FMI Consulting

North American Construction Outlook

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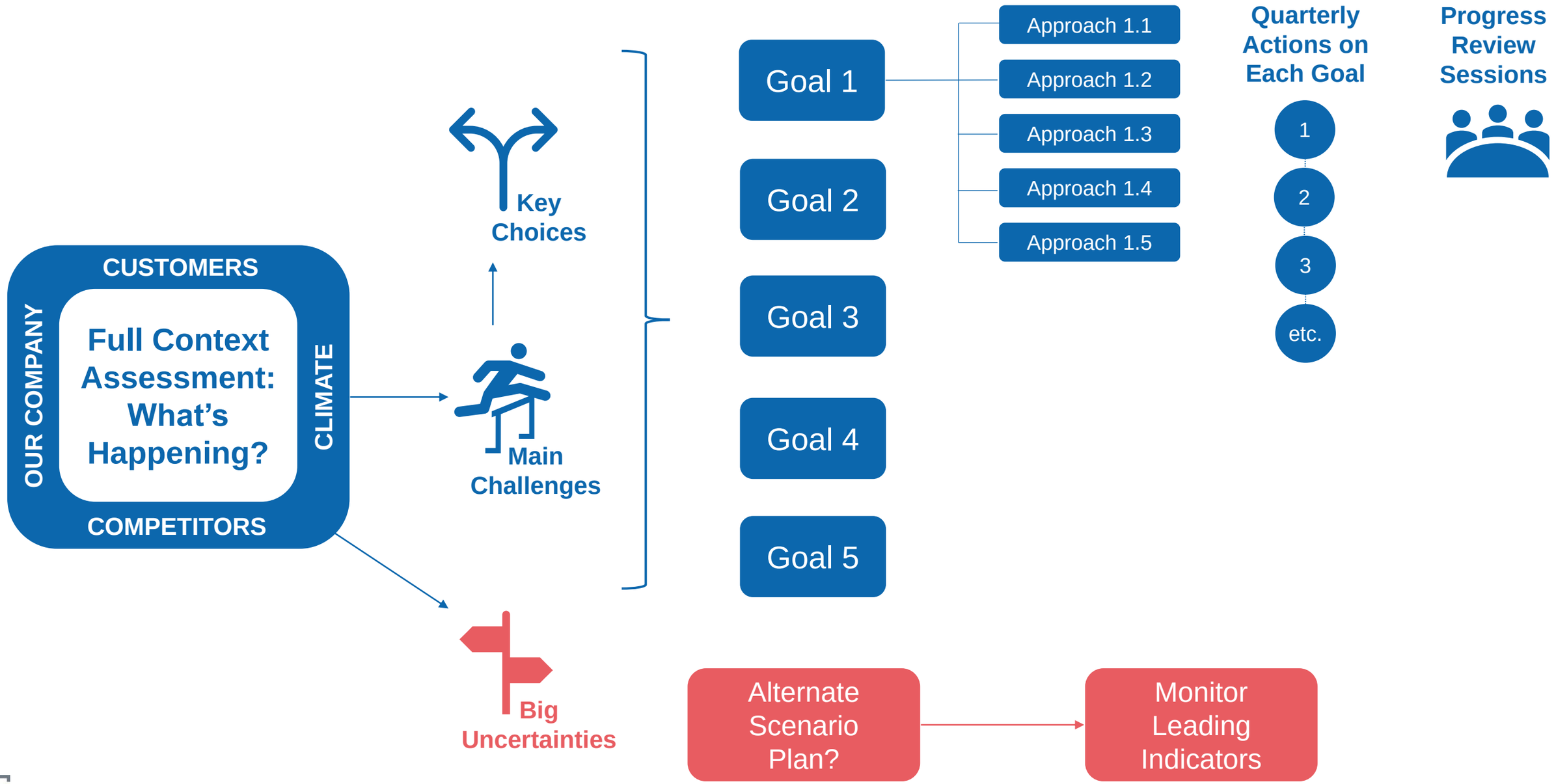
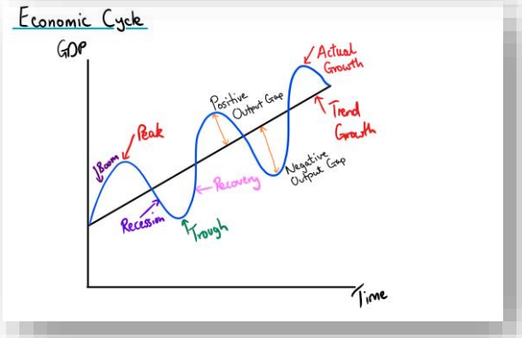
Strategic Planning from Development to Implementation



THREE THINGS TO REMEMBER

Economic Eras

Each era is defined by its economic drivers – what are ours and are they changing



Long-term and short-term economic cycles

Within each economic era, creative destruction will cause economic variability

Paddling with or against the tide

All economic environments have trade-offs, bulls, and bears

Economics and Construction Demand

1
Population Growth

Population growth is strongly correlated to construction demand. All else equal, construction demand will increase at approximately 1:1 with population growth.

2
Depreciation

Replacement of structures past their usable lives. This drives the level of construction demand just to maintain the current built environment assets.

3
Change in Use

Society has changing demands from the built environment. From infrastructure to housing, what and how we consume, produce and tolerate drives what projects get built.

Economic vitality drives the core sources of construction demand an enables construction to meet those demands

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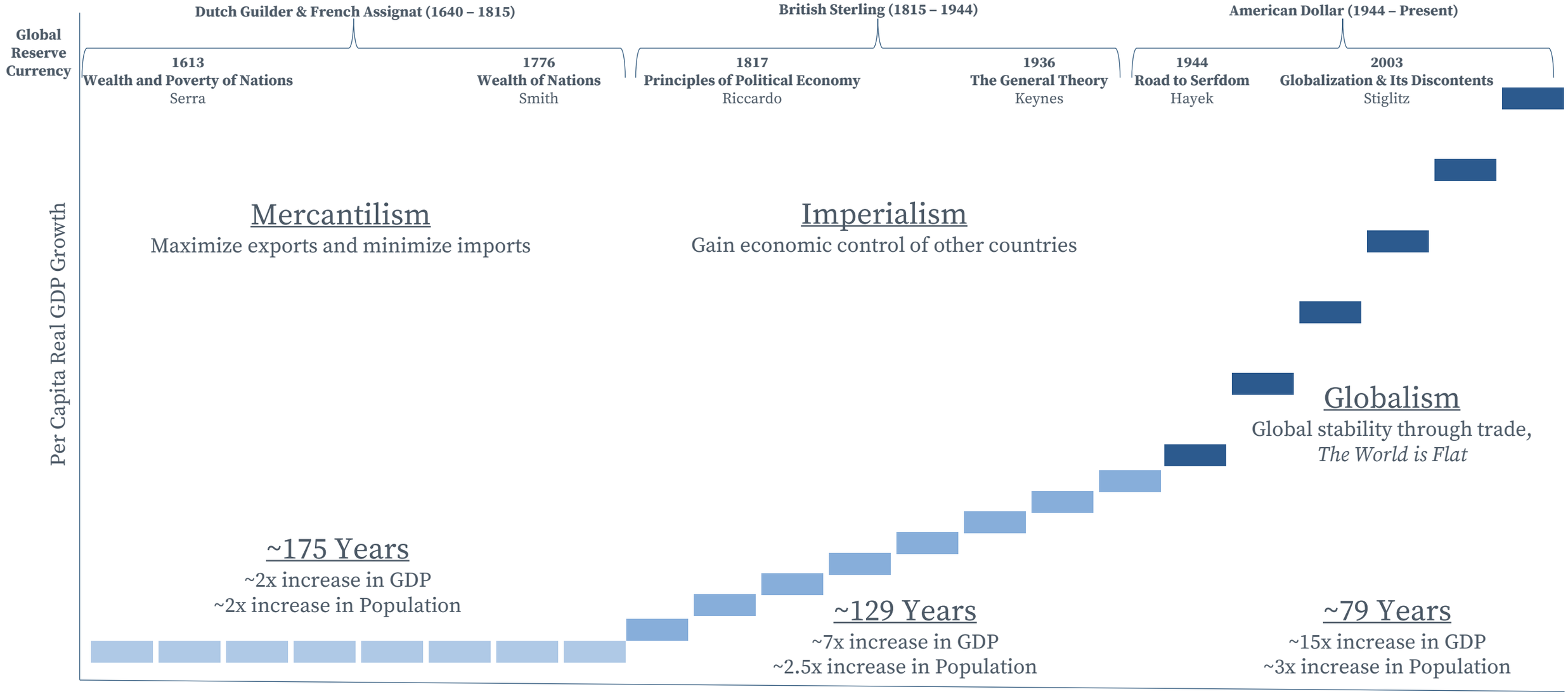
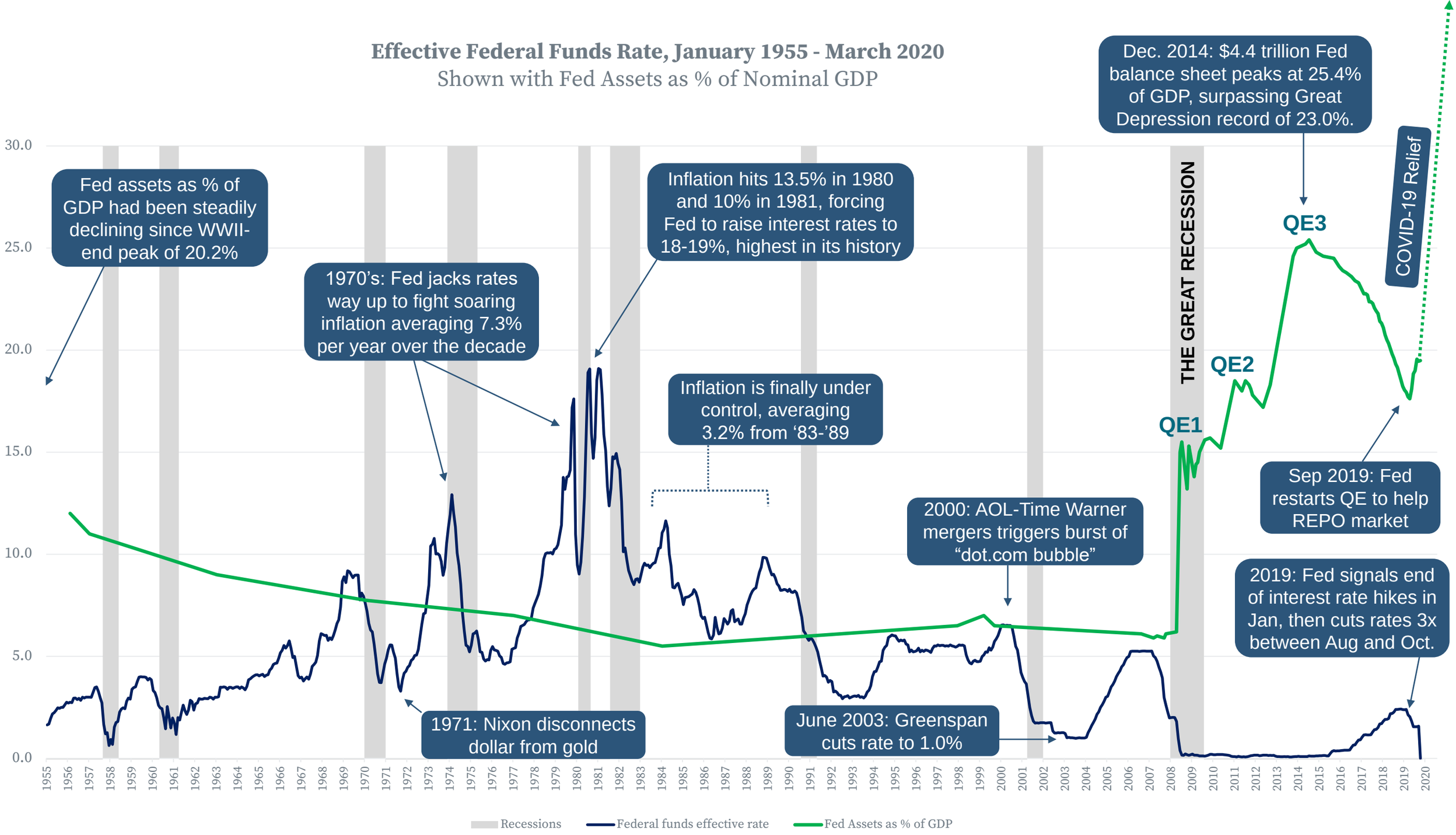
ECONOMIC ERAS & ECONOMIC IDEAS



Effective Federal Funds Rate, January 1955 - March 2020

Shown with Fed Assets as % of Nominal GDP



"Most people think of the Bretton Woods system as a sort of Pax Americana. The American Century, if you will. But that's simply not the case. The entire concept of the Order is that the United States disadvantages itself economically in order to purchase the loyalty of a global alliance. That is what globalization is. **The past several decades haven't been an American Century. They've been an American sacrifice."**

- Peter Zeihan, The End of the World is Just the Beginning: Mapping the Collapse of Globalization

NEW VS. OLD – CONSTRUCTION ACTIVITY REFLECTS THE DIRECTION OF THE ECONOMY

New Economy

Regionalization

Resiliency	Economic competition	Market intervention
Preserving	Trade wars	Capital restrictions

Population Shifting

Demand Shifting	Labor force participation declines
Aging Population	More people per household

Construction demand

Life Sciences	Data Centers	Semiconductor Fabrication
Logistics & Manufacturing	Food & Beverage Manufacturing	Distributed Power

Old Economy

Globalization

Efficiency	Economic cooperation	Market liberation
Expanding	Trade deals	Capital liberation

Population Growth

Total demand growth	Labor force participation steady / increasing
Young / steady population age	Fewer people per household

Construction demand

Lodging	Shopping Centers/ Malls	Movie Theaters
Office	Sports/ Recreation	Textile Mills

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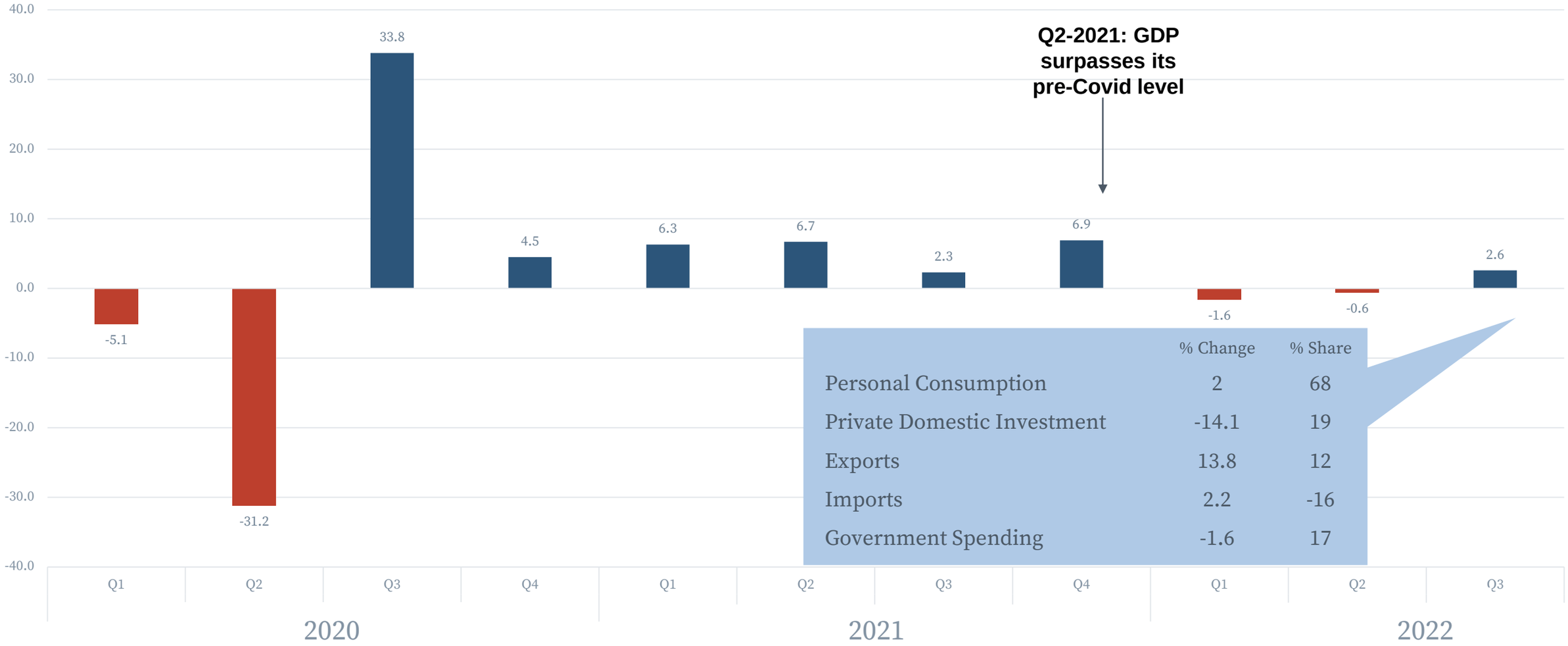
Current decreases in Real Gross Domestic Product (GDP)

Percent Change From Preceding Period, Seasonally Adjusted Annual Rate

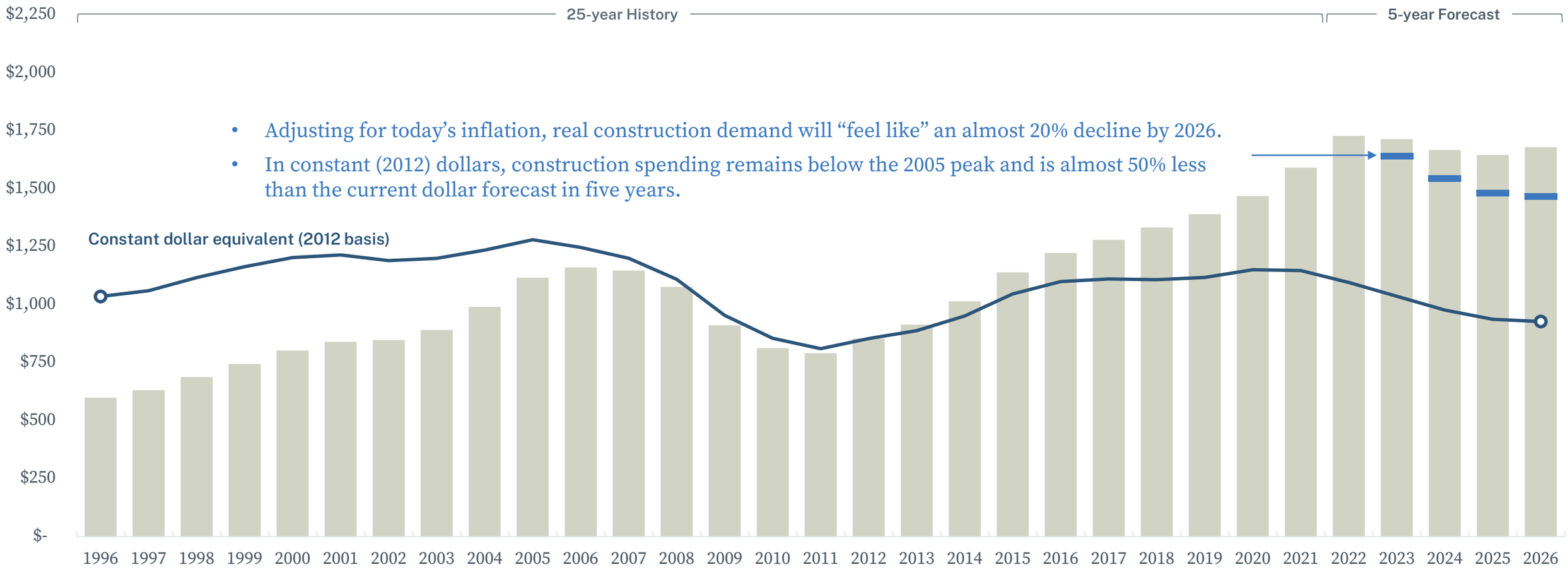


	% Change	% Share
Personal Consumption	2	68
Private Domestic Investment	-14.1	19
Exports	13.8	12
Imports	2.2	-16
Government Spending	-1.6	17

Data source: St. Louis Fed

LESS FOR MORE

Total Construction Spending Put in Place (US)
Billions of current dollars



- Adjusting for today's inflation, real construction demand will "feel like" an almost 20% decline by 2026.
- In constant (2012) dollars, construction spending remains below the 2005 peak and is almost 50% less than the current dollar forecast in five years.

Recession Indicators – Q4 2021

*Prediction Strength = $\frac{\text{Correct Predictions} - \text{False Positives}}{\text{Recessions Considered}}$

Indicators / Metrics	Recessions Considered	Correct Predictions	False Positives	Prediction Strength*	Flag/Warning Timing	Risk Assessment / Trending
PREDICTIVE INDICATORS						
Yield Curve Inversion	6	6	0	100%	<1-3 year	LOW ↔
New Home Sales	7	7	1	86%	<1-3 year	MODERATE / HIGH ↓
Money Supply	8	7	1	75%	<1-3 year	LOW ↑
Unemployment Rate	7	5	0	71%	<1 year	LOW ↓
Lumber Sales	3	3	1	67%	~1-2 year	LOW ↑
U.S. Trade Balance (BOP % Change)	7	6	2	57%	~1-2 year	MODERATE ↑
Months Supply of Homes	8	4	0	50%	<1-1 year	LOW ↓
Copper Price (Doctor Copper)	8	7	3	50%	<1-4 year	MODERATE ↔
Stock Market Performance	4	3	1	50%	<1 year	MODERATE ↑
MBS Held by Banks	2	2	1	50%	<1-2 year	LOW ↑
Residential CPiP	7	4	1	43%	<1-2 year	MODERATE ↑
Rental Vacancy Rates	10	5	1	40%	<1-2 year	MODERATE ↓
Manufactured Goods, New Orders	3	2	1	33%	<1 year	LOW ↑
Consumer Confidence (OECD)	8	6	4	25%	~1-3 year	MODERATE / HIGH ↓
Heavy Duty Truck Sales	8	6	5	13%	~1-2 year	MODERATE / HIGH ↓

15 predictive indicators are listed, 0 (0%) show high risk, 12 (80%) show moderate risk, and 3 (20%) show low risk.

OTHER NON-PREDICTIVE INDICATORS / METRICS	
Nonresidential Buildings CPIP	Trending DOWN
Nonbuilding CPIP	Trending UP
Oil Price (WTI)	Trending DOWN
Search Engine Volume	Trending UP
Consumer Price Index (CPI)	Trending UP
Gross Domestic Product	Trending UP
Consumer Sentiment	Trending DOWN

NRCI – ↑ HCCI - ↑ HMI - ↓ ABI – ↓ PMI – ↓

Sahm Rule - are we in a recession today? → NO ←

- **The analysis above suggests that recovery momentum has slowed, and several conditions have become increasingly challenged.**
- **Those few indicators that are suggesting moderate/high risk (i.e., new home sales, consumer confidence and heavy-duty truck sales) appear to be tied to supply-side/supply chain constraints.** Consumer confidence is being tested against rising prices and ongoing concerns over pandemic response. Likewise, and related, a decline in new home sales is being masked by higher home prices and higher construction costs. Truck sales are most likely down due to general lack of supply in manufacturing inputs (e.g., semiconductors). Demand for goods and consumer spending (represented in U.S. trade, new orders for manufactured goods and months supply of homes) is being upheld through 2020/2021 monetary and fiscal policy alongside high asset prices (i.e., homes, stocks).
- Between 1970 and 2020, government spending as a share of gross domestic product (GDP) has remained (mostly) in the range of 30%-35%, nearing 40% through 2009 and 2010. Government spending as a share of GDP spiked to nearly 60% in Q2 2020 and has since moderated within a 40%-50% range of GDP through the first half of 2021. **Q3 2021 data suggests government spending has now fallen back to 38% of GDP and headed lower. Expect ongoing stagflation pressures into 2022.**

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Gross Domestic Product	Trending UP
Consumer Sentiment	Trending DOWN

PMI – ↓	HMI – ↓	ABI – ↓	NRCI – ↓	HCCI - ↑

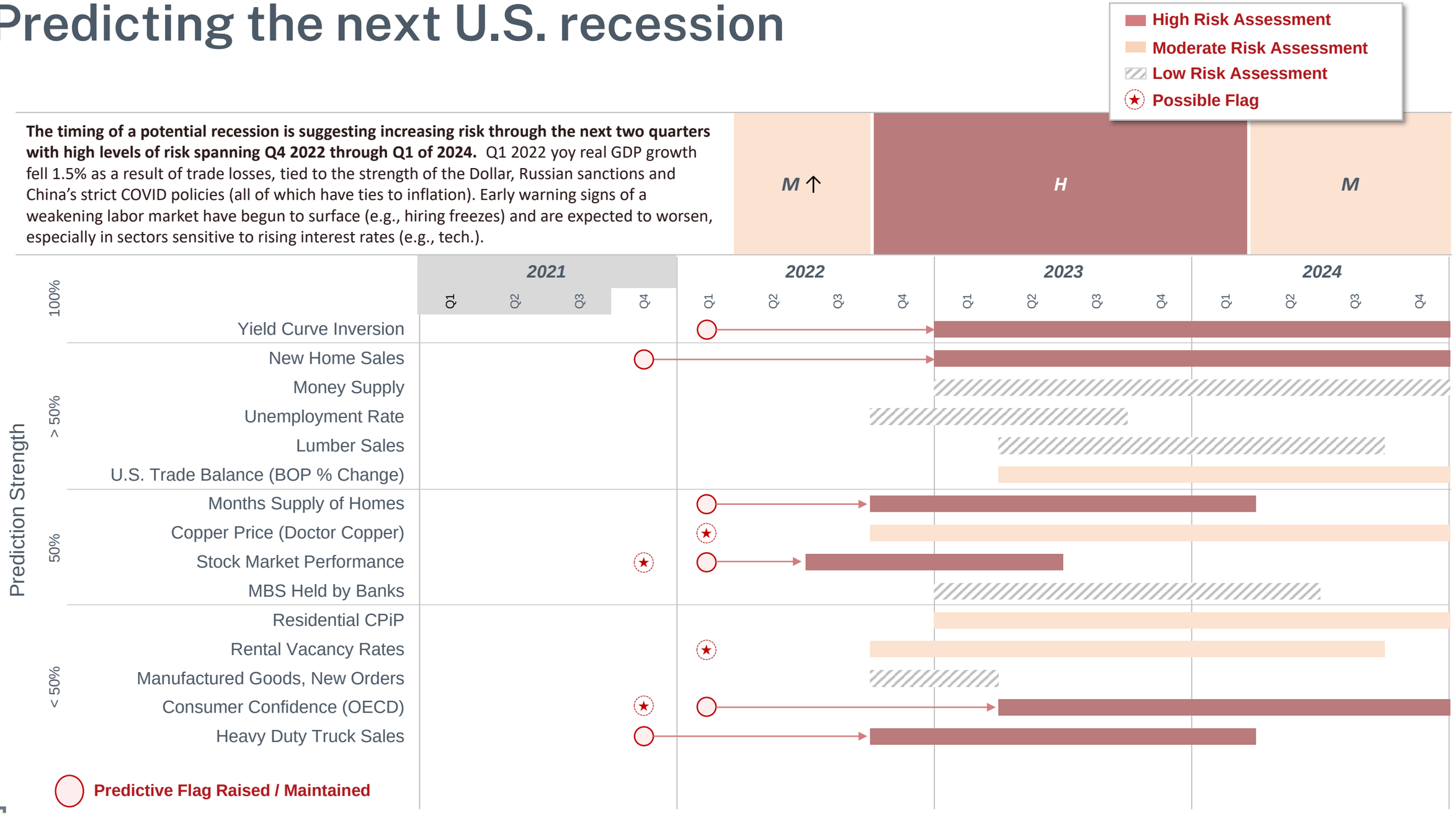
Sahm Rule - are we in a recession today? → NO ←

- **Two-year treasury yields suggest that Fed Funds tops out at approximately 4.5% before stabilization. Further, two-year treasury yields have been in decline for the past month. Traditional recessionary factors (i.e., a fall in asset values/equities, rising unemployment, declining consumer expenditures) historically are most at risk soon after the top of rate hike cycles and recession becomes most obvious as rates are cut.**
- **Currently 9 of the 15 predictive indicators are signaling recession (60%). This quarter a new signal/flag is raised by declining values of MBS held by banks.**
- **Though Q3 real GDP expanded 2.9% (2nd estimate), trade imbalances and global economic disruptions continue to heavily influence production data. Labor data remains challenging with participation low, layoffs announced daily and hiring remaining somewhat strong in leisure and hospitality, health care and government. Real personal income growth remains negative (yoy), saving rates are at all time lows and credit card spending has leveled off over November.**

15 predictive indicators are listed; at least 9 (60%) have flagged a (potential forthcoming) recession, 4 (27%) show moderate risk and 2 (13%) show low risk.

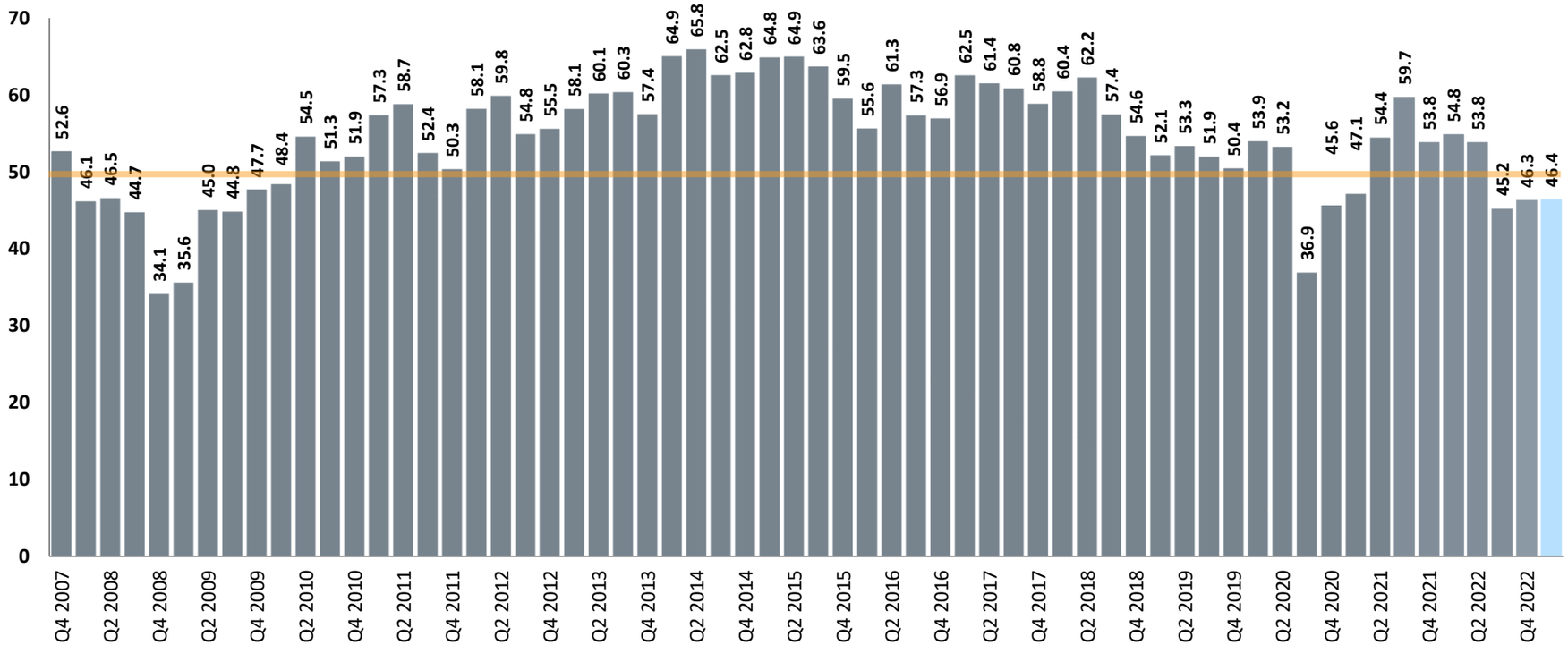
Predicting the next U.S. recession

The timing of a potential recession is suggesting increasing risk through the next two quarters with high levels of risk spanning Q4 2022 through Q1 of 2024. Q1 2022 yoy real GDP growth fell 1.5% as a result of trade losses, tied to the strength of the Dollar, Russian sanctions and China's strict COVID policies (all of which have ties to inflation). Early warning signs of a weakening labor market have begun to surface (e.g., hiring freezes) and are expected to worsen, especially in sectors sensitive to rising interest rates (e.g., tech.).



FMI’s Nonresidential Construction Index

NRCI Scores — Q4 2007 to Q1 2023
(Scores above 50 indicate expansion, below 50 contraction.)



SOURCE: FMI NONRESIDENTIAL CONSTRUCTION INDEX Q1 2023 | SURVEY DATES: DECEMBER 1 – 16

HOW CONFIDENT IS THE MARKET?

AEC Sentiment Indices

October 2022	Q4 2022	Q4 2022	Q4 2022
47.7	46.3	50.8	51.0
↓ 51.7 prior month	↑ 45.2 prior quarter	↑ 48.4 prior quarter	↓ 51.4 prior quarter
Architectural Billings Index (ABI)	Nonresidential Construction Index (NRCI)	Heavy Civil Construction Index (HCCI)	CIRT Sentiment Index

AIA, FMI, CIRT

FMI Consulting

Resilience or Recession?

Resilience

01 Unemployment at historic lows: Overall 3.5%, construction 4.4%

02 Positive GDP growth in Q3 and *anticipated* Q4 at 4.1%

03 Upheld consumer spending on services

04 Reopening borders and fewer international COVID disruptions

05 Lack of National Bureau of Economic Research (NBER) announcement

Recession

Two quarters of real GDP decline, Q1 & Q2 2022 01

Peak & decline in commodities, asset, shipping, CPI, & various predictive indexes 02

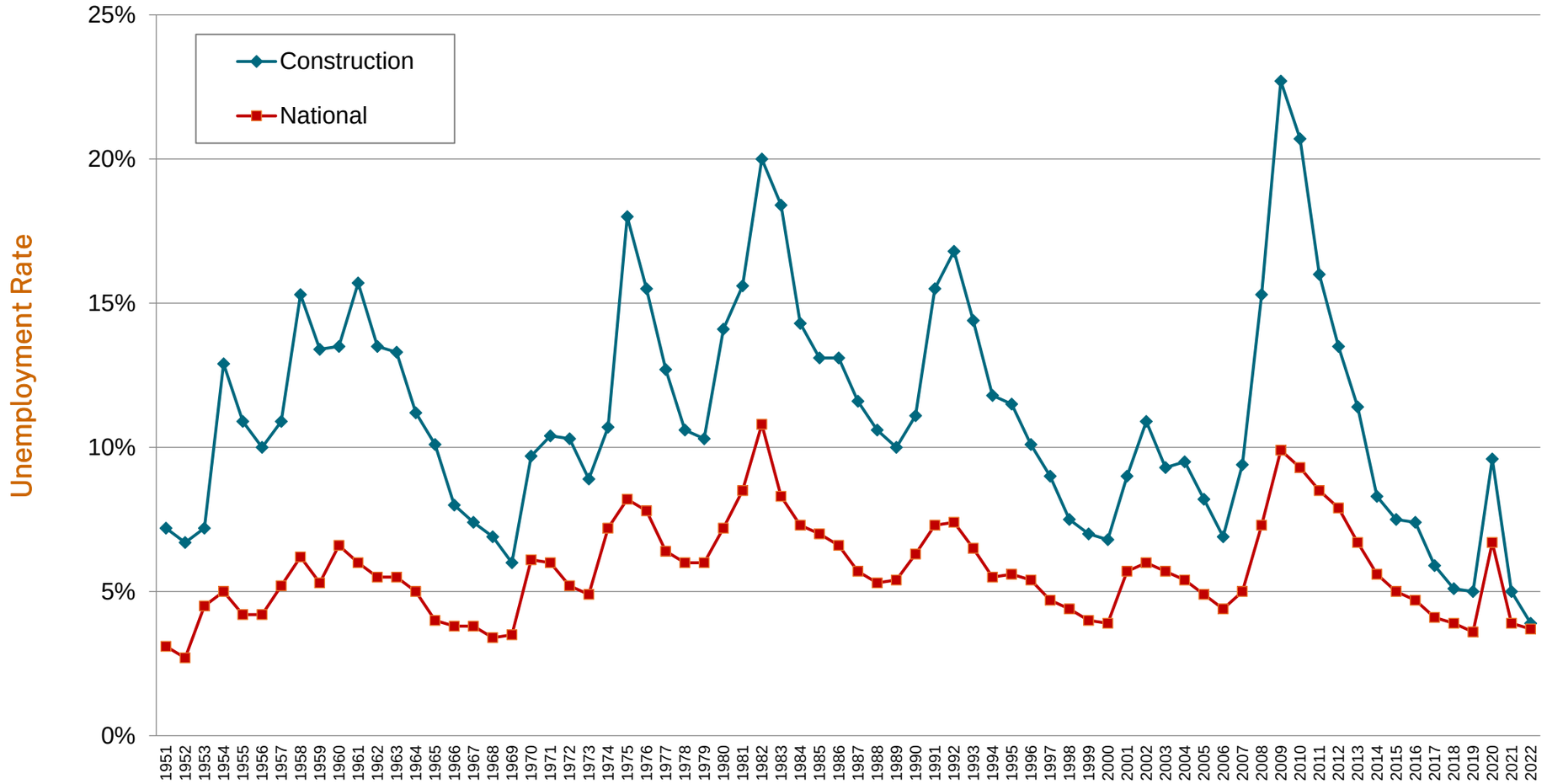
Real income growth turns negative year-over year & consumer saving rate collapses 03

Start of global unified destruction in money supply & aggressive rate hikes 04

Rising housing inventory, price cuts & mortgage rates, declining applications & refinancing 05

Jobs & Unemployment

Construction Unemployment vs. National Unemployment



Source: U.S. Bureau of Labor Statistics
Annual – End of Period

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Many in today's construction industry have neither managed or led through a significant downturn, and almost no one has managed during an extreme inflationary environment.

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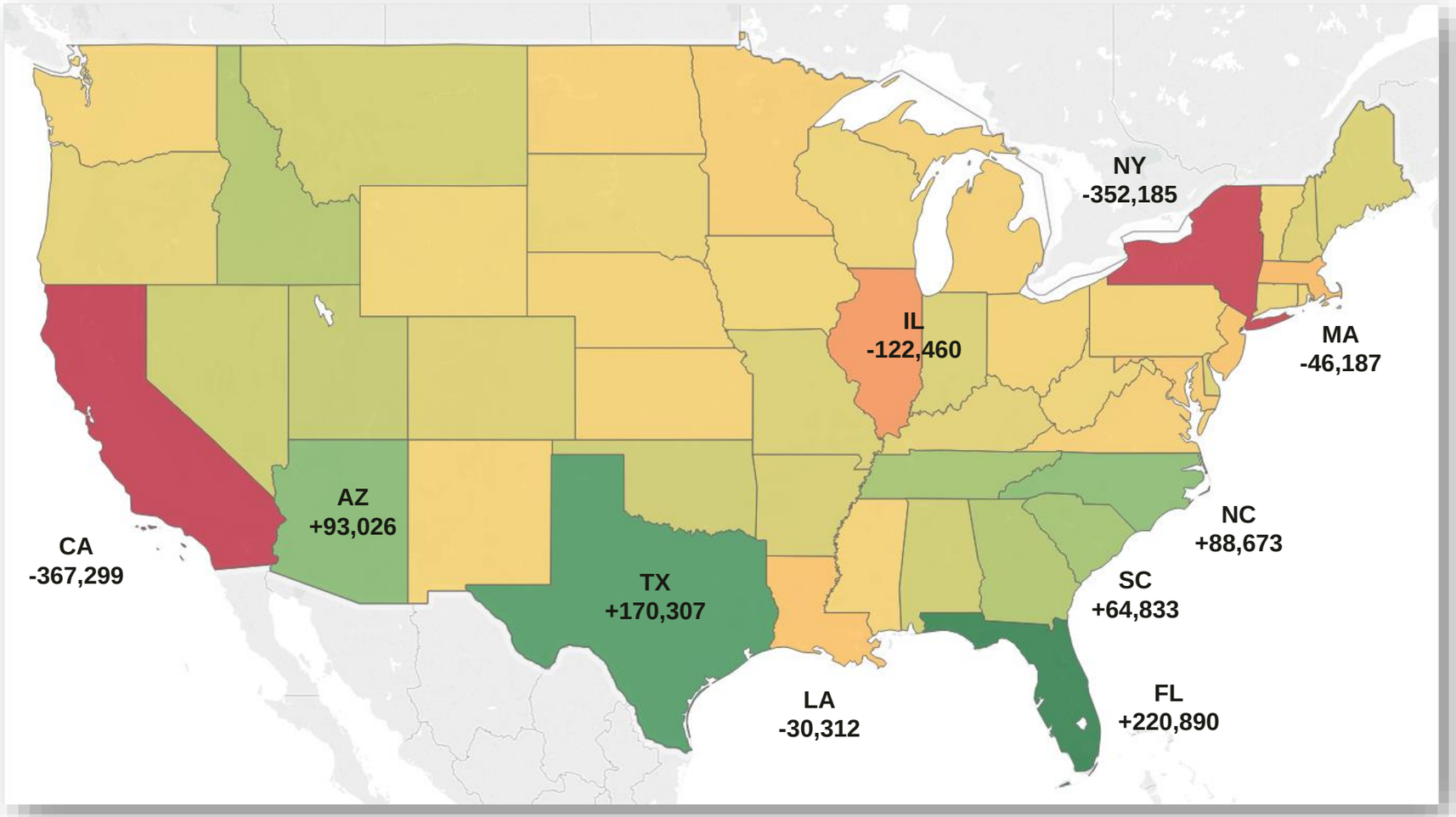
FOLLOW THE PEOPLE

Population Movement by State
Total net migration 2001- 2021

- **Five of the top 10 largest-gaining counties in 2021, were in Texas**. Collin, Fort Bend, Williamson, Denton and Montgomery counties gained a combined 145,663 residents.
- **Los Angeles County, California experienced the largest population loss** of any county, losing 159,621 residents in 2021.
- Seventy-one percent of counties (2,218) experienced positive net international migration.
- Four counties crossed the threshold of 100,000 residents in 2021—Cleveland County, North Carolina (100,359), Lancaster County, South Carolina (100,336), Bastrop County, Texas (102,058), and Grant County, Washington (100,297).
- Los Angeles County, California (9,829,544) and Cook County, Illinois (5,173,146), had more than 5 million residents in 2021, making them the top two most populous counties in the nation.



MORE THAN ONE-IN-THREE CONSTRUCTION DOLLARS ARE SPENT IN JUST 12 MARKETS

Total Construction Spending Put in Place
Metropolitan Statistical Area (MSA); 2021-2025 sum

- Concentration of spending continues in fewer markets
- Old markets move down, and new markets move up
- Megapolitans can equal or rival metropolitans

1. New York

2. Los Angeles

3. Dallas

4. Houston

5. Phoenix

6. Atlanta

7. Seattle

8. Washington, DC

9. San Francisco

10. Miami

11. Chicago

12. Riverside

13. Denver
14. Austin
15. Boston
16. Philadelphia
17. Orlando
18. Tampa
19. Minneapolis
20. Charlotte
21. San Diego
22. Portland

24. Sacramento
25. San Jose
26. Las Vegas
27. Nashville
28. Jacksonville
29. Salt Lake City
30. Detroit
31. Raleigh
32. San Antonio
33. Baltimore
34. Indianapolis
35. St. Louis
36. Sarasota
37. Kansas City
38. Columbus
39. Boise
40. Provo
41. Cincinnati
42. Fort Myers
43. Virginia Beach
44. Pittsburgh
45. Richmond
46. Ogden
47. Charleston
48. Cleveland
49. Oklahoma City
50. Tucson
51. Memphis
52. Colorado Springs
53. Lakeland
54. Milwaukee
55. Greenville
56. Honolulu
57. Naples
58. Providence
59. Louisville
60. Stockton
61. Myrtle Beach
62. Columbia
63. Daytona Beach
64. Grand Rapids
65. Knoxville
66. Fresno
67. Durham
68. Reno
69. Birmingham
70. Melbourne

71. New Orleans
72. Port St. Lucie
73. Omaha
74. Tulsa
75. Rochester
76. Oxnard
77. Hartford
78. Greensboro
79. Bakersfield
80. Worcester
81. Des Moines
82. Spokane
83. Albuquerque
84. Fayetteville
85. Albany
86. Buffalo
87. Madison
88. Baton Rouge
89. Greeley
90. El Paso
91. Bridgeport
92. Winston-Salem
93. Portland
94. McAllen
95. Allentown
96. Boulder
97. Santa Rosa
98. Asheville
99. Fort Collins
100. Augusta
101. Pensacola
102. St. George
103. Ocala
104. Chattanooga
105. Salisbury
106. Huntsville
107. Little Rock
108. Harrisburg
109. Savannah
110. New Haven
111. Fort Walton Beach
112. Killeen
113. Wilmington
114. Salem
115. Bend
116. Vallejo
117. Lexington
118. Dayton
119. Spartanburg
120. Wichita
121. Lancaster
122. Springfield
123. Bremerton
124. The Villages
125. Syracuse
126. Santa Barbara
127. Olympia
128. Manchester
129. Eugene
130. Modesto
131. Tallahassee
132. Springfield
133. Akron
134. Visalia
135. San Luis Obispo
136. Sioux Falls
137. Salinas
138. Toledo
139. Jackson
140. Fort Wayne
141. Prescott
142. Bellingham
143. Scranton
144. Kennewick
145. Anchorage
146. Hilton Head Island
147. Corpus Christi
148. Punta Gorda
149. Trenton
150. Daphne
151. Hickory
152. Brownsville
153. Coeur d'Alene
154. Ann Arbor
155. York
156. Green Bay
157. Gainesville
158. Fargo
159. Lafayette
160. Clarksville
161. Gainesville
162. Lubbock
163. Lincoln
164. Mobile
165. Vero Beach
166. Medford
167. Gulfport
168. College Station
169. Santa Cruz
170. Beaumont
171. Kahului
172. Laredo
173. Logan
174. Lake Havasu City
175. Charlottesville
176. Fayetteville
177. Rochester
178. Lansing
179. Reading
180. Midland
181. Montgomery
182. Roanoke
183. Amarillo
184. Merced
185. Shreveport
186. Idaho Falls
187. Waco
188. Panama City
189. Elkhart
190. Hagerstown
191. Billings
192. Youngstown
193. Chico
194. Grand Junction
195. Davenport
196. Cedar Rapids
197. Evansville
198. Columbus
199. Burlington
200. Barnstable Town
201. Tyler
202. Athens (Go Dawgs)
203. Kalamazoo
204. Yakima
205. Canton
206. Appleton
207. St. Cloud
208. Kingsport
209. Dover
210. Duluth
211. Lynchburg
212. Atlantic City
213. South Bend
214. Yuma
215. Homosassa Springs
216. Warner Robins
217. Burlington
218. Rockford
219. Flagstaff
220. Missoula
221. Mount Vernon
222. Peoria
223. Napa
224. Pueblo
225. Jacksonville
226. Tuscaloosa
227. Las Cruces
228. Norwich
229. Auburn
230. Greenville
231. Rapid City
232. Columbia
233. Utica
234. Flint
235. Fort Smith
236. Lafayette
237. Wenatchee
238. Iowa City
239. Macon (Home)
240. Johnson City
241. Florence
242. Longview
243. Odessa
244. Erie
245. Yuba City
246. Redding
247. Lake Charles
248. Winchester
249. Madera
250. Harrisonburg
251. Oshkosh
252. Bismarck
253. Valdosta
254. Huntington
255. Albany
256. Houma
257. Joplin
258. Bowling Green
259. Sioux City
260. Eau Claire
261. El Centro
262. Racine
263. Santa Fe
264. Champaign
265. Dalton
266. Abilene
267. Topeka
268. Waterloo
269. Blacksburg
270. Longview
271. Binghamton
272. Janesville
273. Wausau
274. Cleveland
275. La Crosse
276. Bloomington
277. Jackson
278. Sherman
279. Jonesboro
280. Muskegon
281. Hammond
282. Cheyenne
283. New Bern
284. California
285. Brunswick
286. Chambersburg
287. Hanford
288. Rocky Mount
289. Morristown
290. Ocean City
291. Monroe
292. Mankato
293. Springfield
294. San Angelo
295. State College
296. Kingston
297. Elizabethtown
298. Staunton
299. Saginaw
300. Sierra Vista
301. Charleston
302. Jefferson City
303. Bangor
304. Dothan AL
305. Lebanon
306. Ithaca
307. Albany
308. Bloomington
309. Dubuque
310. Sheboygan
311. Vineland
312. Glens Falls
313. Monroe
314. Pocatello
315. East Stroudsburg
316. Jackson
317. Wichita Falls
318. Goldsboro
319. Grants Pass
320. Pittsfield
321. Texarkana
322. Corvallis
323. Alexandria
324. Decatur
325. Grand Forks
326. Florence
327. Owensboro
328. Columbus
329. Niles
330. Casper
331. Gettysburg
332. St. Joseph
333. Terre Haute
334. Altoona
335. Sebring
336. Sumter
337. Lewiston
338. Hattiesburg
339. Fond du Lac
340. Rome
341. Hinesville
342. Victoria
343. Great Falls
344. Walla Walla
345. Lawrence
346. Lewiston
347. Carson City
348. Ames
349. Battle Creek
350. Morgantown
351. Grand Island
352. Cape Girardeau
353. Williamsport
354. Mansfield
355. Johnstown
356. Watertown
357. Bloomsburg
358. Carbondale
359. Farmington
360. Springfield
361. Lima
362. Michigan City
363. Kankakee
364. Anniston
365. Wheeling
366. Decatur
367. Manhattan
368. Muncie
369. Kokomo
370. Gadsden
371. Elmira
372. Cumberland
373. Hot Springs
374. Midland
375. Fairbanks
376. Lawton
377. Bay City
378. Beckley
379. Weirton
380. Parkersburg
381. Pine Bluff
382. Danville

Canada Key Takeaways

- **Bank of Canada** has taken their rate up higher than originally anticipated this fall. This will result in a growing squeeze on households, creating the conditions for a consumer-lead slowdown in most provinces.
- **Prairie providences** are anticipated to outperform for the second straight year in 2023. At the same time, oil and natural gas prices should remain elevated, putting tailwinds on the region.
- Canadian forecasts projections also reflect the softer side of the **global economy**. The economic downdraft in Europe will impact exporters in the Atlantic Region, Ontario and Quebec. At the same time softer U.S. economic growth will hurt shipments across the country.
- Strong segments with **growth rates around 5% or greater**
  - Health care
  - Transportation
  - Power
  - Highway & Street
  - Sewage & Waste Disposal
  - Conservation & Development

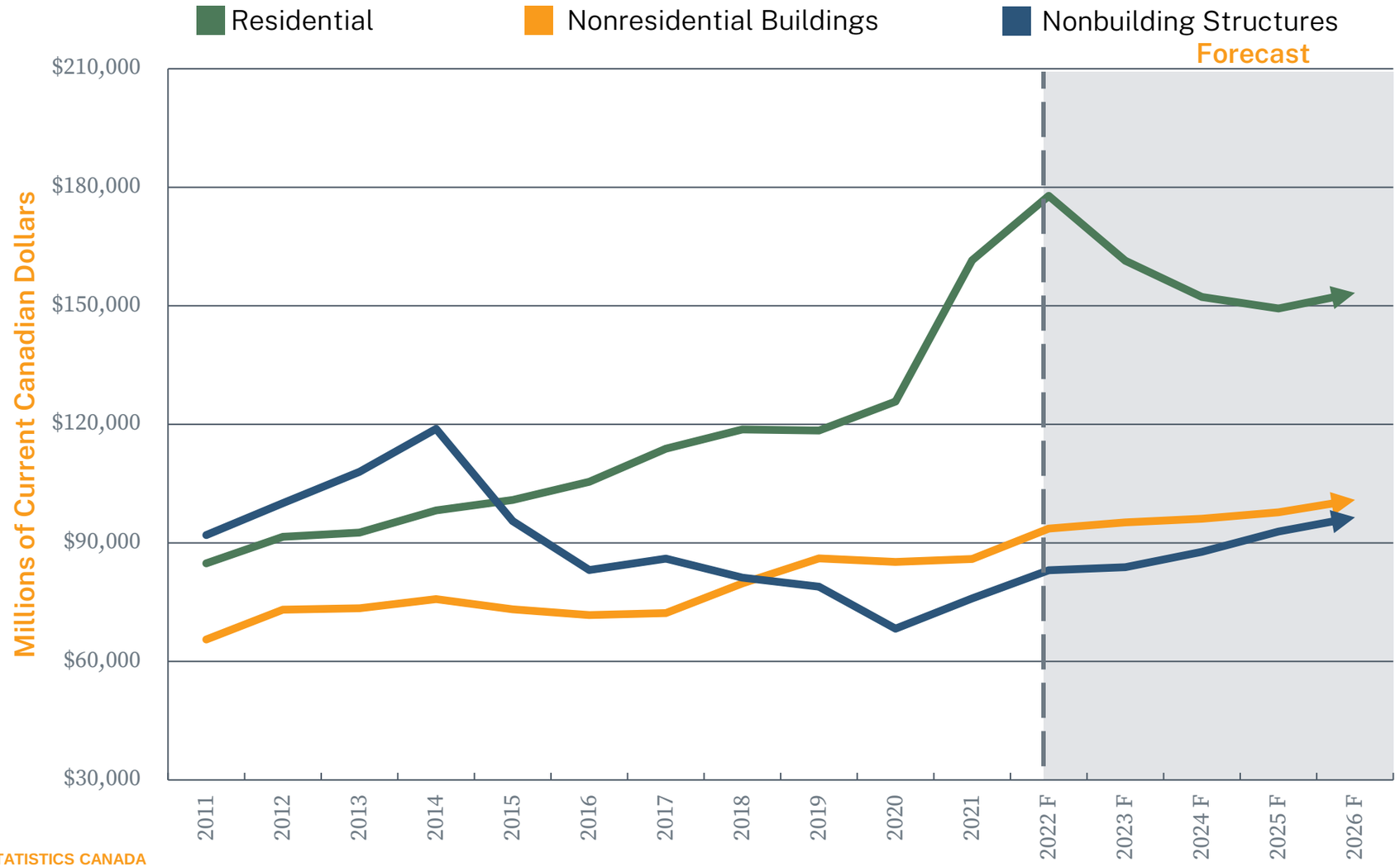
Canada Key Takeaways

- FMI is anticipating a decline in total construction activity, driven primarily by residential markets — forecast period
  - The decline is varied by province and government programs
  - Quebec has a program to build 1.5 million affordable housing units over the next decade
- Infrastructure spending, which includes transportation, highway / street, health care, and education, will be bright spots
- Contractors prioritizing public pursuits will benefit from consistent work stream

- Alberta – and power construction – will remain a bright spot for the construction industry overall
  - Renewable energy has significant government support – notably hydro and solar
- Several major oil and gas projects are winding down this year and next. This should alleviate some of the labor challenges seen on other projects or other segments
- One important distinction between the US and Canada is how heavily concentrated spending activity is
  - Ontario accounts for 35% - 40% of spending
  - Quebec accounts for ~20%
  - Alberta's power spend is 40%-50% of the national power construction spend

Canada Construction Forecast – Q1 2023

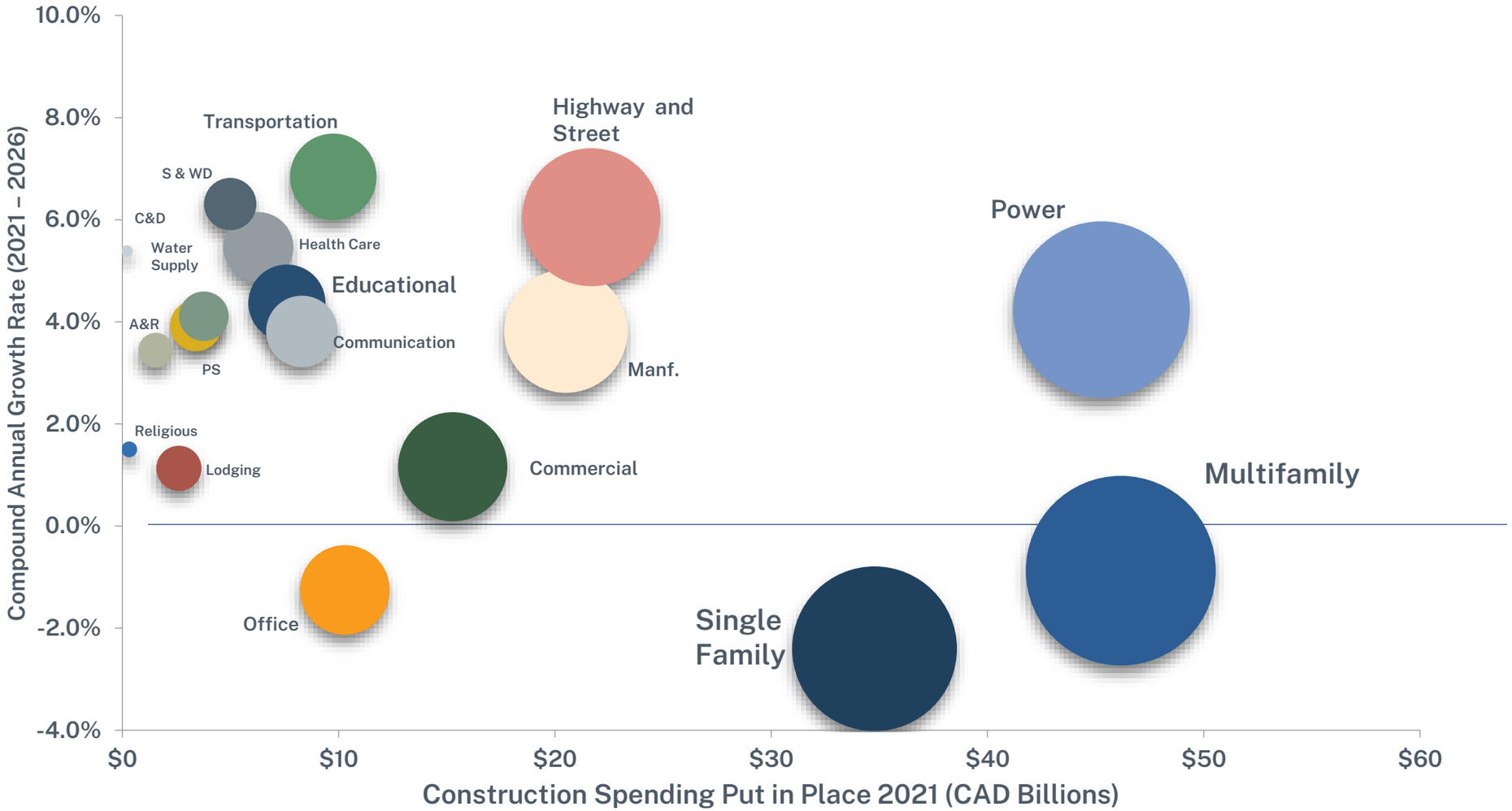
Ten-Year History



SOURCE: FMI FORECAST Q1 2023; STATISTICS CANADA

Canada Construction Forecast – Q1 2023

Construction Spending 2021 and Compound Annual Growth Rate



*Improvements include additions, alterations and major replacements. It does not include maintenance and repairs.

SOURCE: FMI FORECAST Q1 2023; STATISTICS CANADA

Canada Construction Forecast – Q1 2023

Compound Growth Rates 2021 – 2026

Manitoba
-0.1%

Saskatchewan
3.4%

Alberta
3.9%

British Columbia
1.7%

Northern Territories 1.5%

Atlantic Provinces 2.5%

Quebec
1.2%

Ontario
0.7%

SOURCE: FMI FORECAST Q1 2023; STATISTICS CANADA

U.S. Key Takeaways

- Total engineering and construction spending for the U.S. is forecast to end **2022 up 8%,** the same increases as in 2020 and 2021 all led primarily by residential

- Looking to 2023, FMI **forecasts a 2% decline** in engineering and construction spending levels compared to 2022 due to an anticipated fall in residential construction

- Elevated **inflation in 2022 is driving output contraction** across the industry

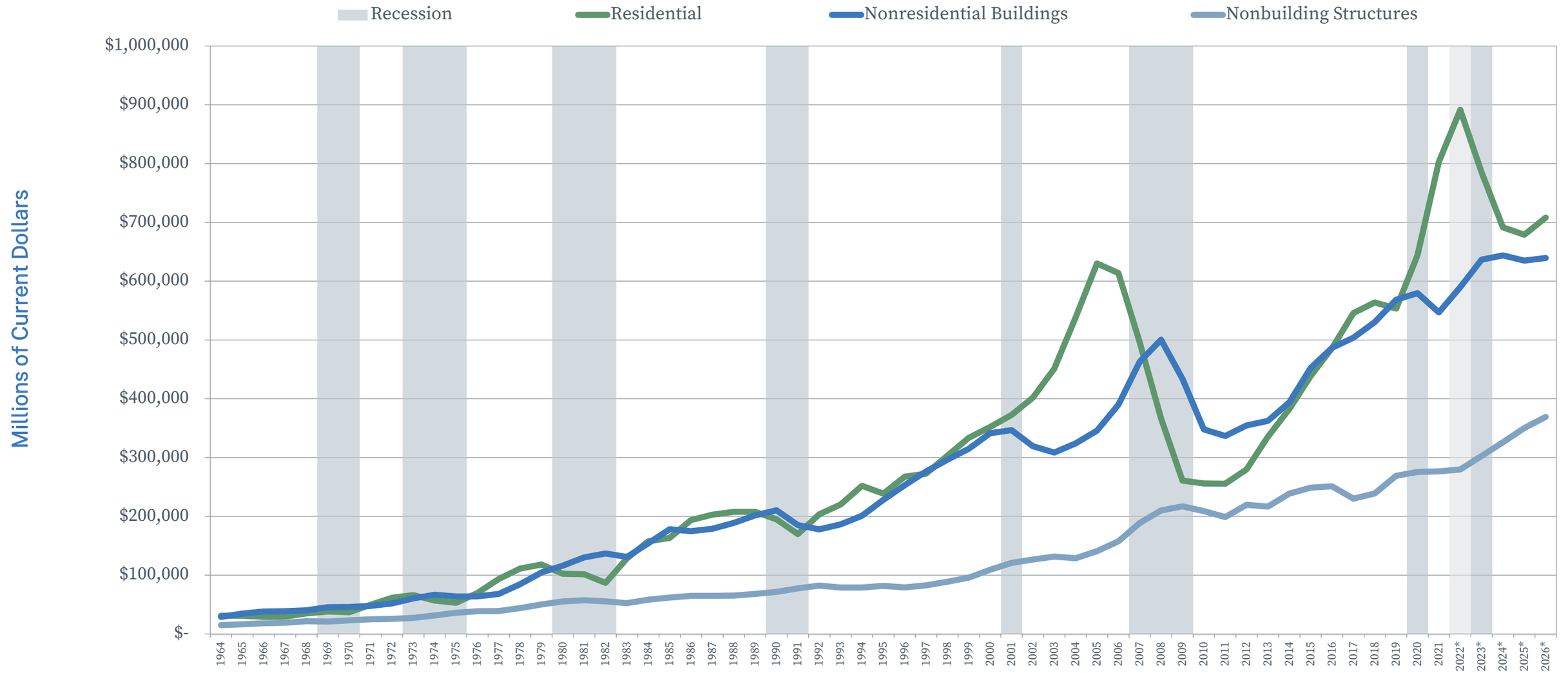
- High growth segments in **2022** (from 2021) **(10%)**
  - Multifamily
  - Residential improvements
  - Commercial
  - Manufacturing
  - Sewage & waste disposal
  - Water supply
  - Conservation & development construction

- Markets with a **0% - 4% growth** rate for 2022 include:
  - Lodging
  - Office
  - Education
  - Transportation
  - Communication

- **Negative** growth markets include
  - Religion
  - Public safety
  - Commercial
  - Office

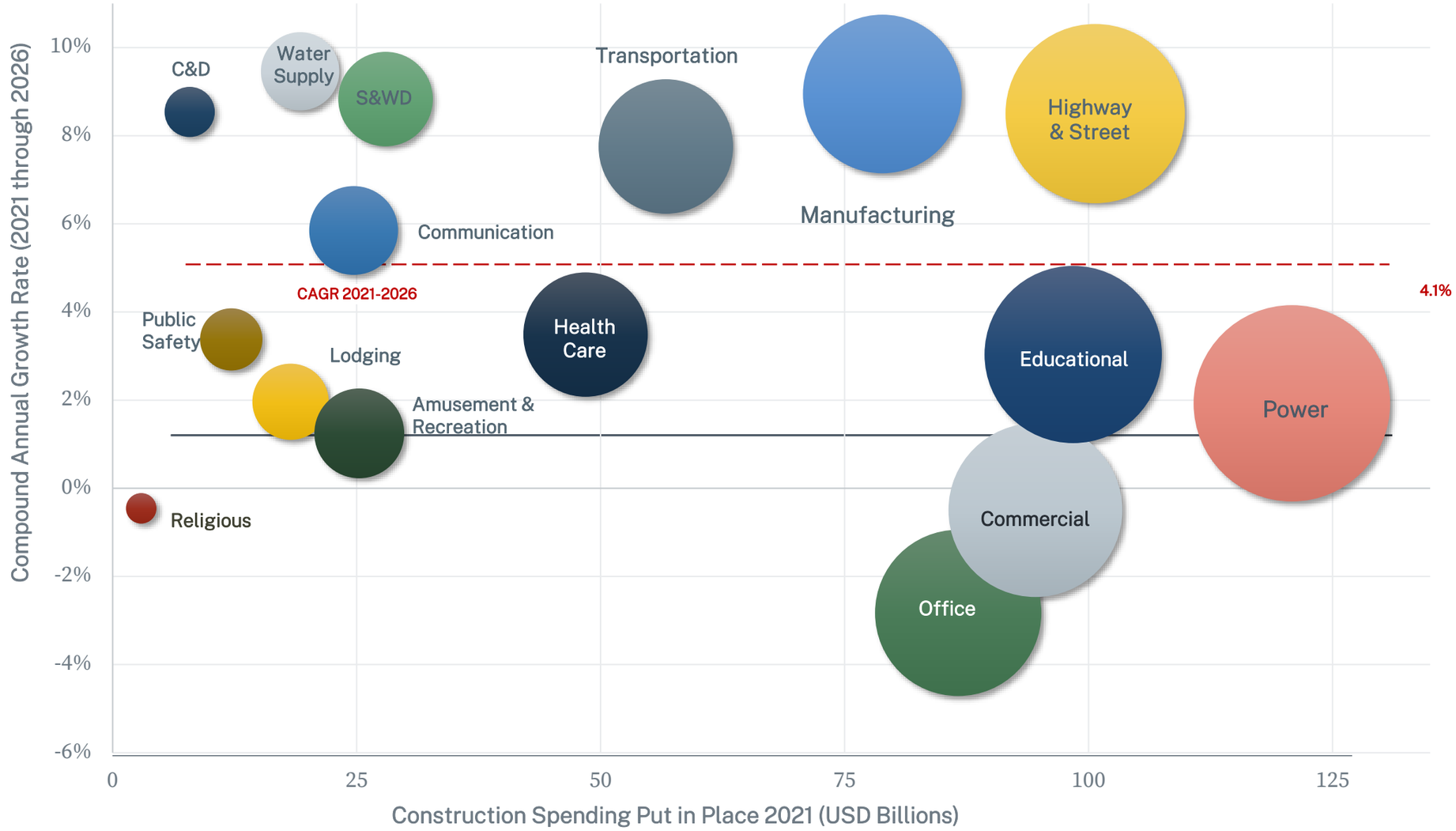
- The latest Nonresidential Construction Index **(NRCI) score of 46.4**, nearly flat from the previous quarter's score of 46.3, suggests ongoing concerns heading into the first quarter of 2023
  - The index has remained under 50 for three quarters and **indicates fewer future engineering and construction opportunities** into 2023

U.S. Construction Forecast – Q1 2023



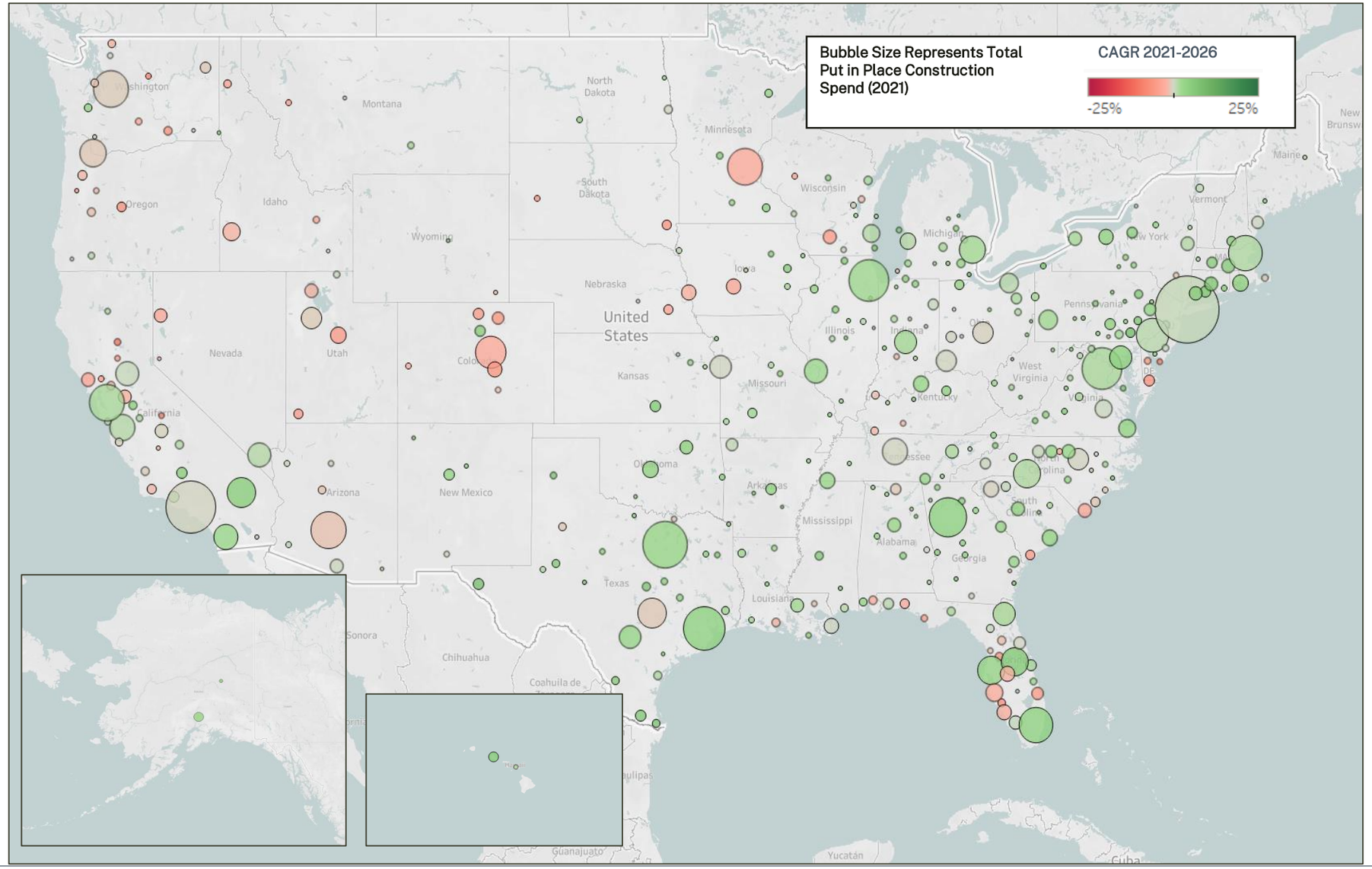
SOURCE: FMI FORECAST Q1 2023

U.S. Nonresidential Construction Forecast – Q1 2023



SOURCE: FMI FORECAST Q1 2023

Based on Q1 2023 CPiP Forecast



NEW VS. OLD – CONSTRUCTION ACTIVITY REFLECTS THE DIRECTION OF THE ECONOMY

New Economy

Regionalization

Resiliency	Economic competition	Market intervention
Preserving	Trade wars	Capital restrictions

Population Shifting

Demand Shifting	Labor force participation declines
Aging Population	More people per household

Construction demand

Life Sciences	Data Centers	Semiconductor Fabrication
Logistics & Manufacturing	Food & Beverage Manufacturing	Distributed Power

Old Economy

Globalization

Efficiency	Economic cooperation	Market liberation
Expanding	Trade deals	Capital liberation

Population Growth

Total demand growth	Labor force participation steady / increasing
Young / steady population age	Fewer people per household

Construction demand

Lodging	Shopping Centers/ Malls	Movie Theaters
Office	Sports/ Recreation	Textile Mills

FMI Consulting

Thank you

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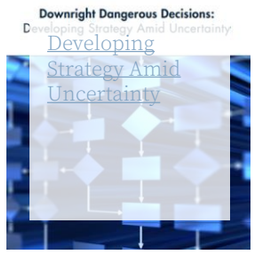
- Will Gruy works with companies across the U.S. serving the built environment with an emphasis on operational improvement and strategic thinking. He specializes in corporate strategy, using a research and evidence-based approach to achieve improved financial results through organizational focus.
- Prior to FMI, Will worked as an IT enterprise insights consultant for a major consulting firm serving global Oil & Gas companies. He developed operational improvement tools for managers that utilized the constant flow of data produced by operations.

Thought Leadership

The Changing Game of Strategy

The Last Normal Day

Downright Dangerous Decisions



Our Latest Construction Outlook – Download

FMI Consulting

FMI is a leading consulting and investment banking firm dedicated exclusively to the built environment. We serve as the industry's trusted advisor, providing current market insights, deep industry research and key relationships that deliver tangible results for our clients.

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