Virginia Retirement System®

# 2025 Board of Trustees Retreat

March 18-19, 2025

Boar's Head
Charlottesville, Virginia

# Board of Trustees Retreat

## Boar's Head | The Ballroom  Wednesday, March 19, 2025

8:00 a.m. Buffet Breakfast - Ballroom Foyer

8:30 a.m. Day 2 Opening Remarks
Andrew Junkin - Virginia Retirement System
*Chief Investment Officer*

8:35 a.m. Macro Overview
Torsten Slok - Apollo Global Management
*Partner and Chief Economist*

9:20 a.m. Geopolitics
Tom Nides - Blackstone
*Vice Chairman, Strategy and Client Relations*

10:15 a.m. 15-Minute Break

10:30 a.m. Data Centers
Matt A'Hearn - Blue Owl
*Head, Digital Infrastructure*

11:10 a.m. Real Estate
Elizabeth Bell - Hamilton Lane
*Co-Head, Real Estate*

11:50 a.m. Healthcare
Dr. Thomas Roberts, Jr.
Farallon Capital Management
*Partner and Vice Chair*

12:30 p.m. Closing Remarks
Andrew Junkin - Virginia Retirement System
*Chief Investment Officer*

Buffet Lunch - Ballroom Foyer

Virginia Retirement System®

# Opening Remarks

Day 2

Andrew Junkin
Chief Investment Officer

Virginia Retirement System®

# Guest Speaker: Macro Overview

Torsten Slok
Partner and Chief Economist

Apollo Global Management

Virginia Retirement System®

# Guest Speaker: Macro Overview
## Torsten Slok | Apollo Global Management

Mr. Slok joined Apollo Global Management in August 2020.

Prior to joining the firm, Mr. Slok worked for 15 years on the sell-side, where his team was top-ranked by Institutional Investor in fixed income and equities for ten years, including #1 in 2019. Previously he worked at the OECD in Paris in the Money and Finance Division and the Structural Policy Analysis Division. Before joining the OECD he worked for four years at the IMF in the Division responsible for writing the World Economic Outlook and the Division responsible for China, Hong Kong, and Mongolia.

Mr. Slok studied at University of Copenhagen and Princeton University. He frequently appears in the media (CNBC, Bloomberg, WSJ, NYT, FT), and he has published numerous journal articles and reviews on economics and policy analysis, including in Journal of International Economics, Journal of International Money and Finance, and The Econometric Journal.

APOLLO

# Outlook for public and private markets

Torsten Slok, Ph.D.
tslok@apollo.com

**Apollo Global Management**

March 2025

Unless otherwise noted, information as of March 2025.

# Legal Disclaimer

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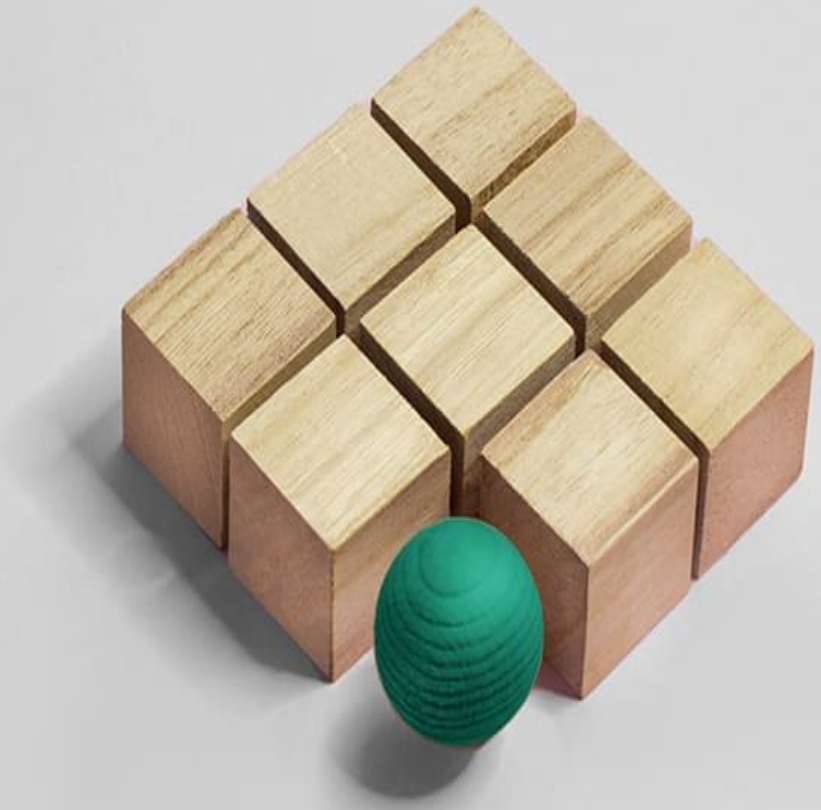
1) DOGE and tariffs

2) Incoming economic data

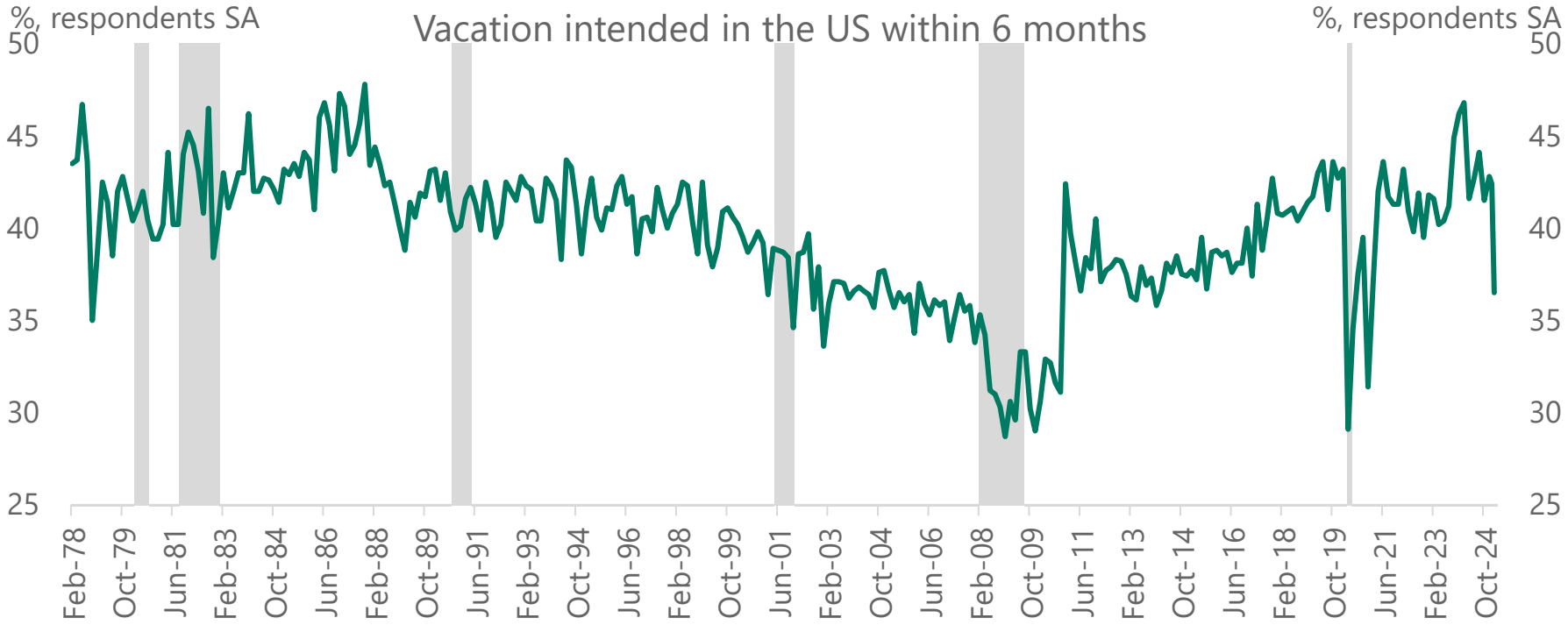
3) Investment implications

Source: Apollo Chief Economist

# Overview

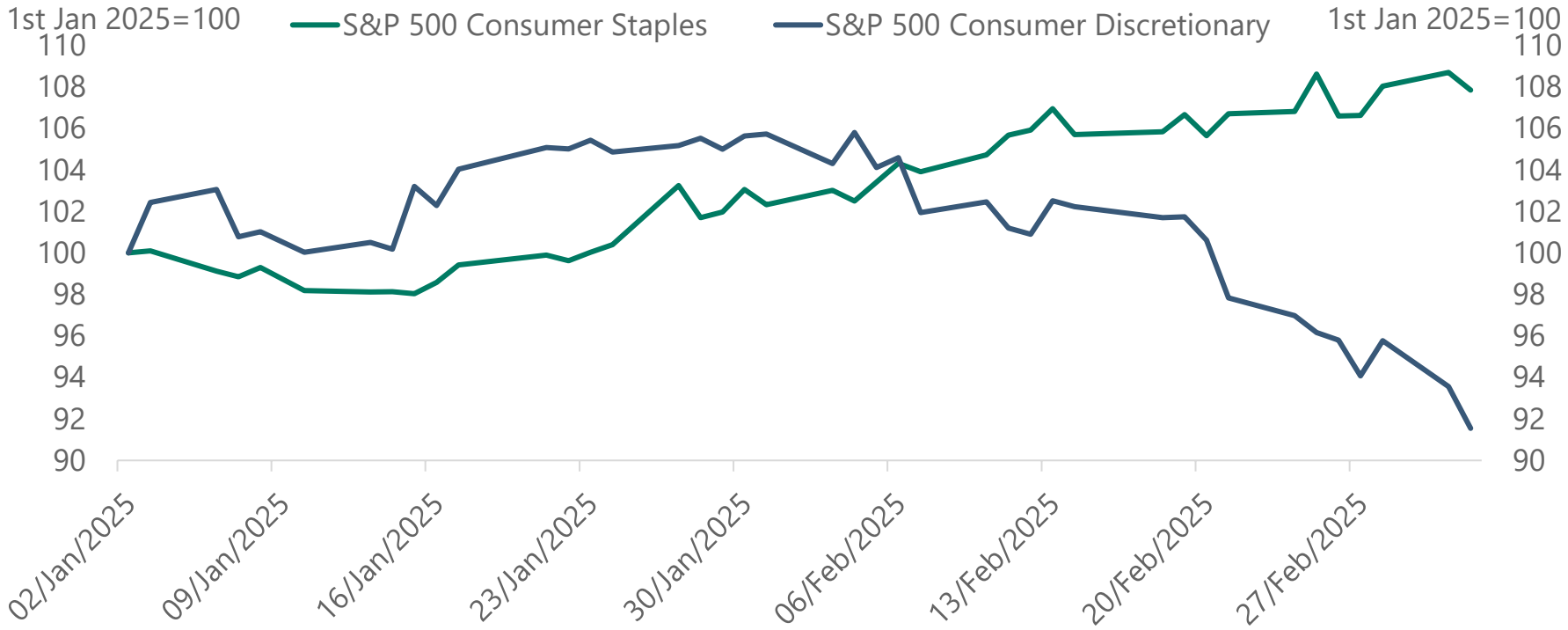


# Fewer people planning vacations



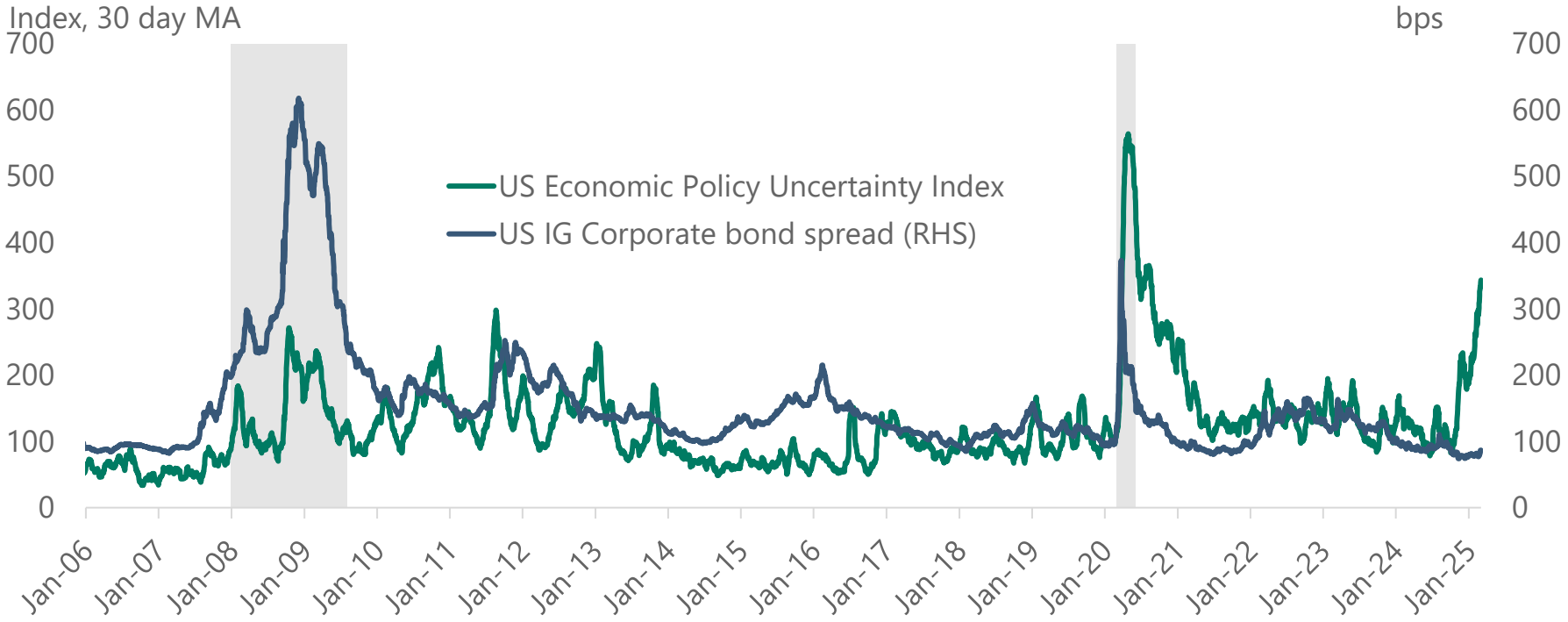

Source: Conference Board, Bloomberg, Apollo Chief Economist.

# Divergence between consumer staples and consumer discretionary



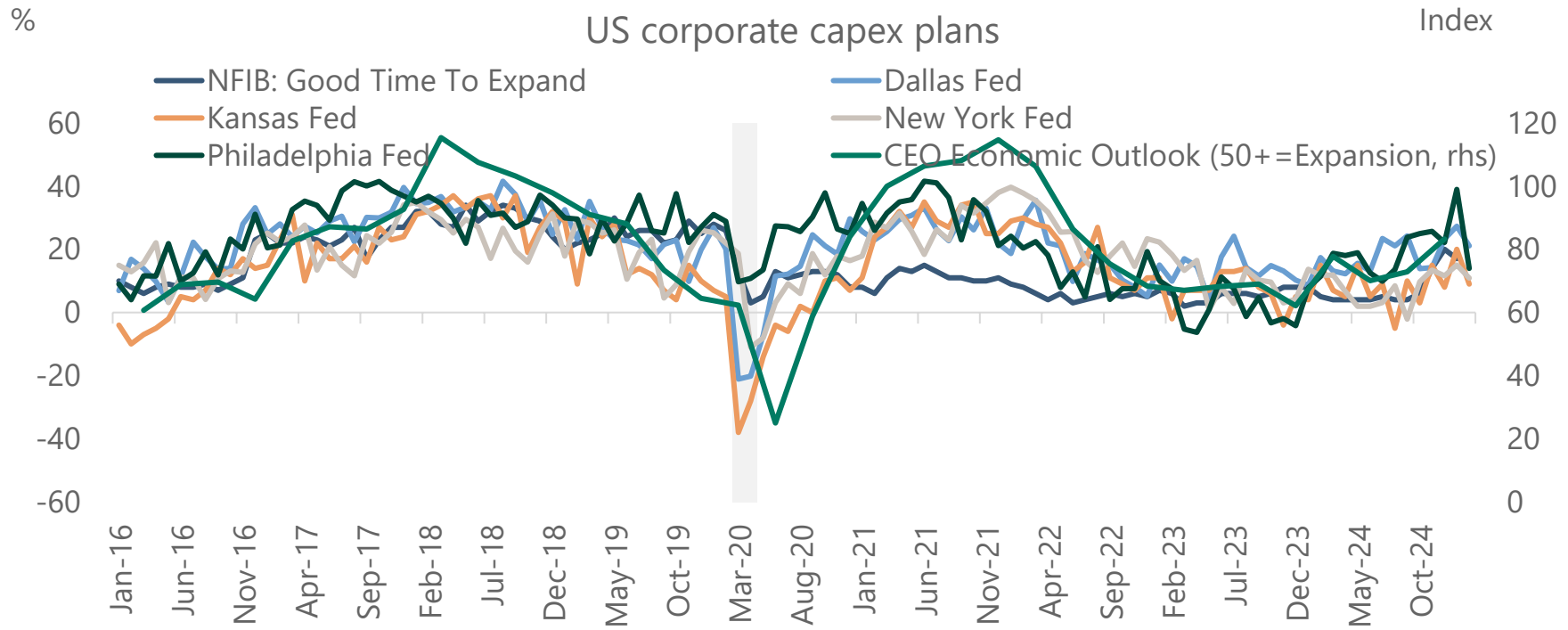

Source: Bloomberg, Apollo Chief Economist

# IG spreads are disconnected from the economic policy uncertainty index



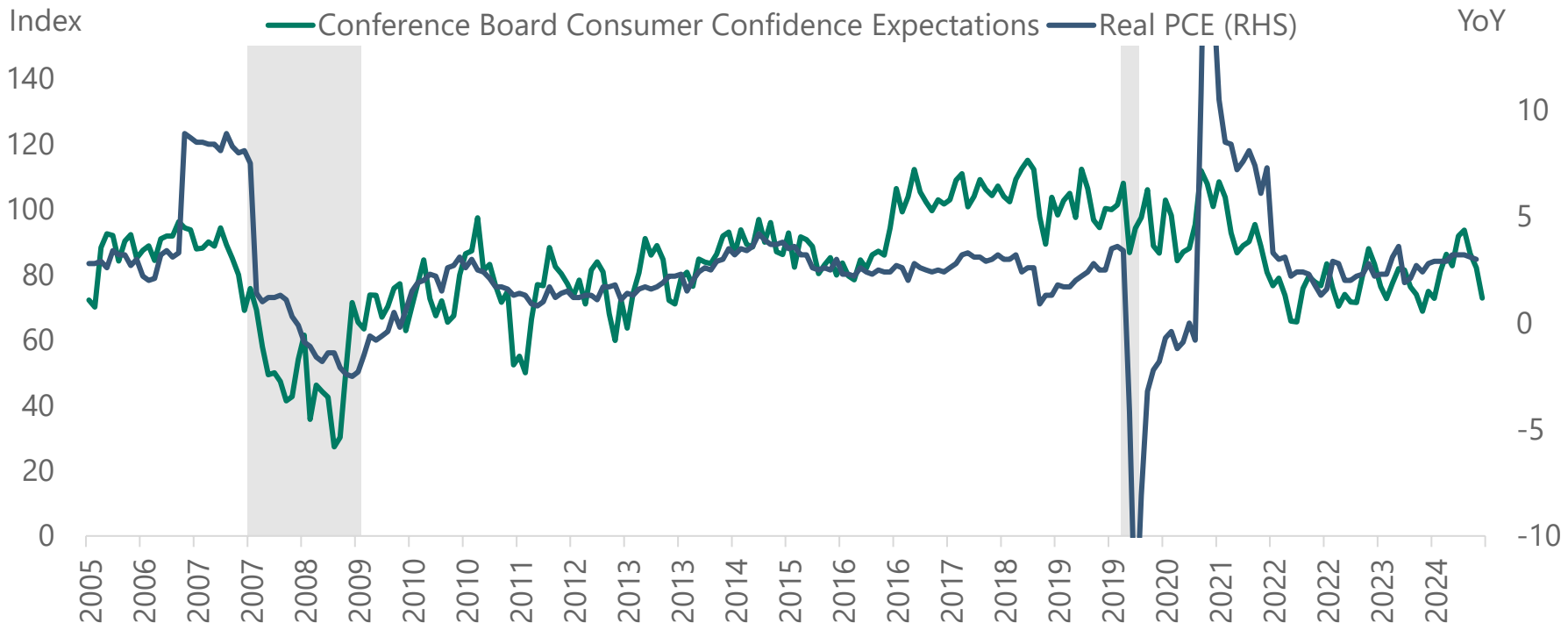

Source: Bloomberg, Apollo Chief Economist

# Corporate capital spending plans reversing




Source: Business Roundtable, NFIB, Federal Reserve Bank of Philadelphia, Dallas, New York, Kansas and Richmond. Apollo Chief Economist.

# Downside risks to consumer spending




Source: Conference Board, BEA, Bloomberg, Apollo Chief Economist

# Consumer business expectations


Source: Conference Board, Haver Analytics, Apollo Chief Economist

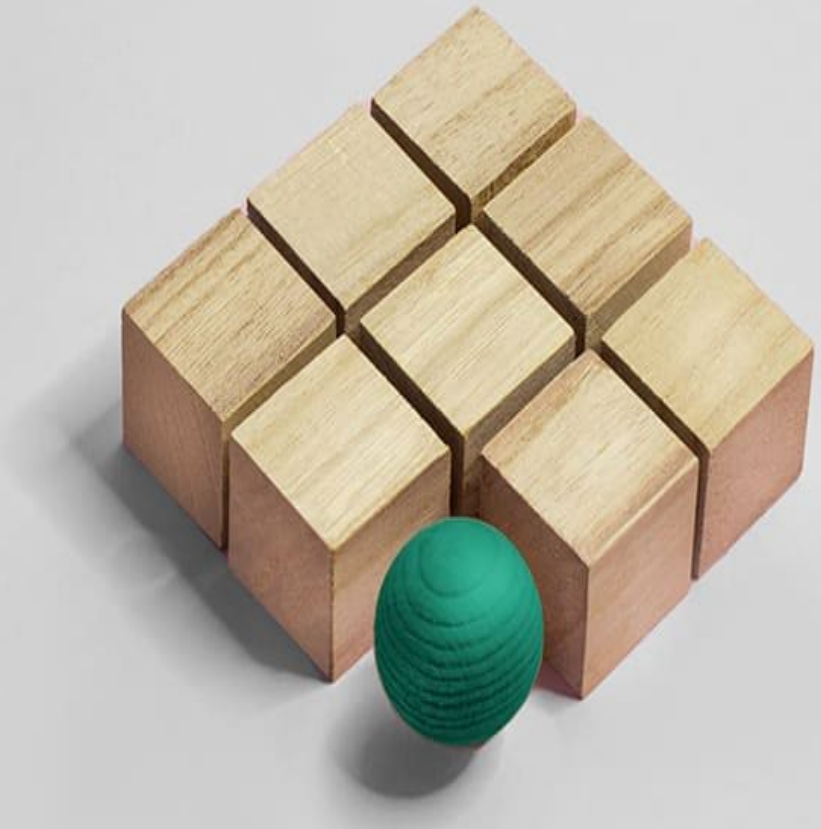
# Consumer inflation expectations


Source: Conference Board, Haver Analytics, Apollo Chief Economist

# Consumers expecting fewer jobs available going forward


Source: Conference Board, Haver Analytics, Apollo Chief Economist

# DOGE and tariffs



# Overview

Key policy areas: **Tariffs, DOGE, immigration, and fiscal policy**

**DOGE impact:**
- Expected federal layoffs: 300k
- For every federal employee there are 2 contractors
- Total unemployment: 7mn
- Total US Employment: 160mn

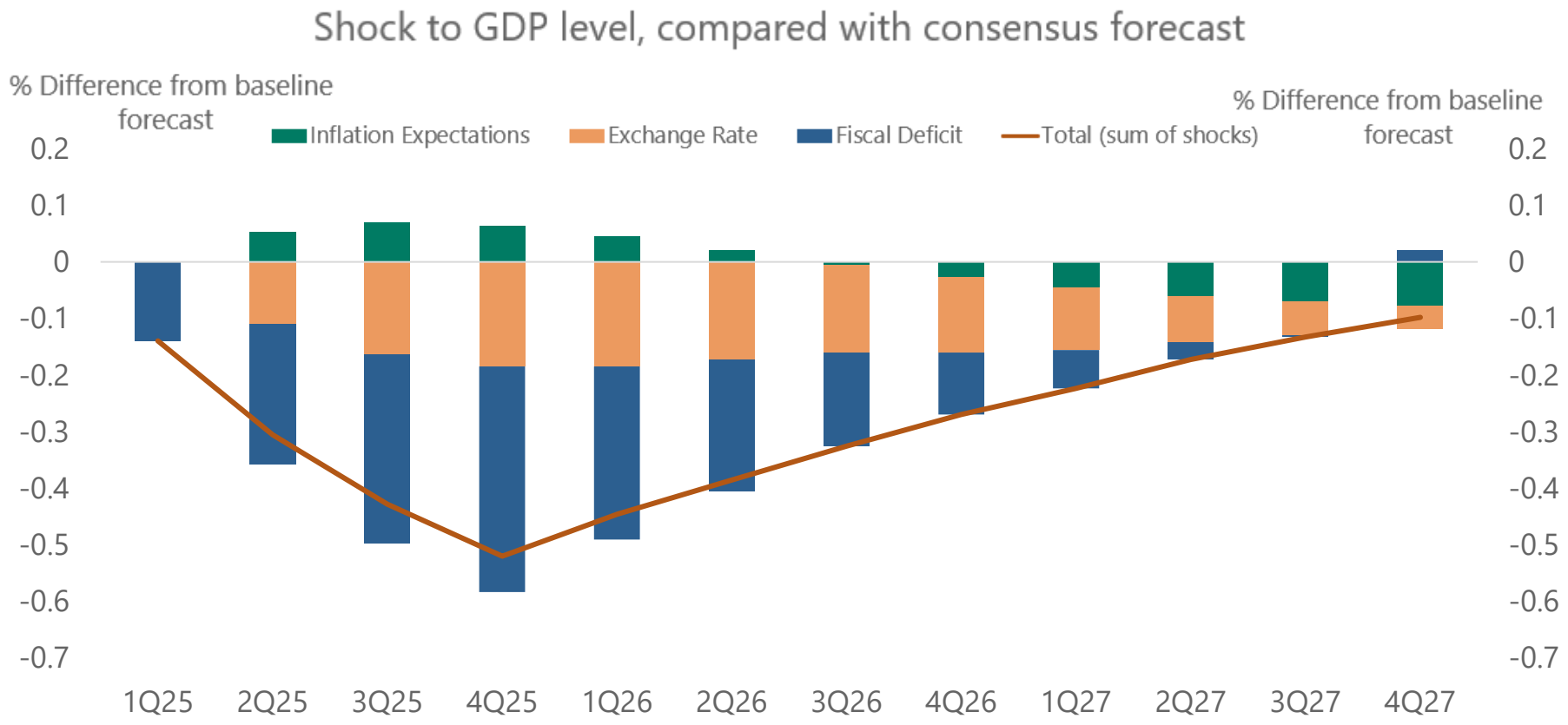
**Tariff impact**:
- Impact on US GDP: -0.4%. CPI: +0.5%. China alone: US GDP: -0.1%. CPI: +0.2%.

**Immigration**:
- Policy changes coming

**Fiscal policy:**
- The budget, not easy to replace income taxes with tariffs

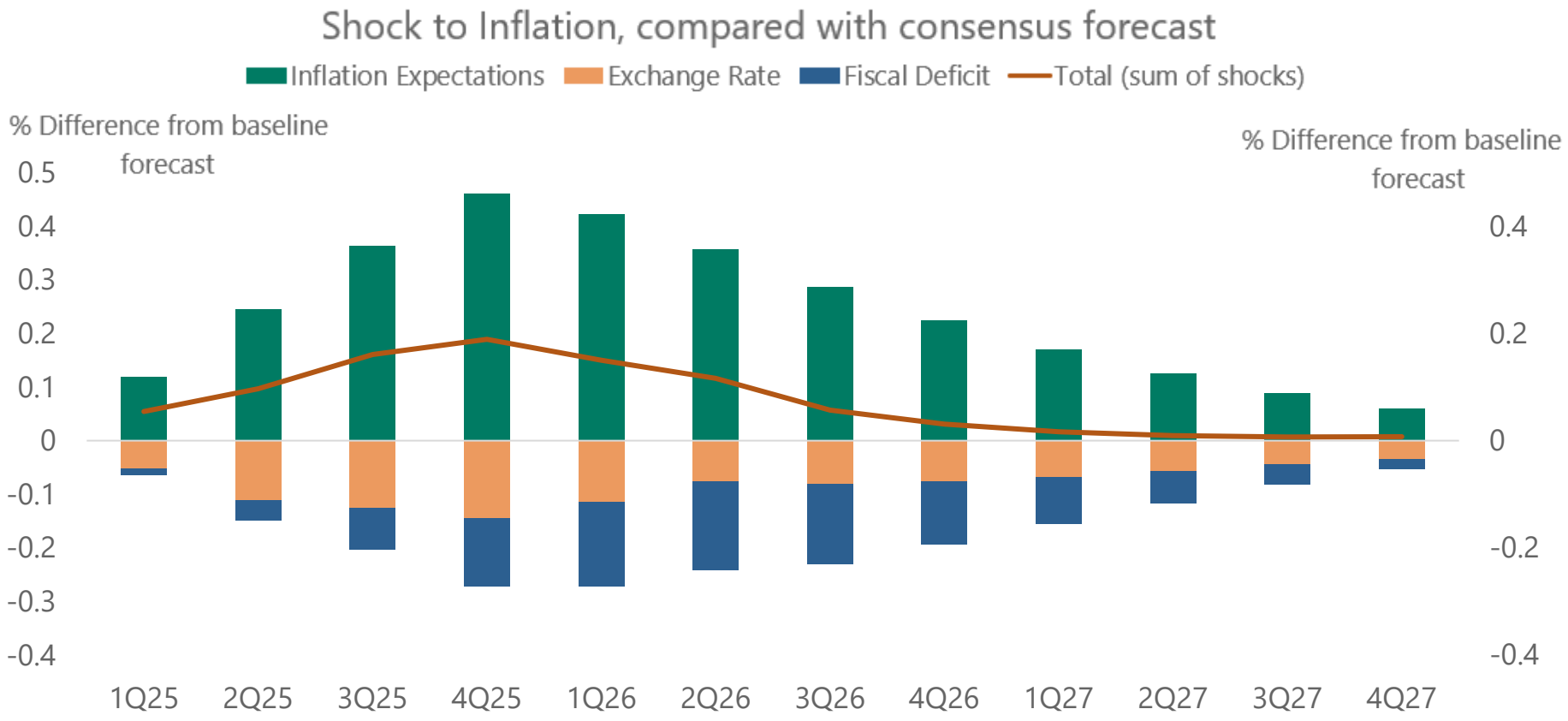
Source: Apollo Chief Economist

# The impact of tariffs and DOGE on GDP



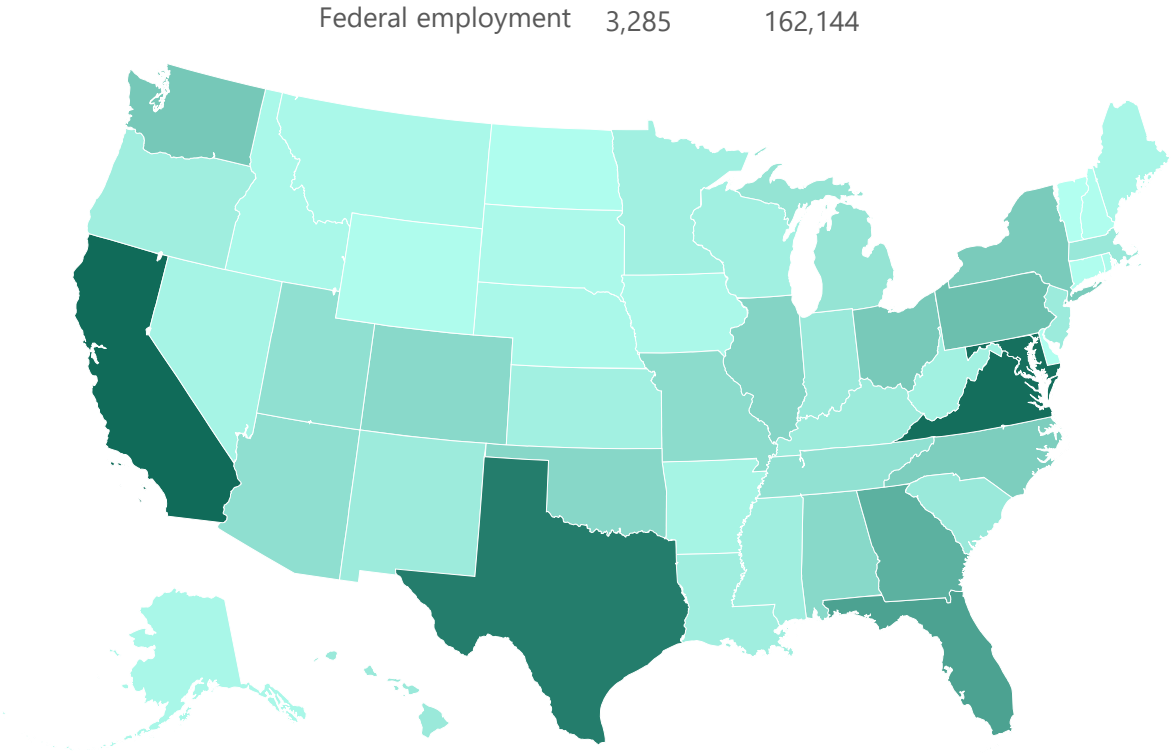

Source: Bloomberg SHOK model, Apollo Chief Economist. Note: Assumptions: $100bn in DOGE savings resulting in 0.4% reduction in fiscal deficit, 5% appreciation of exchange rate and 0.5% - pt increase in inflation expectations shocks applied in Q1 2025.

# The impact of tariffs and DOGE on inflation



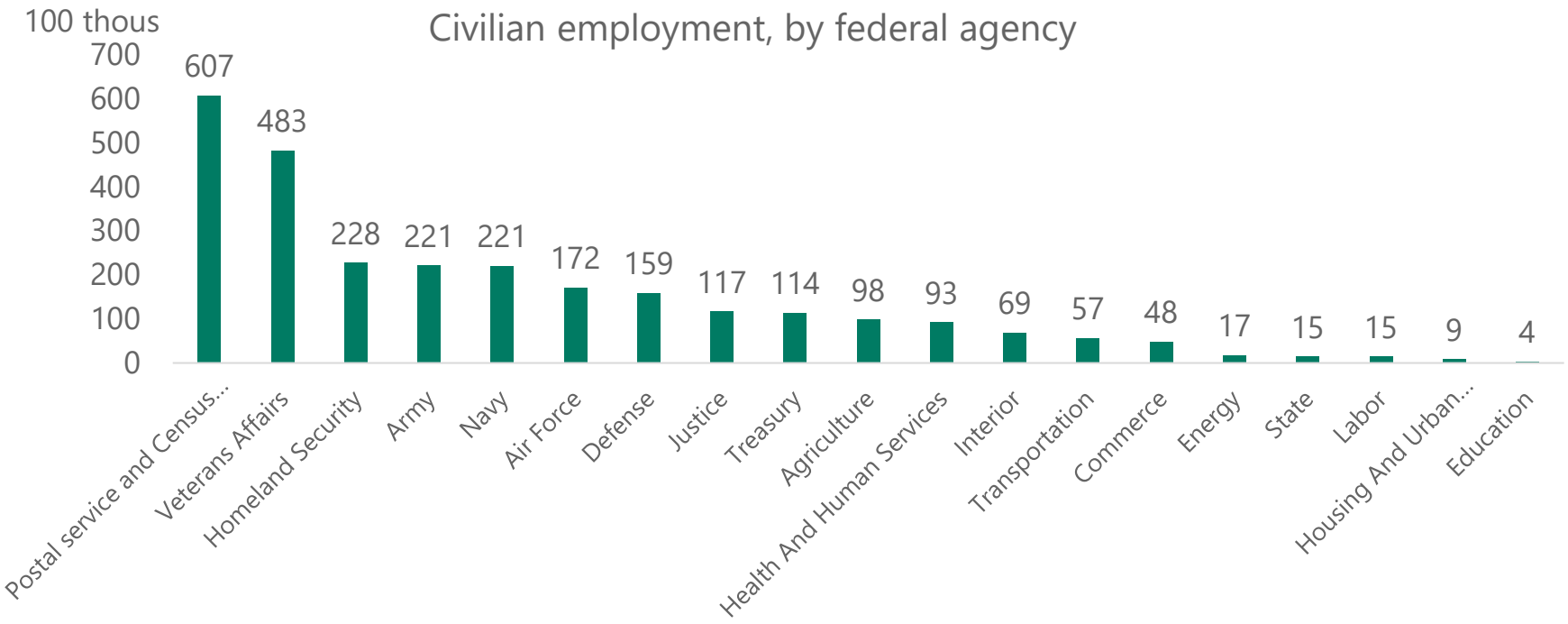

Source: Bloomberg SHOK model, Apollo Chief Economist. Note: Assumptions: $100bn in DOGE savings resulting in 0.4% reduction in fiscal deficit, 5% appreciation of exchange rate and 0.5% - pt increase in inflation expectations shocks applied in Q1 2025.

# 85% of federal government workers are outside the DC area



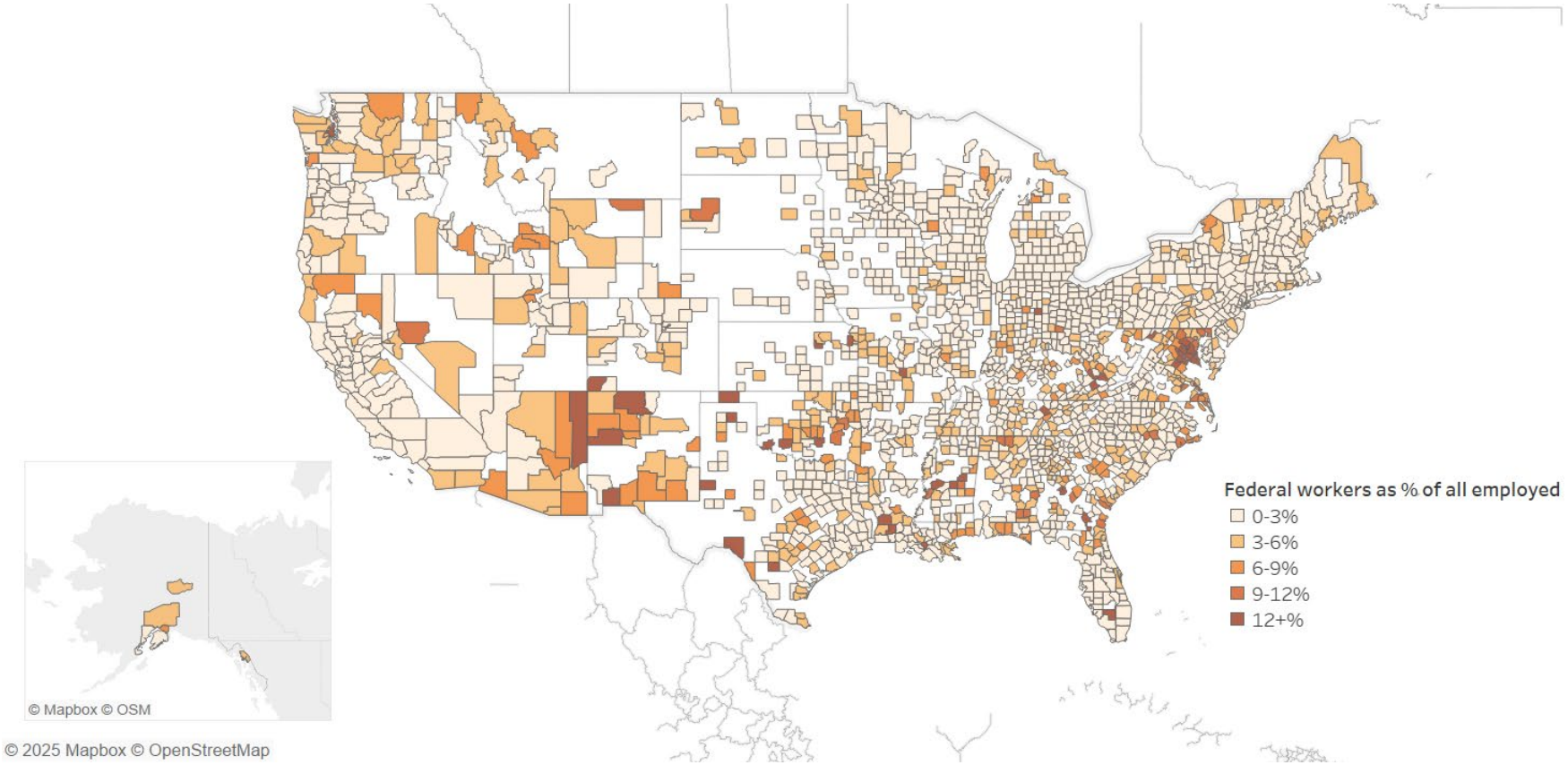

Source: Congressional Research Service, Apollo Chief Economist.

# Total employment in different federal agencies



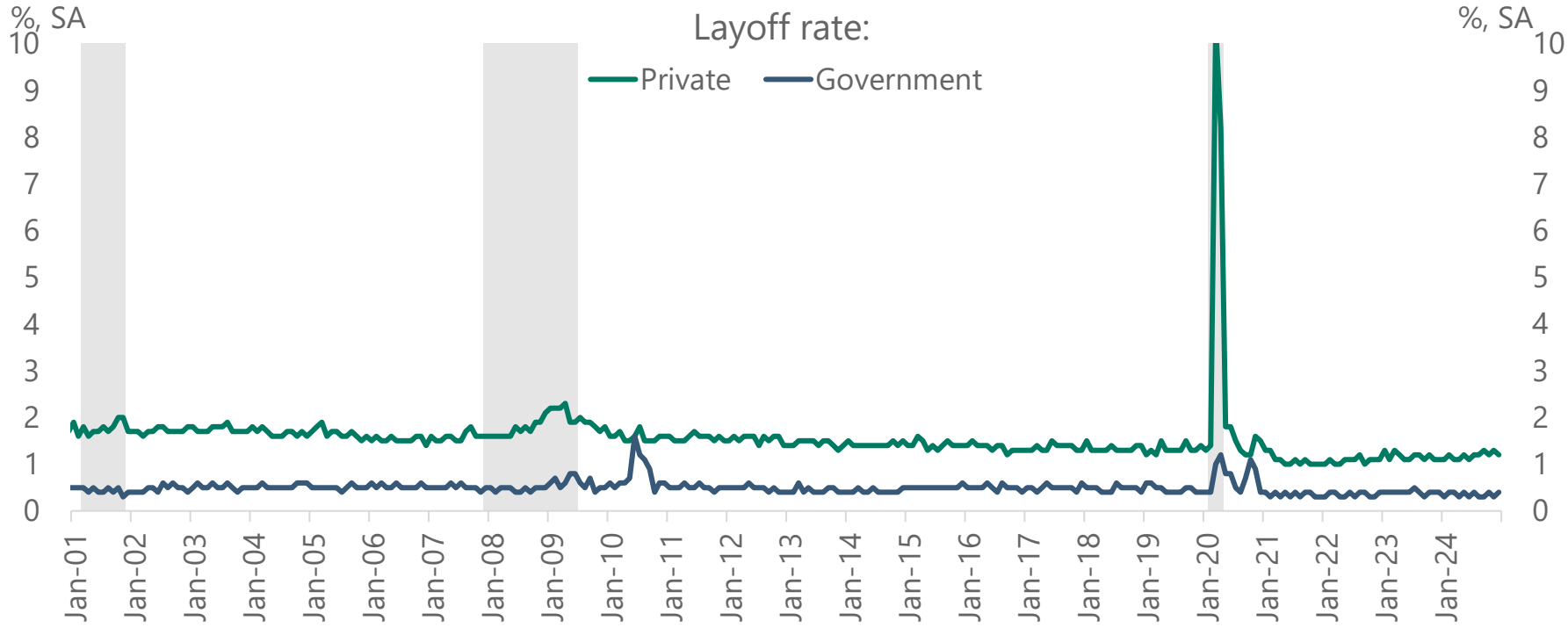

Source: Office of Personnel Management, BLS, Bloomberg, Apollo Chief Economist

# Federal employment as a percentage of total employment, by county



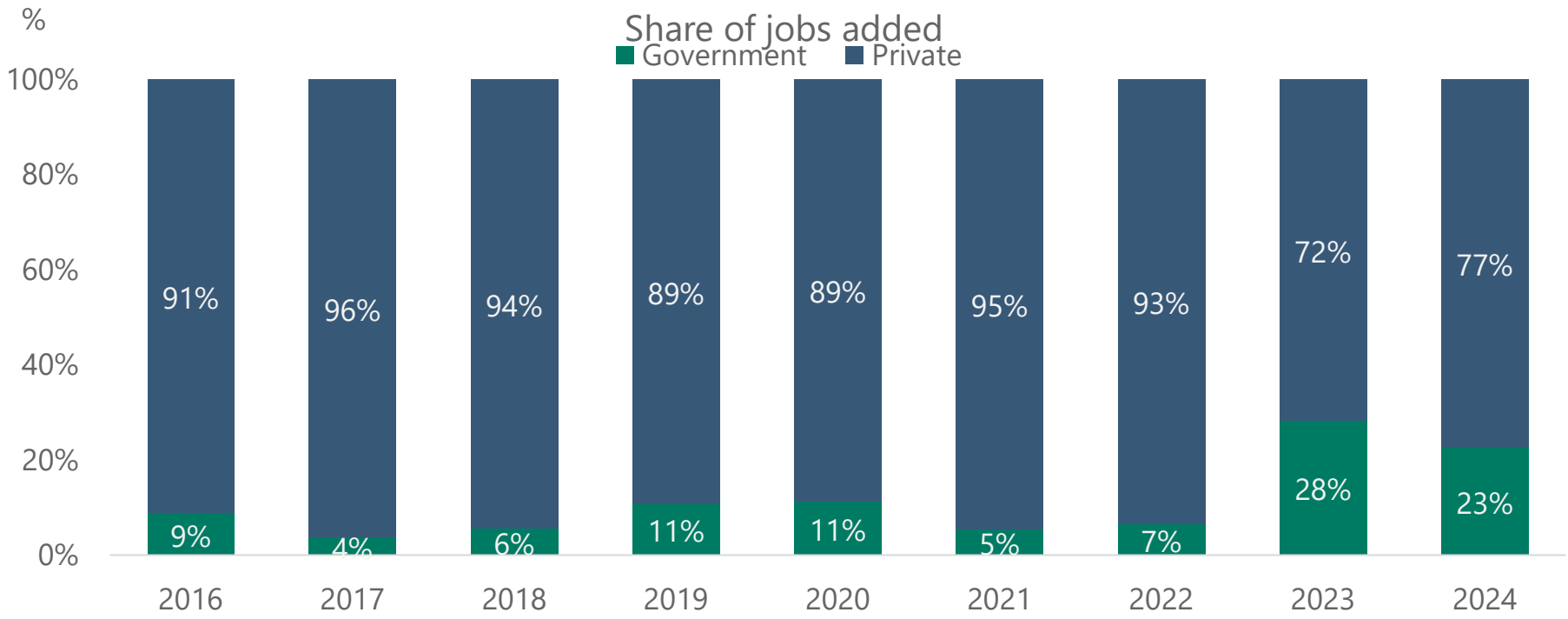

Source: Census Bureau (2023), Apollo Chief Economist.

# The layoff rate in the government sector is one-third of the private sector layoff rate



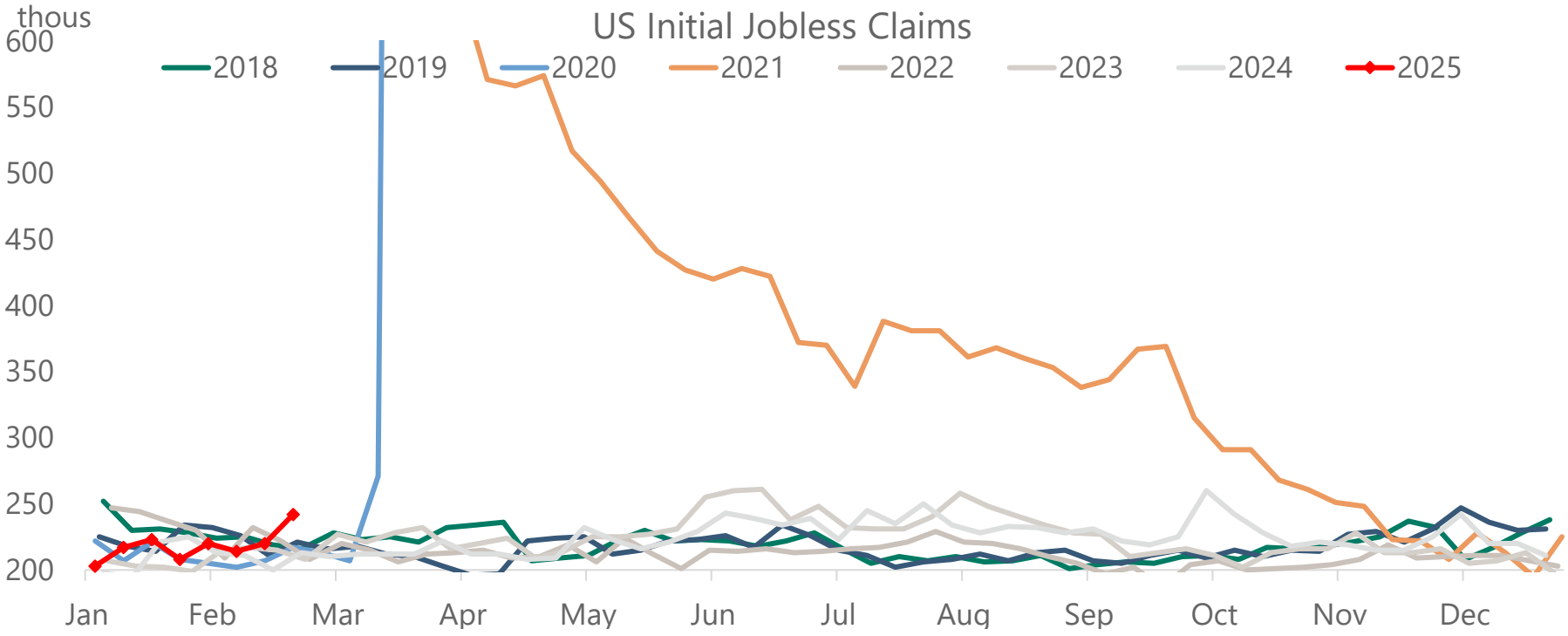

Source: BLS, Bloomberg, Apollo Chief Economist

# Many government jobs added in 2023 and 2024



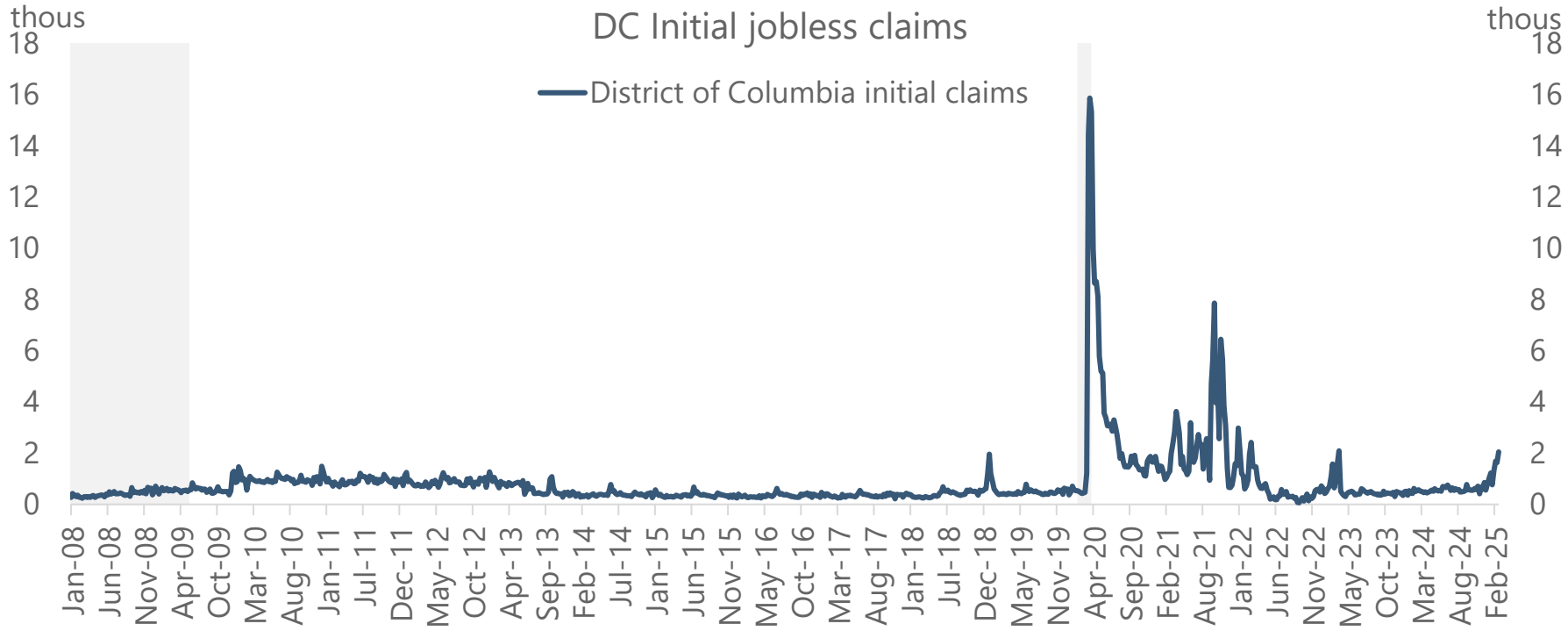

Source: BLS, Haver Analytics, Apollo Chief Economist

# Weekly initial jobless claims has been increasing



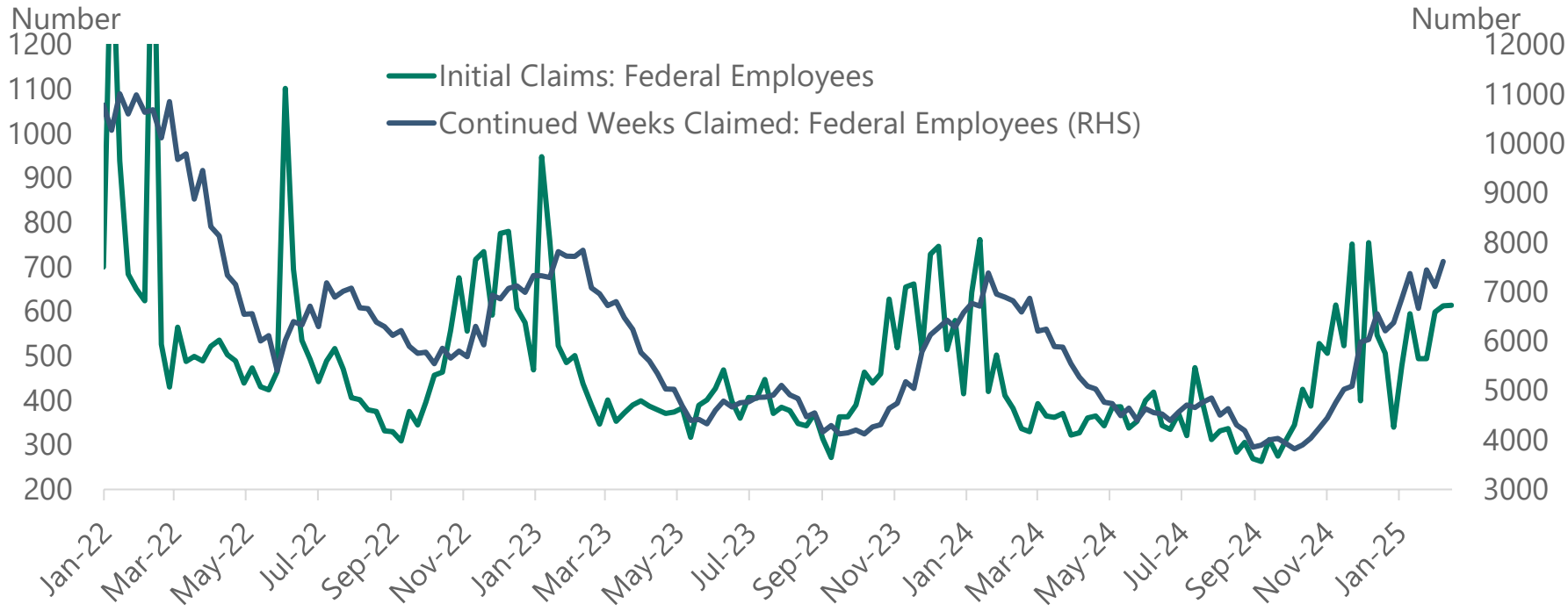

Source: U.S. Department of Labor, Apollo Chief Economist.

# Initial jobless claims in Washington, DC




Source: U.S. Department of Labor, Bloomberg, Apollo Chief Economist.

# Total initial and continuing jobless claims by federal employees



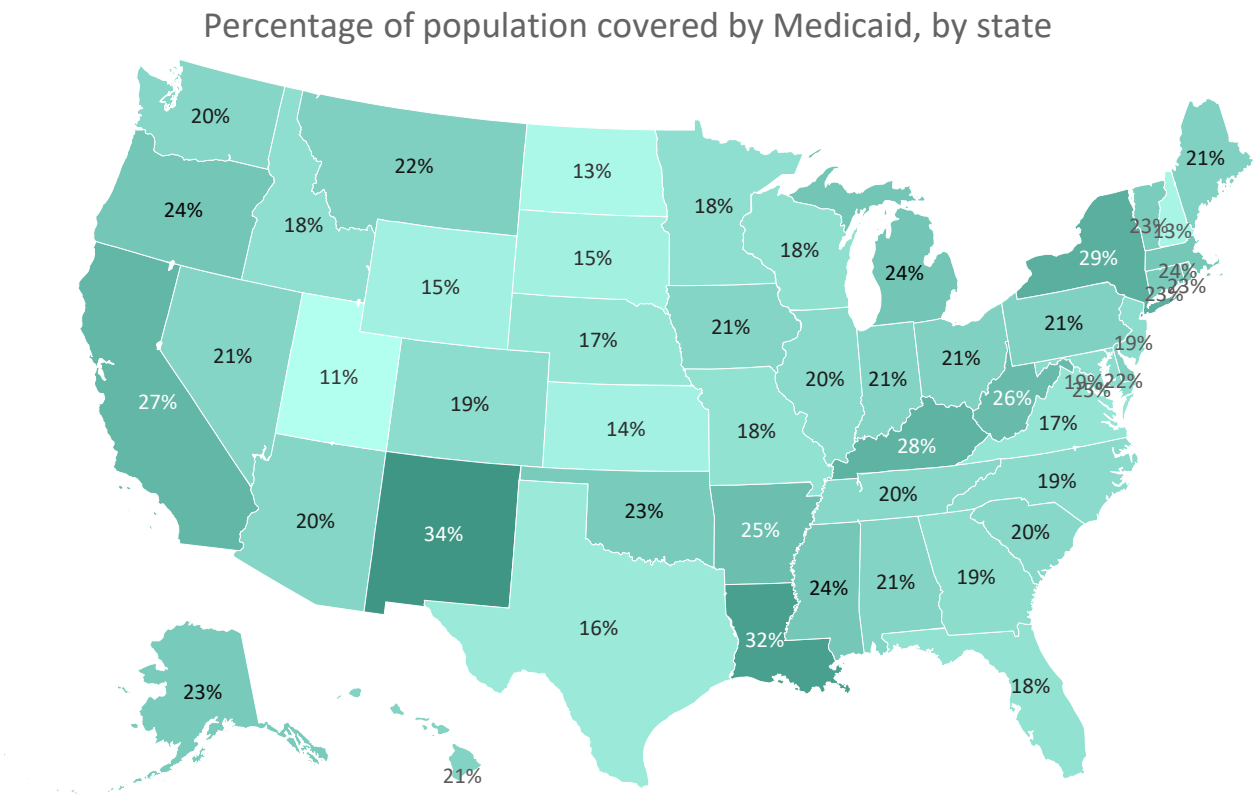

Source: U.S. Department of Labor, Bloomberg, Apollo Chief Economist.

# Tariff timeline

| Effective date | Target countries | Tariff rate | Goods targeted |
|---|---|---|---|
| 4th Feb 2025 | | | |
| 4th March 2025 | | | |
| 12th March 2025 | | | |
| 2nd April 2025 | | | |
| 2nd April 2025 | | | |
| 2nd April 2025 | | | |

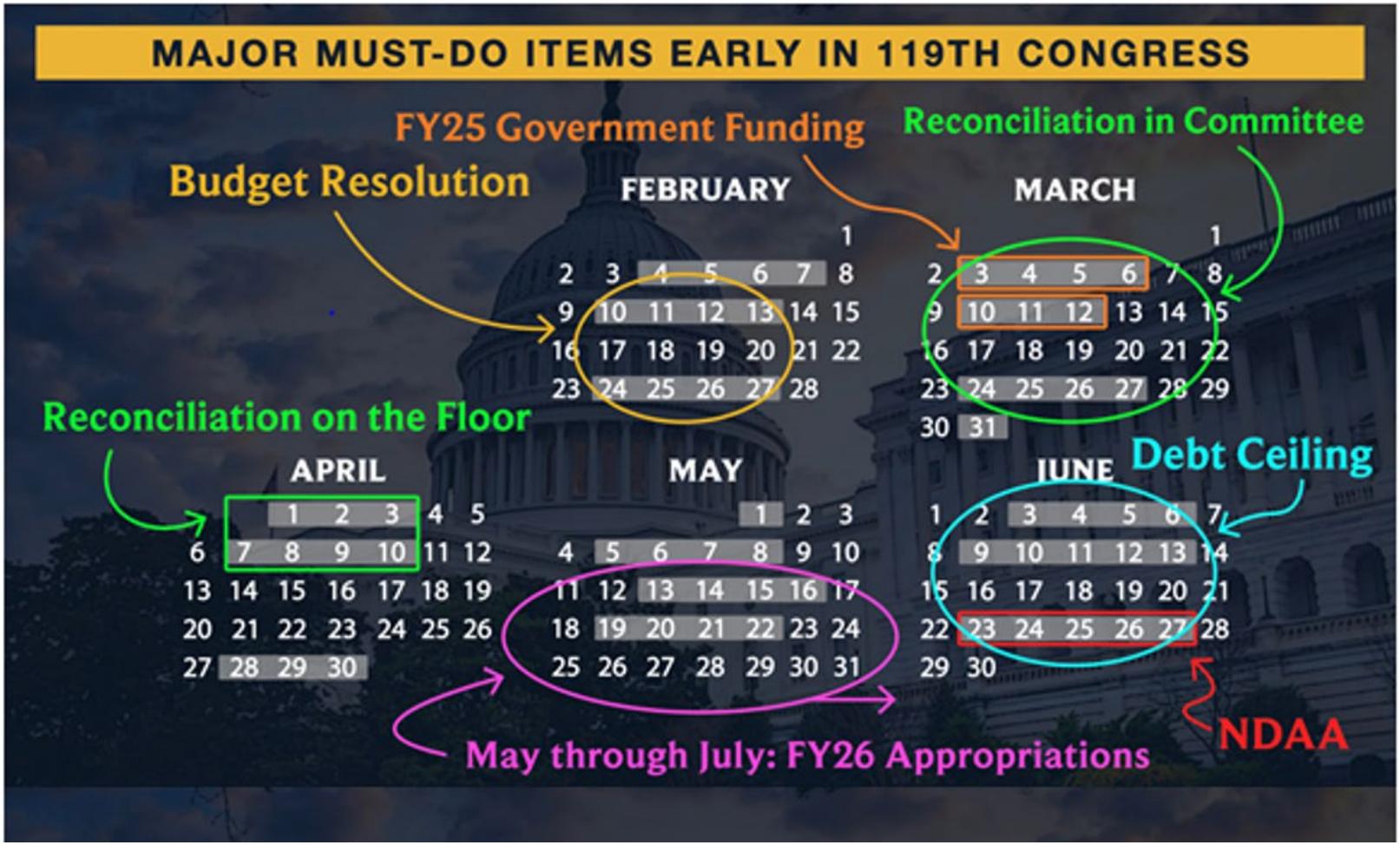
Source: Bloomberg, Apollo Chief Economist

# Percentage of the population covered by Medicaid



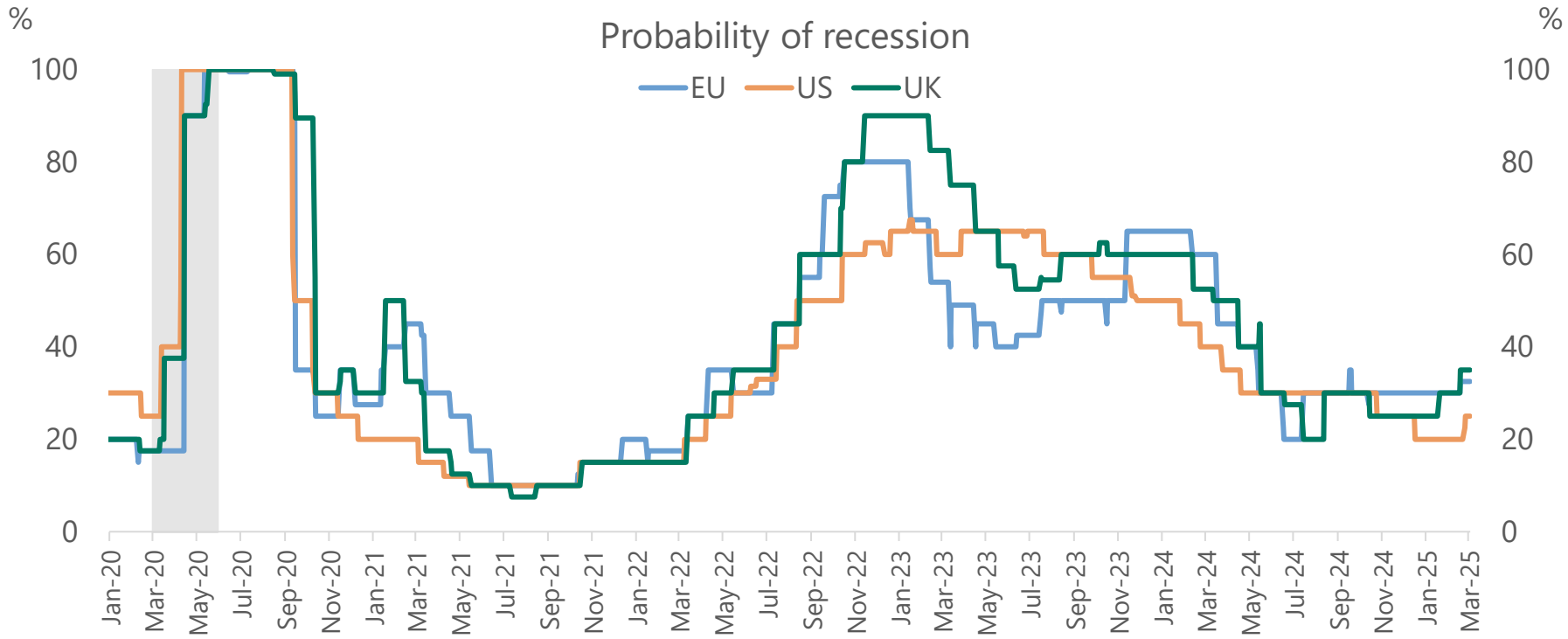

Note: Data for 2023. Source: KFF Health Insurance Coverage of the Total Population, Apollo Chief Economist

# H1 2025 legislative calendar for the first session of the 119th Congress



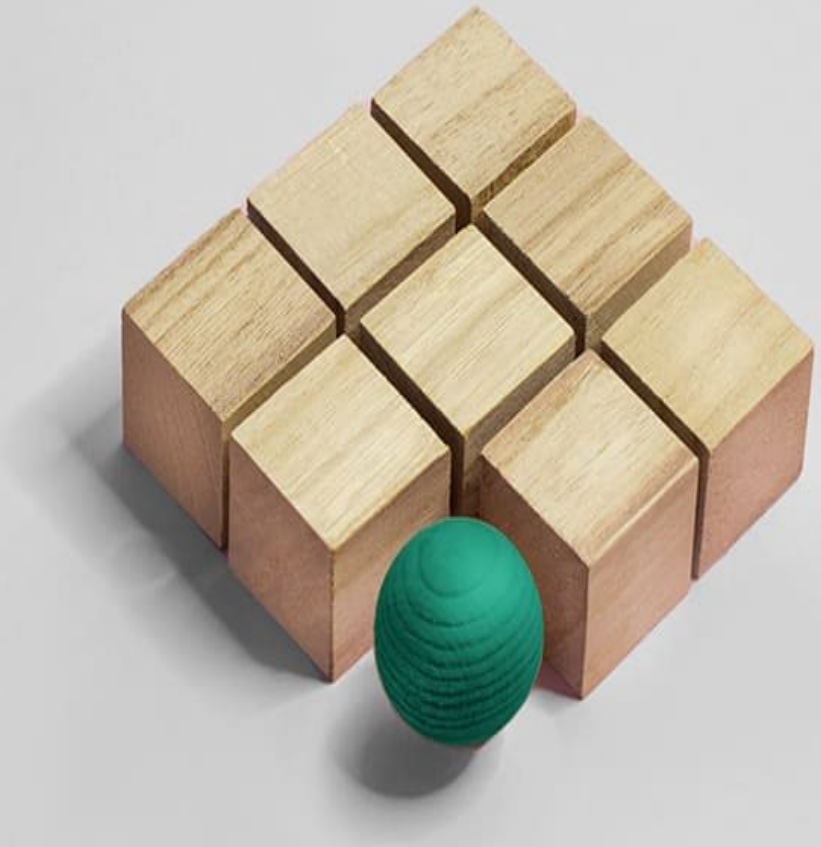

Source: Scalise schedule, Punchbowl News

# Consensus: Probability of a recession in the US, UK, and Europe starting to move higher

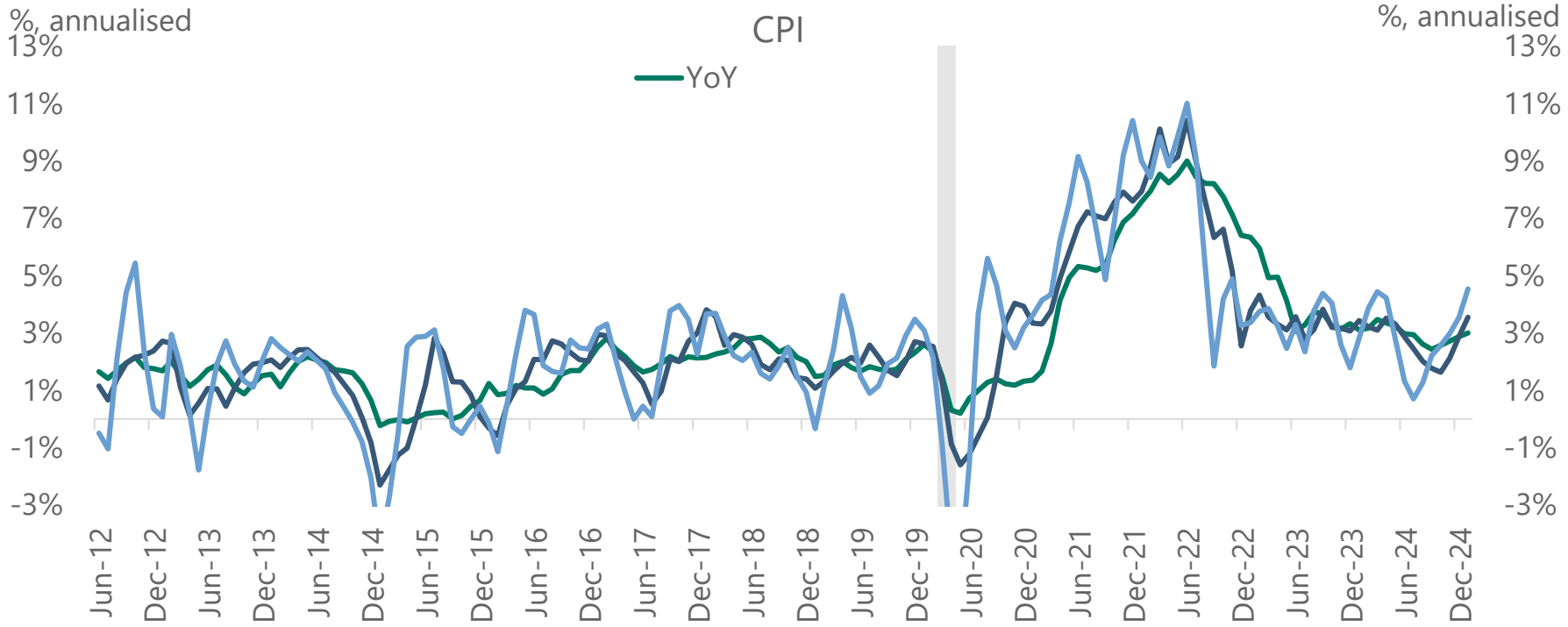



Source: Bloomberg, Apollo Chief Economist

The incoming data



# Inflation is moving away from the Fed's 2% inflation target




Source: BLS, Haver Analytics, Apollo Chief Economist

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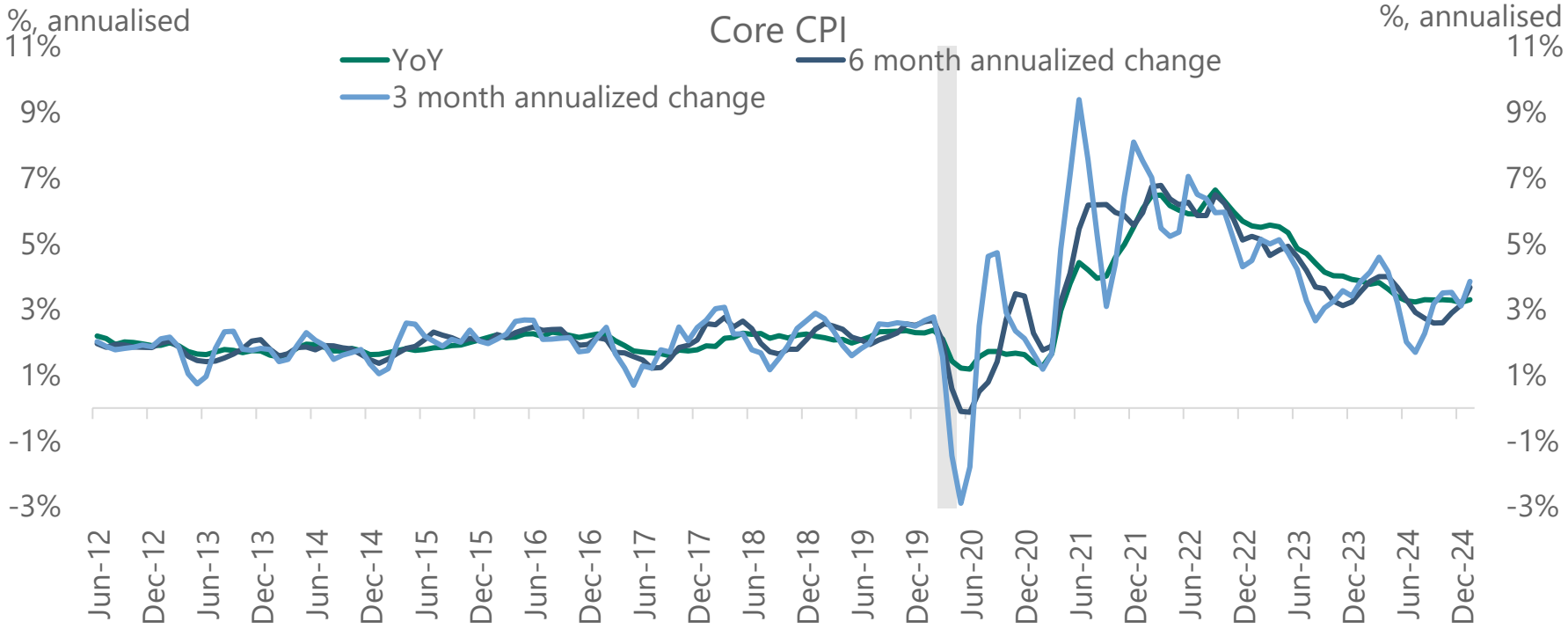
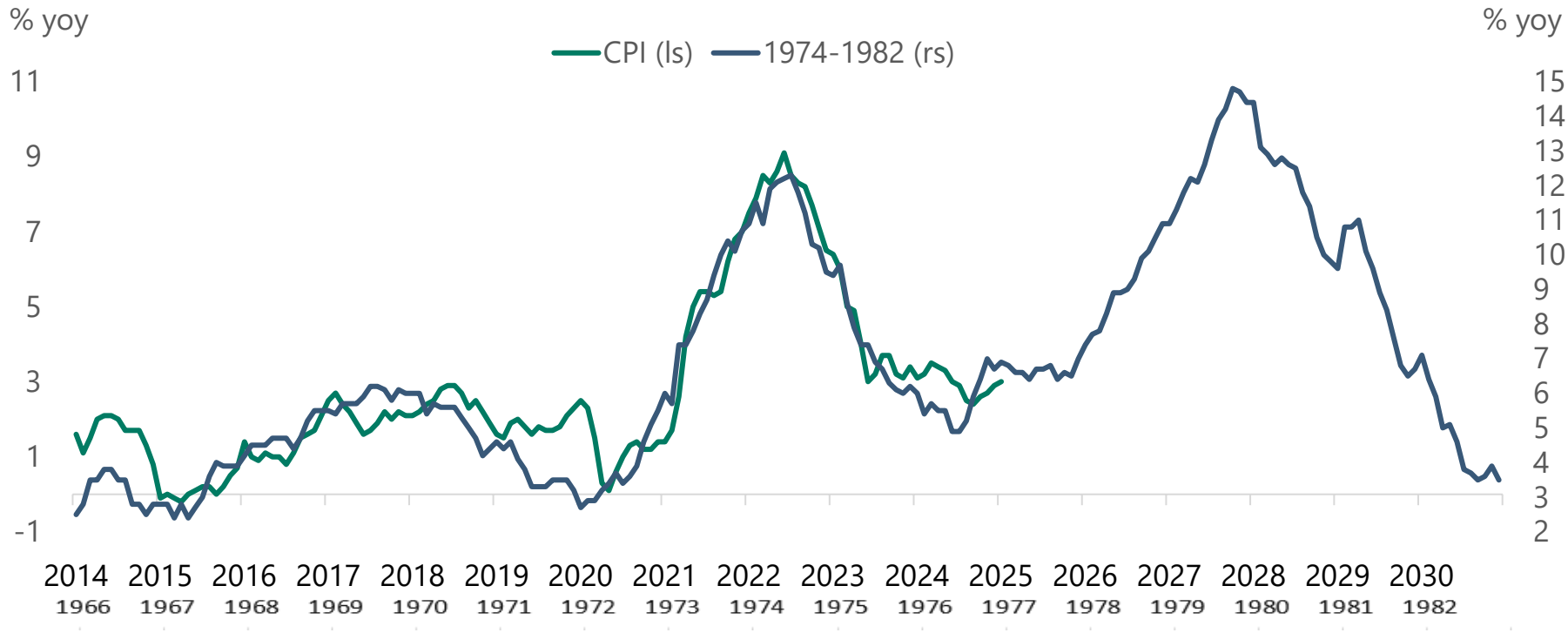


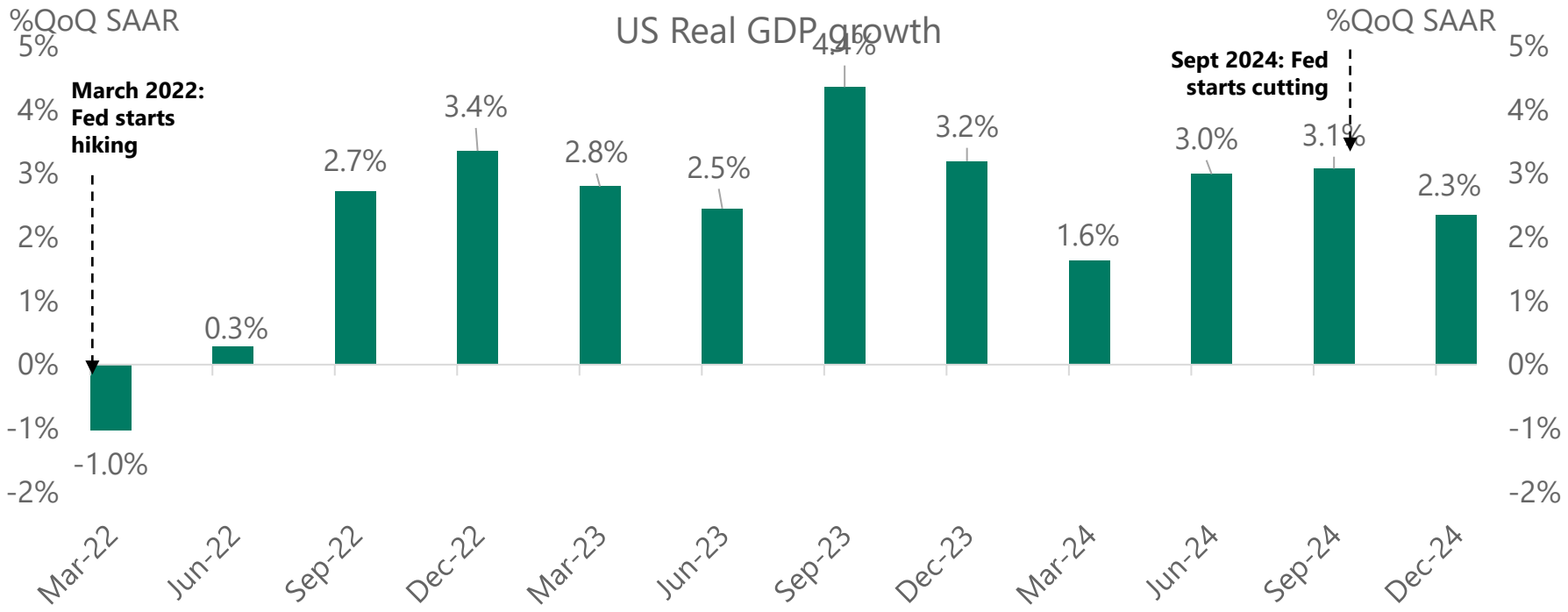

Source: BLS, Haver Analytics, Apollo Chief Economist

# Inflation: Today vs the 1970s




Source: Bloomberg, BLS, Apollo Chief Economist

# The economy is strong, and interest rates will stay higher for longer



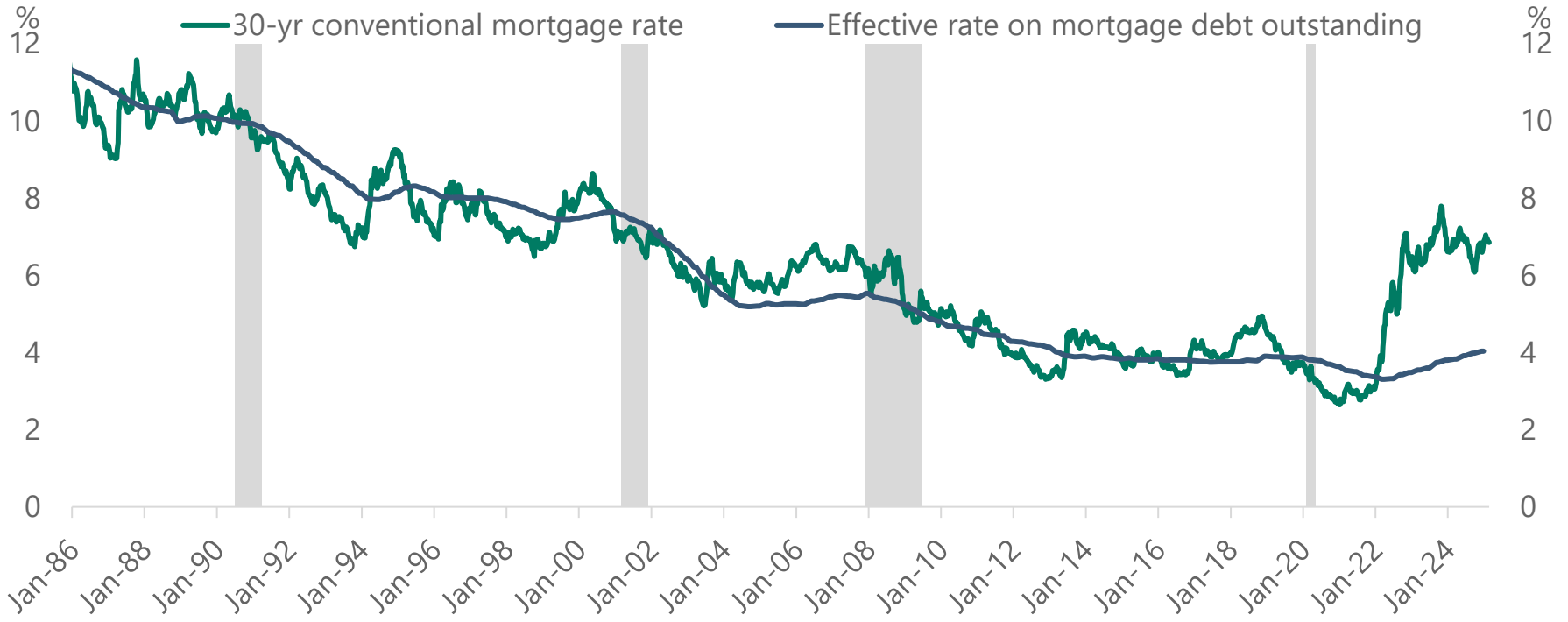

Source: BEA, Haver Analytics, Apollo Chief Economist

# Why is the US economy still strong?

1) Consumers and firms locked in low interest rates during the pandemic
2) High stock prices, high home prices, high crypto prices, and low credit spreads
3) Strong AI/datacenter capex spending
4) Strong defense spending
5) Fiscal policy is still very supportive for growth via CHIPS Act, IRA, and Infrastructure Act

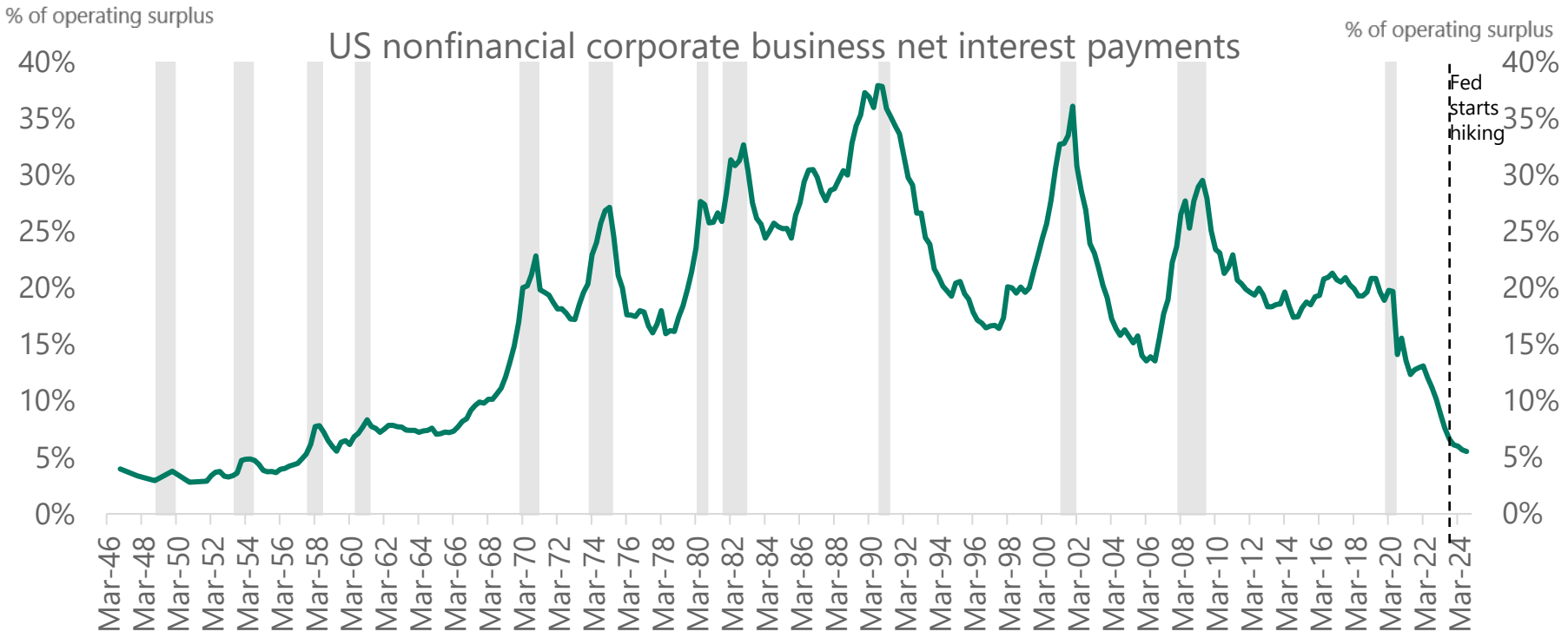
Source: Apollo Chief Economist

# Effective outstanding mortgage rate is 4%



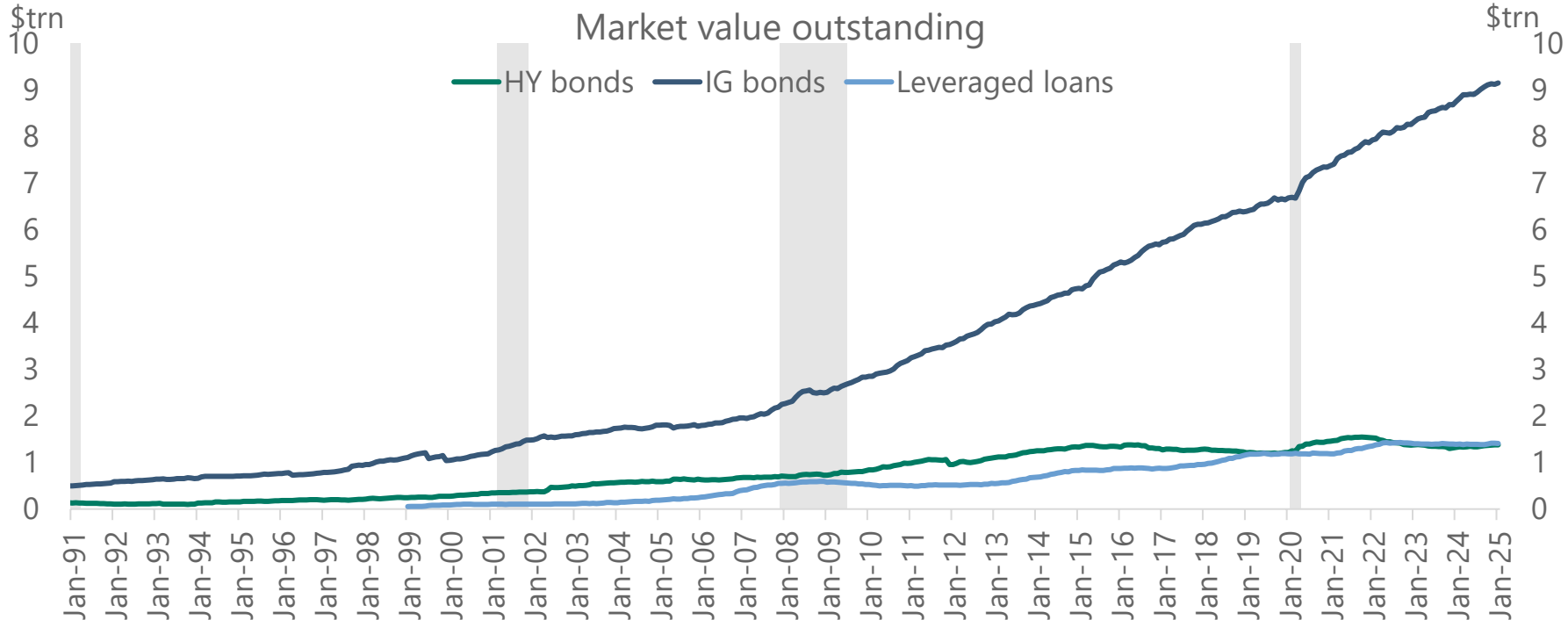

Source: Freddie Mac, BEA, Bloomberg, Apollo Chief Economist. The effective interest rate (%) reflects the amortization of initial fees and charges over a 10-year period, which is the historical assumption of the average life of a mortgage loan.

# Nonfinancial corporate business net interest payments near record low levels



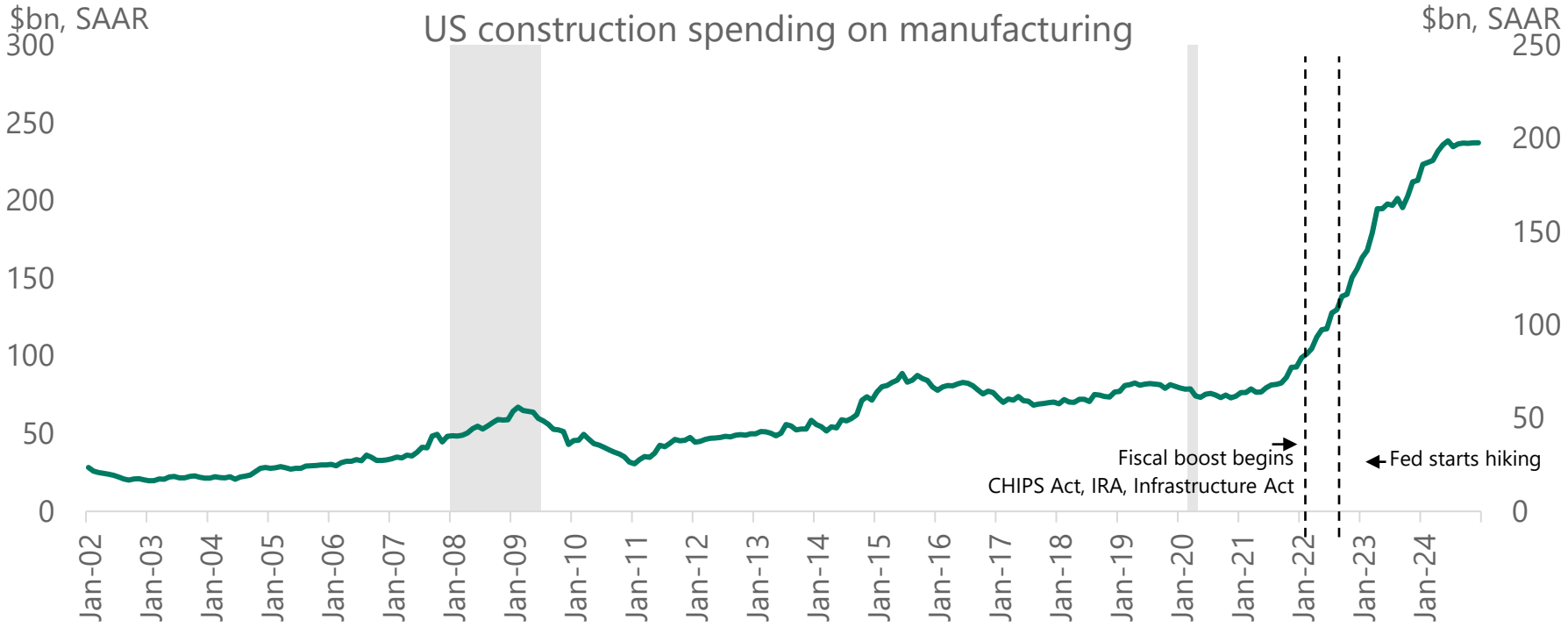

Source: Federal Reserve Board, Haver Analytics, Apollo Chief Economist

# Public IG market has grown from $3trn in 2010 to $9trn today



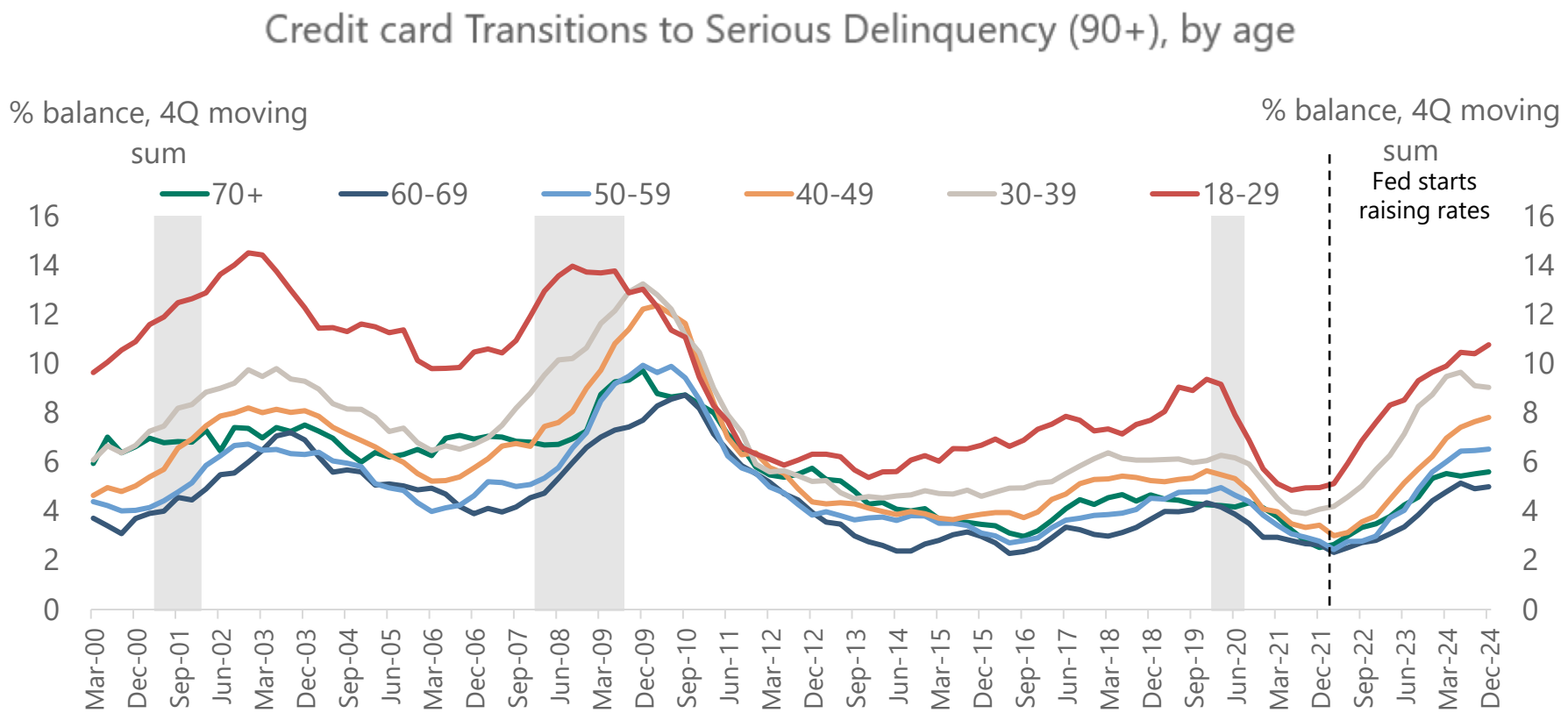

Source: ICE BofA, Bloomberg, Pitchbook LCD, Apollo Chief Economist. Note: Ticker used for HY is H0A0 Index and for IG it is C0A0 Index and for Loans it is SPBDALB Index.

# Positive effects of fiscal policy dominating negative effects of Fed hikes



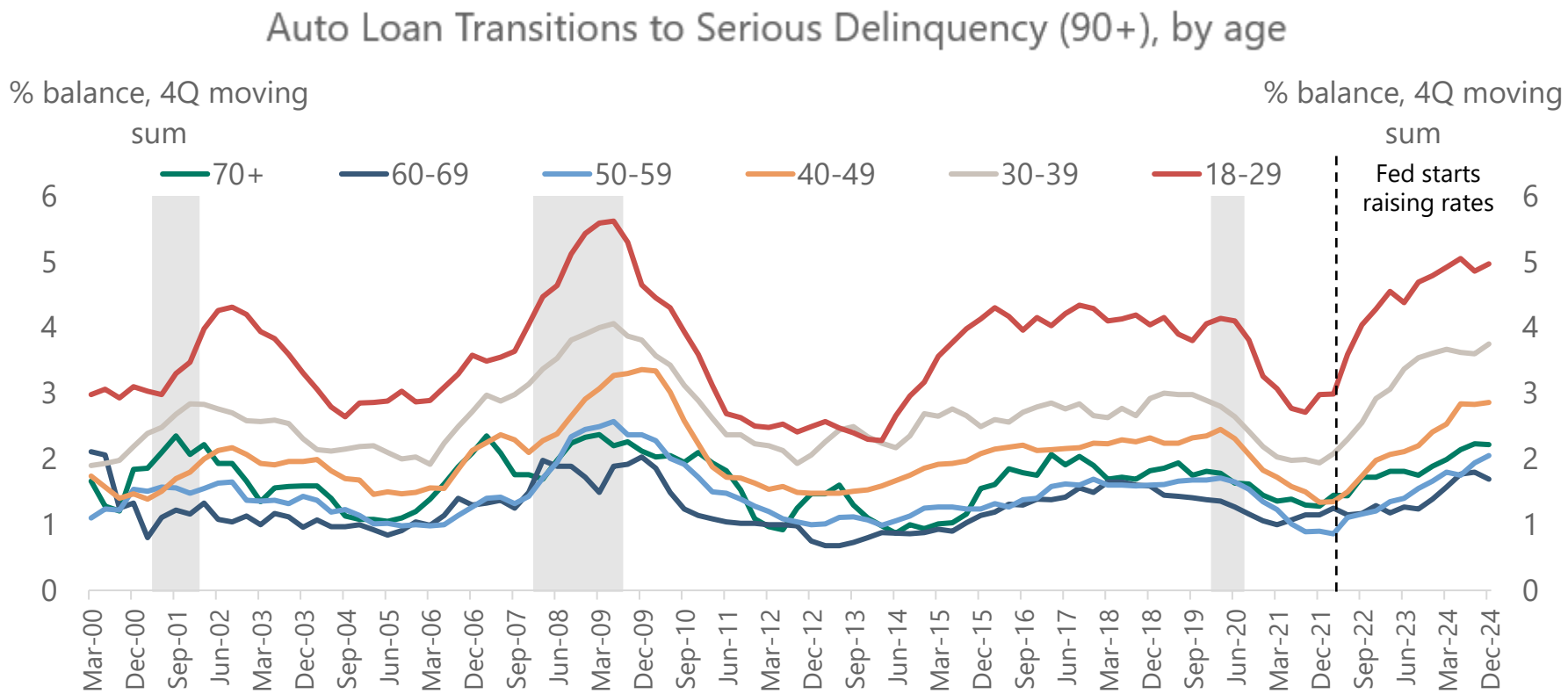

Source: Census Bureau, Haver Analytics, Apollo Chief Economist

# Credit card delinquency rates rising



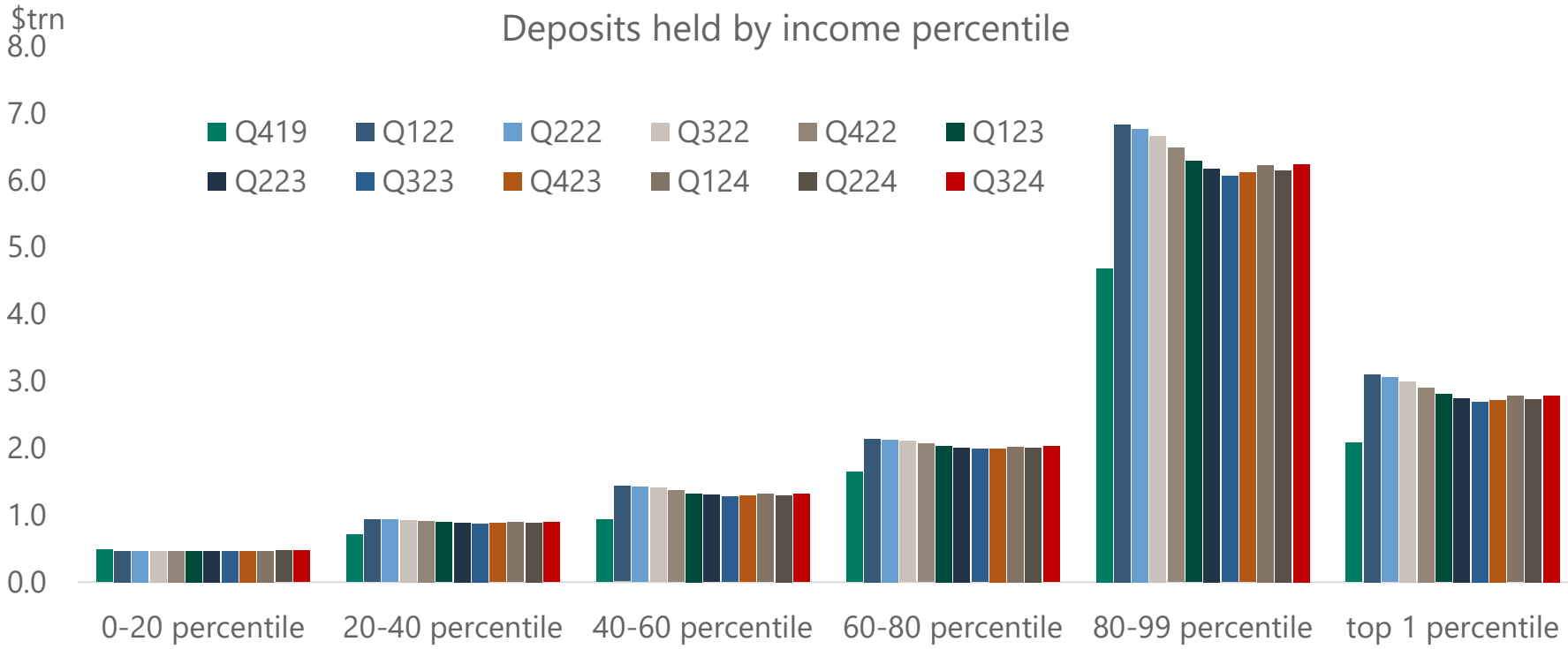

Source: New York Fed Consumer Credit Panel / Equifax, Apollo Chief Economist

# Auto loan delinquency rates rising



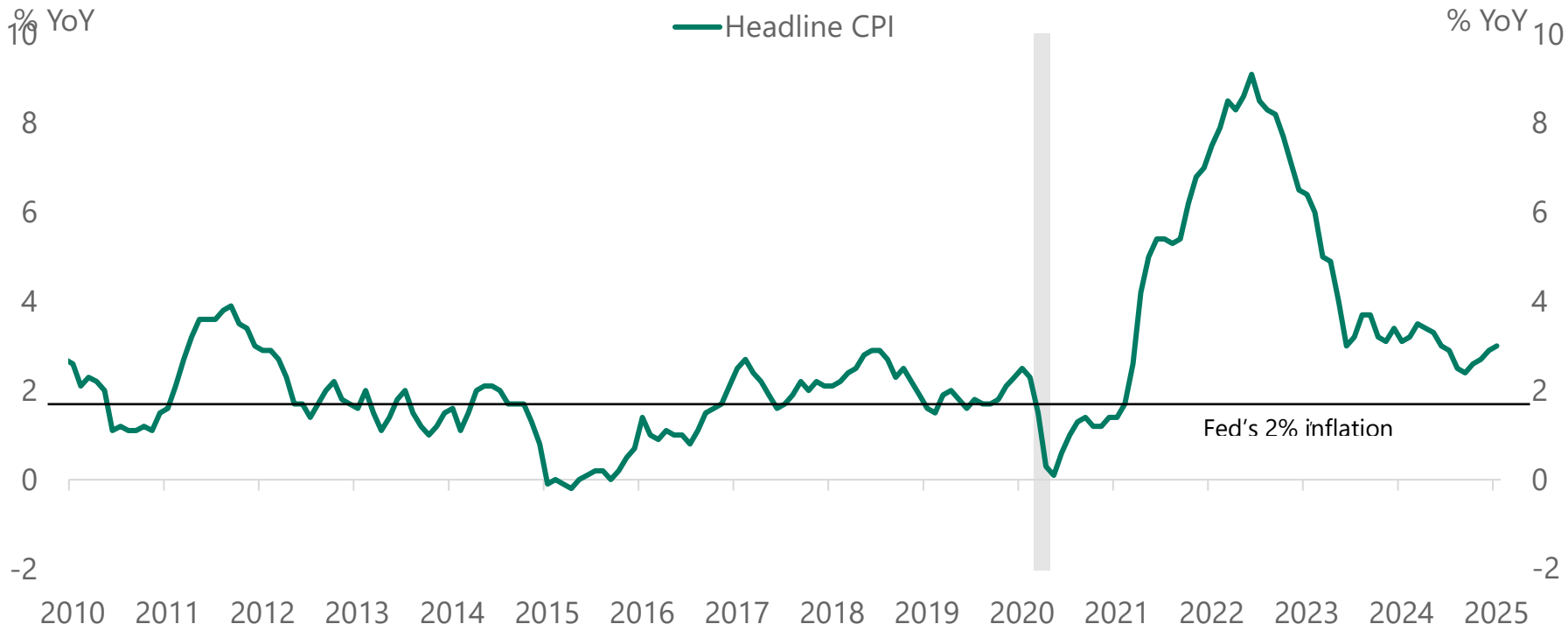

Source: FRBNY Consumer Credit Panel, Equifax, Haver Analytics, Apollo Chief Economist

# Savings across the income distribution




Source: FRB, Haver Analytics, Apollo Chief Economist

# Inflation not quite yet at the Fed's 2% target




Source: BLS, Haver Analytics, Apollo Chief Economist

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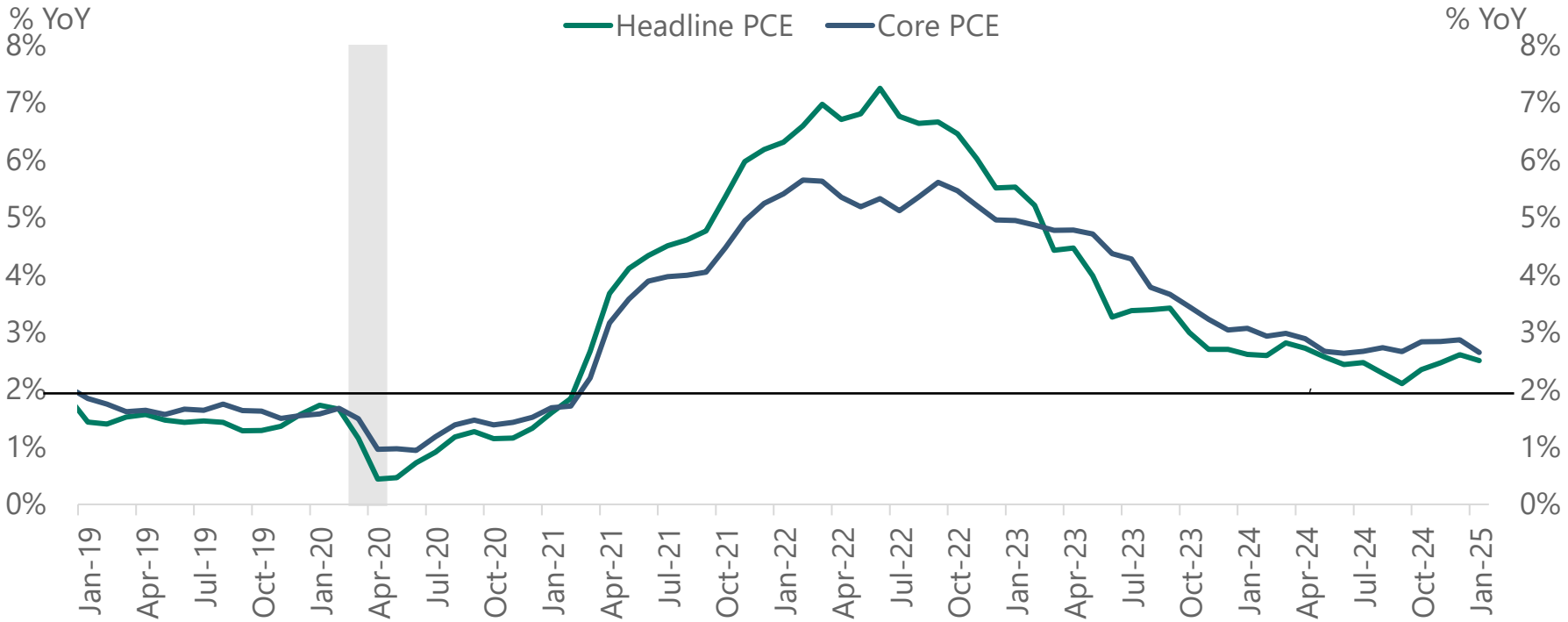
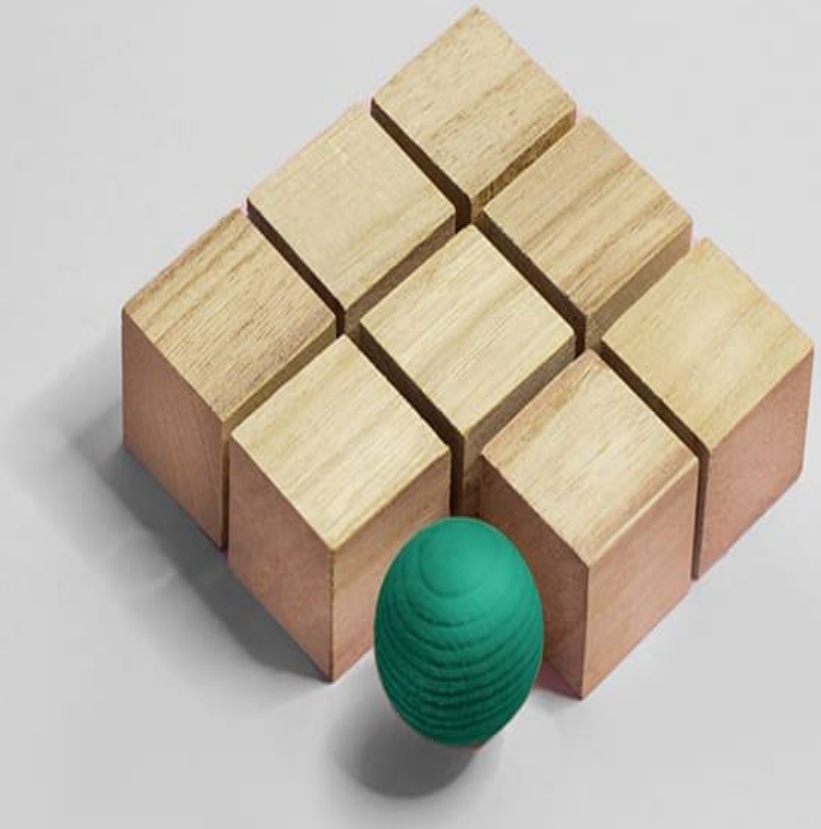
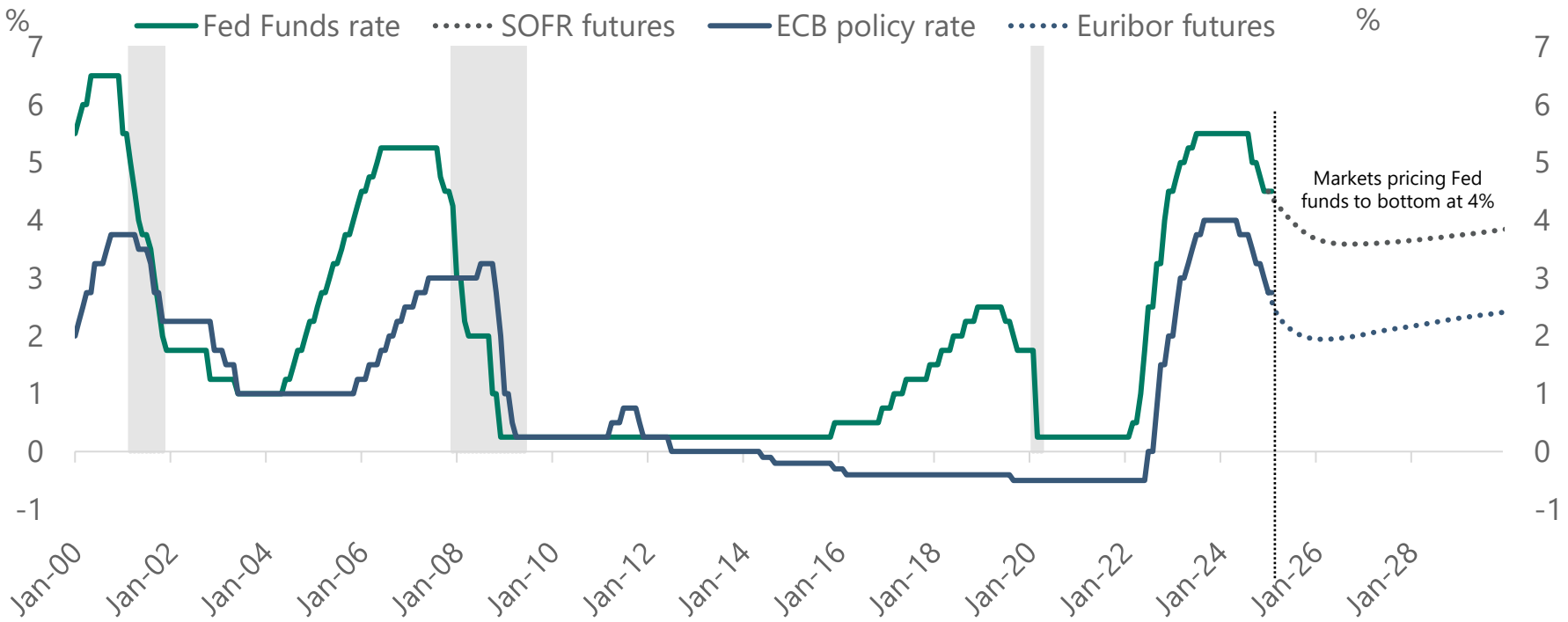



Source: BLS, Haver Analytics, Apollo Chief Economist

# Investment implications

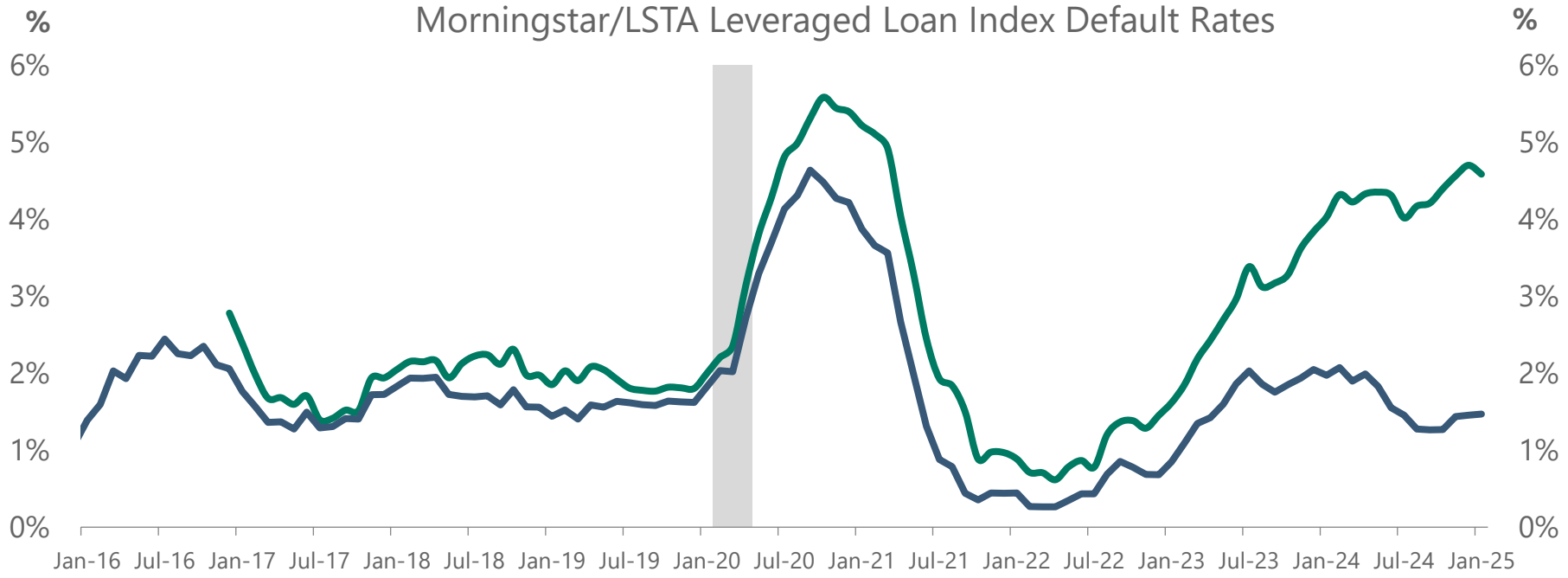


# Interest rates will remain permanently higher



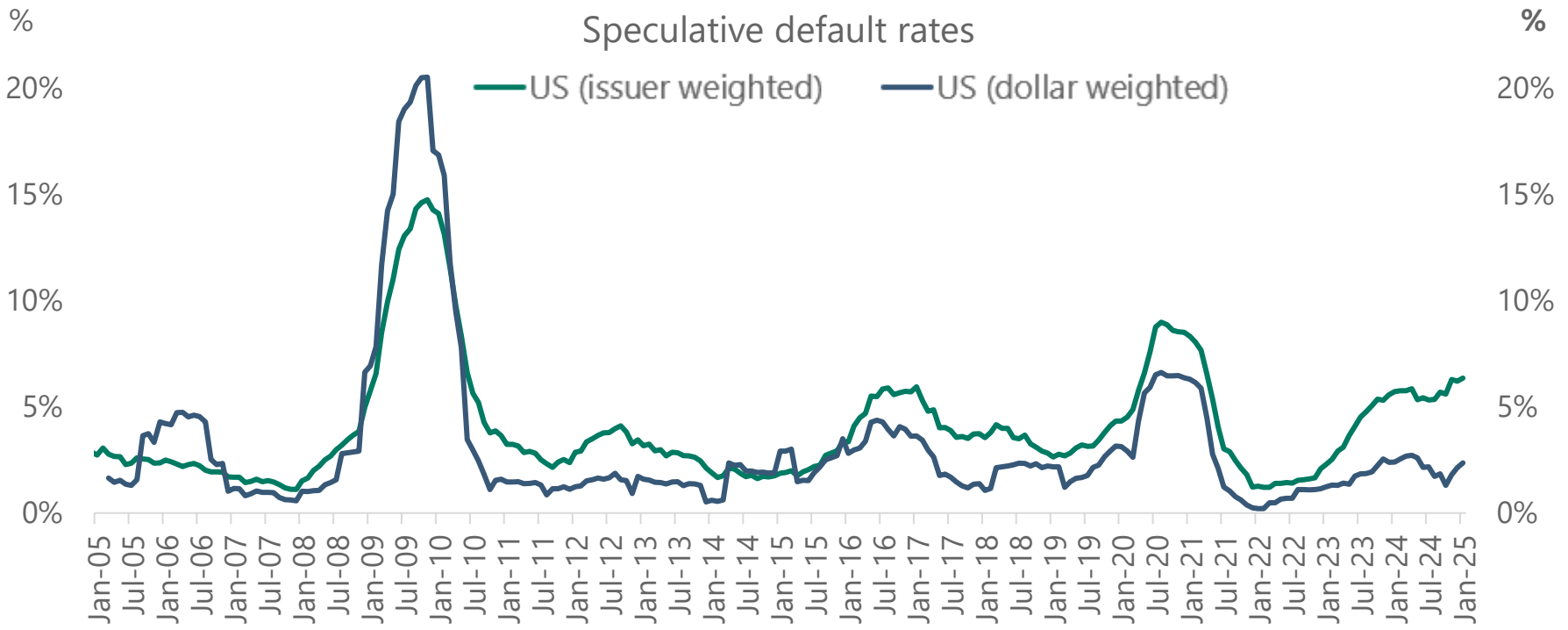

Source: Bloomberg, Apollo Chief Economist

# Leveraged loans: Distressed exchanges putting upward pressure on default rates



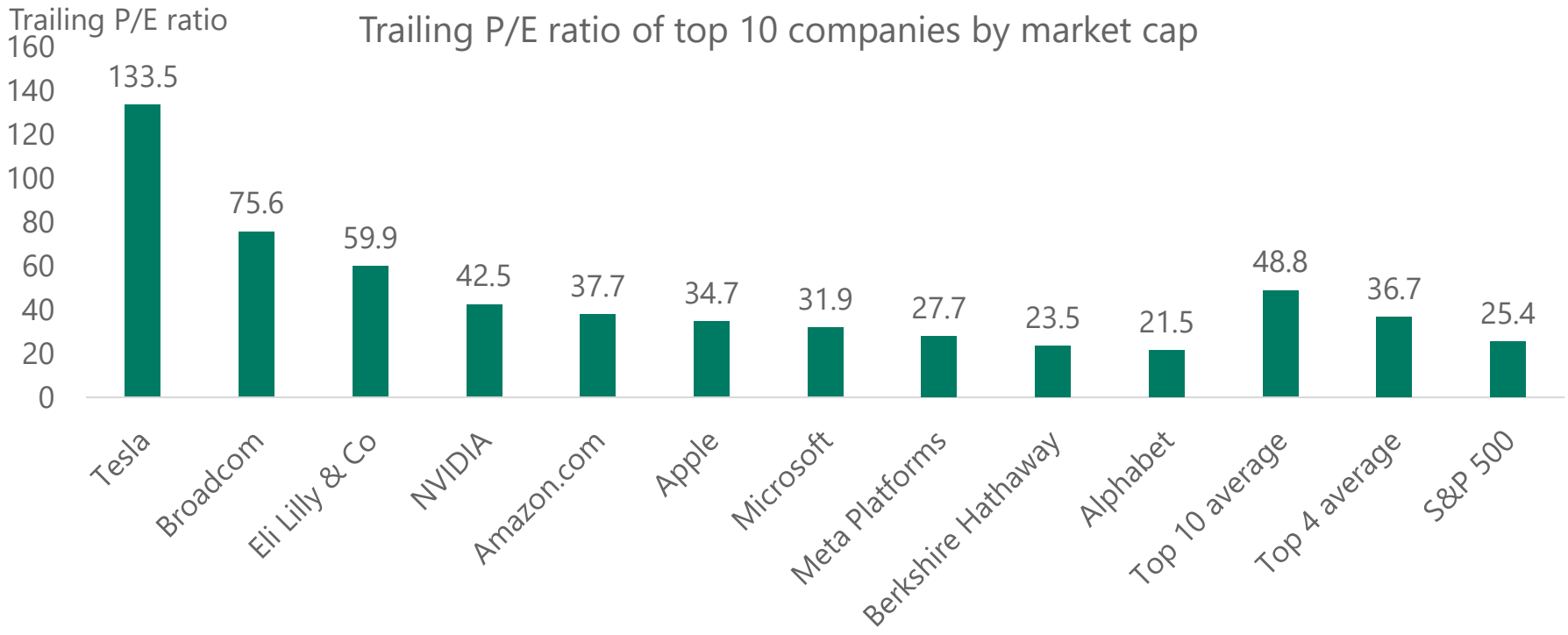

Source: Shobhit Gupta, PitchBook LCD, Apollo Chief Economist

# Big difference between issuer weighted and dollar weighted default rates



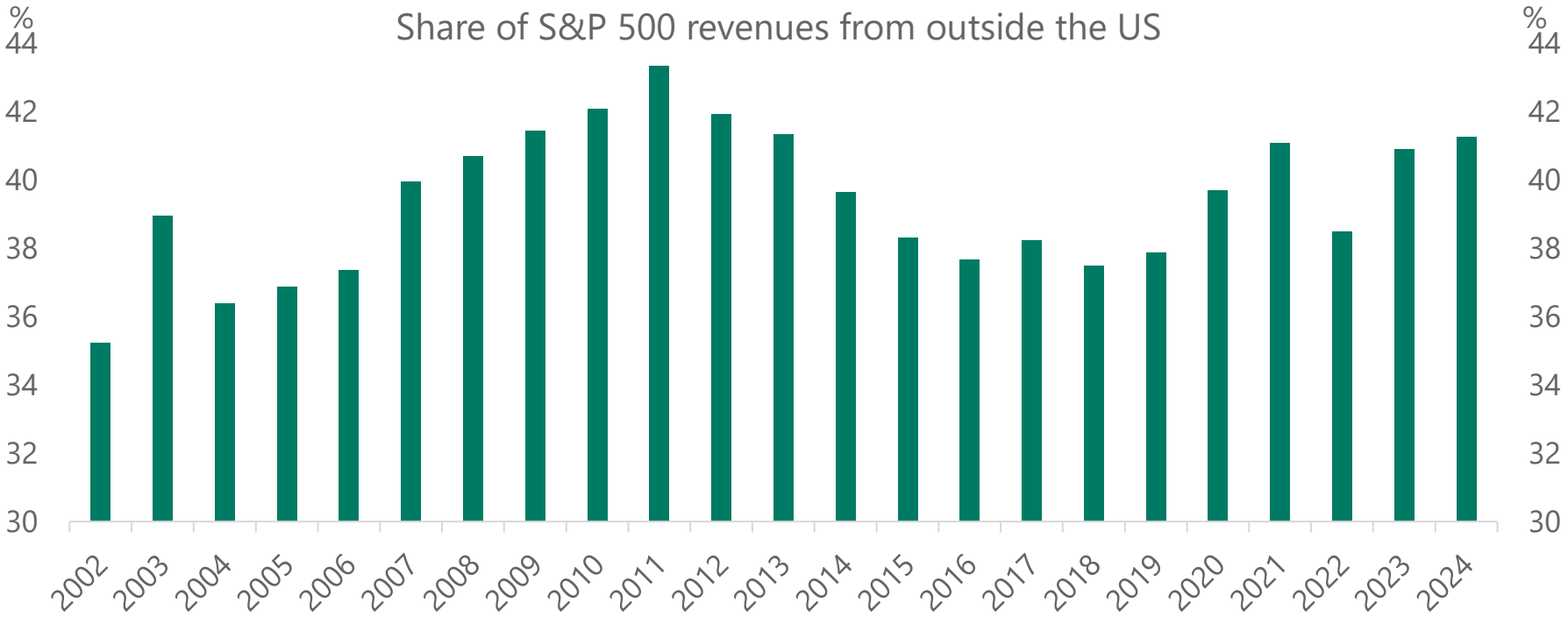

Source: Shobhit Gupta, Moody's Analytics, Apollo Chief Economist

# The average P/E ratio of the top 10 companies in the S&P 500 is almost 50



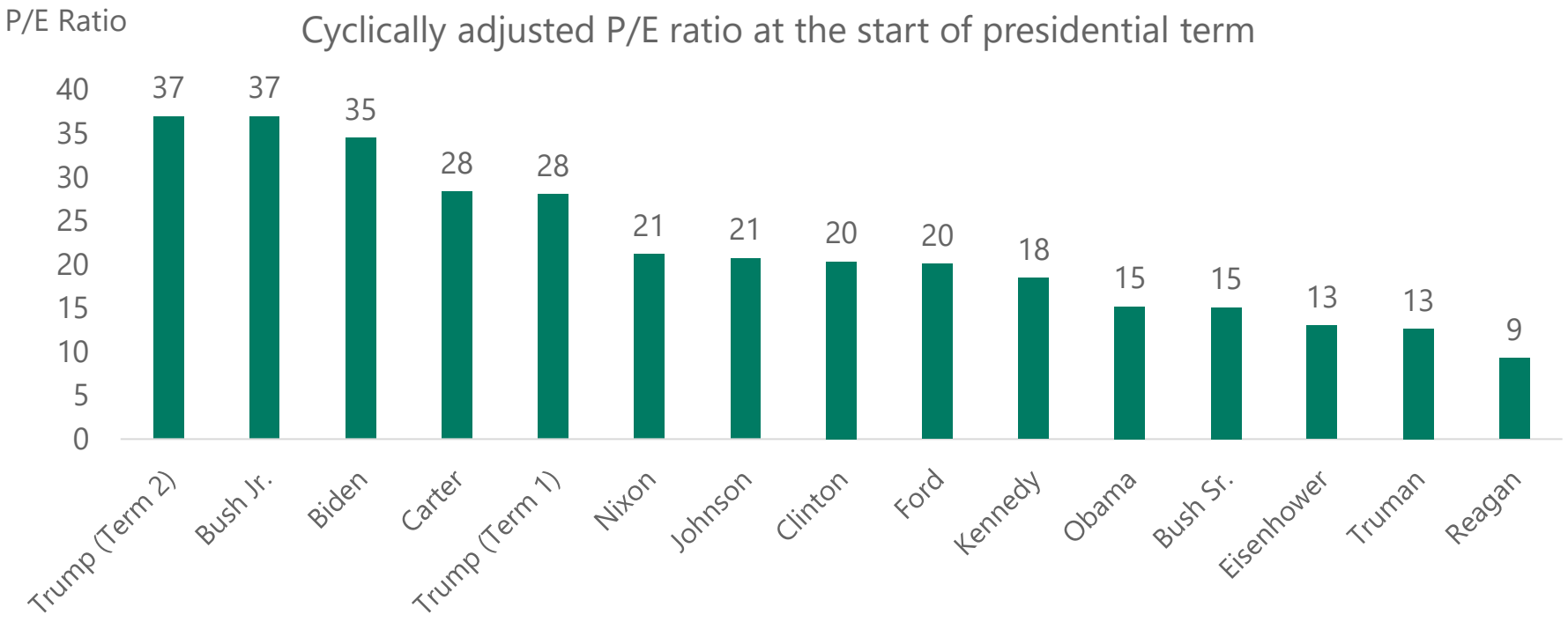

Note: Data as of March 3, 2025. Source: Bloomberg, Apollo Chief Economist

# 41% of revenue in S&P 500 companies comes from abroad



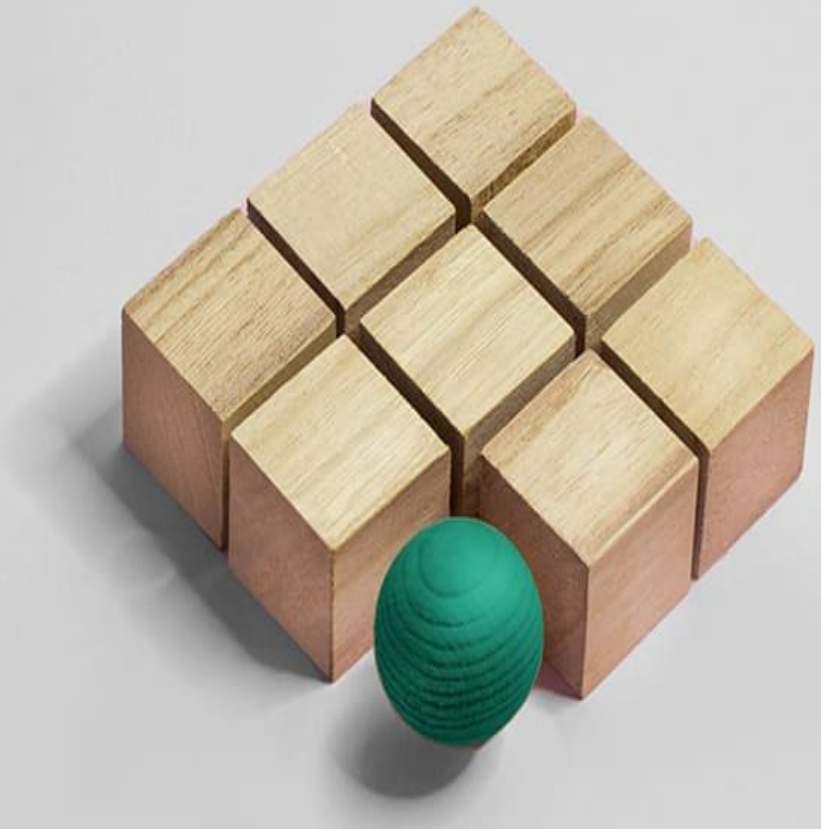

Source: Factset, Apollo Chief Economist

# Shiller CAPE at start of Presidency

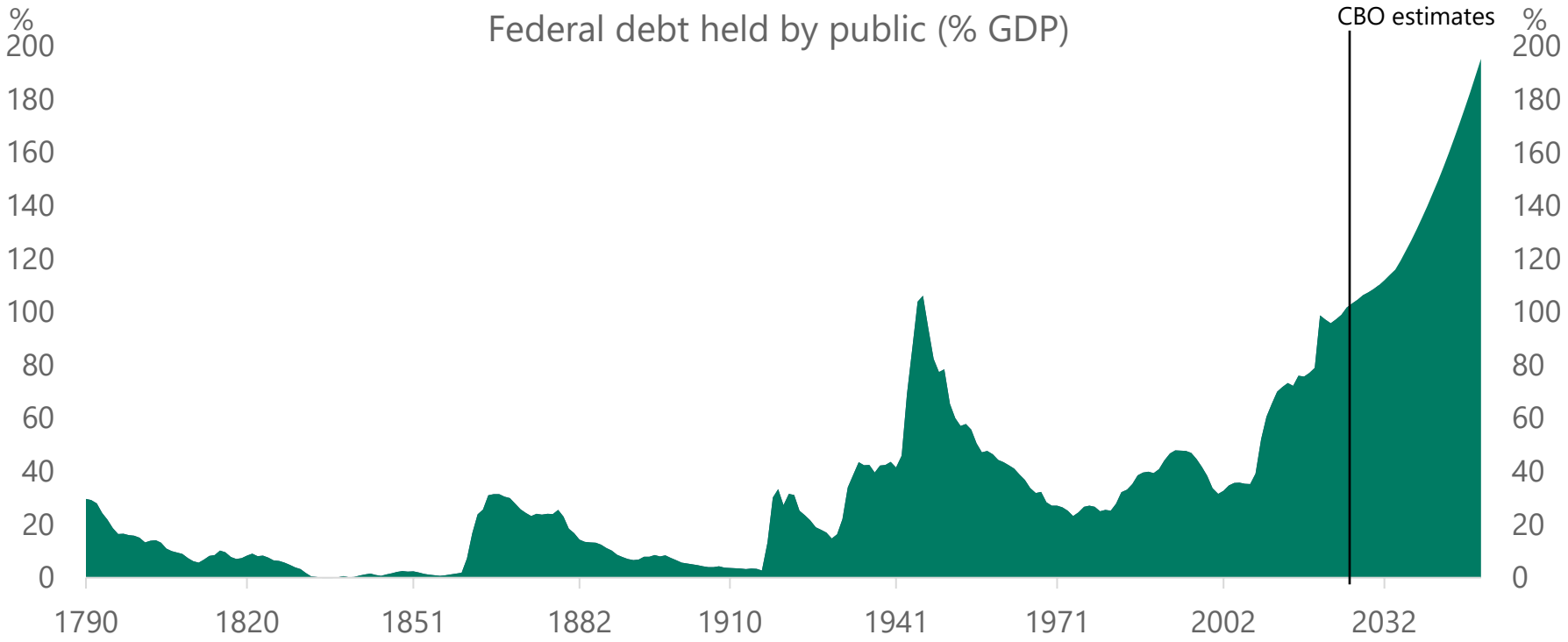



Source: Robert Shiller, Apollo Chief Economist

Risks to the outlook:
Geopolitics,
inflation moving up again, and
deficits/debt

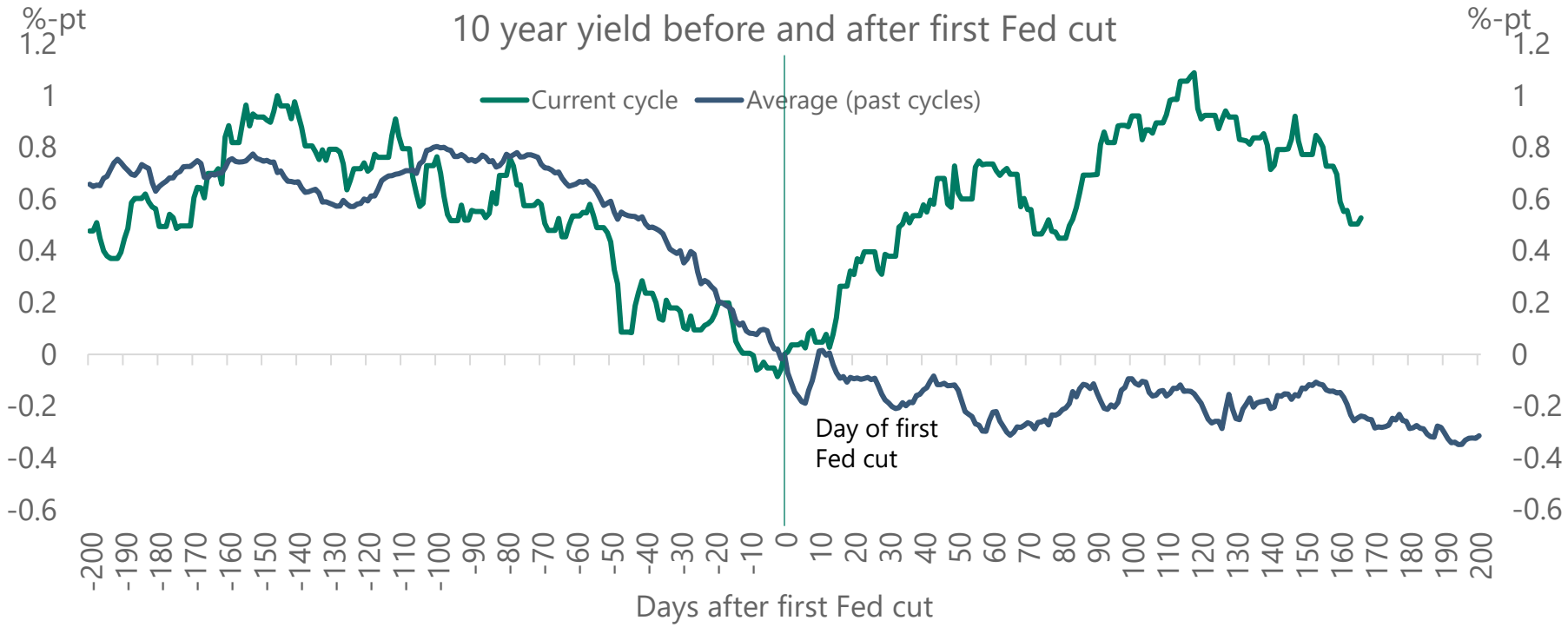


# CBO: Under current policies, government debt outstanding will grow from 100% to 200% of GDP



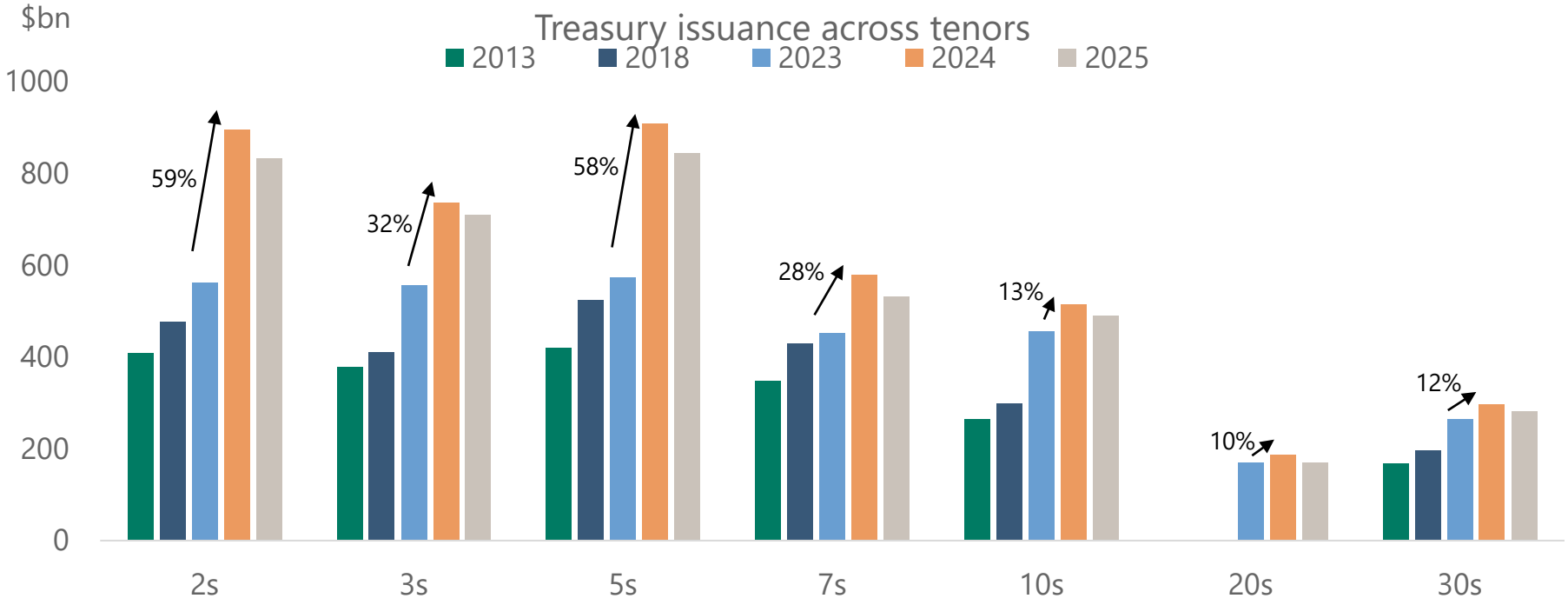

Source: CBO, Haver Analytics, Apollo Chief Economist

# Very unusual behavior in long rates after the Fed started cutting in September 2024



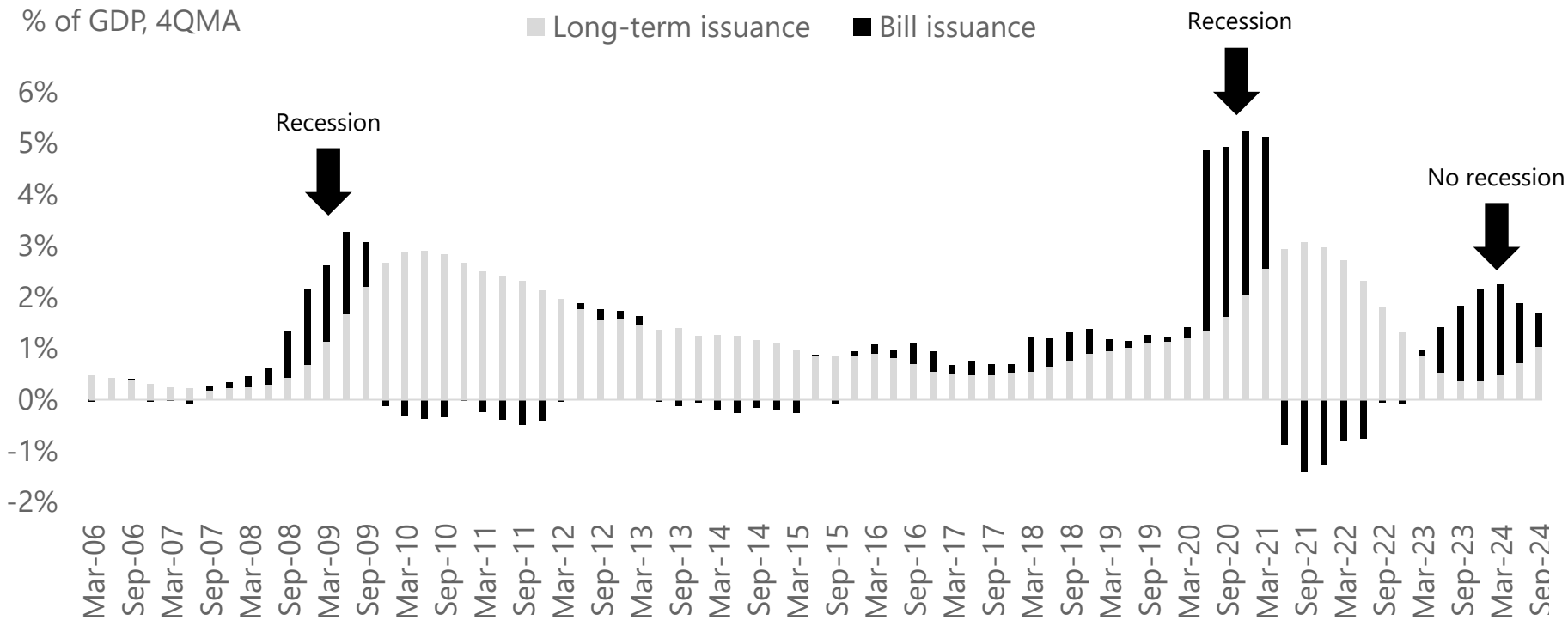

Source: Bloomberg, Apollo Chief Economist

# Treasury auction sizes have increased on average 30% across the yield curve in 2024




Source: SIFMA, TBAC, Haver Analytics, Apollo Chief Economist. Note: Estimates for 2025 from the TBAC. And 2025 annualized using 1Q data from TBAC

# Normally, the Treasury only issues a lot of T-bills during recessions




Source: Haver Analytics, Apollo Chief Economist.

# Torsten Slok, Ph.D.

**Chief Economist**
**Apollo Global Management**
tslok@apollo.com

Torsten Slok joined Apollo in August 2020 as Chief Economist and he leads Apollo's macroeconomic and market analysis across the platform.

Prior to joining, Mr. Slok worked for 15 years as Chief Economist at Deutsche Bank where his team was top ranked in the annual Institutional Investor survey for a decade. Prior to joining Deutsche Bank Mr. Slok worked at the IMF in Washington, DC and at the OECD in Paris.

Mr. Slok has a Ph.D in Economics and has studied at the University of Copenhagen and Princeton University.

# Resources:

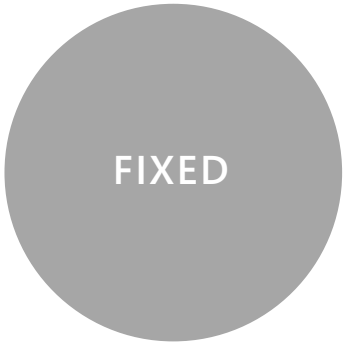
**Penn Wharton Budget Model:**
https://budgetmodel.wharton.upenn.edu/issues/2024/8/26/trump-campaign-policy-proposals-2024

**Committee for a Responsible Federal Budget:**
https://www.crfb.org/papers/fiscal-impact-harris-and-trump-campaign-plans

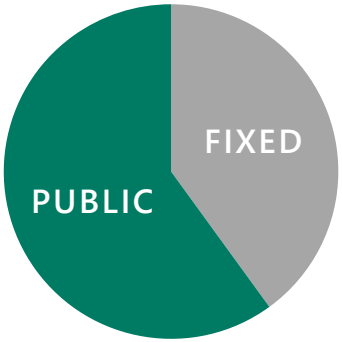
**Tax Foundation:**
https://taxfoundation.org/research/all/federal/donald-trump-tax-plan-2024/

Source: Apollo Chief Economist

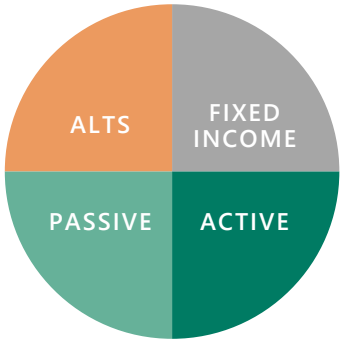
# The evolution of asset allocation



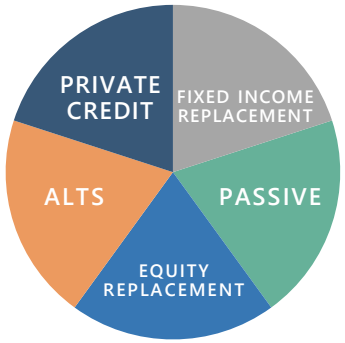

## Foundations
1930s–1980




## Age of 60/40
1980s–2000




## Barbell Portfolio
2001–2020




## Replacement
Now

Source: Apollo Chief Economist

# Seven questions for investors

**1)** Total federal employment including contractors is around 10 million, can DOGE-related firings and cuts create a recession? How will markets respond if jobless claims start moving higher?

**2)** If inflation remains sticky and the Fed doesn't hike, what will happen to long rates and breakevens?

**3)** What will happen with the debt ceiling in June?

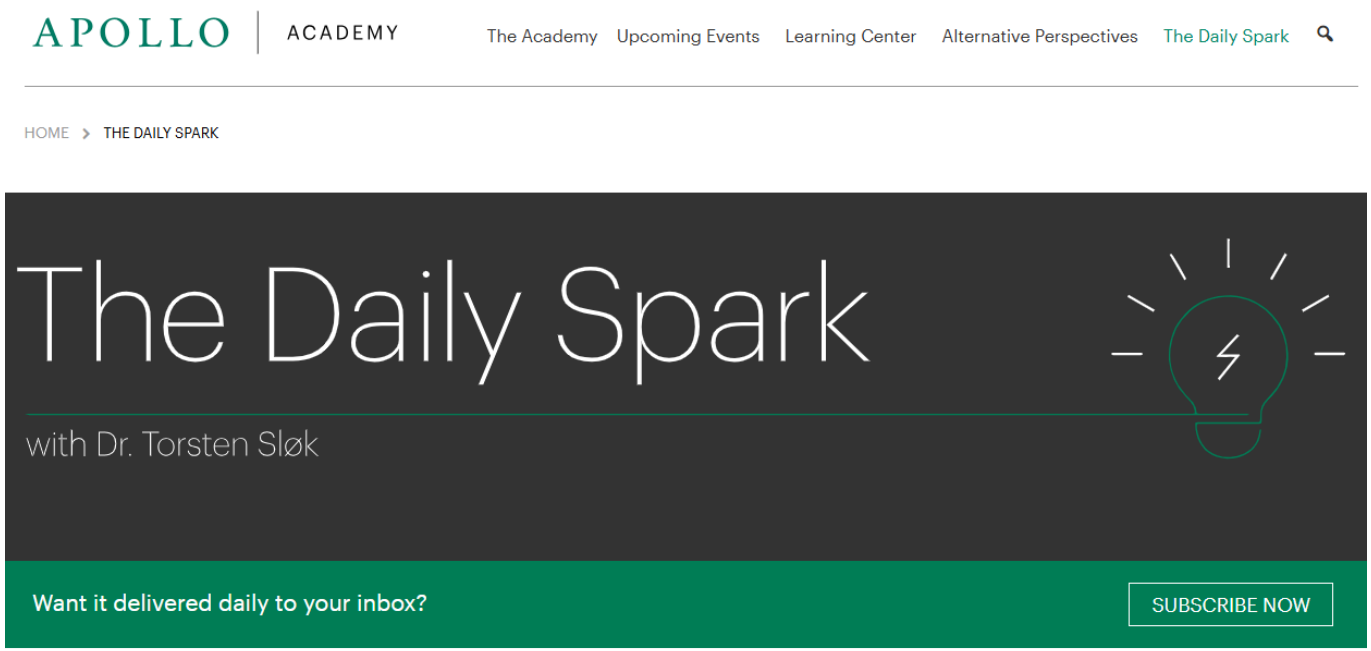
**4)** With extremely high tech concentration in the S&P 500, what will happen if AI-related earnings disappoint? Or if DeepSeek gets even better?

**5)** Who will be the next Fed Chair when Powell's term ends in May 2026, and what are the implications for markets?

**6)** The stock of T-bills outstanding is high as a share of total government debt, will a quarterly refunding announcement later this year increase issuance of coupons, and if yes, what does that mean for long rates?

**7)** What type of sudden events can happen as a result of more and more segmentation in global trade, tech, and security?

Source: Apollo Chief Economist




Source: Apollo Chief Economist

# Guest Speaker: Geopolitics

Tom Nides
Vice Chairman
Strategy & Client Relations

Blackstone

Virginia Retirement System®

# Guest Speaker: Geopolitics
## Tom Nides| Blackstone

Thomas R. Nides is a Vice Chairman, Strategy and Client Relations at Blackstone. He supports a variety of strategic firmwide initiatives, special projects and focus on senior client relationships globally.

Before joining Blackstone, Mr. Nides served as the United States' Ambassador to Israel from 2021 to 2023. Prior to that, he spent over a decade at Morgan Stanley in various capacities including Chief Operating Officer and Vice Chairman. Nides was appointed Deputy Secretary of State and Chief Operating Officer of the U.S. State Department by President Barack Obama and was awarded the nation's highest diplomatic honor by Secretary of State Hillary Clinton for his service. He has also previously been a senior leader at Credit Suisse, Fannie Mae, the Office of the U.S. Trade Representative, and on Capitol Hill.

Nides currently serves on the boards of the Partnership for Public Service, the International Rescue Committee, and the Center for Strategic and International Studies (CSIS). He formerly served as chairman of the board of the Woodrow Wilson Center. He received his B.A. from the University of Minnesota.

# Break

# 10:15 – 10:30


Virginia Retirement System®

# Guest Speaker: Data Centers

Matt A'Hearn
Head
Digital Infrastructure

Blue Owl

Virginia Retirement System®

# Guest Speaker: Data Centers
## Matt A'Hearn | Blue Owl

Matt A'Hearn newly joins Blue Owl as Head of Digital Infrastructure after the strategic acquisition of IPI Partners. Under Matt's leadership as the Managing Partner of IPI, they built one of the largest privately held data center portfolios in the world, with more than 80 operational and under-construction facilities across 29 markets in North America, Europe, and APAC.

Matt has 25 years of experience in the Digital Real Asset space. Immediately prior to IPI, he headed the global investment banking practice in the communications infrastructure sector at Moelis & Company.

Before joining Moelis, Matt was a Principal in the investment banking group at Bank of America Merrill Lynch where he advised corporate and private equity clients.

Earlier in his career, he held roles in the investment banking groups at UBS and Donaldson, Lufkin & Jenrette.

Matt earned a BS in Finance and International Business from the Kelley School of Business at Indiana University.

March 2025

BLUE OWL

# Data Center Industry and Opportunity Overview

## Blue Owl Digital Infrastructure

Matt A'Hearn, Head of Digital Infrastructure

# Blue Owl Capital
# Overview

# Blue Owl is a leading asset manager that is redefining alternatives

Anchored by a strong permanent capital base, we provide businesses with private capital solutions that can drive long-term growth – and offer investors differentiated investment opportunities that aim to deliver strong performance, risk-adjusted returns, and capital preservation

## A solutions provider

### Credit

Our Credit platform serves as a financing partner of choice for private companies, leveraging the expertise across both our direct lending and alternative credit investing capabilities

### GP Strategic Capital

Our GP Strategic Capital platform has been at the forefront of providing innovative long-term minority equity and financing solutions for more than a decade

### Real Assets

Our Real Assets platform is a leader in investing, offering flexible capital solutions to tenants, borrowers, and hyperscalers across asset classes and geographies

$265.3B
AUM[2]

NYSE:
OWL

BBB+ / BBB
From Fitch / S&P[1]

Over
1,100
employees

Headquartered in
New York
with 20+ other offices

1. A security rating is not a recommendation to buy, sell or hold securities and may be subject to revision or withdrawal at any time. For complete ratings definitions, please visit www.standardandpoors.com, and www.fitchratings.com
2. Total assets under management ("AUM") includes the acquisition of IPI Partners' business that closed on January 3, 2025; all other AUM information is as of December 31, 2024.

# We Believe Blue Owl is a Leading Global Investment Manager in Digital Infrastructure

## Hyperscale Focus

Since inception, Blue Owl Digital Infrastructure's focus has been on partnering with leading technology companies and hyperscalers

We believe Blue Owl Digital Infrastructure has become a trusted partner in solving real estate and infrastructure needs derived from technology growth

## Global Execution

Successful execution via vertically integrated approach including local operations and development capabilities in 25+ markets

Demonstrated development track record and strong hyperscale relationships,
as they seek to work with fewer partners globally

## Pure-Play[1] Approach

Experienced team with robust digital infrastructure backgrounds dedicated to hyperscale data center investing

Alignment with technology industry enhanced by sponsor relationships provides differentiated insights and opportunities

**4**
Continents with Global Presence

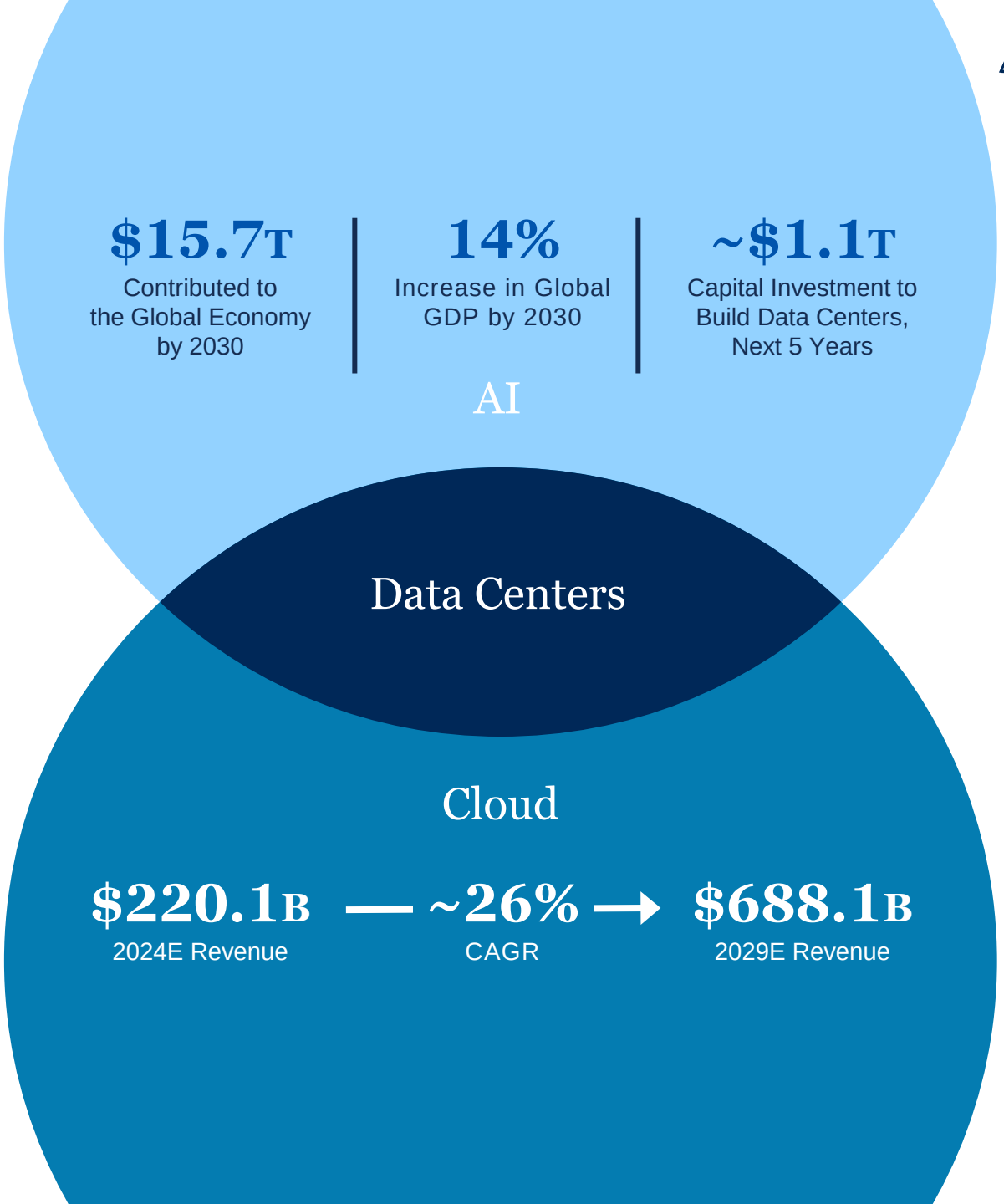
**70+**
Global Blue Owl Digital Infrastructure Team Members

**900+**
Global STACK Team Members[2]

Note: Data above reflects totals for the entire portfolio across Funds I, II, and III as of December 2024. Blue Owl Digital Infrastructure headcount reflected above is as of January 2025. STACK headcount reflected above is as of December 2024. There can be no assurance that Blue Owl Digital Infrastructure will complete any of the development projects in process. Neither past nor projected performance is indicative of future results. 1 "Pure-Play" refers to Blue Owl Digital Infrastructure's single strategy being exclusively focused on data centers and other complementary technology and connectivity-related assets. 2 STACK is Blue Owl Digital Infrastructure's wholly owned/controlled captive operating company.

# Understanding Data Centers

# Data Centers Sit at the Intersection of Generational Growth Driven by Two of the Largest Technological Advances in the 21st Century




Source: McKinsey & Company, "Impact of datacenters on US energy consumption March 2024"; Evercore. Structure Research Market Share Series, "Hyperscale Cloud (June 2024)".
Note: Cloud represents Total Hyperscale Cloud Revenue.

# What is a Data Center?

Data centers house mission-critical IT infrastructure for corporations, governments, and other organizations. On the outside, they are nondescript and typically resemble an industrial building. However, the interior of a data center is highly specialized, and is equipped to handle the immense power requirements needed to keep computer servers humming, even when the power goes out.

**Data centers come in various shapes and sizes, but can generally be placed into four categories:**

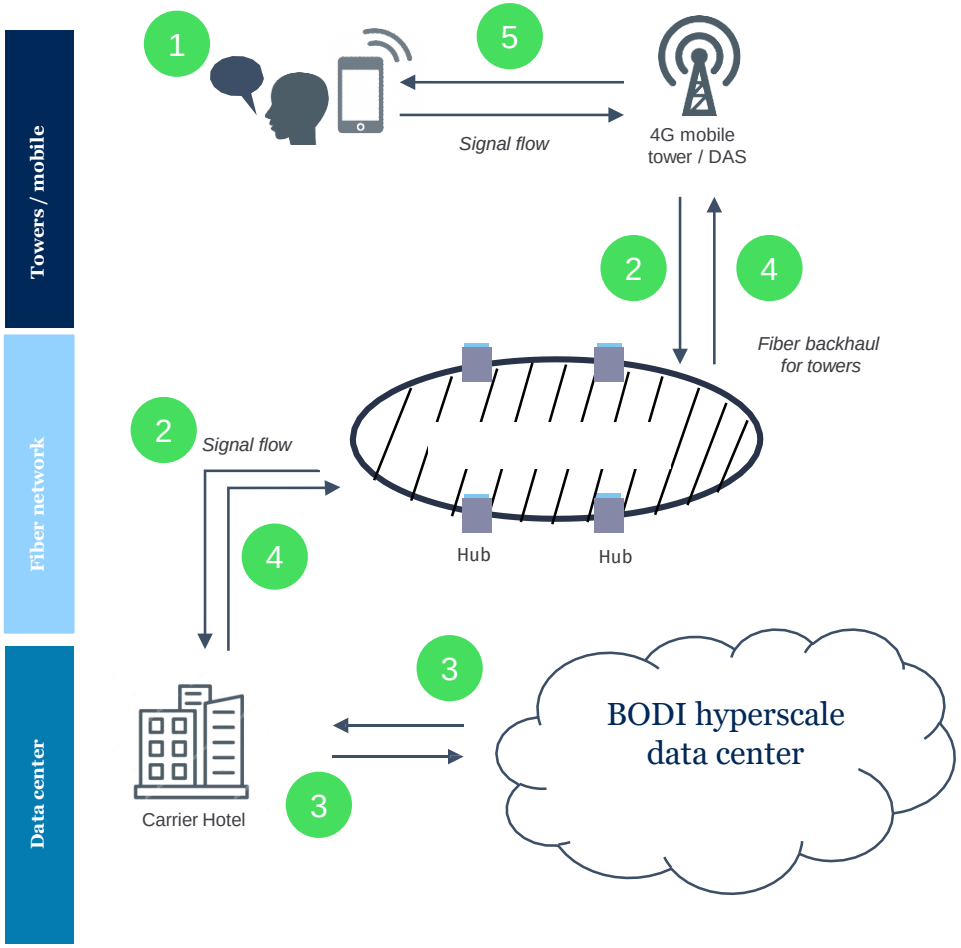
- **Retail**
- **Wholesale**
- **Hyperscale**
- **Powered Shell**
- **Network-Dense**

**Data centers are designed to house information systems and related components such as:**

- **Servers**
- **Routers**
- **UPS**
- **Cooling Units**
- **PDU**

# The Digital Infrastructure Ecosystem in Action

Scenario: *iPhone downloads latest Netflix show*




**Step 1:** User initiates download on iPhone which associates with the nearest Cell Tower/Small Cell site

**Step 2:** Request travels via Fiber to a wireless carrier hotel housed in a Data Center

**Step 3:** Wireless switching center communicates with Netflix to determine the closest location of video. Video is downloaded from BODI hyperscale Data Center and travels back via Fiber to the carrier hotel

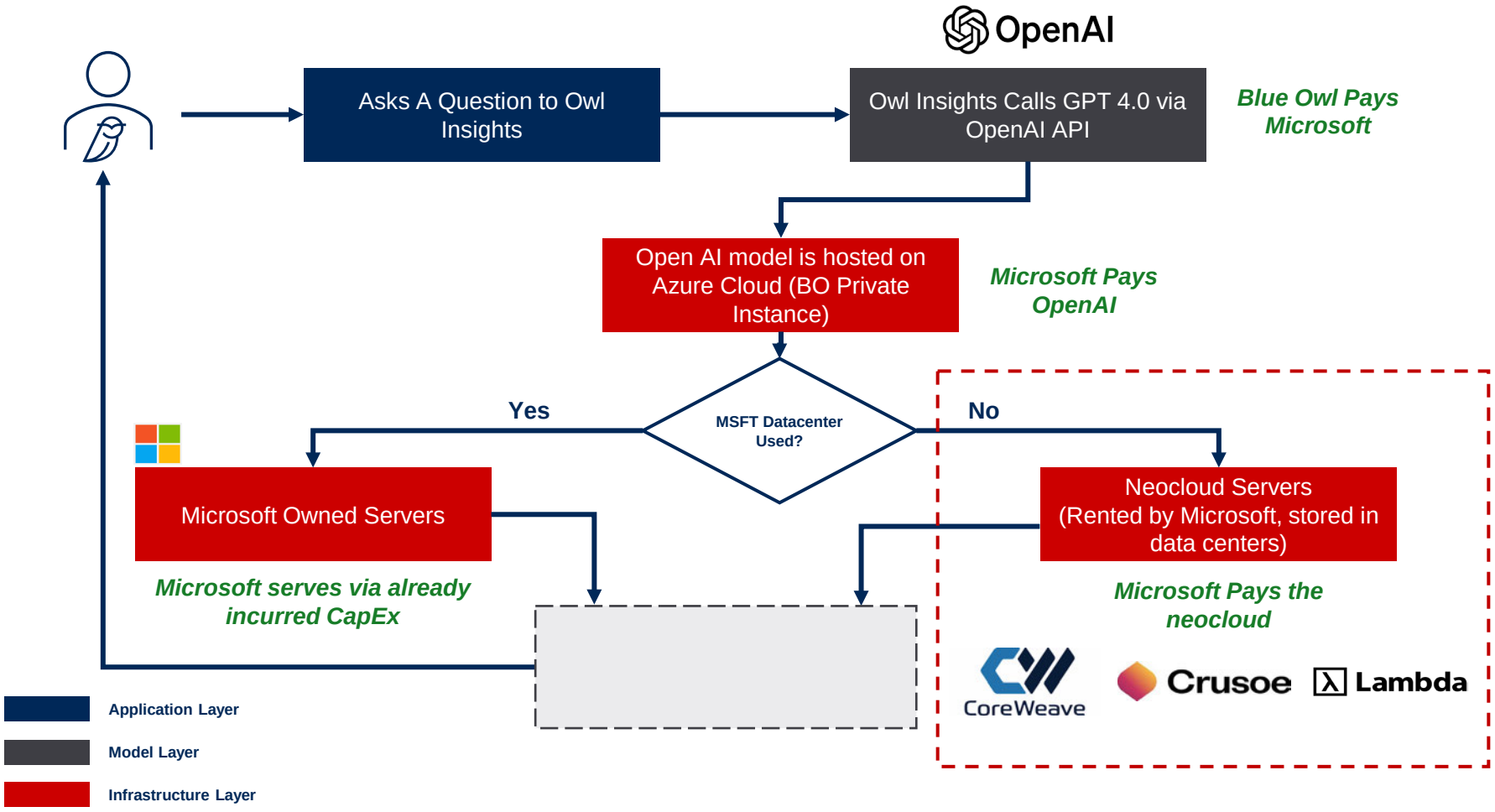
**Step 4:** Video travels from carrier hotel via Fiber back to the Cell Tower/Small Cell site

**Step 5:** Signal travels wirelessly over spectrum from Cell Tower/Small Cell site to user's iPhone

For illustrative purposes only.

# AI Simplified, Illustrative Revenue Model

AI value-chain of monetization goes from application layer to foundation model to compute with different players taking a % of revenues.




For illustrative purposes only.

# Data Center Business Models

Most data center operators fall into one of three categories:

**1) Retail:** providing space, power and value added services to a large number of smaller corporates at a high unit price

**2) Wholesale:** providing space and power to a handful of large corporates

**3) Hyperscale:** providing large scale customized space and power to one or a small number of extremely large consumers of data center space at a low unit price

| | Retail | Wholesale | Hyperscale |
|---|---|---|---|
| **Tenants** | Enable enterprise, SMB and government customers to outsource services to reduce costs and scale IT tasks | Primarily large enterprise with sophisticated IT departments | Large technology service providers, cloud computing companies, social media companies |
| **Contract sizes** | • ~3kW to <250kW of power capacity (customers pay for committed power regardless of usage)<br>• ~25 to 10k sq ft (or by rack) | • 250kW to >1MW of power capacity (pass-through costs)<br>• >10k sq ft of contiguous floor space | • >1MW of power capacity (pass-through costs) |
| **Contract Length** | 3-5 years | 3-10 years | 7-20 years |
| **Property Ownership** | Mostly leased | Typically ownership of physical building infrastructure and land | Typically, ownership of physical building infrastructure and land |
| **Interaction with Customer** | Retail operators house customers' services & IT equipment alongside other tenants' | Customers prefer to manage all data center equipment themselves, outsourcing only power & cooling service mgmt. to operators | Customers prefer to manage all data center equipment themselves, outsourcing only power & cooling service mgmt. to operators |
| **% Recurring Revenue** | ~90% | ~95% | ~100% |
| **EBITDA Margins** | 40-50% | 50-60% | 60-70% |
| **Number of Tenants** | 100+ | 10+ | 1-5 |
| **Operators** | expedient, NEXTDC, GLOBAL SWITCH, EQUINIX, VXCHNGE | DIGITAL REALTY, QTS, VANTAGE DATA CENTERS, DATA4 SMART DATACENTERS AT SCALE, Aligned Energy | AIRTRUNK, STACK INFRASTRUCTURE, Ascenty, Beale Infrastructure, CloudHQ |

# Demand Transforms Data Center Leasing Norms

Since Blue Owl Digital Infrastructure's inception, capacity needs have ramped and evolved significantly. Tenants have moved from initially leasing single data halls to leasing entire campuses today. **100MW campuses now require ~$1.2b of capital investment.**

## Capacity Ramp Over Time

2-8MW

Single Data Hall

2018

24-48MW

Data Center Building

2021

72-200MW

Data Center Campus

2023

500-1,000+MWs

Data Center Campus

2024

Note: Figures are a depiction of how Blue Owl Digital Infrastructure's leases have changed since inception.

# BODI Primarily Invests in Two Distinct Hyperscale Data Center Types

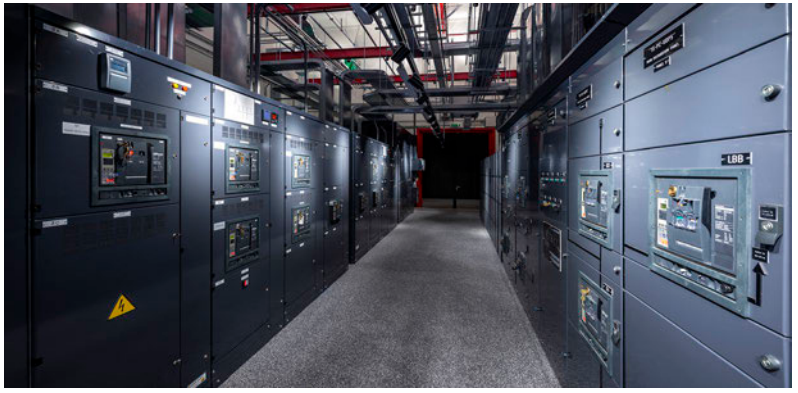
Powered Shell & Turnkey data centers share many similar features, including long-term contracts with the highest quality tenants. They differ primarily in landlord scope and lease structure

| | Powered Shell | Turnkey |
|---|---|---|
| **Construction Type** | Fully built core and shell with power and connectivity | Equivalent to powered shell, with additional fit-out infrastructure that includes generators, HVAC batteries and other components |
| **Construction Costs** | $2M – $3M per MW | $10M – $15M per MW |
| **Lease Structure and Covered Costs** | Triple-net lease<br>All costs including insurance, taxes and electricity passed through to tenant | Modified gross + electricity<br>Revenue grossed up for electricity pass-through; responsible for all property taxes, insurance and operational maintenance |
| **Operating Responsibilities** | Hyperscaler tenant is responsible for operating data center after construction completion – no level agreements for uptime | Landlord is responsible for data center construction completion – service level place |
| **Lease Term** | 10 Years – 15 Years | 10 Years – 15 Years |
| **Lease Pricing** | Typically, 7.0% – 8.0% Yield-on-Cost ("YOC")<br>2.0% – 3.0% annual escalators | Typically, 7.5% – 10.0% Yield-on-Cost<br>2.0% – 3.0% annual escalators |
| **Property Ownership** | Owned physical building infrastructure and land | Owned physical building infrastructure and land |

Source: Proprietary

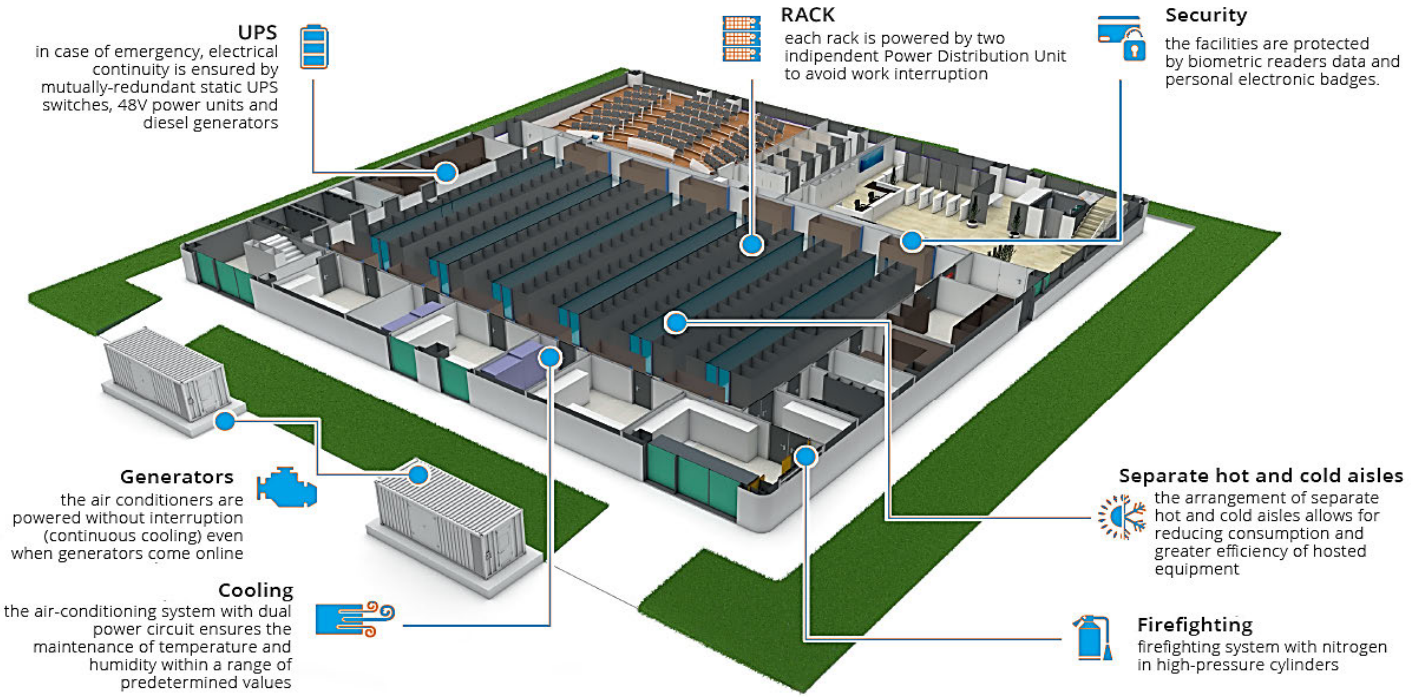
Note: The terms and descriptions noted here for both types of development are for illustrative purposes only and may not reflect the development scope and structure of an actual development. Construction costs, lease structure and covered costs, lease terms, and lease pricing terms may greatly vary and there is no assurance that IPI may achieve the terms noted here.

# BODI Data Centers



# Components of a Data Center

Data center operators are responsible for providing space, power, cooling and physical security for tenants to store and operate computer servers.




**Building Shell:** The bare shell which often includes fiber connectivity, plumbing and electricity

**UPS:** Batteries to deliver an uninterrupted power supply (UPS)

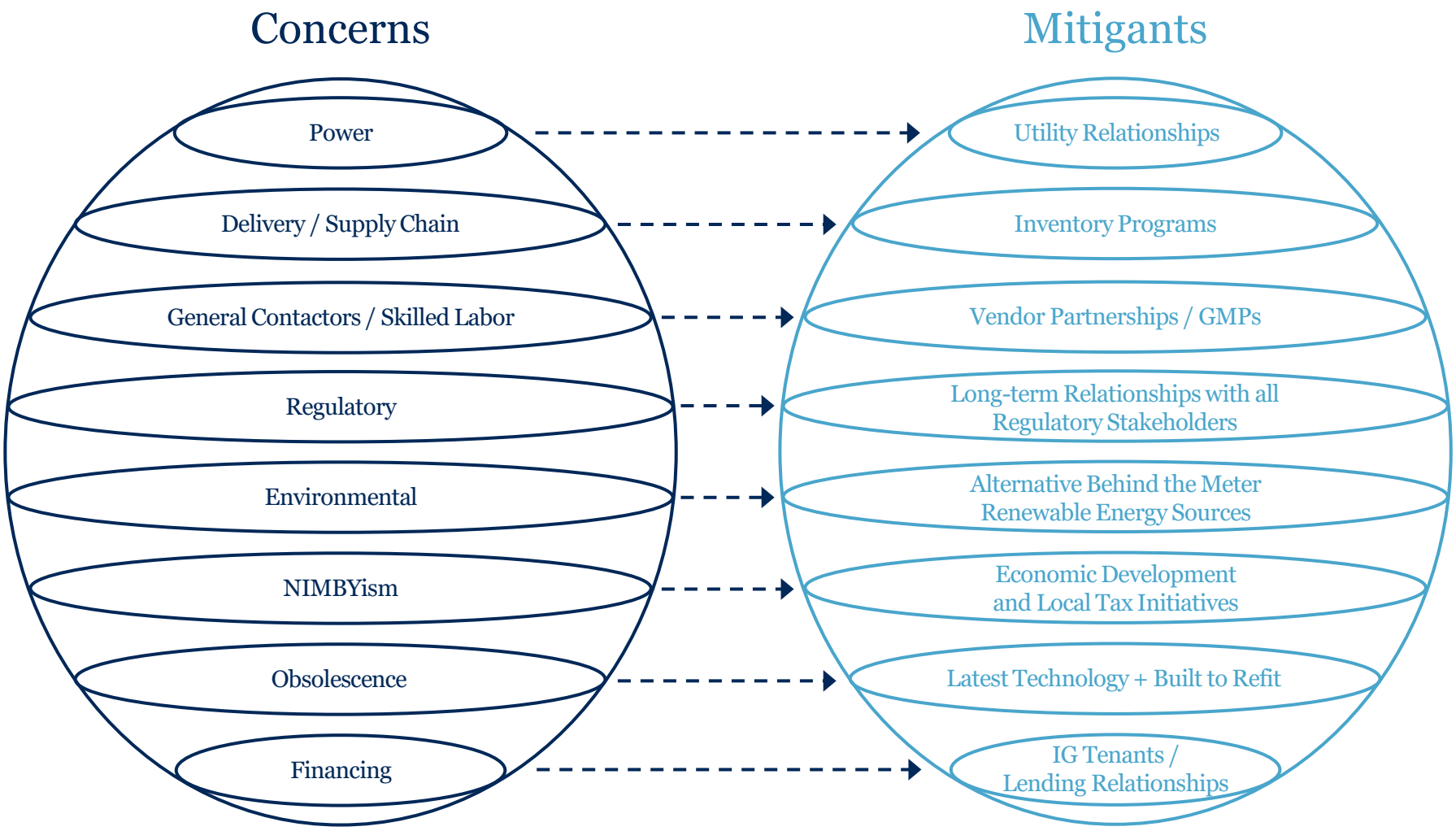
**Generators:** Located on-site and programmed to run within seconds of an unplanned power outage

**Cooling:** Used to remove heat by HVAC systems by transferring heat to exchangers located outside of the facility. These systems can be sprinkled with water to increase efficiency

**Fire Suppression:** Typical fire safety systems can damage data center hardware so many data centers will use suppression systems which displace oxygen in the air

**Physical Security:** Security guards, video surveillance, gates, mantraps, and multifactor or biometric locks

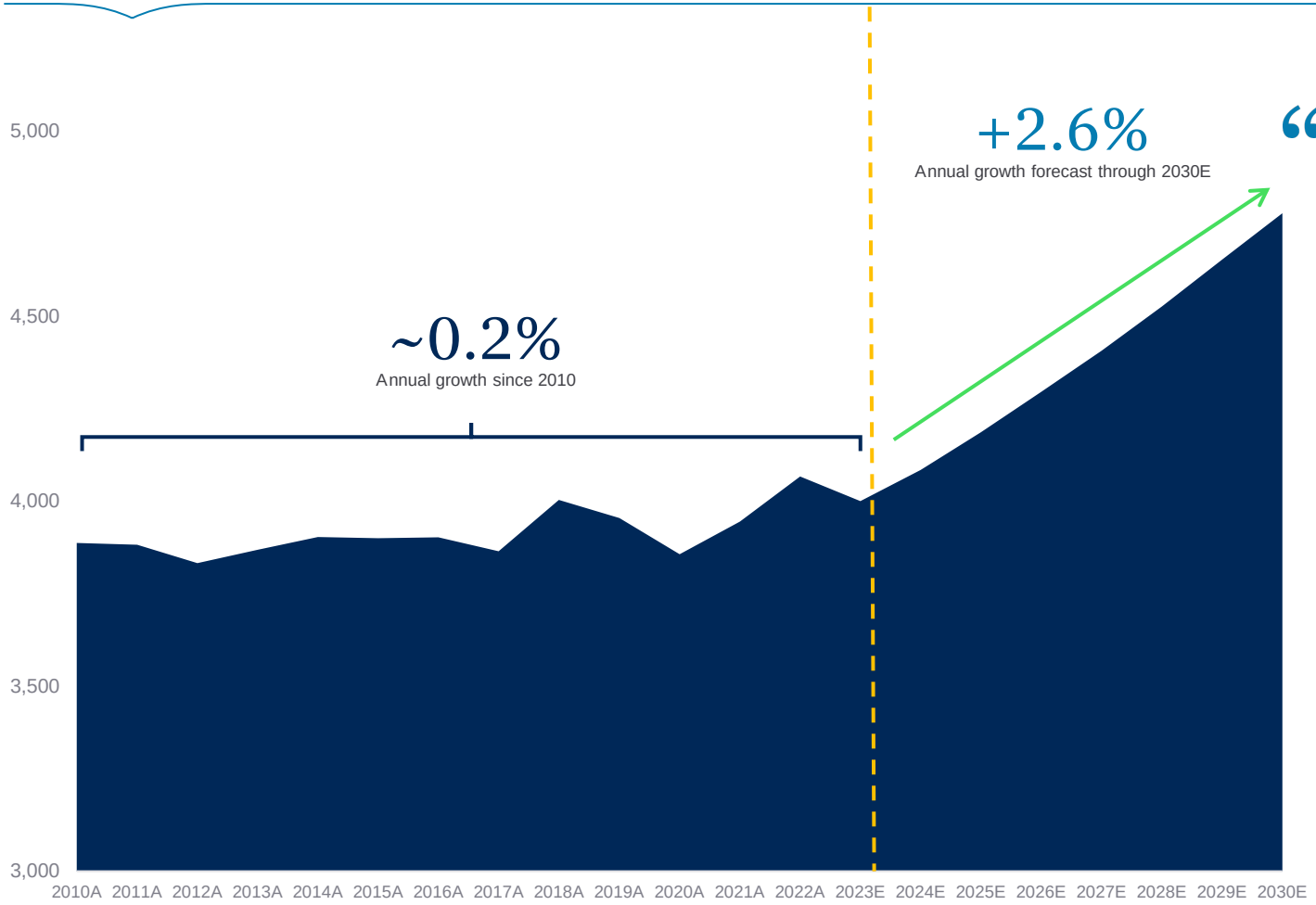
# Considerations for Development




For illustrative purposes only.

# US Power Demand is Expected to Accelerate, After More Than A Decade of Flat Growth

## US Historical & Forecasted Power Demand (TWh)




> *It is clear that load and demand on the [grid] will continue to increase, with the growth of digitization and electrification*

Howard Gugel

SVP, Regulatory Oversight

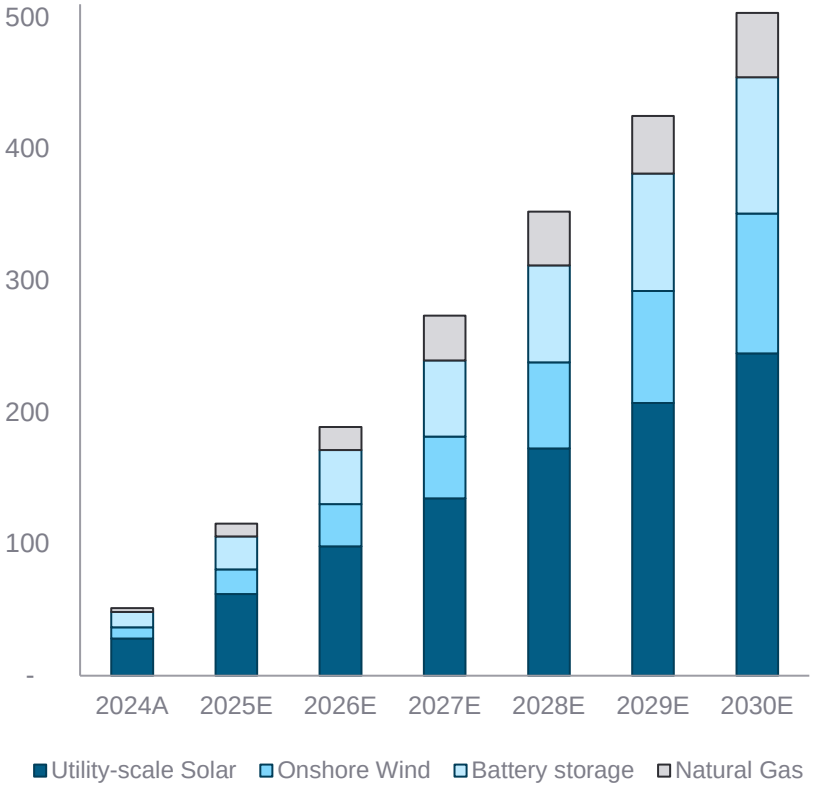
NERC
NORTH AMERICAN ELECTRIC RELIABILITY CORPORATION

Source: US Energy Information Administration (EIA); Goldman Sachs Equity Research; BODI estimates; Howard Gugel, SVP of Regulatory Oversite, North America Electric Reliability Corporation.

# Historic Levels of Grid Investment Anticipated to Power Data Centers and Deliver Full Economic Benefits

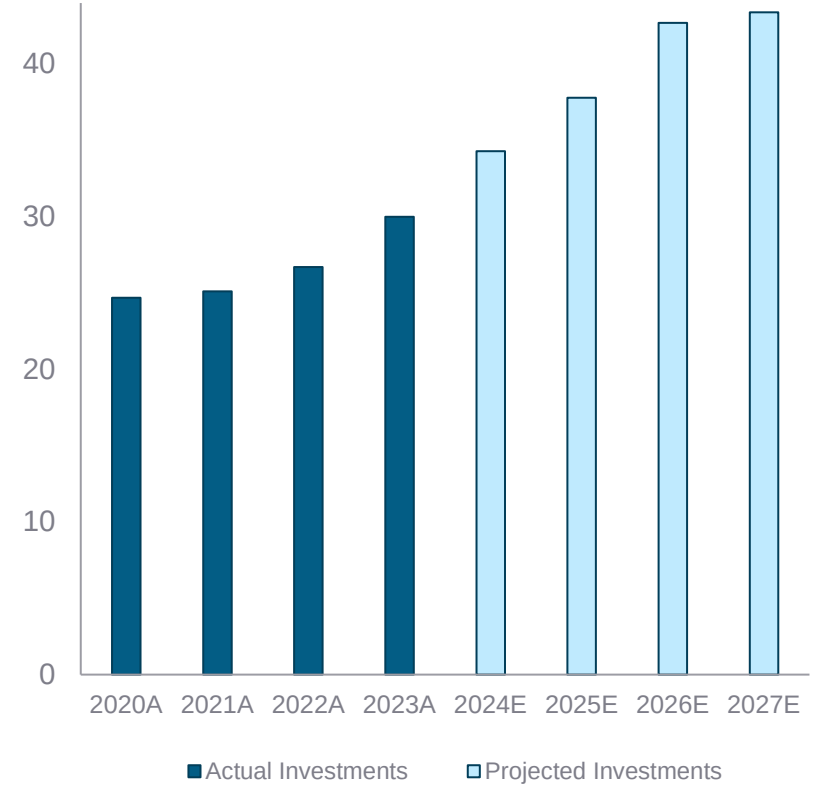
**Generation:** Over ~500 GW of New US Generating Capacity Through 2030

Cumulative Forecasted US Capacity Additions[1]
*Gigawatts*




**Transmission:** Over ~$150 Billion of US Utility Investments Between 2024 and 2027

Annual US Transmission Investments, Actual and Projected[2]
*$ Billions*




Notes: (1) Under baseline scenario; excludes small-scale solar (~86 GW cumulative) and other miscellaneous sources (~22 GW cumulative). Source: Bloomberg estimates, July 2024.
(2) Includes transmission investments from investor-owned electric companies and stand-alone transmission companies, in nominal US dollars. Source: Edison Electric Institute, January 2025.

# Outlook for Investing in Data Centers

# AI Case Study: OpenAI

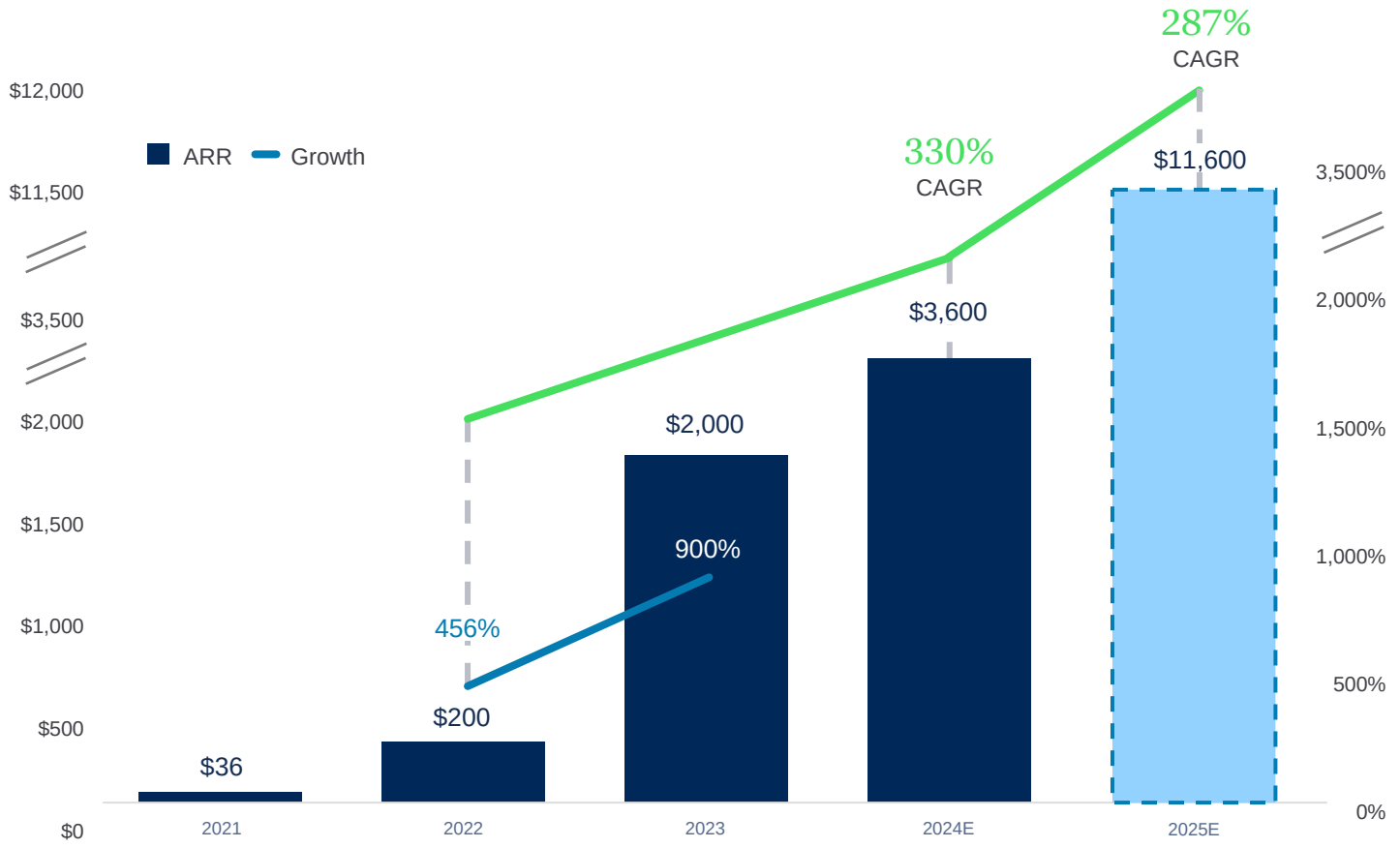
Within 60 days of launching, ChatGPT eclipsed **100M users**, and 20 months later they have scaled from **$0 to $3.6B** of recurring revenue. Today, OpenAI is valued at **$157B, nearly double what the company was valued at earlier this year**.

## Annual Recurring Revenues ($M)

OpenAI

**November 2022:**

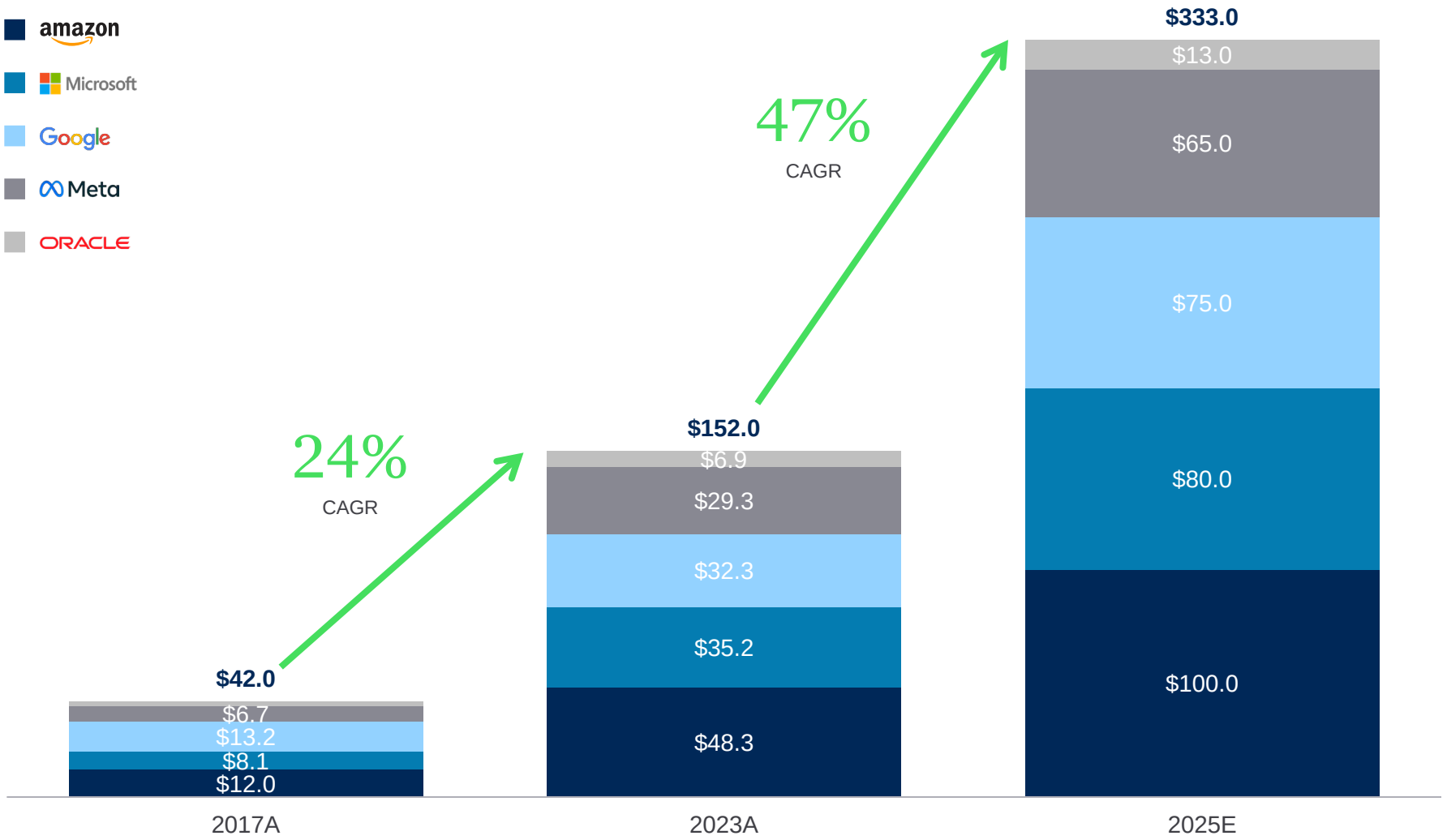
The Launch of ChatGPT Catalyzes OpenAI Revenue Growth




Source: New York Times: OpenAI Is Growing Fast and Burning Through Piles of Money (September 2024) – 2024-2025 ARR; The Information: OpenAI Projections Imply Losses Tripling to $14B in 2026 (October 2024) – 2023 ARR; Notorious: OpenAI's Revenue Breakdown (July 2024) – 2021-2022 ARR; New York Times: OpenAI Completes Deal That Values Company at $157 Billion (October 2024) – OpenAI Valuation.
Note: Trademarks are property of their respective owners. ChatGPT has not recommended the services of Blue Owl Digital Infrastructure. The Blue Owl Digital Infrastructure Funds do not expect to invest in ChatGPT and there is no assurance that Blue Owl Digital Infrastructure Funds will develop data center assets on or behalf of or provide corporate related services to ChatGPT.

# Hyperscaler CapEx Growth

CapEx spend amongst 5 of the largest hyperscalers grew 24% on average from 2017 to 2023. From 2023 to 2025, **CapEx is expected to increase 47% on average largely due to the increased spend to support AI workloads**.




Source: Financial Times - Big Tech lines up over $300bn in AI spending for 2025 (February 2025) – Amazon, Microsoft, Google, Meta Capex; RBC – Building AI (August 2024) – Oracle Capex.
Note: Trademarks are property of their respective owners. None of the companies illustrated here have recommended the services of Blue Owl Digital Infrastructure. Although certain of the above referenced companies are tenants of Blue Owl Digital Infrastructure-owned assets, Blue Owl Digital Infrastructure Funds do not expect to invest in any of the referenced companies nor can there be any assurance that Blue Owl Digital Infrastructure Funds will develop data center assets on behalf of any of the referenced companies.

# AI Training vs Inferencing

Both “inference” and “training” are essential stages in building and deploying AI applications, they serve different purposes and require different considerations.

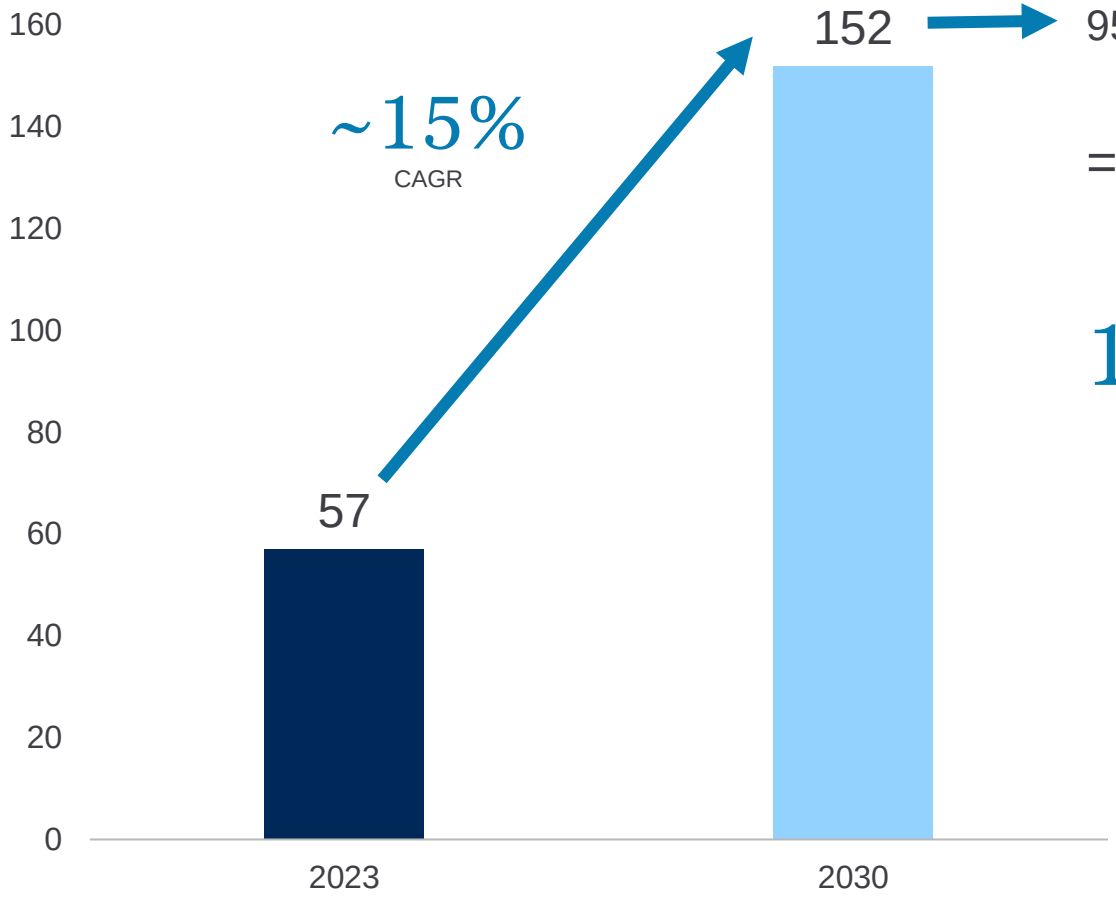
| | Training | Inferencing |
|---|---|---|
| **Purpose** | Teaching a model using historical data so it can patterns or learn tasks | Using that trained model to make predictions on new production environment |
| **Data Flow** | Typically processes massive amounts of labeled data, multiple passes through the dataset (epochs) | Processes new, unlabeled data one sample at a time (or small batches) to provide outputs |
| **Computation** | Computationally heavy | Lighter in computation |
| **Time Sensitivity** | Depending on the dataset size and hardware, it might hours, days, or even weeks | Usually happens in real-time or near real-time, latency |
| **Hardware Requirements** | Specialized hardware accelerators (like GPUs or TPUs) handle large-scale matrix operations | Performed on GPUs, CPUs, FPGAs, or specialized edge |
| **Costs** | High upfront cost, periodic re-training | Lower cost per instance, depending on latency |

Source: TRG Datacenter – “AI Inferencing vs Training”.

# Demand for Data Centers Has Never Been Higher

Data center demand will continue to hit unprecedented heights in the coming years, necessitating trillions of dollars in spending to hit desired capacity levels

## Global Data Center Demand (GW)



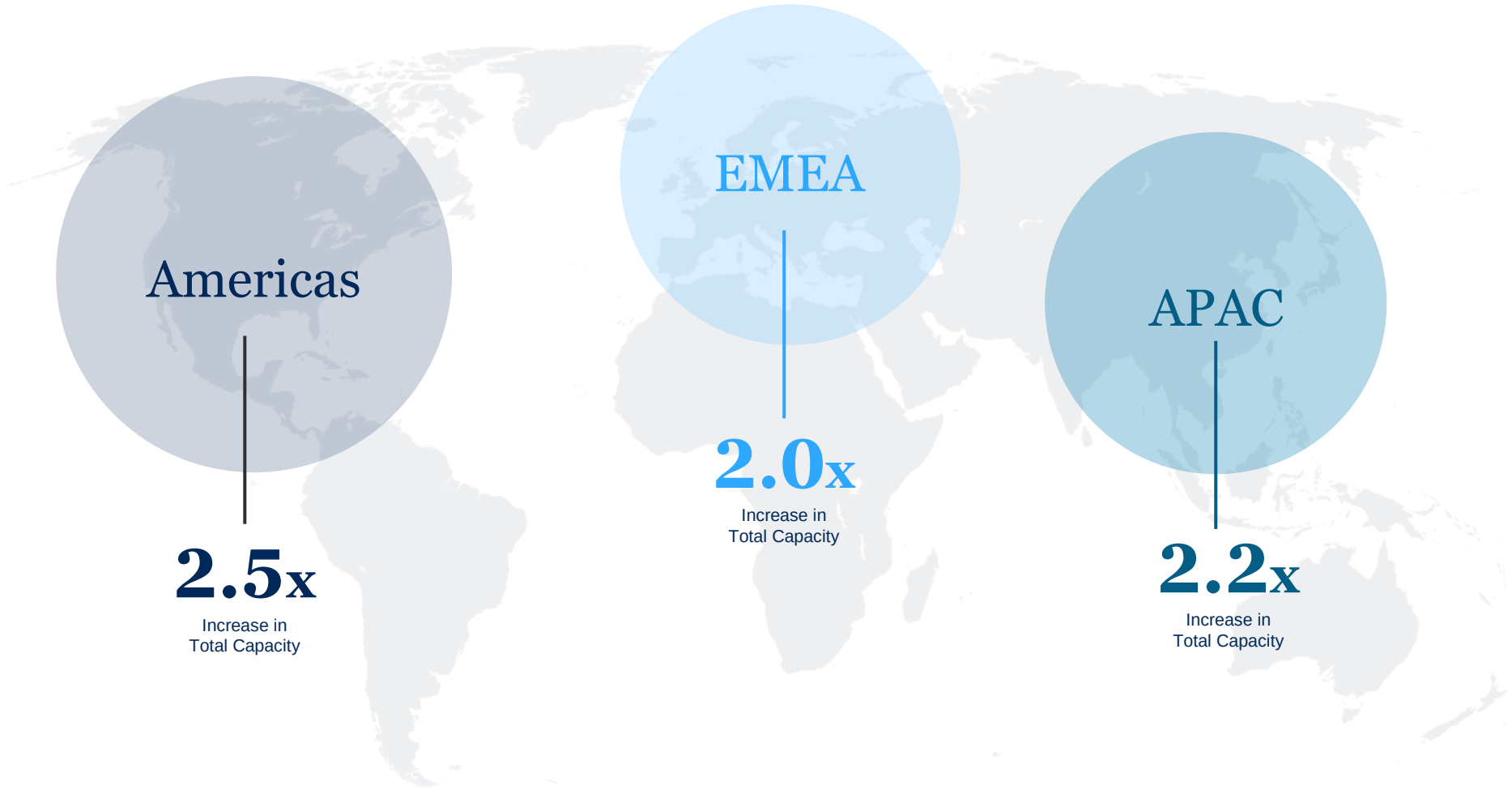

95,000 MW x $12M / MW

= $1.1T to Build Data Centers to Support This Demand

10GW = 2 New York Cities

Source: RBC Datacenter Download (June 2024) – Global Data Center Demand.

# Capacity Growing Globally to Meet Demand




Source: Cushman & Wakefield, “Global Data Center Comparison”
Note: Expected data center MW growth provided.

# Q&A

# Important Information

# Important Information

**Unless otherwise noted the Report Date referenced herein is as of (March 3, 2025).**

**Past performance is not a guarantee of future results.**

**Assets Under Management ("AUM") refers to the assets that we manage, and is generally equal to the sum of (i) net asset value ("NAV"); (ii) drawn and undrawn debt; (iii) uncalled capital commitments; (iv) total managed assets for certain Credit and Real Estate products; and (v) par value of collateral for collateralized loan obligations ("CLOs") and other securitizations.**

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# Guest Speaker: Real Estate

Elizabeth Bell
Co-Head
Real Estate

Hamilton Lane

Virginia Retirement System®

# Guest Speaker: Real Estate
## Elizabeth Bell| Hamilton Lane

Elizabeth is a Managing Director and Co-Head of Real Estate on the Real Assets team, where she is responsible for due diligence of primary, secondary and co-investment opportunities in real estate. She is a member of the Real Asset Investment Committee.

Prior to joining Hamilton Lane in 2022, Elizabeth was a Managing Director with Jaguar Growth Partners where she was responsible for leading Latin American real estate private equity investments. Previously, Elizabeth was an Investment Manager at Aberdeen Asset Management on the Property Multi-Manager team and was a Vice President at Equity International, responsible for investing in emerging markets real estate companies. Earlier in her career, Elizabeth was an Associate at real estate private equity firm, JER Partners, and an investment banking analyst at Deutsche Bank.

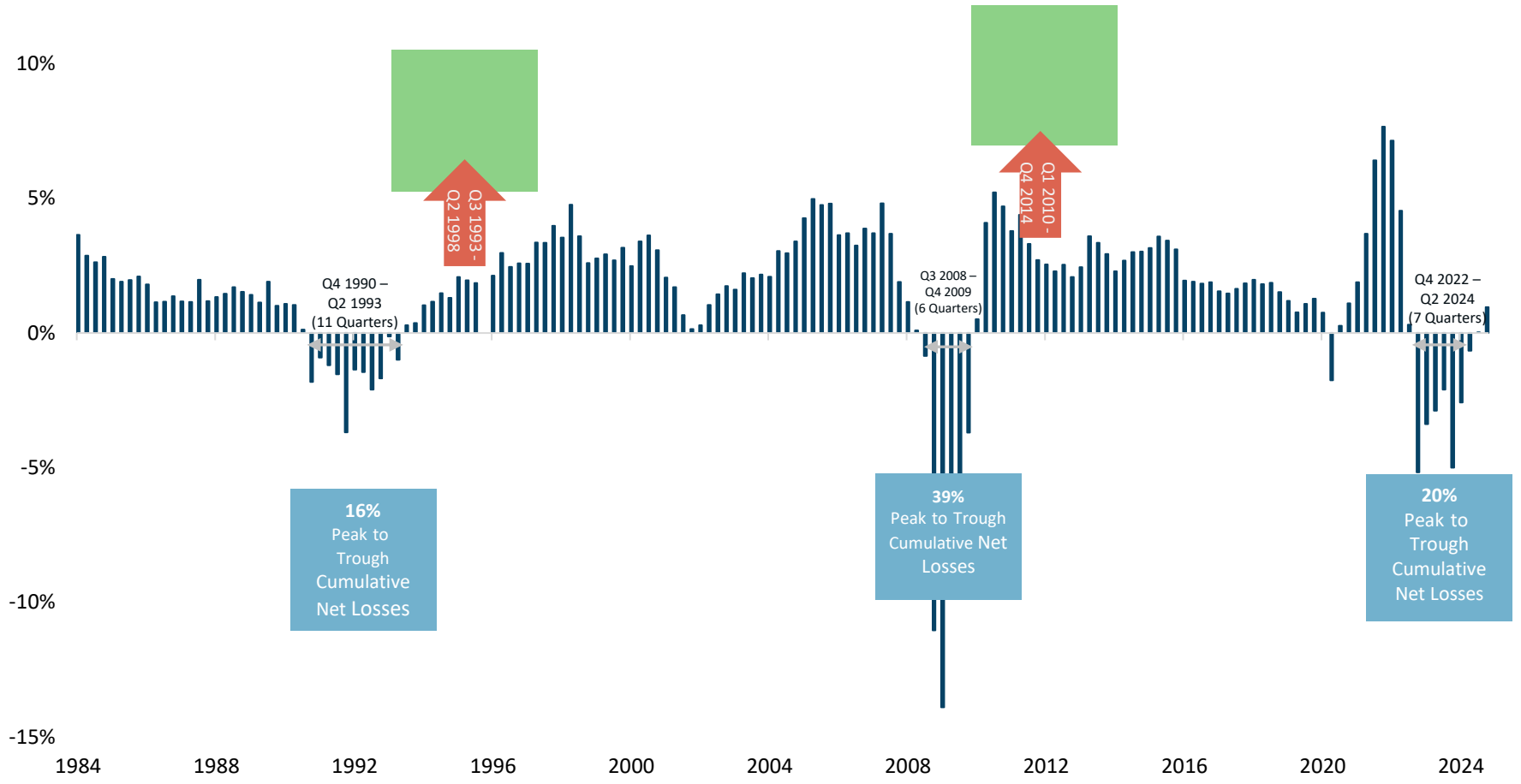
Elizabeth received her M.B.A from the Wharton School at the University of Pennsylvania and an A.B. from Princeton University.

Hamilton Lane

# VRS Offsite: Real Estate Overview

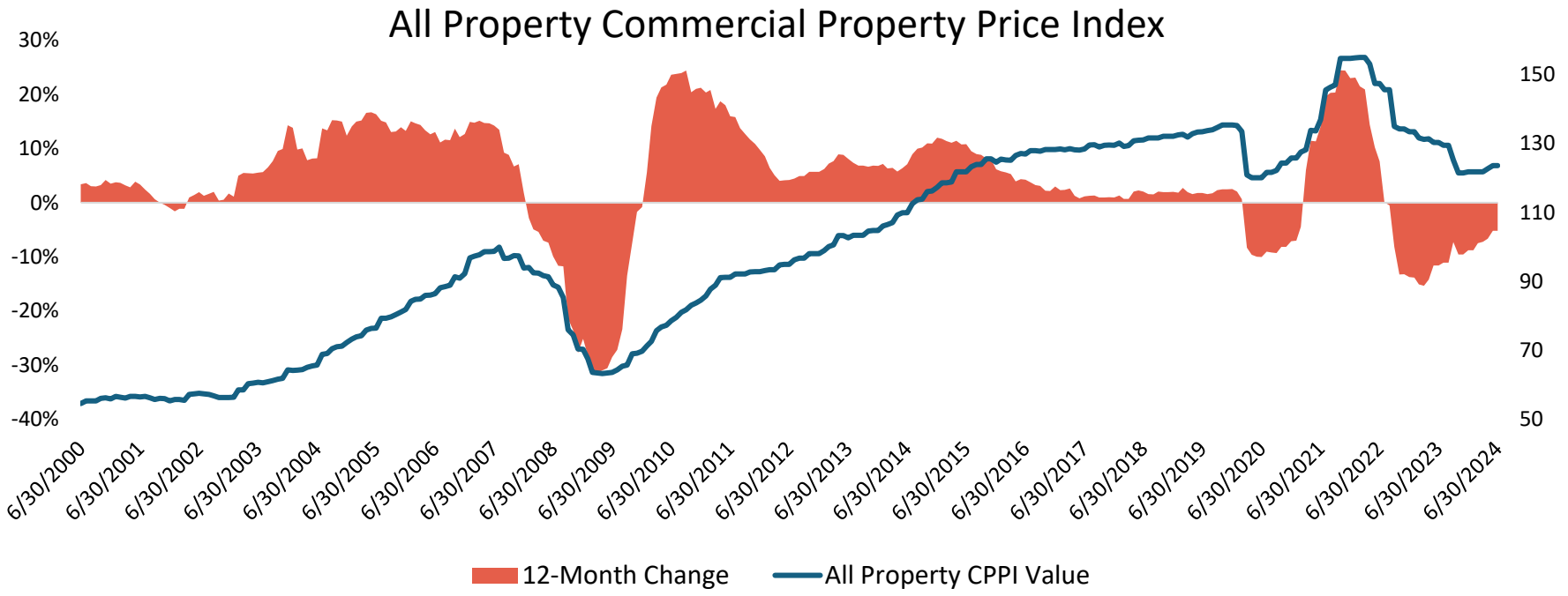
March 2025

# NFI – ODCE Net Total Returns (1984 – 2024)



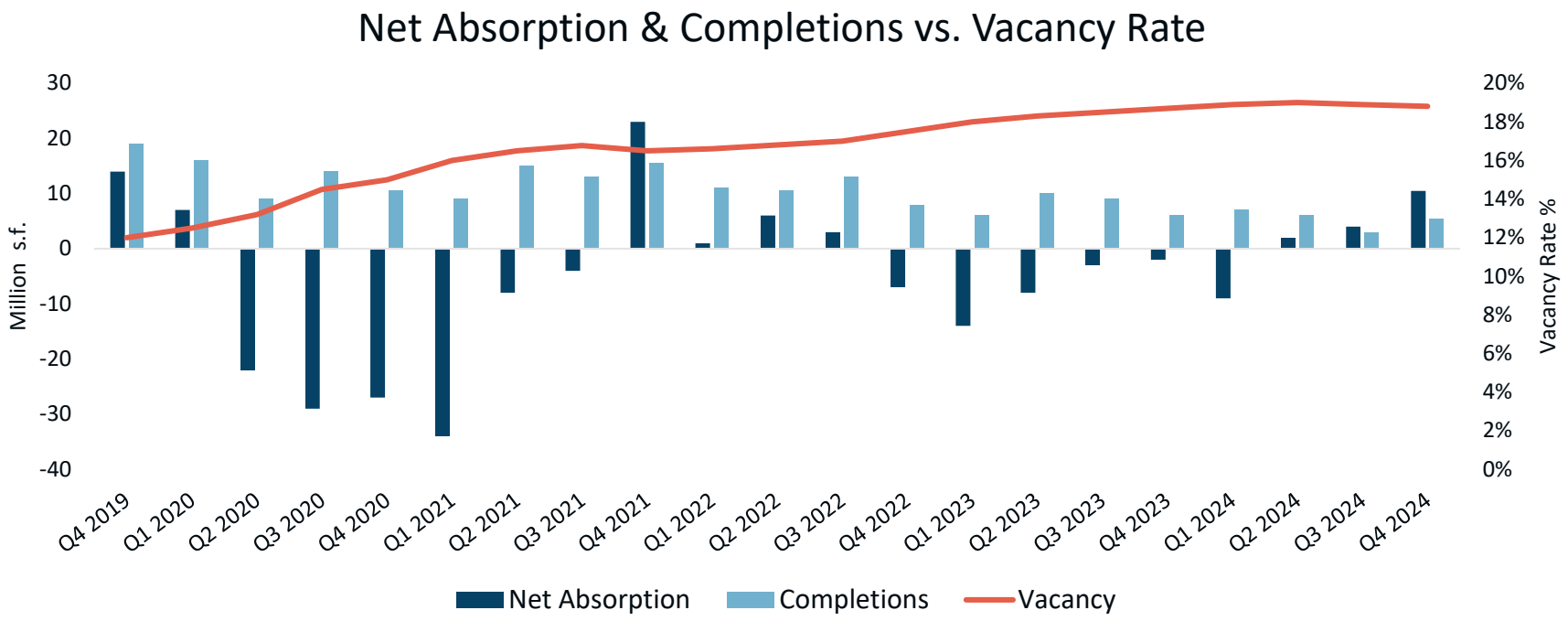

Source: NFI-ODCE Index as of 12/31/24

# Green Street Commercial Property Price Index (CPPI)



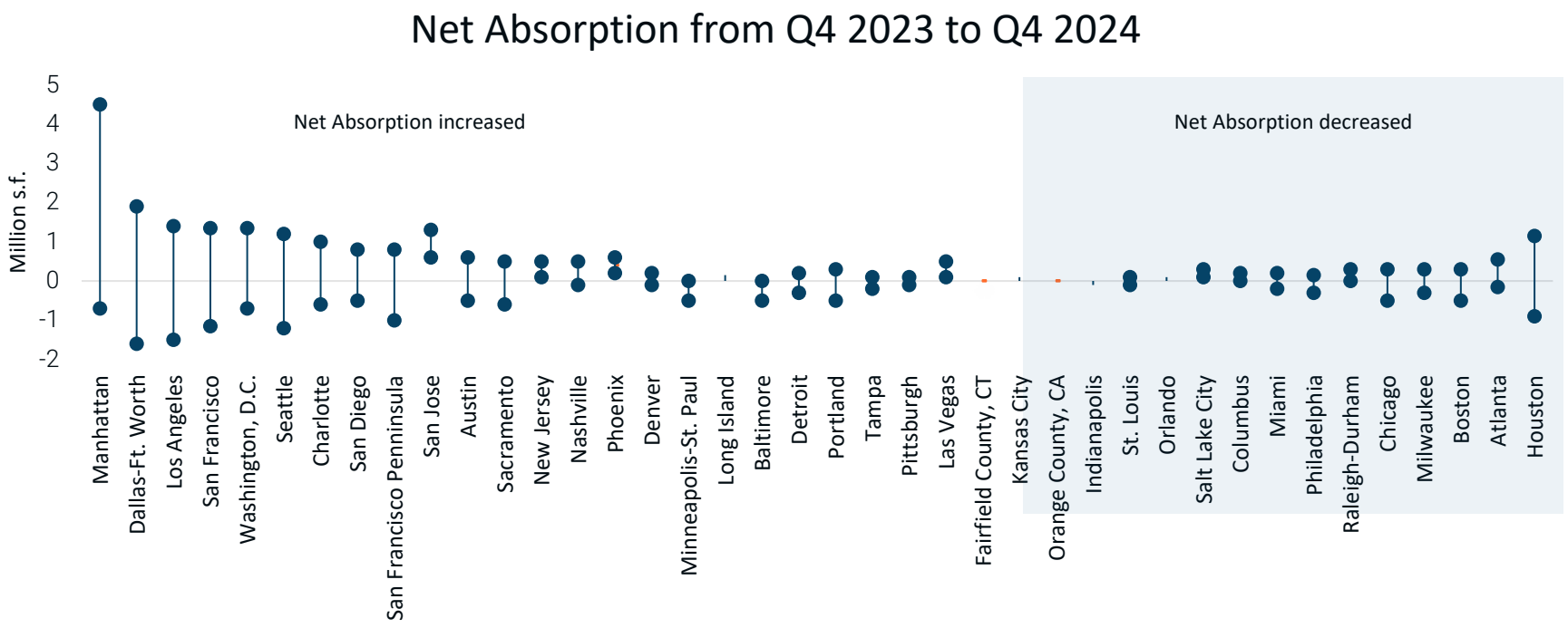

Source: Green Street

# U.S. Office Snapshot



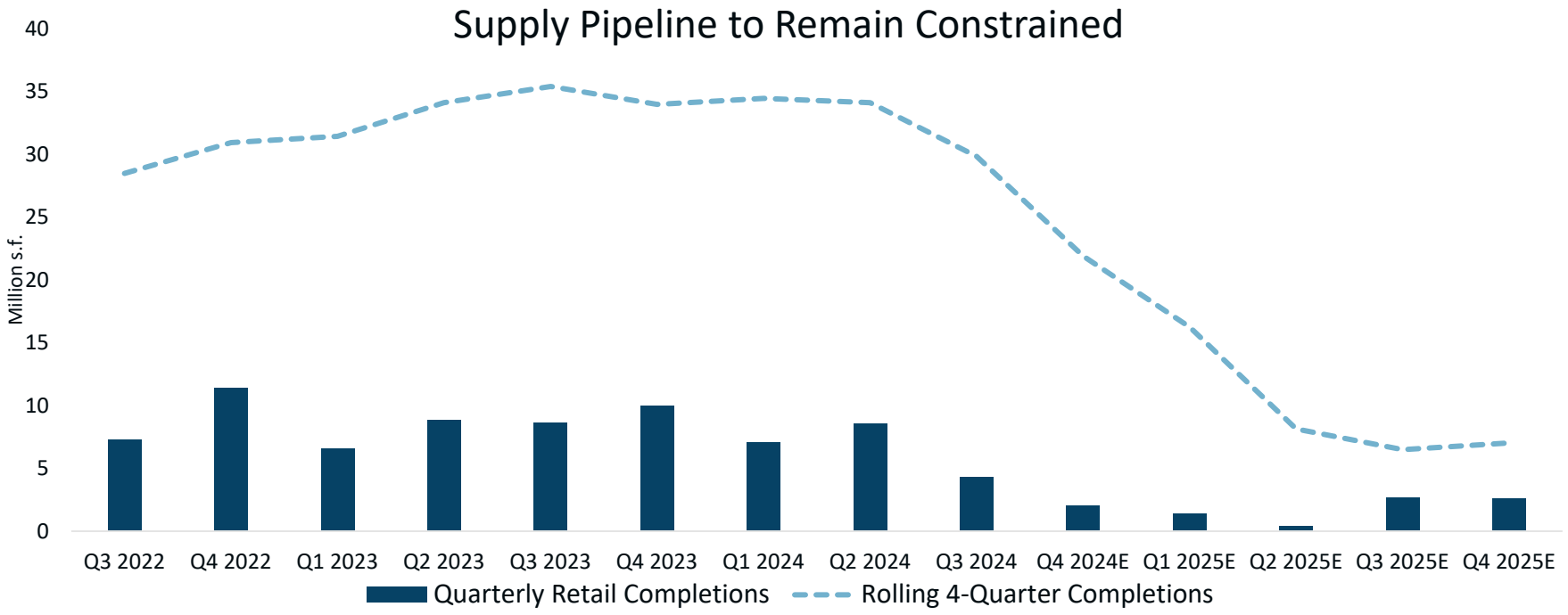

Source: CBRE Econometric Advisors, as of 12/31/24

# Market-by-Market Office Absorption



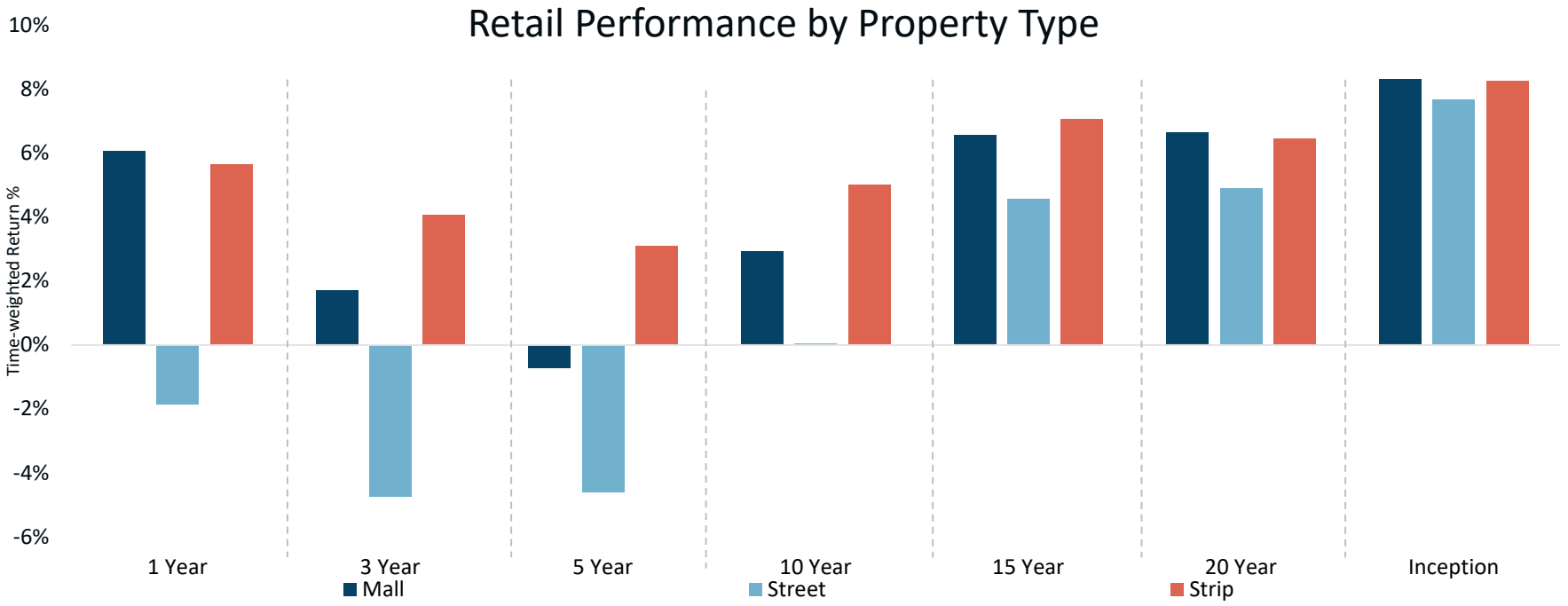

Source: CBRE Econometric Advisors, as of 12/31/24

# Limited New Supply in Retail Sector



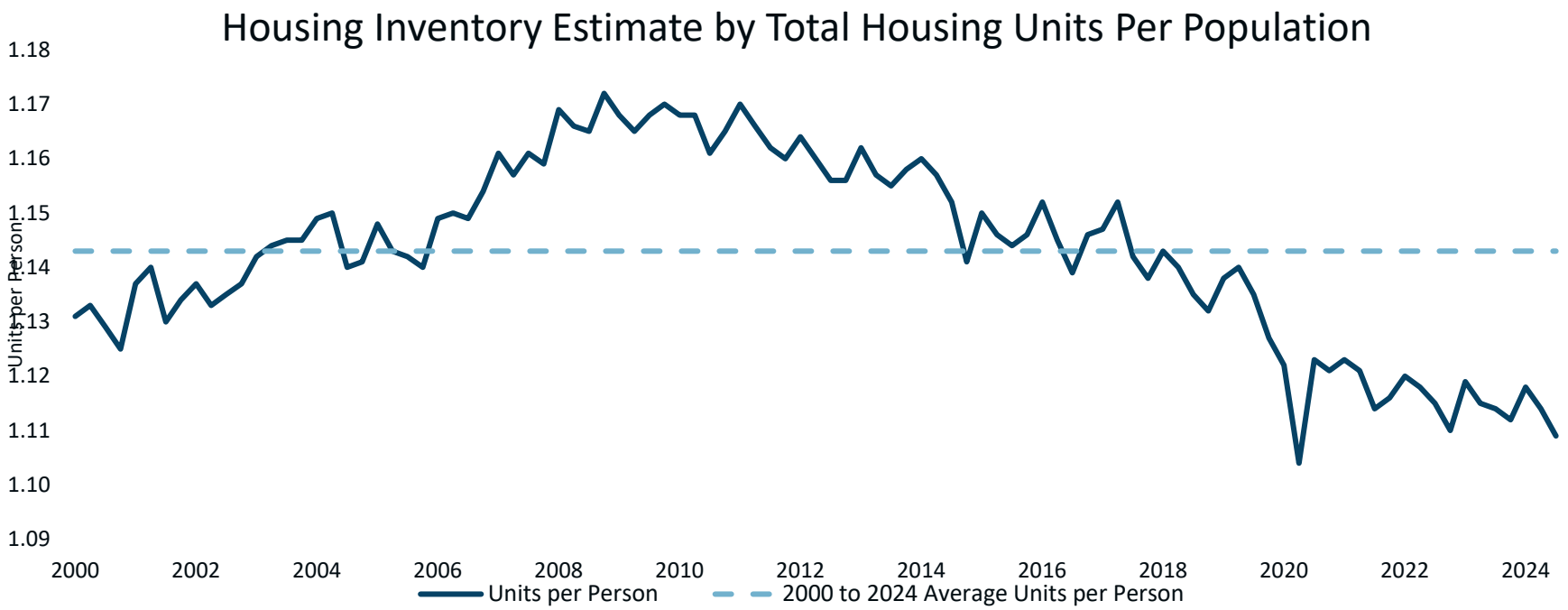

Source: CBRE Econometric Advisors, as of 9/30/24

# Bifurcation across Types of Retail



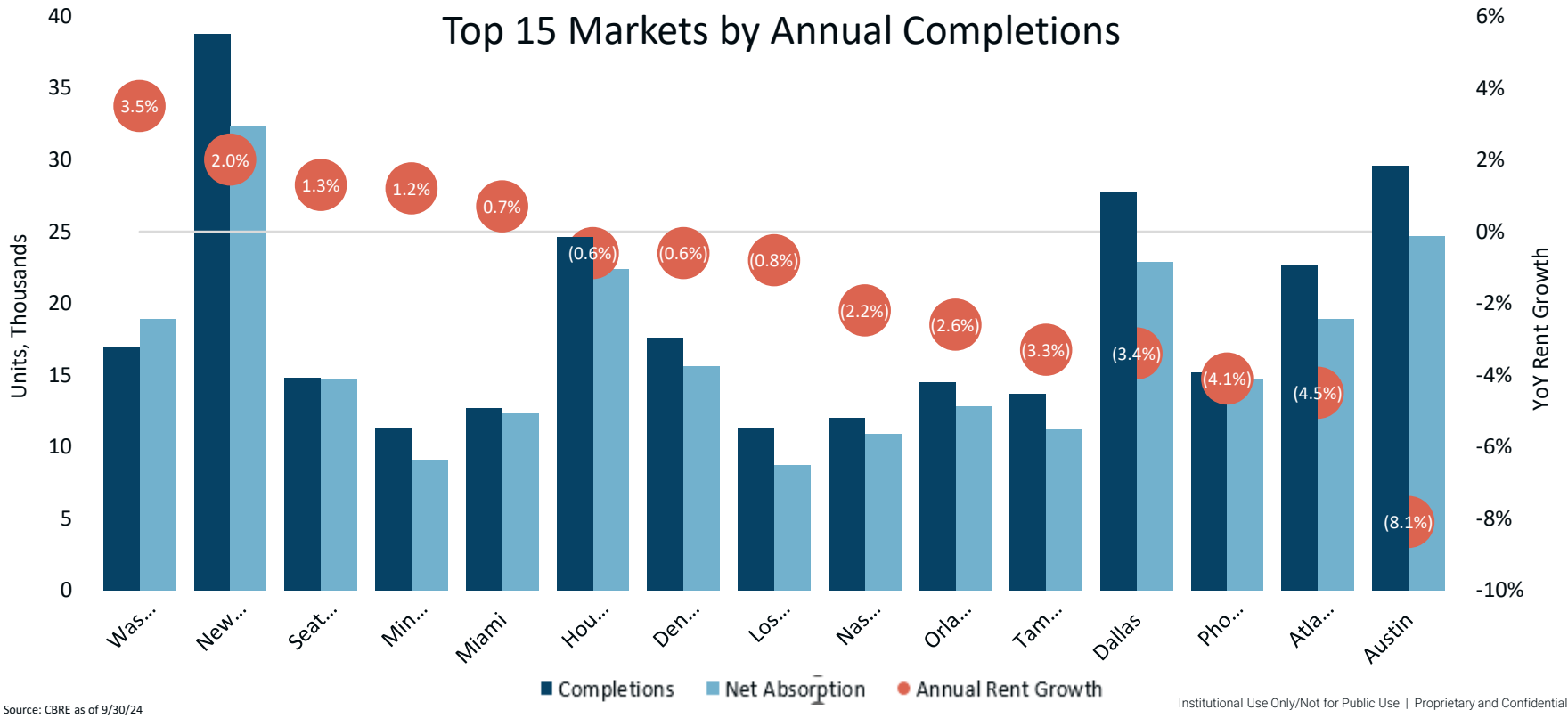

Source: NCREIF, as of 12/31/24
Note: NCREIF defines strip retail as anchored or unanchored open-air shopping centers that consist of an aggregation of in-line stores with a common parking area. Street retail is storefront retail that is typically located in the lower floors of, or adjacent to an office or multifamily building

# Housing Supply Constraint



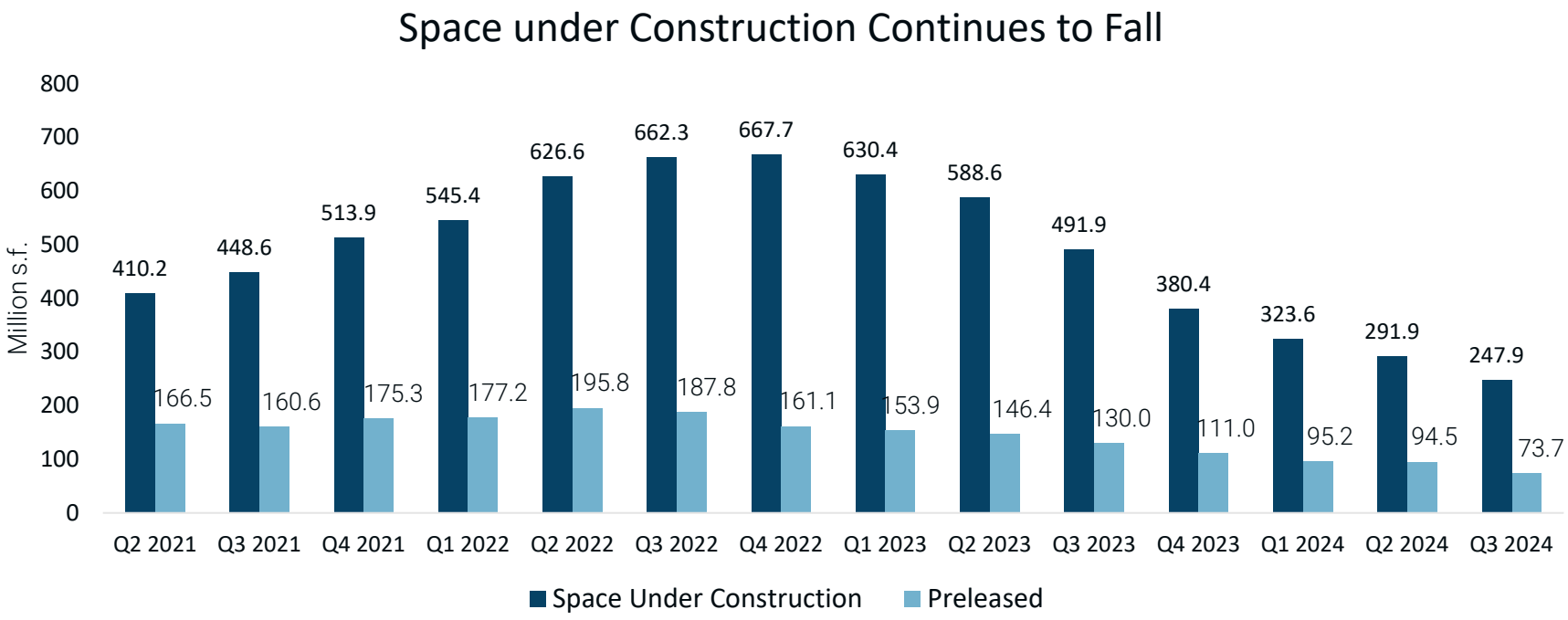

Source: Census Bureau, FRED and Apollo Chief Economist as of November 2024

# For-Rent Multifamily Supply by Market



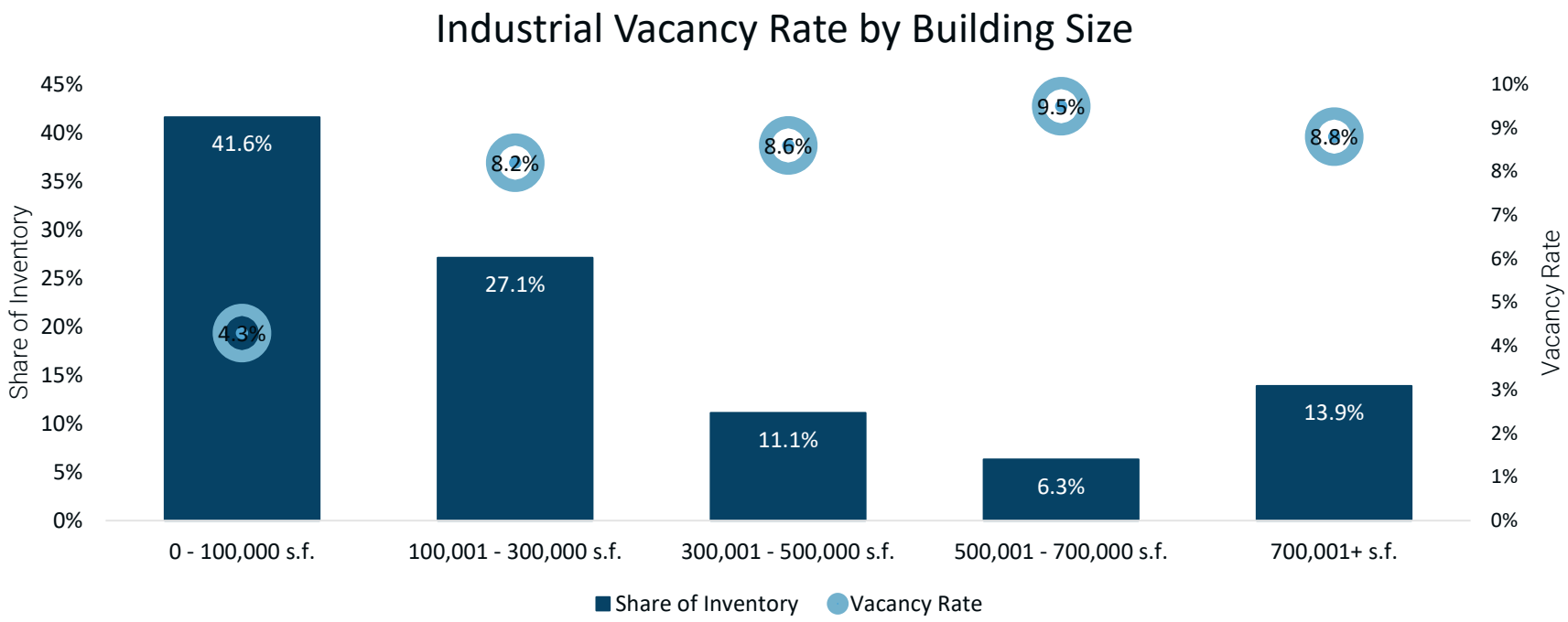

Source: CBRE as of 9/30/24

# Industrial Supply Growth




Source: CBRE Research, as of 9/30/24

# Vacancy by Industrial Building Size




Source: CoStar, Newmark Research, October 2024

# Alternative Property Types

## Manufactured / Affordable Housing

Manufactured: factory-built, single-family homes that sit on rented land
Affordable: need to navigate local/national regulations and tax incentives


## Healthcare

Medical office: on-campus or off-campus outpatient services
Life science buildings and R&D lab space

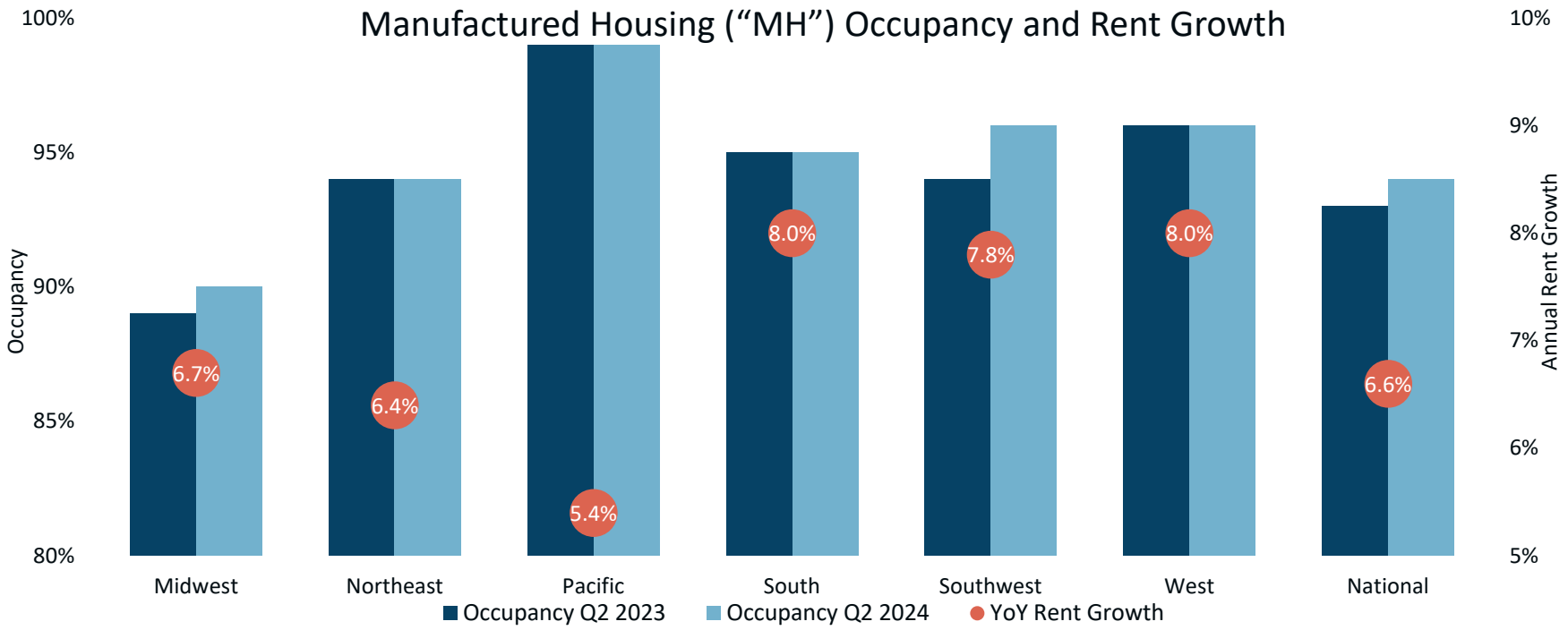

## Senior Living / Student Housing

Similar to apartment, with higher operating demands
Offers additional facilities and services not found in apartments


## Storage

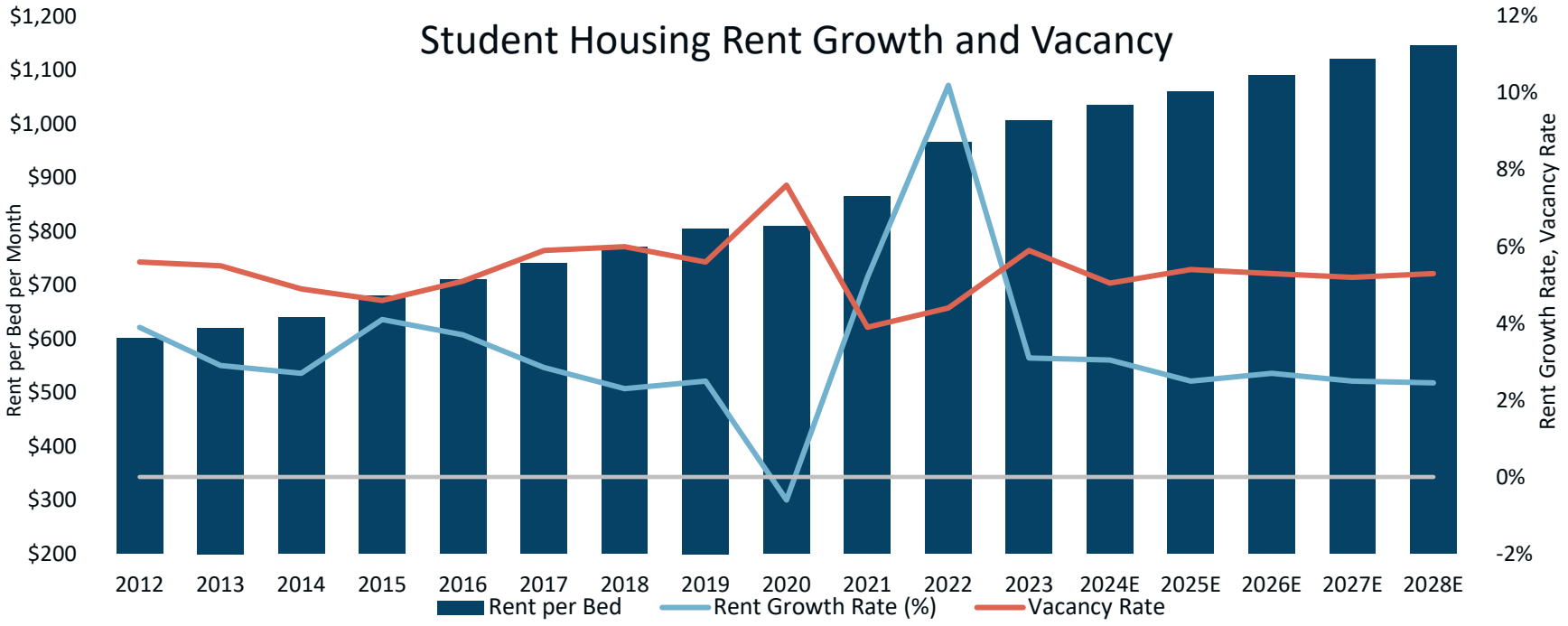
Self-storage: full service, climate controlled to no service, outdoor facilities
Industrial outdoor storage: low coverage, truck terminals to container storage


# Alternative Sectors: Manufactured Housing



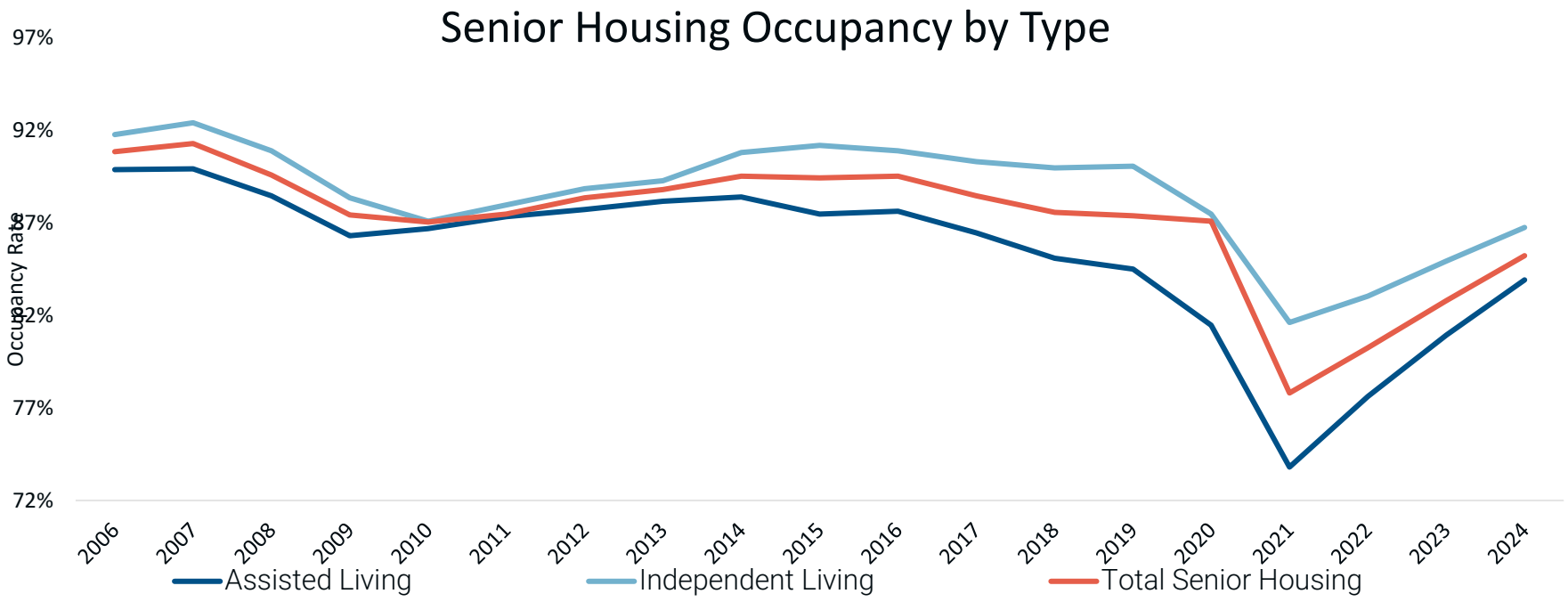

Source: Fannie Mae as of September 2024

# Alternative Sectors: Student Housing



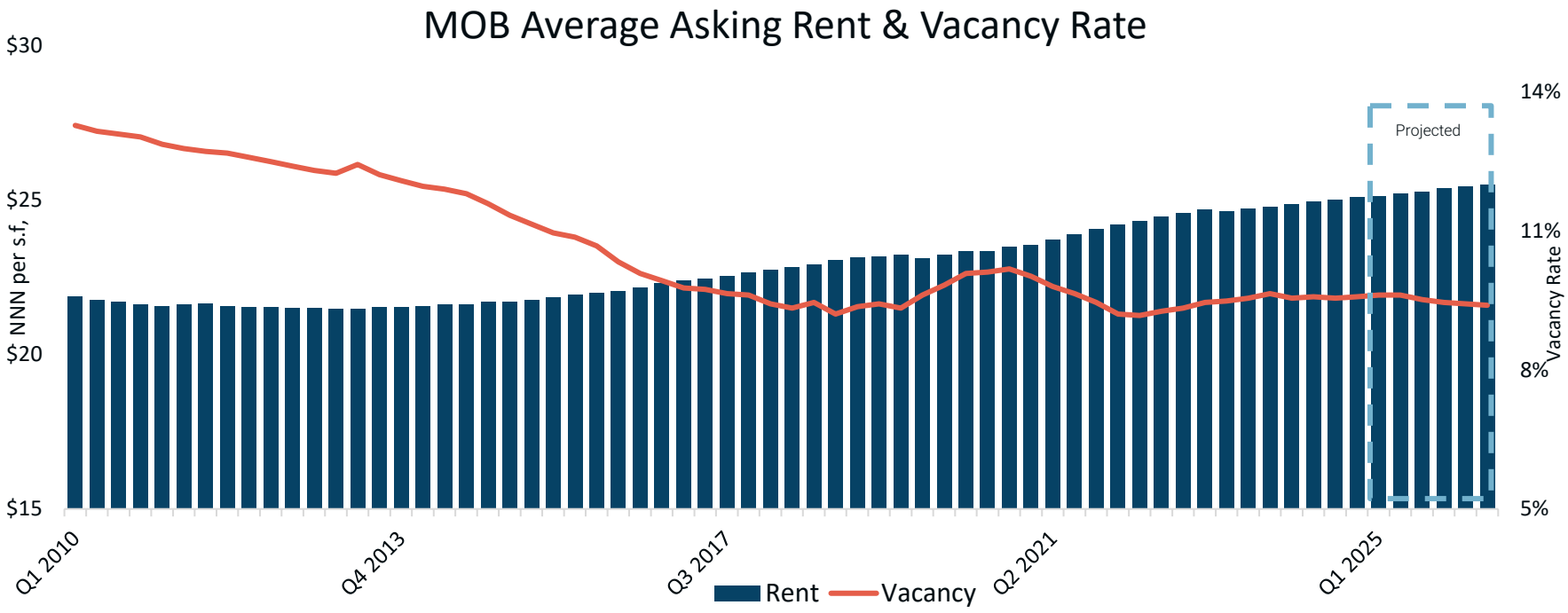

Source: Axiometrics as of August 2024

# Alternative Sectors: Senior Housing




Sources: NIC MAP Vision, as of 9/30/24

# Alternative Sectors: Medical Office Buildings (MOB)




Sources: CBRE, as of 9/30/24

# Guest Speaker: Healthcare

Dr. Thomas Roberts, Jr.
Partner & Vice Chair

Farallon Capital Management

Virginia Retirement System®

# Guest Speaker: Healthcare

## Dr. Thomas Roberts, Jr.| Farallon Capital Management

Dr. Roberts joined Farallon in 2005 and is a Partner of the firm in the Arbitrage group and the Vice Chair of Farallon. Prior to joining Farallon, Dr. Roberts was an attending oncologist at Massachusetts General Hospital, an Instructor of Medicine at the Harvard Medical School, and a Visiting Scientist at Massachusetts Institute of Technology. He maintains an active medical license. Dr. Roberts obtained two baccalaureate degrees (summa cum laude) from the University of Pennsylvania, including a B.S. from the Wharton School of Business (elected Phi Beta Kappa junior year). He obtained his medical degree from Harvard Medical School. Dr. Roberts performed his internal medicine training at the Massachusetts General Hospital and his medical oncology training through the Dana-Farber/Partners Cancer Care Oncology Fellowship Program.

# VRS Offsite: Impact of Healthcare Innovation on Life

**Thomas G. Roberts, MD, Farallon Capital Management, L.L.C.**

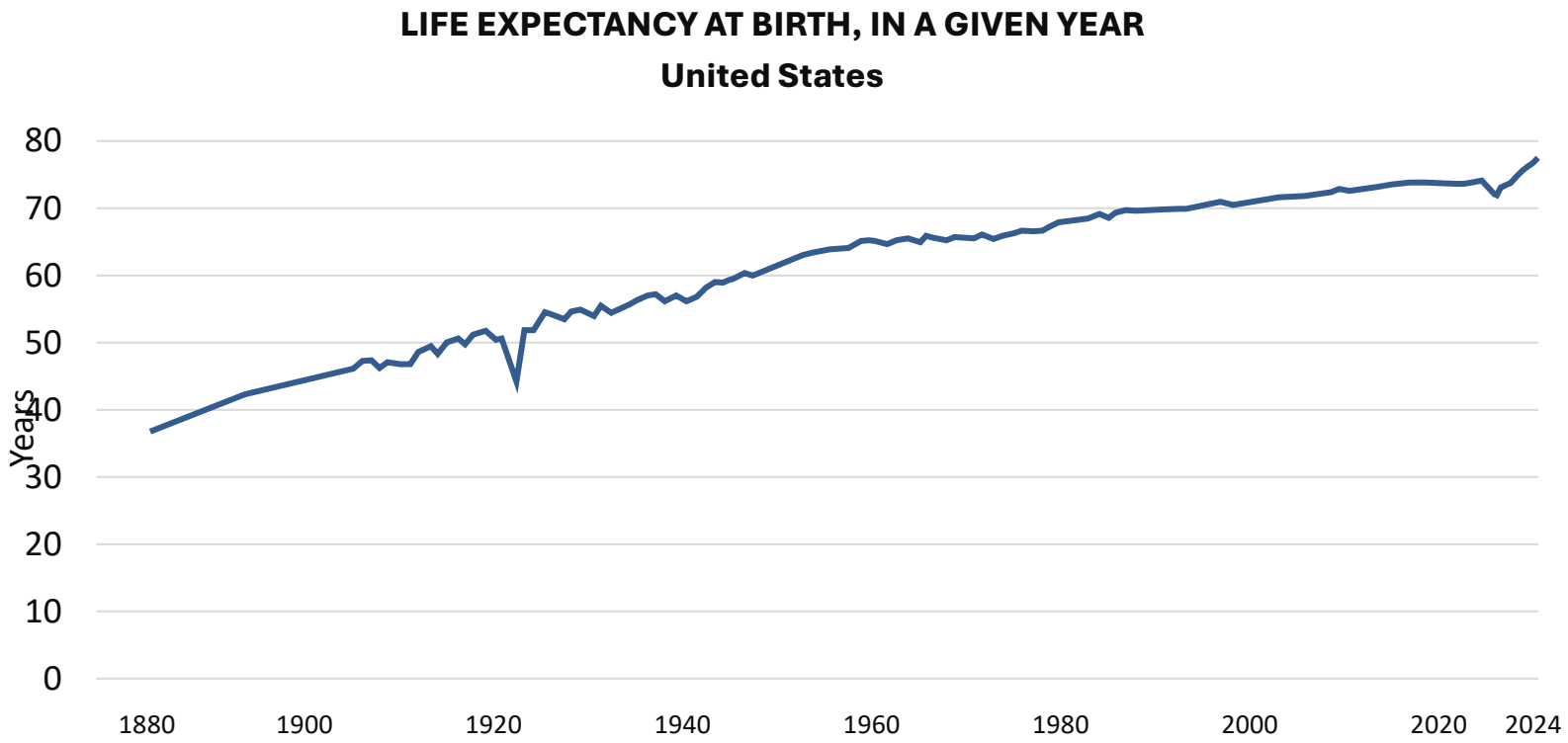
# History of Life Expectancy in the US

| Year | Life Expectancy (Years) | Change from Previous Period (Years, %) | Notes |
|---|---|---|---|
| 1850 | 38.3 | -- | Similar to Roman and Medieval lifespans |
| 1900 | 47.3 | 9.0 (24%) | Better sanitation, lower childhood mortality |
| 1950 | 68.2 | 20.9 (44%) | Antibiotics, vaccines, post-war prosperity |
| 2000 | 76.8 | 8.6 (13%) | Lifestyle improvements, cancer treatments |
| 2025 | 78.8 | 2.0 (3%) | Biotechnology, innovation |

Source: OurWorldInData.org

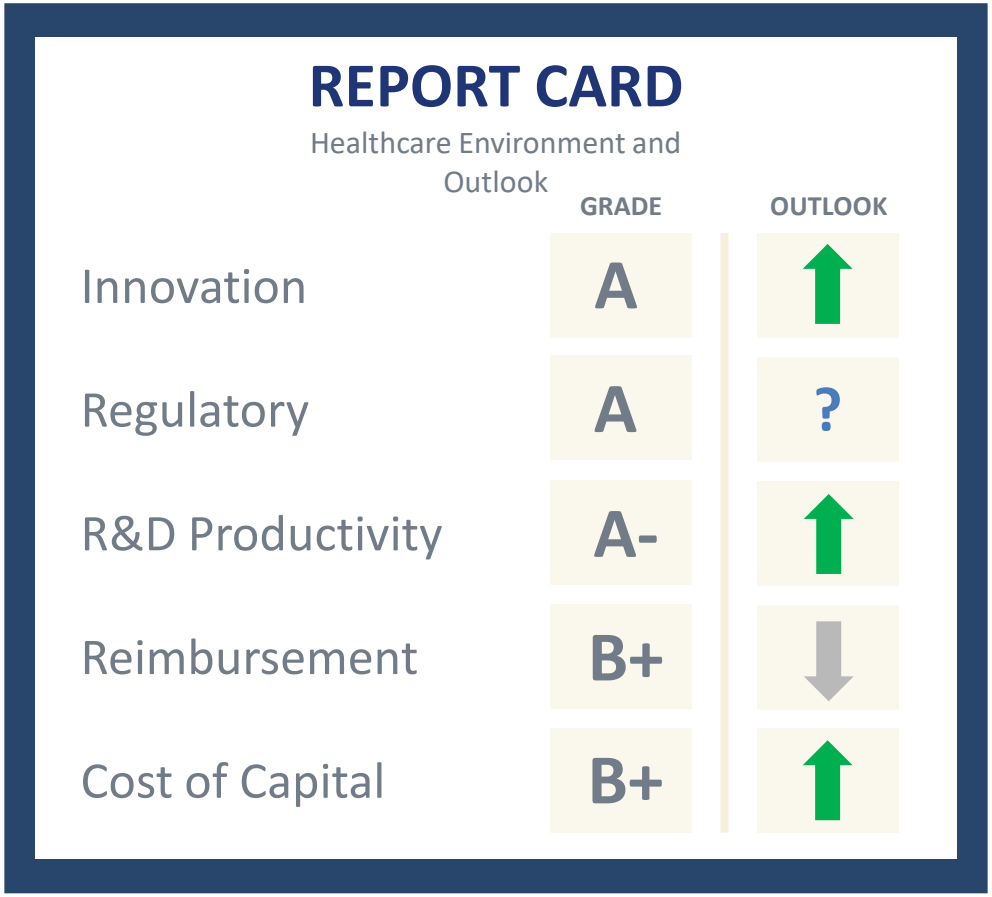
# History of Life Expectancy in the US

Life expectancy in the United States was 70.7 years in 1970. Today it's nearly 80 years, even after a dip due to the pandemic.

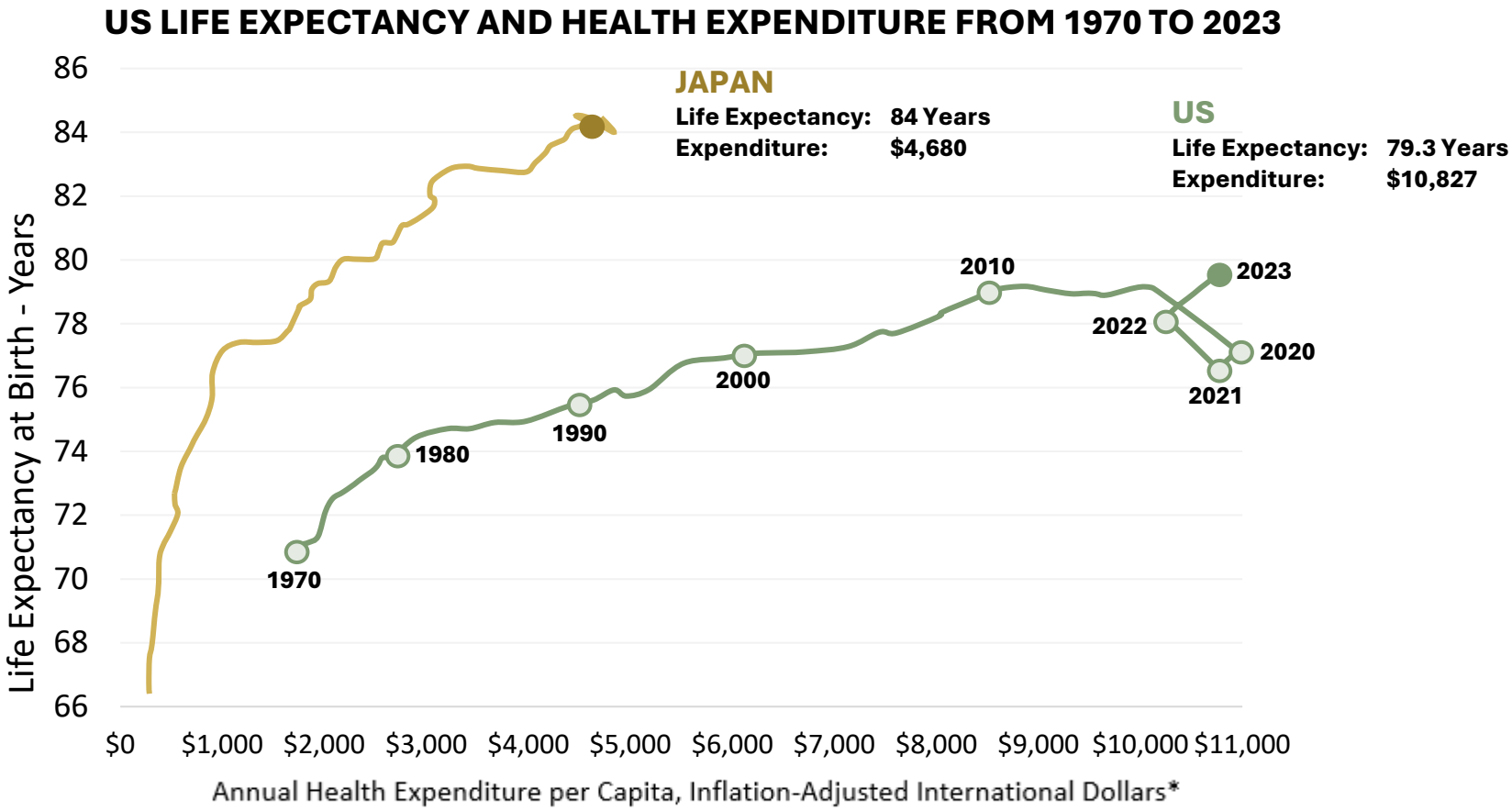



Source: UNWPP (2022); HMD (2023); Zijdeman et al. (2015); Riley (2005); OurWorldinData.org

# Healthcare Report Card



# Life Expectancy in the US




*The International Dollar (PPP) is benchmarked to the US Dollar and accounts for differences in purchasing power among countries.
Sources: Original figure from Nicholas Rapp at Fortune Magazine (UN, OECO, Our World in Data) Amended with Japanese per-capita health expenditure and life expectancy from Data Commons

# Drivers of Longevity

## PUBLIC HEALTH

**Plumbing**
**Infection Control**
**Vaccines**
**Prenatal Health**
**Improved Car Safety**

## LIFESTYLE

**Sleep**
**Stress**
**Relationships**
**Diet**
**Exercise**

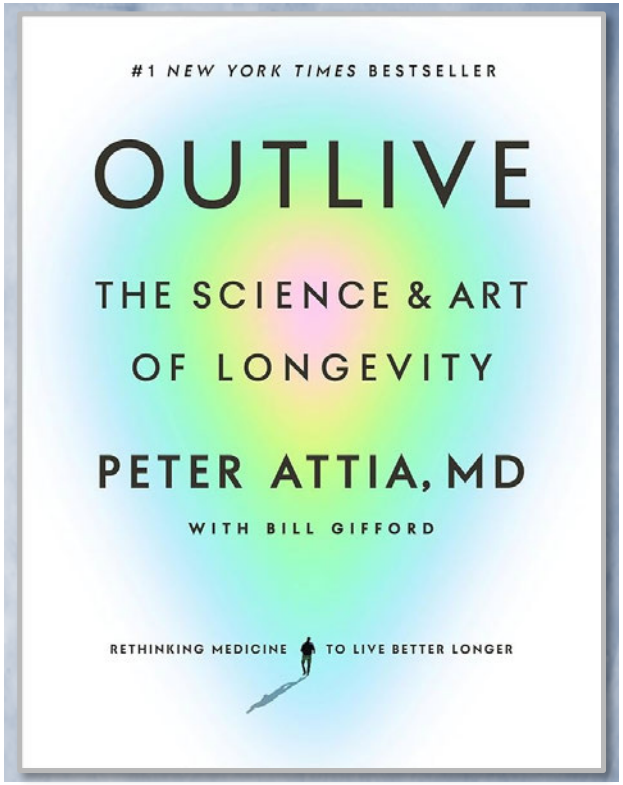
## MEDICINES

**Antibiotics**
**Antihypertensives**
**Statins**
**Diabetes Control**

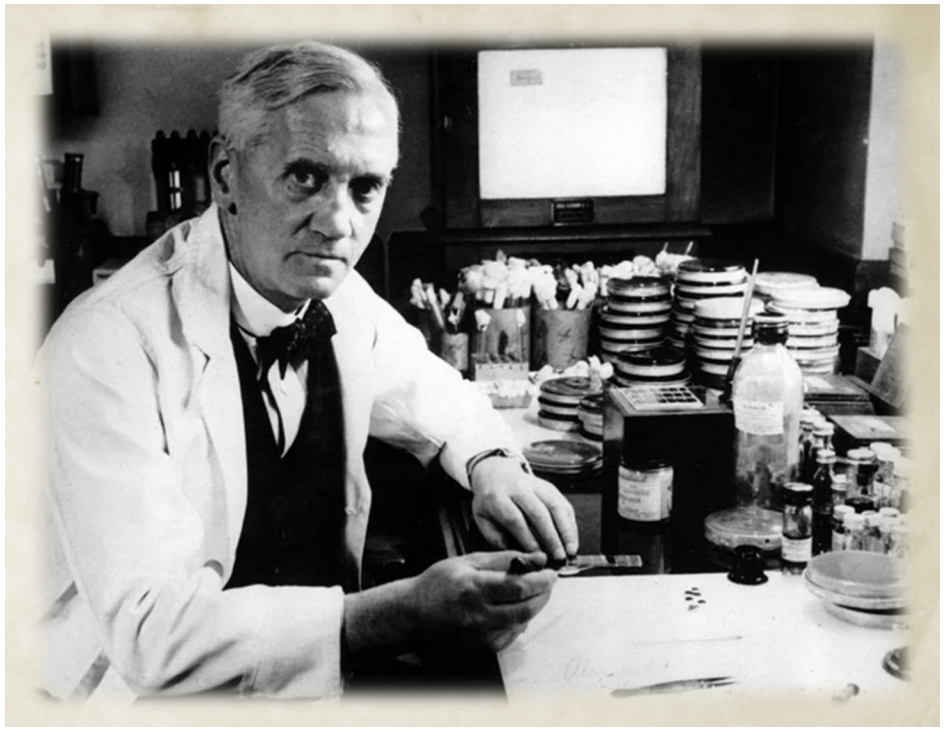
# Drivers of Longevity: Public Health – Prenatal Health and the Beginnings of Germ Theory

**Ignaz Philipp Semmelweis**

# Drivers of Longevity: Lifestyle



# Drivers of Longevity: Medicines - Antibiotics



**Alexander Fleming**

# Top 10 Causes of Death in U.S.A., 2023 (1 to 5)

| | Cause of Death | Prevalence | Deaths | Years Potential Life Lost[1] |
|---|---|---|---|---|
|  | Heart Disease | 128.0M | 680,981 | 17.4M |
|  | Cancer | 18.0M[2] | 613,352 | 8.6M |
|  | Unintentional Injury | 24.8M[3] | 222,698 | 6.3M |
|  | Stroke | 9.4M | 162,639 | 2.3M |
|  | Chronic Lower Respiratory Diseases | 14.3M[4] | 145,357 | 1.7M |

1) Years of Potential Life Lost; 2) Number of cancer survivors living in US; 3) Number of doctor visits for unintentional injuries in 2018; 4) Chronic obstructive pulmonary disease prevalence given (main driver of CLRD mortality)
Sources: CDC, NIH, US Census, professional medical societies, and leading academic journals. Calculations include proprietary assumptions. Granular data available upon request.

# Top 10 Causes of Death in U.S.A., 2023 (6 to 10)

| | Cause of Death | Prevalence | Deaths | Years Potential Life Lost[1] |
|---|---|---|---|---|
|  | Alzheimer's Disease | 6.9M | 114,034 | 1.3M |
|  | Diabetes | 38.0M | 95,190 | 7.1M |
|  | Kidney Disease | 35.5M | 55,253 | 3.1M |
|  | Chronic Liver Disease and Cirrhosis | 4.5M | 52,222 | 8.4M |
|  | COVID-19 | 8.4M | 49,932 | 4.5M |

1) Years of Potential Life Lost
Sources: CDC, NIH, US Census, professional medical societies, and leading academic journals. Calculations include proprietary assumptions. Granular data available upon request.

# METHODOLOGY

## Mortality and Prevalence

From the CDC National Center for Health Statistics if available, otherwise from academic societies or studies in top journals

## Years of Potential Life Lost

Primarily from the American Heart Association's 2024 report on Heart Disease and Stroke Statistics with the following exceptions: YPLL[1] for both cancer and accidental injuries were taken from the National Cancer Institute

## Example Interventions

Therapies under development that exemplify current areas of scientific, public, and investor interest as well as demonstrate drug developmental paths with well defined regulatory guidelines

## Potential Life Years Benefit Per Person Affected

The quotient of YPLL for the treatable population (if available) divided by the population most likely to benefit from that therapy

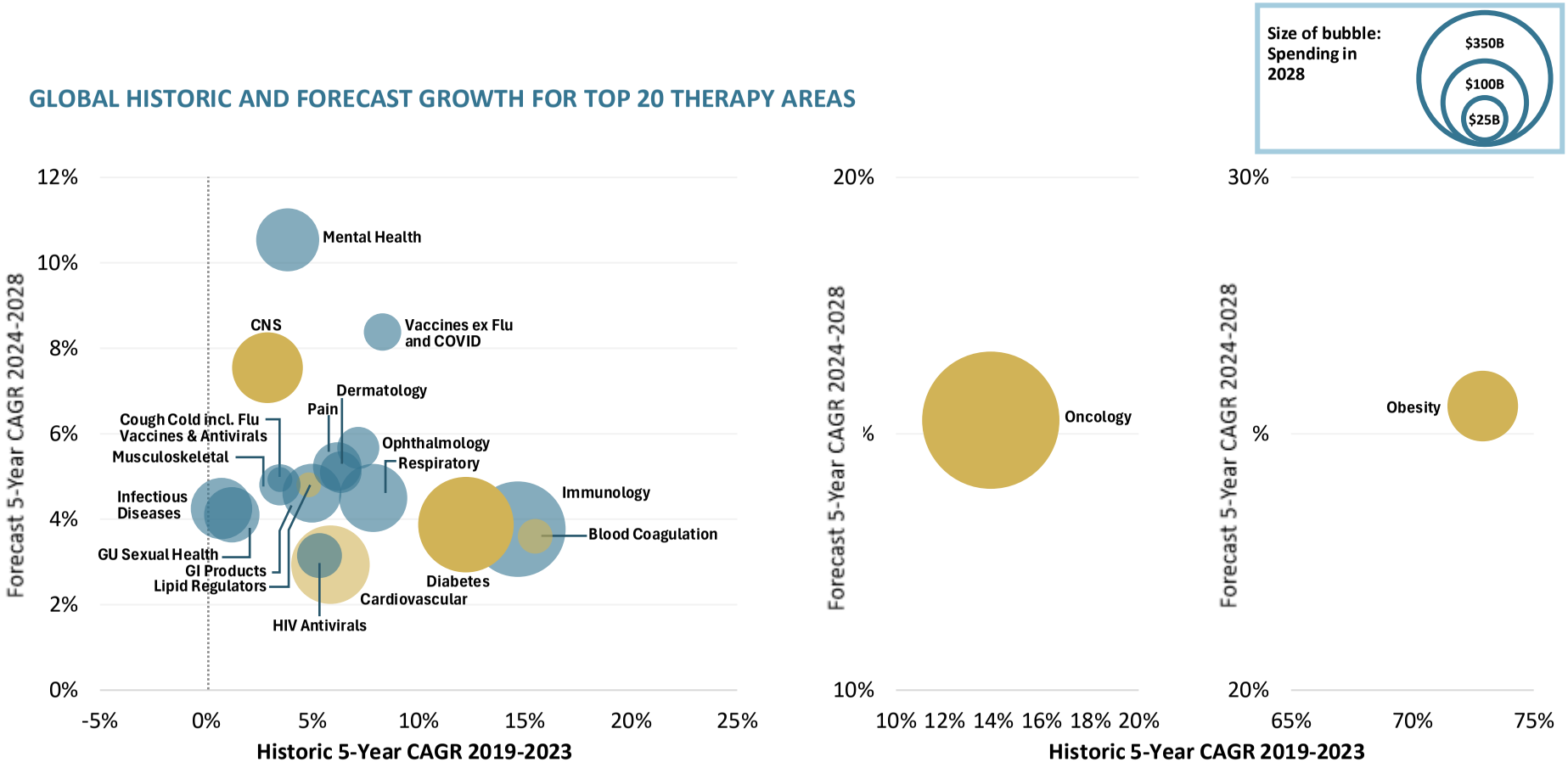
Exceptions are KRAS[2] driven cancers, for which potential life benefit reflects the average effect size of historical new oncology approvals, and sickle cell disease for which benefit is directly calculated as the difference in lifespan between a sickle cell patient and the average American lifespan

Optimistic view – assumes that the therapies under development fully ameliorate early mortality

1) YPLL: Years of Potential Life Lost; 2) KRAS: **K**irsten **RA**t **S**arcoma, a gene involved in cellular survival which can drive formation of cancer when mutated

# Expenditure Heavily Weighted to Oncology, Diabetes, and Immunology

## GLOBAL HISTORIC AND FORECAST GROWTH FOR TOP 20 THERAPY AREAS




Source: IQVIA: The Global Use of Medicines 2024: Outlook to 2028. Jan. 2024. Excludes spending related to COVID.

# Interventions: New and Under Development (1 to 5)

| Disease / Treatment Area | Diagnosis | Therapy and Technology | Prevalence* |
|---|---|---|---|
|  Heart Disease | Resistant Hypertension | Angiotensinogen silencing with siRNA | 24M |
|  Heart Disease | Coronary Disease | Lp(a) silencing with siRNA and ASO | 5.7M |
|  Cancer | KRAS Driven Solid Tumors | Multi-KRAS inhibitors | 197K (incidence) |
|  Stroke | Thromboembolism in DOAC restricted pts | Anti FXI therapy | 39.9K (incidence) |
|  Chronic Lower Respiratory Diseases | COPD | Ensifentrine | 14M |

siRNA: small interfering ribonucleic acid; ASO: anti-sense oligonucleotide; Lp(a): Lipoprotein (a); KRAS: **K**irsten **RA**t **S**arcoma gene; DOAC: direct oral anti-coagulant; FXI: coagulation factor eleven
*Calculations include proprietary assumptions. Estimates are preliminary and for illustrative purposes, based on best available data and methods. Granular data available upon request.
Sources: CDC, NIH, US Census, professional medical societies, and leading academic journals.

# Interventions: New and Under Development (6 to 10)

| Disease / Treatment Area | Diagnosis | Therapy and Technology | Prevalence* |
|---|---|---|---|
|  Alzheimer's | Mild to Moderate Cognitive Impairment | Amyloid clearance and gene silencing | 5.5M |
|  Diabetes | Uncontrolled FBG | B-cell implants | 7.1M |
|  Kidney Disease | Stage 5 ESRD | Xenotransplant | 532K |
|  MASH (liver disease) | F3 F4 (compensated) | Efruxifermin | 0.5M |
|  Genetic Diseases | Sickle Cell Disease | Gene Editing Therapy | 100K |

FBG: fasting blood glucose; ESRD: end stage renal disease; MASH: Metabolic dysfunction associated steatohepatitis; F3/4: fibrosis levels ranked 1 (lowest) to 4 (highest)
*Calculations include proprietary assumptions. Estimates are preliminary and for illustrative purposes, based on best available data and methods. Granular data available upon request.
Sources: CDC, NIH, US Census, professional medical societies, and leading academic journals.

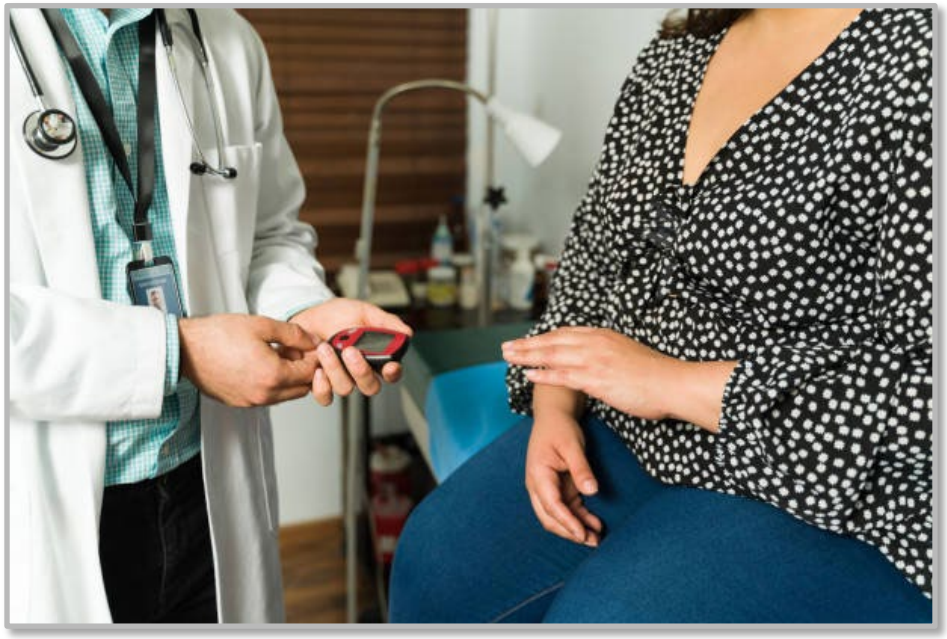
# Intervention Examples

**QUALITY OF LIFE**

**OUTCOMES**

**CURE**

# Patient Vignette: Diabetes and Obesity



# Diabetes and Obesity: 15 Years Ago

## THERAPY

### AVAILABLE THERAPIES

- Biguanides
- Dipeptidyl pptidasee-4 inhibitors
- Sodium-Glucose Cotransporter 2 inhibitors
- Sulfonylureas
- Thiazolidinedione
- Insulin

## QUALITY OF LIFE

### STRUGGLE TO CONTROL GLUCOSE

- Over 20% struggle with glucose control, leading to a sense of failure
- Managing the condition can dominate daily life
- Excess weight negatively impacts prognosis and QoL
- Increased fatigue makes physical activity challenging
- As a result, healthier lifestyle changes become more difficult

### ACCELERATED AGEING

Illness speeds up degeneration

- Joint degeneration
- Vision problems

## OUTCOMES

### HIGH RATES OF COMPLICATIONS

- Retinopathy in 26%
- Neuropathy rates
  - Autonomic: 30%
  - Peripheral: 42%
- Peripheral artery disease: 20%-50%
- Foot ulcers: 15%-34%

Source: Lundeen 2023; Pfannkuche 2020; Soyoye 2021; McDermott 2022; NIDDK

# Diabetes and Obesity: Present

## THERAPY

### CURRENT THERAPIES

GLP1-R agonists
- Semaglutide

GIP agonist & antagonists
- Tirzepatide (GLP/GIP dual agonist)

Other Incretins
- Cagrilintide

### EMERGING TECHNOLOGIES

Myostatin inhibitors– driving muscle growth
- Bimagrumab

CBD receptor modulators
- Monlunabant

β cell transplants

## QUALITY OF LIFE

### FEELING BETTER

Improved physical functioning:
- Accomplish ADLs
- Increased exercise ability
- Reduced pain

### AGEING BETTER

Slowing degeneration:
- Improved joint health
- Activation of cytoprotective pathways
- Reduced oxidative stress

## OUTCOMES

### IMPROVED BLOOD SUGAR of ~ 2.4%[1]

Could be the difference:
- Eligibility for surgery
- Successful pregnancy
- Vision loss
- Painful neuropathy

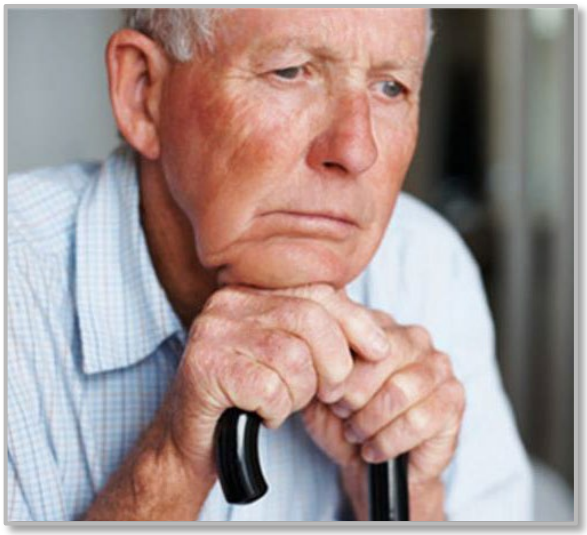
### MUSCLE GAIN AND RETENTION

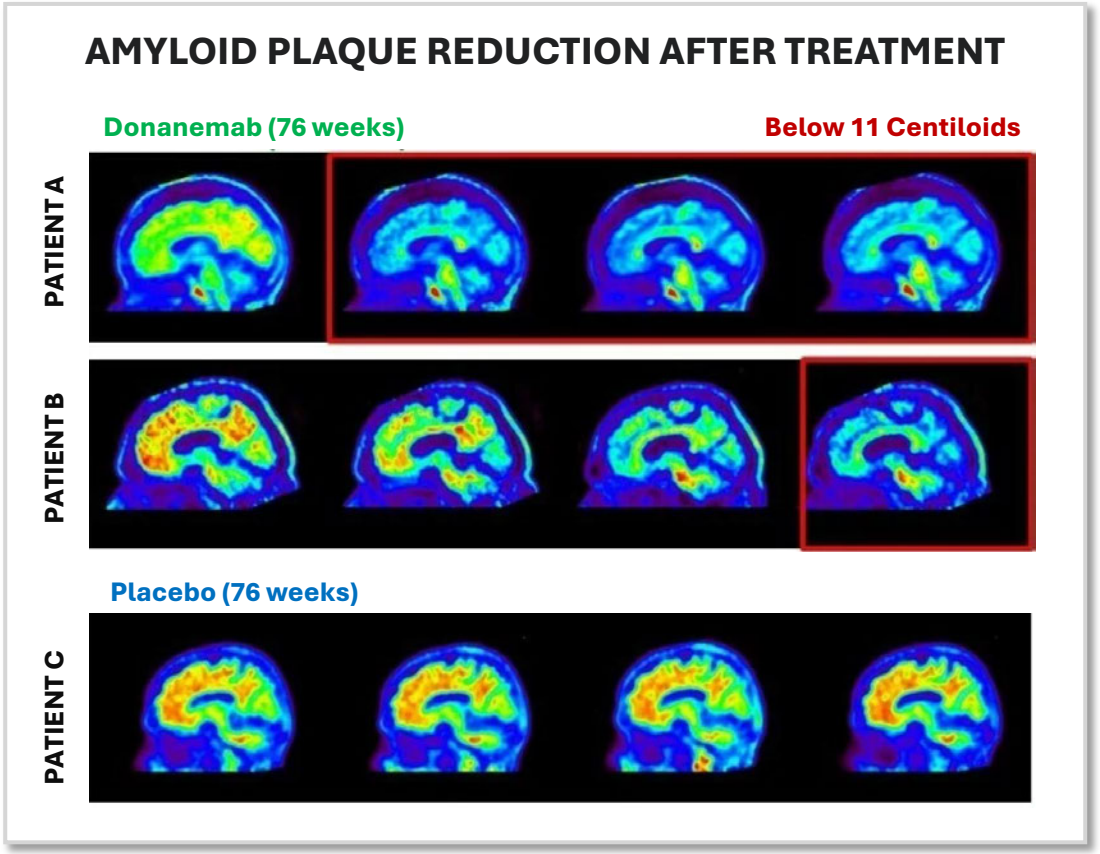
Increased muscle will likely reduce fat through increased resting metabolic rate

Could be the difference:
- Falls
- Fractures
- Frailty

GLP: Glucagon-Like Peptide; GIP: gastric inhibitory polypeptide; CBD: Cannabidiol; ADL: activities of daily living
1) Approximate ΔA1c with tirzepatide in SURPASS-4 trial (Del Prato, 2021)

# Patient Vignette: Alzheimer's Disease





# Alzheimer's Disease: 15 Years Ago

## THERAPY

### AVAILABLE THERAPIES

Acetyl CoA esterase inhibitors

- Donepezil

NMDA antagonists

- Memantine

## QUALITY OF LIFE

### PROGRESSIVE LOSS OF FUNCTION

- Loss of emotional regulation
- Cognitive decline
- Loss of ability to perform ADLs

### PROGRESSIVE LOSS OF ROLE

- Decreasing ability to fulfill family and social role

## OUTCOMES

### UNININHIBITED DISEASE COURSE

Disease course proceeds at natural rate

- Severe dementia
  - Inability to feed or care for self

### SECONDARY ILLNESS

Loss of self care results in

- Bed sores
- Infection
- Nutritional deficiencies

CoA: co-enzyme A; NMDA: N-methyl-D-aspartate receptors; ADL: activities of daily living

# Alzheimer's Disease: Present

## THERAPY

### CURRENT TREATMENTS

Plaque clearance

- mAbs against Aβ plaques

### EMERGING TECHNOLOGIES

Prevention of pathologic protein production

- Gene silencing
  - RNAi, ASO
  - Small molecule translation inhibitors
- Aβ monomer stabilization
- Aβ vaccine

Muscarinic receptor agonism

## QUALITY OF LIFE

### FEELING BETTER

- Improved emotional regulation
- Less confusion

### AGEING BETTER

- Maintain independence
- Maintain role in family and social circles
- Prevent personality changes

## OUTCOMES

### DELAY OF DISEASE LIMITATIONS

Prevent or delay need for

- Supervision
- Assistance with ADLs
- Professional care and separation from family

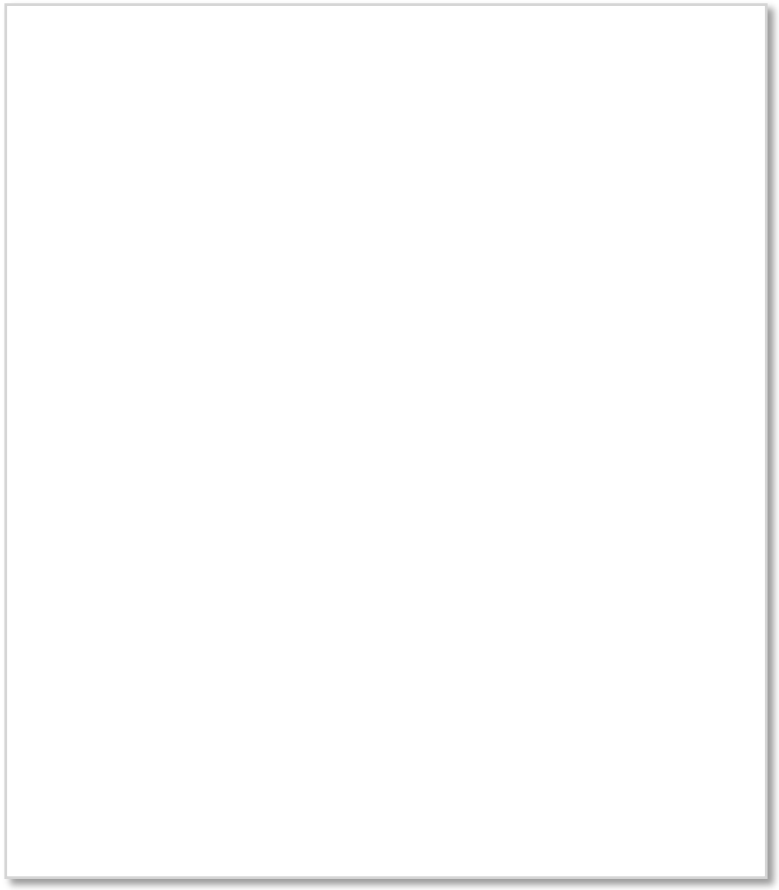
### PREVENTION OF SECONDARY ILLNESS

Illnesses due to poor self care

- Bed sores
- Nutritional deficiencies

mAb: monoclonal antibody; Aβ: amyloid beta plaques; RNAi: RNA interference; ASO: anti-sense oligonucleotide; ADL: activities of daily living

# Patient Vignette: Genetic Treatments And Cures – Spinal Muscular Atrophy



# Genetic Diseases: 15 Years Ago

## THERAPY

### AVAILABLE THERAPIES

Palliative and supportive

- No targeted therapy

### SMA THERAPIES

- Pain control
- Mobility devices
- Respiratory support

### SCD THERAPIES

- Pain control
- Transfusions for anemia
- HU approved in 1998: 1st DMT

## QUALITY OF LIFE

### TIED TO GENETIC DESTINY

- Limited ability to modify the course of illness
- Therapy goal of maximizing comfort or adapting to live with condition

### SMA QOL

- Progressive decline in function predictable
  - Allows PT/OT and respiratory interventions as needed

### SCD QOL

- Exercise intolerance
- Fear of VOC at any moment

## OUTCOMES

### HISTORICAL

- Outcomes were much the same as they were before modern medicine

### SMA OUTCOMES

Limited lifespan

- Type 0: <6 months
- Type 2: <30 years

### SCD OUTCOMES

Limited lifespan

- 1970: <20 years
- Today: 50 years
- With gene therapy: normal

HU: hydroxyurea; DMT: disease modifying therapy; PT/OT: physical therapy/ occupational therapy; VOC: vaso-occlusive crisis

# Genetic Diseases: Present

## THERAPY

### CURRENT TREATMENTS

Hematology

- Hemophilia A/B
- Sickle Cell Disease
- Thalassemia

CNS

- Spinal Muscular Atrophy

### EMERGING TECHNOLOGIES

Hepatology

- α1 Anti-Trypsin Deficiency
- Glycogen Storage Disease 1a

Cardiovascular Health

- Familial Chylomicronemia
- Hyper Lp(a)

## QUALITY OF LIFE

### FEELING BETTER

Sickle Cell Disease:

- Prevention of painful VOCs
- Improved exercise & activity tolerance

### AGEING BETTER

α1 Anti-Trypsin:

- Prevention of COPD
- Prevention of cirrhosis

## CURE

### REMOVAL OF DISEASE LIMITATIONS

Hemophilia:

- Elimination of activity restrictions
- Normalization of lifestyle

### PREVENTION OF SECONDARY ILLNESS

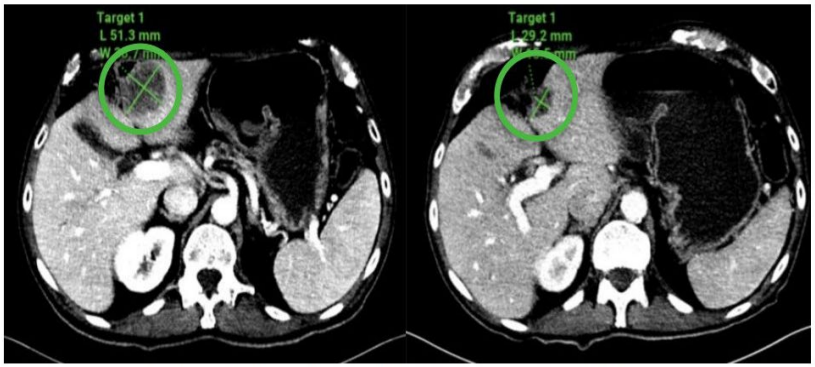
Hyper Lp(a)

- Prevention of stroke and myocardial infarctions

VOC: vaso-occlusive crisis; COPD: chronic obstructive lung disease

# Patient Vignette: Oncology

**Baseline** **Week 12**




Target Lesion: Liver (segment 3)

**KRAS Q61H PANCREATIC**

CT image source: Revolution Medicines

# Oncology for KRAS-Driven PDAC: 15 Years Ago

## THERAPY

### AVAILABLE THERAPIES

PDAC

- Surgery
  - 20% of cases are eligible
- Systemic chemotherapy
  - FOLFIRINOX & gemcitabine regimens

### OTHER KRAS CANCERS

- 30% of SCLC
- 50% of CRC

## QUALITY OF LIFE

### CHEMO RELATED DECLINE

- Fatigue, breathlessness
- Nausea, diarrhea/constipation
- Neuropathy
- Hemocytopenia

### CANCER RELATED DECLINE

- Venous thromboembolism
- Fatigue
- Pain
- Cachexia
- Disseminated intravascular coagulation

## OUTCOMES

### POOR SURVIVAL

Stage I or II

- 5-year survival: 12.5%
- Median survival: 1.5 -3.5 yrs

Metastatic

- 5-year survival: <3%
- Median survival: 4-7 months

### VERY RARELY CURED

Small cancers, if found incidentally and fully resected

PDAC: pancreatic ductal adenocarcinoma; FOLFIRINOX: folinic acid, fluorouracil, irinotecan, oxaliplatin; SCLC: small cell lung cancer; CRC: colorectal cancer

# Oncology for KRAS-Driven Cancers: Present

## THERAPY

### NEAR FUTURE

Inhibitors of G12C in “OFF” state

- Lumakras (sotorasib)
- Krasati (Adagrasib)
- MRTX1133

### EMERGING TECHNOLOGIES

Multi KRAS inhibitors

- ON state inhibitor
  - Daraxonrasib (RMC-6236)
- OFF state inhibitors
  - BI 3706674

## QUALITY OF LIFE

### REDUCED SIDE EFFECTS

Targeted therapy has less systemic toxicity, reducing

- Nausea/ vomiting
- Chemo related cytopenia and neuropathy

### INCREASED TIME WITH FAMILY

- Allows patients more time to get their affairs in order and spend time with loved ones

## OUTCOMES

### IMPROVED SURVIVAL

Unknown increase in duration

- Will be measured in months

### DELAYED CANCER RELATED DECLINE

- Delayed course compared to chemo-only therapy

# Interventions: New and Under Development (1 to 5)

| Disease / Treatment Area | Diagnosis | Therapy and Technology | Prevalence* | Potential Life Years of Benefit Per Person* | Potential Effect on Average US Lifespan* |
|---|---|---|---|---|---|
| Heart Disease | Resistant Hypertension | Angiotensinogen silencing with siRNA | 24M | ~0.3 yrs | +8.4 days |
| Heart Disease | Coronary Disease | Lp(a) silencing with siRNA and ASO | 5.7M | ~1.5 yrs | +9.3 days |
| Cancer | KRAS Driven Solid Tumors | Multi-KRAS inhibitors | 197K (incidence) | ~2.8 mos | +0.05 days |
| Stroke | Thromboembolism in DOAC restricted pts | Anti FXI therapy | 39.9K (incidence) | ~3.0 yrs | +0.1 days |
| Chronic Lower Respiratory Diseases | COPD | Ensifentrine | 14M | QOL improvement | None |
| | | | | SUB TOTAL | +17. 9 DAYS |

siRNA: small interfering ribonucleic acid; ASO: anti-sense oligonucleotide; Lp(a): Lipoprotein (a); KRAS: **K**irsten **RA**t **S**arcoma gene; DOAC: direct oral anti-coagulant; FXI: coagulation factor eleven
*Calculations include proprietary assumptions. Estimates are preliminary and for illustrative purposes, based on best available data and methods. Granular data available upon request.
Sources: CDC, NIH, US Census, professional medical societies, and leading academic journals.

## Interventions: New and Under Development (6 to 10)

| Disease / Treatment Area | Diagnosis | Therapy and Technology | Prevalence* | Potential Life Years of Benefit Per Person* | Potential Effect on Average US Lifespan* |
|---|---|---|---|---|---|
|  Alzheimer's | Mild to Moderate Cognitive Impairment | Amyloid clearance and gene silencing | 5.5M | ~0.2 | +1.2 days |
|  Diabetes | Uncontrolled FBG | B-cell implants | 7.1M | 1 yrs | +7.7 days |
|  Kidney Disease | Stage 5 ESRD | Xenotransplant | 532K | 5.9 yrs | +3.4 days |
|  MASH (liver disease) | F3 F4 (compensated) | Efruxifermin | 0.5M | 3.3 yrs | + 0.8 days |
|  Genetic Diseases | Sickle Cell Disease | Gene Editing Therapy | 100K | 26 yrs | +2.8 days |
| | | | | **SUB TOTAL** | **+15.9 DAYS** |

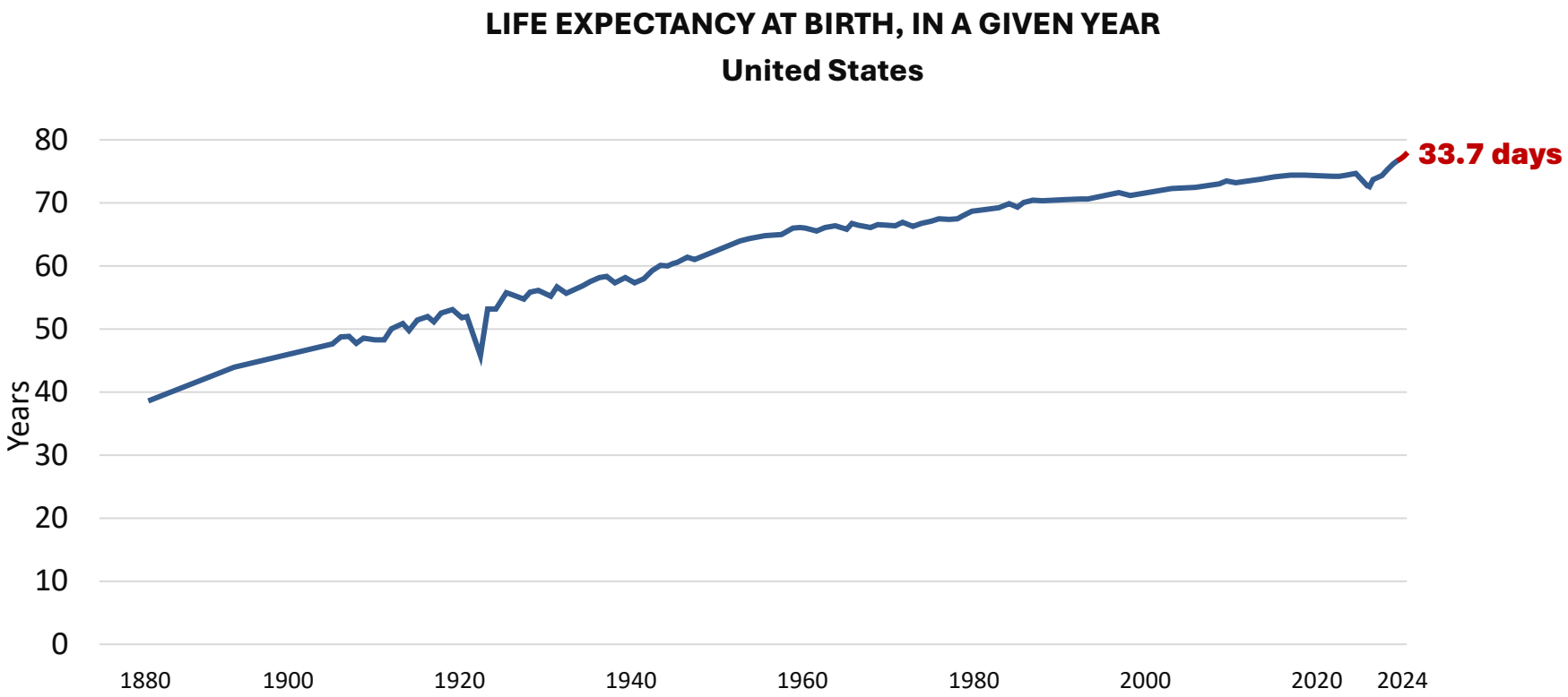
FBG: fasting blood glucose; ESRD: end stage renal disease; MASH: Metabolic dysfunction associated steatohepatitis; F3/4: fibrosis levels ranked 1 (lowest) to 4 (highest)
*Calculations include proprietary assumptions. Estimates are preliminary and for illustrative purposes, based on best available data and methods. Granular data available upon request.
Sources: CDC, NIH, US Census, professional medical societies, and leading academic journals.

## Total Impact on US Lifespan

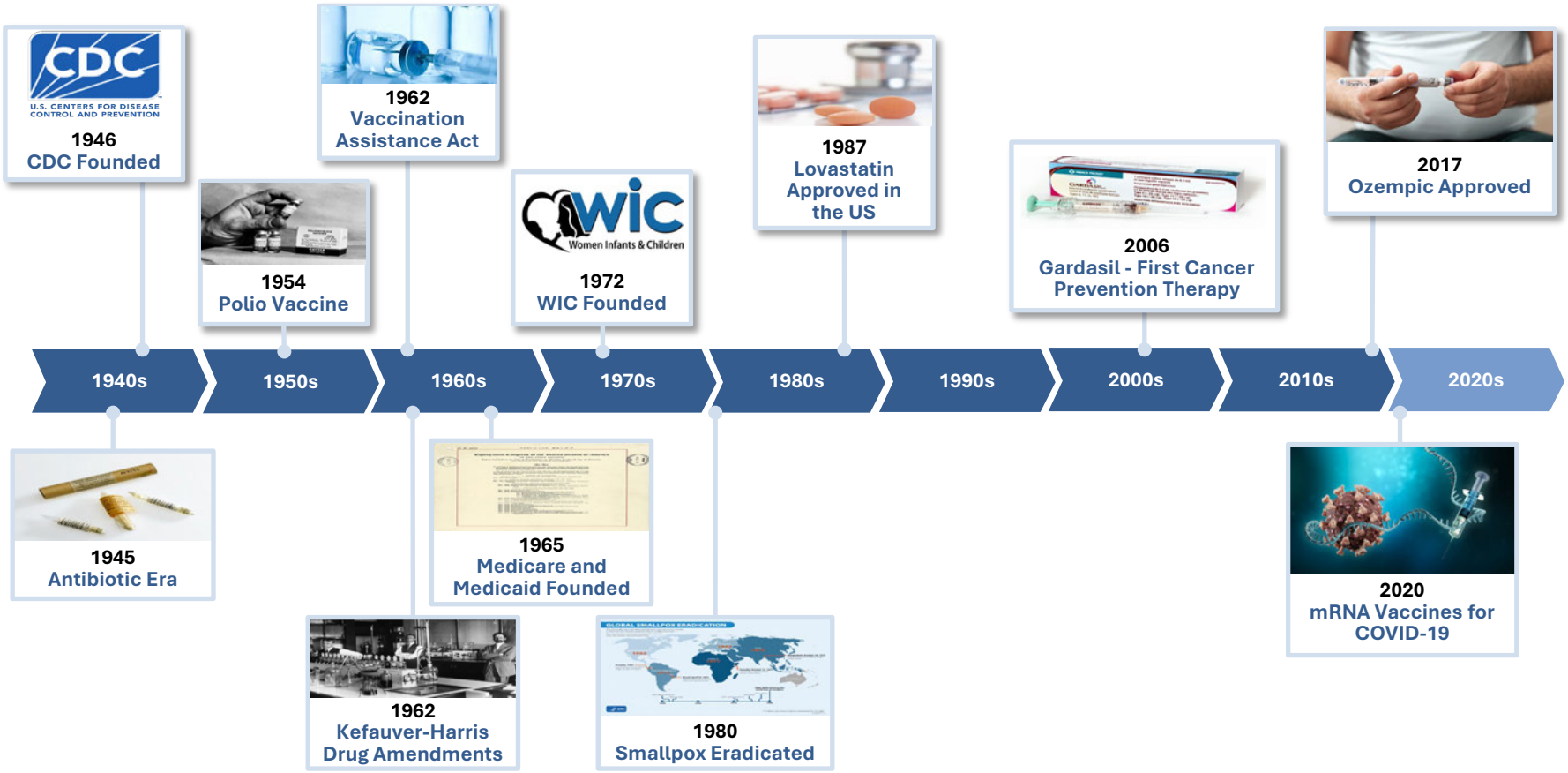
# THEORETICAL EFFECT ON MORTALITY FROM SELECTED INNOVATIVE INTERVENTIONS

**33.7 days**

# Total Impact on US Lifespan



# Advancing Medicine at a Population Scale: Science, Policy and Politics




Source: CDC, World Health Organization, Nature, CMS, NWICA, The Journal of the American Medical Association, Multidisciplinary Digital Publishing Institute, FDA, Mayo Clinic.

# Potential Large Disruptors: Opportunities and Horizons

## Near Future

**Large Advances for Small Populations**

## Medium Term

**AI-Enabled Drug Design Regulatory Streamlining**

## Distant Future

**Paradigm Shift in Medical Sciences**

# On Humanity


...and impermanence
reminds us to hold what
we have with breaths of
quiet joy.
silvi
2.13.25
@thepoetrystore

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# Closing Remarks

Day 2

Andrew Junkin
Chief Investment Officer

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