster growing industries in the 1970s and 1980s.
- Auto conglomerate champions of the 1920s to the 1960s (The "Big Three": General Motors, Ford, and Chrysler). In 1900, about 1% of the US population owned a car. By 1950, this figure was above 50%, and 75% in 1960. Such a massive expansion was an immense secular boost for major automakers, which radically transformed from a large set of small independent shops to large conglomerates capable of mass-producing cars at scale. Their ability to do so comparatively cheaply (through economies of scale and technological innovations such as the assembly line) became a key barrier to entry in the industry, allowing the Big Three to preserve their market share for a long time. In the 1960s, the two trends started to reverse: the market for autos became more saturated, as car ownership started to plateau, and new competitors in Asia caught up with the technology and started undercutting US producers, eroding their competitive advantage.
- Oil champions of the 1900s through the present (Exxon, Mobil, Chevron, Marathon, etc.). Oil companies were longstanding champions, leveraging the combination of an expanding market and strong structural barriers to entry to stay relevant for over a century. The largest company in 1900, Standard Oil, underwent a series of breakups and subsequent mergers to essentially become Exxon Mobil today. The company benefited from a century of unprecedented secular expansion in oil demand, thanks to electrification and growing auto adoption. The company was also able to leverage its monopolistic power to build economies of scale and compete for prices on the world stage, pushing the limits of antitrust regulation with the Exxon and Mobil merger in 1999. The oil sector was a champion for decades and only started to lose share in the last couple of decades, with challenges ranging from navigating the energy transition to new supply being unlocked with the advent of the US shale market.
- Telecom champion of the 1930s to the 2000s (AT&T). The current AT&T is a descendant of the Bell Telephone Company, which was the first company to introduce telephony in the US at the end of the 19th century. With first-mover advantage, ownership over the entire landline network, and strong vertical integration, the AT&T monopoly had enormous barriers to entry, contributing to an exceptionally strong competitive moat that lasted for over 70 years, until it was broken up by antitrust in 1984. More recently, the combination of 1) the fading relevance of landlines over cellular networks, 2) antitrust regulation eroding some longstanding barriers to entry, and 3) new cellular and internet-focused players emerging as a result of these secular shifts ended up weakening AT&T's competitive moat and driving below-market returns.



In the last two decades, information technology companies (across computer software, hardware, and internet services) have dominated the list of champions, riding on the tailwind of an exceptionally high secular expansion in this relatively new market, driven by technological innovation unlocking new business opportunities. While the dot-com bubble showed how markets can be too forward looking, anticipating future earnings growth that was not backed by fundamentals, the more recent expansion in market share has been largely driven by rapidly expanding earnings. The last two decades experienced exceptionally high turnover in the top 15 companies by market cap, as innovators dethroned longstanding conglomerates and competed in markets (internet services and computer software) that had fewer structural barriers to entry.



There are a number of reasons why today's IT champions could stay at the top for now, continuing to outperform. Those range from strong competitive moats (network effects, advantage on data acquisition, advanced technical capabilities), incredibly strong balance sheets to finance new ventures that tap into new pools of secular spending growth, and a somewhat unprecedented ability to acquire and internalize the capabilities of small innovative businesses before they have the time and resources to develop as challengers. At the same time, antitrust regulation threatening a breakup of the likes of AT&T and Standard Oil looms as a not-so-distant possibility, and technological revolutions like AI could rapidly change the equilibrium and, for those that are unable to adapt, render their services marginally less useful, just like railroads after the invention of the car or landlines with the introduction of the cellular network. At one time, IBM's stature also looked insurmountable. Today, IBM accounts for less than 0.3% of US-listed companies by market cap and less than 1% by market cap of all technology and technology hardware firms, the sector that accounts for the bulk of today's champions.

In terms of pricing, we see meaningful divergences within the cohort of current champions—in some cases, valuations look consistent with these companies' strong prospects, and in other cases, more outperformance than is likely looks priced in. The following table shows today's champions, the current share of their market cap and earnings, and analyst estimates of long-term growth.

- 1			•
Toda	v's Cl	าลm	pions

Company	Sector	Mkt Cap Share	Earnings Share	Analyst Consensus LTG (Bias- Adj)
MICROSOFT CORP	Software	5.5%	3.9%	9.9%
APPLE INC	Technology Hardware	5.3%	3.9%	8.2%
NVIDIA CORP	Semiconductors	4.8%	2.3%	7.1%
ALPHABET INC	Internet Services	3.8%	4.1%	12.6%
AMAZON.COM INC	Internet Services	3.3%	1.8%	13.1%
META PLATFORMS INC	Internet Services	2.1%	2.2%	10.4%
LILLY (ELI) & CO	Pharmaceuticals	1.4%	0.4%	15.2%
BROADCOM INC	Semiconductors	1.1%	0.3%	3.5%
JPMORGAN CHASE & CO	Banks	1.0%	2.4%	0.3%
TESLA INC	Autos	1.0%	0.2%	7.9%

A consideration for investors today is that most investors' portfolios have higher exposure than ever to the current champions. Investors often end up increasingly allocated to the previous outperformer because stock holdings tend to be managed with reference to the market cap, and markets that outperform become a bigger share of the overall market. Today, that's more the case than ever—in part due to the concentration of champions in the US market, and in part due to the US market's large weight in global benchmarks and the prevalence of indexing. Over a third of a typical US-market-weighted portfolio is allocated to the current basket of champions, and in a world portfolio, this share ends up close to 20%—the highest in over 50 years.



Appendix—Champions by Decade

Below, we show for reference the past champions by decade and highlight for each decade the key dynamics at play. Note: the names of the companies are as of today (e.g., Exxon Mobil was basically known as Jersey Standard until 1972 but is listed in the tables below as Exxon Mobil through each decade).

1900 and **1910**—The early 20th century is dominated by railroad monopolies (Penn Central, New York Central, etc.) and oil giants, including Standard Oil (now Exxon Mobil) and Marathon. Railroads are at the heart of US industrialization, enabling goods to be transported at a pace and volume before unseen. The prior four decades had been marked by fierce competition between railway magnates as the railway system rapidly expanded, and by the 1900s, these pool into a few powerful monopolies. Oil companies, as discussed above, benefit from increasing demand and high barriers to entry for competition.

1900			1910		
Company Name	Sector	Share of Total Mkt Cap	Company Name	Sector	Share of Total Mkt Cap
EXXON MOBIL CORP	Oil	8%	EXXON MOBIL CORP	Oil	4%
PENN CENTRAL CO	Transportation	3%	MARATHON	Oil	3%
NEW YORK CENTRAL RAILROAD	Transportation	2%	PENN CENTRAL CO	Transportation	3%
CHICAGO BURLINGTON AND QUINCY RAIL	Transportation	2%	UNION PACIFIC CORP	Transportation	3%
AMERICAN TOBACCO CO	Tobacco	2%	SANTA FE PACIFIC CORP	Transportation	3%
NEW YORK NEW HAVEN AND HARTFORD RAIL	Transportation	2%	NORTHERN PACIFIC RAILWAY CO	Transportation	2%
PULLMAN INC	Construction	1%	AT&T CORP	Telecom	2%
LAKE SHORE & MICHIGAN SOUTHERN RAIL	Transportation	1%	BURLINGTON NORTHERN SANTA FE	Transportation	2%
BURLINGTON NORTHERN SANTA FE	Transportation	1%	NEW YORK CENTRAL RAILROAD	Transportation	2%
NEW VALLEY CORP	Real Estate	1%	CHICAGO BURLINGTON AND QUINCY RAIL	Transportation	2%

1920 and 1930—Oil giants move to the top, while railroad monopolies are dethroned (as new forms of transportation erase their competitive moat). New champions—including AT&T, the dominant force in building out US telephone networks, and auto conglomerate General Motors (benefiting from expanding auto ownership by US households and improved manufacturing techniques)—rise to the top in the 1920s.

In the 1930s, chemicals maker DuPont rides a wave of new advances in materials science (such as the invention of nylon and Teflon), and GE (which was founded in the late 1800s) rises to the top after pioneering television broadcasting in the late 1920s and then developing aircraft superchargers during World War I, which become indispensable in the following decades, especially leading into World War II.

1920			1930		
		Share of Total			Share of Total
Company Name	Sector	Mkt Cap	Company Name	Sector	Mkt Cap
EXXON MOBIL CORP	Oil	3%	AT&T CORP	Telecom	3%
MARATHON	Oil	2%	GE	Aerospace/Defense	2%
AT&T CORP	Telecom	2%	GENERAL MOTORS CO	Auto and Parts	2%
PENN CENTRAL CO	Transportation	2%	EXXON MOBIL CORP	Oil	2%
MOBIL CORP	Oil	1%	MARATHON	Oil	2%
CHEVRON CORP	Oil	1%	DU PONT (E I) DE NEMOURS	Chemicals	1%
GENERAL MOTORS CO	Auto and Parts	1%	CONSOLIDATED EDISON INC	Utilities	1%
SANTA FE PACIFIC CORP	Transportation	1%	CITICORP	Banks	1%
UNION PACIFIC CORP	Transportation	1%	TRANSAMERICA CORP. (LOS ANGELES, CA)	Banks	1%
MAGNOLIA PETROLEUM CO.	Oil	1%	PENN CENTRAL CO	Transportation	1%

1940 and 1950—Many of the champions that rose to the top in the 1920s and the 1930s remain on top (AT&T, GE, DuPont, Exxon, GM) for decades. Chemicals dominance continues, benefiting from war-driven demand for materials and scientific innovation—Union Carbide joins DuPont at the top of the market in the 1940s. The strong spending power and rise of consumerist culture following WWII contributes to the appearance of the first megaretailer, Sears, rising to the top by 1950.

1940			1950		
Company Name	Sector	Share of Total Mkt Cap	Company Name	Sector	Share of Total Mkt Cap
AT&T CORP	Telecom	6%	AT&T CORP	Telecom Services	4%
GENERAL MOTORS CO	Auto and Parts	4%	GENERAL MOTORS CO	Auto and Parts	4%
DU PONT (E I) DE NEMOURS	Chemicals	4%	DU PONT (E I) DE NEMOURS	Chemicals	3%
EXXON MOBIL CORP	Oil	2%	EXXON MOBIL CORP	Oil	2%
GE	Aerospace/Defense	2%	HUMBLE OIL & REFINING CO.	Oil	2%
R R REALISATIONS LTD	Aerospace/Defense	2%	UNION CARBIDE CORP	Chemicals	1%
TEXAS PACIFIC LAND TRUST	Real Estate	2%	GE	Aerospace/Defense	1%
CREOLE PETROLEUM CORP	Oil	1%	CREOLE PETROLEUM CORP	Oil	1%
UNION CARBIDE CORP	Chemicals	1%	SEARS ROEBUCK & CO	Retailers	1%
HUMBLE OIL & REFINING CO.	Oil	1%	CHEVRON CORP	Oil	1%

1960 and 1970—The post-war optimism of the 1950s spurred a wave of creativity and advancements, particularly within computing and electronics, such that tech companies enter the top of the market in force (IBM, Xerox, Kodak) by the 1960s and 1970s, dethroning some prior champions. In particular, chemicals champions fall away as demand growth slows (both DuPont and Union Carbide face reputation issues as new scientific research links their materials to health issues), and oil loses some dominance at the start of this decade. Autos remain dominant in the 1960s, with Ford joining GM in the top 10, but start to fade away by the 1970s as a result of new competition and slowing demand growth.

1960			1970		
Company Name	Sector	Share of Total Mkt Cap	Company Name	Sector	Share of Total Mkt Cap
AT&T CORP	Telecom Services	5%	INTL BUSINESS MACHINES CORP	Computer Services	6%
GENERAL MOTORS CO	Auto and Parts	5%	AT&T CORP	Telecom	4%
DU PONT (E I) DE NEMOURS	Chemicals	4%	GENERAL MOTORS CO	Auto and Parts	3%
EXXON MOBIL CORP	Oil	3%	EASTMAN KODAK CO	IT Manufacturers	2%
GE	Aerospace/Defense	3%	EXXON MOBIL CORP	Oil	2%
INTL BUSINESS MACHINES CORP	Computer Services	2%	SEARS ROEBUCK & CO	Retailers	1%
MARATHON	Oil	2%	INFORMATION DISPLAYS INC	IT Manufacturers	1%
TEXACO INC	Oil	2%	XEROX HOLDINGS CORP	IT Manufacturers	1%
FORD MOTOR CO	Auto and Parts	2%	PAUL REVERE CORP	Life/Health Insurance	1%
UNION CARBIDE CORP	Chemicals	1%	TEXACO INC	Oil	1%

1980—The impact of the past inflationary decade is clear in the champions entering the 1980s. Oil overwhelmingly dominates the market. GM remains in the top but is knocked down a place coming out of the recession of the late 1970s/early 1980s. Sears loses its footing to other retailers (e.g., Walmart, Kmart, etc.) that draw customers with low prices as households struggle with pressures from high inflation.

1980		
Company Name	Sector	Share of Total Mkt Cap
INTL BUSINESS MACHINES CORP	Computer Services	4%
AT&T CORP	Telecom Services	3%
EXXON MOBIL CORP	Oil	3%
GENERAL MOTORS CO	Auto and Parts	1%
SCHLUMBERGER LTD	Oil	1%
AMOCO CORP	Oil	1%
GE	Aerospace and Defense	1%
MOBIL CORP	Oil	1%
STANDARD OIL CO	Oil	1%
ATLANTIC RICHFIELD CO	Oil	1%

1990—The disinflationary 1980s are the opposite of the prior inflationary decade, and by 1990, the oil champions mostly fall out of the top 10, with the most resilient giants—Exxon and Amoco—as the notable exceptions). Exxon actually rises further in the 1980s despite softer oil prices, as it makes substantial cuts to match the revenue drop and boosts its stock value through a massive buyback program. Other than GM, which faces increased foreign competition and slipping sales, all the other non-oil champions (IBM, GE, AT&T) remain on top. Pharmaceuticals (Merck and Bristol-Myers) make an appearance for the first time, benefiting from the industry's shift toward "blockbuster drugs" and from compounding scientific understanding leading to a record number of drugs hitting the market (e.g., Merck's hepatitis B vaccine approved in 1986).

1990		
Company Name	Sector	Share of Total Mkt Cap
EXXON MOBIL CORP	Oil	6%
INTL BUSINESS MACHINES CORP	Computer Services	5%
GE	Aerospace and Defense	5%
AT&T CORP	Telecom Services	4%
ALTRIA GROUP INC	Tobacco	3%
MERCK & CO	Pharmaceuticals	3%
AMOCO CORP	Oil	3%
BRISTOL-MYERS SQUIBB CO	Pharmaceuticals	3%
NABISCO GROUP HOLDINGS CORP	Food Producers	2%
DU PONT (E I) DE NEMOURS	Chemicals	2%

2000—Excitement generated by new technology and tech bubble dynamics drive many new technology companies to the top (Microsoft, Intel, Cisco, etc.). Most of the other non-tech champions are existing champions that remain near the top of the market (GE, Exxon, and Merck, although the latter two move down a few places). Walmart makes its first appearance, following in the footsteps of megaretailer Sears. The merger of two major financial institutions, Citicorp and Travelers Group, places Citigroup as the first bank to enter the list since 1930.

2000		
Company Name	Sector	Share of Total Mkt Cap
MICROSOFT CORP	Computer Software	3%
GE	Aerospace and Defense	3%
CISCO SYSTEMS INC	IT Components	2%
INTEL CORP	Semiconductors	2%
EXXON MOBIL CORP	Oil	2%
WALMART INC	Retailers	1%
INTL BUSINESS MACHINES CORP	Computer Services	1%
CITIGROUP INC	Banks	1%
MERCK & CO	Pharmaceuticals	1%
LUCENT TECHNOLOGIES INC	IT Components	1%

2010—In the midst of the financial crisis, staples (Walmart, Procter & Gamble, Johnson & Johnson) and strong balance sheet companies (Berkshire, Alphabet) dominate the market. Outside of big tech (with strong balance sheets and secular growth tailwinds) and oil (amid a tight oil market), cyclicals are not among the market giants. GE is on its way out after losses in the GE Capital business nearly sink the company.

2010		
Company Name	Sector	Share of Total Mkt Cap
EXXON MOBIL CORP	Oil	2%
MICROSOFT CORP	Computer Software	2%
WALMART INC	Retailers	1%
PROCTER & GAMBLE CO	Personal Care	1%
BERKSHIRE HATHAWAY	Investment Companies	1%
APPLE INC	IT Manufacturers	1%
JOHNSON & JOHNSON	Pharmaceuticals	1%
GE	Aerospace and Defense	1%
ALPHABET INC	Internet Services	1%
INTL BUSINESS MACHINES CORP	Computer Services	1%

2020—Following a decade of rapid growth in smartphones, social media usage, and, generally, a shift to greater spending via online platforms, internet services (Meta, Alphabet), cloud providers (Microsoft, Amazon, Alphabet), and technology hardware companies (Apple) dominate. Additionally, companies well positioned to navigate the shift to online spending and home delivery also make the champions list (Walmart, Amazon, Visa).

2020		
Company Name	Sector	Share of Total Mkt Cap
APPLE INC	IT Manufacturers	4%
MICROSOFT CORP	Computer Software	4%
AMAZON.COM INC	Internet Services	3%
ALPHABET INC	Internet Services	3%
META PLATFORMS INC	Internet Services	2%
BERKSHIRE HATHAWAY	Investment Companies	2%
VISA INC	Business Services	1%
JPMORGAN CHASE & CO	Banks	1%
JOHNSON & JOHNSON	Pharmaceuticals	1%
WALMART INC	Retailers	1%

Important Disclosures and Other Information

This research paper is prepared by and is the property of Bridgewater Associates, LP and is circulated for informational and educational purposes only. There is no consideration given to the specific investment needs, objectives, or tolerances of any of the recipients. Additionally, Bridgewater's actual investment positions may, and often will, vary from its conclusions discussed herein based on any number of factors, such as client investment restrictions, portfolio rebalancing and transactions costs, among others. Recipients should consult their own advisors, including tax advisors, before making any investment decision. This material is for informational and educational purposes only and is not an offer to sell or the solicitation of an offer to buy the securities or other instruments mentioned. Any such offering will be made pursuant to a definitive offering memorandum. This material does not constitute a personal recommendation or take into account the particular investment objectives, financial situations, or needs of individual investors which are necessary considerations before making any investment decision. Investors should consider whether any advice or recommendation in this research is suitable for their particular circumstances and, where appropriate, seek professional advice, including legal, tax, accounting, investment, or other advice. No discussion with respect to specific companies should be considered a recommendation to purchase or sell any particular investment. The companies discussed should not be taken to represent holdings in any Bridgewater strategy. It should not be assumed that any of the companies discussed were or will be profitable, or that recommendations made in the future will be profitable.

The information provided herein is not intended to provide a sufficient basis on which to make an investment decision and investment decisions should not be based on simulated, hypothetical, or illustrative information that have inherent limitations. Unlike an actual performance record simulated or hypothetical results do not represent actual trading or the actual costs of management and may have under or overcompensated for the impact of certain market risk factors. Bridgewater makes no representation that any account will or is likely to achieve returns similar to those shown. The price and value of the investments referred to in this research and the income therefrom may fluctuate. Every investment involves risk and in volatile or uncertain market conditions, significant variations in the value or return on that investment may occur. Investments in hedge funds are complex, speculative and carry a high degree of risk, including the risk of a complete loss of an investor's entire investment. Past performance is not a guide to future performance, future returns are not guaranteed, and a complete loss of original capital may occur. Certain transactions, including those involving leverage, futures, options, and other derivatives, give rise to substantial risk and are not suitable for all investors. Fluctuations in exchange rates could have material adverse effects on the value or price of, or income derived from, certain investments.

Bridgewater research utilizes data and information from public, private, and internal sources, including data from actual Bridgewater trades. Sources include BCA, Bloomberg Finance L.P., Bond Radar, Candeal, CBRE, Inc., CEIC Data Company Ltd., China Bull Research, Clarus Financial Technology, CLS Processing Solutions, Conference Board of Canada, Consensus Economics Inc., DataYes Inc, Dealogic, DTCC Data Repository, Ecoanalitica, Empirical Research Partners, Entis (Axioma Qontigo Simcorp), EPFR Global, Eurasia Group, Evercore ISI, FactSet Research Systems, Fastmarkets Global Limited, the Financial Times Limited, FINRA, GaveKal Research Ltd., Global Financial Data, GlobalSource Partners, Harvard Business Review, Haver Analytics, Inc., Institutional Shareholder Services (ISS), the Investment Funds Institute of Canada, ICE Derived Data (UK), Investment Company Institute, International Institute of Finance, JP Morgan, JSTA Advisors, M Science LLC, MarketAxess, Medley Global Advisors (Energy Aspects Corp), Metals Focus Ltd, Moody's ESG Solutions, MSCI, Inc., National Bureau of Economic Research, Neudata, Organisation for Economic Cooperation and Development, Pensions & Investments Research Center, Refinitiv, Rhodium Group, RP Data, Rubinson Research, Rystad Energy, S&P Global Market Intelligence, Scientific Infra/EDHEC, Sentix GmbH, Shanghai Metals Market, Shanghai Wind Information, Smart Insider Ltd., Sustainalytics, Swaps Monitor, Tradeweb, United Nations, US Department of Commerce, Verisk Maplecroft, Visible Alpha, Wells Bay, Wind Financial Information LLC, Wood Mackenzie Limited, World Bureau of Metal Statistics, World Economic Forum, and YieldBook. While we consider information from external sources to be reliable, we do not assume responsibility for its accuracy.

This information is not directed at or intended for distribution to or use by any person or entity located in any jurisdiction where such distribution, publication, availability, or use would be contrary to applicable law or regulation, or which would subject Bridgewater to any registration or licensing requirements within such jurisdiction. No part of this material may be (i) copied, photocopied, or duplicated in any form by any means or (ii) redistributed without the prior written consent of Bridgewater® Associates, LP.

The views expressed herein are solely those of Bridgewater as of the date of this report and are subject to change without notice. Bridgewater may have a significant financial interest in one or more of the positions and/or securities or derivatives discussed. Those responsible for preparing this report receive compensation based upon various factors, including, among other things, the quality of their work and firm revenues.