

The Future is Now: Recovery and Trends

a webinar presentation prepared for

Hawai'i REALTORS®

by Paul H. Brewbaker, Ph.D., CBE

TZ Economics, Kailua, Hawaii

July 14, 2021



TZ ECONOMICS

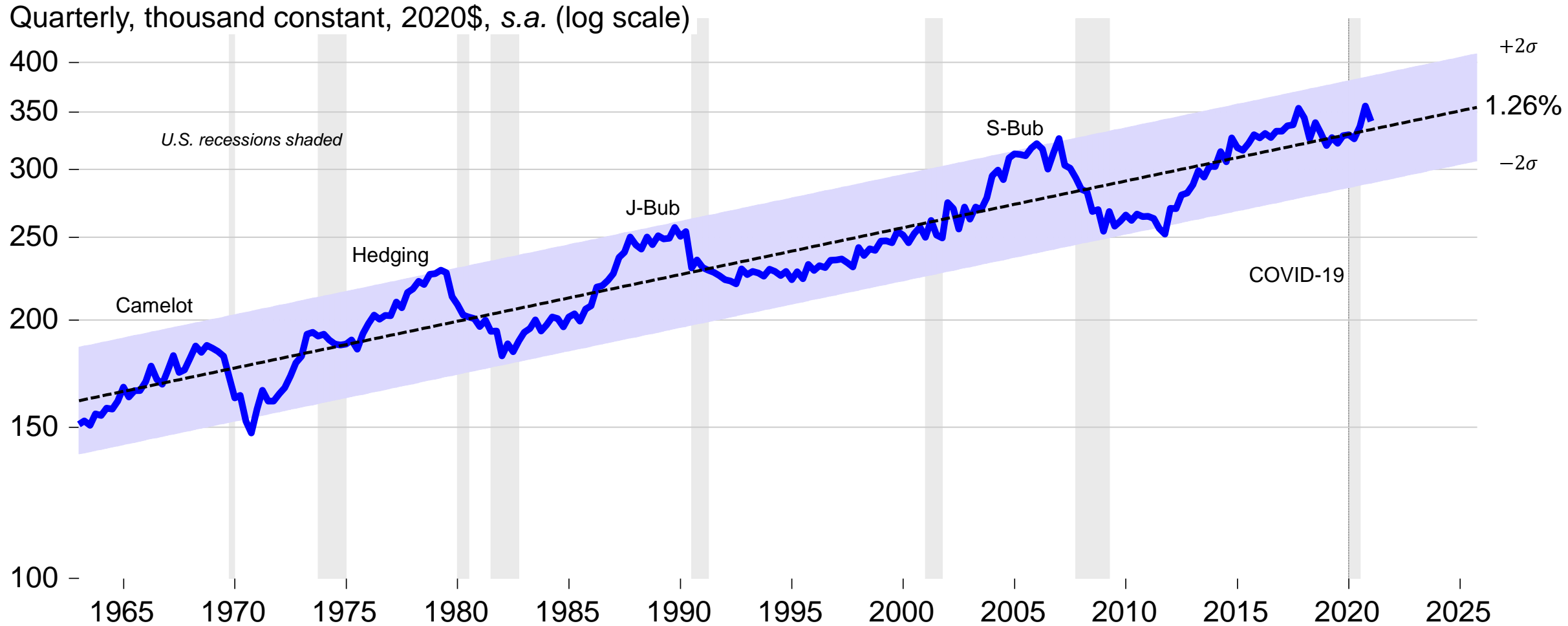
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Housing asset pricing Tiny Bubbles?

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Real median U.S. house prices have cycled within a 99% conf. interval for 50 years: media wonks now want pandemic to spawn a “bubble”



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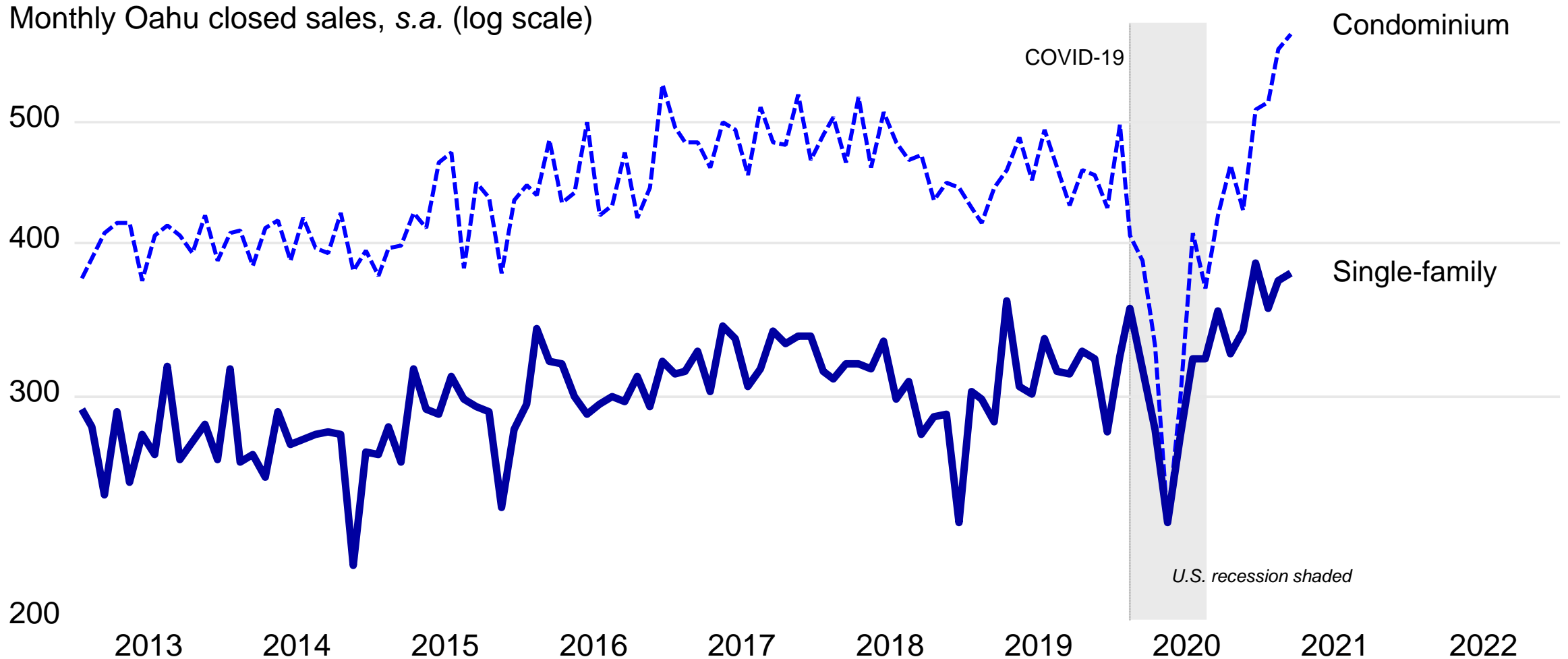
Sources: U.S. Census Bureau, HUD, Median Sales Price of Houses Sold for the U.S. [MSPUS], BLS, Consumer Price Index for All Urban Consumers: All Items in U.S. City Average [CPIAUCSL], retrieved from FRED, Federal Reserve Bank of St. Louis; (<https://fred.stlouisfed.org/series/MSPUS>, <https://fred.stlouisfed.org/series/CPIAUCSL>); regression of natural log of real median house prices on time trend 1963Q1-2020Q1.



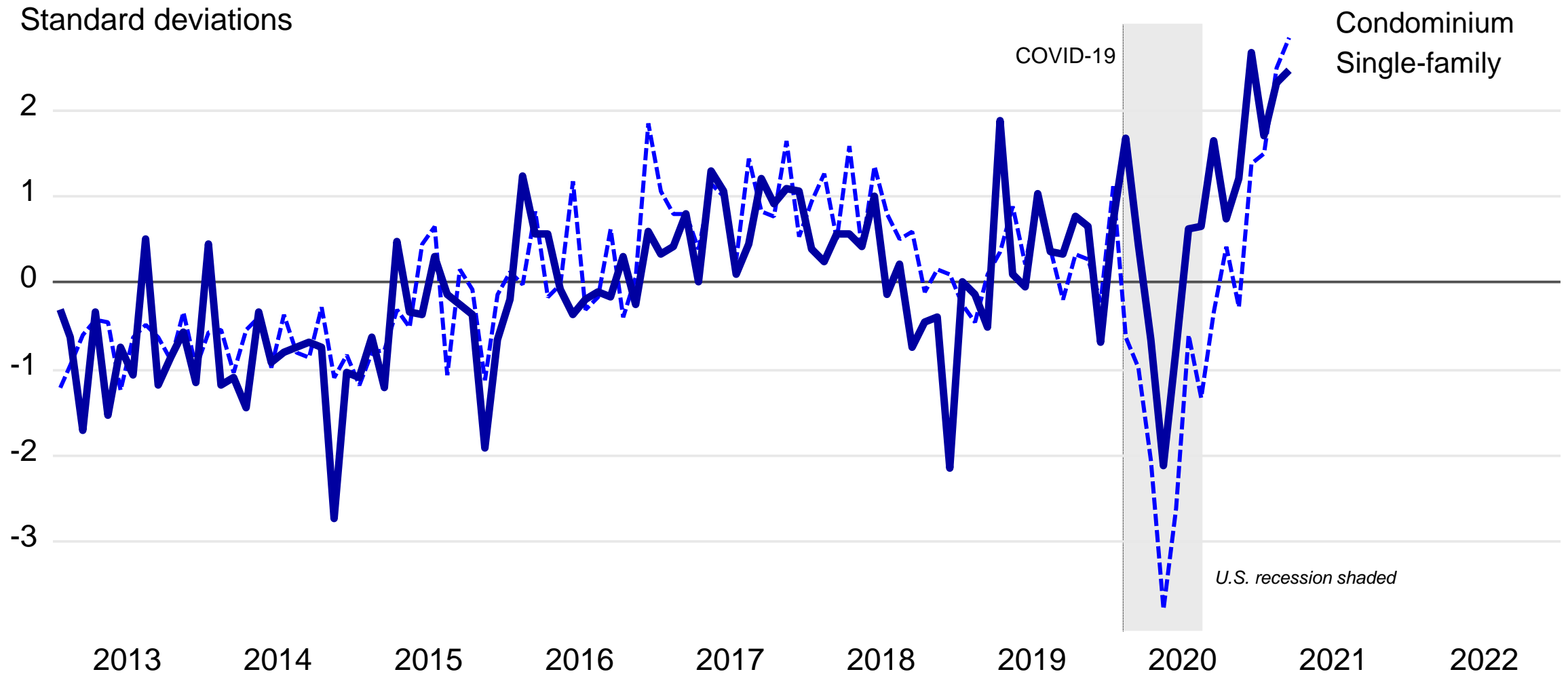
Bubbliciousness or “Too Soon To Tell?”

- Work-from-Home (WFH) making Tiny Bubbles in Oahu single-family home prices?
 1. Condos less so, *idiosyncratic* to detached dwellings, not to “housing” generally
 2. Wave of urban core valuation downward pressure; backwash of urban bargains?
 3. Low mortgage interest rates don’t *differentially* affect housing segments
- WFH implications for residential *and* commercial real estate
 1. Flight to suburbs, exurbs, “Zoomtowns” like Kauai, West Maui; one-time shift?
 2. Less office space? More space in the office (distancing)? More collaboration space(s)?
 3. Retail Zombie Apocalypse? “Strip mall, Megachurch, or last mile fulfilment, pick one.”
- Nicholas Bloom (Stanford) vs. Ed Glaeser (Harvard): ongoing urban economics debate
 1. Work from home here to stay or just a thing people do now at Microsoft, Google, and Apple?
 2. *Triumph of the City*: Boomers abandon urban core, rents fall, Millennials swarm in?
 3. Hybrid work 2-3 days/week in office: in-person collaboration, less commuting; little of both?

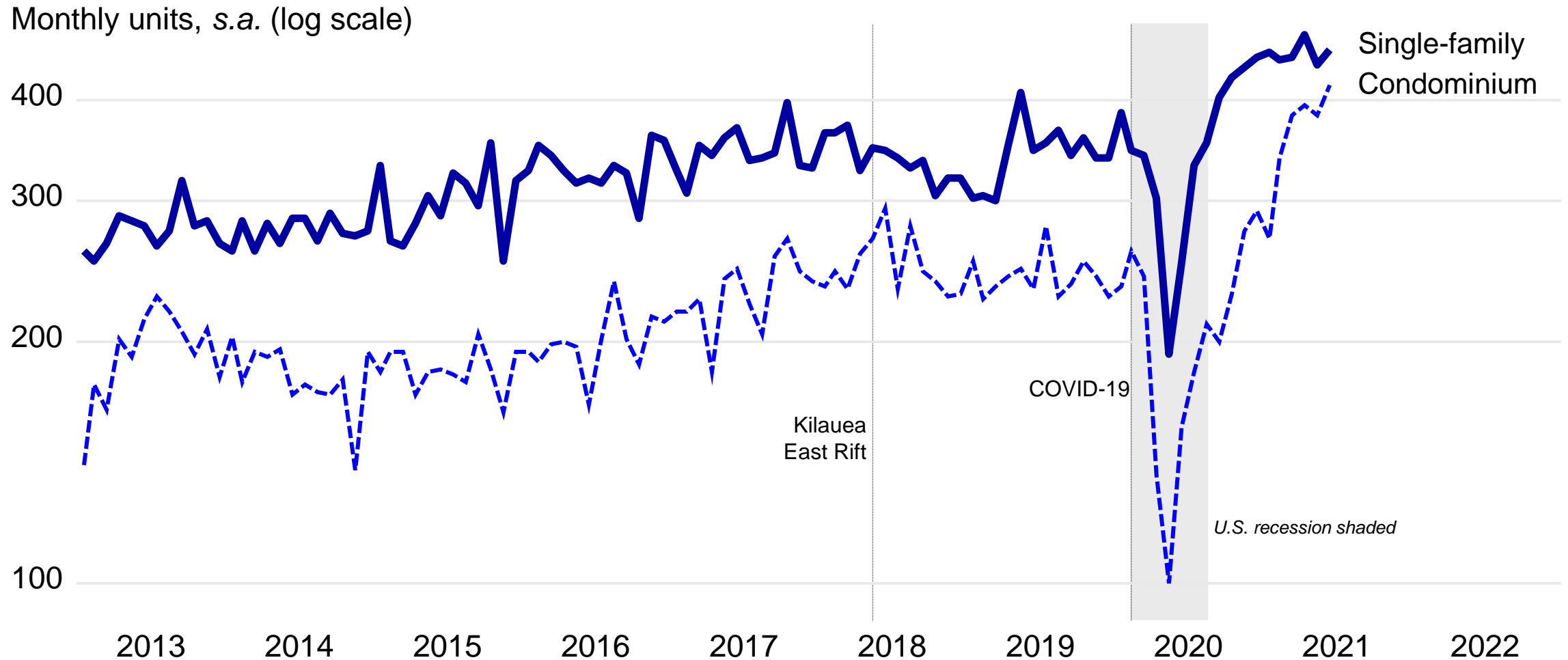
Lots of excitement—in a low interest rate environment—about recent condo sales growth after a deep decline in sales during spring 2020



Normalized Oahu sales data show that distinction was in severity of condo sales' loss to Covid; roughly matching recoveries



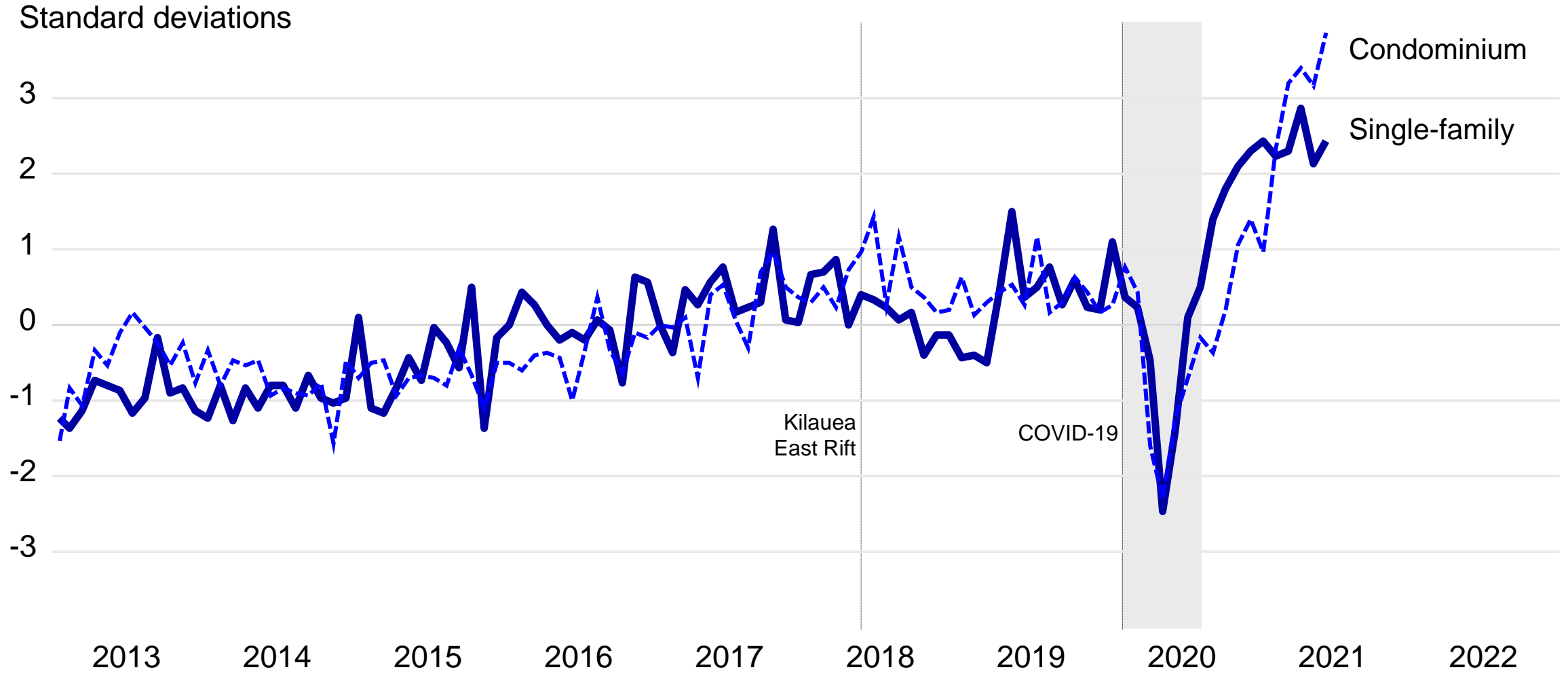
Nearby Island existing home sales stalled after Kauai floods and Kilauea eruption in 2018, then plummeted after onset of Covid shock



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Sources: Hawaii Information Service, Realtors Association of Maui, also compiled in *Monthly Economic Indicators* by Hawaii DBEDT (<http://dbedt.hawaii.gov/economic/mei/>), monthly through June 2021, seasonally-adjusted using log transforms of underlying data with X-13 ARIMA filter by TZ Economics.

Normalized Neighbor Island sales data highlight equal drops, speedy recovery in single-family home segment, subsequent condo rebound



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Sources: Hawaii Information Service, Realtors Association of Maui, also compiled in *Monthly Economic Indicators* by Hawaii DBEDT (<http://dbedt.hawaii.gov/economic/mei/>), monthly through June 2021, seasonally-adjusted using log transforms of underlying data with X-13 ARIMA filter by TZ Economics.

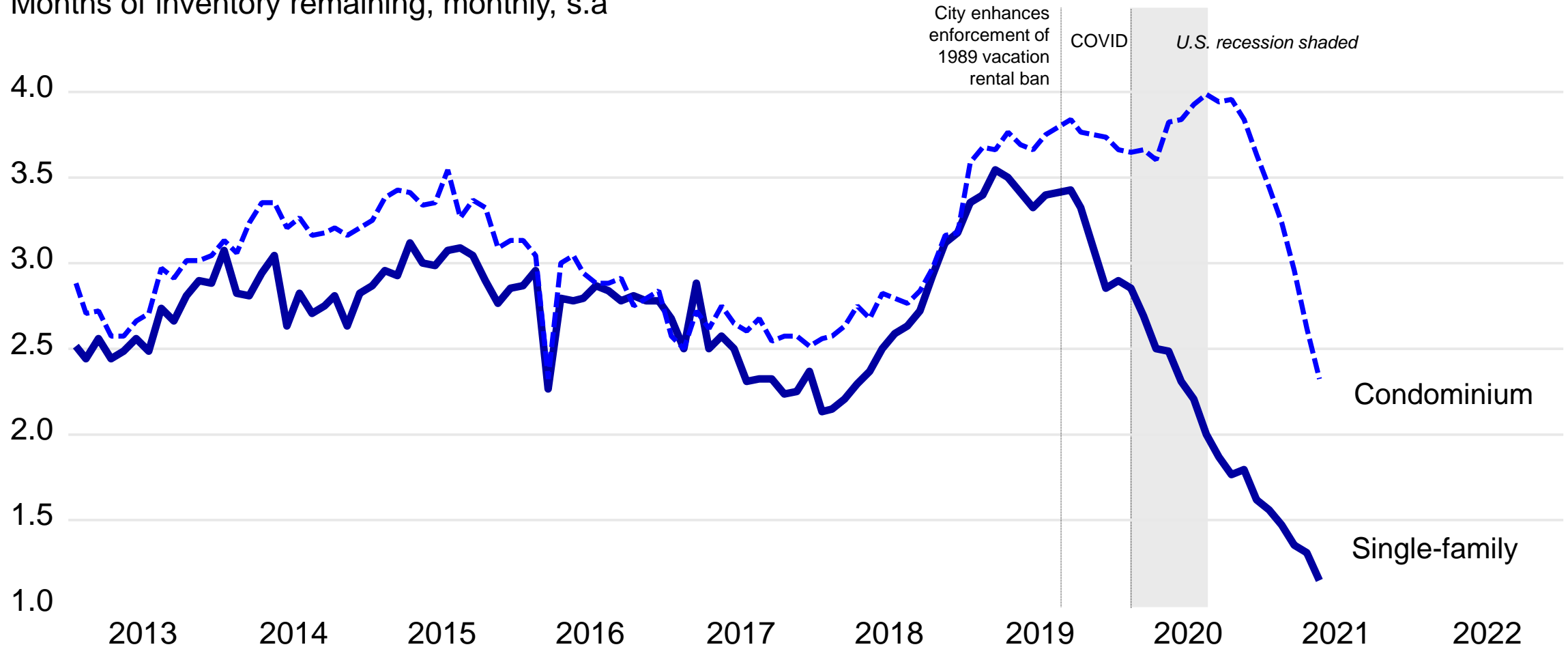


Supply chain: rise in housing demand, near-zero supply response

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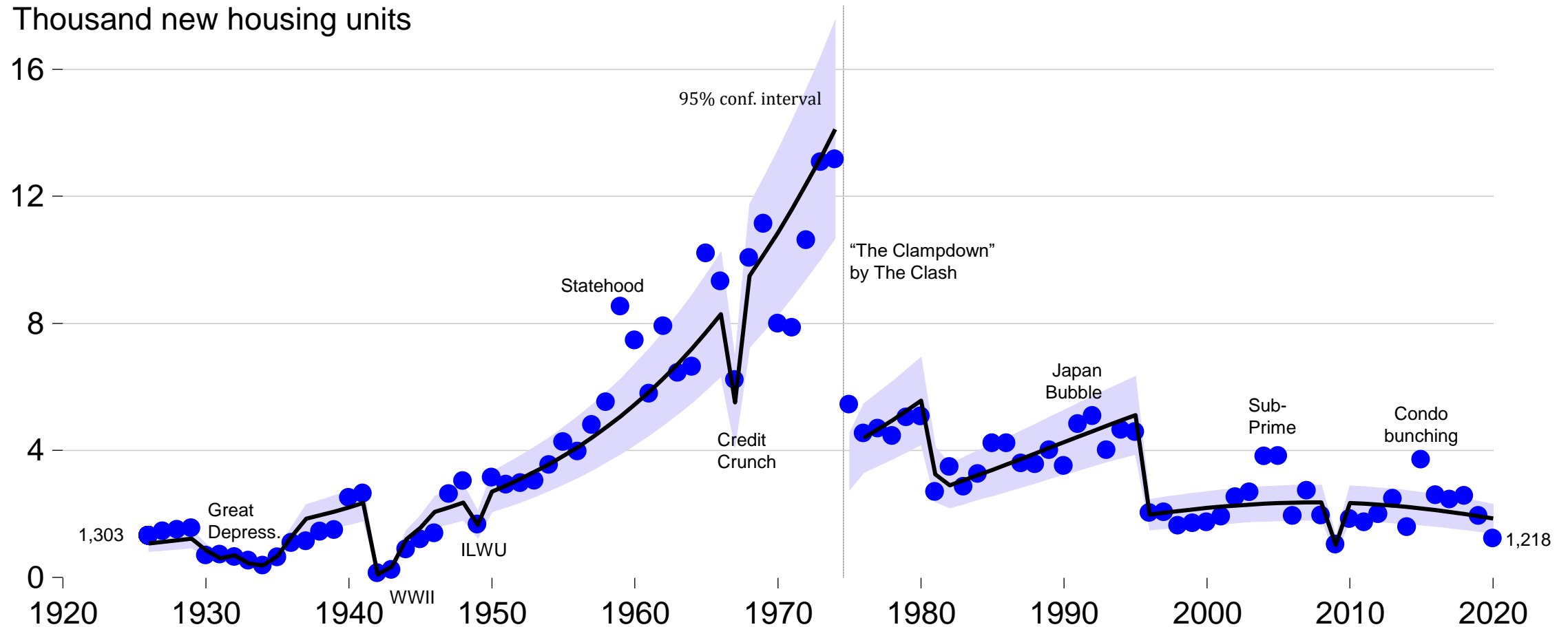
Oahu months of inventory remaining dropped for single-family homes in 2020 but condo inventories piled up before re-aligning in 2021

Months of inventory remaining, monthly, s.a



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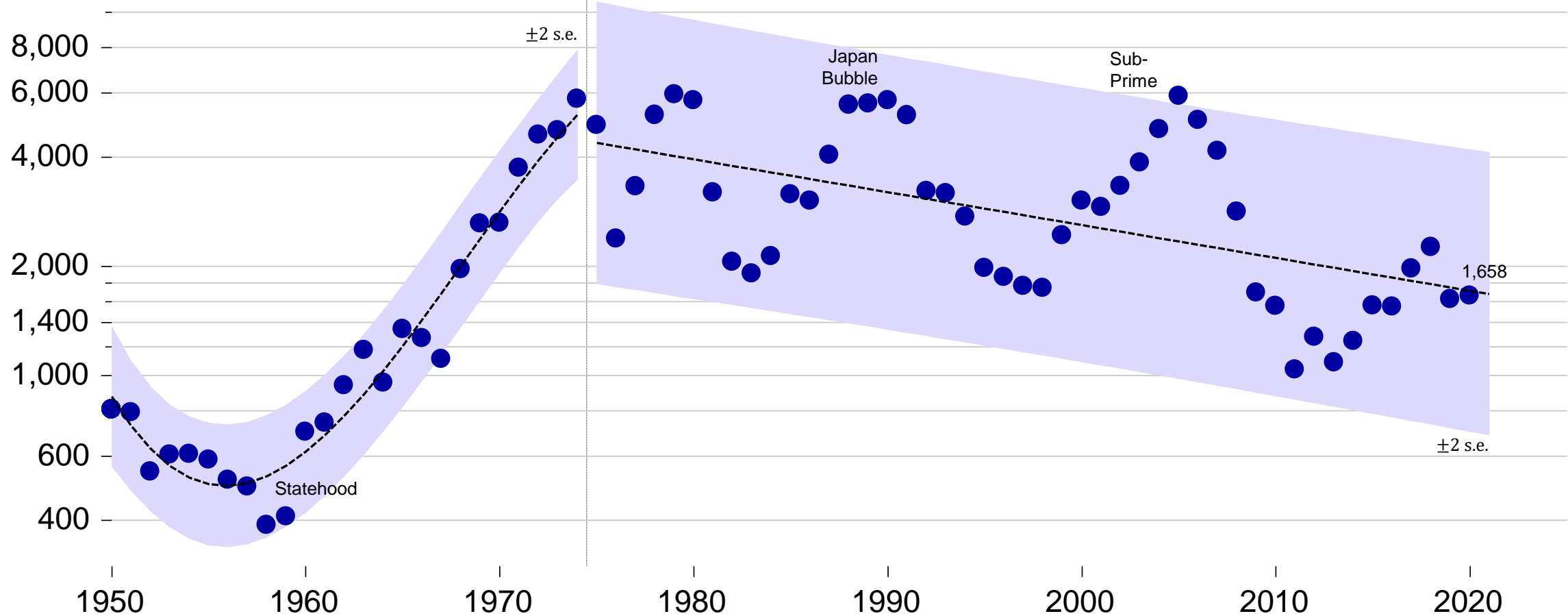
Oahu homebuilding for the last century: model with exogenous and endogenous breaks points to policy FAIL, 1975 (LUC changes, etc.)



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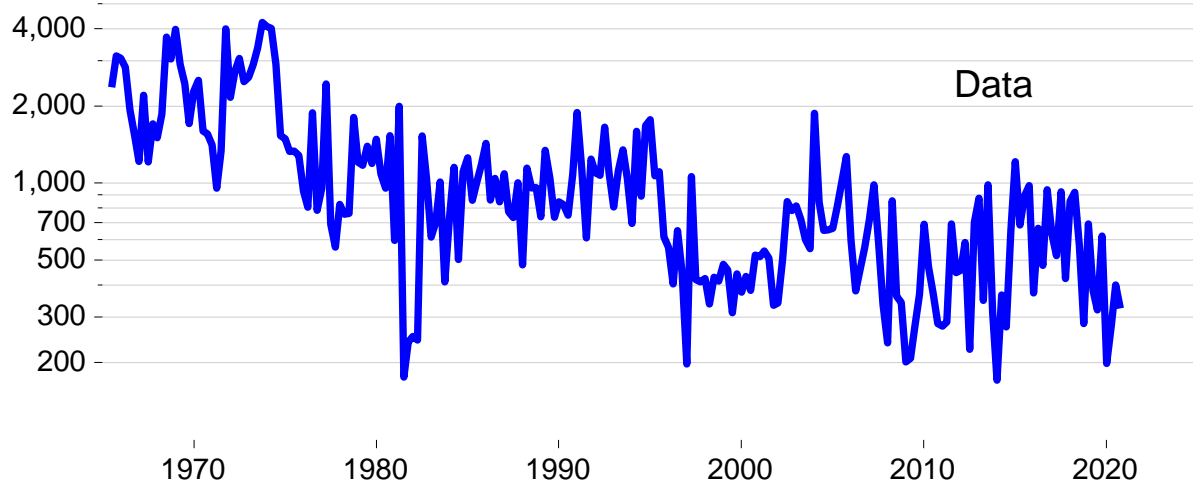
Tighter trend in Neighbor Island homebuilding also broke after 1975 Land Use Law changes, turning down and amplifying production cycle

Neighbor Isle new housing unit authorizations (log scale)

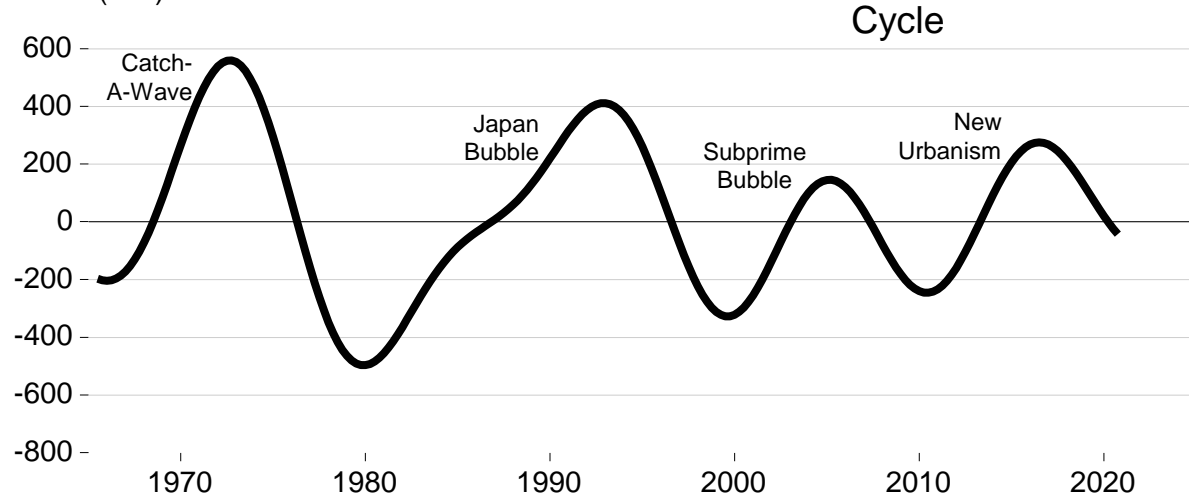


Decomposition of Oahu newly-permitted residential units, 1967-2020

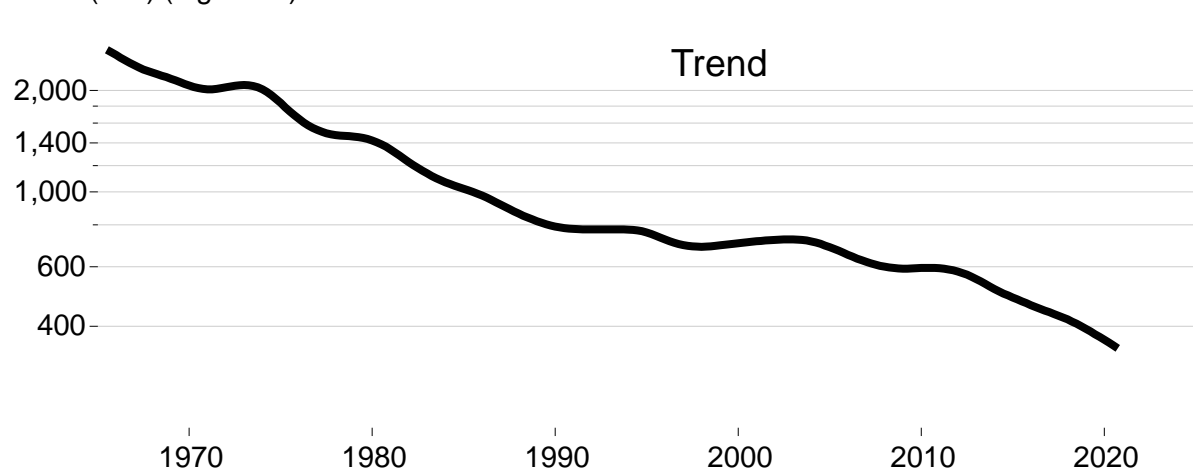
Quarterly new housing units authorized by building permit (s.a.) (log scale)



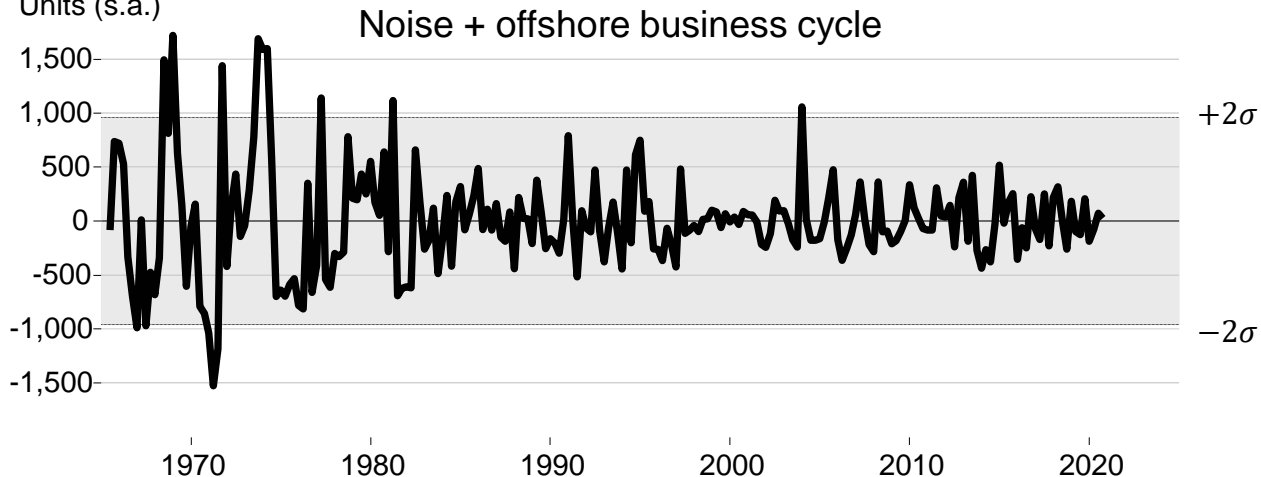
Units (s.a.)



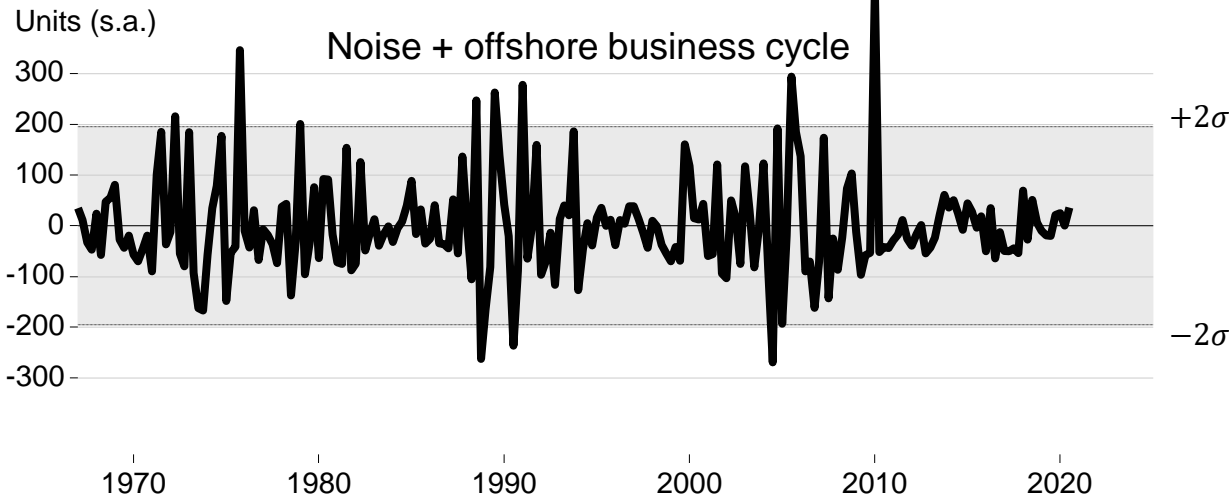
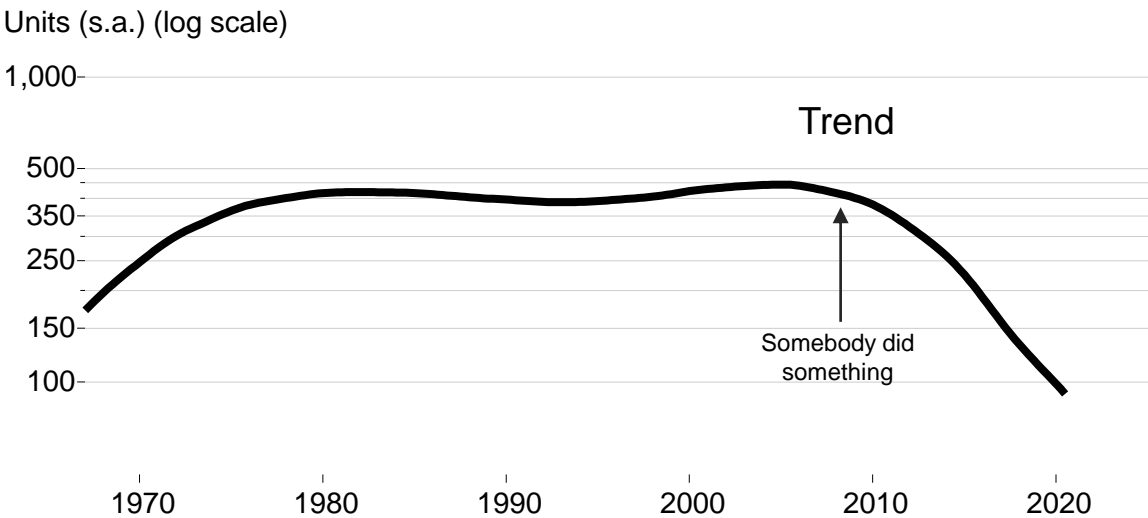
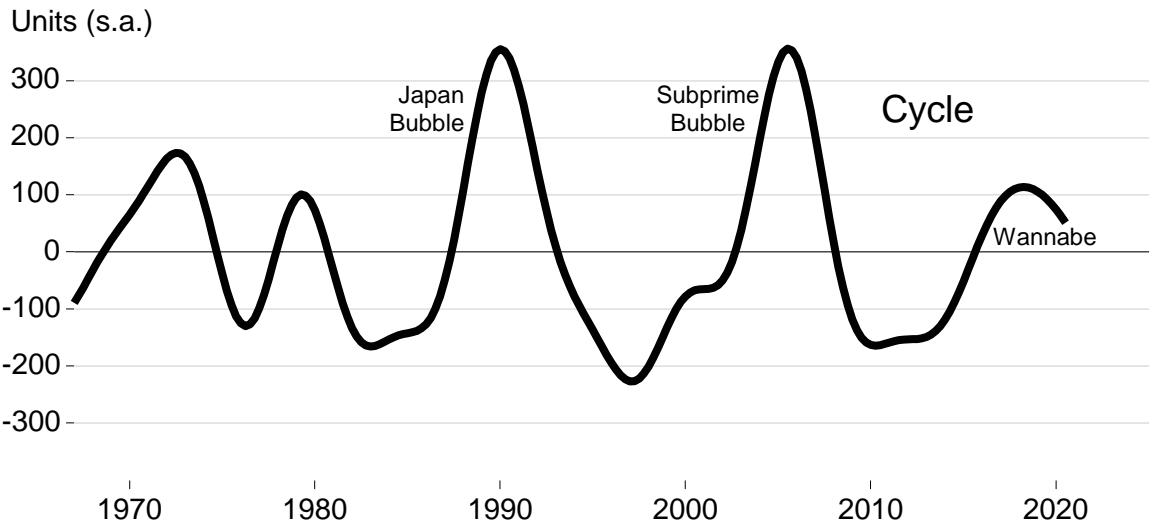
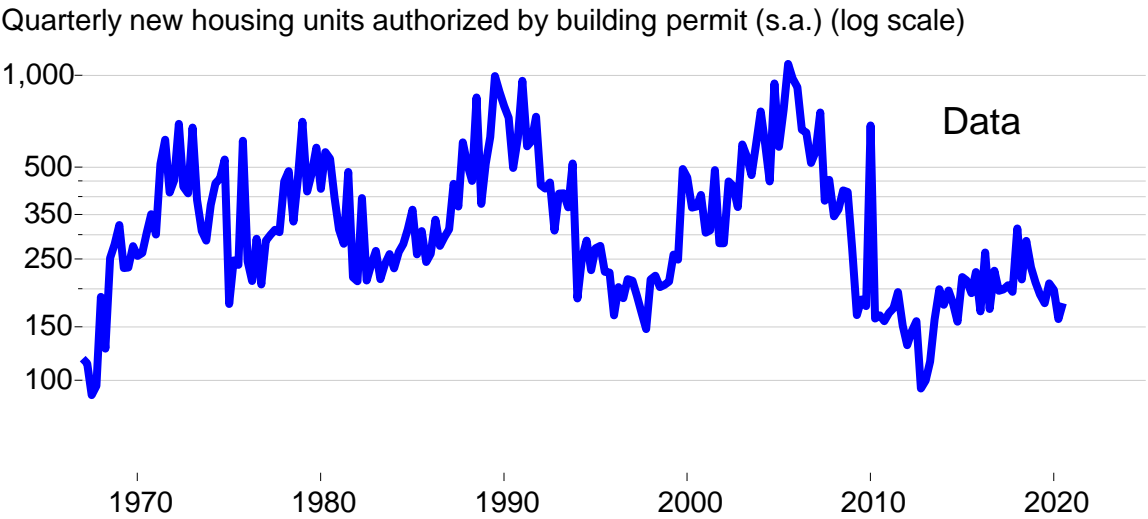
Units (s.a.) (log scale)



Units (s.a.)

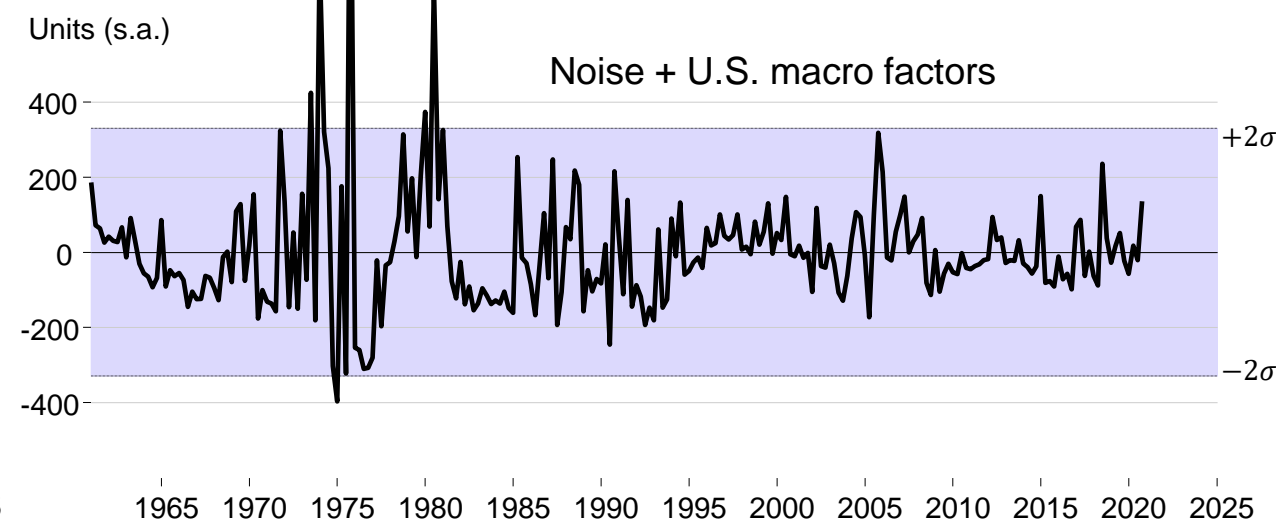
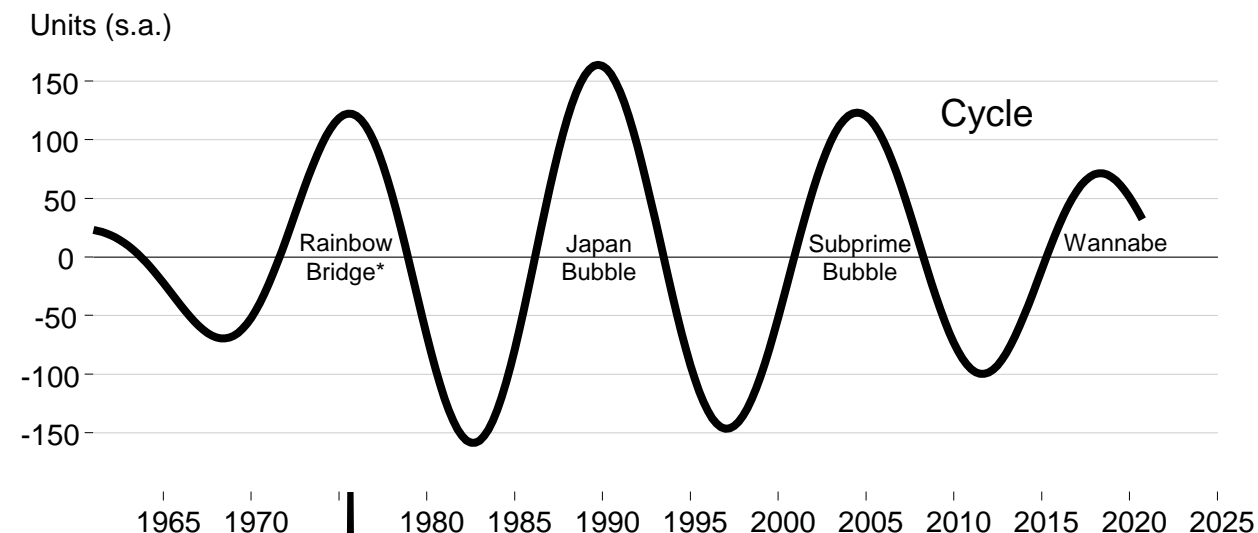
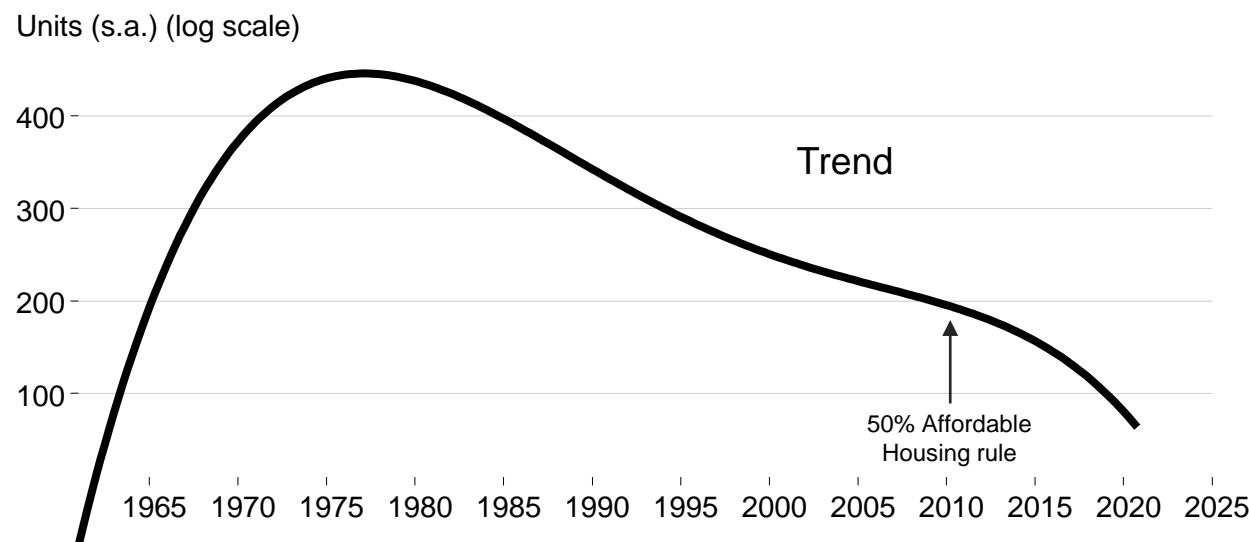
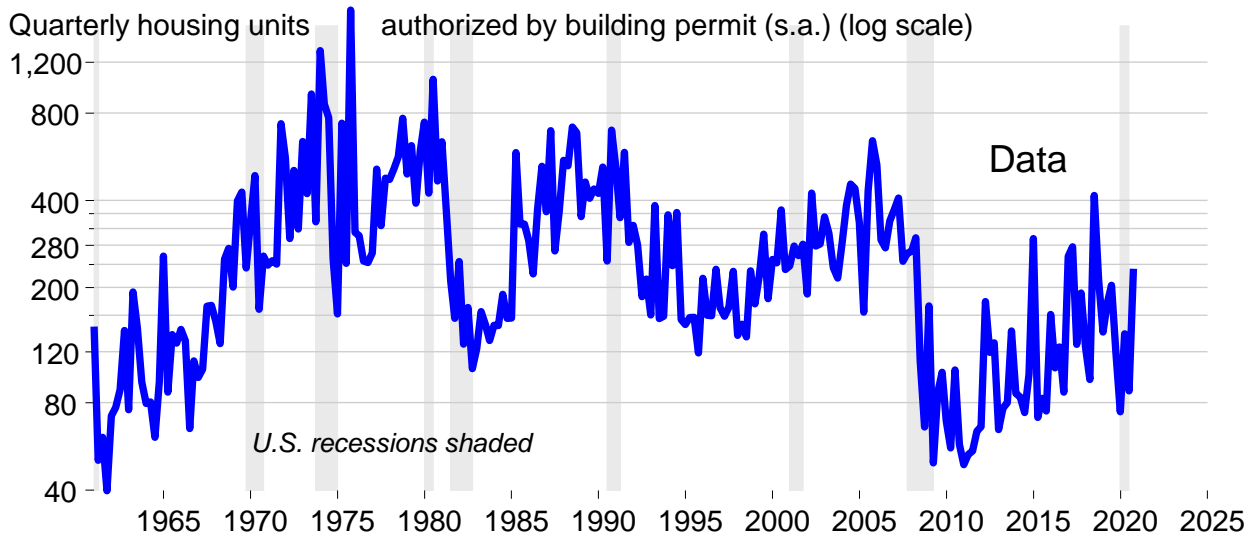


Decomposition of Hawaii Isle residential building permit units, 1967-2020



Sources: County building department, Bank of Hawaii, Hawaii DBEDT (<http://dbedt.hawaii.gov/economic/qser/selected-county-tables/>); seasonal adjustment using Census X-13 ARIMA filter, decomposition using Christiano-Fitzgerald asymmetric band-pass frequency filter assuming first-difference stationarity and short:long cycle periods of 20:80 quarters, and Hodrick-Prescott filter trend extraction by TZ Economics.

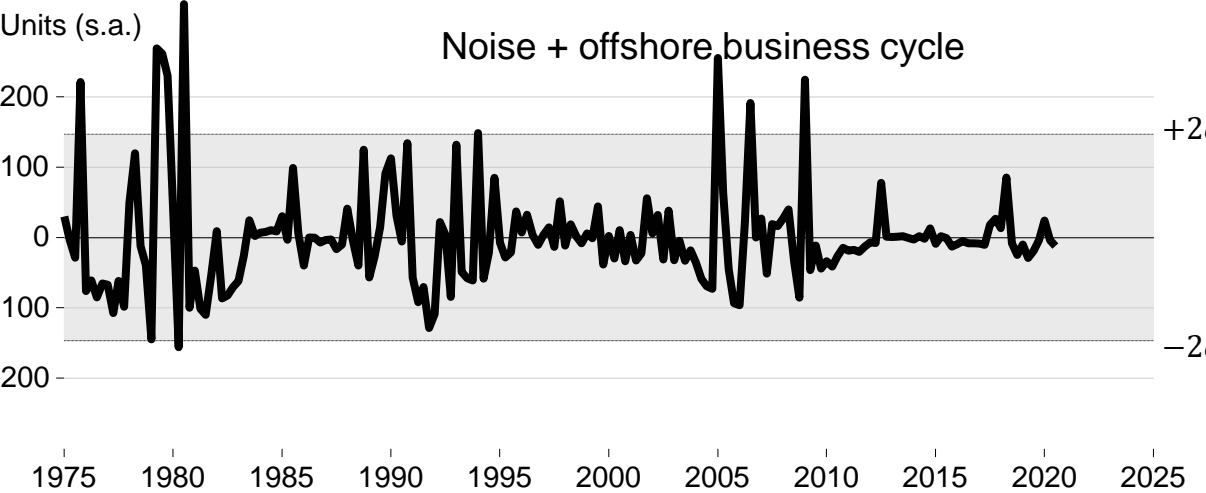
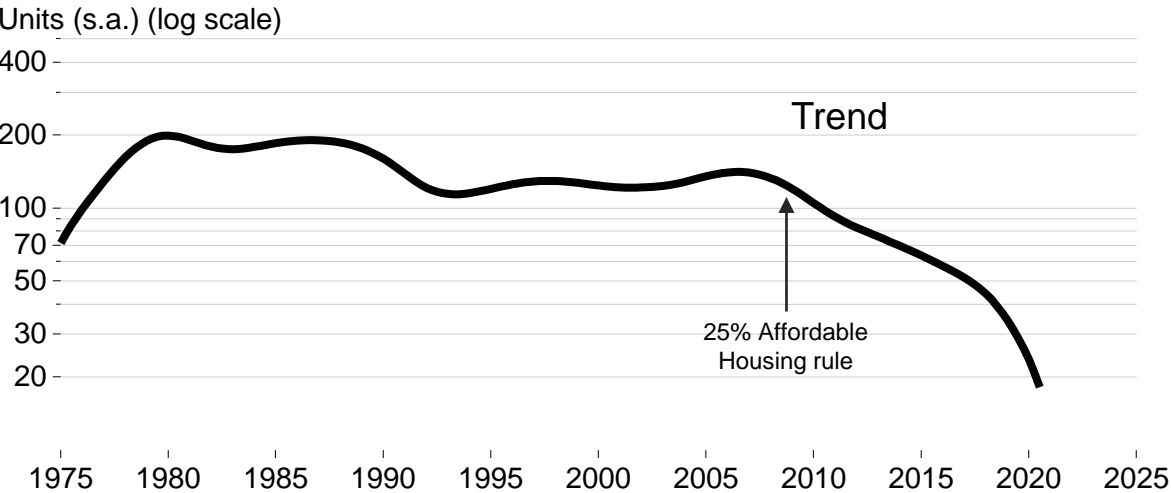
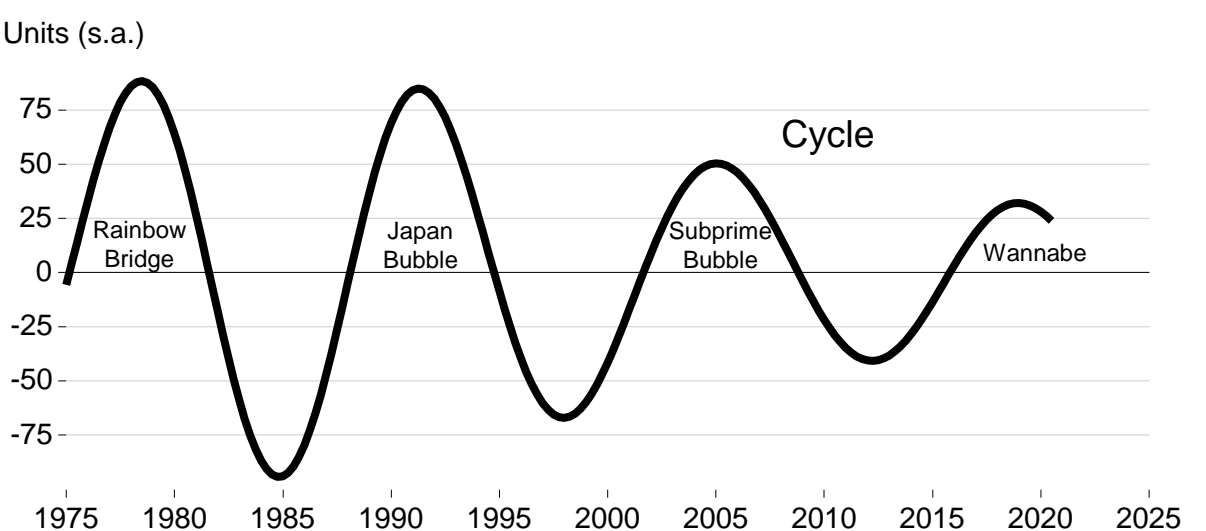
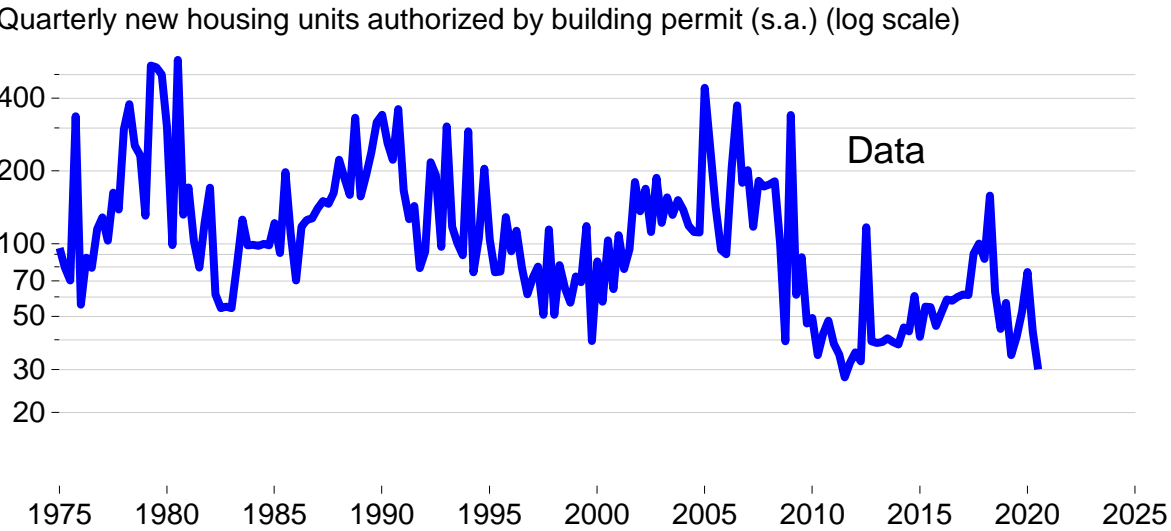
Decomposition of Maui residential building permit units, 1961-2020



Sources: County building department, Bank of Hawaii, Hawaii DBEDT (<http://dbedt.hawaii.gov/economic/qser/selected-county-tables/>); seasonal adjustment using Census X-13 ARIMA filter, decomposition using Christiano-Fitzgerald asymmetric band-pass frequency filter assuming stationarity and short:long cycle periods of 40:80 quarters, along with polynomial trend regression of noncyclical component on time by TZ Economics.

*<https://www.youtube.com/watch?v=qFfnIYbFEiE&list=PLtnY-SZHyHasY450Ftd-rplrCLW20ffi>

Decomposition of Kauai residential building permit units, 1975-2020



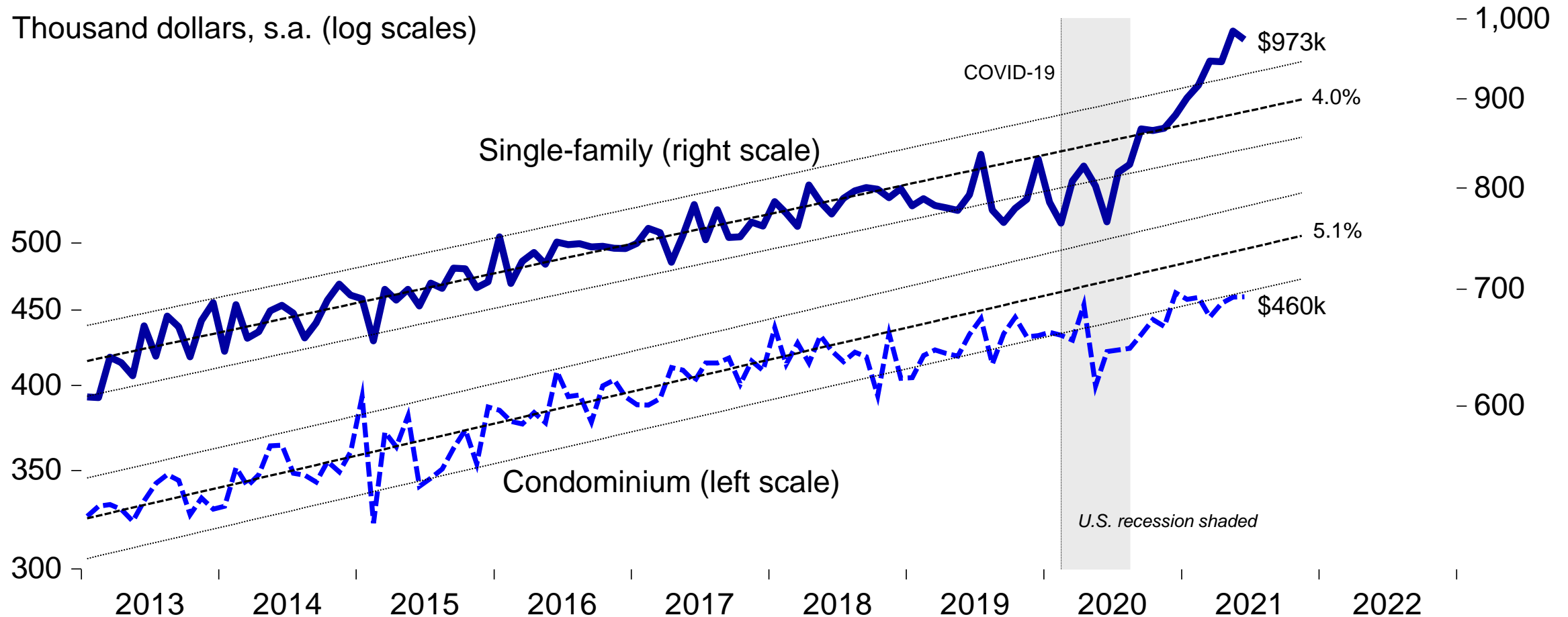
Sources: County building department, Bank of Hawaii, Hawaii DBEDT (<http://dbedt.hawaii.gov/economic/qser/selected-county-tables/>); seasonal adjustment using Census X-13 ARIMA filter, decomposition using Christiano-Fitzgerald asymmetric band-pass frequency filter assuming stationarity and short:long cycle periods of 40:80 quarters, and Hodrick-Prescott filter trend extraction by TZ Economics.



Same mortgage rates, building costs, different outcome *idiosyncratic* to single-family (detached) dwellings from COVID-19, but not condos

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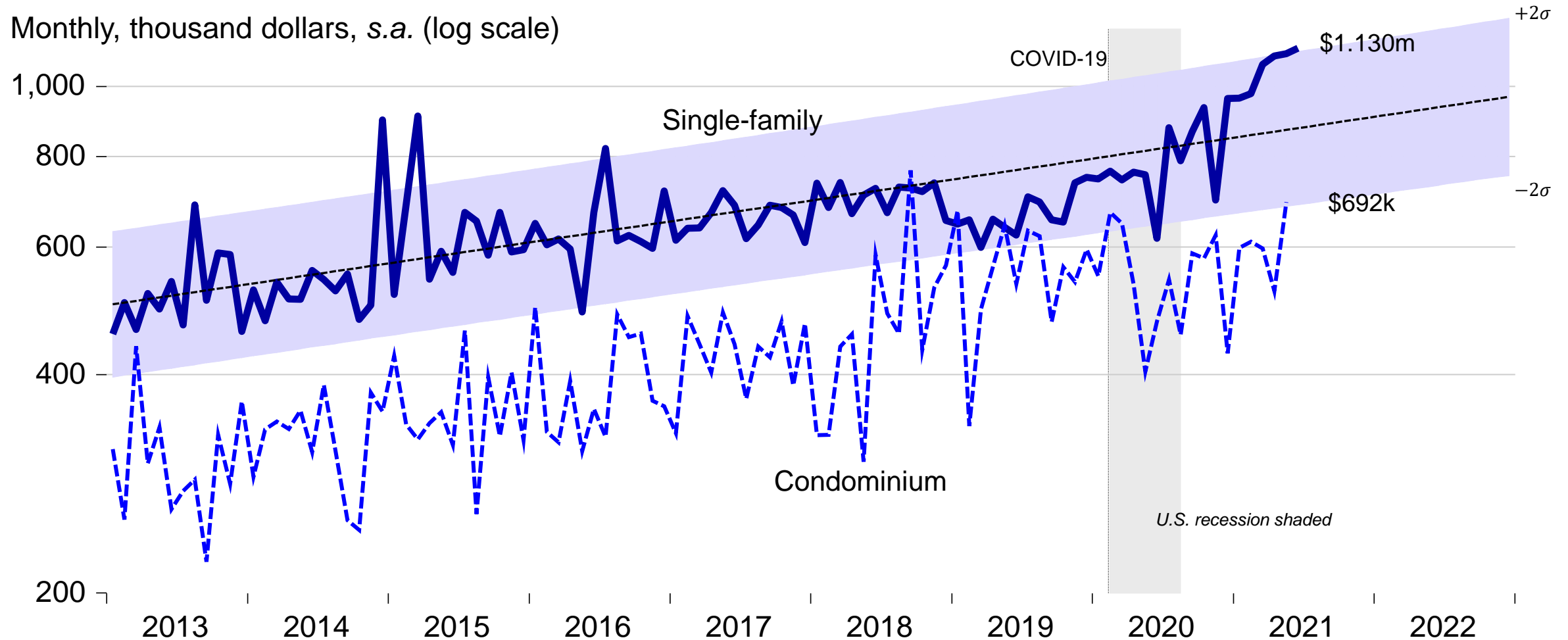
Oahu median home prices *below* trend after mid-2018; duality post-COVID: single-family price break-out, condo medians still below trend



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Sources: Honolulu Board of Realtors, monthly data through June 2021; seasonal adjustment and trend regression (January 2012 – June 2018) by TZ Economics; trend annual appreciation rates were 4.0 percent for single-family homes and 5.1 percent for condominiums, each depicted with 2 standard-error bandwidth (99 percent confidence interval).

Kauai single-family median price surged above \$1 million but condo prices remained on 2010s track: segment-specific factors?

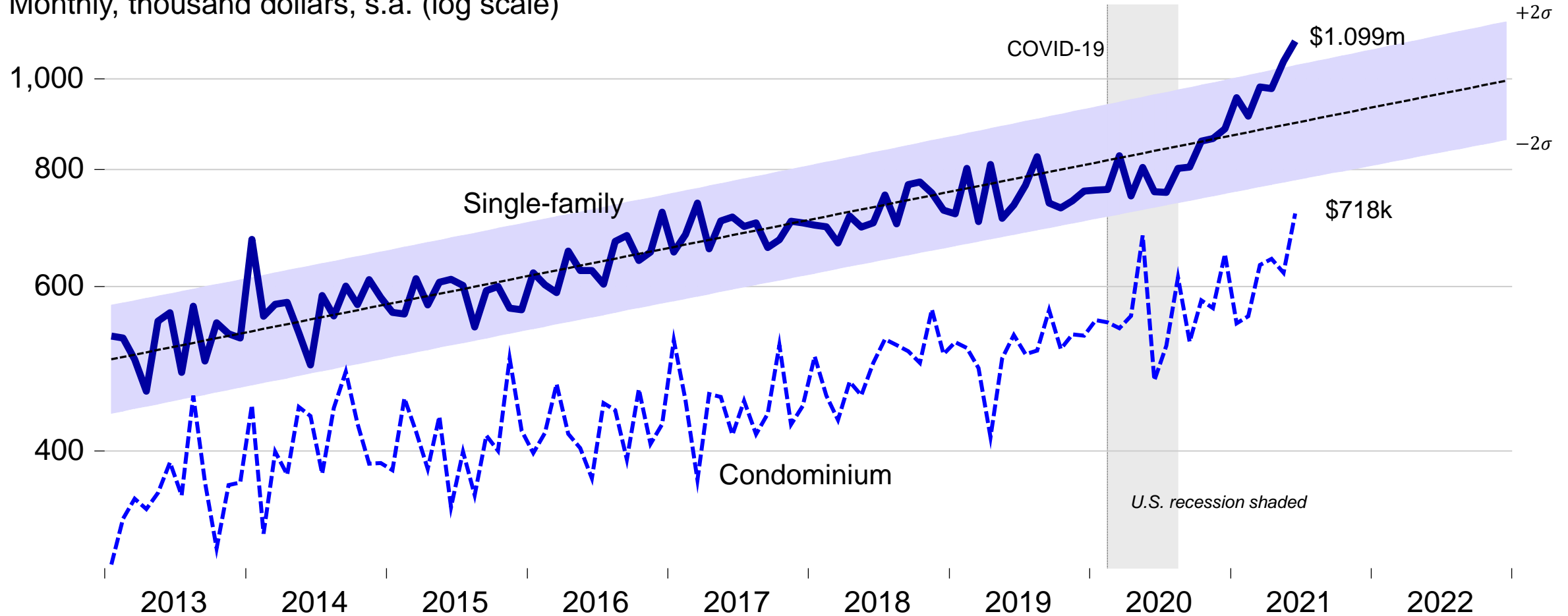


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Sources: Kauai Board of Realtors (<https://www.kauaiboard.com/Kauai-sales-statistics-2/>); Hawaii DBEDT (<http://dbedt.hawaii.gov/economic/mei/>); data through June 2021, seasonal adjustment and trend regression (June 2012 – June 2018) by TZ Economics.

Maui single-family median price surged over \$1 million post-Covid but condominium valuations stayed closer to 2010s pre-Covid trajectory

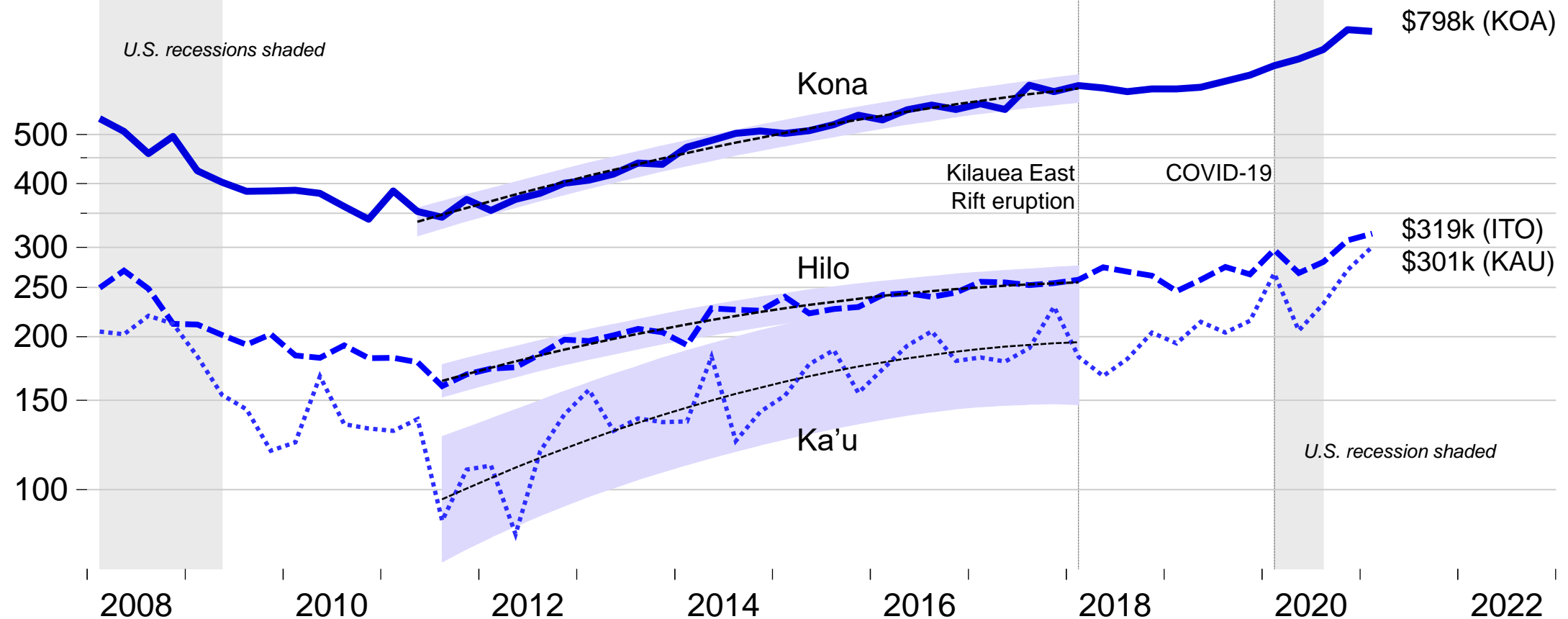
Monthly, thousand dollars, s.a. (log scale)



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Big Isle median single-family home price appreciation in 2010s was a deceleration into stall from volcano, Kona Side perked up post-Covid

Quarterly, thousand dollars, s.a. (log scale)





Post-Covid housing valuations relative to LR trends

- How do recent price movements fit into *de-trended* home price movements over four decades?
- Here's your recipe, have your kids try this at home; fun for the whole family:
 1. Extract the long-term trend in median home prices since 1980
 2. Calculate the difference between actual and long-term trend prices: de-trended prices
 3. Extract the cycle from de-trended prices
 4. What remains is the non-cyclical portion of prices

What happened to this residual, the *non-cyclical* portion of prices, *just* in the last year?

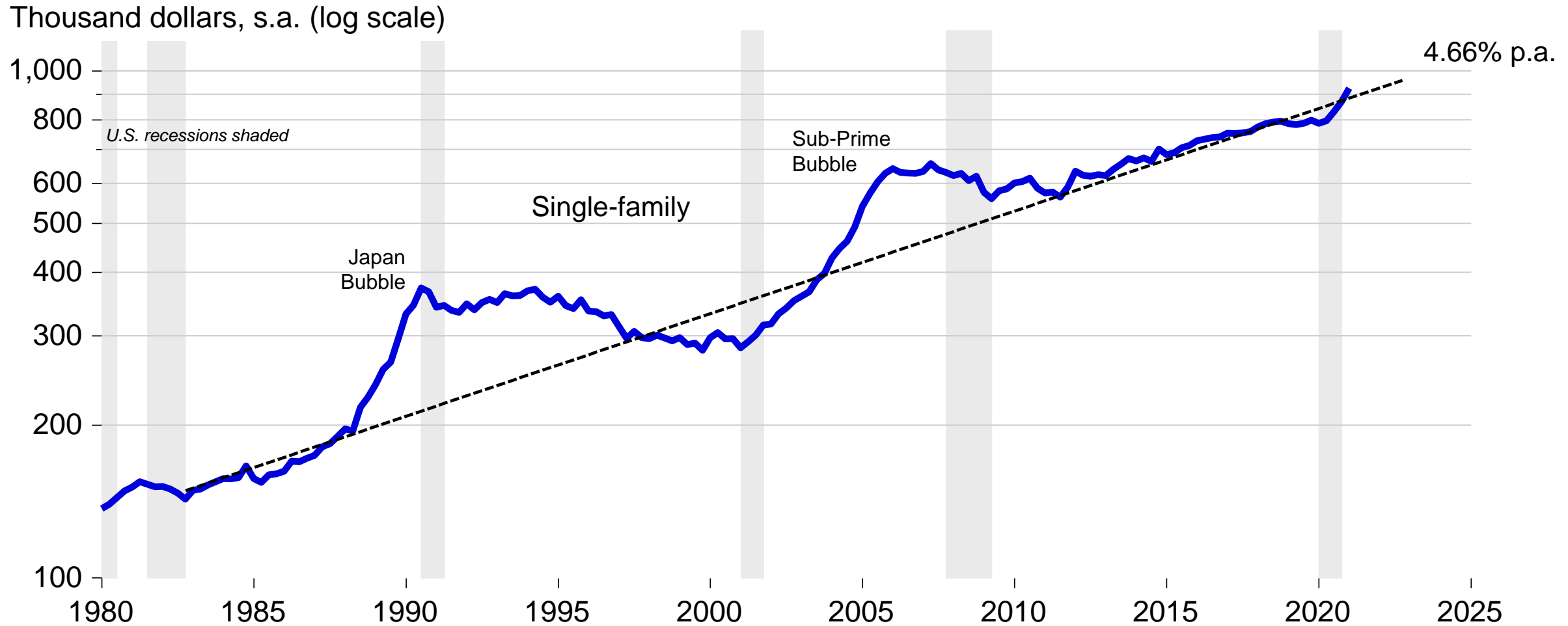
Answer: confirms what you see in underlying data, **price jump was all in SF homes, not condos**



Looking deeper into sales price distributions for evidence

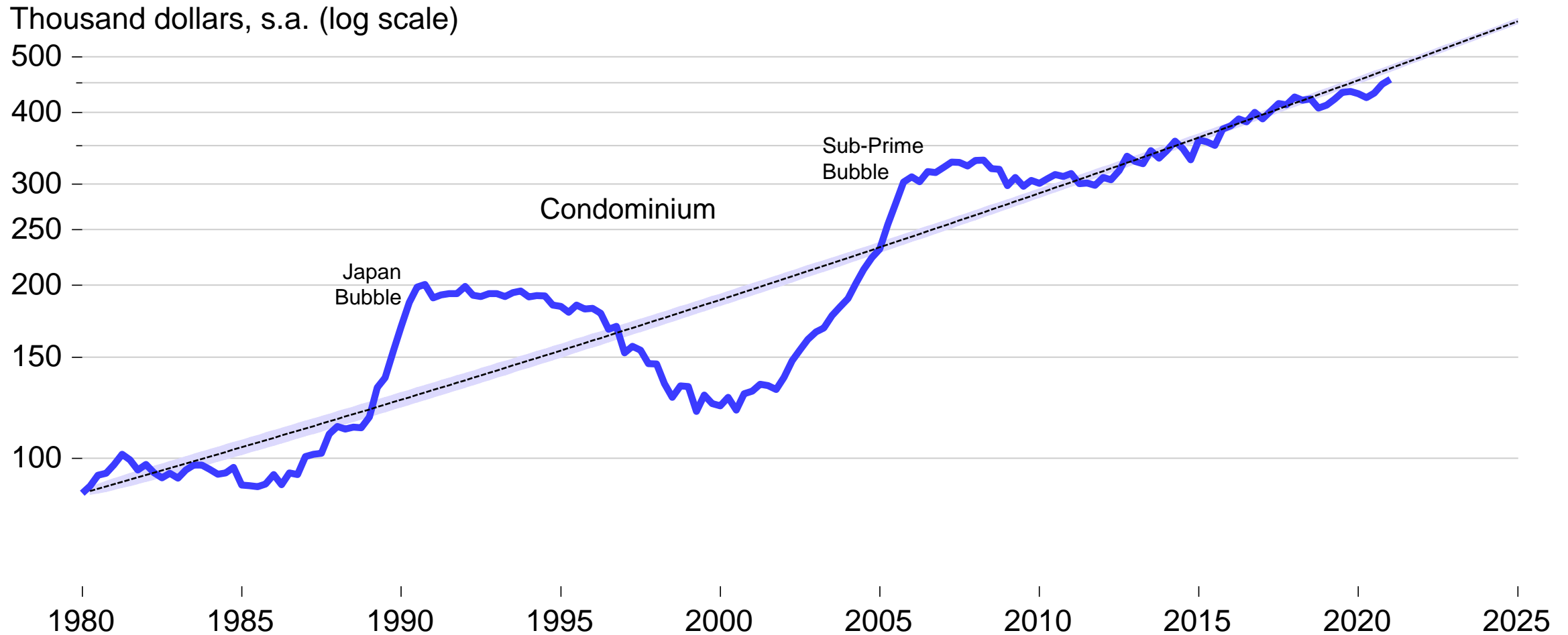
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Regression of (log change) of Oahu median single-family home prices on time 1982Q4-2018Q4, associated projection through 2022



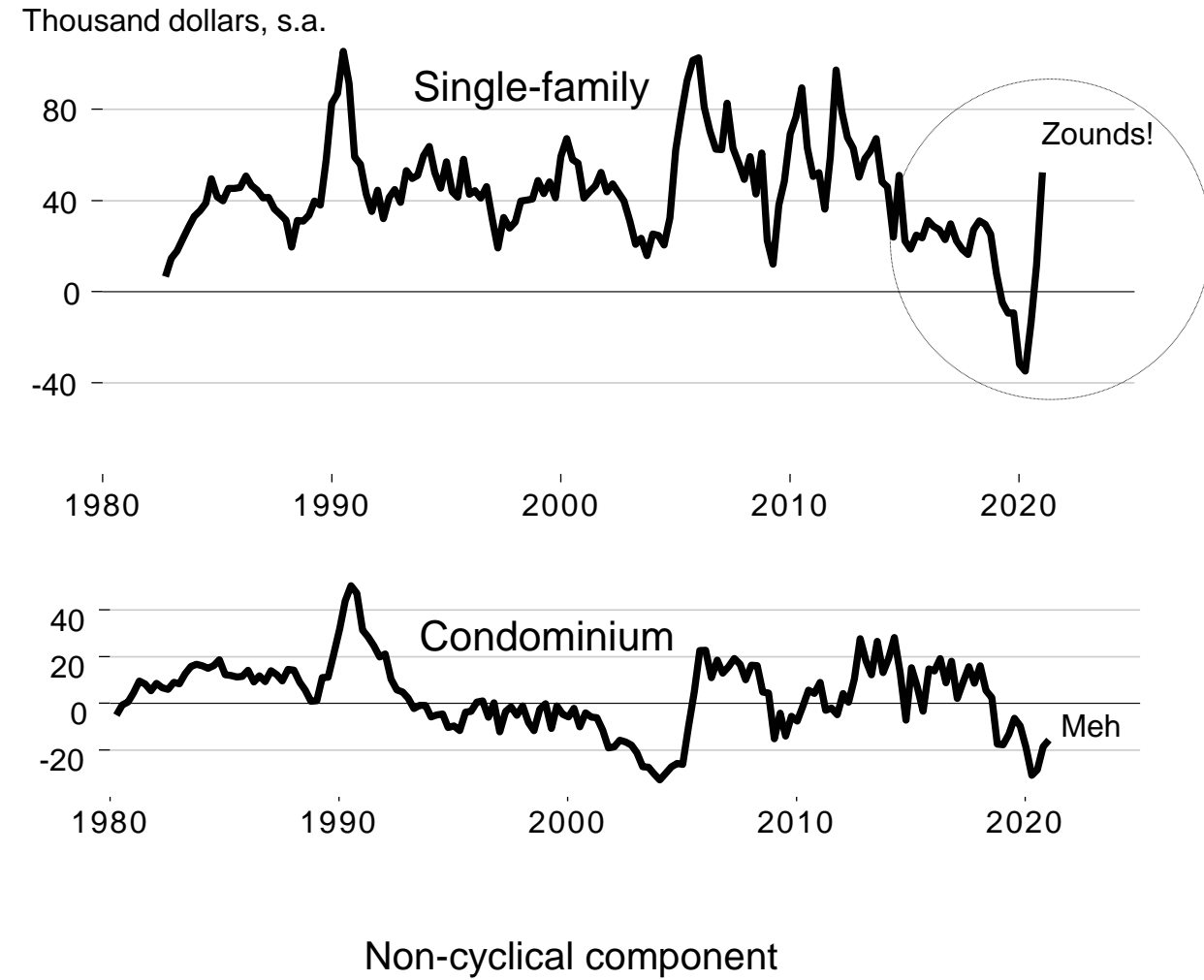
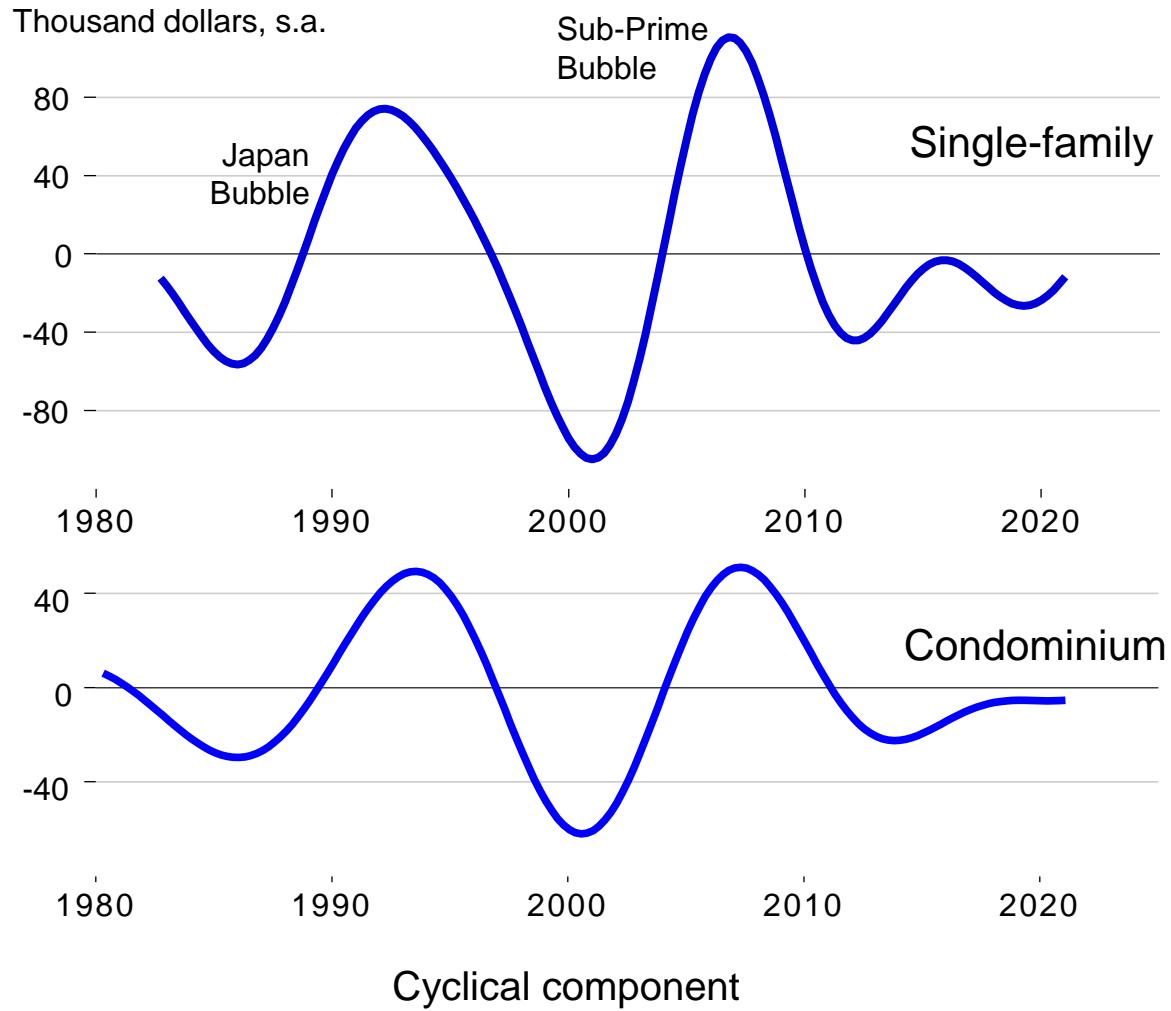
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Regression of (log change of) Oahu median residential condominium prices on time, 1980Q1-2018Q2, associated projection through 2024



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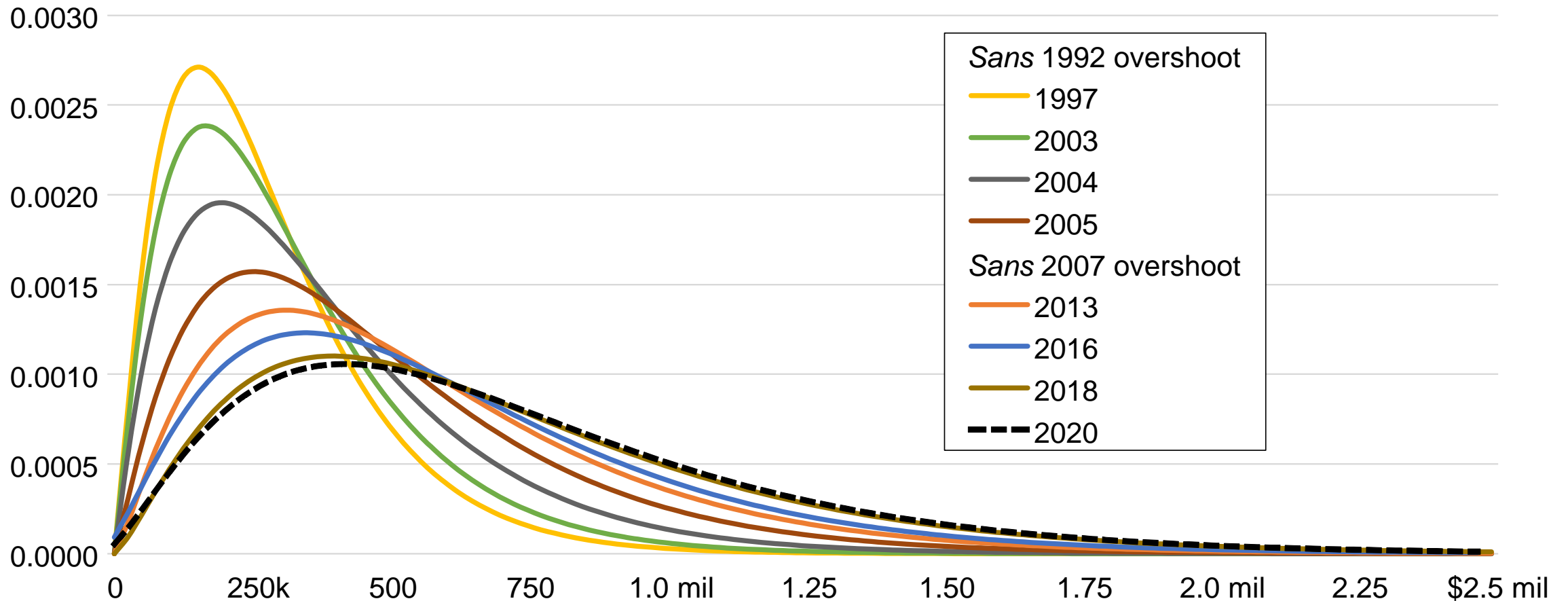
Decomposition of Oahu median single-family and condo price trend residuals 1980/82-2021Q1 into cyclical, non-cyclical components



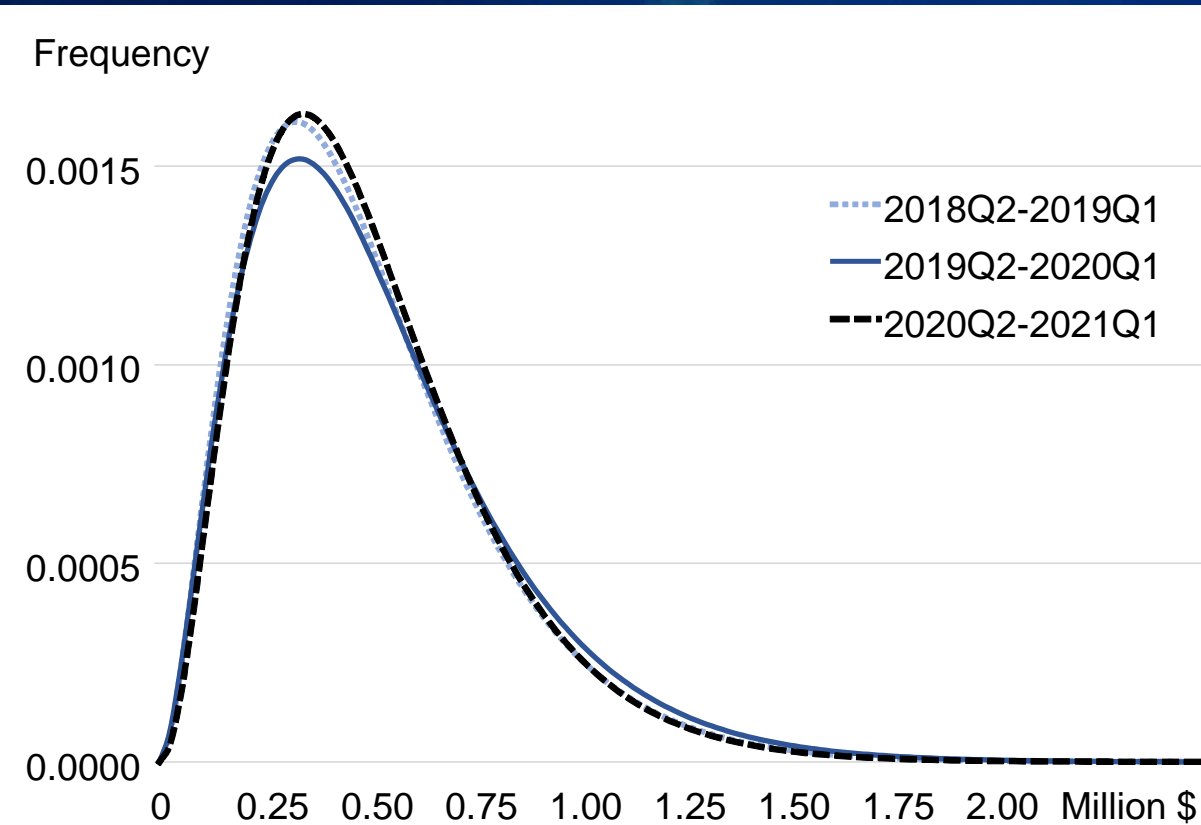
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Sources: Honolulu Board of Realtors, quarterly data through 2021Q1; seasonal adjustment and trend regression on stationary component of home prices (first differences of natural logs), using a Christiano-Fitzgerald asymmetric band-pass filter with short:long parameters set at 30:84 (quarters), 36:84 (quarters) for condos, assuming stationarity I(0)

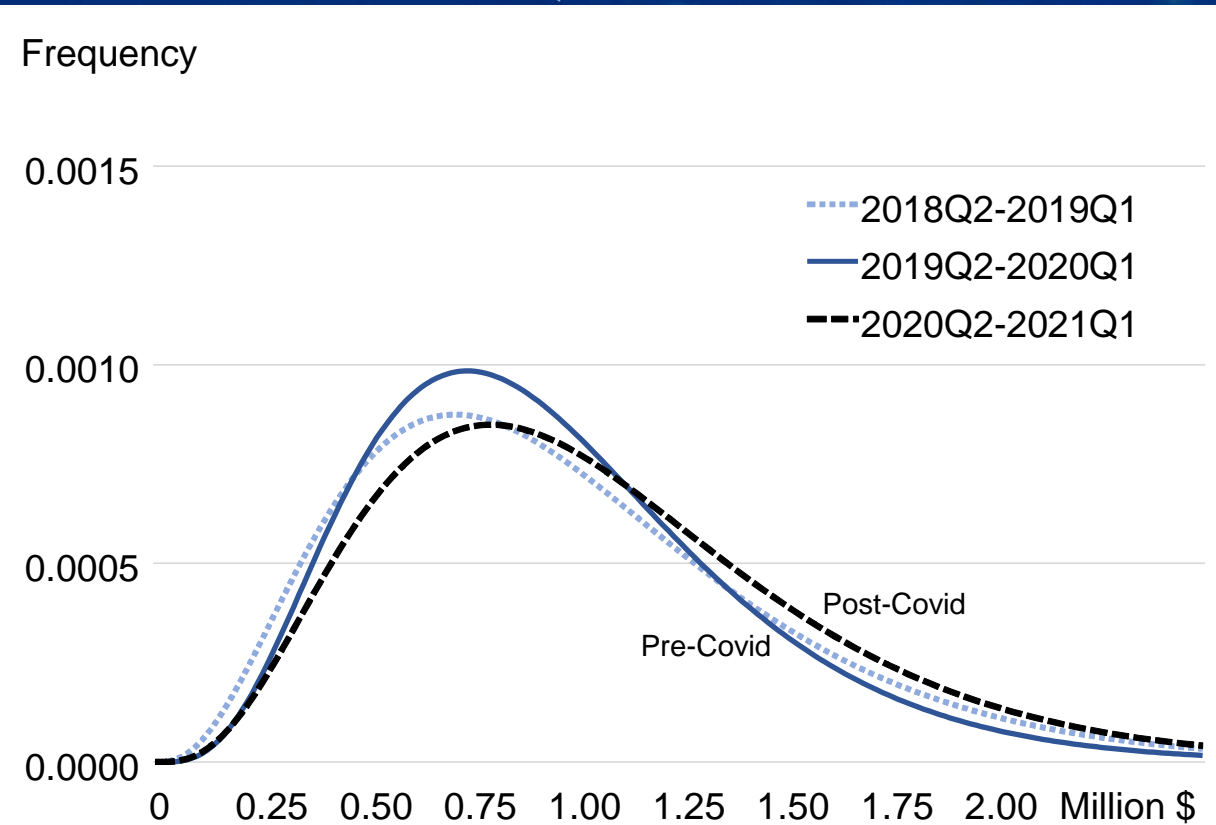
Excluding Bubblicious outlier years (e.g. 1992, 2007), long-run Oahu appreciation appears as orderly transition of price distributions



Only *single-family* Oahu existing home sales price distributions display significant upward bulge in valuations, pre- vs. post-Covid

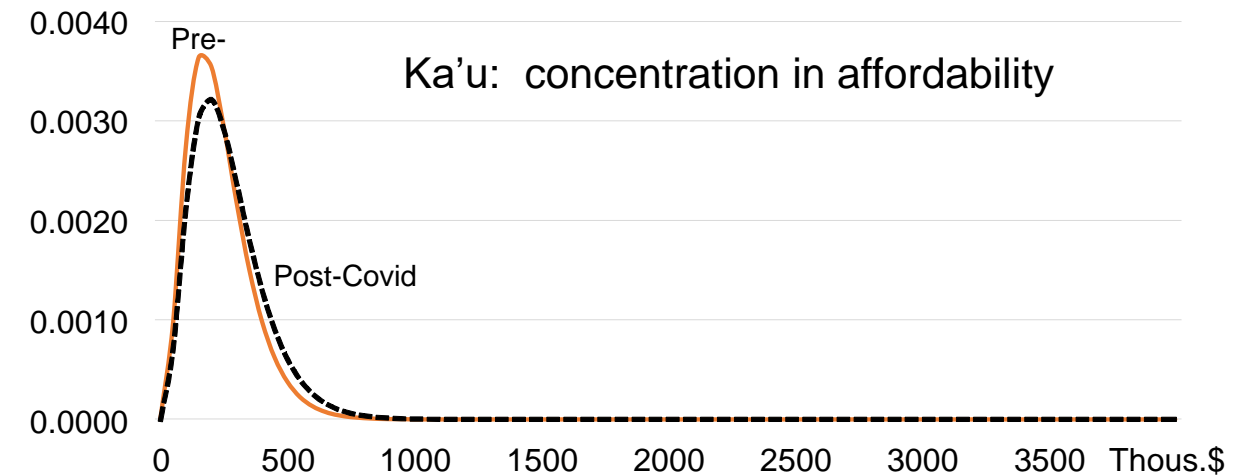
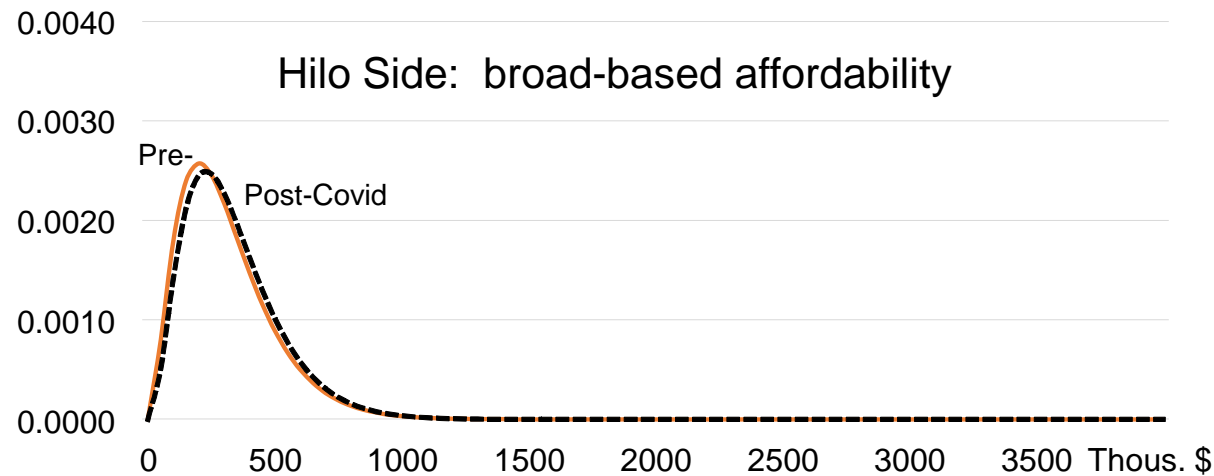
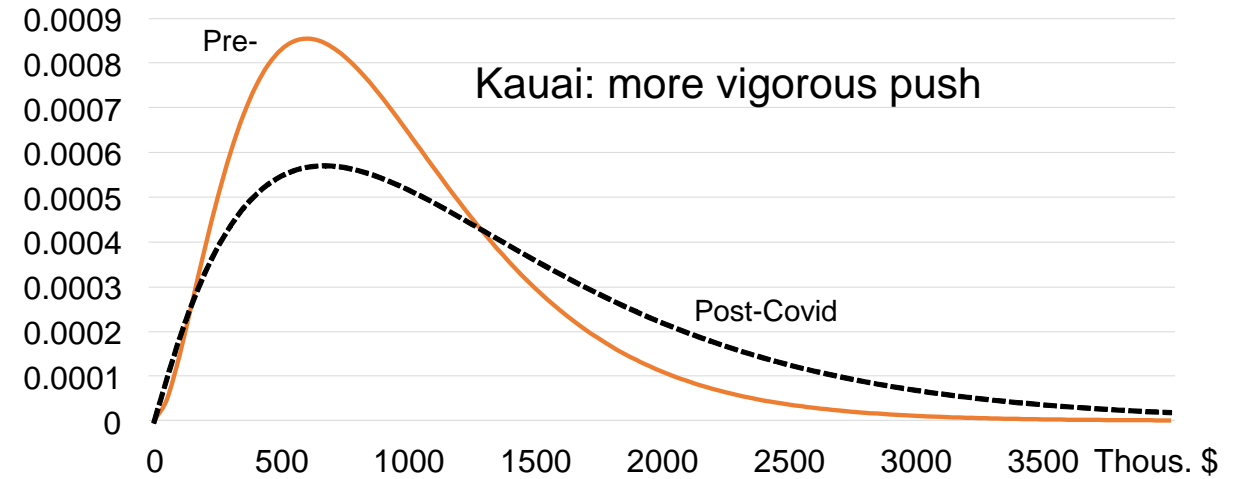
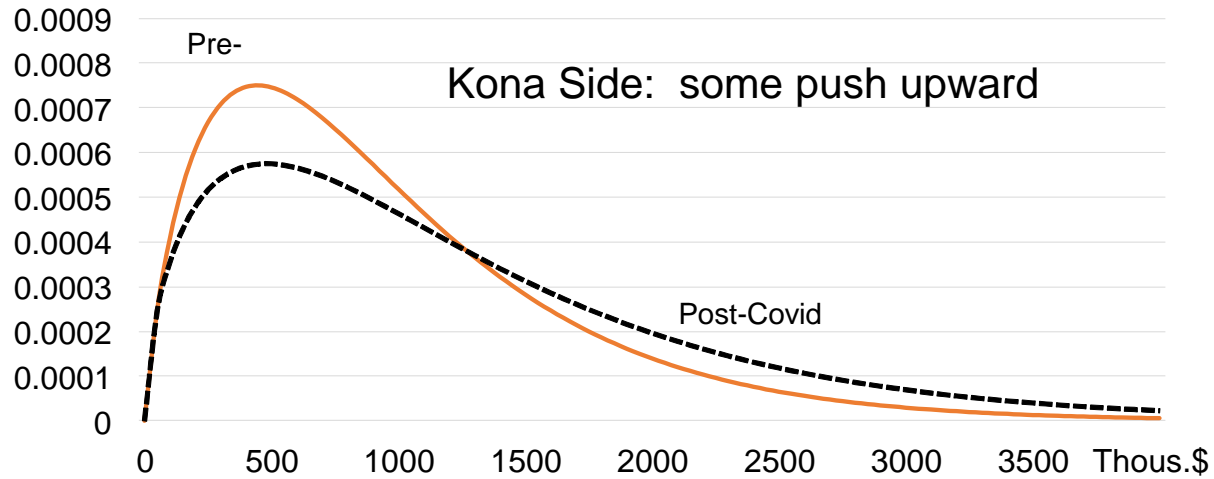


Condominium (years ending March)



Single-family (years ending March)

For some Neighbor Island single-family markets, estimated empirical Gamma home price distributions exhibit pre- vs. post-Covid shifts



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Sources: Hawaii Information Service, empirical Gamma distributions for years April 2019-March 2020 and April 2020-March 2021, less five transactions (out of 6,328 total) over \$20 million, two on Kauai post-Covid, one in Kona pre-Covid, and two in Kona post-Covid, estimated by TZ Economics.

Oahu post-Covid statistics show jump in single-family prices in year ending March 2021; other distribution moments relatively stable

<i>Thousand \$ or as noted</i>	Oahu condominium			Oahu single-family		
Year beginning	2018Q2	2019Q2	2020Q2	2018Q2	2019Q2	2020Q2
Median	415.500	430.000	440.000	790.000	789.000	857.000
Maximum	7,287.500	10,880.000	9,250.000	18,800.000	17,900.000	18,700.000
Minimum	30.000	10.000	17.500	125.000	91.350	89.500
1 Mean (average)	499	523	506	986	953	1,060
2 Standard deviation	407	466	435	947	689	785
3 Skewness	6	7	9	10	9	7
4 Kurtosis	61	96	133	143	143	101
Observations (sales)	5,597	5,438	5,090	3,586	3,850	3,955


Each set of statistics is reported for the full sample beginning in the second quarter of each year and ending in the first quarter of the subsequent year. The peak of the U.S. business cycle was in February 2020. Hawaii's first PCR test for COVID-19 was conducted on March 4, 2020. The State of Hawaii's Stay-At-Home order took effect March 25, 2020. Regional references for the Big Island are TMK 1-4 (Hilo), TMK 5-8 (Kona), and TMK 9 (Ka'u).

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Differential impacts of unusual demand event, supply constraints, appear in some N. Isle pre- vs. post-Covid single-family statistics

<i>thou. \$ or as noted</i>	Ka'u			Hilo side			Kona side			Kauai		
Year beginning:	2018Q2	2019Q2	2020Q2	2018Q2	2019Q2	2020Q2	2018Q2	2019Q2	2020Q2	2018Q2	2019Q2	2020Q2
Median	191.575	230.000	257.500	269.000	275.000	295.000	612.000	640.000	765.000	673.450	678.875	850.000
Maximum	815.000	640.000	720.000	1,750.000	1,900.000	2,900.000	18,500.000	25,000.000	37,000.000	11,712.000	8,000.000	36,750.000
Minimum	15.000	42.000	23.500	15.000	9.000	25.000	107.680	50.000	100.000	171.150	150.000	225.000
1 Mean (average)	196	234	265	302	310	331	875	995	1,324	1,047	932	1,440
2 Standard deviation	117	114	132	186	193	218	1,169	1,524	2,302	1,180	808	2,469
3 Skewness	1	0	1	2	2	4	8	8	9	5	4	9
4 Kurtosis	7	3	4	13	11	36	92	90	110	35	26	112
Observations	146	175	182	1,223	1,310	1,450	894	1,040	1,009	540	584	578

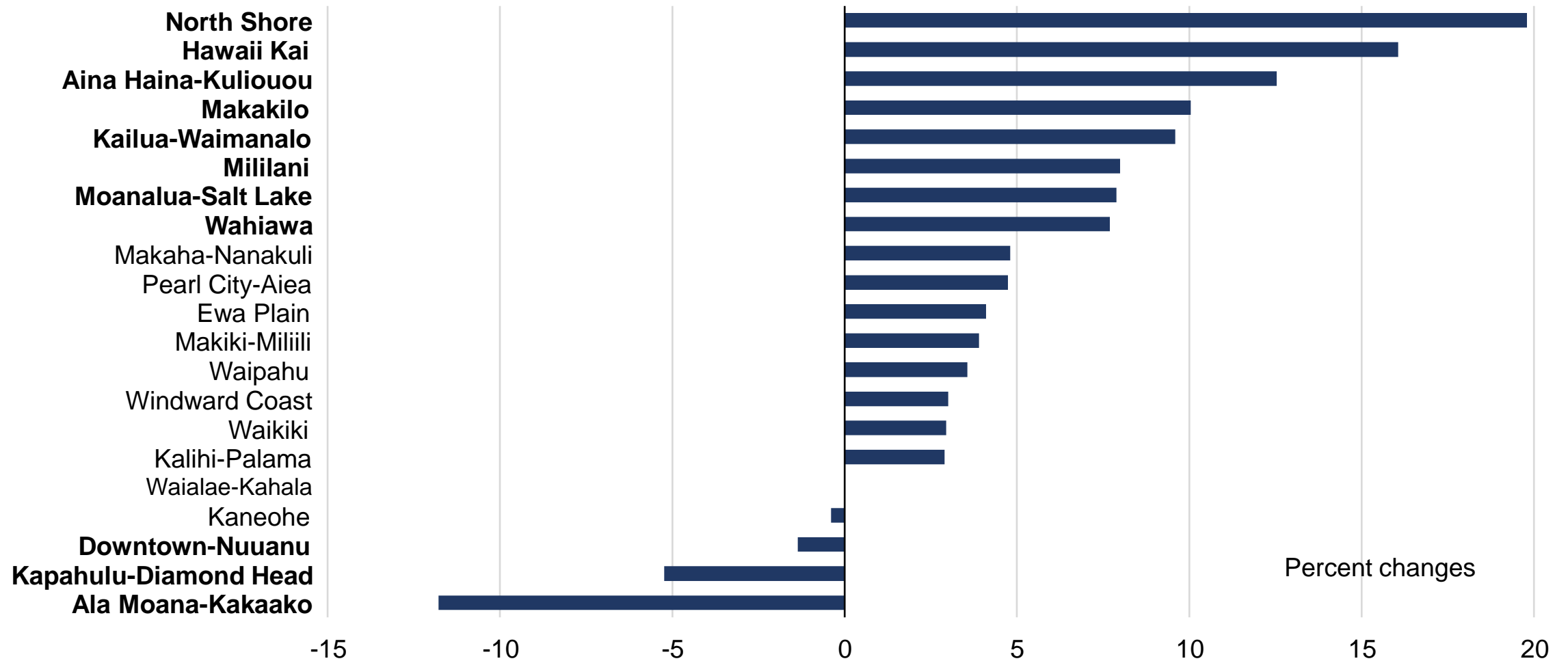
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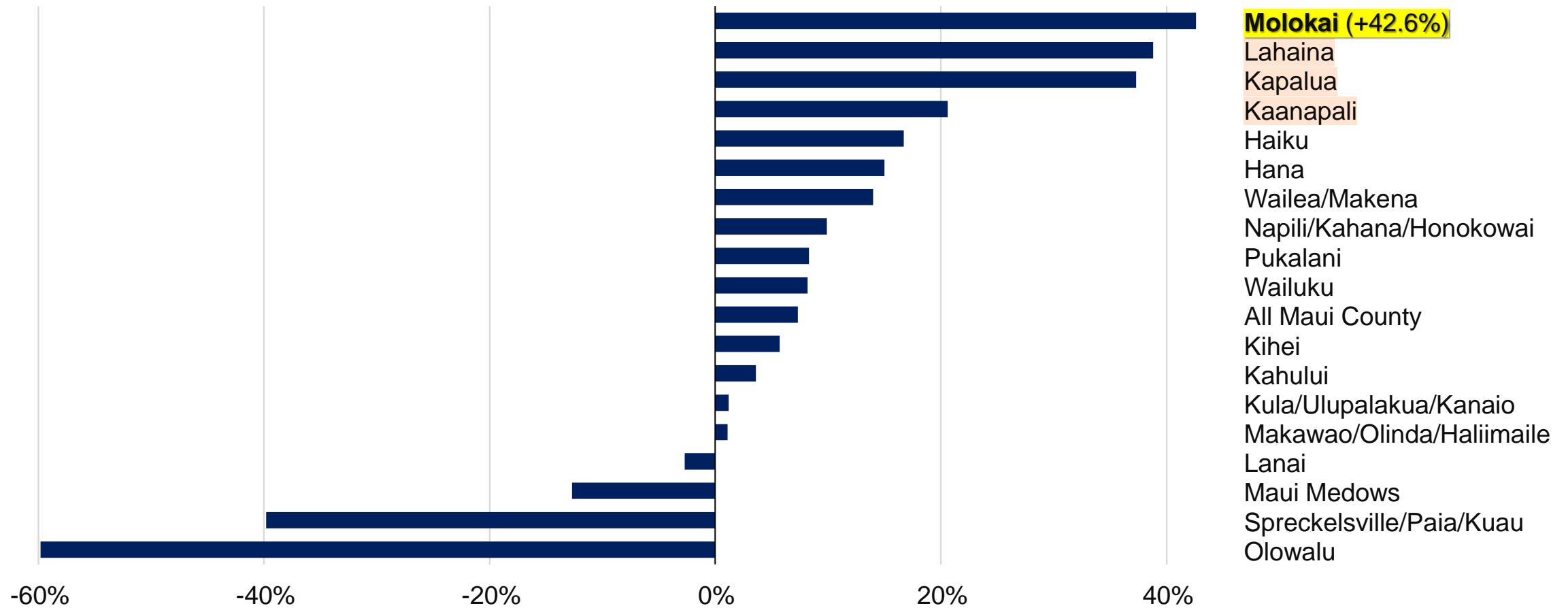
The Donut Effect: flight to suburbs, exurbs, Zoomtowns; will backwash revive the urban core in 2021 and 2020s?

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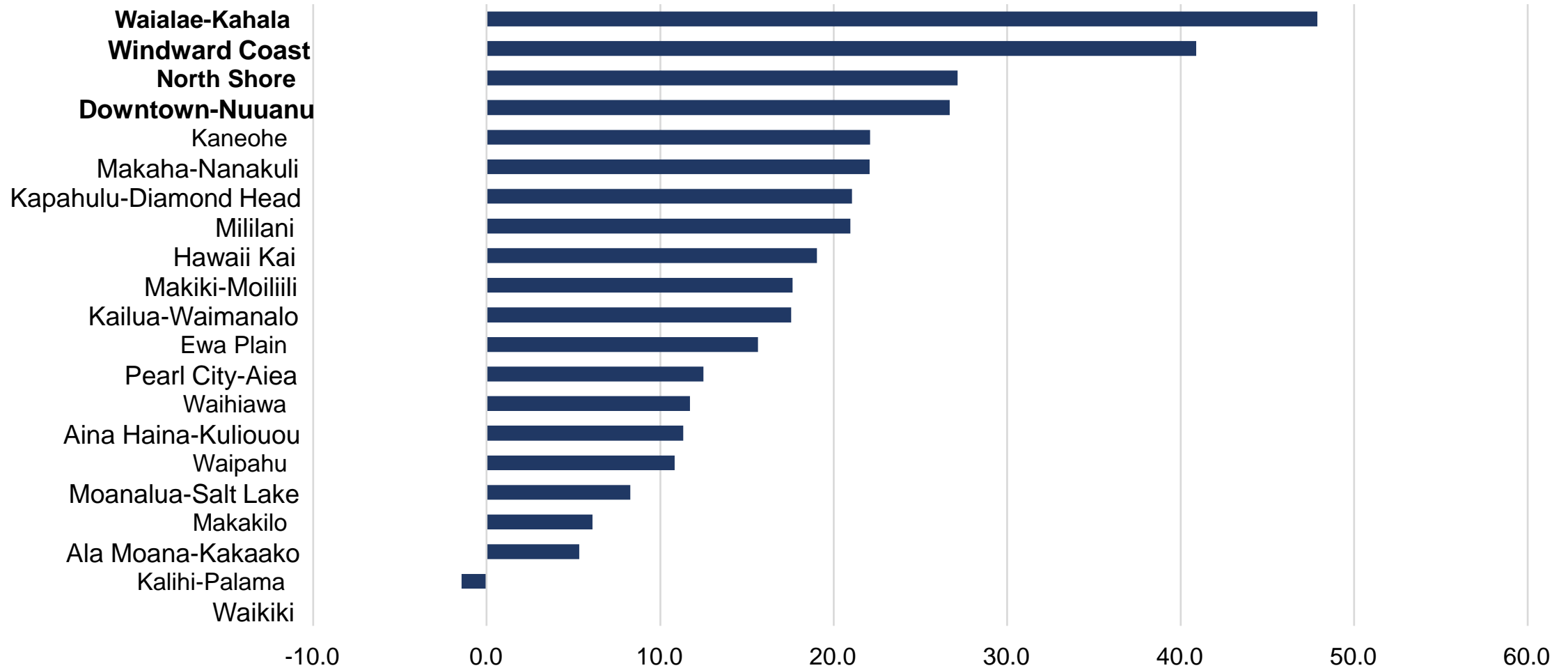
Oahu single-family home price appreciation by neighborhood in 2020, “Donut Effect”: post-COVID move to suburbs, exurbs from urban core



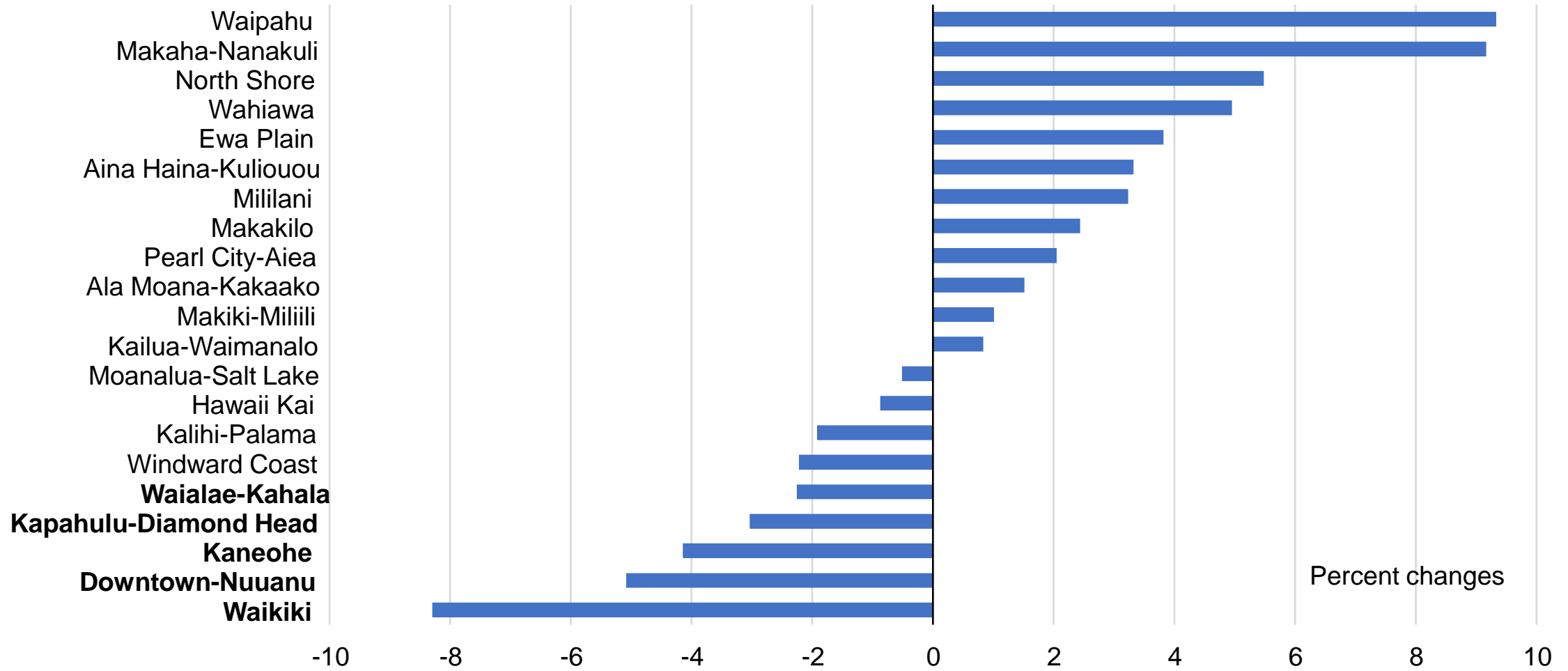
Maui County SF median home price appreciation during 2020 by hood not inconsistent with vagabond (remote) workers and Zoomtowns



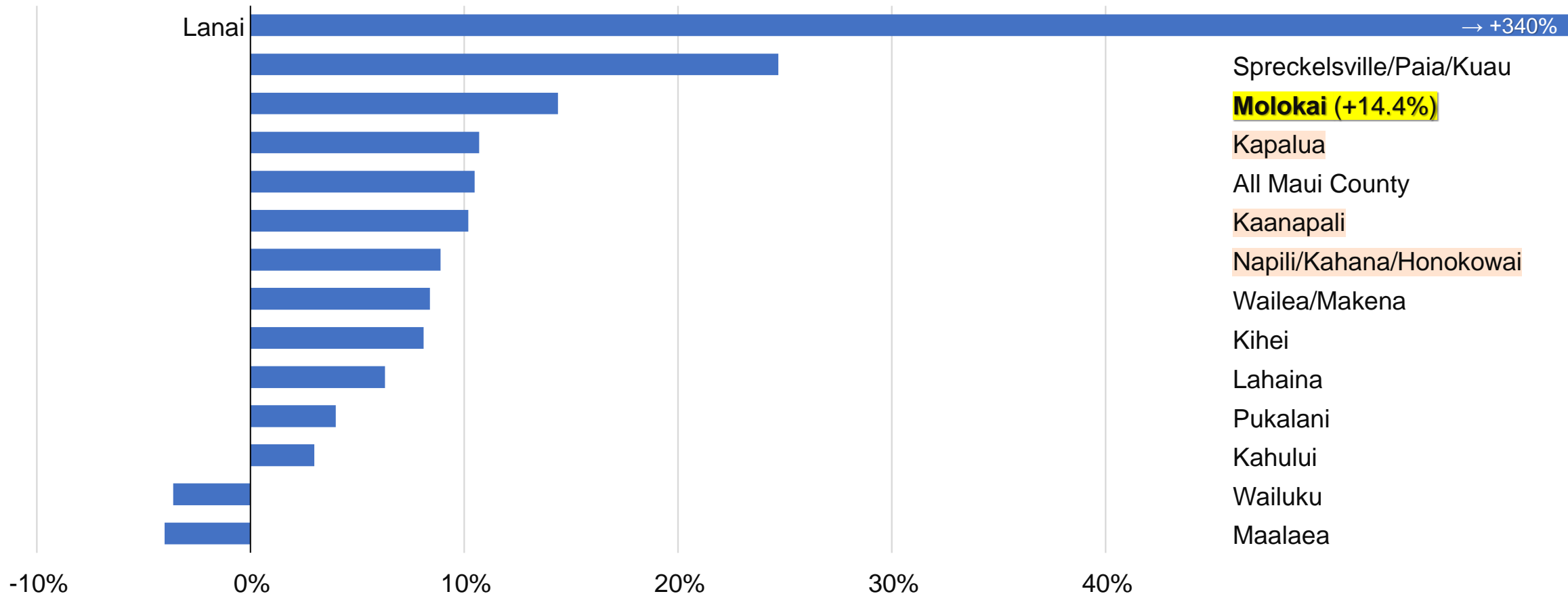
Oahu single-family home price appreciation by neighborhood in first half 2021: Donut Effect may be dissipating spatially



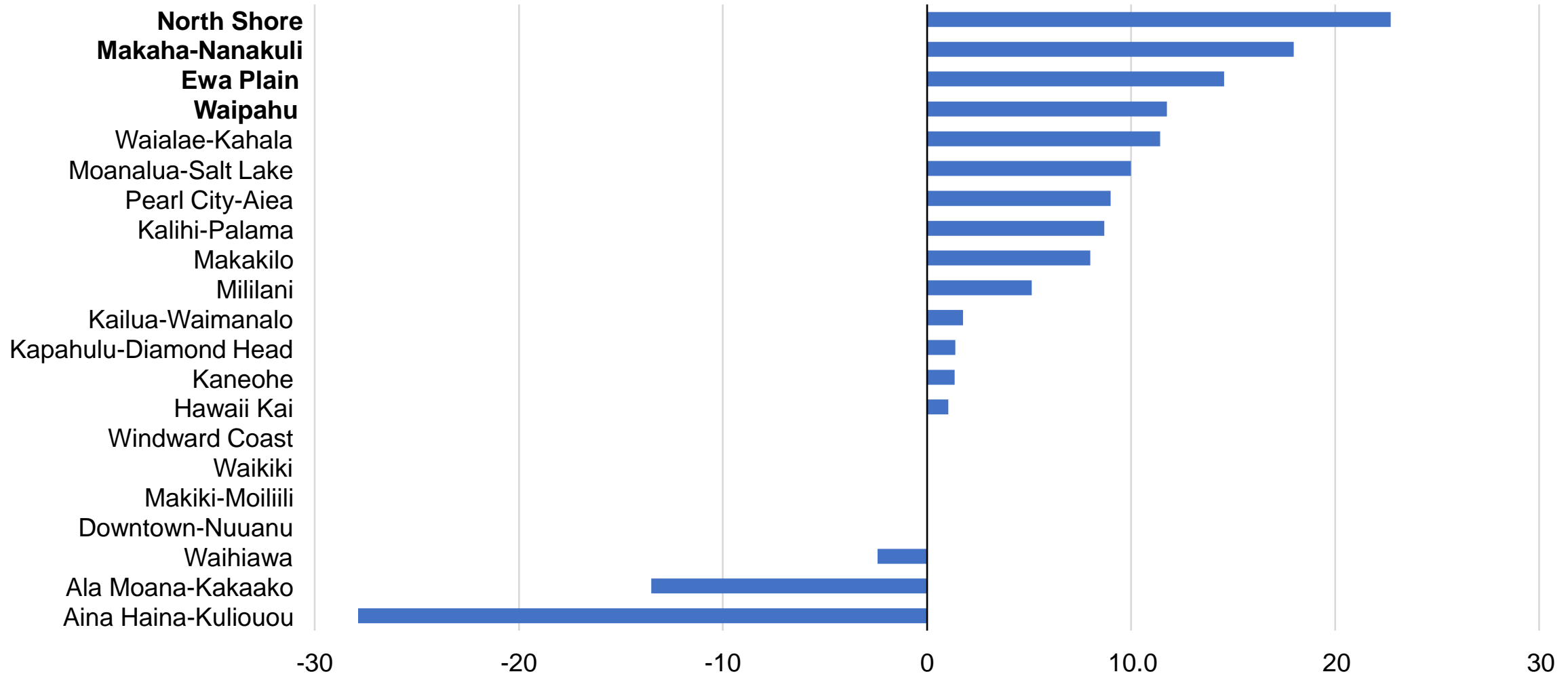
Oahu condominium price appreciation by neighborhood in 2020: more of a post-COVID West Side tilt, plus vacation rental fire-sale



Not to be left out: Maui County 2020 residential condominium price appreciation also favored Molokai, West Maui (Lanai small sample)



Oahu condominium price appreciation by neighborhood January-May 2021: not clear 2020 pattern isn't beginning to shift spatially



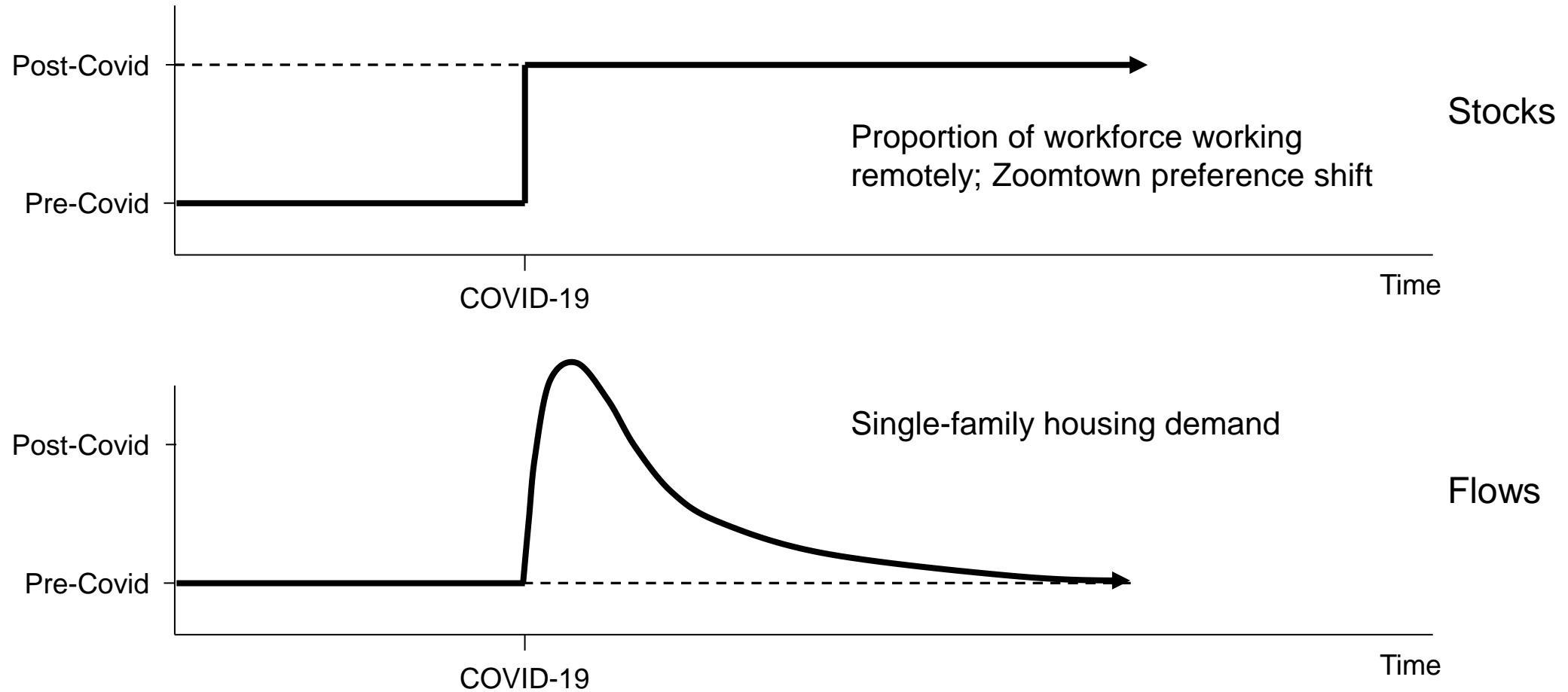
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Ways that post-Covid single-family and residential condominium segments diverged : condo inventory pile-up, SF price Tiny Bubble

- Single-family median prices exploded; condo median prices languished (“\$1 meellion” headline)
- Sales dropped after Covid appeared, initially, rose shortly thereafter in both segments, however:
 1. Listings evaporated for single-family homes (hoarding), one year ago, but sales later leapt
 2. Listings for condominiums surged as vacation rental investors exited: fire-sales externality
 3. Sales dropped more for condominiums than for single-family homes, one year ago
 4. Consequence: inventory/sales ratios (stocks/flows) lingered for condos, fell for single-family
- Highly-correlated months-of-inventory remaining (+0.96), SF vs. condo, uncorrelated (−0.67)
- Worse yet: Covid in 2020 “piled-on” trash heap created by Honolulu City Council in 2019, “putting undocumented vacation rentals in cages”—Murphy’s Law: crack down on Oahu vacation rentals *after thirty years* of not enforcing their prohibition, what could go wrong? If it can, it will.

When we used blackboards this might picture the post-Covid flow of housing demand; does Oahu housing supply respond this fast?



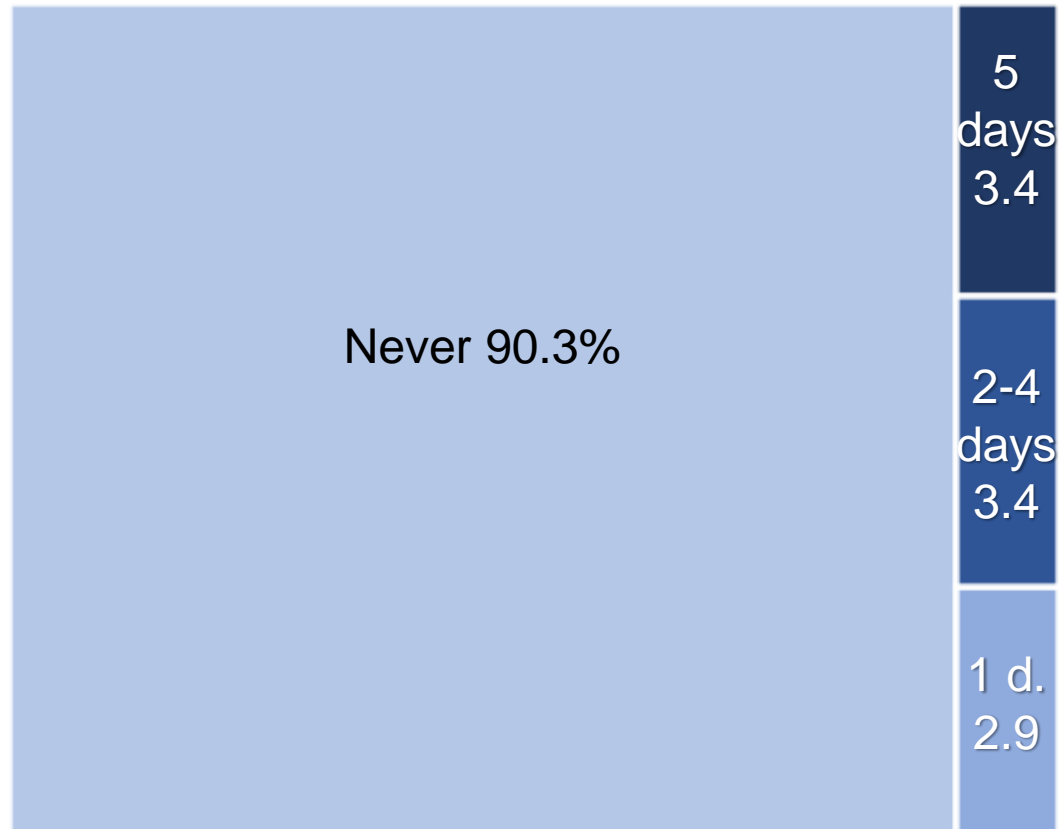


Work-From-Home (WFH) and labor force changes

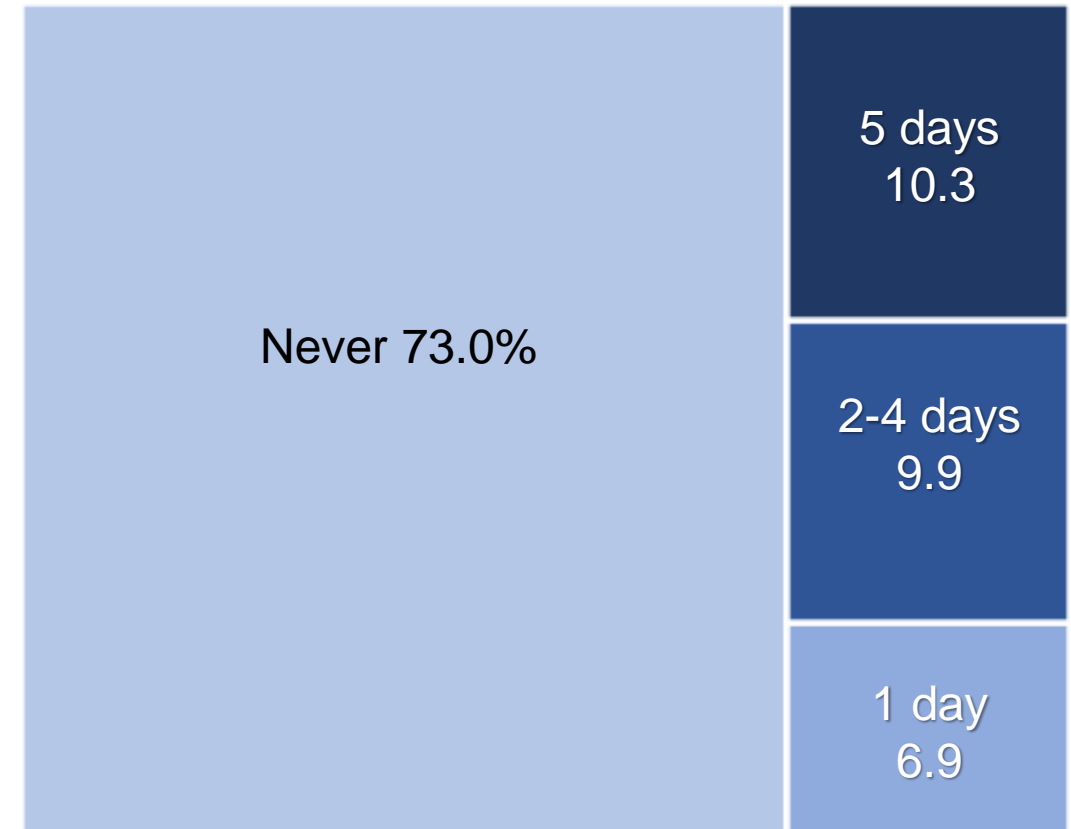
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FRB Atlanta (May 2020) survey results: “the share of working days spent at home is expected to triple after the COVID-19 crisis ends”

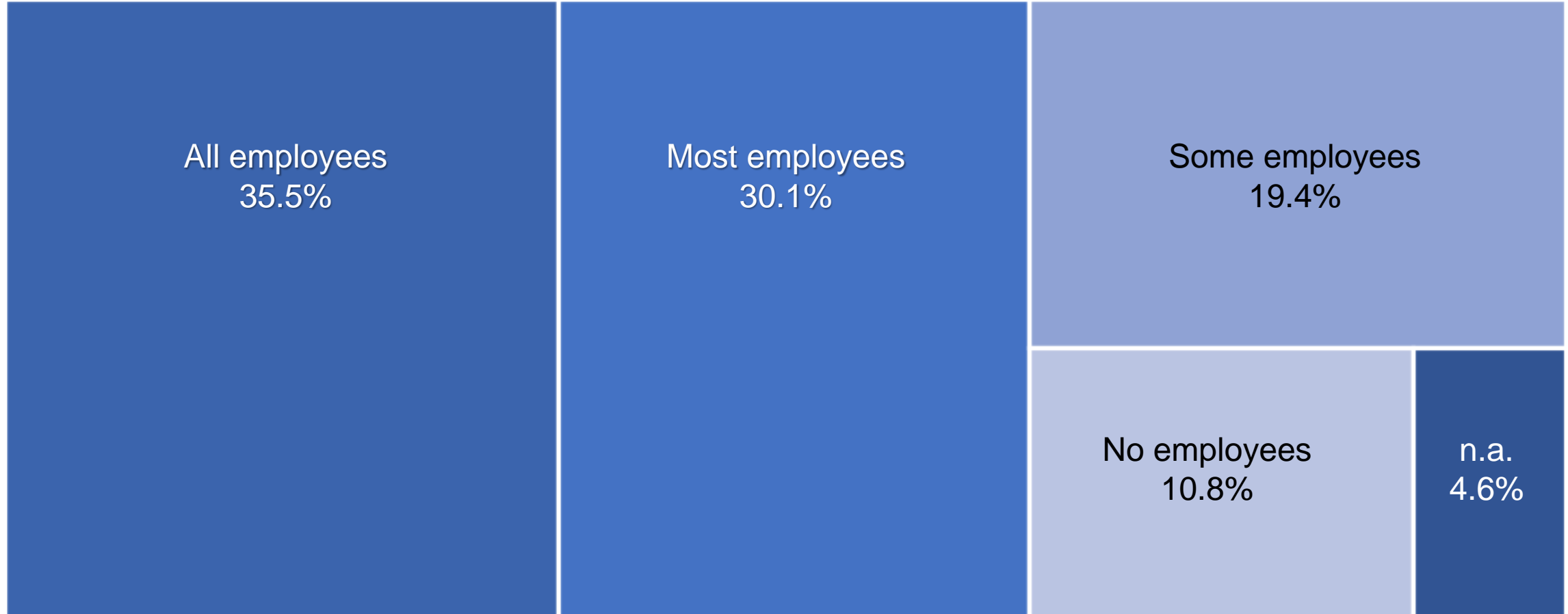
Pre-Crisis Work From Home



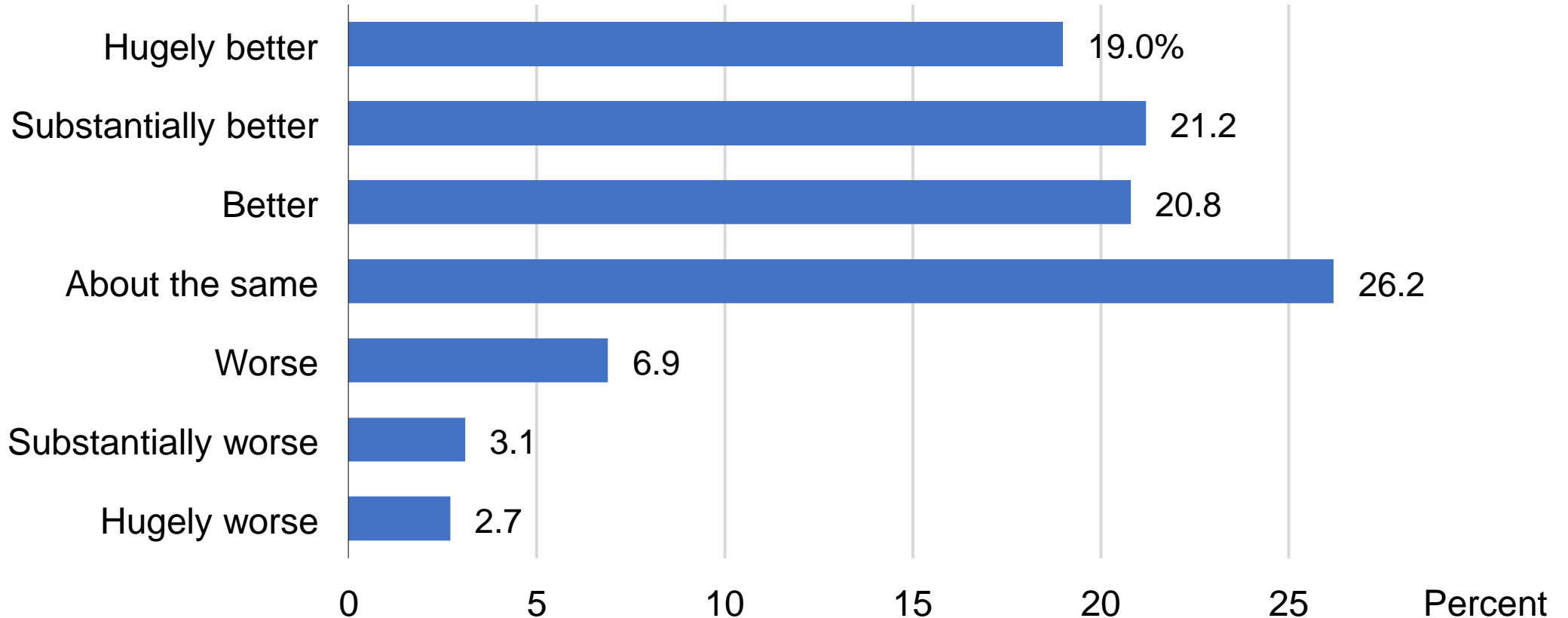
Post-Crisis Work From Home



January 2021 NABE member survey of firms: Did your company implement new work from home policies due to the health crisis?



Survey of firms: “Compared to expectations before Covid (in 2019) how has working from home turned out?” (Four survey waves, 2020)



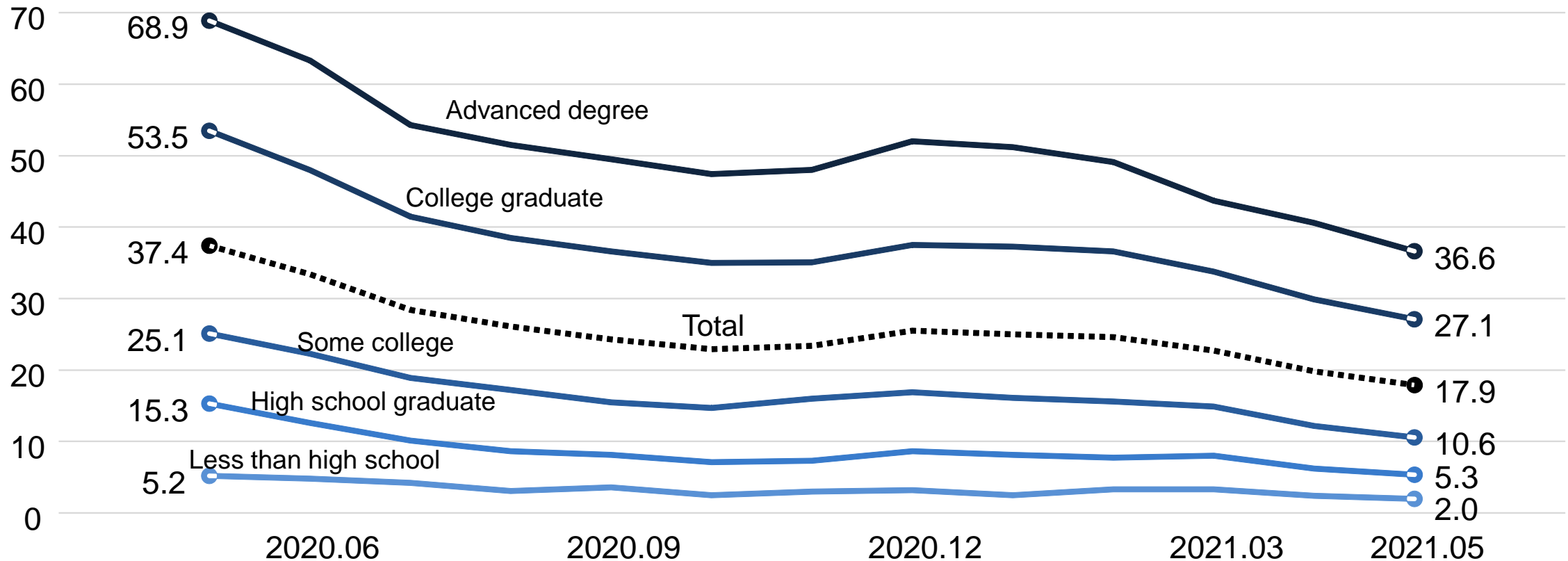
n = 2,500 (May, July, September/October 2020), 5,000 (August)

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Source: Nicholas Bloom on working from home: will it persist? (https://www.youtube.com/watch?v=N8_rvy-hqUs), Princeton Bendheim Center for Finance, working paper by Jose Maria Barrero, Nicholas Bloom, and Stephen J. Davis (January 2021), “Why Working From Home Will Stick,” posted at https://nbloom.people.stanford.edu/sites/g/files/sbiybj4746/f/wfh_will_stick_v5.pdf.

U.S. workers who teleworked or worked at home for pay specifically because of COVID-19, excluding those who did pre-pandemic*

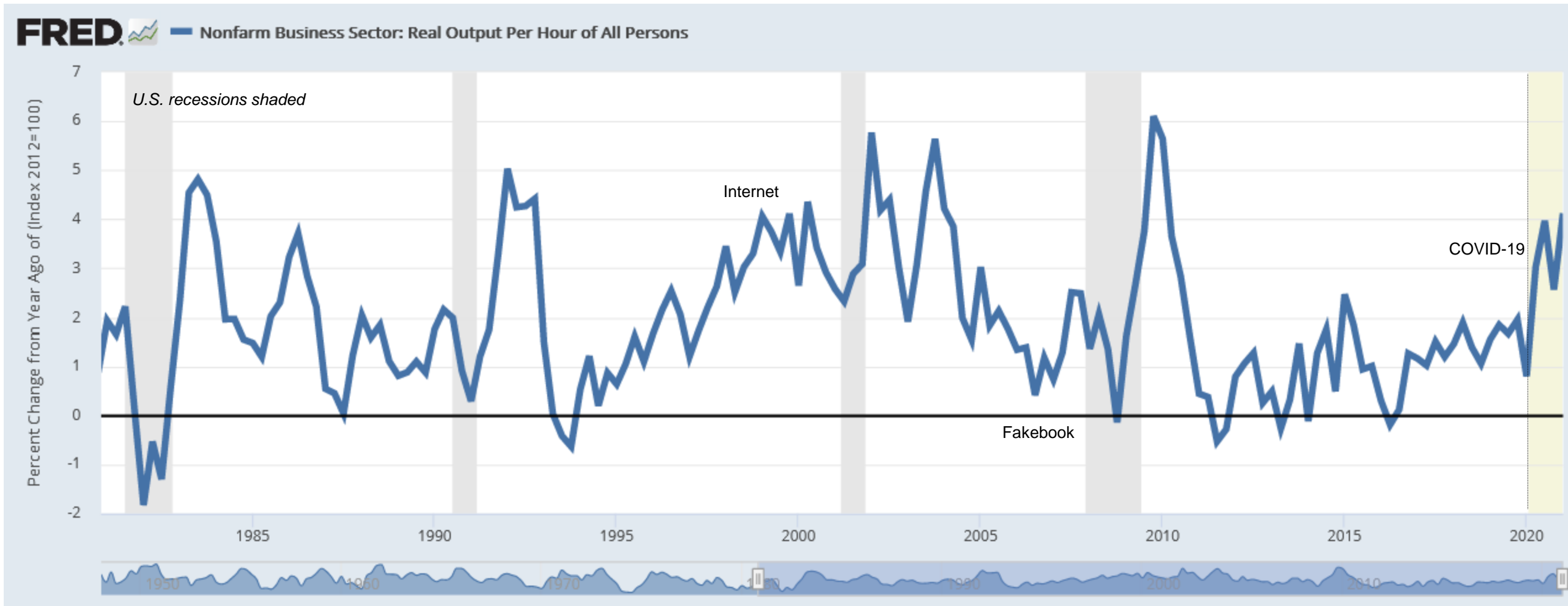
Percent of workers



*Or those whose telework was unrelated to the pandemic.

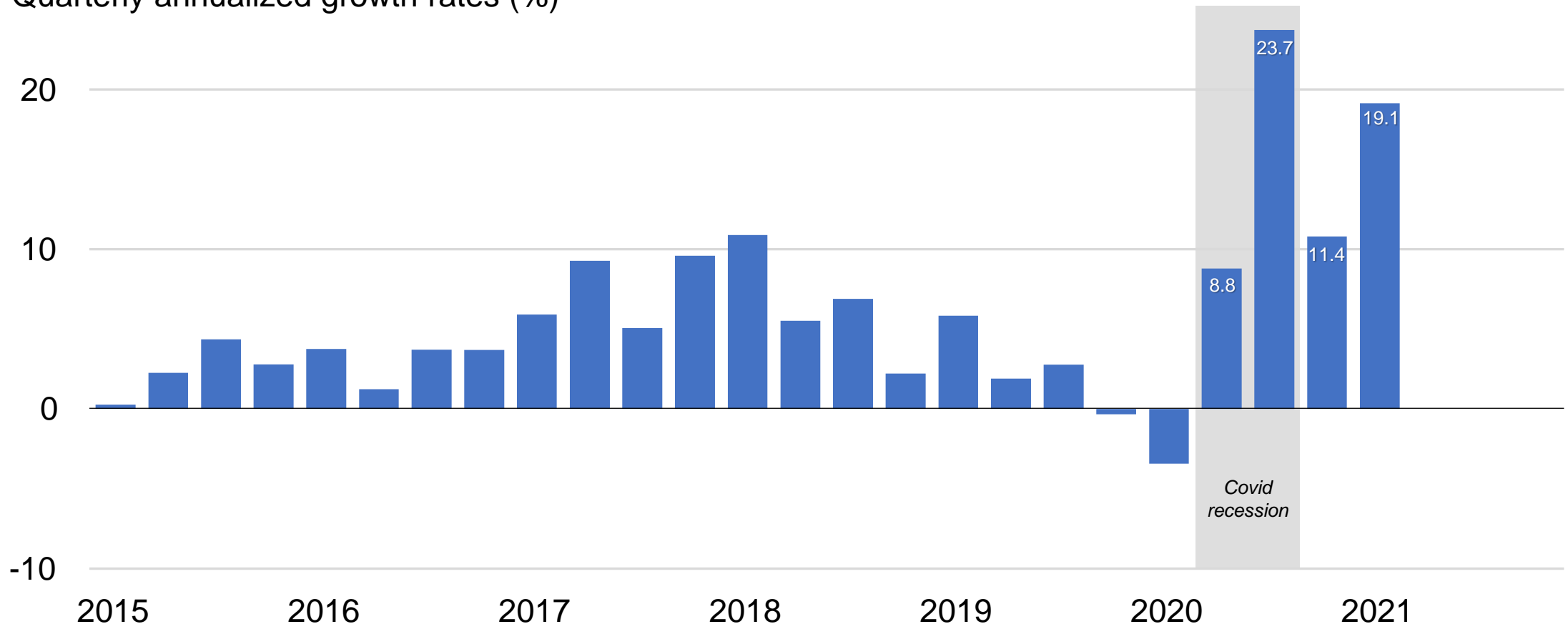
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Jump in output per hour of workers in nonfarm business sector (labor productivity) *during* recession unique to Covid event



Related WFH impacts of Covid: increased investment in IT equipment and software; remote work, fiscal stimuli, private savings/investment

Quarterly annualized growth rates (%)

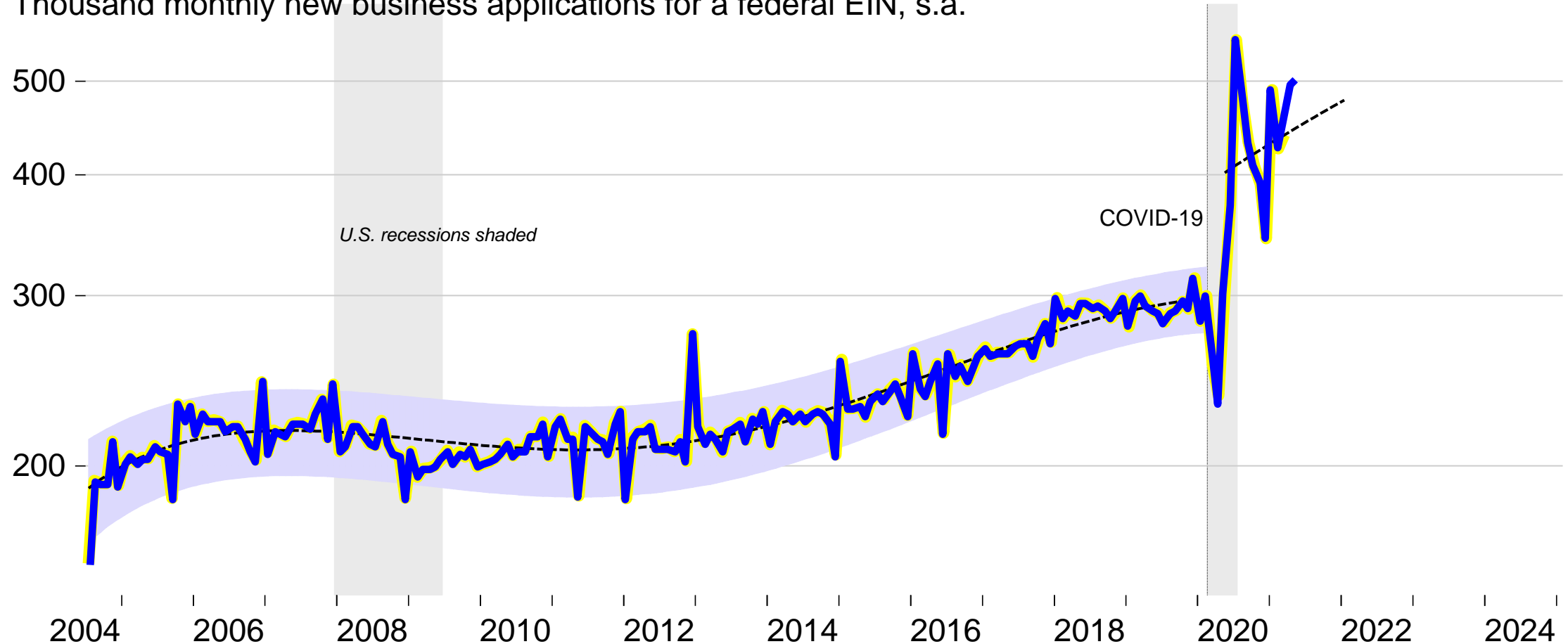


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Source: U.S. Bureau of Economic Analysis, Private fixed investment in information processing equipment and software [A679RC1Q027SBEA], retrieved from FRED, Federal Reserve Bank of St. Louis; <https://fred.stlouisfed.org/series/A679RC1Q027SBEA>, May 19, 2021.

Monthly U.S. private non-ag business applications for federal EIN: post-Covid entrepreneurship unleashed? “Take this job and shove it”

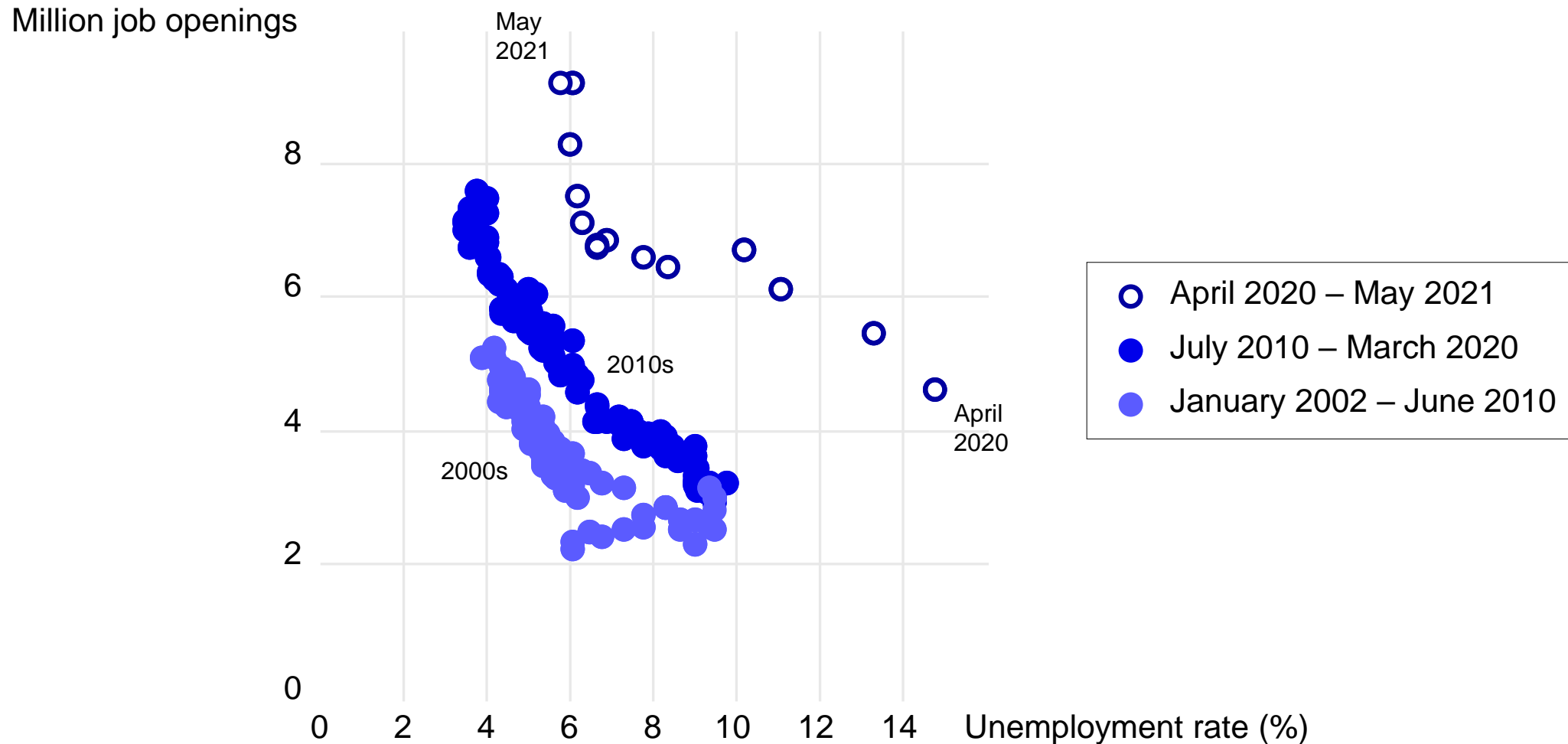
Thousand monthly new business applications for a federal EIN, s.a.



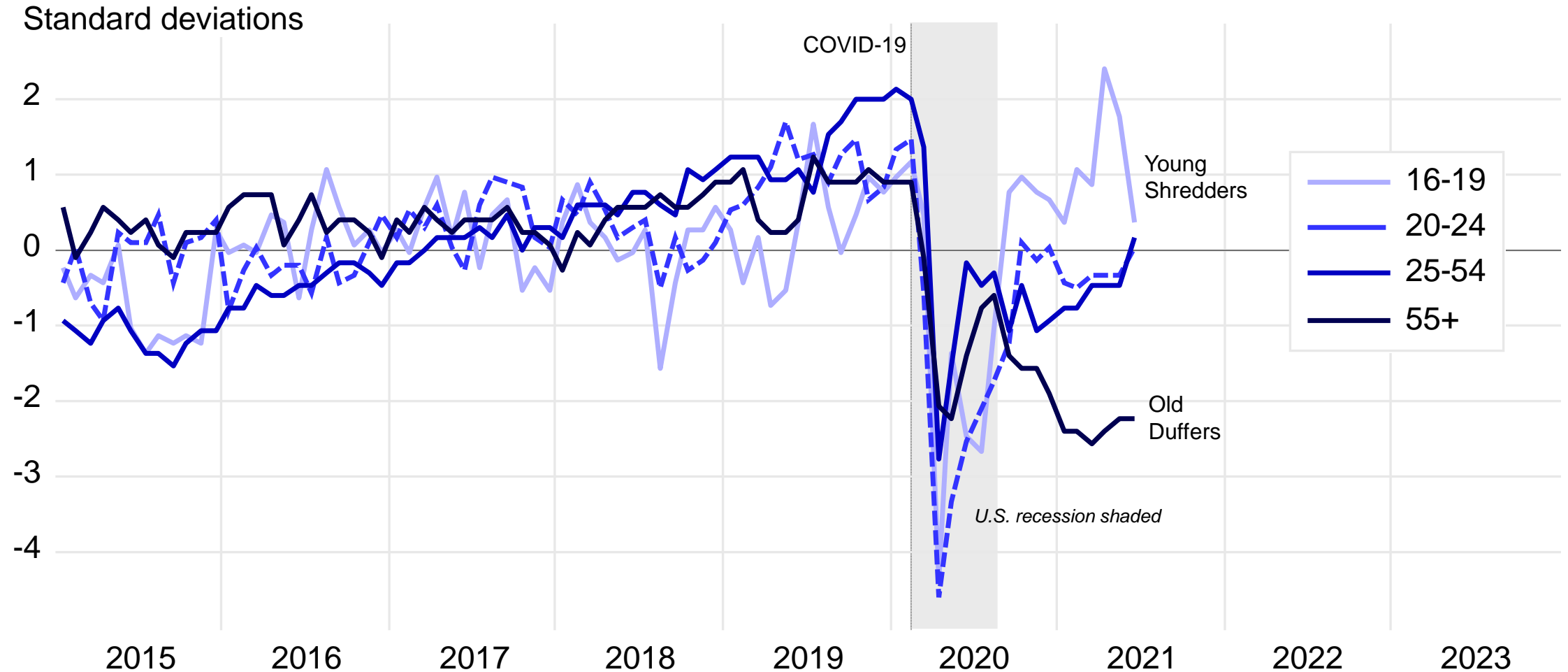
*Applications for an Employer Identification Number (EIN), except for applications for tax liens, estates, trusts, certain financial filings, applications outside of the 50 states and DC or with no state-county geocodes, applications with certain NAICS codes in sector 11 (agriculture, forestry, fishing and hunting) or 92 (public administration) that have low transition rates, and applications in certain industries (e.g. private households, civic and social organizations).

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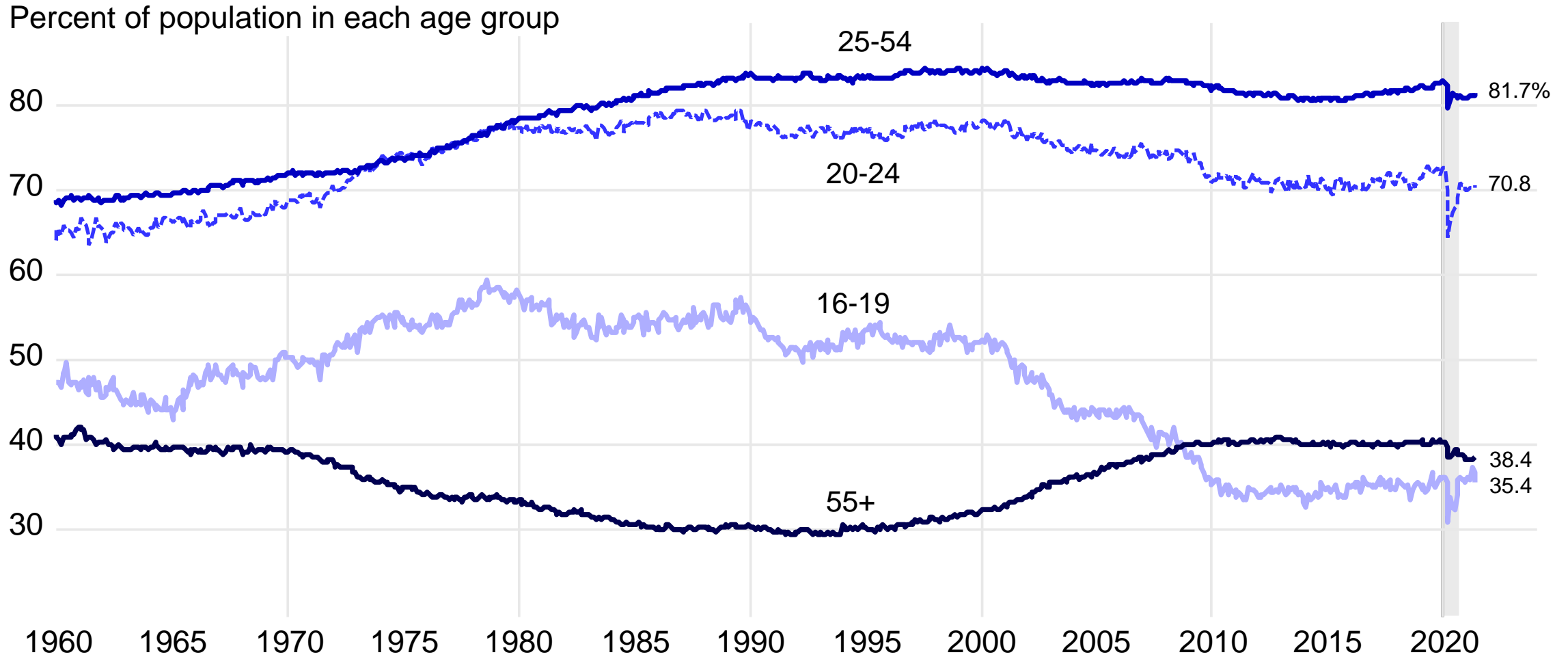
U.S. Beveridge Curve: higher unemployment means fewer jobs open; post-pandemic mismatch \Rightarrow *more* openings for given unemployment



Normalized labor force participation rates by age: large post-Covid rebound in younger cohorts, persistently lower rates in older cohorts



Younger workers since the 1980s face larger opportunity cost for *not* acquiring higher education than in past; workforce participation lower



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What do valuation dynamics tell us about pre-/post-Covid markets?

- Common characteristics of asset pricing bubbles: (a) detachment from economic fundamentals; (b) information asymmetry; (c) herding; (d) expectations of *others'* expectations
- Currently, Hawaii housing is not experiencing a meme bubble (GME, AMC, cryptocurrencies)
 1. Fundamentals consistent: low interest rates, economic recovery, strong balance sheets
 2. Transitory biological event; investors looking to longer-lived assets as safe havens
 3. Unique Covid impact: The Donut Effect,* demand moving to suburbs, exurbs, Zoomtowns
 4. Inelastic supply / regulatory barriers: fewer for sale listings, building (verb) constrained
- Hawaii home price bubbliciousness in SF Kauai, Maui, Oahu, possibly Kona, but not condos
- Novel coronavirus SARS-Cov-2 \Rightarrow novel factors affecting in housing demand and supply
 1. Tourists absent for 6-12 months—zero vacation rental cash flow (drop in condo demand)
 2. Remote work / work-from-home (WFH) new source of SF demand—vagabond workers
 3. Demographic change and net out-migration: medium- to longer-term factors (appendix)

*Arjun Ramani, Nicholas Bloom (January 2021) “The donut effect: How COVID-19 shapes real estate,” Stanford Institute for Economic Policy Research *SIEPR Policy Brief*, cite several phenomena: (a) High-density urban rents fell since start of pandemic; (b) housing demand shifted from urban centers to suburbs, but not substantially from more to less expensive cities; (c) working from home caused commercial occupancy rates, property prices to fall; (d) falling urban property values were likely driven by more skilled residents leaving high-value properties, with consequences for city budgets (<https://siepr.stanford.edu/research/publications/donut-effect-how-covid-19-shapes-real-estate>).

Pau

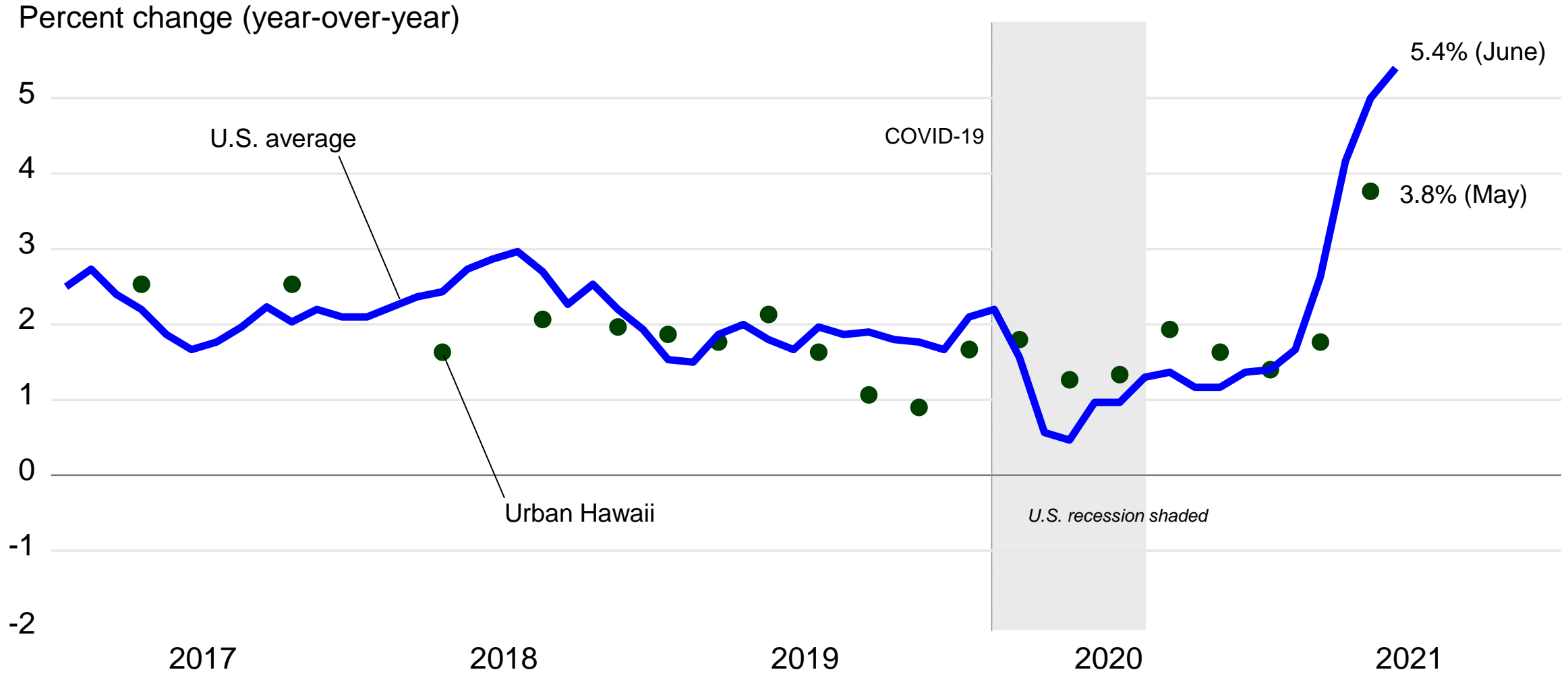




Appendix 1: inflation fear-mongering

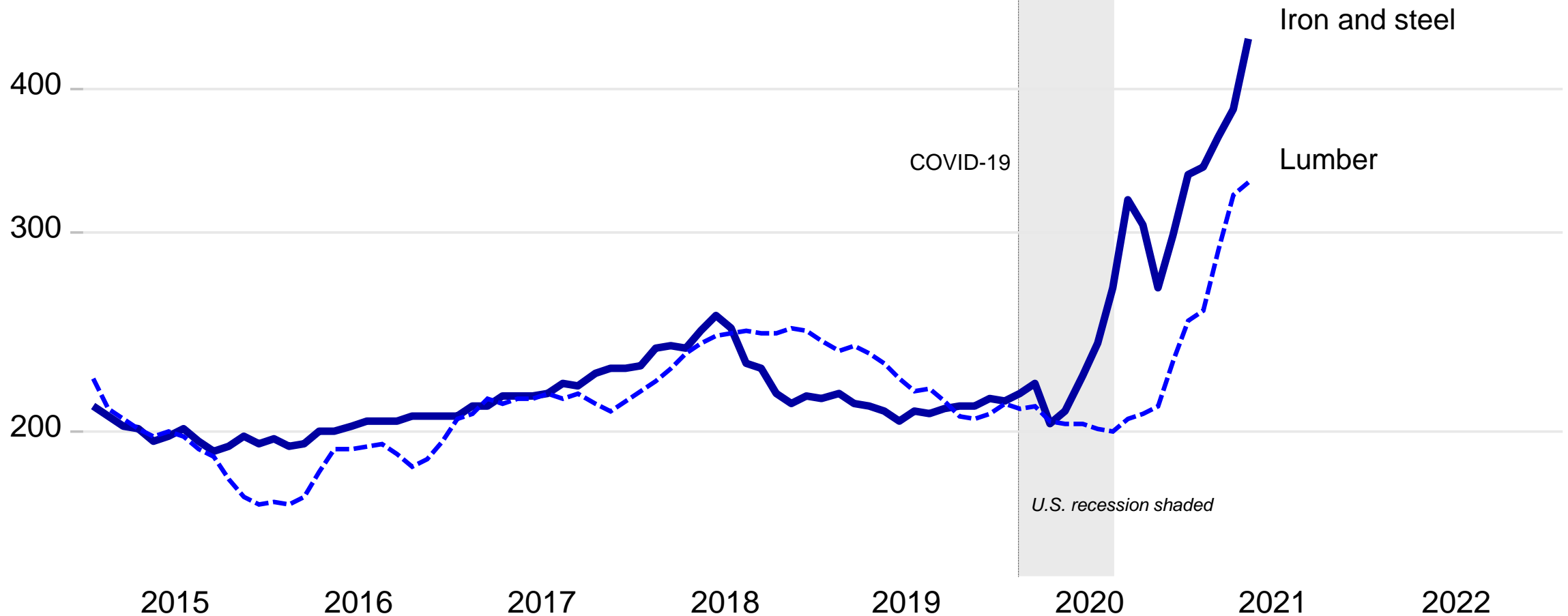
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Inflation is measured as the annual percent change in the index; and supply chain disruptions (from a pandemic) cause transitory inflation



Shuttered then rebooted factories, supply chain disruptions, factor constraints, strong recovery, raised producer prices, building costs

Index, monthly, s.a. (1982 = 100) (log scale)

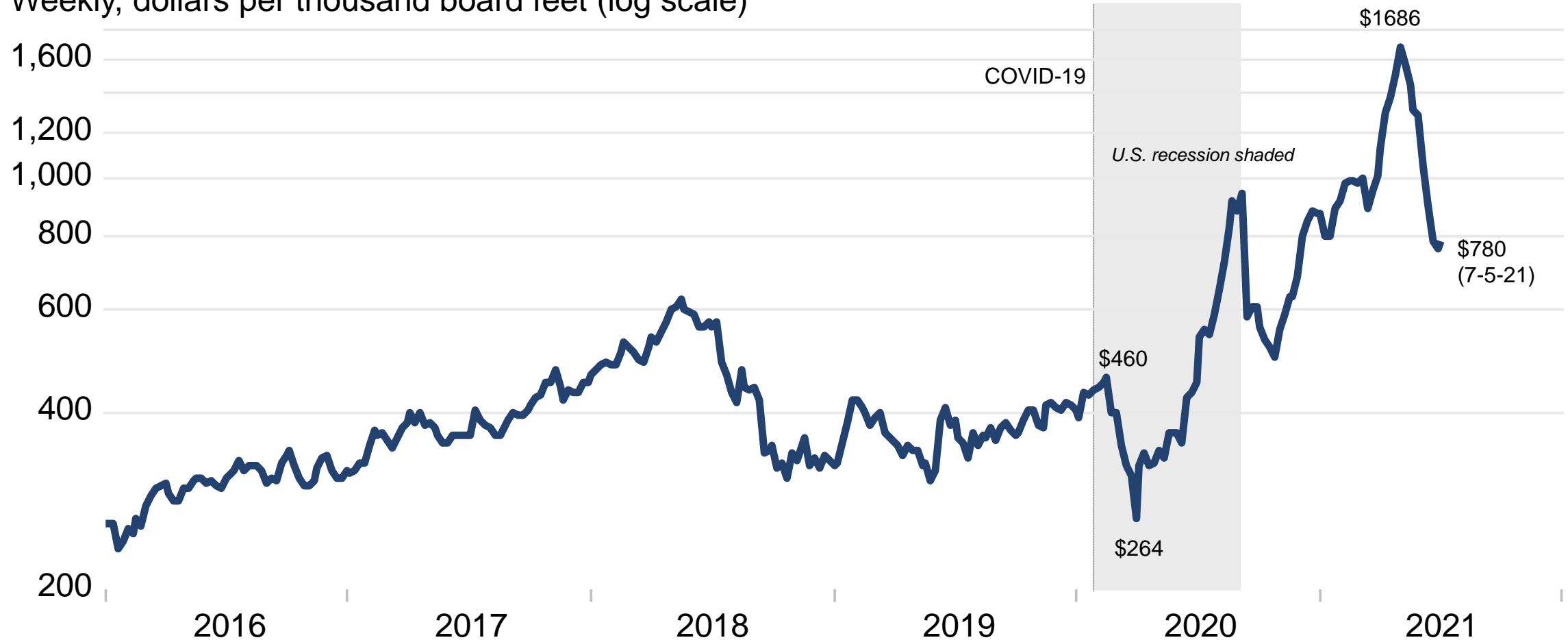


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Sources: U.S. Bureau of Labor Statistics, Producer Price Index by Commodity: Lumber and Wood Products: Lumber [WPS081], Producer Price Index by Commodity: Metals and Metal Products: Iron and Steel [WPU101], data through May 2021, retrieved from FRED, Federal Reserve Bank of St. Louis (<https://fred.stlouisfed.org/series/WPS081>, <https://fred.stlouisfed.org/series/WPU101>), July 6, 2021.

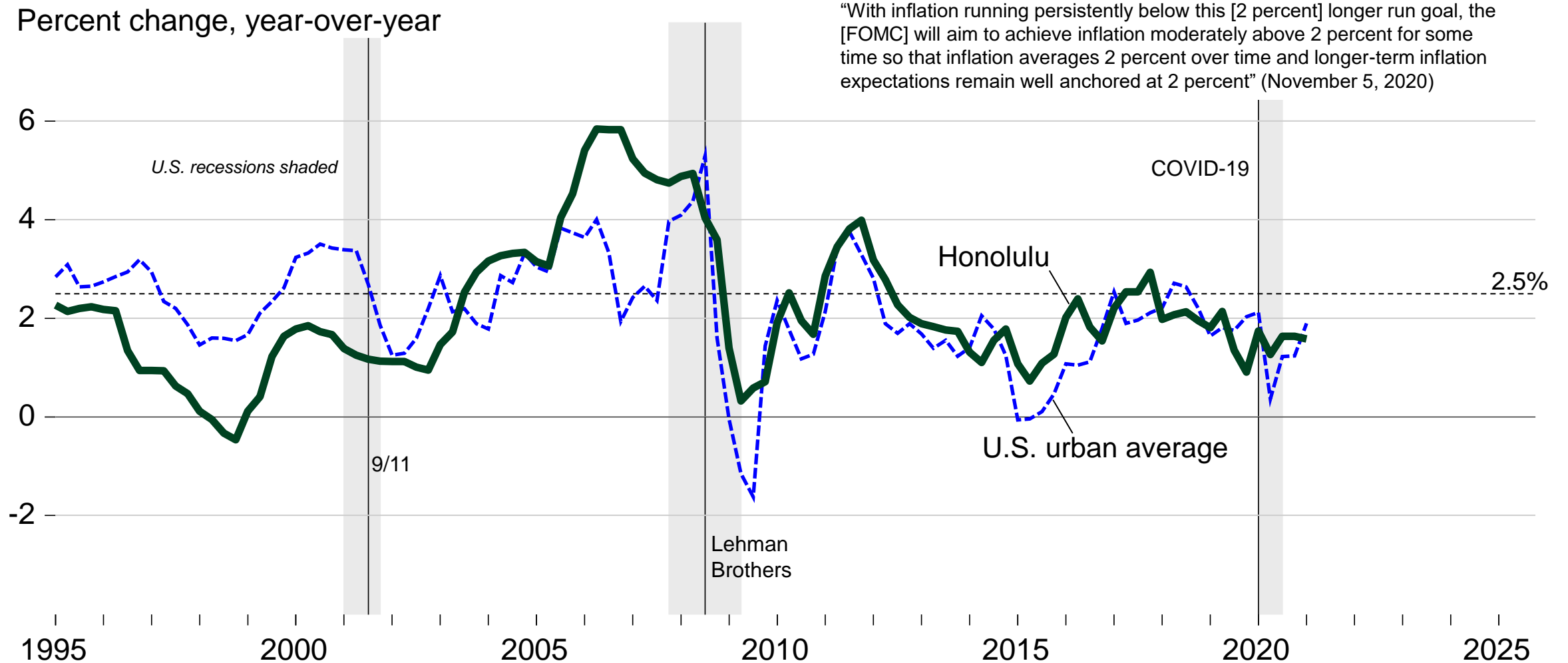
Lumber futures contracts prices fell ½ in last 2 months as Covid supply chain disruptions began to be resolved: *transitory* inflation

Weekly, dollars per thousand board feet (log scale)

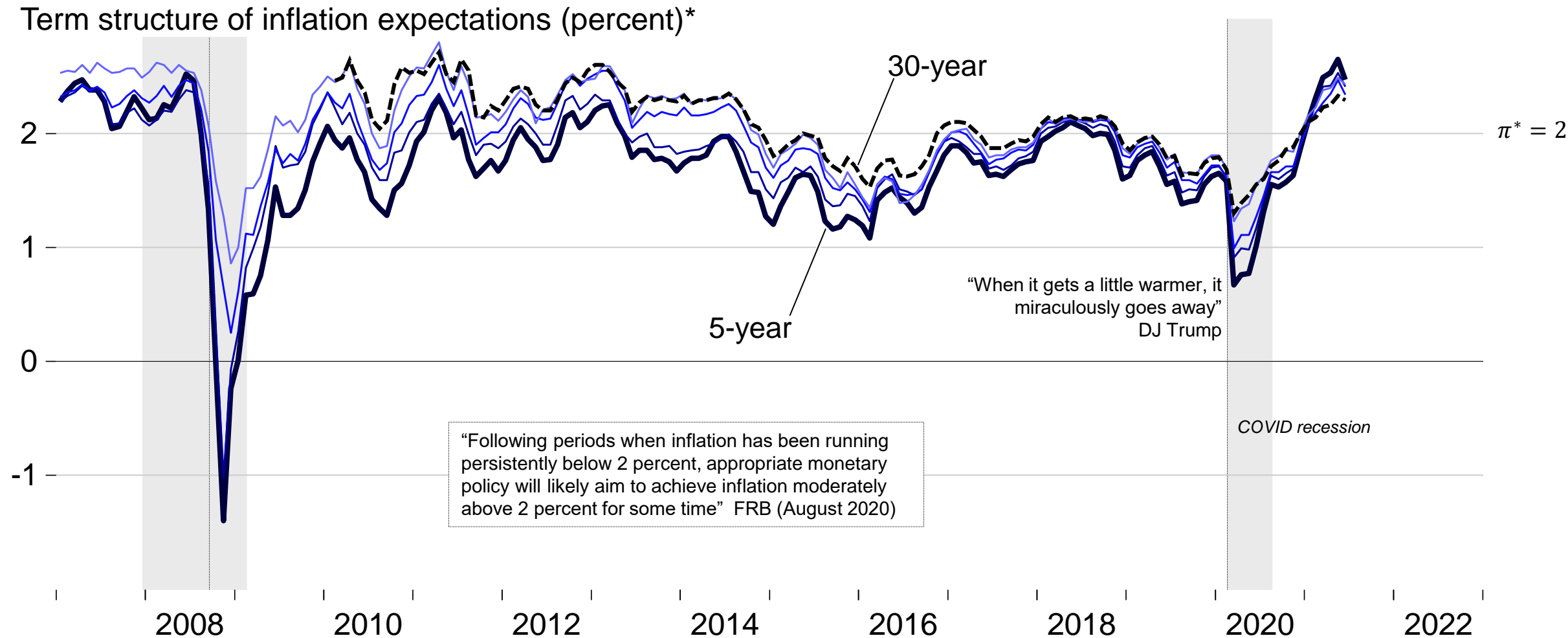


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U.S. and Hawaii CPI-U inflation: FOMC committed to PCE inflation averaging 2 percent, implies headline CPI inflation ≥ 2.5 percent



August 2020 update to FOMC Longer-Run Goals accepts that since 2014 LR inflation expectations $\pi^e \leq 2\%$ leave room for symmetric reflation



*Nominal U.S. Treasury yields minus TIPS yields at same maturities

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Source: Board of Governors of the Federal Reserve System (<https://www.federalreserve.gov/datadownload/Choose.aspx?rel=H15>), monthly implied inflation expectations through June 2021 and *Statement on Longer-Run Goals and Monetary Policy Strategy* (August 2020) <https://www.federalreserve.gov/monetarypolicy/review-of-monetary-policy-strategy-tools-and-communications-statement-on-longer-run-goals-monetary-policy-strategy.htm>

U.S. economic forecasts (and monetary union) provide insight into likely price inflation scenarios this year and next, even for Hawaii

	Median forecast		2021		2022		
<i>percent changes</i>	2021	2022	Lowest 5	Highest 5	Lowest 5	Highest 5	<i>n</i>
<hr/>							
<i>Q4/Q4</i>							
Core PCE deflator	2.2	2.1	1.6	3.2	1.7	2.6	45
PCE deflator	2.6	2.2	2.2	3.6	1.7	3.3	43
GDP implicit price deflator	2.7	2.3	2.1	3.3	1.7	3.0	45
CPI-U	2.8	2.3	1.7	3.7	1.6	3.2	45
Real U.S. GDP	6.7	2.8	4.1	8.1	2.2	4.8	46
<hr/>							
<i>Annual average</i>							
Real U.S. GDP	6.5	4.4	5.0	7.3	2.9	5.6	49



Post-Covid monetary policy

- Monetary policy builds on Bernanke quantitative easing
 1. Stabilize financial markets immediately with liquidity injection (confidence = liquidity)
 2. Forward guidance so nobody can fake like they didn't know the plan
 3. Treasury yields confirm that recovery began last fall, front-run to interim term structure
- Inflation Mansplaining
 1. Inversion of term structure of implied inflation expectations implies that it is transitory
 2. Evolution of inflation targeting
 - a) Mishkin, Bernanke *et al* publish textbook *Inflation Targeting* (1999)
 - b) Ned Gramlich (in Honolulu): “you’d have to be living in a cave not to know...” (2005)
 - c) FRBSF Prez Janet Yellen (at BOH luncheon): “our non-target target for inflation” (2007)
 - d) Fed Chair Bernanke publishes a target target: 2 percent PCE deflator (Jan 2012)
 - e) Fed Chair Powell’s AIT elaboration: 2 percent *on average over time* (Aug 2020)

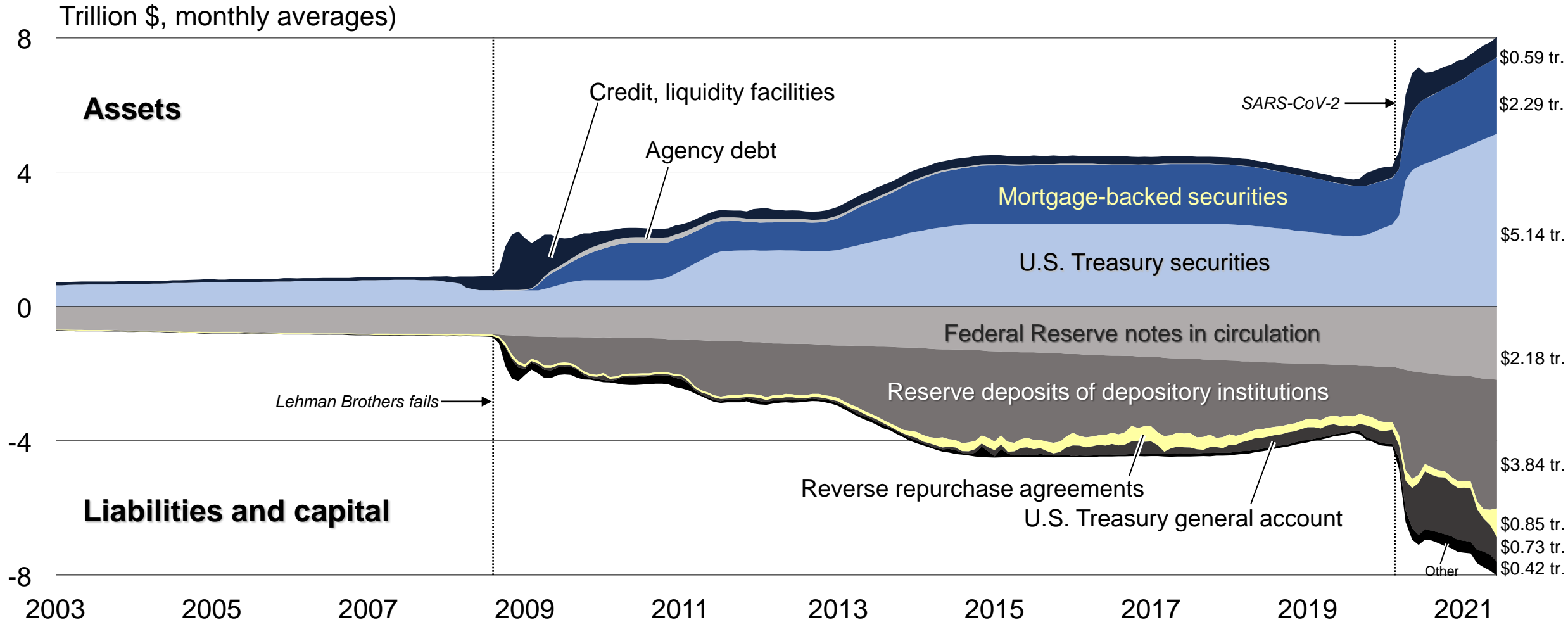
The FOMC forecast for inflation this year increased by 1 percentage point between March and June 2021, but is expected to revert to 2%

Percent

Variable	Median ¹				Central Tendency ²				Range ³			
	2021	2022	2023	Longer run	2021	2022	2023	Longer run	2021	2022	2023	Longer run
Change in real GDP	7.0	3.3	2.4	1.8	6.8–7.3	2.8–3.8	2.0–2.5	1.8–2.0	6.3–7.8	2.6–4.2	1.7–2.7	1.6–2.2
March projection	6.5	3.3	2.2	1.8	5.8–6.6	3.0–3.8	2.0–2.5	1.8–2.0	5.0–7.3	2.5–4.4	1.7–2.6	1.6–2.2
Unemployment rate	4.5	3.8	3.5	4.0	4.4–4.8	3.5–4.0	3.2–3.8	3.8–4.3	4.2–5.0	3.2–4.2	3.0–3.9	3.5–4.5
March projection	4.5	3.9	3.5	4.0	4.2–4.7	3.6–4.0	3.2–3.8	3.8–4.3	4.0–5.5	3.2–4.2	3.0–4.0	3.5–4.5
PCE inflation	3.4	2.1	2.2	2.0	3.1–3.5	1.9–2.3	2.0–2.2	2.0	3.0–3.9	1.6–2.5	1.9–2.3	2.0
March projection	2.4	2.0	2.1	2.0	2.2–2.4	1.8–2.1	2.0–2.2	2.0	2.1–2.6	1.8–2.3	1.9–2.3	2.0
Core PCE inflation ⁴	3.0	2.1	2.1		2.9–3.1	1.9–2.3	2.0–2.2		2.7–3.3	1.7–2.5	2.0–2.3	
March projection	2.2	2.0	2.1		2.0–2.3	1.9–2.1	2.0–2.2		1.9–2.5	1.8–2.3	1.9–2.3	
Memo: Projected appropriate policy path												
Federal funds rate	0.1	0.1	0.6	2.5	0.1	0.1–0.4	0.1–1.1	2.3–2.5	0.1	0.1–0.6	0.1–1.6	2.0–3.0
March projection	0.1	0.1	0.1	2.5	0.1	0.1–0.4	0.1–0.9	2.3–2.5	0.1	0.1–0.6	0.1–1.1	2.0–3.0

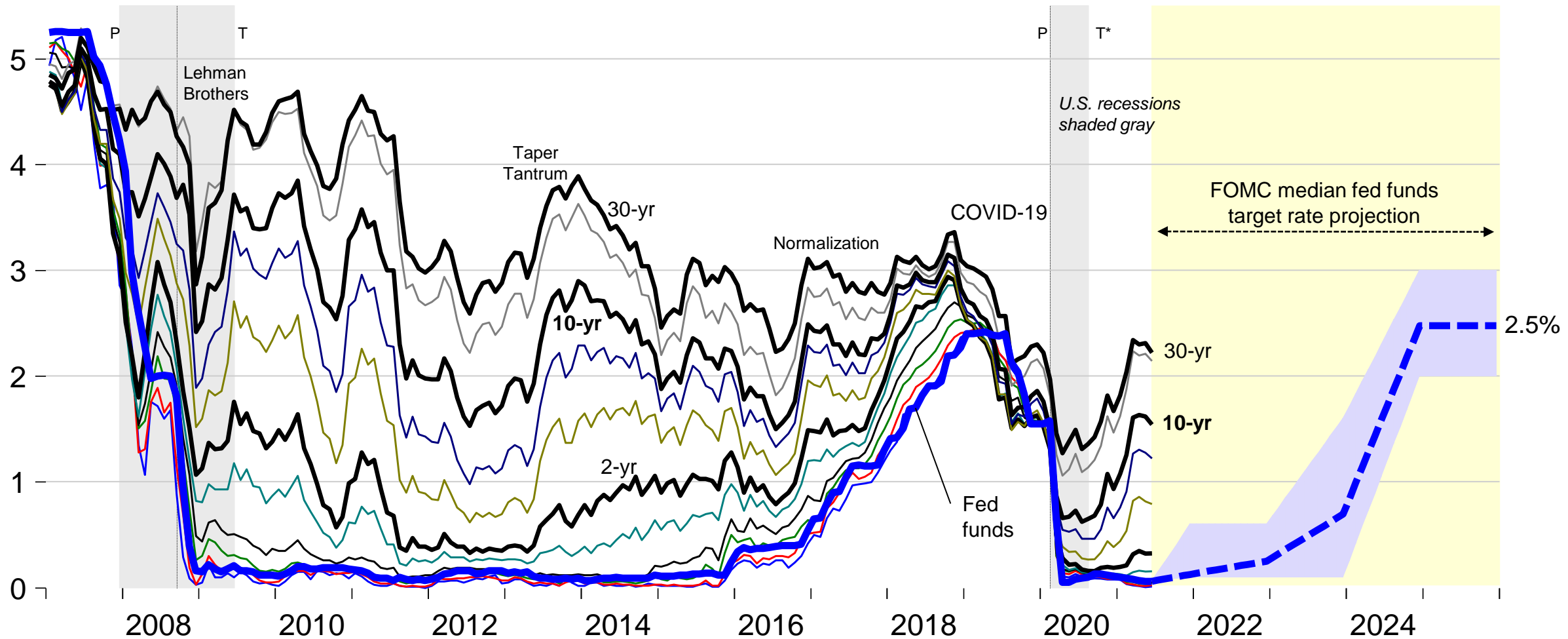
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Monetary stabilization, accommodation of liquidity preference, fiscal stimuli expanded Federal Reserve asset purchases, balance sheet



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Nominal U.S. Treasury yields: overnight rates at zero lower bound, as of June 16, 2021 FOMC projected low, inching upward through 2023

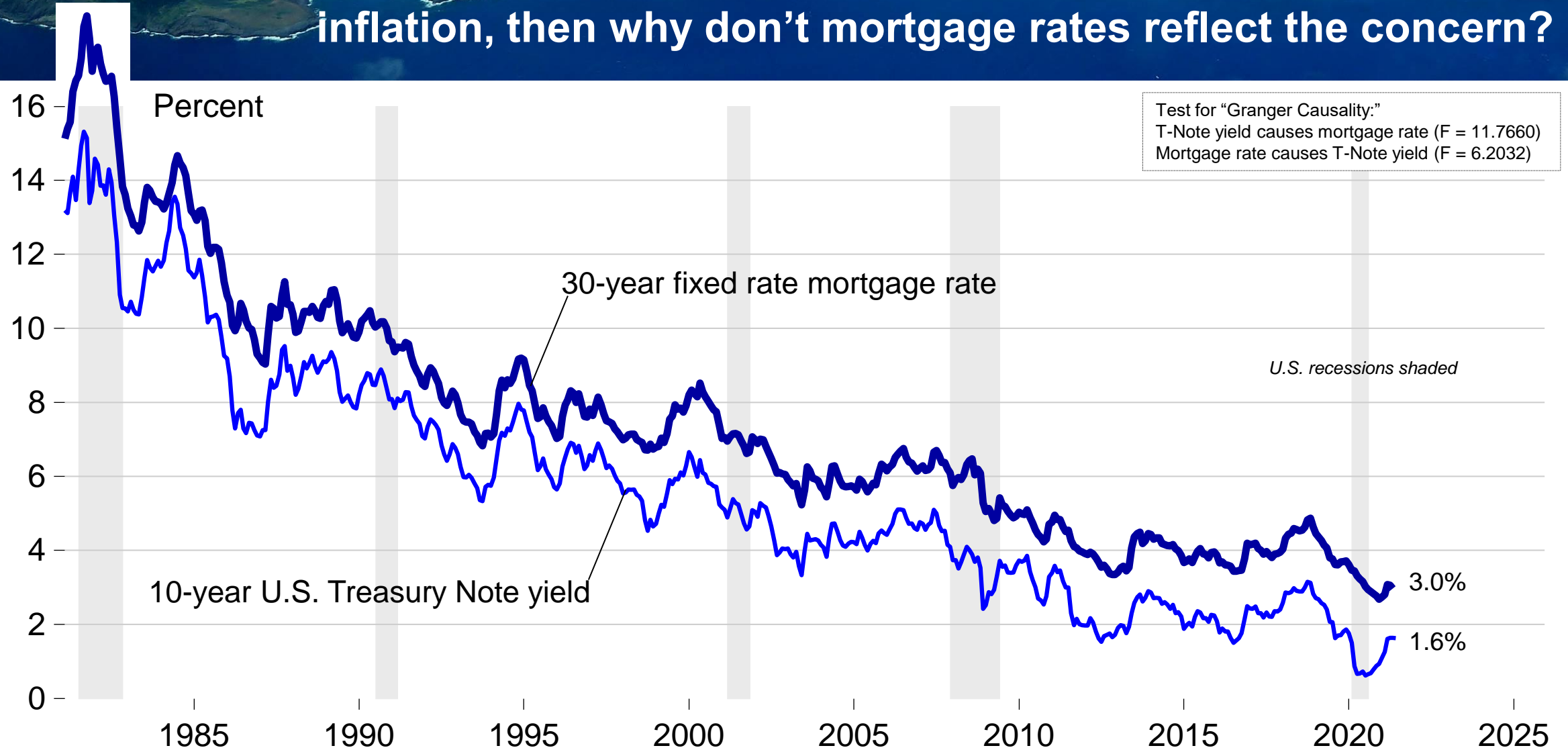


*Unofficial (<https://www.nber.org/research/data/us-business-cycle-expansions-and-contractions>)

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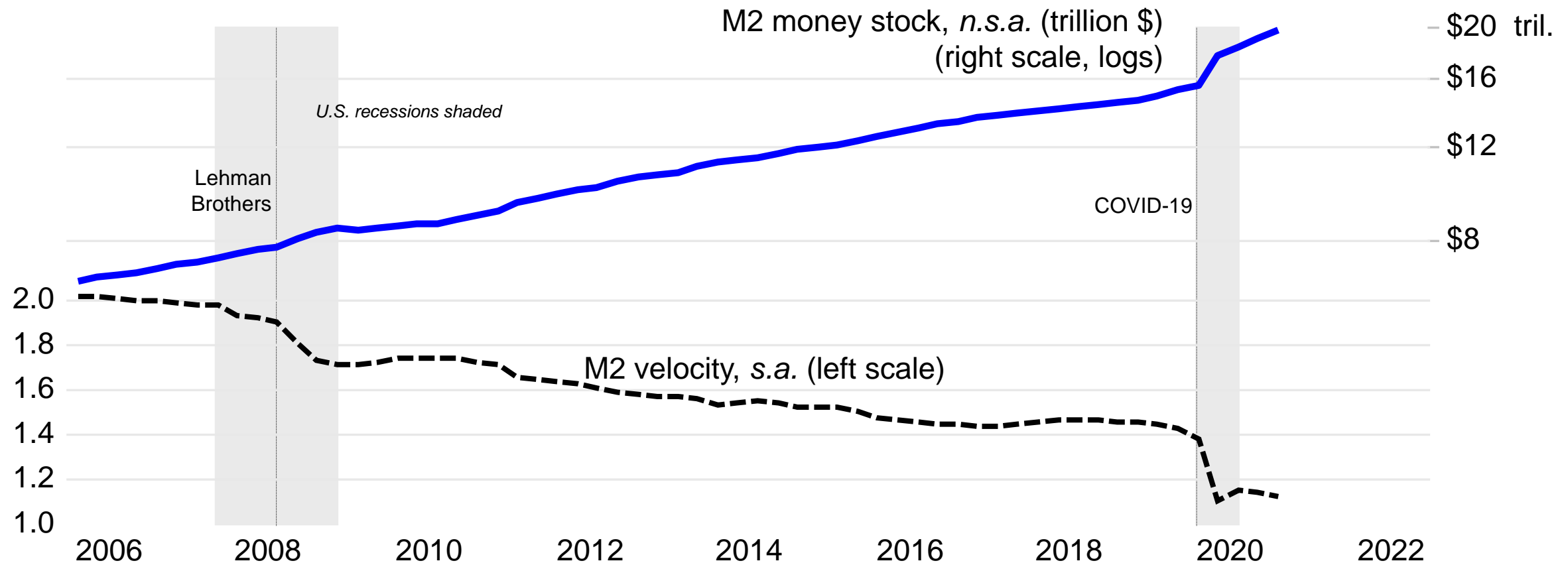
Sources: Board of Governors of the Federal Reserve System (<https://www.federalreserve.gov/datadownload/>), Federal Open Market Committee (FOMC) (June 16, 2022) (<https://www.federalreserve.gov/monetarypolicy/fomcprojtabl20210616.htm>).

Talk is cheap? If “everybody” is concerned about reviving 1980s inflation, then why don’t mortgage rates reflect the concern?



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Confidence is liquidity: Covid raised precautionary demand. Q: Why was boosting M2 money stock not inflationary? A: Velocity collapsed



Beginning May 2020, M2 consists of M1 plus: (1) small-denomination time deposits (time deposits in amounts of less than \$100,000) less IRA and Keogh balances at depository institutions; and (2) balances in retail MMFs less IRA and Keogh balances at MMFs. Seasonally adjusted M2 is constructed by summing savings deposits (before May 2020), small-denomination time deposits, and retail MMFs, each seasonally adjusted separately, and adding this result to seasonally adjusted M1.

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Pau

