

Mid-Year Real Estate Review

With Economist Paul Brewbaker

Hawaii's Economy, Interest Rates, Real Estate Projections!

Tuesday, July 14, 2026

Oahu Country Club

11:30 a.m. - 1:30 p.m.

Lunch & Presentation - \$47.00

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 - Top 25 **Vacant Land Sales in Hawaii**

Pacific Business News rankings include appearances from 2016-present.
All information is approximate and subject to change. Luxury Homes International RB-18777

2026: 14th Largest & 5th Non-franchised

Your predictions for 2027



In July 2027

2026

- | | |
|---------------------------------|-------------|
| 1. YTD Median Condo Price? | \$515,000 |
| 2. YTD Median Home Price? | \$1,180,000 |
| 3. Interest rate 30 year fixed? | 6.50% |



Paul Brewbaker

Principal, TZ Economics

- Principal at TZ Economics
- Former Chief Economist for Bank of Hawaii
- Graduate of Stanford University
- PhD from the University of Hawaii

Navigating another oil shock

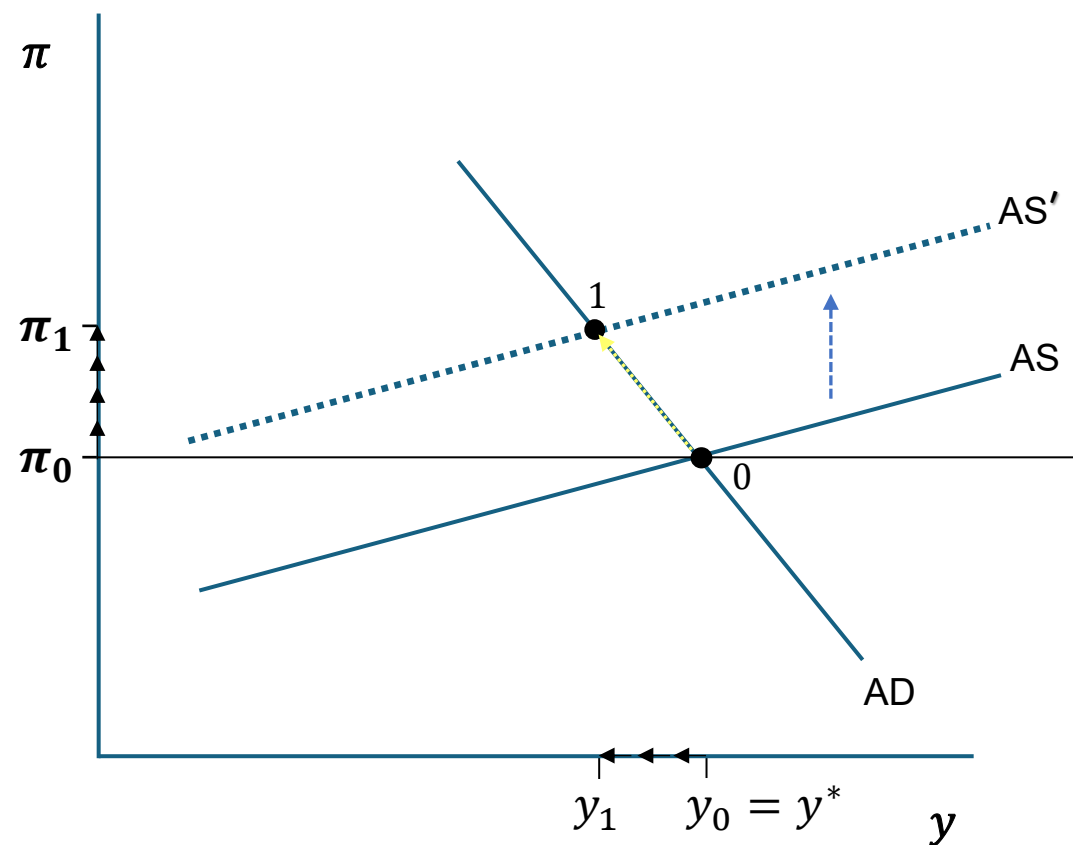
A presentation prepared for the
Mid-Year Real Estate Review
Oahu Country Club

by Paul H. Brewbaker, Ph.D., CBE
TZ Economics, Kailua, Hawaii
July 14, 2026

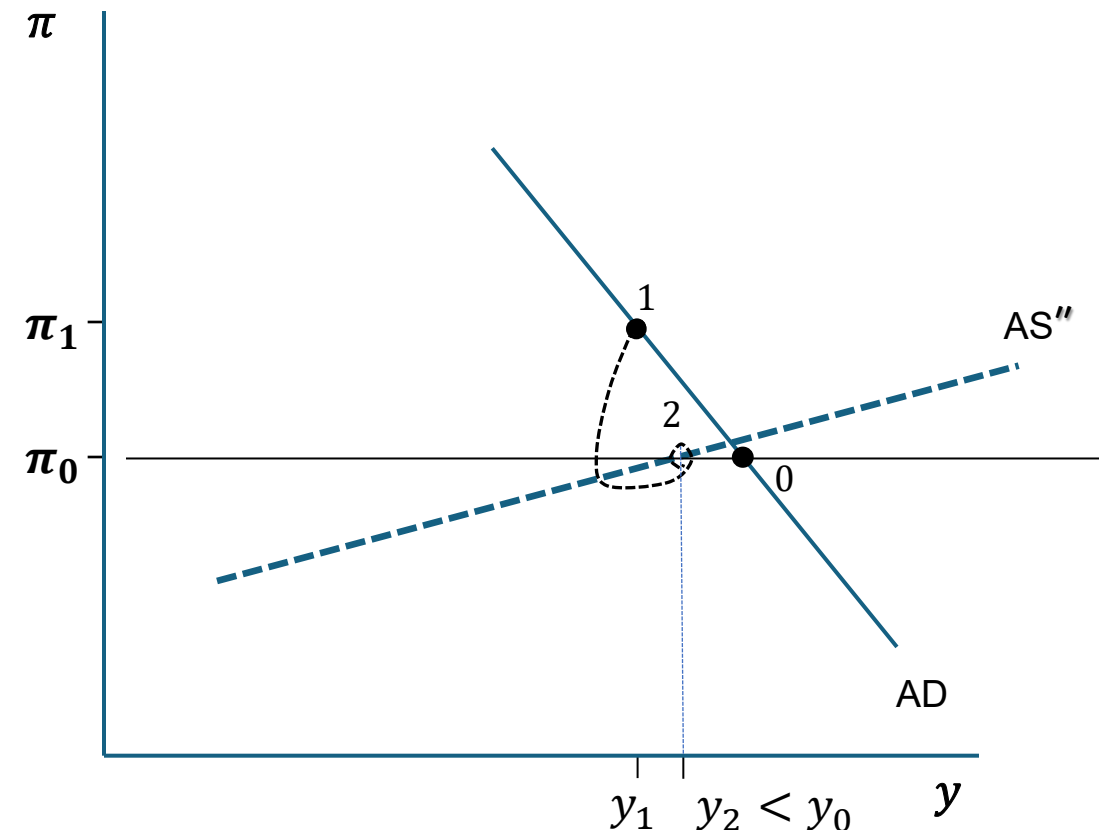


Macroeconomics in 2026 same as in 2025: aggregate supply shocks

Two supply shocks: 2025 trade shock (tariffs) and 2026 petroleum shock ($dAS < 0$);
Risk: higher inflation ($\pi = \hat{p} \equiv d \ln p > 0$), lower output ($dy < 0$), SR and LR



π_1 = Aggregate supply shock from tariffs
Aggregate supply shock from petroleum
SR recession risk (output recedes from y^*)



Long-run convergence to new steady-state
(ignoring foreign reaction functions): LR
productivity loss, lower potential output ($y_2 < y^*$)

Is the 2020s the 1970s?

One difference: polar-opposite trade policy

- Trump tariffs—reversal of 80 years of trade theory, global economic integration
- Unprecedented economic policy uncertainty
- Increase in U.S. import taxes to rates unprecedented in last century (tariffs)

Similarities: ongoing Middle East wars, Iran upheaval, oil price spikes, inflation

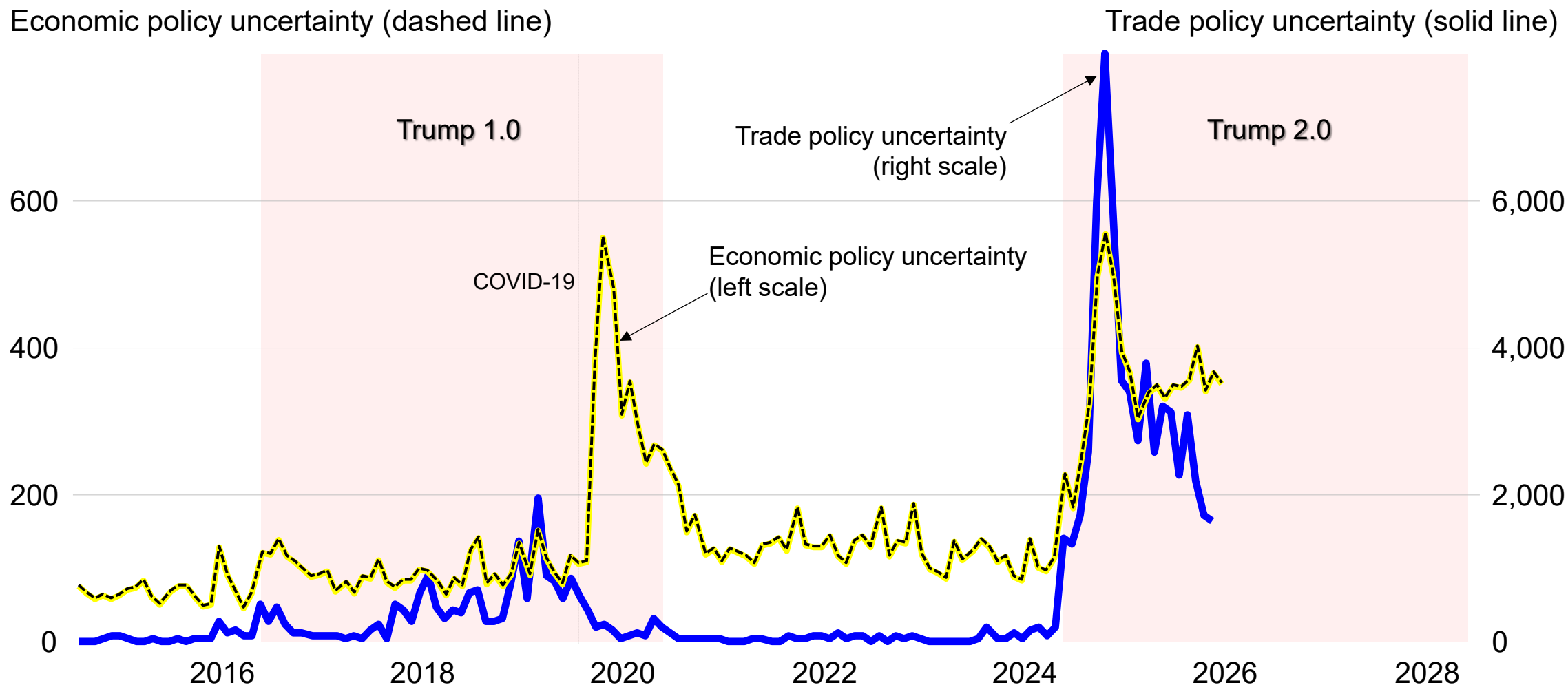
- Hawaii end-use petroleum consumption same today as 1970s
- Ecopious advocacy of exclusive renewable energy (déjà vu)
- Petroleum, geopolitically-rooted commodity price spikes dominate aggregate supply shocks

Major differences

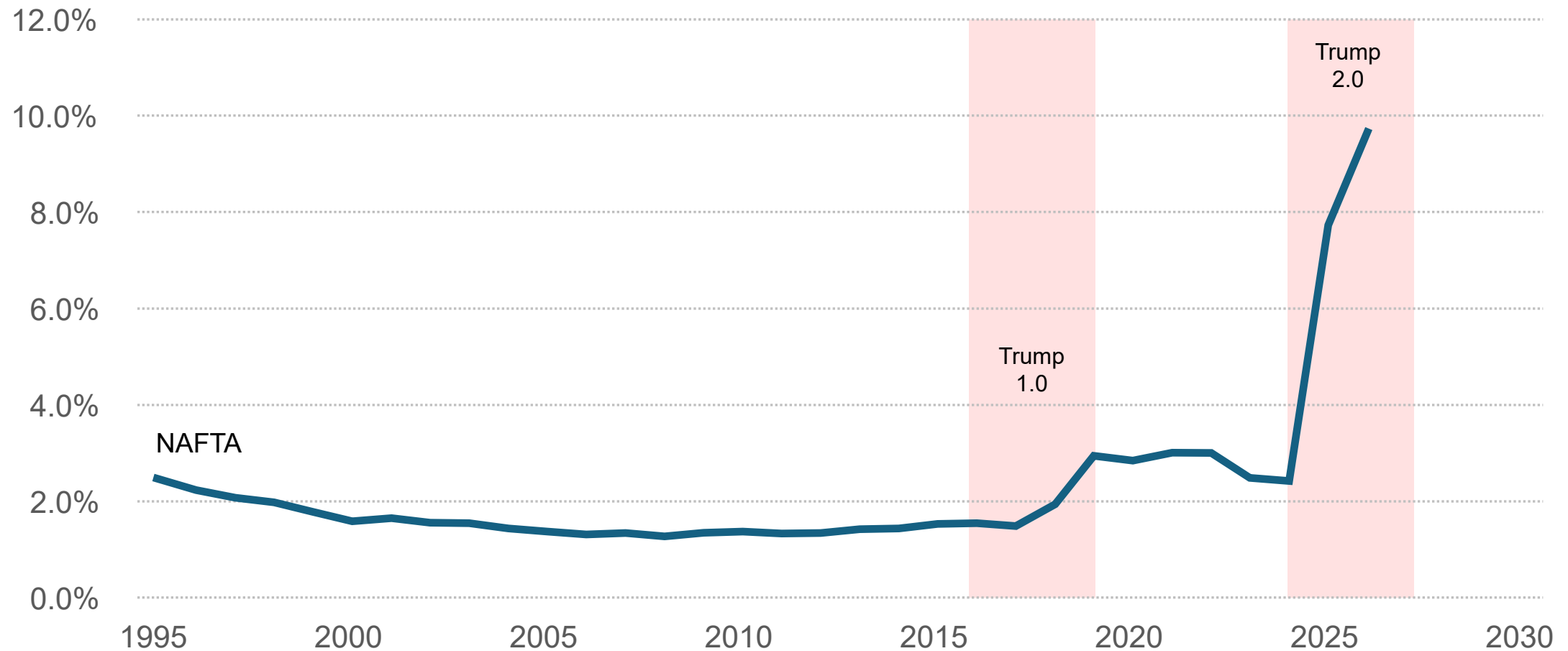
- Commodity price collapse of 1980s more rapid, current downtrend slower
- More viable, commercially competitive renewable electricity generation sources today
- Monetary policy inattentive to inflation expectations in 1970s; center of policy-makers' focus today

Trade policy: neo-mercantilist fail

Economic policy uncertainty, specifically trade policy—measured using LLMs on 10 U.S. newspapers—and intervals between presidential elections

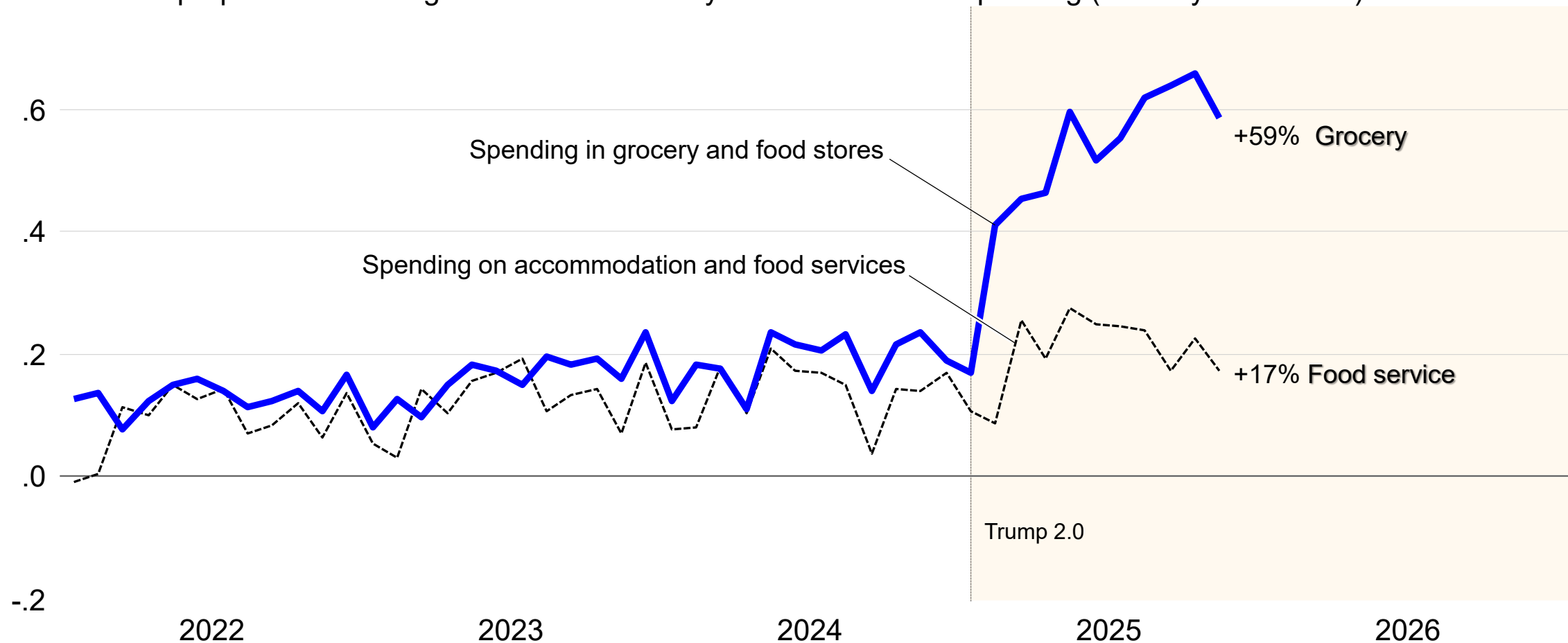


International trade theory meets the U.S. Supreme Court; Pokémon (evolved form) U.S. effective tariff rates illegal, highest since back to 1930s (Smoot-Hawley; Great Depression)



One way to see how tariffs may be finding Hawaii consumers: observed jump in spending from resident' credit and debit card processing data in 2025

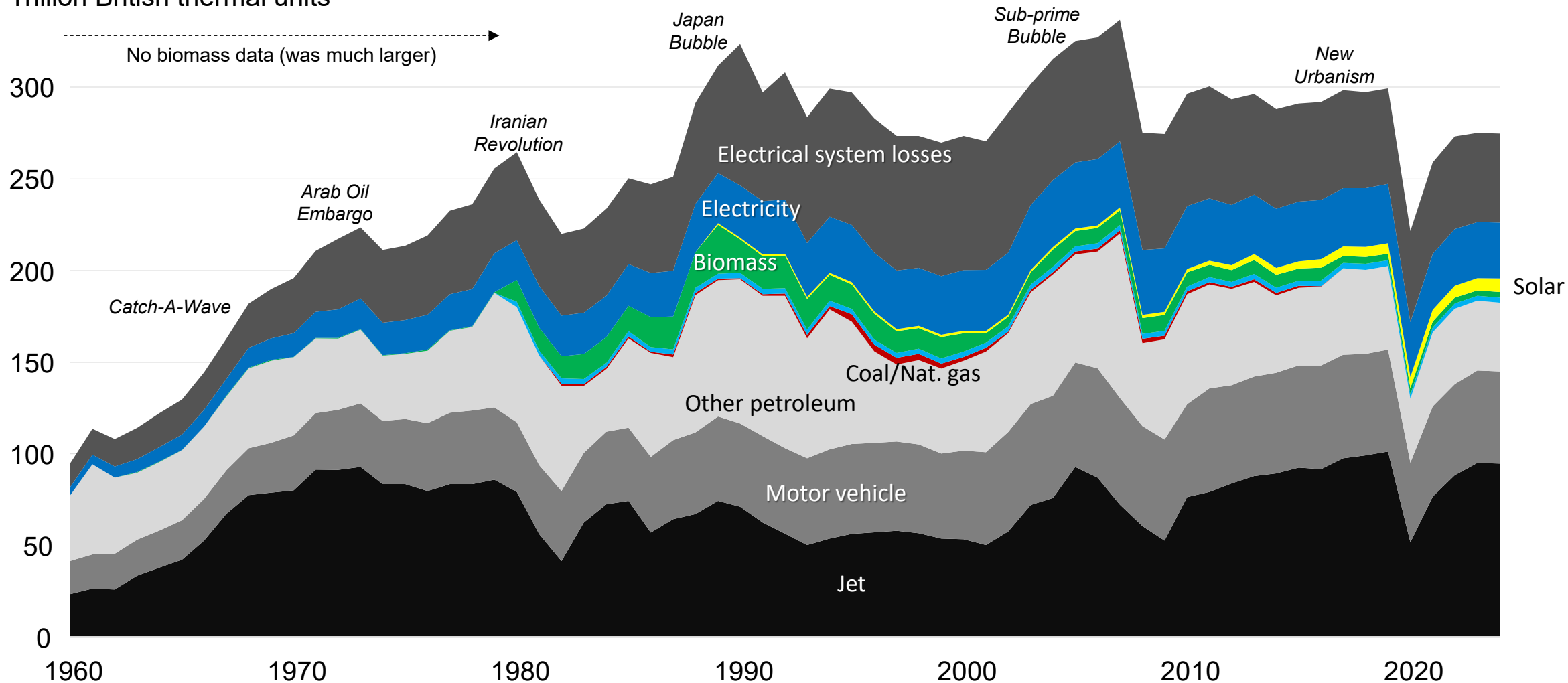
Cumulative proportionate changes in median monthly Hawaii consumer spending (January 2020 = 0.0)



Another oil shock, another inflation: is the 2020s the 1970s?

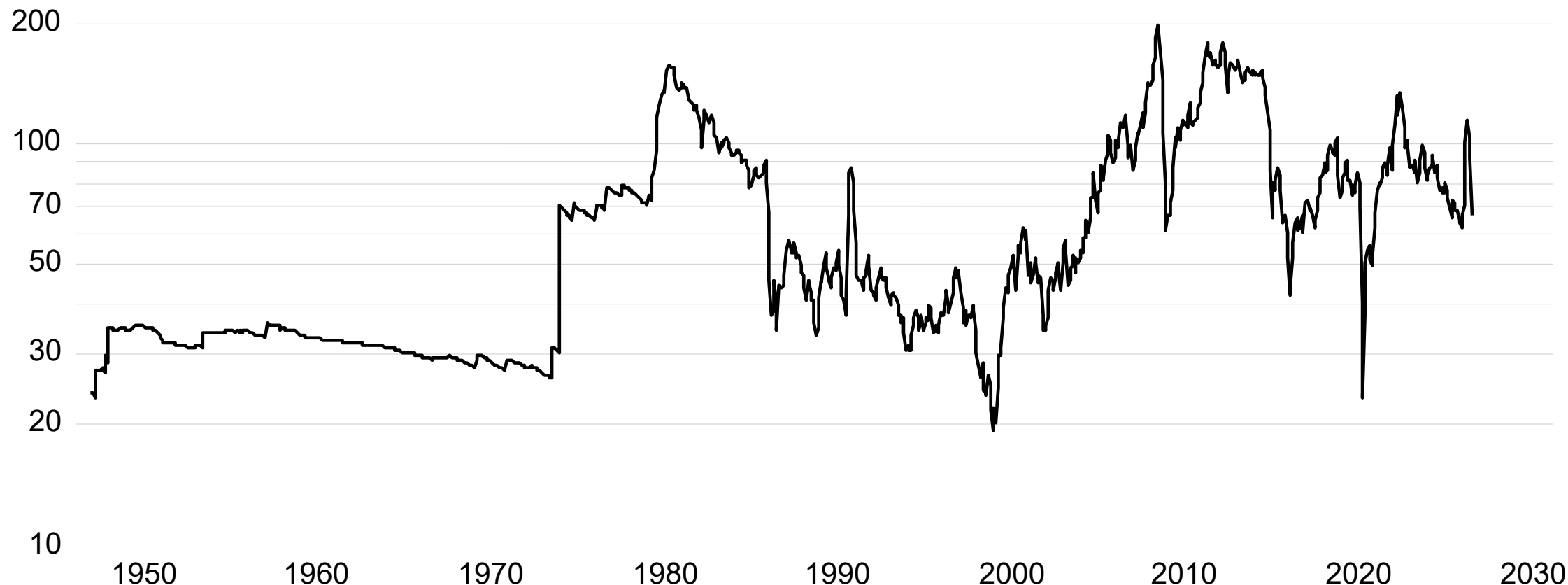
Hawaii end-use energy consumption: petroleum use about same, real GDP rose;
187.8 tril. Btu (oil); \$52 bil. (GDP) (1979) → 182.5 tril. Btu (oil); \$118 bil. (GDP) (2024)

Trillion British thermal units



Real crude oil prices are same in 2020s as in late-1970s, but on trend have been falling for nearly 20 years—latest transitory spike from Iran War “to be continued”

Real monthly average crude oil spot prices, n.s.a. (constant 2025\$/bbl, log scale)

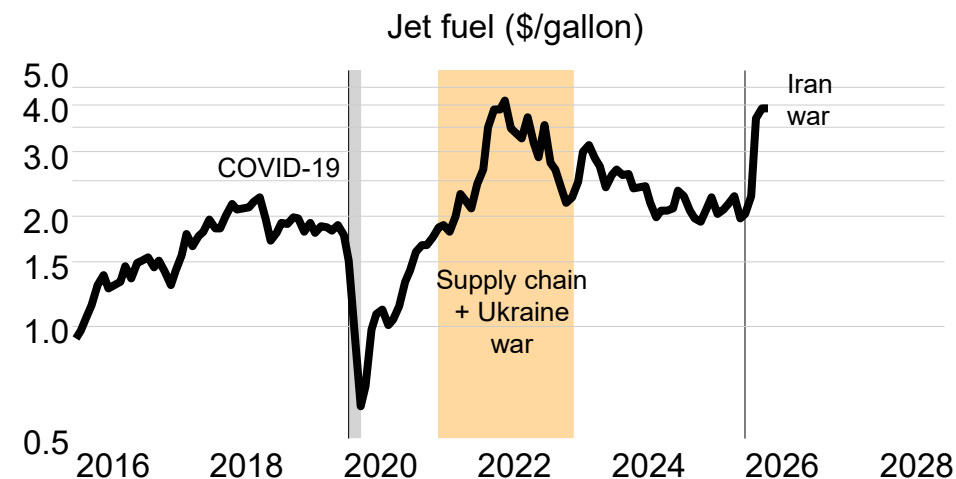
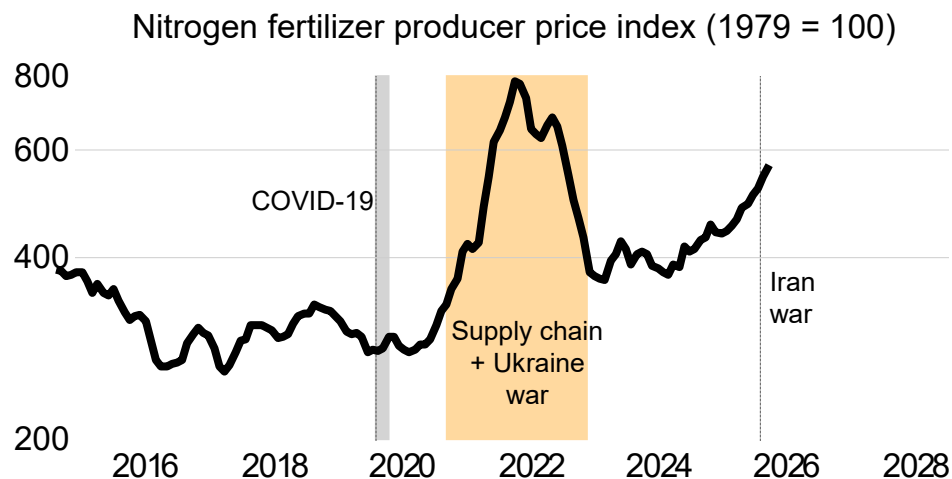
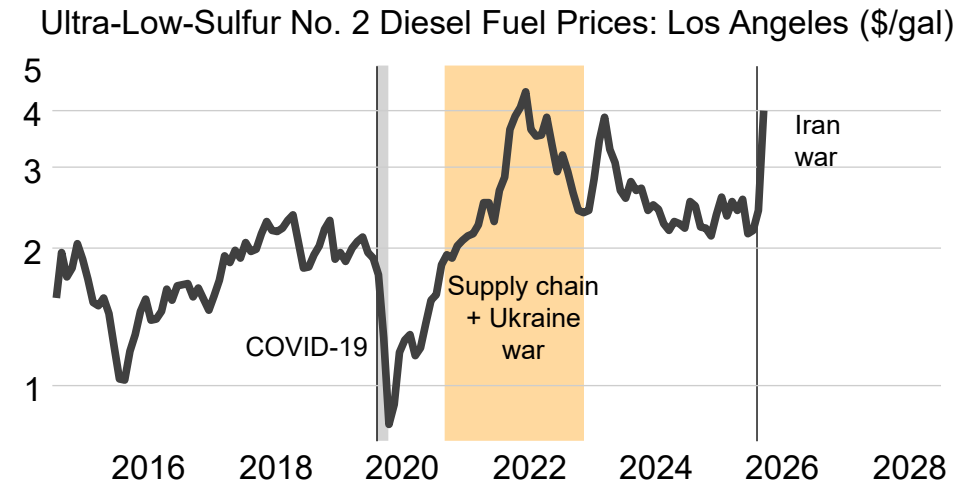
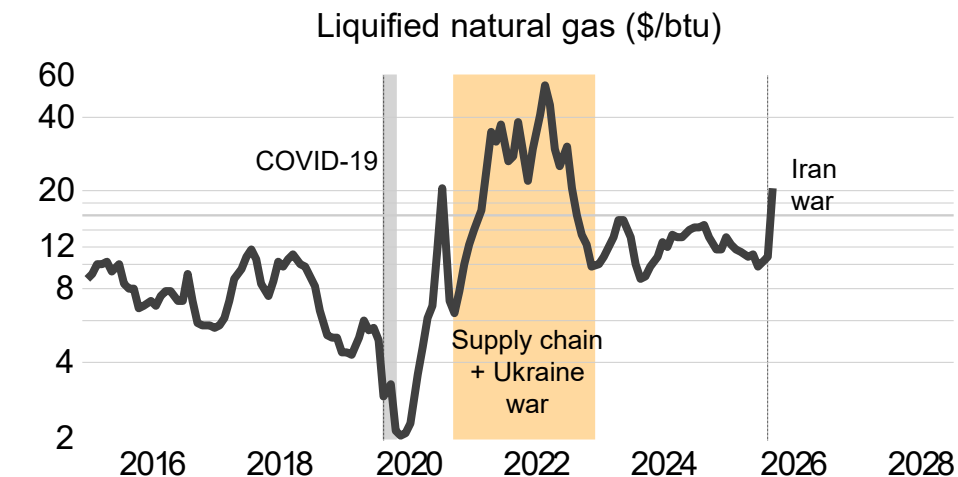


Price of Brent crude since 2018: \$73/bbl $\pm$ \$19 depending on the latest risk; tariffs (2018), China meltdown (Oct 2018), COVID-19 (Feb 2020), Ukraine (Feb 2022), Iran (Feb 2026)

Crude Oil Prices: Brent – Europe (\$/barrel)



Not every price you hear about affected by Persian Gulf blockades looks like a hockey stick since the start of the U.S. war on Iran, but many vulnerable, pre-war (prices through April)



How much spot crude petroleum prices increased informs how much Hawaii CPI energy inflation and overall inflation will ensue; current impulse about + 2.5 s.d.

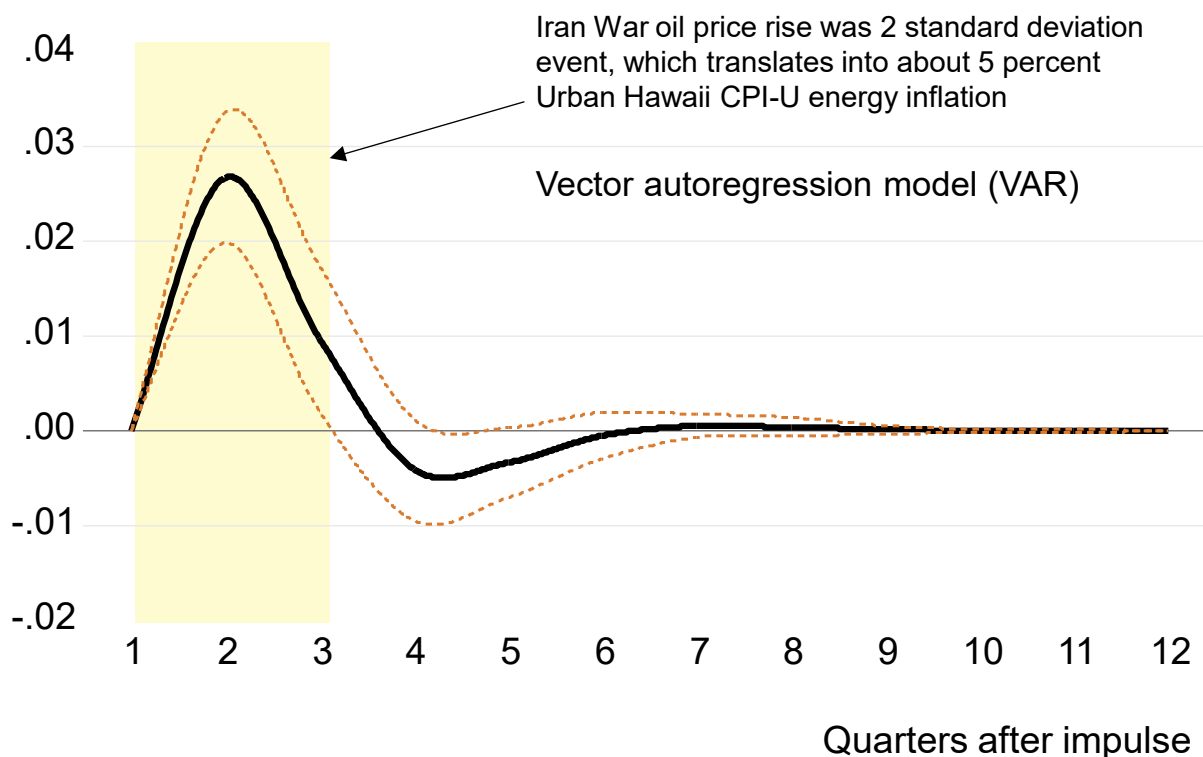
Daily Brent crude oil price stats (2018-2026(July 8))

Mean	\$ 73.71
Median	\$ 73.39
Maximum	\$ 138.21 (Iran War)
Minimum	\$ 9.12 (COVID-19)
<i>Standard deviation*</i>	\$ 18.63
Skewness	0.0653
Kurtosis	4.2427
Observations (<i>n</i> =)	2,221

*Unconditional; conditional annualized s.d.
(volatility) is 40.5% (mean), 32.6% (median);
peak \$120/bbl approx. 2.5 standard deviations
above \$74 price average 2018-2026 (Jul)

Impulse response to 1 s.d. change in oil prices takes 3-4 quarters to play out in Hawaii CPI energy inflation; 2.5 s.d. increase through April $\Rightarrow$ up to +6.5% CPI energy inflation

Response of HNL CPI-U energy inflation to Brent crude inflation
Cholesky one standard deviation impulse (adjusted for degrees of freedom), ± 2 analytic asymptotic standard errors



For quarterly data 1978-2026Q1, using log changes, response coefficients are interpreted as elasticities. The 0.026 peak value (+2 quarter after impulse) from the impulse response function is a percentage point response. Following a one standard deviation upward shock in Brent crude petroleum spot prices, the Urban Hawaii consumer price index energy component increases by 2.6 percentage points above its baseline trajectory at its peak.

Calculated inflation impact:

Multiply the response coefficient (0.026) by the magnitude of the price shock in standard deviations (2.5):

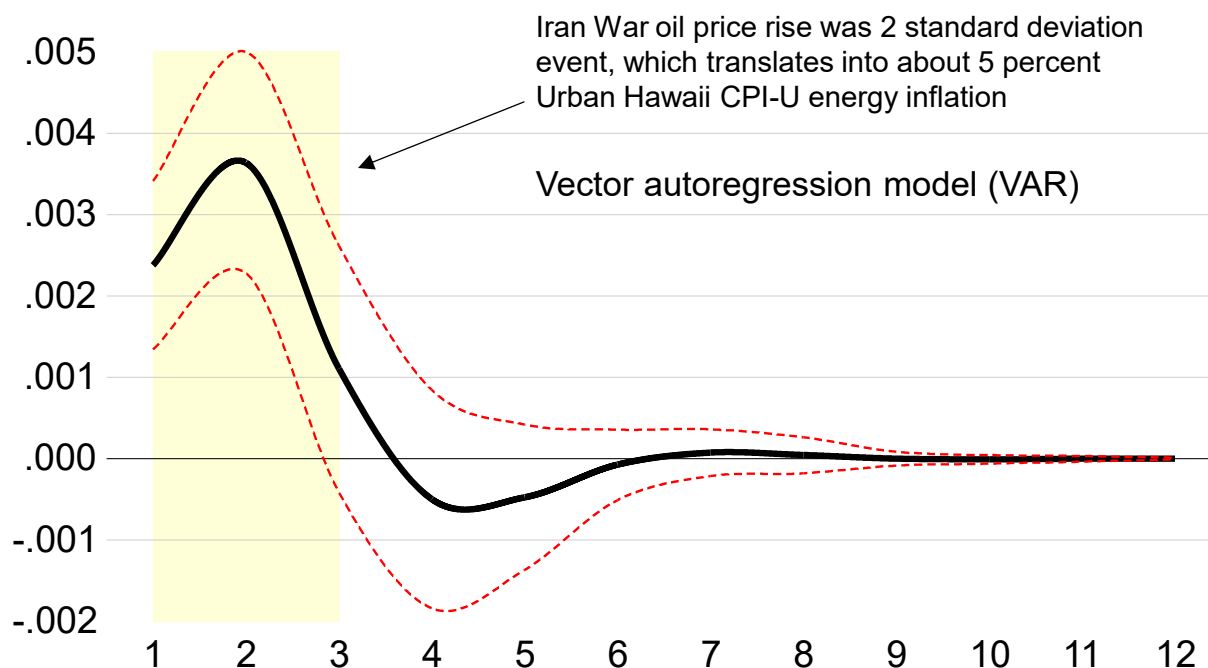
$$\hat{p}_{CPI-energy} = \varepsilon_{VAR} \cdot 2.5 \text{ s.d. shock}$$

$$\hat{p}_{CPI-energy} = .026 \cdot 2.5$$

$$\hat{p}_{CPI-energy} = 6.5\%$$

Impulse response to 1 s.d. change in oil prices takes 3-4 quarters to play out in Hawaii CPI All Items inflation; current > 2 s.d. increase $\Rightarrow$ up to 4% CPI Hawaii inflation

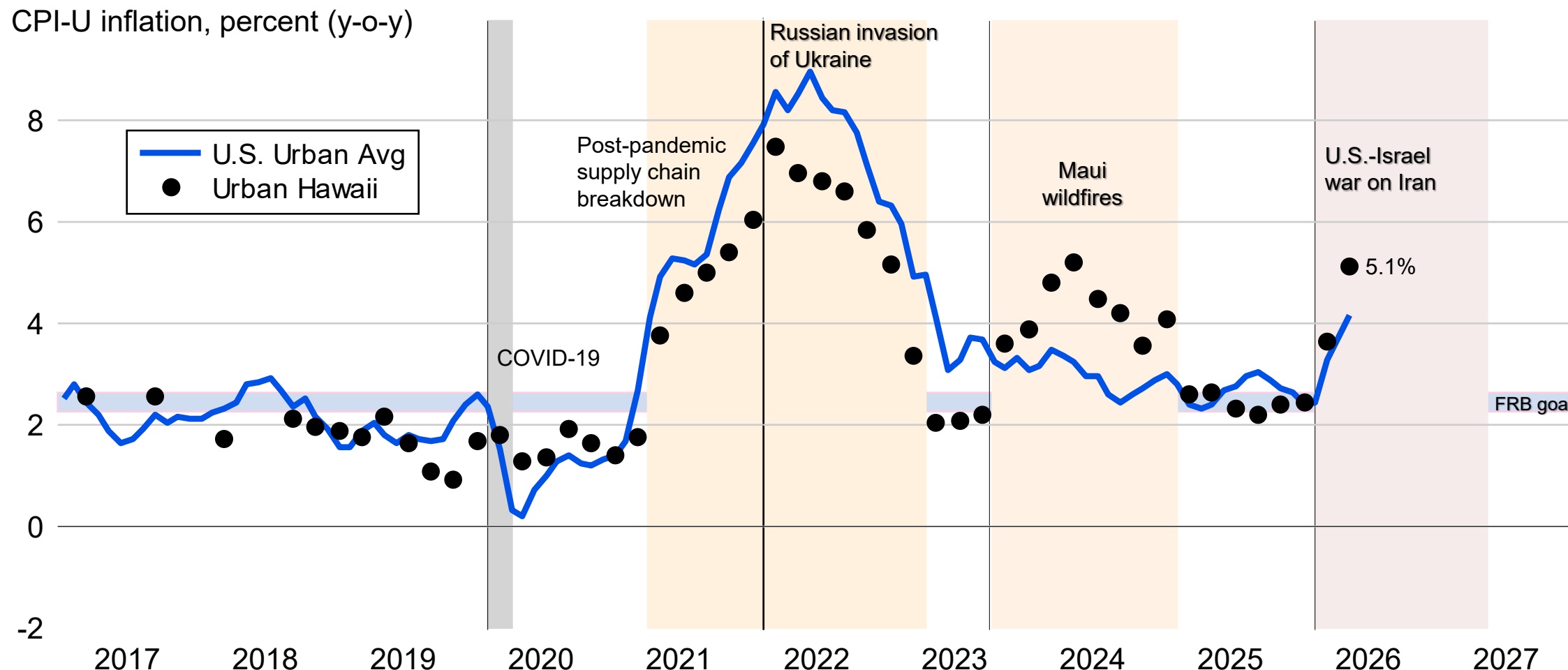
Response of HNL CPI-U energy inflation to Brent crude inflation
Cholesky one standard deviation impulse (adjusted for degrees of freedom), ± 2 analytic asymptotic standard errors



For quarterly data 2005-2026Q2, strictly for petroleum prices as vector-autoregression factors, estimated inflation from a Brent crude spot price of \$73/bbl with +2.0 s.d. to \$110/bbl, and with +2.5 s.d. increase to \$119, respectively:

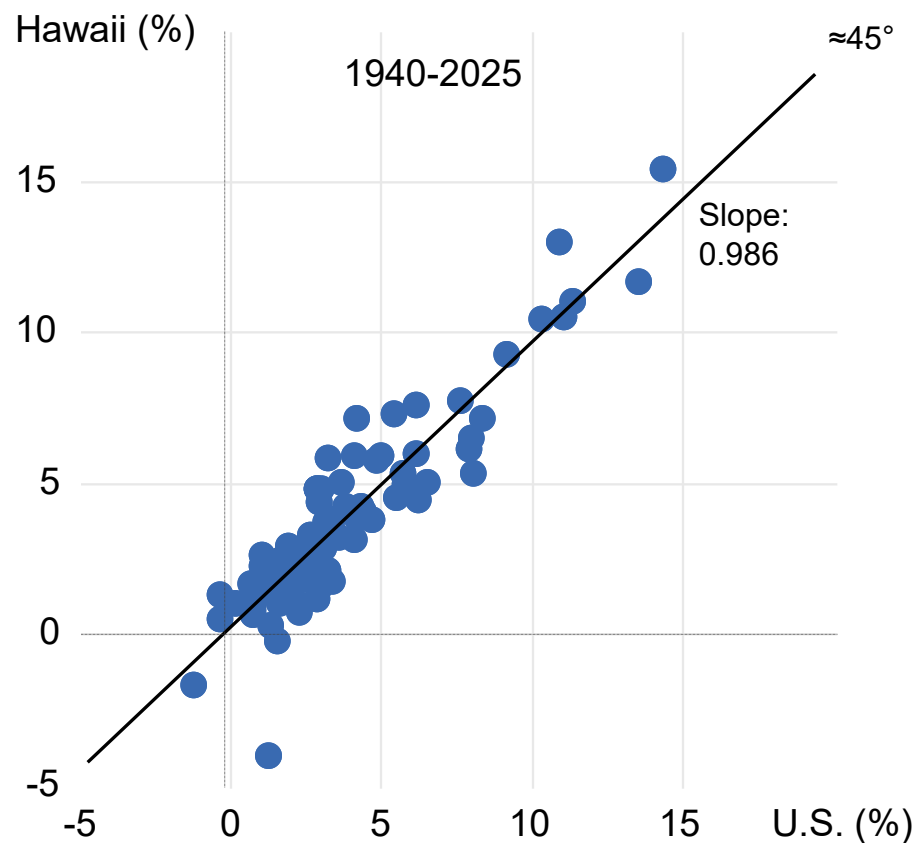
- (+2.0 s.d.) 1.2-1.4 percentage points higher inflation rates during the first 2-3 quarters (statistically significant responses); *i.e.* if the inflation rate was to be 2.5%, instead it would range from 3.6-3.9%
- (+2.5 s.d.) 1.5-1.8 percentage points higher inflation rates during the first 2-3 quarters (statistically significant responses); *i.e.* if the inflation rate was to be 2.5%, instead it would range from 4.0-4.3%
- [About 2.1 percentage points over four quarters in cumulative, vector error-correction impacts (rising from 2.5% to 4.6% inflation)]

Inflation comes and goes from specific forcing factors, including those idiosyncratic to Hawaii, but persists in peoples' minds long after it is over; 2020s shocks echo some from 1970s



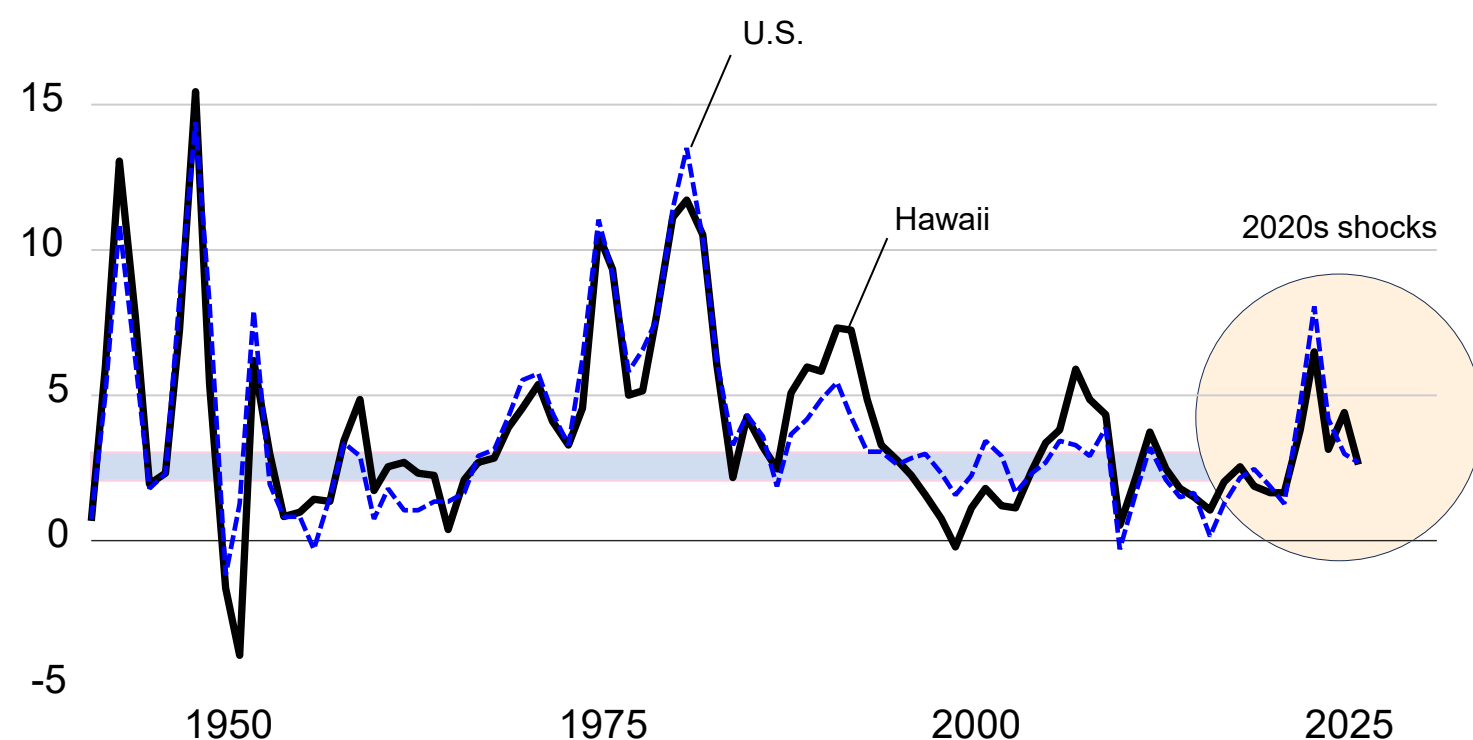
Monetary, economic union (U.S.), e-commerce crush long-run regional inflation differentials;
what about “monopoly,” “evil corporations?” Economic theory says “arbitrage” plugs gaps

Hawaii vs. U.S. inflation



Hawaii and U.S. annual inflation

Annual percent change



Mapping from inflation to interest rates to the Oahu housing market

Risk of doubling or tripling inflation reverses monetary policy direction

Where things were at end-2025: transition through Soft Landing had been expected

- Federal Reserve Chair replacement was expected to be uneventful
- Muted inflation impacts from 2025 tariffs held out hope for 2026

Then came war on Iran, closure of Straits of Hormuz

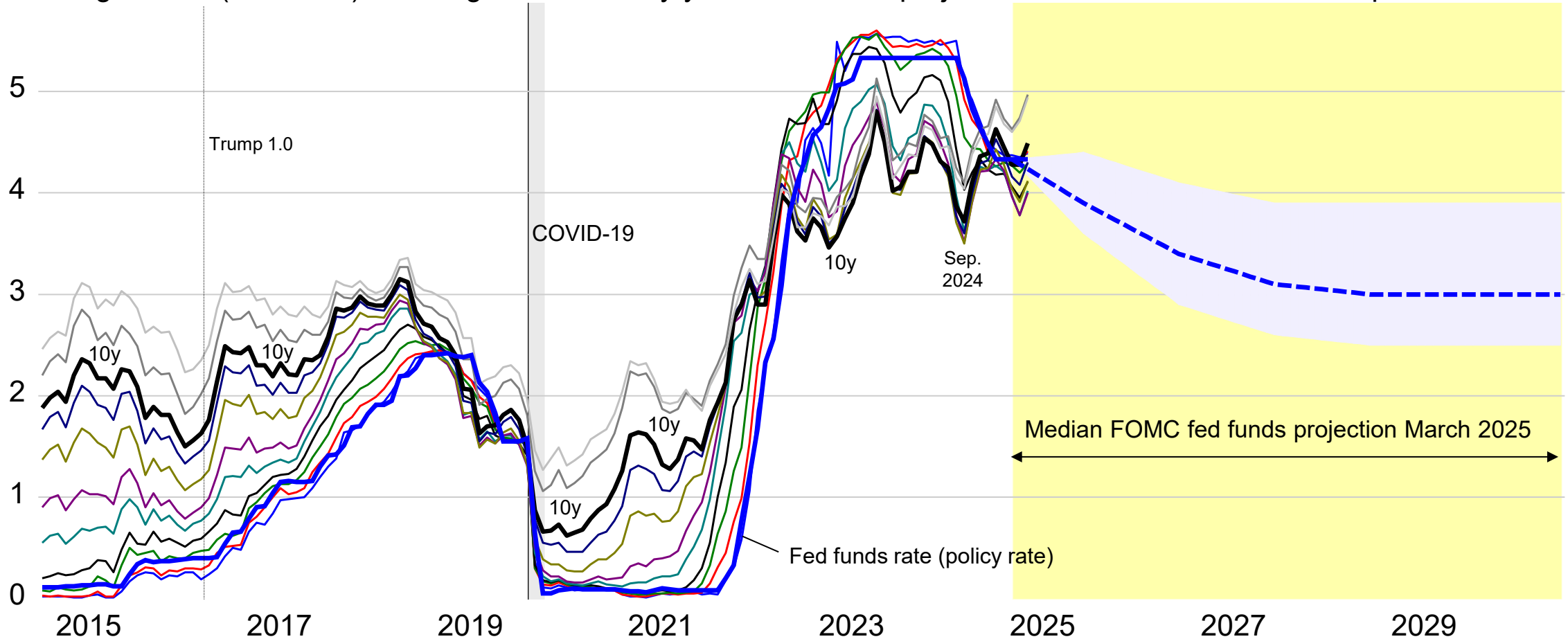
- Crude petroleum price spike moderated by Chinese import decrease (10-12 mbd end-2025 down to 5-6 mbd end-2026Q2)
- Iranian leverage over Straits of Hormuz assured by Memorandum of Misunderstanding

Expectations: higher long-term interest rates, higher inflation risk premium

- Abort downward trend in mortgage rates
- Headwind for housing sales volumes

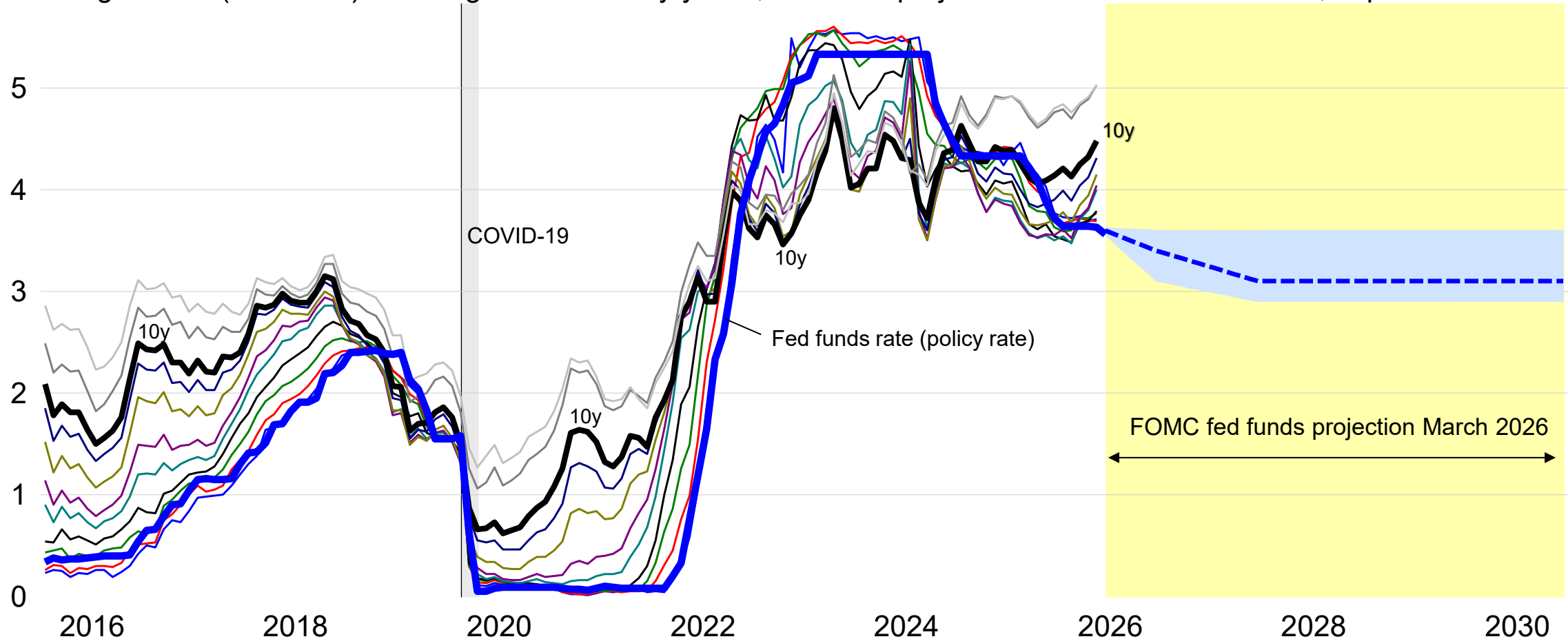
Term structure of U.S. Treasury yields and overnight fed funds rate (Federal Reserve policy rate): FOMC had paused in 2025 amidst higher uncertainty

Overnight rates (fed funds) and long-term Treasury yields, and FRB projections for the fed funds rate, in percent



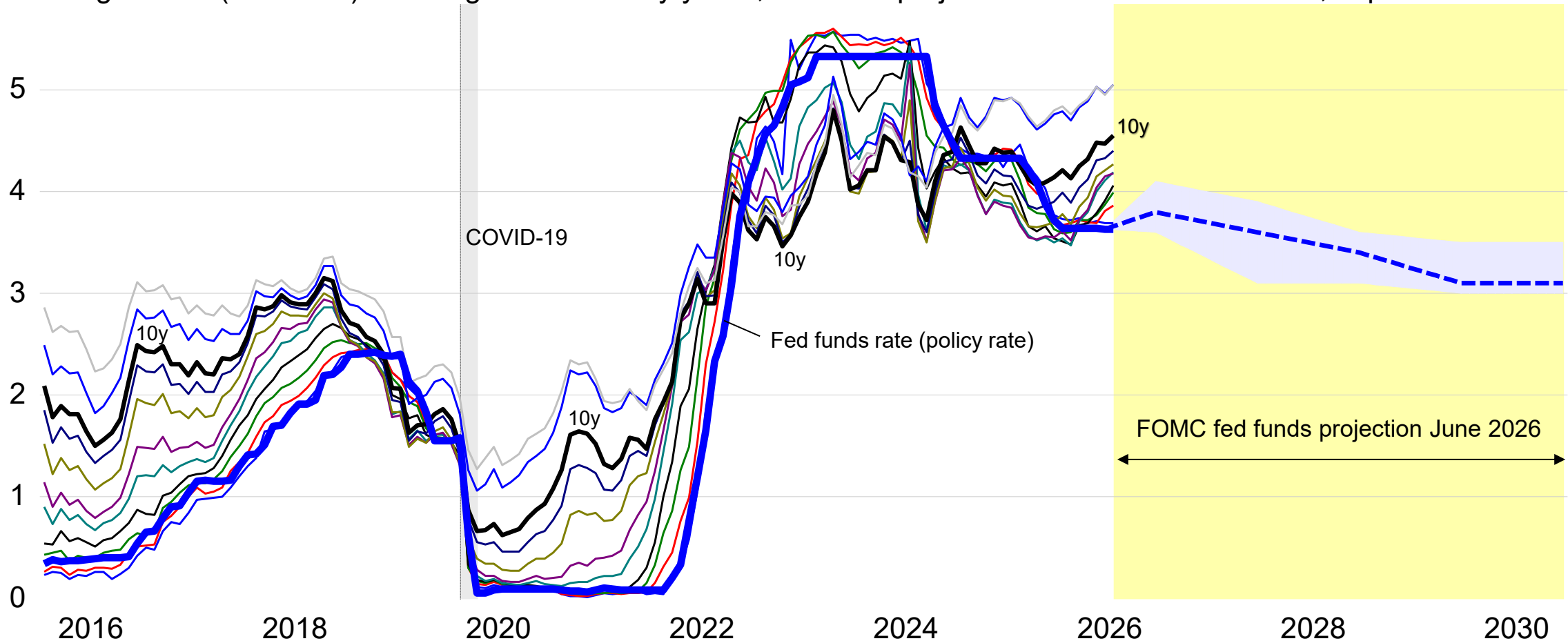
Term structure of U.S. Treasury yields and overnight fed funds rate (policy rate): FOMC had resumed soft landing but then Iran war came into the picture

Overnight rates (fed funds) and long-term Treasury yields, and FRB projections for the fed funds rate, in percent



Term structure of U.S. Treasury yields and overnight fed funds rate (policy rate): soft landing gone; now the Iran war has revived inflation risks, and FOMC shifted outlook

Overnight rates (fed funds) and long-term Treasury yields, and FRB projections for the fed funds rate, in percent

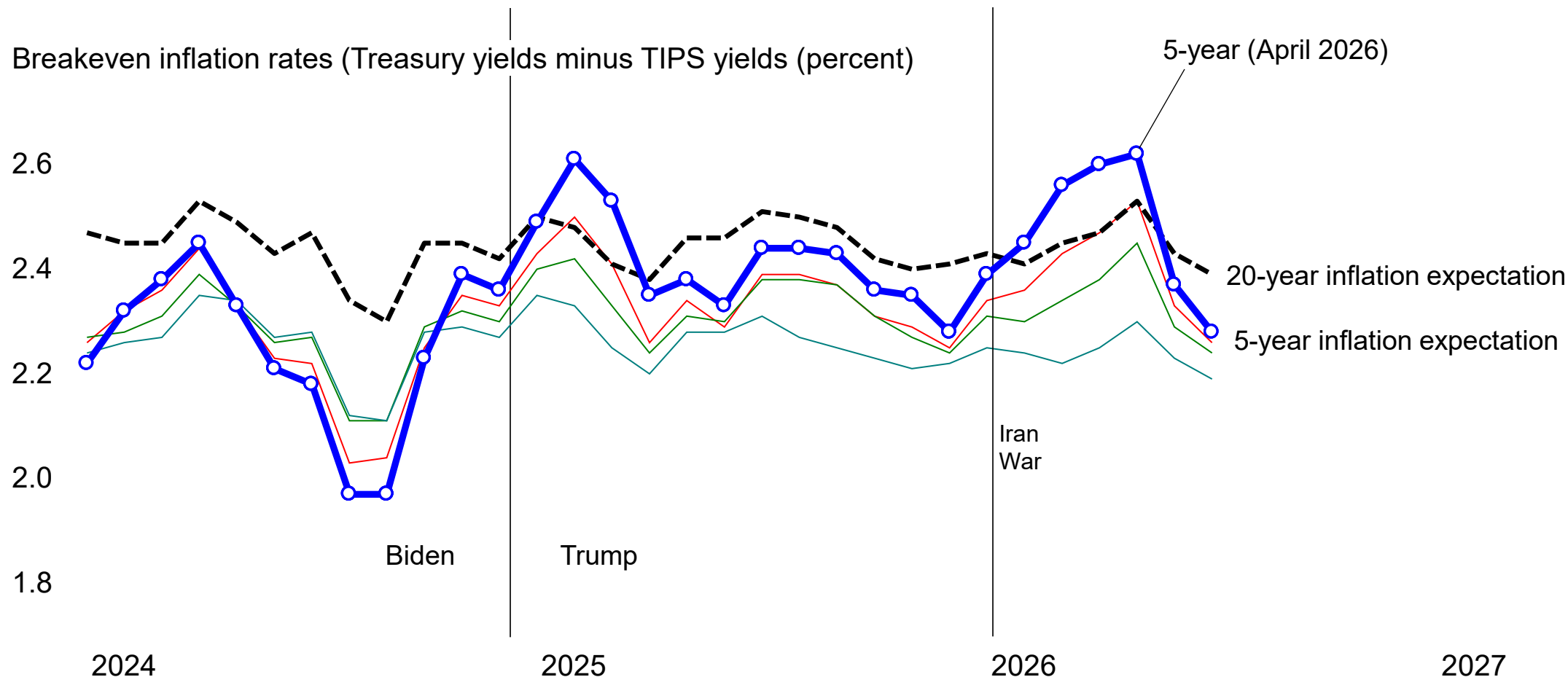


Treasury yields have presented a challenge to post-pandemic mortgage interest rates:
10-year T-Note benchmark in 2010s yielded 2 percentage points less than since 2023

Percent, adjusted to constant maturities

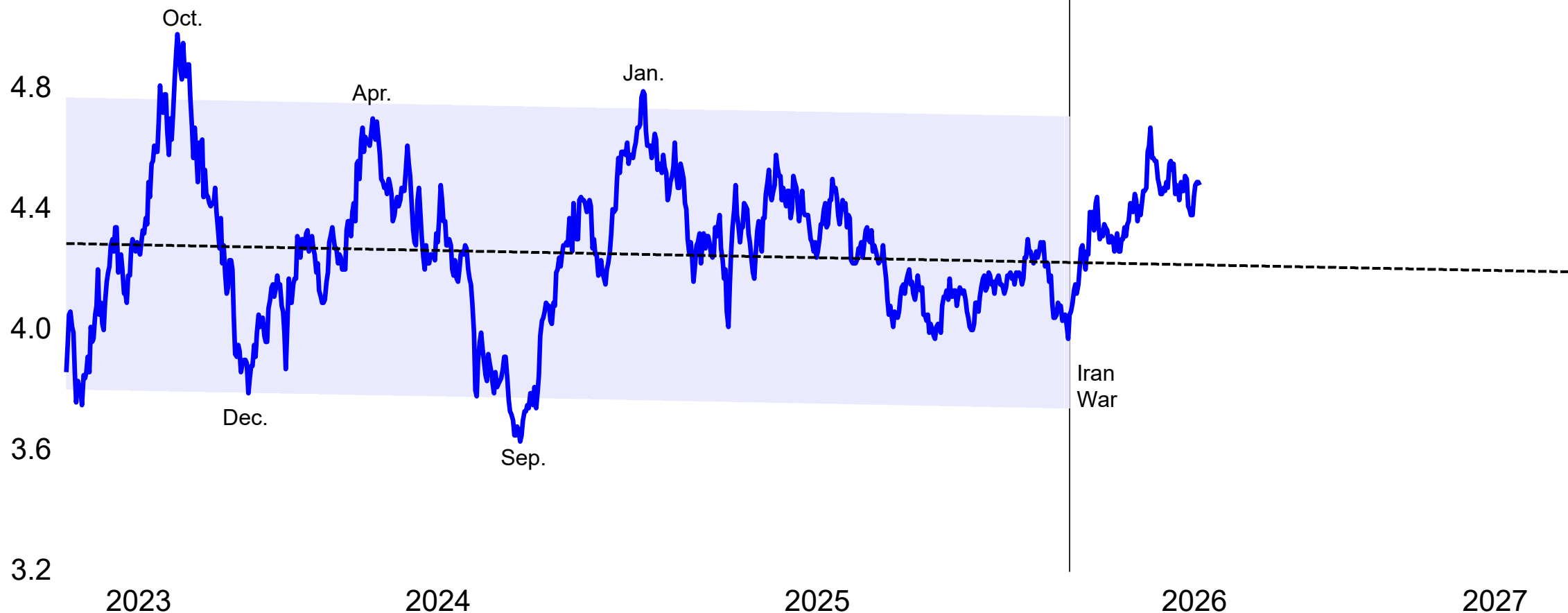


Iran War threw a wrench into inflation expectations formation, short-term vs. long-term (30 basis-point increase in 5-year inflation risk premium between Dec. 2025 and Apr. 2026)



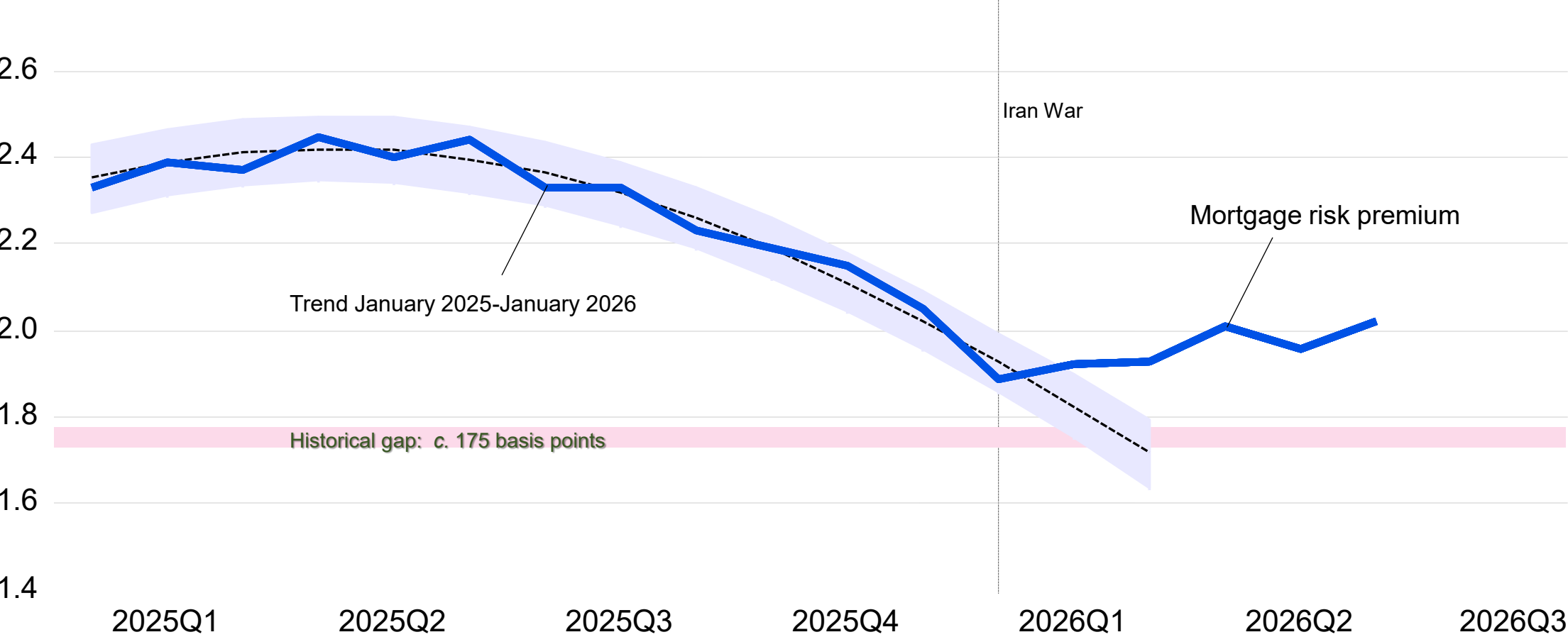
Close-up: 10-year U.S. Treasury Note yields have been trending *downward* gradually since 2023, narrowing bandwidth during Soft Landing, jumping back up after Iran War

Daily yields on 10-year T-Notes in percent, adjusted to constant maturities



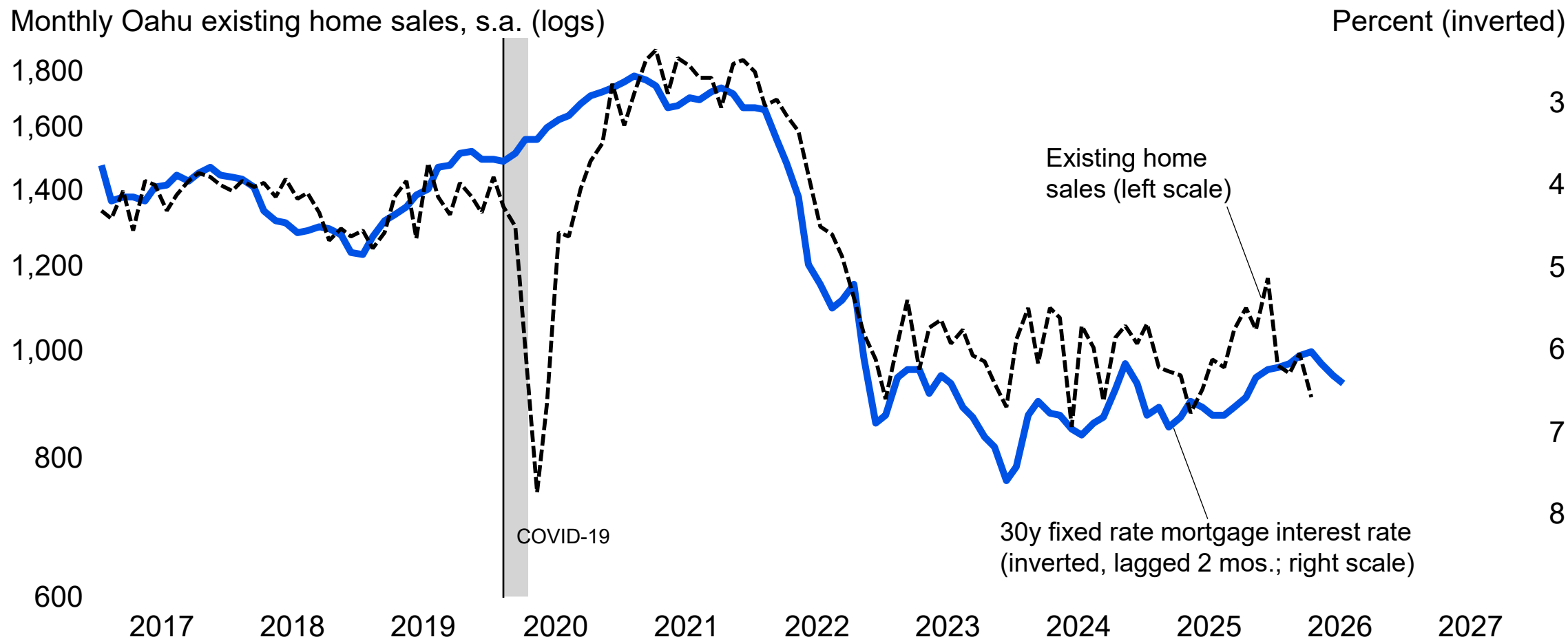
30yr mortgage interest rate premium to 10yr T-Note yield, surging in 2025 with policy uncertainty, stuck above historical norm by 20-25 b.p. since Iran War

30y mortgage interest rate minus 10y T-Note yield (weekly averages; percentage points)



Sources: Freddie Mac, 30-Year Fixed Rate Mortgage Average in the United States (weekly averages), and Board of Governors of the Federal Reserve System (US), Market Yield on U.S. Treasury Securities at 10-Year Constant Maturity, Quoted on an Investment Basis retrieved from FRED, Federal Reserve Bank of St. Louis (<https://fred.stlouisfed.org/series/MORTGAGE30US> and <https://fred.stlouisfed.org/series/DGS10>), July 13, 2026. Projection from non-linear regression through January 19, 2025 depicted with 2 standard-error bandwidth.

Strong inverse relationship between 30-year fixed-rate mortgage interest rates, Oahu home sales; decline in mortgage rates reversed after Iran War



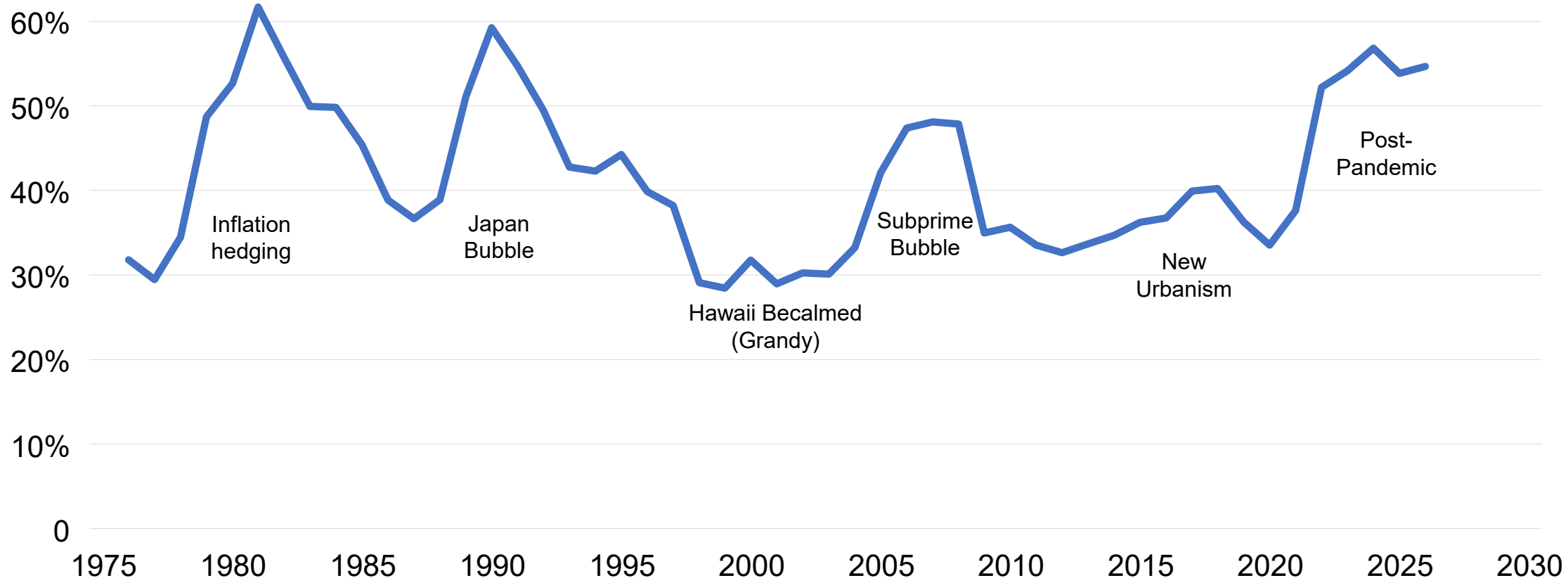
What housing valuations are telling us now

Long-term valuation trends holding, but nuances important

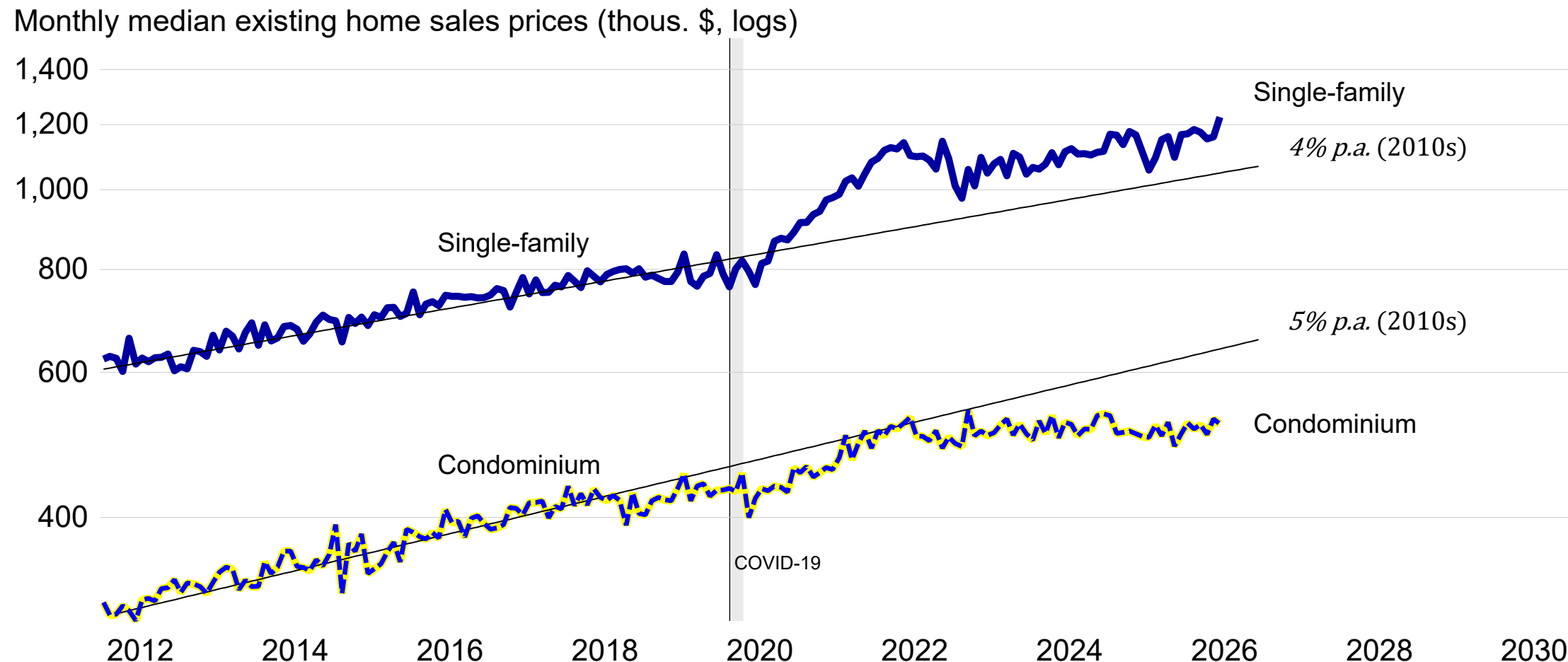
- Housing affordability impairment unusually persistent
- Oahu condos in their own Private Idaho as outliers
- Multifactor nuances: short-term rental haters, remote work, insurance, vintage
- Key long-term concern: Oahu had the juice 35 years ago, not any more

Honolulu (single-family home) housing affordability index (higher is less affordable):
supply shocks (this year, oil) + demand shock (WFH) = persistent affordability erosion

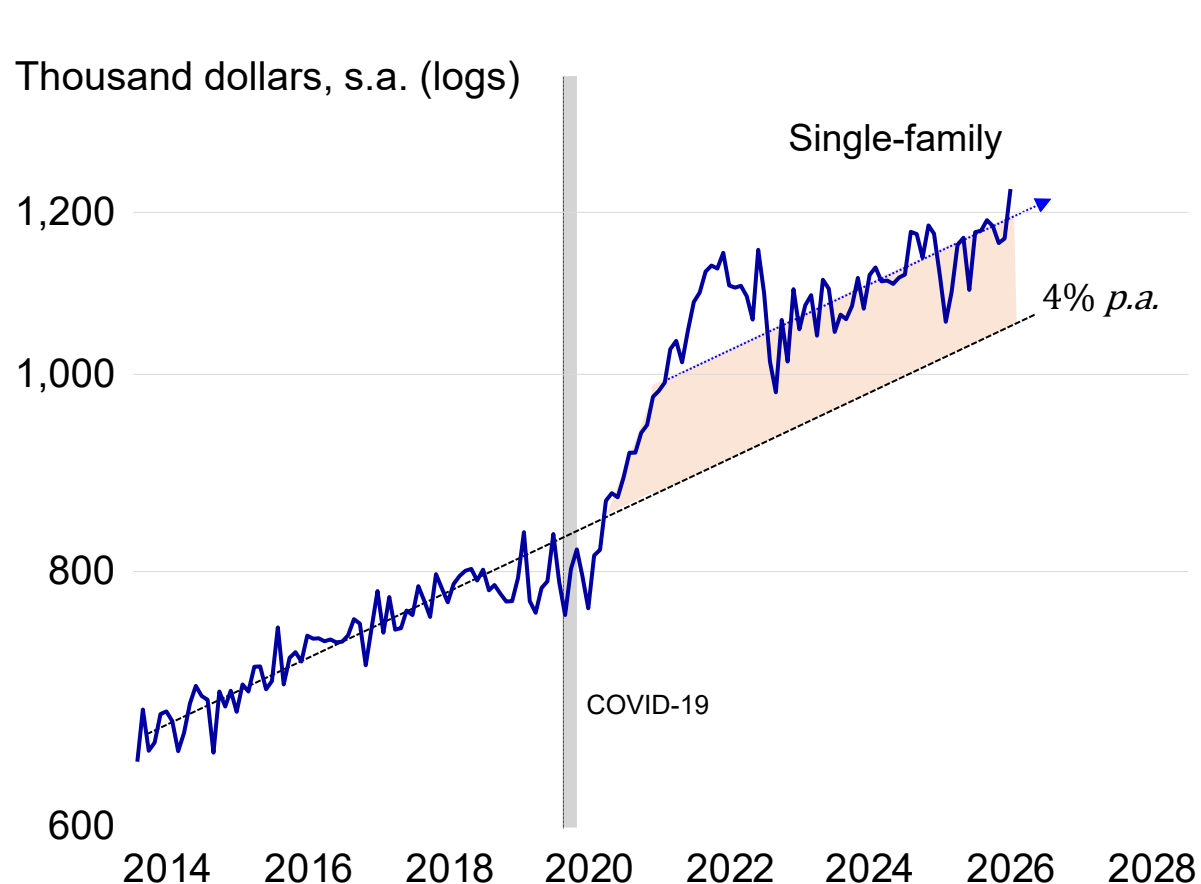
Index of Oahu housing affordability (higher is worse): ratio of mortgage payment to 4-person median income



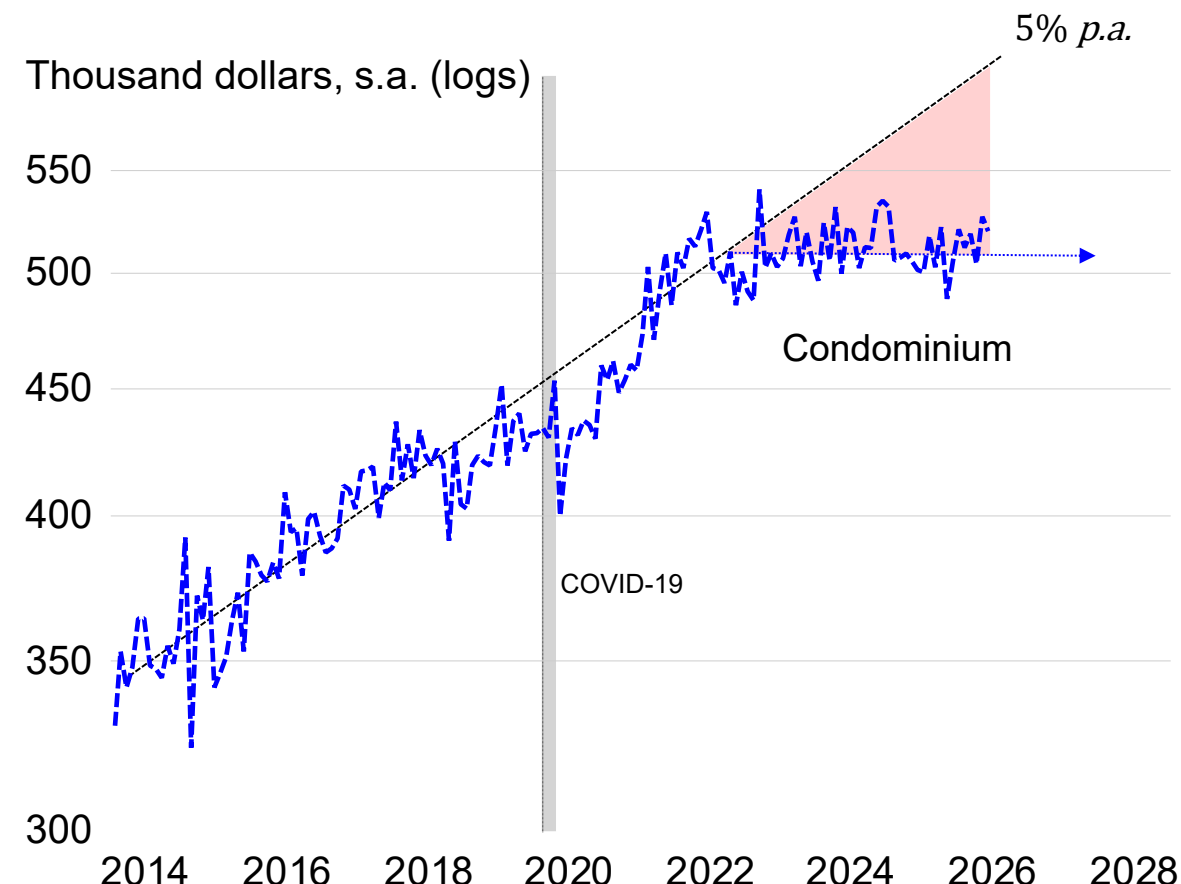
Post-pandemic divergence of Oahu median single-family home prices and condo prices, relative to trend, expresses structural distinctions (e.g. working from home)



Median Oahu single-family home prices overshoot above trend during covid with remote work adoption, stayed on parallel, higher *trajectory* than condo prices (latter impaired by insurance)

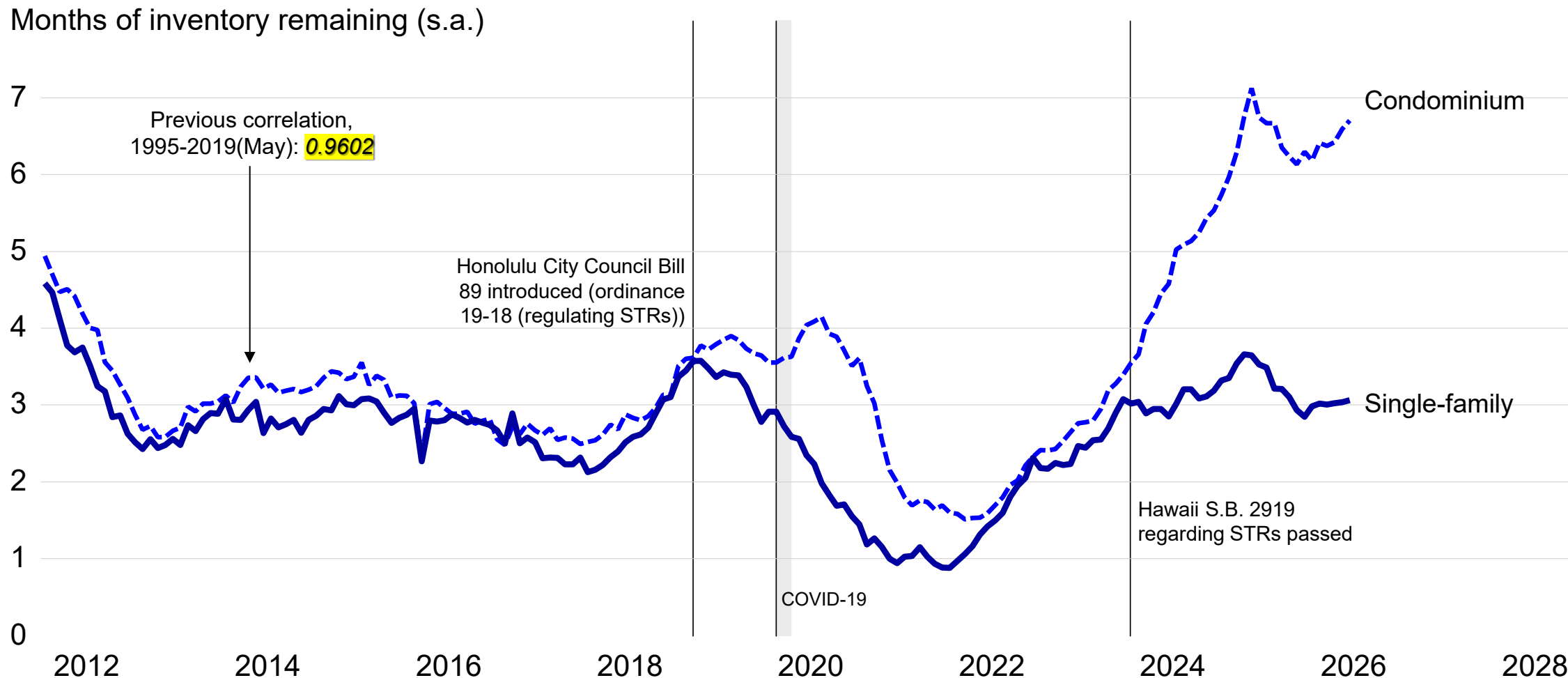


Oahu median single-family home prices
(boosted by WFH in Oahu suburbs vs. in-town)



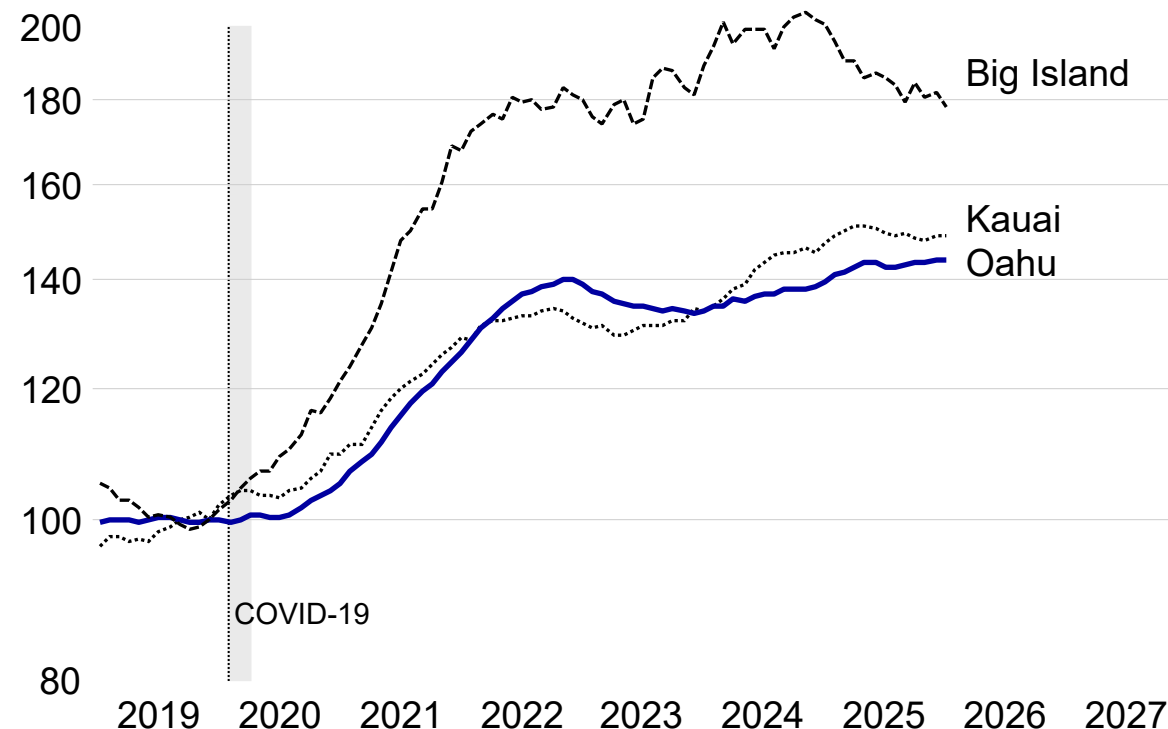
Oahu median condominium prices
(disadvantaged by WFH, insurance costs)

Vintage issues and insurance costs challenge condo associations in high-rise structures 80 percent of which were built before *Magnum, P.I.*; but STR haters are killing condo inventories



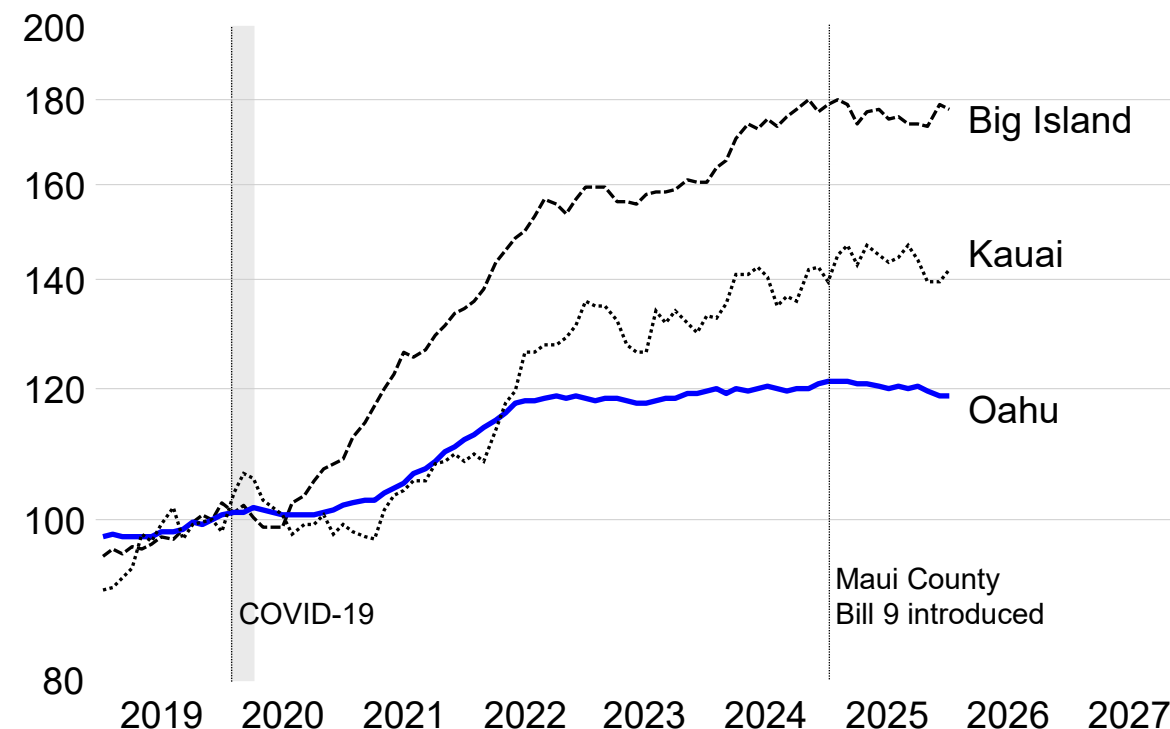
Post-pandemic WFH boosted single-family home prices *and* Neighbor Island condo prices (Digital Nomads; resort areas); Maui chose to self-destruct by banning *legal* short-term rentals

Monthly median single-family home sales prices (2019 = 100, logs)*



Single-family homes
(WFH advantage)

Monthly median condominium sales prices (2019 = 100, logs)*

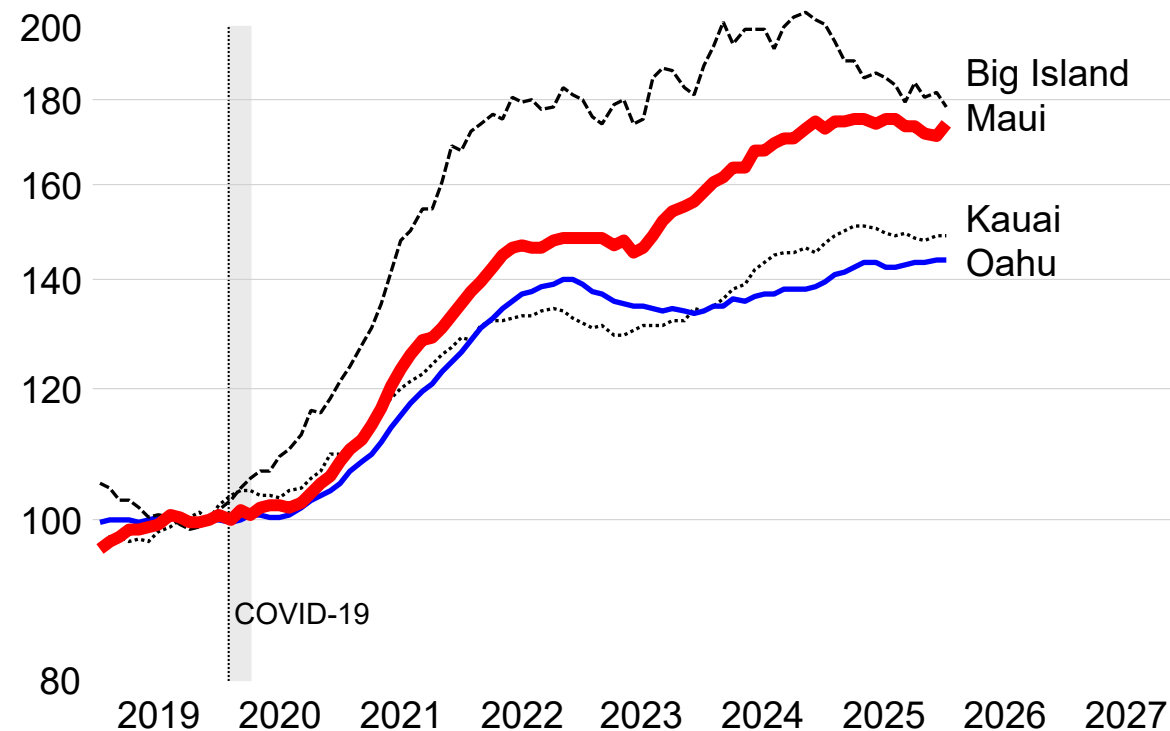


Residential condominiums
(Digital Nomads, resort areas)

*12-month moving averages

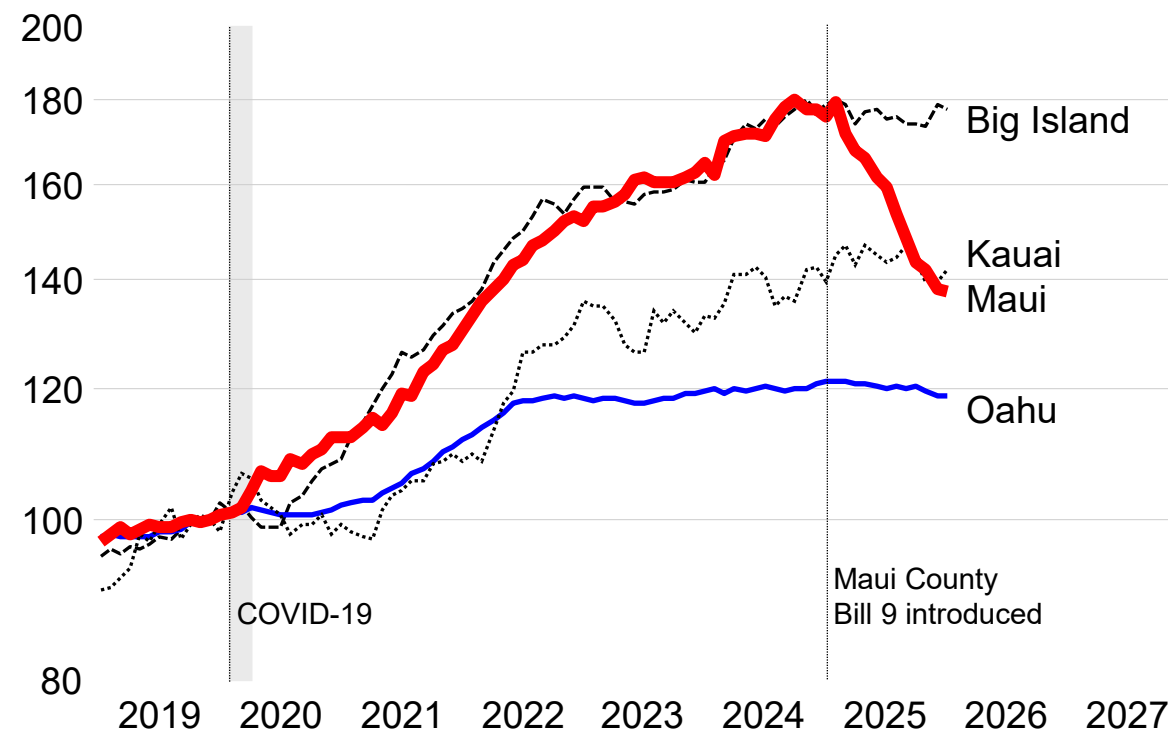
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Single-family homes

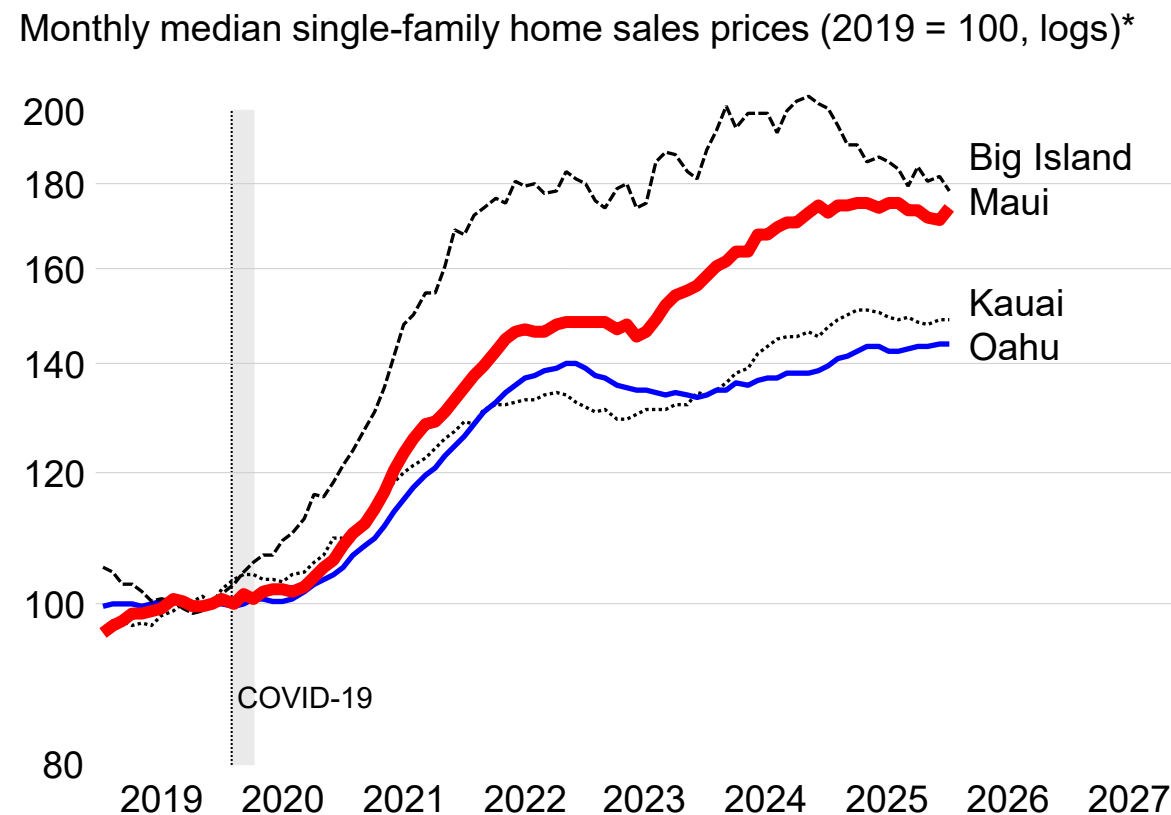
Monthly median condominium sales prices (2019 = 100, logs)*



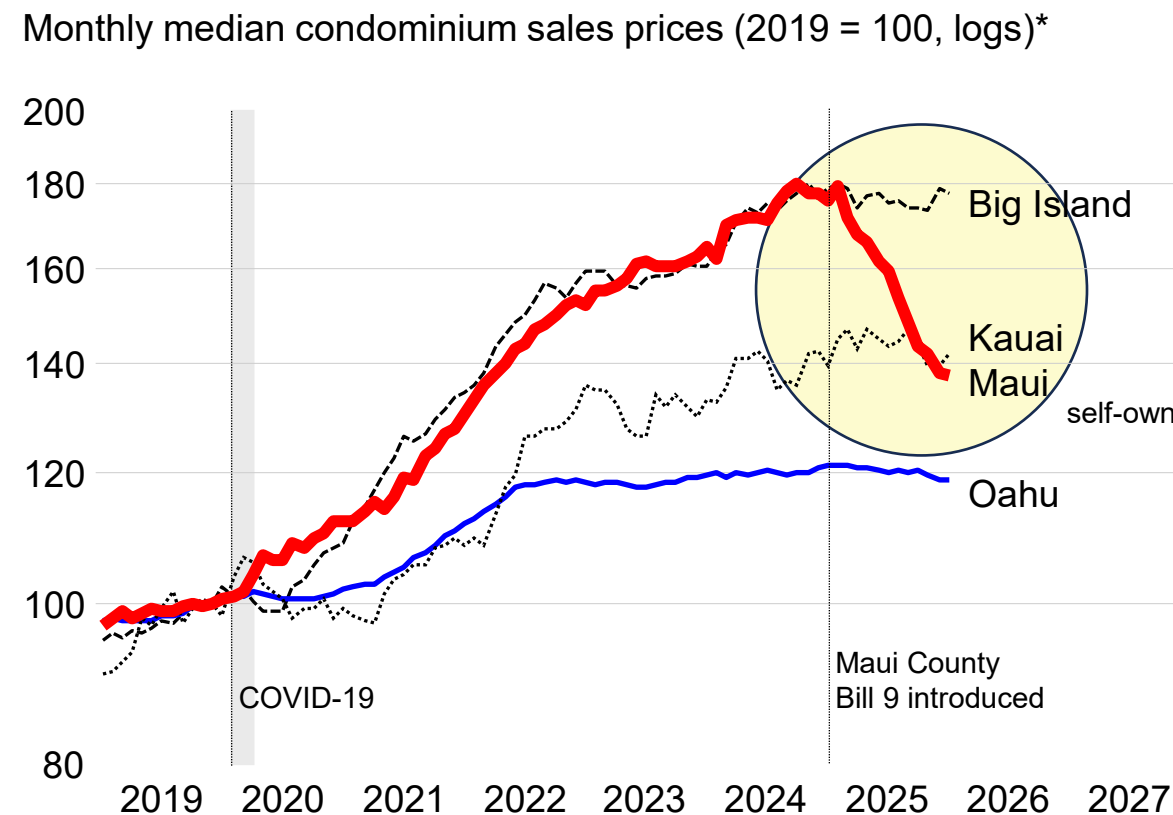
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Single-family homes



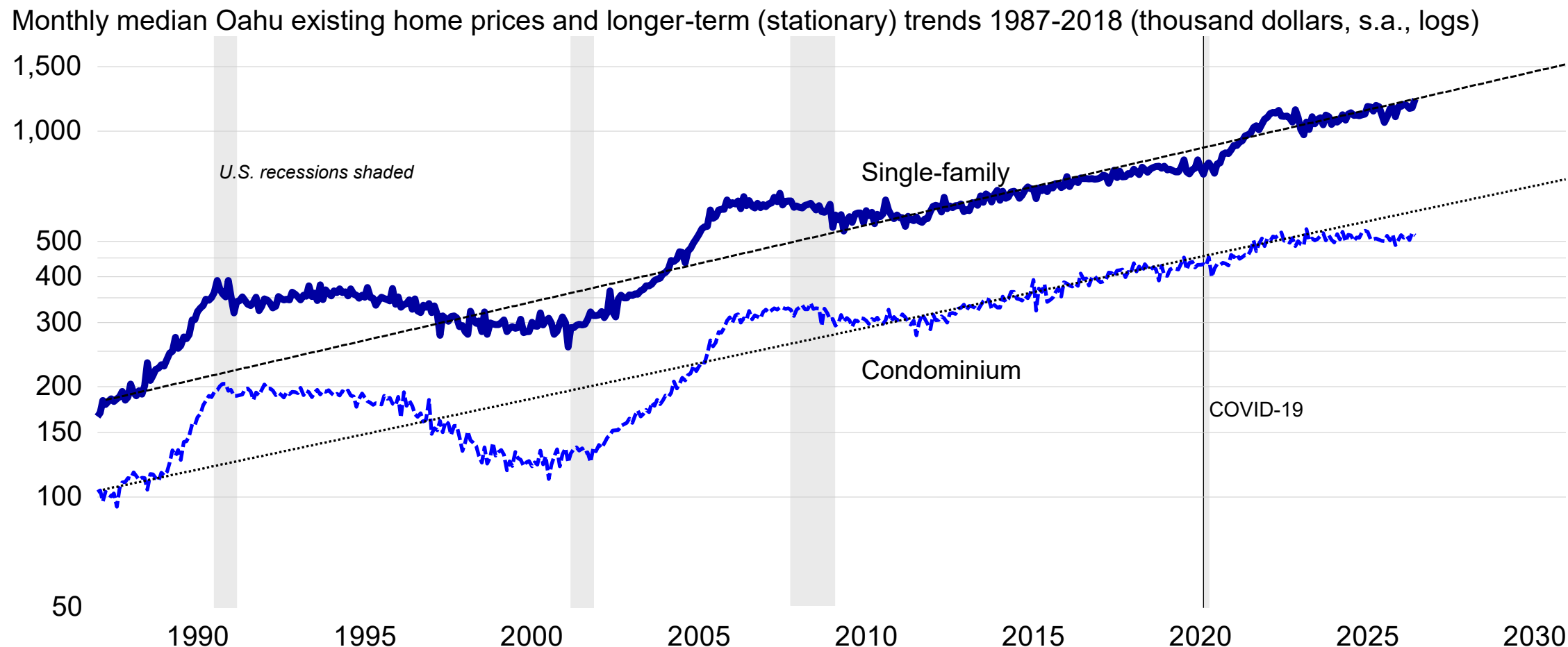
Residential condominiums

*12-month moving averages

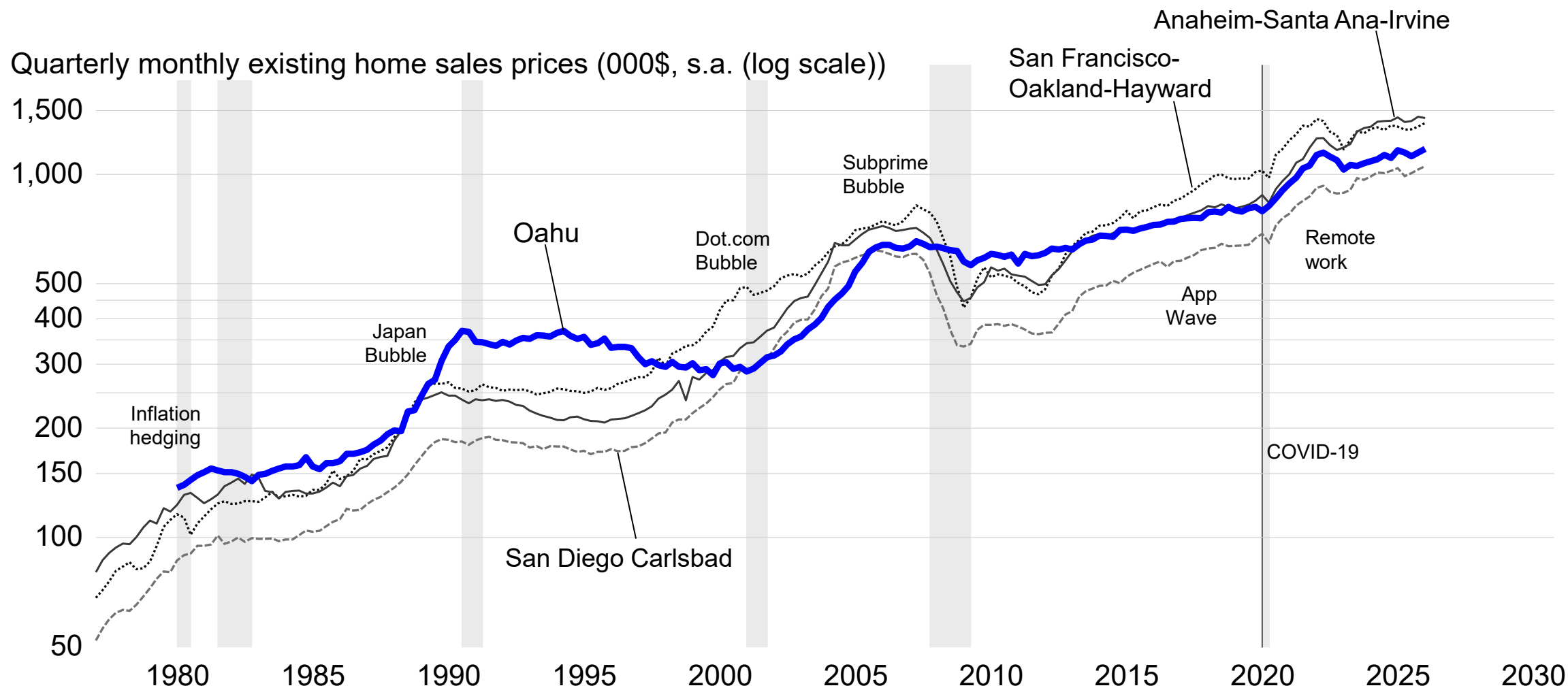
- Remote work changed housing fundamentals. Demand shifted towards detached dwellings, toward suburbs, exurbs, and Zoomtown (working from home; digital nomads)
- Massive self-own. Maui Bill 9 (2025)—reneging on short-term rentals undermined credibility of county pre-commitment to private property rights and zoning (“time inconsistency”)
- Delaying Bill 9 implementation to 2029-30 fooled no one. Policy is about signaling: investors saw the train wreck coming (STR ban), busted moves (sell). Maui condo price overshooting happened between *introduction* and *passage* of Bill 9, not after (“sell the rumor; buy the fact”).
- Asset prices fall “too far.” Policy regime switch created a fire-sale externality, but *only* in the condo market, and *only* on Maui; prices fall until low enough for future *above* average returns
- Front-running UHERO “affordability” forecast. Investors trade on expectations; condo deflation happened during *deliberation*, not implementation; risk of adverse collateral consequences*

*Ben S. Bernanke and Mark Gertler (Fall 1995) “Inside the Black Box: The Credit Channel of Monetary Policy Transmission,” *Journal of Economic Perspectives*, vol. 9, no. 4 (pp. 27–48) (<https://www.aeaweb.org/articles/pdf/doi/10.1257/jep.9.4.27>).

Estimated over longer horizons, valuation trends for both Oahu housing market segments converge to 4-5 percent *per annum* for 30 years of HBR data; “past performance no guarantee...”

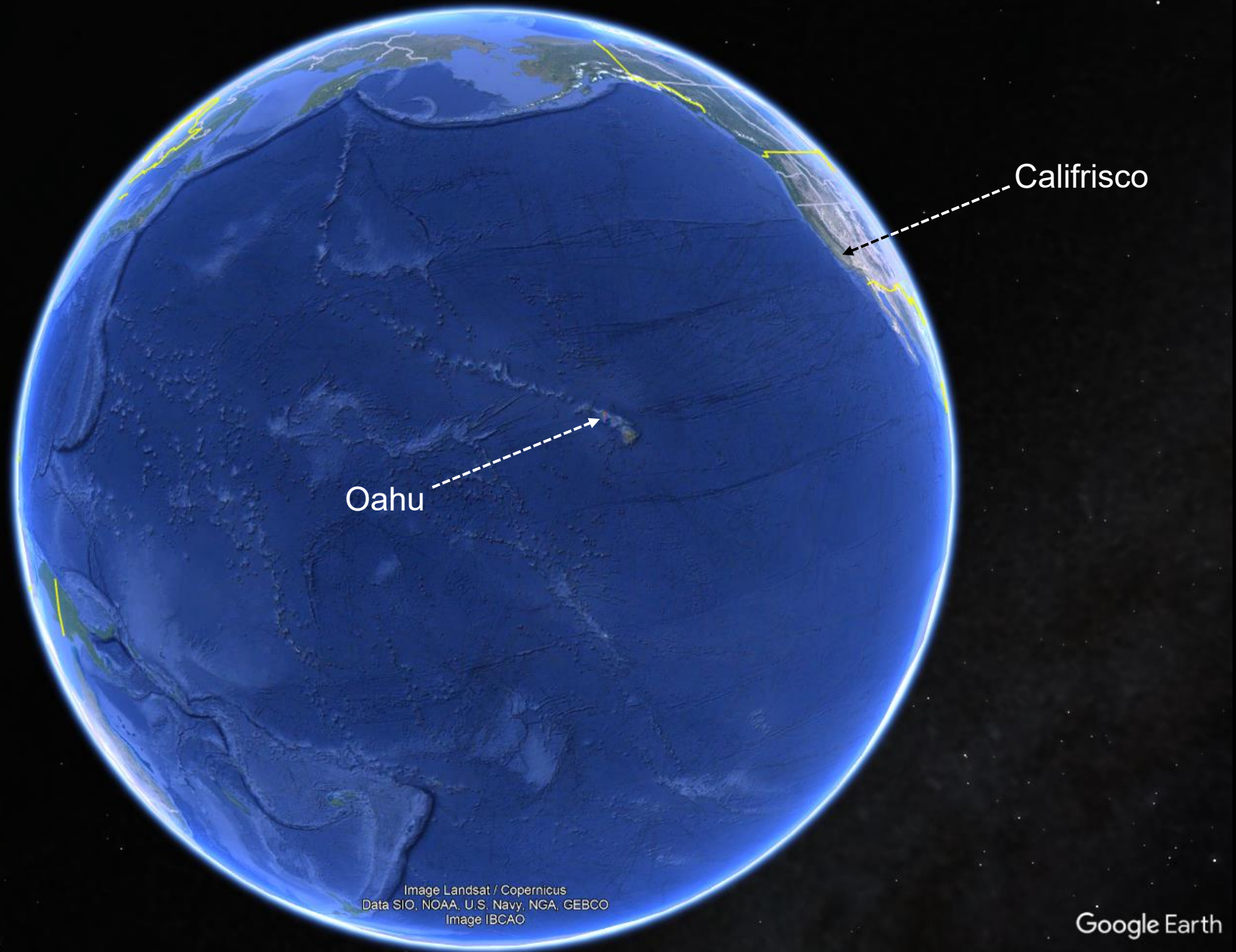


Oahu and California metro median existing single-family home sales prices through 2026Q1: LR co-movement substantiates no-arbitrage equilibrium

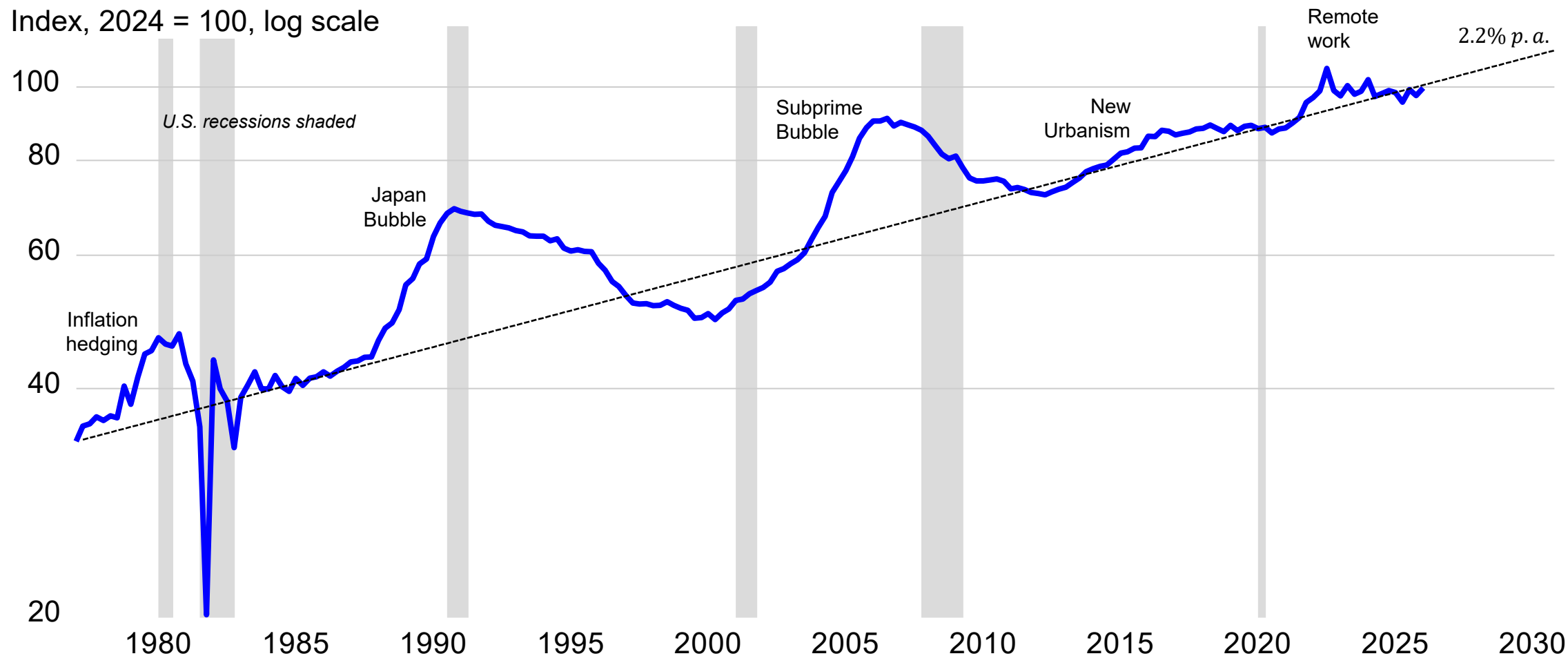


Why would Oahu
and California
home price
dynamics be
synchronous?

Arbitrage



Oahu real FHFA house price index through 2026Q1: convergence to long-run real appreciation (2.2% *p.a.*), valuation cycles less bubblicious than in past



Summarizing some key takeaways: can next generation rise to challenges?

- Supply shocks—unconstitutional tariffs, Hormuz Strait impedance, recurrent inflation risks
- Unprecedented macro-policy uncertainty (cannot fix AS problems with AD solutions)
- Higher-order impacts: rising risk premia (interest rates); spillovers (fertilizer, aluminum, air travel)
- Unraveling of U.S. geopolitical hegemony (trust gone)
- Post-pandemic structural changes: supply chains, remote work, *etc.*; now AI—a lot to digest
- Problems compounded by local economic policy self-owns

Interest rate forecasts: National Association for Business Economics (June 2026)

	2026June	26Q3	26Q4	27Q1	27Q2	27Q3	27Q4
Federal funds rate	3.625	3.625	3.625	3.563	3.375	3.375	3.356
10-year Treasury Note	4.470	4.410	4.360	4.300	4.250	4.232	4.230
Mortgage rate @ +200 b.p.	6.470	6.410	6.360	6.300	6.250	6.232	6.230
Mortgage rate @ +175 b.p.	6.220	6.160	6.110	6.050	6.000	5.982	5.980

NABE Outlook Survey (June 2026)

“NABE Outlook Survey Panel Lowers Growth Forecasts, Raises Inflation Projections, and Pushes Out Fed Easing”

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