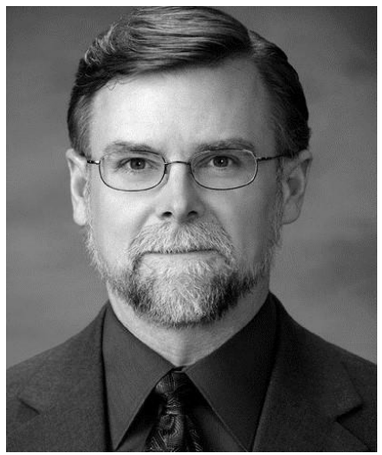
Investing for the next dozen years

Rob Brown, PhD, CFA

Julex Capital Advisory Board Member, Website www.robbrownonline.com



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The nature of change

95% of the time it’s about speed or pace

Nature of change - There are two very different kinds of change

The “95% of the time”

About . . . speed or pace

Best possible approach

See what worked best in the past and modify it at the edges to reflect current day realities

The “5% of the time”

About . . . direction

Worst possible approach

See what worked best in the past and modify it at the edges to reflect current day realities

Guarantees faceplant

Speed of change - An example of the 95%

SLOW

FAST

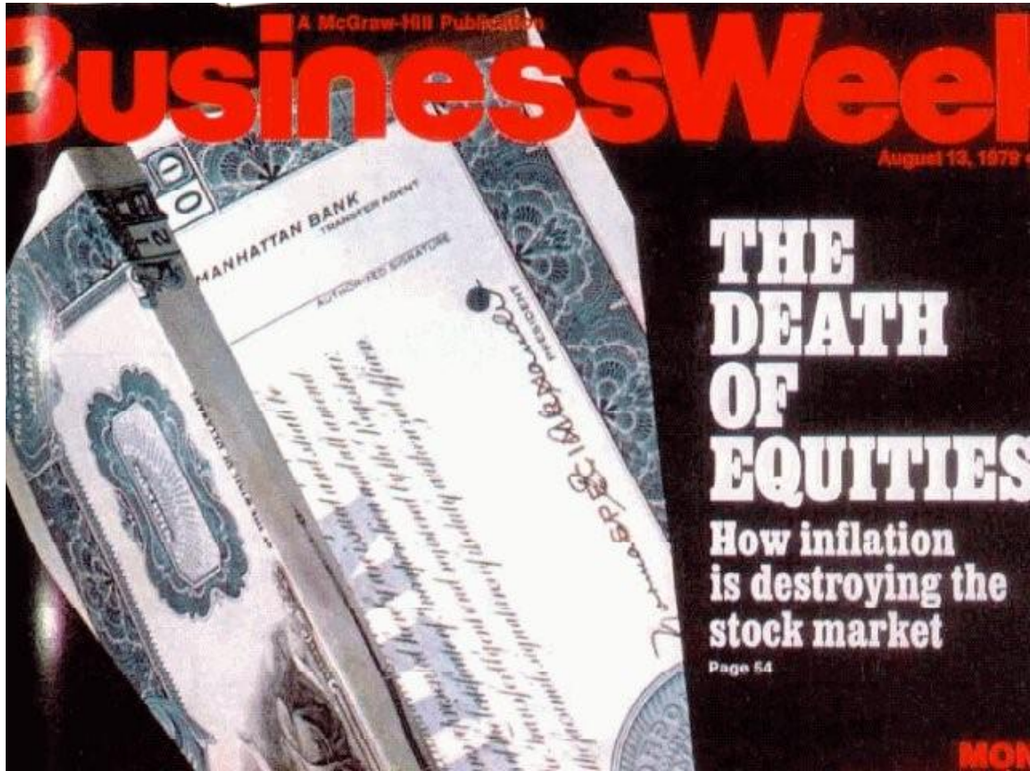
When was the last time we had directional change?

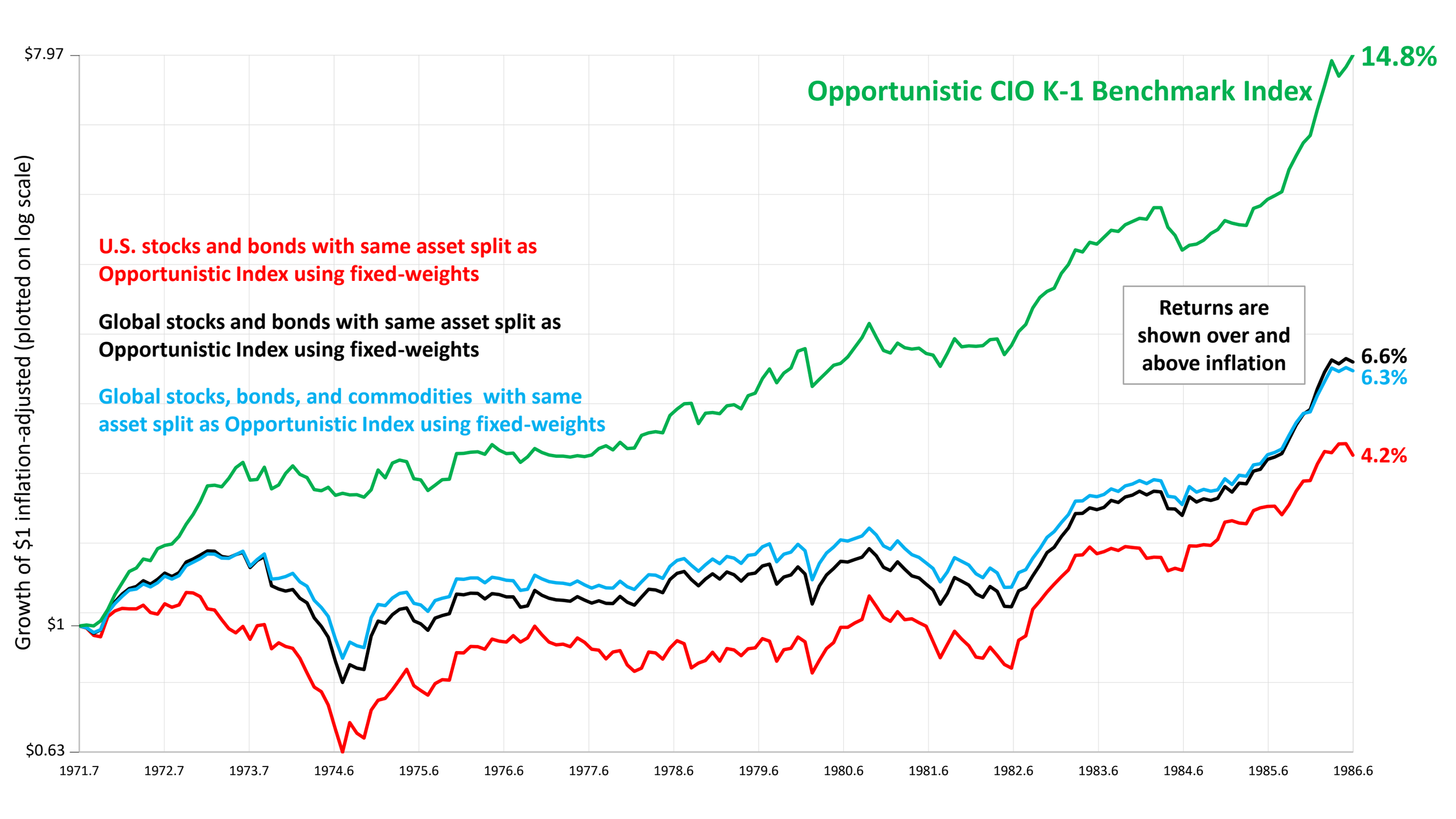
Maybe the 1970s?

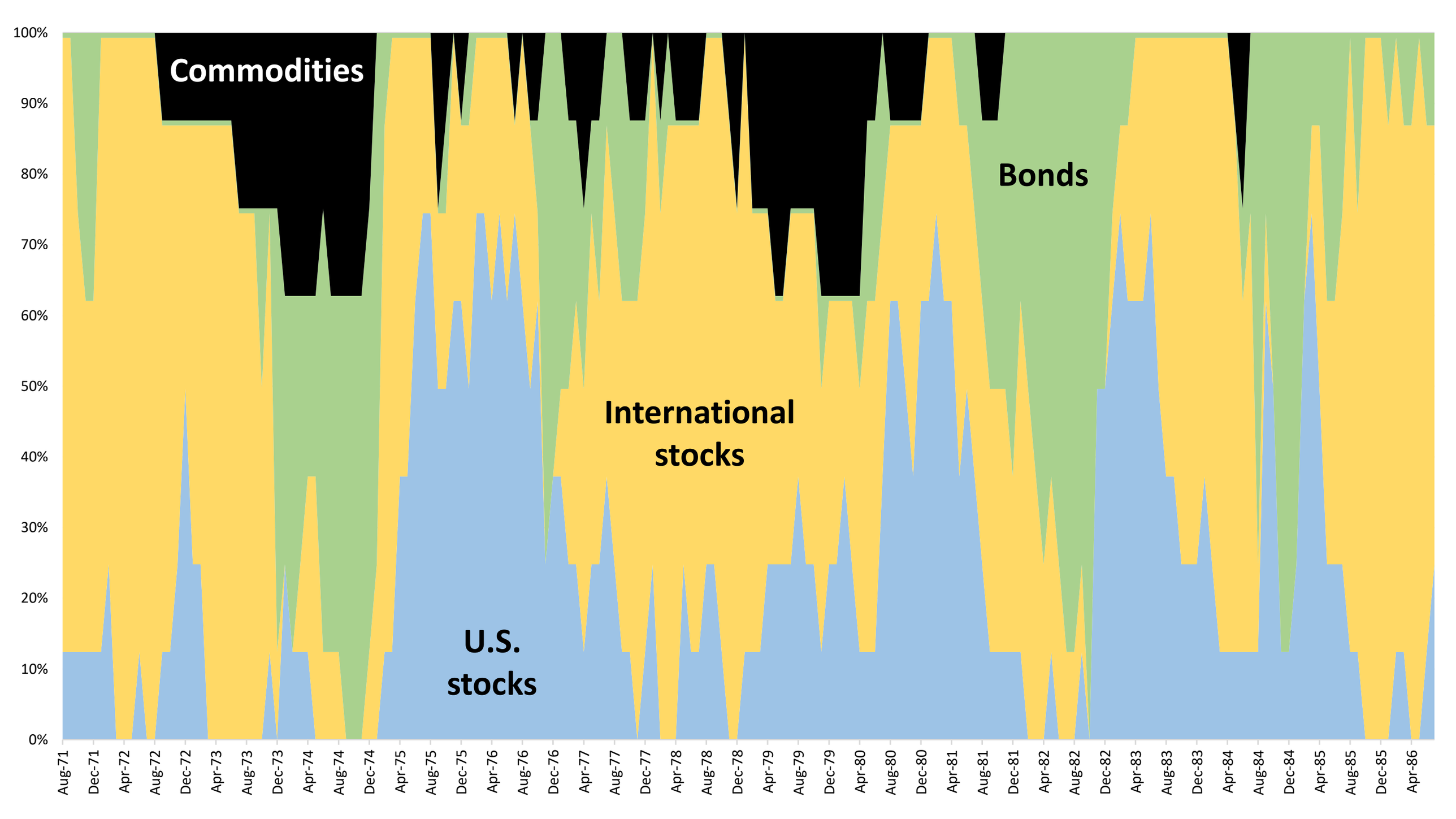
NO . . . . probably not

Era 1971-1986

- OPEC oil embargos to the U.S.
- 1973 Arab-Israeli War
- Race Riots in most major cities
- Unemployment rising to highest level since The Great Depression
- Interest rates hit 16 ½%
- Series of three economic recessions
- Black Monday (Oct 1987) when the market fell -25% in just 120 minutes
- Highest inflation in over 100 years
- Oil rose 1,140% in just over nine years
- Regan revolution that transformed American politics




$7.97
$1
$0.63
Growth of $1 inflation-adjusted (plotted on log scale)
1971.7
1972.7
1973.7
1974.6
1975.6
1976.6
1977.6
1978.6
1979.6
1980.6
1981.6
1982.6
1983.6
1984.6
1985.6
1986.6
Opportunistic CIO K-1 Benchmark Index
14.8%
U.S. stocks and bonds with same asset split as Opportunistic Index using fixed-weights
4.2%
Global stocks and bonds with same asset split as Opportunistic Index using fixed-weights
6.6%
Global stocks, bonds, and commodities with same asset split as Opportunistic Index using fixed-weights
6.3%
Returns are shown over and above inflation


Commodities
Bonds
International stocks
U.S. stocks
100%
90%
80%
70%
60%
50%
40%
30%
20%
10%
0%
Aug-71
Dec-71
Apr-72
Aug-72
Dec-72
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Dec-85
Apr-86

The last time we had directional change

Was probably the broadly-defined WWII era

Directional change - A second example of the 5%

1929-1946

- Great Depression of 1929
- World War II
- Eight-year drought - The Dust Bowl
- ENIAC began the computer revolution
- A scalable market for U.S. Treasury bonds was developed

- Large and rapidly growing economy
- Relatively separate from the rest of the world, endeavoring to remain apart and uninvolved

- Leader of the Free World
- Major provider of capital to other nations
- Nation builder

Why directional change now? Part 1

- Fossil to renewables
- Haves versus the have-nots
- China cold war
- Velocity of money
- Interest rates
- Fundamental intrinsic valuations *(on stocks, bonds, and trophy real estate)*

Why directional change now? Part 2

- Zombies
- Weather and demographics
- Suppression of creative destruction *(undermining evolution, renewal, and future opportunity)*
- European war
- Reinvention of four industries *(Transportation, Medicine, Energy, Digital finance and contracting)*
- An *"Andrew Jackson"* governmental regression
- Deglobalization

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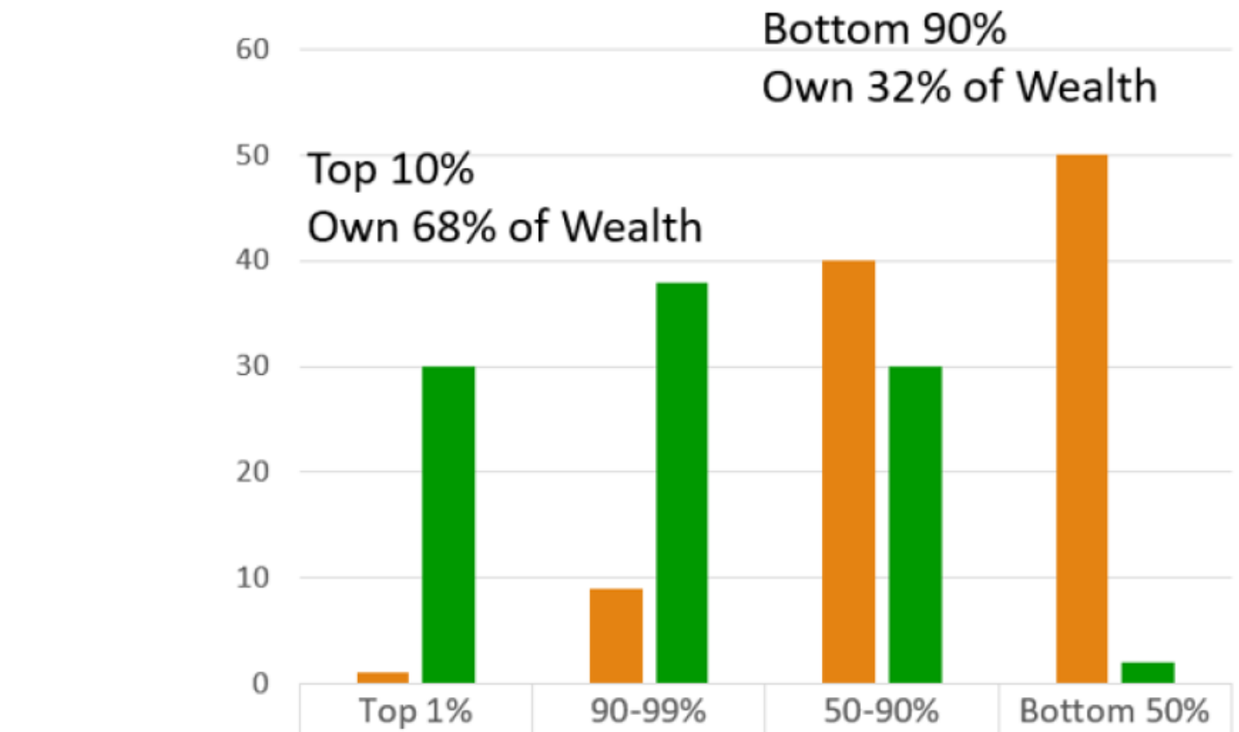
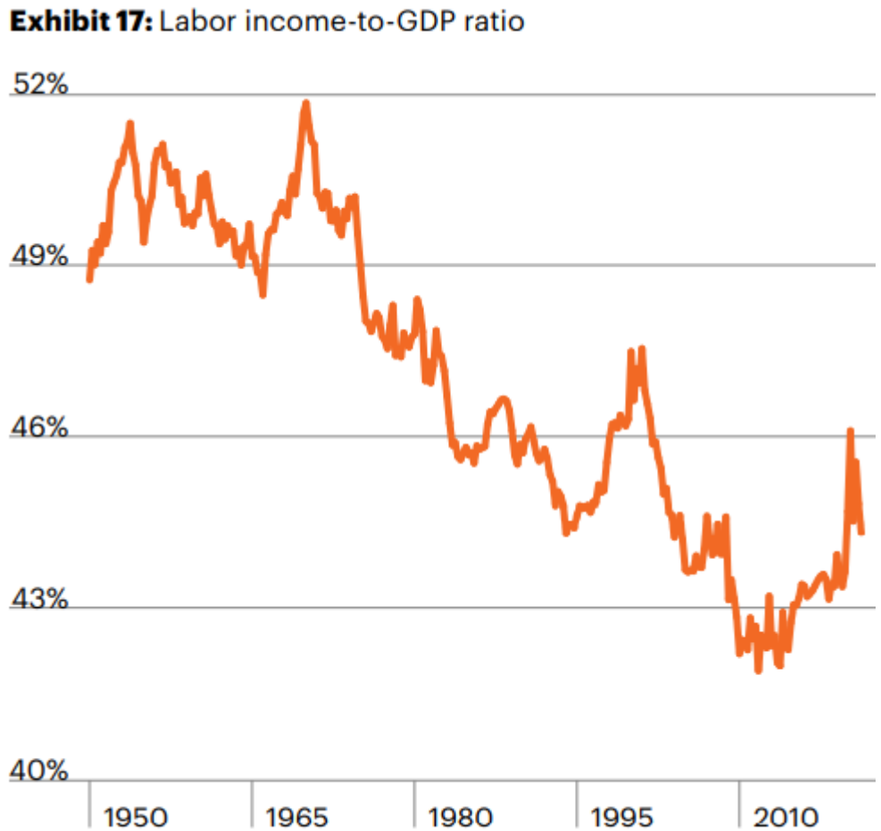
Wealth inequality - this is not just a U.S. issue



	Top 1%	90-99%	50-90%	Bottom 50%
% of Population	1	9	40	50
% of Wealth	30	38	30	2

Source: Statista



Source: U.S. BEA, as of June 30, 2021.

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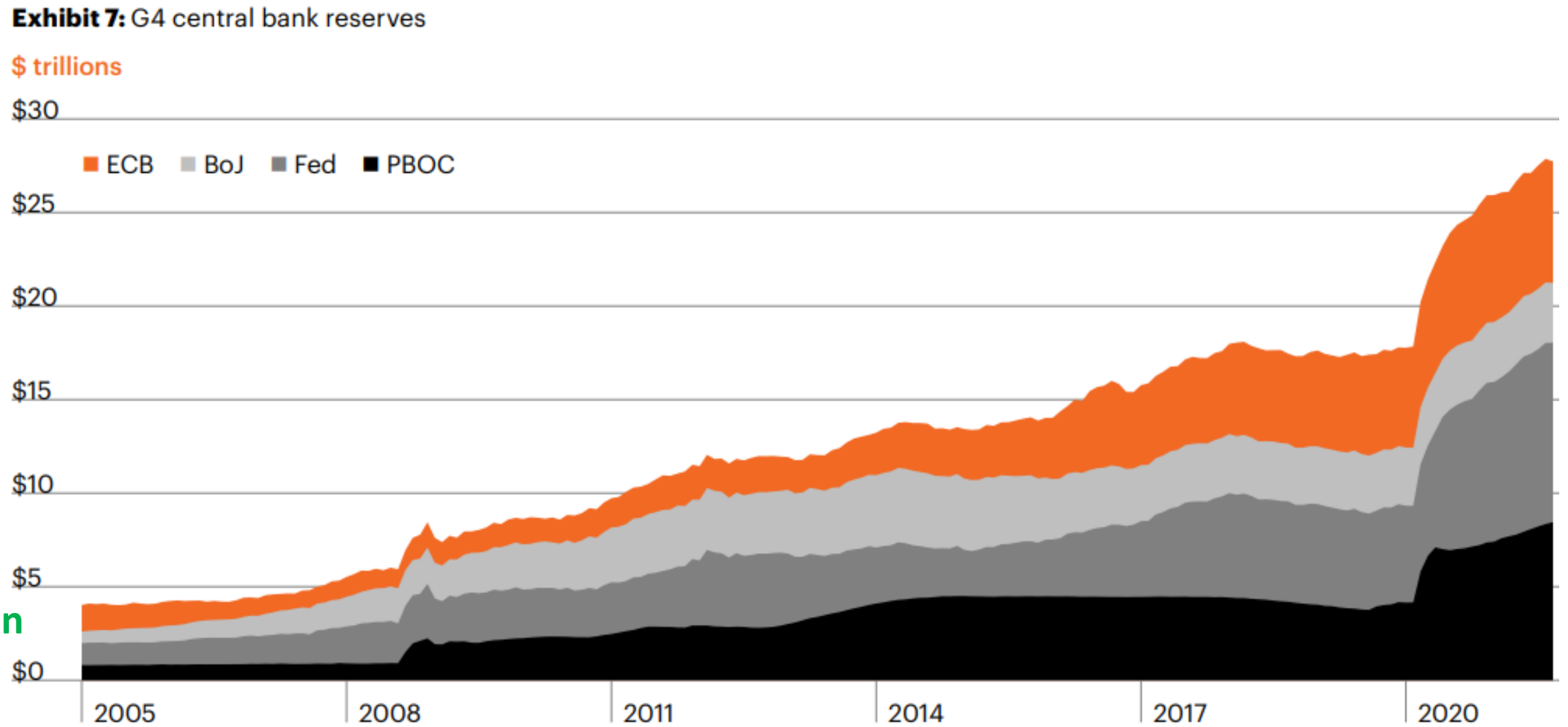
Lack of creative destruction



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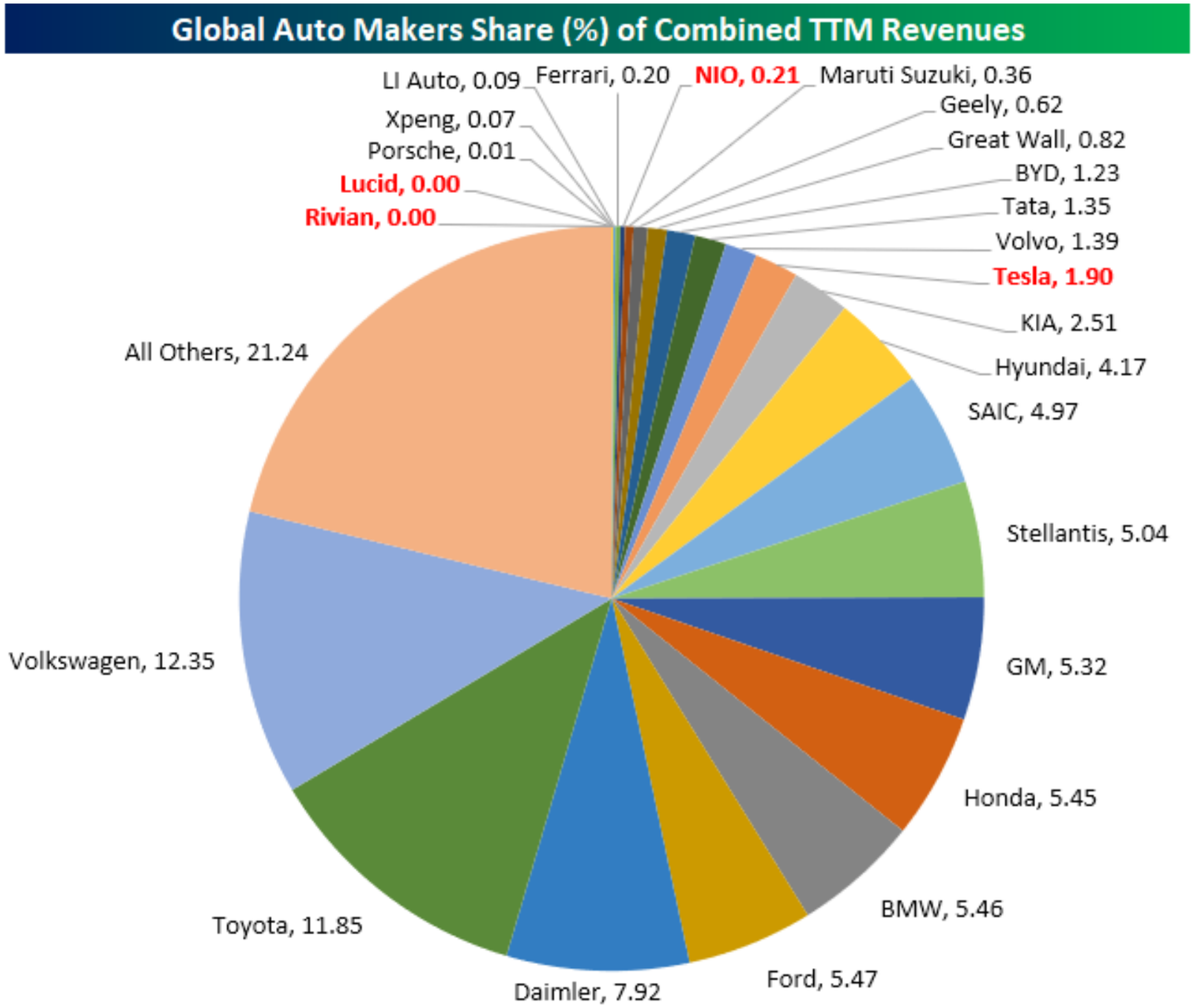
Transportation

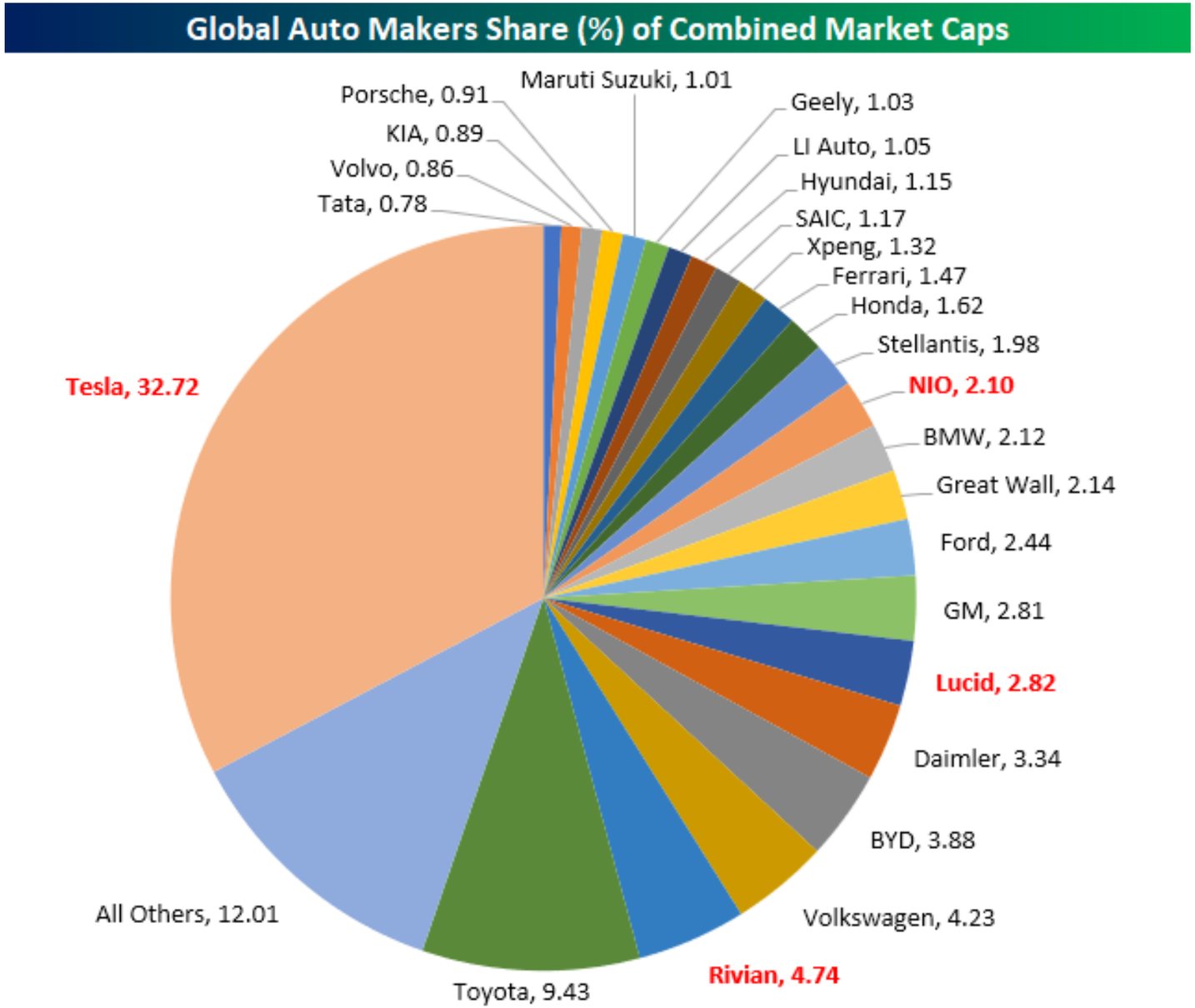
- Not about “cars”
- It’s about
  - Cars
  - Trucks
  - Buses
  - Farm equipment
  - Industrial equipment

- Not about “electric”
- It’s about
  - Conversion from fossil fuels to renewables
  - Autonomy
  - Abandoning ownership

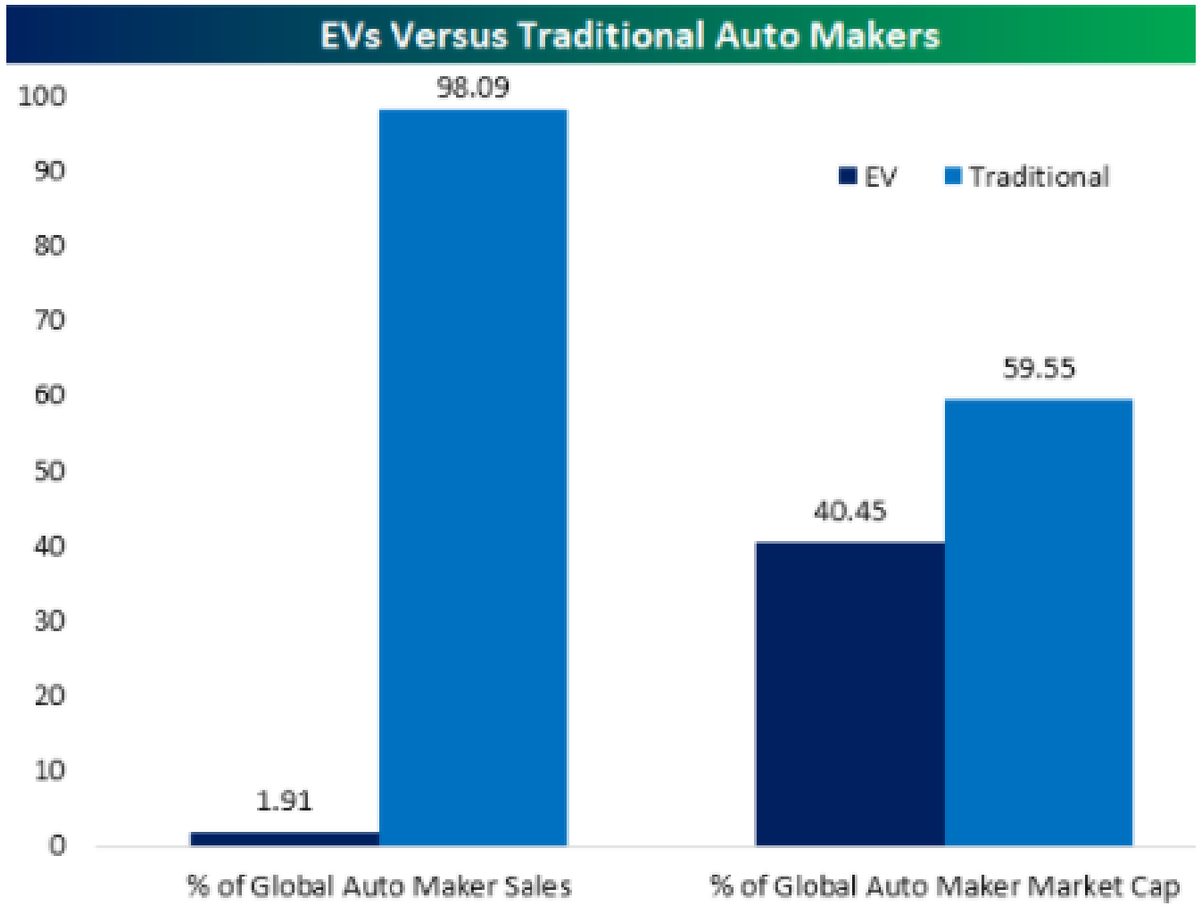
Who makes the most cars



Who has the largest market capitalization



Electric vs gas autos



Who makes what

Who's worth what

Energy

Energy

- Yes, the world has begun the conversion from fossil to renewables
- Renewables
  - Solar
  - Wind
  - Geothermal
  - Ocean
  - Hydro
  - Fission
  - Fusion

- BUT . . . . That is not the real story
- The real story is all about . . . Energy storage

#1 - Batteries

BATTERIES

The contributions of a number of scientists and innovators created our understanding of the forces of electricity, but Alessandro Volta is credited with the invention of the first battery in 1800. On its most basic level, a battery is a device consisting of one or more electrochemical cells that convert stored chemical energy into electrical energy.

Learn More

We're going to need a lot more grid storage. New iron batteries could help.

Flow batteries made from iron, salt, and water promise a nontoxic way to store enough clean energy to use when the sun isn't shining.

By Dawn Stover

February 23, 2022

#2 - Thermal energy storage

THERMAL ENERGY STORAGE

Modern solar thermal power plants produce all of their energy when the sun is shining during the day. The excess energy produced during peak sunlight is often stored in thermal energy storage facilities – in the form of molten salt or other materials – and can be used into the evening to generate steam to drive a turbine to produce electricity.

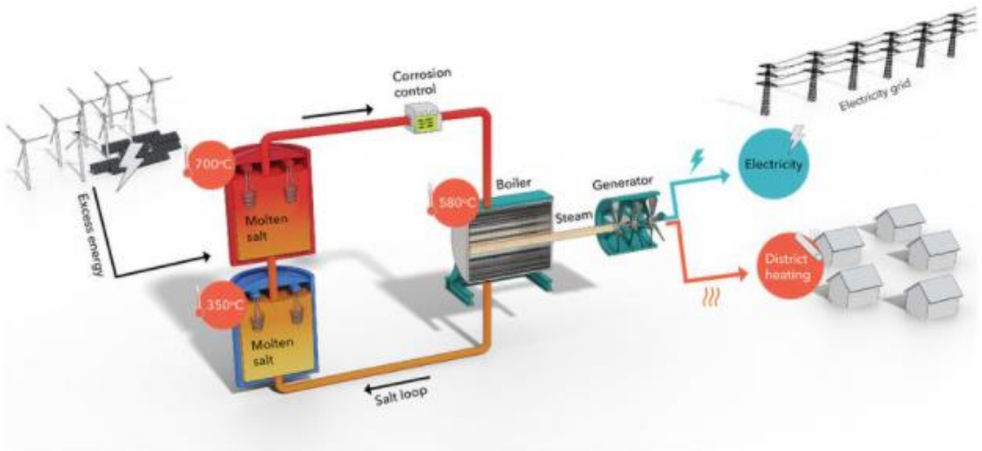
Learn More

Danish Startup Gets Billionaire Backing to Store Energy in Salt

By Morten Buttler +Follow
December 5, 2021, 12:00 PM MST

A startup developing a technology to store energy in molten salt has raised about $12 million from backers, including Denmark's richest man.

Hyme will spend some of the money on a pilot plant to find new ways to store unused electricity from wind and solar, Chief Executive Officer Ask Lovschall-Jensen said in an interview. And the Danish company is already considering another financing round "to ensure that we can head toward global deployment," he said.



Molten Salt concept illustration. *Source: Hyme*

#3 - Mechanical energy storage

MECHANICAL ENERGY STORAGE

Mechanical energy storage systems take advantage of kinetic or gravitational forces to store inputted energy. While the physics of mechanical systems are often quite simple (e.g. spin a flywheel or lift weights up a hill), the technologies that enable the efficient and effective use of these forces are particularly advanced. High-tech materials, cutting-edge computer control systems, and innovative design makes these systems feasible in real-world applications.

Learn More

#4 - Hydrogen energy storage

HYDROGEN ENERGY STORAGE

Electricity can be converted into hydrogen by electrolysis. The hydrogen can be then stored and eventually re-electrified. The round trip efficiency today is lower than other storage technologies. Despite this low efficiency the interest in hydrogen energy storage is growing due to the much higher storage capacity compared to batteries (small scale) or pumped hydro and CAES (large scale).

Learn More

#5 - Pumped hydro power

PUMPED HYDRO-POWER

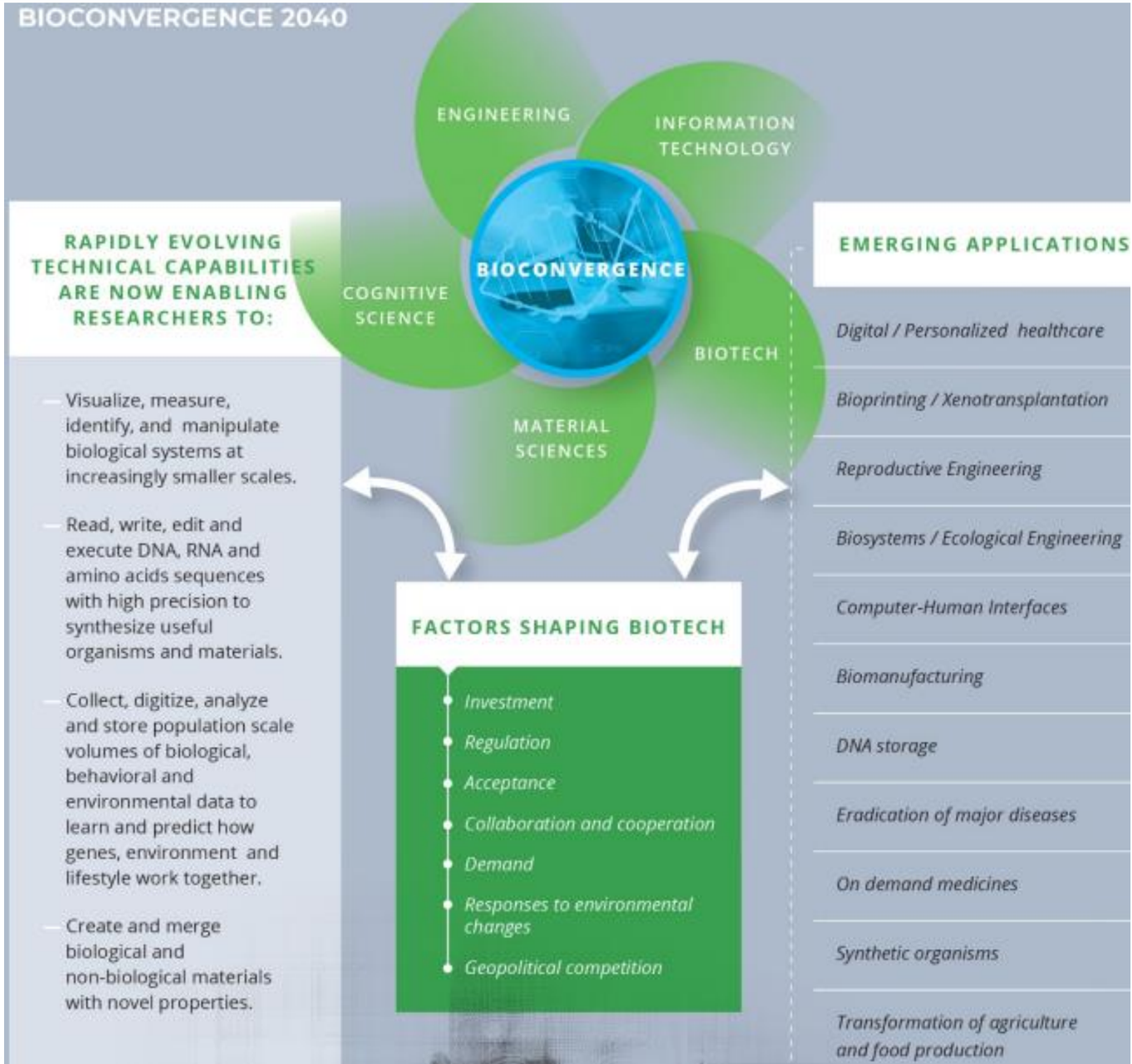
Gravity is a powerful, inescapable force that surrounds us at all times – and it also underpins one of the most established energy storage technologies, pumped hydro-power. Currently the most common type of energy storage is pumped hydroelectric facilities, and we have employed this utility-scale gravity storage technology for the better part of the last century in the United States and around the world.

Learn More

Medicine

This is far more than vaccine development

- mRNA vaccine development
- But . . . a much broader range of applications
- Some of the most exciting include
  - Displacing conventional agriculture
  - Genetically altered organisms
  - Large-scale controlled environment farms
  - Factory cultivation



or . . . Biological mining and pollution abatement

Bloomberg Green

Digital Video

Can Plants That Suck Metal From Soil Replace Mining?

Mining is destructive to everything around it but renewable tech requires more metal than ever. Now there may be a green solution to this conundrum.

By James Bullock and David Rovella
November 23, 2021, 9:45 AM MST

Agro-mining is the process of growing plants that absorb metal through soil, an elegant mechanism to clean poisoned lands and maybe gather battery components like nickel and cobalt without blowing holes in the ground and laying waste to surrounding ecosystems. On this episode of The Spark,

Digital finance

Digital finance and contracting

- No, this is not about Crypto (that was just an unfortunate and temporary malady)

- This is an outgrowth of several technologies . . . all harmonizing together
  - Artificial intelligence
  - Social networks
  - Machine learning
  - Mobile applications
  - Distributed ledger technology *(i.e., blockchain)*
  - Cloud computing
  - Big data analytics

Snapshot of current firms operating in the space

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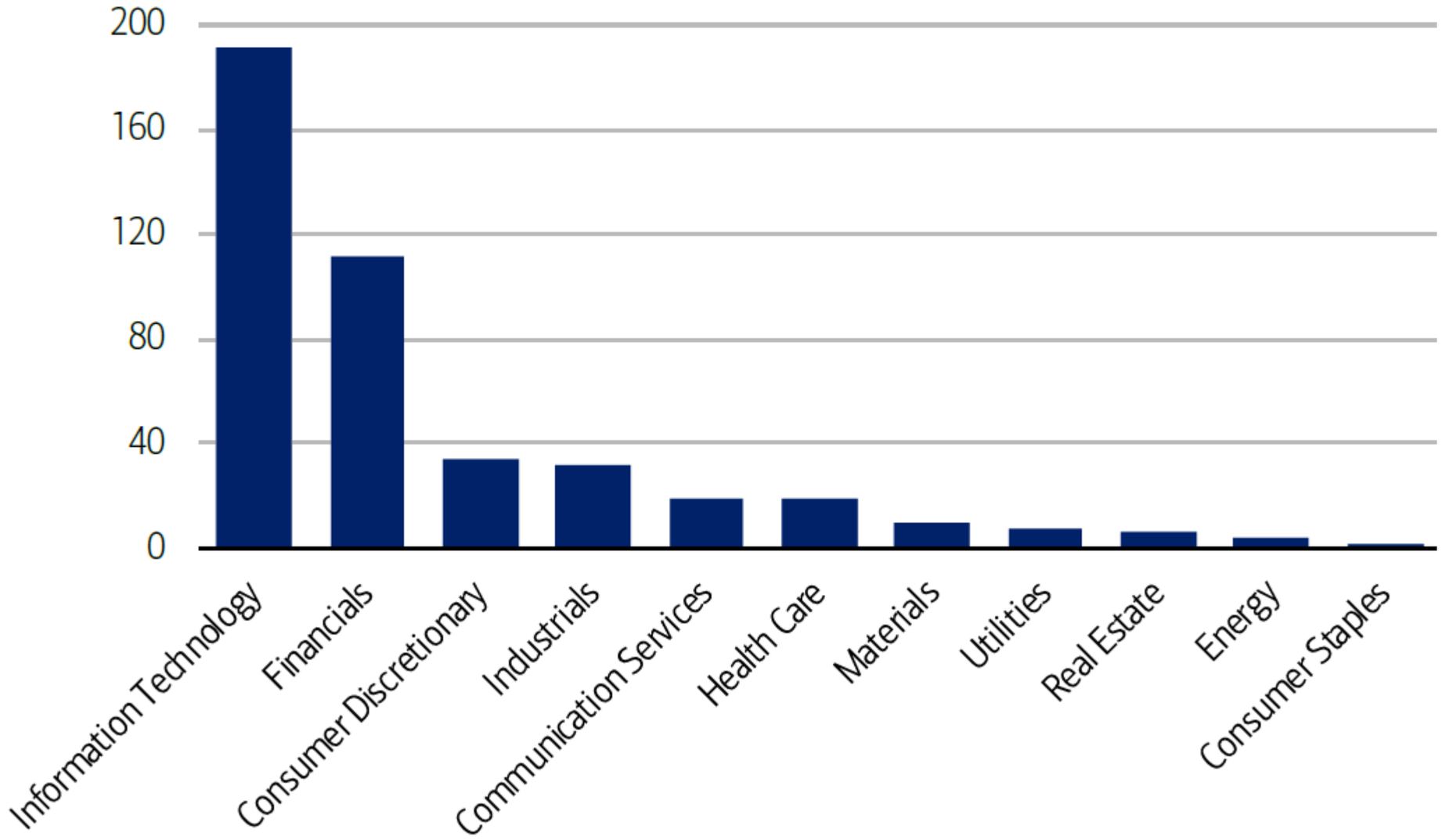
Exhibit 1: Digital asset ecosystem

A quick snapshot of the expansive and developing ecosystem from Wallets & Custody Services to Infrastructure & Development

Appreciate - this is not just about finance or banking *!!*

Exhibit 8: Sector breakdown of US companies that mentioned a digital asset keyword* on an earnings call skewed to Tech and Financials

NLP analysis of 48,117 earnings call transcripts since 1Q'18; avg 3,208 transcripts reviewed per quarter



Yes, it starts with banking

- The global banking system is
  - Old, outdated
  - Built from “1950s technology
- It will be rebuilt from whole-cloth
- Resulting in
  - Greater efficiency
  - Lower cost
  - Enhanced transparency
  - Improved surety
  - Fewer intermediaries and hand-touches
  - Greater speed
  - Interoperability *(facilitating proprietary applications)*
  - Improved oversight

Early wins

- Banking
- Investments
- Finance
- Insurance
- Contracting

A nice read on the topic, but it is 141 pages

Accessible version

BofA GLOBAL RESEARCH

BofA SECURITIES

Global Cryptocurrencies and Digital Assets

Digital Assets Primer: Only the first inning

Primer

Digital asset sector too large to ignore; not just bitcoin, so much more

With a $2tn+ market value and 200mn+ users, the digital asset universe is too large to ignore. We believe crypto-based digital assets could form an entirely new asset class. Bitcoin is important with a market value of ~$900bn, but the digital asset ecosystem is so much more: tokens that act like operating systems, decentralized applications (DApps) without middlemen, stablecoins pegged to fiat currencies, central bank digital currencies (CBDCs) to replace national currencies, and non-fungible tokens (NFTs) enabling connections between creators and fans. Venture Capital digital asset/blockchain investments were $17bn+ in 1H/2021, dwarfing last year's $5.5bn. This creates a new generation of companies for digital assets trading, offerings and new applications across industries, including finance, supply chain, gaming and social media.

Welcome to the token economy

Bitcoin was designed as money, but is increasingly viewed as "digital gold." Ethereum created a generalized platform powered by smart contracts, enabling the development of hundreds of applications that could transform finance, insurance, legal, real estate and many other industries. Digital assets that enable applications to be built, like the Apple iPhone did with its App Store, are gaining the most value. Our view is that there could be more opportunity than skeptics expect. In the near future, you may use blockchain technology to unlock your phone; buy a stock, house or fraction of a Ferrari; receive a dividend; borrow, loan or save money; or even pay for gas or pizza.

DApps and NFTs: the most innovation

Decentralized Finance (DeFi) is an ecosystem that allows users to utilize financial products and services, such as lending, borrowing, insurance and trading, without relying on a traditional financial institution. DApps may bring financial services to many of the 1.7bn unbanked globally through a simple smartphone app. NFTs are changing the way creators connect with fans and receive compensation (and Gen Y & Z along with a few boomers are snapping them up). NFT sales were $3bn+ in August, up from $250mn in all of 2020, led by demand from celebrities, corporations and individuals (Beeple's digital artwork NFT sale at Christie's for $69mn was a catalyst, for example).

04 October 2021

Cryptocurrency & Digital Assets
United States

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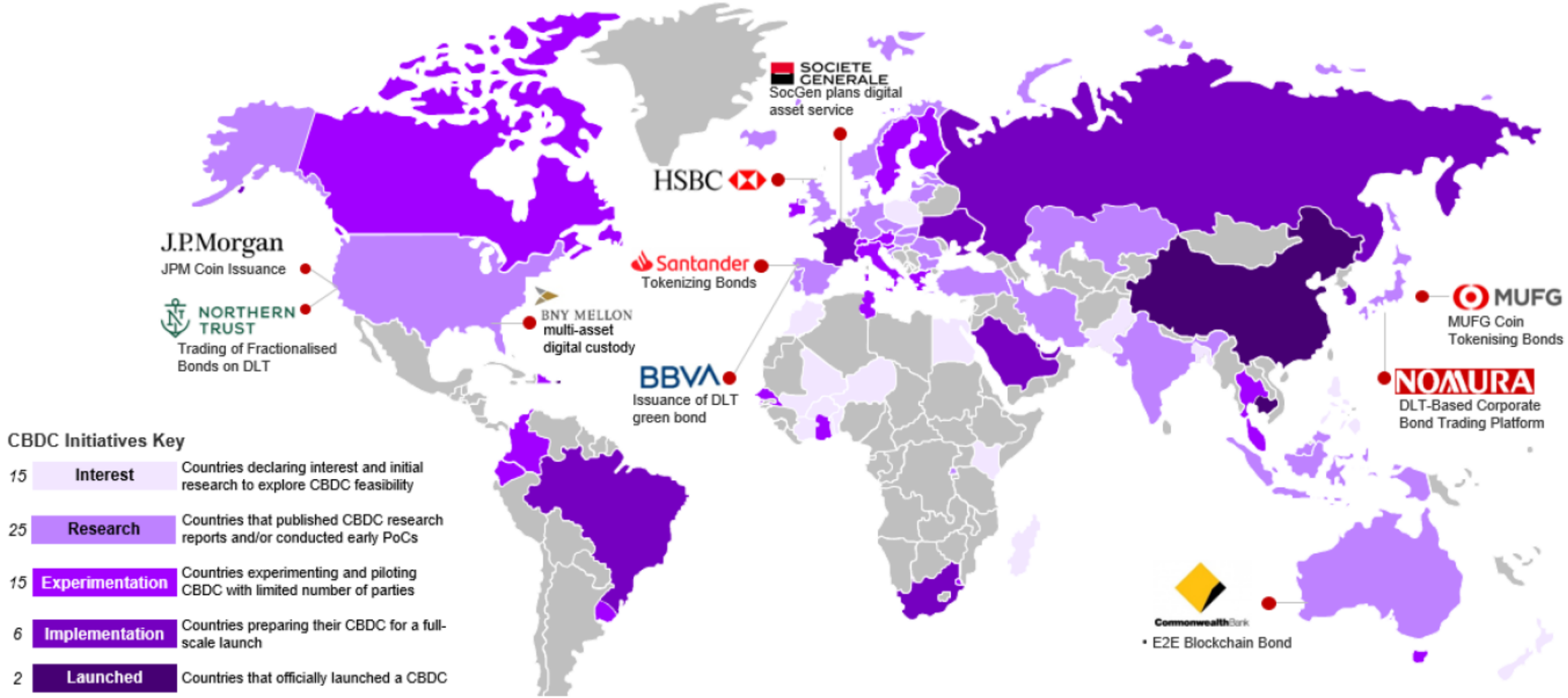
See Team Page for List of Analysts

Digital finance has little to do with the U.S. - It's purely global

Exhibit 15: Central and commercial banks across the world have significantly increased CBDC and digital asset initiatives

Global CBDC and digital asset initiatives map



Source: Accenture

As of August 2021

Nature of change - There are two very different kinds of change

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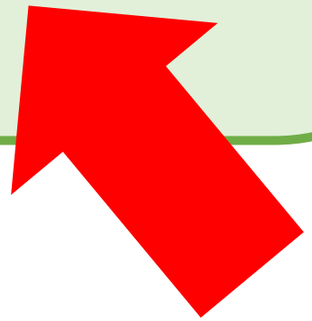
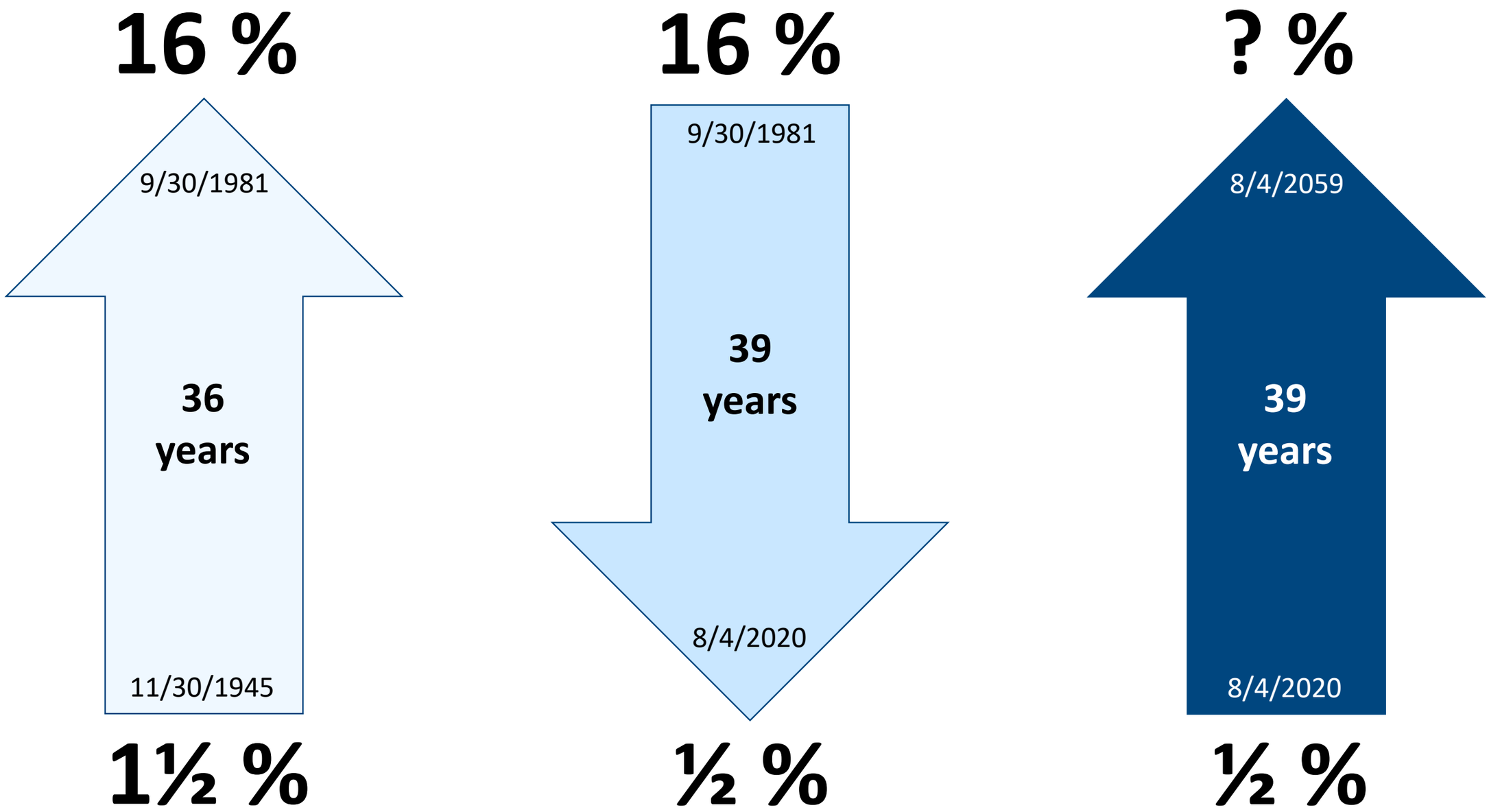


1981 to 2021 (40 years) was rare, exceptional, and won’t be seen again

It was a classic “one-off”

Interest rates . . . What do the next “39 years” hold for us?



Returns for over last 40 years . . . Since Sep 1981

- Annual returns for over 40 years
- Sep 1981 through Oct 2021

- 12.7% stocks
- 11.5% for a 60/40 portfolio of stocks/bonds
- 8.8% bonds

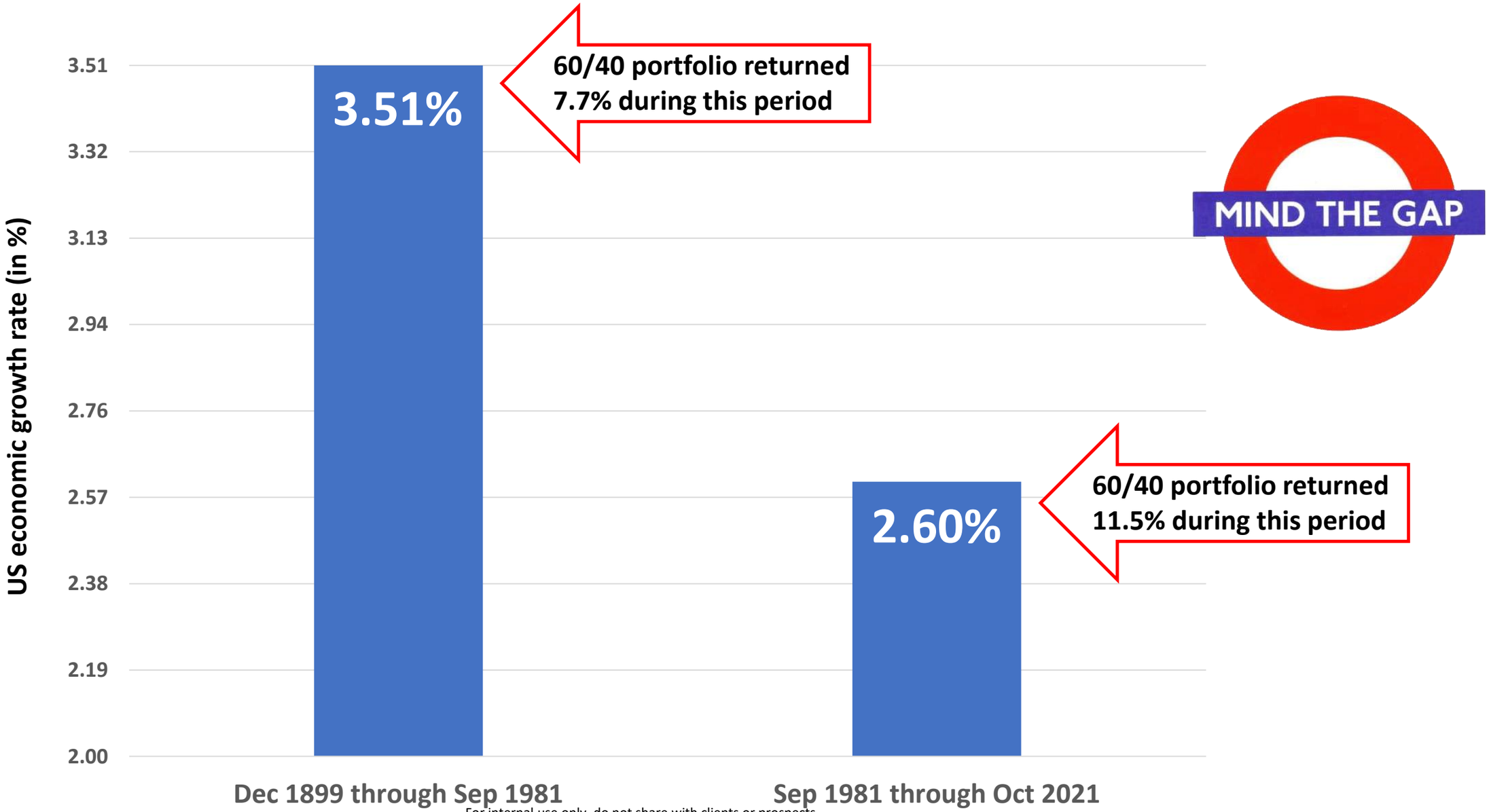
But the 60/40 portfolio only returned **7.7%** during the preceding 81.8 years (since Dec 1899)

So how can this be?

Was the US economy doing better during the most recent 40+ years?

- Stocks defined as 80% S&P 500 and 20% S&P 400 MidCap
- Bonds defined as 50% 10-year US Treasuries, 25% Dow Jones Investment Grade Corporate Bond Index, 25% GFD Indices USA Total Return AAA Corporate Domestic Bond Index
- The 60/40 portfolio is rebalanced monthly, this rebalancing contributed to its high long-term return

US economy before and after Sep 1981 . . . This doesn't make sense



Interest rates and inflation

	9/30/1981	8/31/2020	Change (in percentage terms)
Yield on the 10-year U.S. Treasury Bond	15.84%	0.52%	-97%
Year-over-year CPI inflation	11.0%	1.3%	-88%

The rewards were taken from labor . . . and transferred to capital

	9/30/1981	8/31/2020	Change (in percentage terms)
Corporate after-tax profits as a % of GDP	5.71%	10.10%	77%
Wage and salary disbursements as % of GDP	47.2%	44.93%	-5%

We built an economic expansion based on ever increasing debt

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	9/30/1981	8/31/2020	Change (in percentage terms)
Household CREDIT debt as % of GDP	46.0%	77.9%	69%
Household MORTGAGE debt as % of GDP	30.1%	51.1%	70%
Household debt as a % of Disposable Personal Income	65.1%	93.6%	44%
Publically held federal debta as % of GDP	27.5%	109.5%	298%
Total credit market debt as % of GDP	161.0%	385.9%	140%

Household's got ever more excited . . . seeing only the upside

	9/30/1981	8/31/2020	Change (in percentage terms)
U.S. household allocation to stocks (direct and indirect)	29.5%	56.5%	92%

Finally, stock valuations flew to the sky

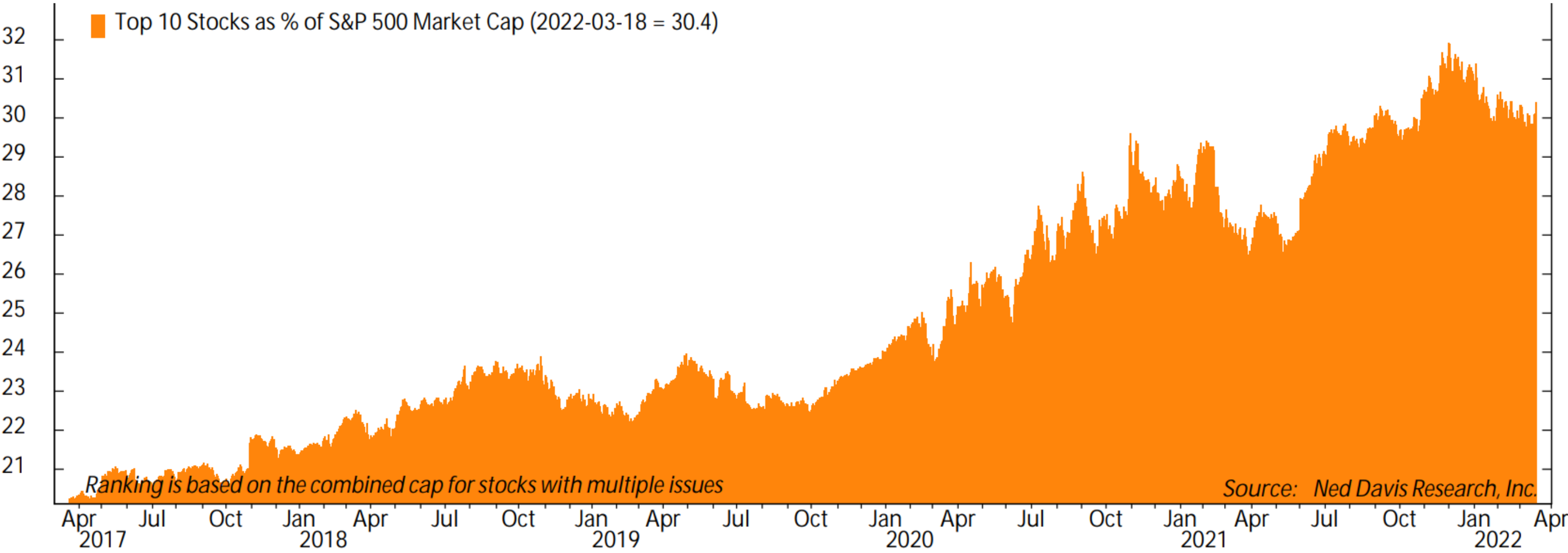
	9/30/1981	8/31/2020	Change (in percentage terms)
S&P 500 P/E ratio	7.61x	35.27x	363%
Median P/E ratio	7.7x	29.7x	286%
S&P 500 dividend yield	5.6%	1.3%	-77%
Stock market capitalization as % of Nominal Gross Domestic Product (Stocks/Economy)	37%	159%	330%
S&P 500 median Price/Sales	0.37x	2.53x	584%
Price/Sales above or below its trendline path	-52.58%	19.32%	"huge"
Shiller ratio (Cyclically adjusted Price-to-Earnings) based on ten years	8x	33x	313%
Tobin's Q (market value / net wealth) measures "build vs buy"	0.31x	1.48x	377%
Tobin's Q above or below its trendline path	-57.16%	24.32%	"huge"

Index funds underperform

Index funds, by design and construction . . .

- Overweight the most overpriced stocks and
- Underweight the cheapest stocks

S&P 500 Index is distorted by ten ultra-large companies



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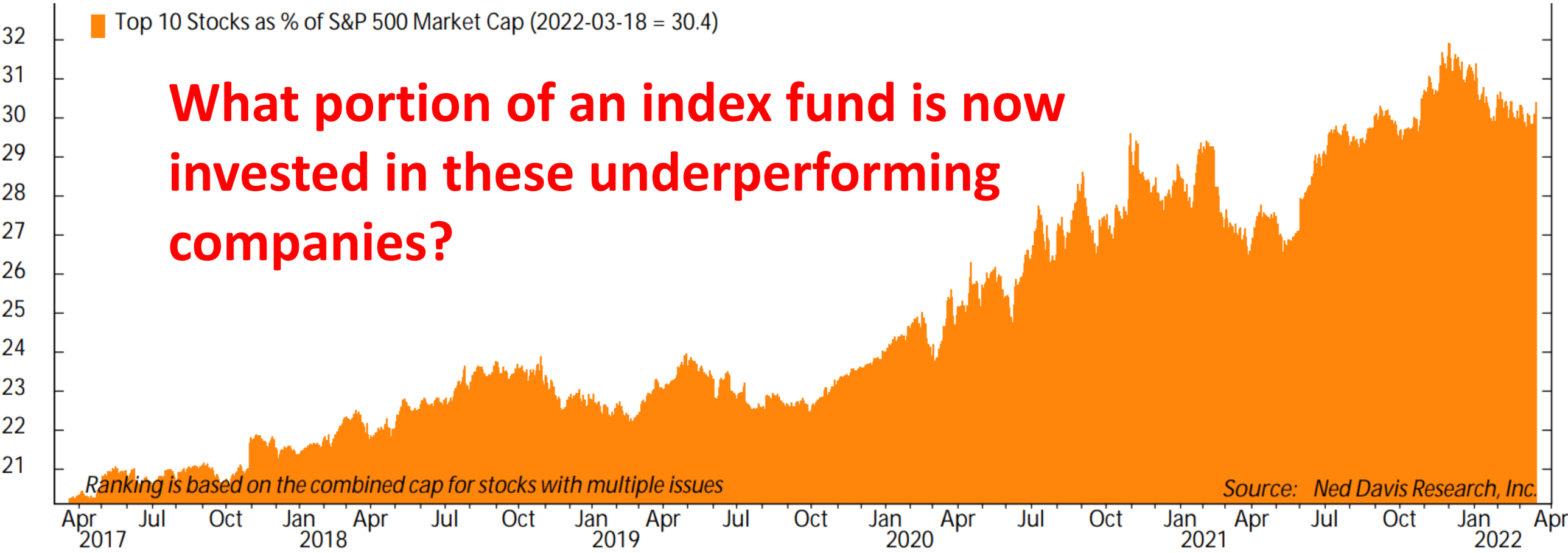
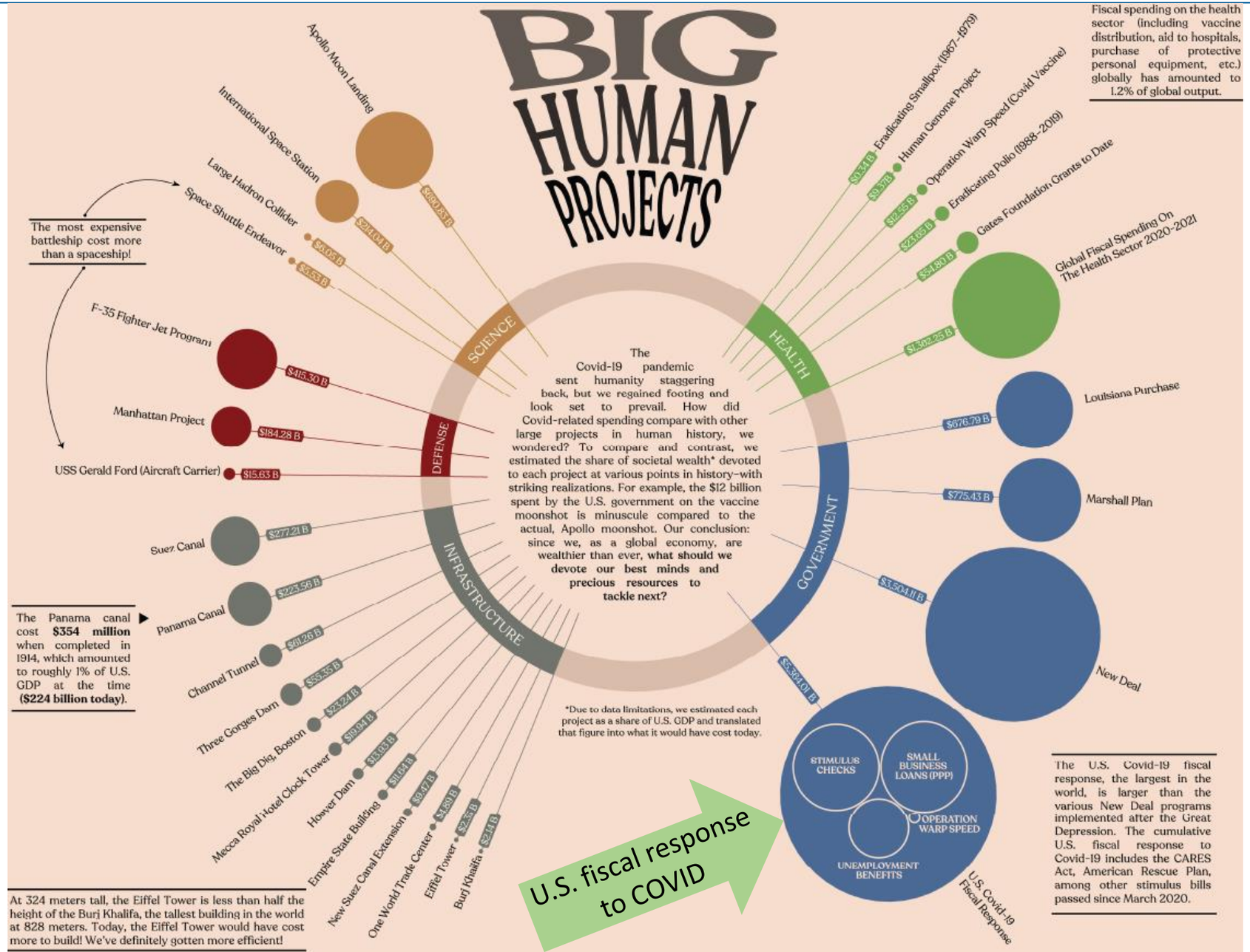


What portion of an index fund is now invested in these underperforming companies?

Fiscal and monetary stimulus in response to COVID-19



Leaving out the ten largest companies generates superior performance

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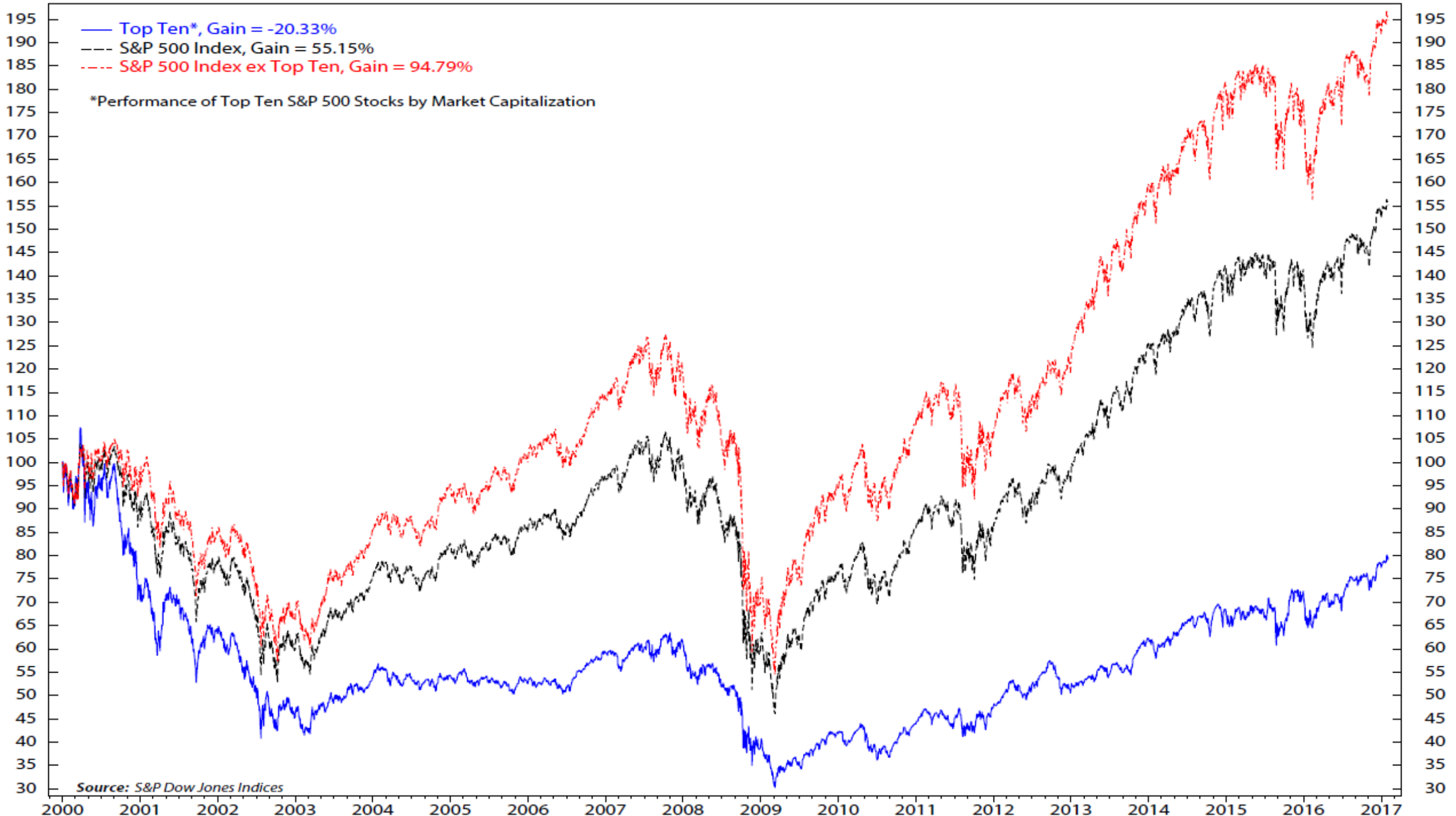

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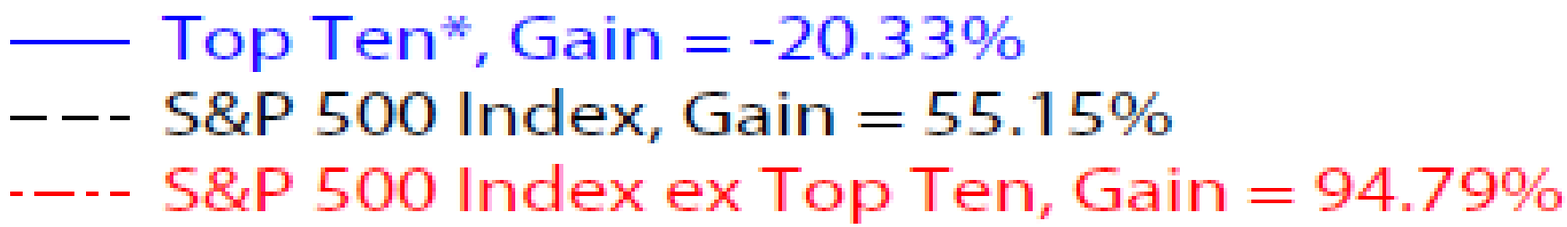

*Performance of Top Ten S&P 500 Stocks by Market Capitalization

The largest U.S. company has always underperformed - by a lot *!!*

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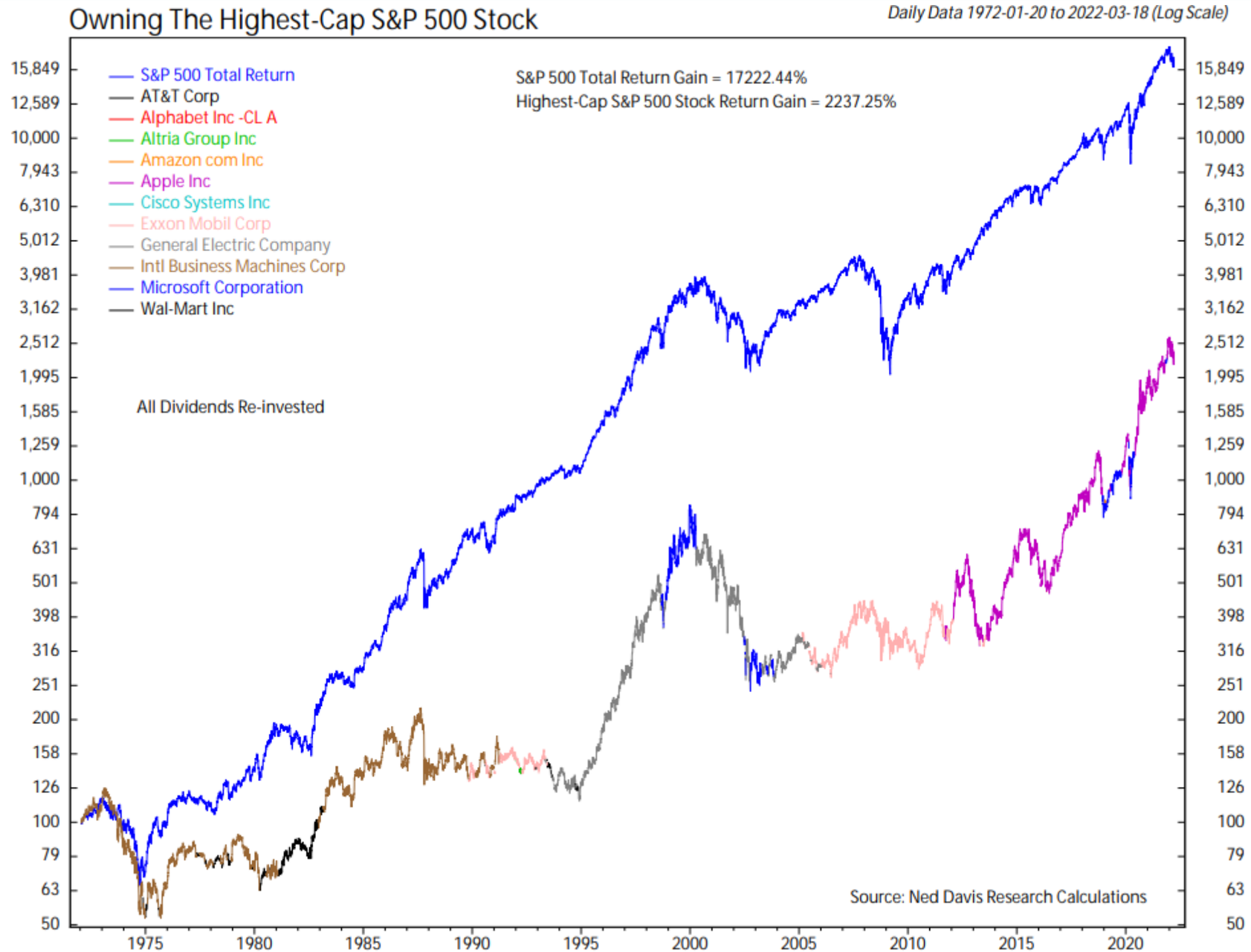



S&P 500 Total Return
AT&T Corp
Alphabet Inc -CL A
Altria Group Inc
Amazon com Inc
Apple Inc
Cisco Systems Inc
Exxon Mobil Corp
General Electric Company
Intl Business Machines Corp
Microsoft Corporation
Wal-Mart Inc
S&P 500 Total Return Gain = 17222.44%
Highest-Cap S&P 500 Stock Return Gain = 2237.25%
All Dividends Re-invested
Source: Ned Davis Research Calculations
15,849
12,589
10,000
7,943
6,310
5,012
3,981
3,162
2,512
1,995
1,585
1,259
1,000
794
631
501
398
316
251
200
158
126
100
79
63
50
1975
1980
1985
1990
1995
2000
2005
2010
2015
2020

The bottom line

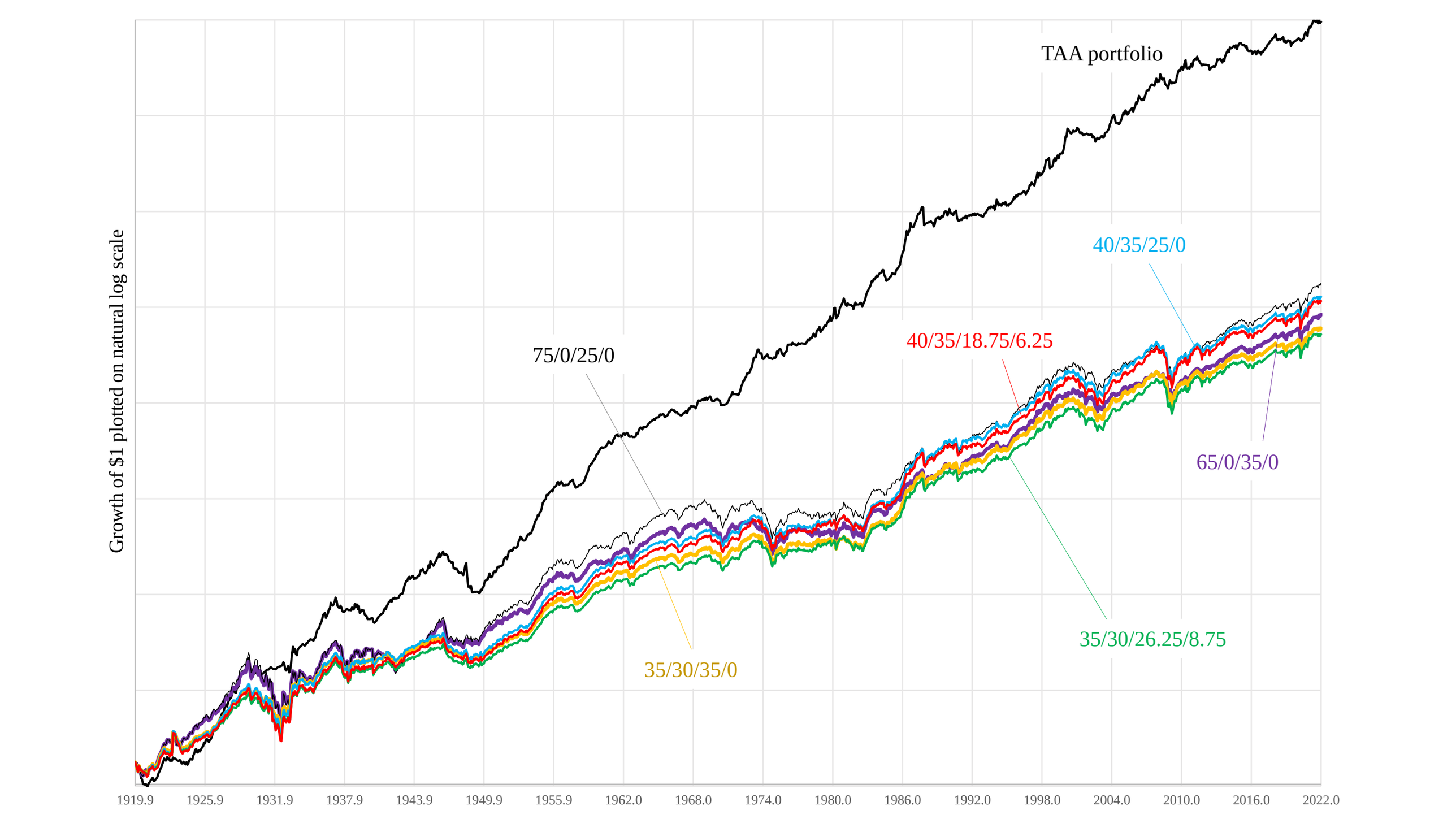
Don’t let yourself be gaslighted

Bottom line

- Serious reasons to expect something
  - Different
  - Challenging

Gaslighting - Outlandish outlooks

- The word “Gaslighted” means manipulated into not seeing reality
- As evidenced by forecasts of 2022 security returns, investors are routinely gaslighted into believing the future is bright
- The reality is that severe market corrections are highly likely in this decade of the 2020s


TAA portfolio
40/35/25/0
40/35/18.75/6.25
75/0/25/0
65/0/35/0
35/30/26.25/8.75
35/30/35/0
Growth of $1 plotted on natural log scale
1919.9
1925.9
1931.9
1937.9
1943.9
1949.9
1955.9
1962.0
1968.0
1974.0
1980.0
1986.0
1992.0
1998.0
2004.0
2010.0
2016.0
2022.0

Statistics over entire time period (102.1 years) using inflation-adjusted monthly returns

	TAA portfolio	65/0/35/0	75/0/25/0	35/30/35/0	40/35/25/0	35/30/26.25/8.75	40/35/18.75/6.25
Real return	10.80	6.40	6.86	6.19	6.66	6.11	6.60
Correlation with TAA portfolio	1	0.58	0.58	0.65	0.65	0.67	0.66
Annualized standard deviation	11.74	12.56	14.22	10.41	11.73	10.51	11.80
Return per unit of volatility	0.92	0.51	0.48	0.59	0.57	0.58	0.56

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How to explain tactical asset allocation to a client

Friday

April 8th

11:00 a.m. EASTERN

Important Disclosures

All data and statistics were provided by Global Financial Data, Inc. and NDR, Inc. (unless otherwise indicated in the exhibit)

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