Workforce and economic surprises in the post-covid 2020s

Slides prepared for the
Hawaii Workforce Development Council Meeting
June 28, 2022

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TZ Economics, Kailua, Hawaii
Hawaii has highest normalized daily COVID-19 case counts in U.S.

- COVID-19 variant waves (Delta, Omicron, BA.2): less lethal, more infectious
  - 9/11-magnitude decreases in travel volumes, each wave (minus 15-20 percent)
  - Ongoing suppression of resident economic activity in high-frequency data
  - Unambiguous negative impacts on job openings

- Economic activity still being tamped down by recurrent waves (ignore denialism)

- Rough ride for economic recovery, now at risk of slowdown to stifle inflation
Kauai still the worst, currently with a 23% test positivity rate (zounds)

Daily county averages, new confirmed COVID-19 cases per million residents

Travel demand contracted after each Hawaii’s COVID-19 waves—Delta, Omicron (BA.1, BA.2)—through June 2022; weekly data

Weekly Hawaii passenger arrivals (thousands, s.a.) (right scale)

COVID-19 recession shaded

Pre-flight testing initiated

Tough to average zero

Weekly averages of daily Hawaii COVID-19 cases/million residents (left scale)


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Behavioral changes in anonymized daily Hawaii resident mobility data on retail, food service, recreation activity: people act before “leaders”

Google smartphone GPS mobility index for Hawaii residents relative to January 2020


Each COVID-19 variant wave since June 2021 coincided with suppressed Hawaii job postings, throttling an upward trend.

Index of average Hawaii job postings relative to January 4-31, 2020


*See previous slide  †Lia Kamana (December 23, 2021) "Mayor Blangiardi emphasizes personal decision-making and personal responsibility at this stage in the fight against COVID-19," (https://www.kitv.com/video/mayor-blangiardi-emphasizes-personal-decision-making-and-personal-responsibility-at-this-stage-in-the-fight/video_2bebac07-357f-5dbd-87a9-c567800fcb0.html)
Inflation: “This Not The Mainland” (bumper sticker)

- Consumption surge initiated recovery, but goods consumption now braking hard
- Services consumption never did catch up; tourism still at 0.8-0.9 of potential
- Urban Hawaii inflation (7.0% May 2022) not the highest in forty years!
- Hawaii inflation also not cumulation of 5-15 year build-up: try 1-year kick-flip (This Not The ’70s)
- Hawaii inflation a mix of global supply chain disruption (about 3 percentage points) and “macro” factors on the aggregate demand side of economy (about 4 percentage points)
- Goods inflation predictable: petroleum (Putin); used vehicles (semiconductor spillover); food (supply chain)—Federal Reserve policy can’t fix Russian invasion of Ukraine
- Gave up on the Phillips Curve did you? What inflation did you expect at 4% unemployment
- Outlook—take a chill pill, wait 18 months for inflation to subside
Quarterly Urban Hawaii consumer price inflation at mid-2022 not the highest in 40 years; not drawn out as in past macroeconomic surges.


Inflation rising from mix of 2021 supply chain constraints, pandemic disruptions, input price shocks (oil, labor), demand (fiscal stimulus)

Percent change, year-over-year

-2 - 0 - 2 - 4 - 6 - 8 -


U.S. urban average
Urban Hawaii
COVID-19
March
8.6%
7.0%

Do the math: segregate (1) headline inflation (micro (AS)); (2) Urban Hawaii core inflation (macro (AD)); (3) pre-covid trend. $\sum = 7\%$ actual

Urban Hawaii consumer price indexes, March 2021 = 100 (log scale)

Component rates of Urban Hawaii inflation May 2022 led by energy and food—classic supply shocks—but core inflation rate also high

Motor fuel: 37.8%
Fuels and utilities: 23.6%
Used vehicles: 15.5%
Food at home: 10.1%
New vehicles: 8.2%
All items: 7.0%
Household furnishings and operations: 6.9%
Other goods and services: 6.8%
Food away from home: 6.8%
Recreation: 3.9%
Rent of primary residence: 2.2%
Apparel: 2.1%
Education and communication: 1.7%
Owners' equivalent rent of residences: 0.7%
Alcoholic beverages: -0.3%

Year-over-year percent changes

For Hawaii it's mostly about oil prices (up from < $40/bbl to > $120/bbl), motor vehicles (semiconductors), and food

Source: U.S. Bureau of Labor Statistics (https://www.bls.gov/cpi/data.htm); this reaggregation omits certain items including "Medical care" (not continuously available), and "Public transportation."
Those who forget the past are condemned to retweet it: oil prices simply returned to pre-covid levels before Russia invaded Ukraine.
Chicago Board of Trade corn (maize) futures now in decline (again), should provide relief in producer prices over coming months

U.S. Producer Price Index for Construction Materials well above historical inflation rate of 2.4 percent; recent stabilization (2022)

Lumber futures prices, PPI for lumber volatile since COVID-19 but should settle as resolution supply chain disruptions continues

Daily lumber futures prices, dollars/thousand board feet (logs)

Monthly PPI (1982 = 100) (logs)

Futures Prices

Producer Price Index

Urban Hawaii Phillips Curves largely validate theoretical inverse relationship between inflation, unemployment ("flattest in 2010s")
Monetary policy transition to lift-off

- FOMC now cranking the overnight lending rate target +75 basis points/meeting: fed funds rate (SOFR will match) by 2023 to overnight rate in range of 3-4%

- Long end of yield curve already (End Game) waiting at 3.0-3.5% (forward guidance)

- Inflation expectations (“breakeven inflation rates”) still well-anchored (given AIT)

- Quantitative tightening details: $30 bil./month Treasuries maturing, $17.5 bil./month MBS maturing; more liquidity minutiae—reverse repo bid/offer rate 1.55/1.75%
U.S. Treasury yield curve flattened substantially over first half 2022

Nominal U.S. Treasury yield curve: FOMC moving aggressively to contain aggregate demand pressure on inflation, anchor expectations

Next steps for monetary policy: (1) tapering asset purchases; (2) fed funds rate lift-off; (3) balance sheet run-off (in that order, sequentially)

Sources: Monthly averages of weekly averages, Federal Reserve Board (Statistical Release H.4.1), compiled through week of June 8, 2022 (https://www.federalreserve.gov/releases/H41/default.htm)
Term structure of expected inflation from nominal Treasury minus TIPS yields

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

Why this is not the 1970s: (nominal – real) U.S. Treasury yields: long run inflation expectations $\pi^e \leq 2.75\%$ remain well-anchored

"Following periods when inflation has been running persistently below 2 percent, appropriate monetary policy will likely aim to achieve inflation moderately above 2 percent for some time" FRB (August 2020)

Another transmission channel for interest rates: strong dollar reduces Japanese daily visitor expenditure (elasticity $c \approx -0.4$); Euro ambiguous.

Inverse relationship between Hawaii home sales and mortgage interest rates (2008-2022(May))

Sources: Honolulu Board of Realtors, Hawaii Information Service, Realtors Association of Maui, Hawaii Association of Realtors, Hawaii DBEDT (http://dbedt.hawaii.gov/economic/mei/), Freddie Mac, retrieved from FRED, Federal Reserve Bank of St. Louis (https://fred.stlouisfed.org/series/MORTGAGE30US), monthly through May (sales) and June (rates) 2022; seasonal adjustment and regression by TZE
Ignoring other factors \textit{(ceteris paribus)}, over the last decade of relatively steady existing home sales growth (the “escalator,” not “roller coaster”), each percentage point increase in the 30-year fixed rate mortgage interest rate was associated with about a 15-20 percent decrease in sales.

But other factors \textit{are not equal}, and one version of the housing cycle is evident in the sometime \textit{clockwise} rotation of data in this scatterplot over specific intervals of time. Two intervals provide notable bookends: (1) The Great Recession (2008-2009); and (2) the post-covid mini-bubble (summer 2020 through summer 2021). The long tail of the latter (literally, through spring 2022), looks ripe for a hard right turn after a doubling of mortgage interest rates.

Sources: Honolulu Board of Realtors, Hawaii Information Service, Realtors Association of Maui, Hawaii Association of Realtors, Hawaii DBEDT (http://dbedt.hawaii.gov/economic/mei/), Freddie Mac, retrieved from FRED, Federal Reserve Bank of St. Louis (https://fred.stlouisfed.org/series/MORTGAGE30US), monthly through May (sales) and June (rates) 2022; seasonal adjustment and regression by TZE
Oahu single-family housing affordability through 2021FH with 20% down at 4-person HUD median income / required (0.31), 30-yr FRM

Oahu mortgage payment (30y FRM) as percent of median 4-person family income

Post-pandemic labor markets

- Labor force participation in Hawaii still down 2 percentage points from pre-covid—possibility that 2020s will be constrained by pandemic legacy (exit—see ya!)

- Hawaii employment gains fading, real wage growth eroding, unemployment stabilizing

- Jelike da mainland: job openings way higher than normal, given unemployment rate

- The Great Resignation: Hawaii in last year leading the nation in quits in many months

- Also true: dem buggahs nevah going back to da office (tell your HR Police)—remote work is here to stay and all the Smart Kids are doing it, maybe 20 percent of workers
Post-Covid Hawaii participation rates, employment rates, falling short of pre-Covid benchmarks, diminished by similar factors (e.g. aging)

Procyclical movement in de-trended *Hawaii* labor force participation rates (%), zeroed at each unemployment rate trough (vertical lines)

Percentage points

<table>
<thead>
<tr>
<th>Year</th>
<th>Participation (right)</th>
<th>Cumulative changes in de-trended Hawaii labor force participation rates (left scale)</th>
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<tbody>
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<td>1980</td>
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<td>2020</td>
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<td>2025</td>
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</tbody>
</table>

*U.S. recessions shaded*  
*Hawaii Becalmed*  
*9/11*  
*Subprime Bubble*  
*Trend estimate*  
*Cumulative changes in de-trended Hawaii labor force participation rates (left scale)*  
*Vertical lines are cyclical unemployment rate troughs*  
COVID-19  
TBD  
Next?

*Christopher Grandy (2002), *Hawaii Becalmed: Economic Lessons of the 1990s*, University of Hawaii Press


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“Almost all of the decline in the [labor force] participation rate since the onset of the pandemic is due to changes in job-loss and job-finding rates and thus accounted for by the participation cycle. This is not only true in the aggregate, but also for all of the groups we consider [i.e. by sex, age, education, race and ethnicity]. … We show that these similarities in the source of the participation declines across groups is indicative of a broader pattern: The very uneven effect of COVID-19 on different groups in 2020 largely has subsided in 2021.”

“A longer-run historical comparison … reveals that both the unemployment rate and participation cycle in June 2021 are comparable with those in the early fall of 2014. Using the labor market expansion after 2014 as a baseline, we show that the participation cycle is likely to lag the recovery in the unemployment rate in coming years, just like it did in previous recoveries.”

−Hobijn and Şahin (September 2021) “Maximum Employment and the Participation Cycle”

Note: “The measurement of the participation cycle does not require an estimate of the trend participation rate” (Hobijn and Şahin (2021)) so the illustration in the next slide is for heuristic purposes, only
Payroll employment in Hawaii still “only” 92-93 percent of end-2010s occupied jobs, but recovery throttled by COVID-19 variant waves.

Monthly, thousand occupied jobs, s.a. (log scale)

Source: Hawaii DBEDT (http://dbedt.hawaii.gov/economic/mei), seasonal adjustment by TZE
Neighbor Island jobs took a bigger hit than Oahu before COVID-19 vaccines released; now there are more than 50,000 jobs still missing.

Source: Hawaii DBEDT (http://dbedt.hawaii.gov/economic/mei), seasonal adjustment by TZE
Statewide jobs by selected industries exhibit some of the “stalling” in economic recovery, and probably some structural changes as well.

Monthly indexes (2016 = 100, s.a.)

Health
Government
Construction

Professional/ Biz services
Finance
Manufacturing

Transportation Accommodation*
Retail

*Including food services

Percent Change in Employment*

In Hawaii, as of April 22, 2022, employment rates among workers in the bottom wage quartile decreased by 13.9% compared to January 2020 (not seasonally adjusted).

Week ending
Apr 22, 2022

-11.6%
High Wage
(>$73K)

-13.9%
Low Wage
(<$29K)

-20.2%
Middle Wage
($29K-$73K)

*Change in employment rates (not seasonally adjusted), indexed to January 4-31, 2020. This series is based on payroll data from Paychex and Intuit, worker-level data on employment and earnings from Earnin, and timesheet data from Kronos. The dotted line is a prediction of employment rates based on Kronos and Paychex data.

last updated: June 17, 2022  next update expected: June 24, 2022

Hawaii metro area real average hourly earnings rose 1.9% p.a. pre-covid, jumped with low-wage covid job loss; recent inflation erosion

Constant, 2021 dollars/hour, s.a. (log scale)

Alternative measures of Hawaii labor underutilization, 4-quarter trailing through 2022Q1; U-\(i\), \(i < 3\), \(i > 3\) are uninformative about business cycle

Hawaii unemployment as percent of labor force

U.S. recessions shaded

Employment stagnation

COVID-19

U-6

U-5

U-4

U-3

U-1

U-2

Hawaii Beveridge Curve: higher unemployment ↔ fewer jobs open; post-covid even more job openings for a given unemployment rate.

Hawaii job openings as percent of payroll employment (jobs) (%)

Hawaii unemployment rate (%)

Hawaii’s Great Resignation—voluntarily separations excl. retirements, transfers to other locations—note “Back to School” challenges

Quits as percent of jobs

U.S. recessions shaded

COVID-19

Aloha Air shutdown


After they quit? Census Bureau national business registration data show leap, oscillatory convergence in new enterprise-formation.

Monthly applications for federal Employer Identification Numbers* (EIN), thousands, s.a. (logs)

*Applications for an 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).

Sources: U.S. Census Bureau, Business Applications for All NAICS in the U.S., retrieved from FRED, Federal Reserve Bank of St. Louis (https://fred.stlouisfed.org/series/BABATOTALSAUS); monthly data through May 2022, fourth-order polynomial trend regression depicted with 2 standard-error bandwidth.
Resident behavior changes in anonymized Hawaii mobility data: more time at home, less time in traditional workplaces—2022Q2 fade-out

Google smartphone GPS mobility indexes for Hawaii residents relative to January 2020

- Time spent at home: +6.5% (home)
- Time spent in workplaces: −32.3% (work)

Pre-covid distribution of U.S. workers who worked at home and how often they worked exclusively by selected characteristics, 2017-2018

- Never: 75.3%
- Almost never: 13.7%
- 1-2 days: 4.3%
- 3-4 days: 3.6%
- 5 days: 3.2%

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

Percent of U.S. workers who teleworked because of COVID-19

*Or those whose telework was unrelated to the pandemic.

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

Percent of U.S. workers who teleworked because of COVID-19 by gender

- **Women, 25-54 years**: 44.9%
- **Women, 55+**: 37.8%
- **Men, 25-54**: 33.6%
- **Men, 55+**: 29.7%
- **Women, 16-24 years**: 23.6%
- **Men, 16-24**: 14.5%

*Or those whose telework was unrelated to the pandemic.

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


*Or those whose telework was unrelated to the pandemic.
Household pulse data* for Hawaii show that ≥ 1/5 of respondents live in households in which at least one adult teleworked because of Covid

* Surveys before April 2021 define “Percentage of adults living in households where at least one adult has substituted some or all of their typical in-person work for telework because of the coronavirus pandemic,” from April-June 2021 “Percentage of adults living in households where at least one adult has teleworked because of the coronavirus pandemic in the last 7 days,” and beginning in July 2021, “Percentage of adults in households where someone worked onsite at a workplace in the last 7 days (i.e. 65.8% between April 27 and May 9, 2022);" or one-third who did not.

Results of the BLS 2021 Business Response Survey: percent of jobs that involved teleworking in 2021 because of the coronavirus pandemic.

U.S. employed persons who teleworked by occupation, May 2022; why it “pays” in math, law, finance, science, engineering, etc.

<table>
<thead>
<tr>
<th>Occupation</th>
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<th>5%</th>
<th>10%</th>
<th>15%</th>
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U.S. employed persons who teleworked by industry, May 2022: financial, professional, technical, information, public sectors

Expectations for work from home 2022 (FRB Dallas (February 2022)): 63% commute only, 25% hybrid work, 13% work from home only

(a) Aggregate

<table>
<thead>
<tr>
<th>Month</th>
<th>Commute Only</th>
<th>WFH Some days</th>
<th>WFH Only</th>
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<tbody>
<tr>
<td>Feb 2020</td>
<td>7.6 (0.3)</td>
<td>31.4 (1.1)</td>
<td>62.1 (1.3)</td>
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<td>May 2020</td>
<td>17.1 (0.3)</td>
<td>13.4 (0.8)</td>
<td>75.3 (0.3)</td>
</tr>
<tr>
<td>Dec 2020</td>
<td>20.7 (1.1)</td>
<td>55.2 (1.1)</td>
<td>24.7 (1.2)</td>
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<td>Expected 2022</td>
<td>12.7 (0.9)</td>
<td>62.6 (1.3)</td>
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(b) By Demographic Group

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<th>Commute Only</th>
<th>WFH Some days</th>
<th>WFH Only</th>
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<td>4.0</td>
<td>+5.0</td>
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<td>Hispanic</td>
<td>2.7</td>
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<tr>
<td>Younger</td>
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<td>+7.9</td>
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<tr>
<td>Low Inc</td>
<td>2.9</td>
<td>5.9</td>
<td>+8.8</td>
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<td>Male</td>
<td>6.4</td>
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<td>+9.2</td>
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<td>Children</td>
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<td>7.4</td>
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<td>Mid Inc</td>
<td>5.8</td>
<td>3.2</td>
<td>+10.7</td>
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<td>Mid Educ</td>
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<td>No Children</td>
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<td>Older</td>
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<td>+16.7</td>
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<td>High Inc</td>
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<td>+16.7</td>
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<td>Female</td>
<td>11.4</td>
<td>7.2</td>
<td>+18.6</td>
</tr>
<tr>
<td>Non B/HW</td>
<td>13.6</td>
<td>6.0</td>
<td>+19.5</td>
</tr>
<tr>
<td>High Educ</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Revised Oahu home price distributions post-Covid: much more substantive move upward in SF prices than condo, post-covid

Oahu condominium sales prices

Oahu single-family home sales prices

Source: Honolulu Board of Realtors (by special arrangement), annual data ending in March of each year, 2019, 2020, 2021, empirical gamma distributions estimated by TZ Economics
Oahu single-family home price appreciation by ’hood in 2020: COVID shift to exurbs, suburbs from urban core—The Donut Effect*


Oahu monthly existing SF home median sales prices jumped after the covid recession, not condos, suggesting buyer preference shift.

Monthly, thousand $, s.a. (log scales)

Sources: Honolulu Board of Realtors, Hawaii DBEDT (http://dbedt.hawaii.gov/economic/mei/); monthly through May 2022; seasonal adjustment, trend regressions by TZ Economics are from mid-2011 through mid-2018, projected forward through period of soft valuations at end-2010s, pre-covid; separate nonlinear regression on single-family medians only after June 2020.
Bubblicious arc of median single-family prices post-covid (logs) means price deceleration *preceded* recent rise in interest rates.

Monthly median SF prices, thous.$, s.a., (log scale)

- 1,400
- 1,200
- 1,000
- 800
- 600
- 400


U.S. recession
Shaded gray

COVID-19

Trend 2012-2018

Sources: Honolulu Board of Realtors, Hawaii Information Service, Realtors Association of Maui, Hawaii Association of Realtors, Hawaii DBEDT (http://dbedt.hawaii.gov/economic/mei), monthly through May 2022; seasonal adjustment, trend regressions from mid-2011 through mid-2018 and non(log)linear regression on Big Island prices from May 2020 – May 2022 by TZE.
“I’m beginning to think that this pandemic…has accelerated structural change in the economy. …You can sense it in the distributed platform as a way of working—telework. Automation, global value chains had already…wrecked havoc with the workplace but I think the workplace is changing faster today than at any time since the industrial revolution.

The questions we put out had two sides to them. One side measure the pandemic. …The other side of that was to take a look at the way that the workplace itself was restructuring. So, we’ve gone from 36 percent at telework in the payroll employment to about 14 percent and it’s leveling off. Well, if it stays at 14 percent that’s a very serious, high percentage.

We did surveys on workplace safety, on sick leave, all of that’s changing too as the workplace changes. So, I think the research question coming out of this at least for the Labor Department will be to say:

- How has the structure of the workplace changed?
- How has the structure of labor relations changed?

because of the pandemic.

We’re not going to go back to normal because the changes already are noticeably permanent in certain areas. That’s what our surveys…are beginning to shed light on this, I don’t what to call it, maybe it’s The New Economy. And on this point 86 percent now of payroll employment is in the services-providing sector…and that really accelerated in the last five years. So, that’s another indication that we’ve got some permanent changes going on.”
Macroeconomic data: jobs, real GDP, arrivals—“the 90% problem”

- Everything in Hawaii’s economy is about “90 percent” of pre-covid (2019)
  - Arriving passenger volumes (90 percent of 2019 through June 20, 2022)
  - Jobs (93 percent)
  - Real Hawaii GDP (95 percent)

- Problem: that means everything is about 90-95 percent of 2017, five years ago—nobody will talk about Hawaii’s 2018-2019 recession (huh?) (heads in the sand)

- Hawaii real GDP is 15 percentage points below the trend through mid-2017 (it would take double the entirety of tourism exports (value-added), pre-covid, to return to trend)

- Meanwhile: did the next U.S. recession already start? Because the growth recession sure did (first half 2022 U.S. real GDP growth may have been non-positive)

- Either way: all the risk is to the downside, and the next covid variant is gearing up
Real U.S. GDP per capita since Dutch established New Amsterdam: after Industrial Revolution per capita output grew at 2 percent p.a.

During the post-WWII era, after demobilization, Hawaii an “Emerging Market” economy with above-U.S. per capita real output growth

Superlative Hawaii economic growth throttled after 1970s by zoning and regulation; and now—post-pandemic—by deindustrialization

Sources: As in previous two slides.
Ignoring its own recession in 2018-2019, Hawaii real GDP at end-2021 was 15 percent lower than its pre-covid trend (through mid-2017).

First quarter real U.S. GDP growth was *minus* 1.5 percent as net exports fell; even stronger dollar in 2022Q2, fading consumption.

Source: U.S. Bureau of Economic Analysis (https://apps.bea.gov/Table/index_nipa.cfm)
High-frequency Nowcasting estimates of U.S. real GDP growth in second quarter 2022 began slipping away from 2% after mid-May.

**Daily estimate: 0.0 percent — June 16, 2022**

The GDPNow model estimate for real GDP growth (seasonally adjusted annual rate) in the second quarter of 2022 was 0.0 percent on June 16, 2022, unchanged from June 15 after rounding. After this morning’s (June 16) housing starts report from the US Census Bureau, the nowcast of second-quarter real residential investment growth increased from −8.5 percent to −7.7 percent.

---

**Evolution of Atlanta Fed GDPNow real GDP estimate for 2022: Q2**

Quarterly percent change (SAAR)

Sources: Blue Chip Economic Indicators and Blue Chip Financial Forecasts

Note: The top (bottom) 10 average forecast is an average of the highest (lowest) 10 forecasts in the Blue Chip survey.

**Source:** Federal Reserve Bank of Atlanta (https://www.atlantafed.org/cqer/research/gdpnow.aspx?panel=1); next update June 27, 2022
Output and employment will stall, near-term, if not recede: 70 percent probability no recession

Soft Landing means reset to 2 percent inflation in the next 18 months (following the inflation surge over the last 14 months—yes that’s all it’s been)

The constraint on Hawaii economic growth is lodging capacity, unchanged since the mid-1980s save for “undocumented vacation rentals” facing prohibition

Hawaii’s got way bigger problems:
  o Hawaii residents voting with their feet: Oahu net outmigration since mid-2010s
  o Deindustrialization: dismantling telescopes; biotech cancelled (Crispr-Cas9 Nobel Prize?); HTA destination management objective (July 2021) “decrease total visitors to Oahu;” VRs
  o You only think you have entitlement to build, you just have another lawsuit
  o TheTrain will not reach Ala Moana, which is being challenged by e-commerce
  o The Board of Water Supply can’t drill a well, much less desalinate *the Pacific Ocean*
Пау
Appendix: Hawaii longer-run population, demographic trends

by Paul H. Brewbaker, Ph.D., CBE
TZ Economics, Kailua, Hawaii
January 2022
Pre-pandemic real earnings by educational attainment favored skills-task complementarity despite lower productivity growth after 2005

Real earnings index (1975 = 100)

Pre-pandemic real earnings growth by educational attainment favored women since 70s, enhanced by experience from rising participation.

Real earnings index (1975 = 100)

184 Advanced degree
179 College grad
152 Some college
136 High school
134 Less

Female


Real earnings index (1975 = 100)

139 Advanced degree
117 College grad
105 Some college
91 High or less

Male


Mean real earnings at all educational attainment levels higher for men than women, virtually unchanged over decades for less well-educated.

Real earnings in thousand constant, 2020 dollars

**Female**

- Mean real earnings at all educational attainment levels higher for men than women, virtually unchanged over decades for less well-educated.

**Male**

Hawaii statewide population estimates including 2020 and official State projection (2018): more people leaving than arriving = fewer people

Thousand Hawaii residents (log scale)

State projections (2018) @ 0.6% p.a.

Actual intercensal data

Source:
Population losers and gainers 2019→2020: no clear pattern (e.g. coal, petroleum states in mid-2010s), but Hawaii lost population pre-Covid

<table>
<thead>
<tr>
<th>Population losers</th>
<th>Population gainers</th>
</tr>
</thead>
<tbody>
<tr>
<td>% changes</td>
<td>% changes</td>
</tr>
<tr>
<td>Persons</td>
<td>Persons</td>
</tr>
<tr>
<td>-0.6492 New York</td>
<td>0.9469 North Carolina</td>
</tr>
<tr>
<td>-0.6275 Illinois</td>
<td>0.9769 Montana</td>
</tr>
<tr>
<td><strong>-0.6081 Hawaii</strong></td>
<td><strong>1.0383 Delaware</strong></td>
</tr>
<tr>
<td>-0.5835 West Virginia</td>
<td>1.0453 Washington</td>
</tr>
<tr>
<td>-0.3842 Mississippi</td>
<td>1.1225 Florida</td>
</tr>
<tr>
<td>-0.3333 Alaska</td>
<td>1.1699 South Carolina</td>
</tr>
<tr>
<td>-0.2784 Louisiana</td>
<td>1.2901 Texas</td>
</tr>
<tr>
<td>-0.2528 Connecticut</td>
<td>1.4515 Utah</td>
</tr>
<tr>
<td>-0.1827 Michigan</td>
<td>1.5364 Nevada</td>
</tr>
<tr>
<td>-0.1763 California</td>
<td>1.7768 Arizona</td>
</tr>
<tr>
<td>-0.1221 Pennsylvania</td>
<td>2.1158 Idaho</td>
</tr>
<tr>
<td>-0.1120 Vermont</td>
<td></td>
</tr>
<tr>
<td>-0.1000 New Jersey</td>
<td></td>
</tr>
<tr>
<td>-0.0976 Rhode Island</td>
<td></td>
</tr>
<tr>
<td>-0.0281 Ohio</td>
<td></td>
</tr>
<tr>
<td>-0.0190 Massachusetts</td>
<td></td>
</tr>
</tbody>
</table>

% changes: 0.9469 North Carolina 99,439
0.9769 Montana 10,454
1.0383 Delaware 10,141
1.0453 Washington 79,588
1.1225 Florida 241,256
1.1699 South Carolina 60,338
1.2901 Texas 373,965
1.4515 Utah 46,496
1.5364 Nevada 47,488
1.7768 Arizona 129,558
2.1158 Idaho 37,853

Pre-Covid Oahu population decline reminder of mid-20th century experience of Neighbor Islands with plantation mechanization

Oahu net domestic migration has been negative for decades: more residents leaving from than moving to Oahu; “voting with their feet”

Neighbor Island 2010s population change: more net out-migration, save on Big Island, lower fertility, aging; slow to no population growth

- **Big Island**
  - Net domestic migration negative on Maui for since 2015; Kauai in 2019-2020; on Big Island after volcanic eruption
  - Kauai population decline in 2019 and 2020 (−440)
  - July 2010 – July 2020 cumulative percent changes:
    - 9.7% Big Island (17,979 persons)
    - 4.6% Kauai (4,643 persons)
    - 8.3% Maui (12,877 persons)


---
Educational attainment, population and migration shares: more highly educated more mobile; international immigrants more bifurcated

<table>
<thead>
<tr>
<th></th>
<th>Residents</th>
<th>Domestic in-migrants</th>
<th>Domestic out-migrants</th>
<th>International in-migrants</th>
</tr>
</thead>
<tbody>
<tr>
<td>Percent of persons aged 18 and over and not in school</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Advanced degrees</td>
<td>9.8</td>
<td>14.9</td>
<td>14.7</td>
<td>10.2</td>
</tr>
<tr>
<td>Bachelor’s degree</td>
<td>20.4</td>
<td>28.2</td>
<td>23.9</td>
<td>24.8</td>
</tr>
<tr>
<td>Some college</td>
<td>30.1</td>
<td>36.2</td>
<td>30.2</td>
<td>28.4</td>
</tr>
<tr>
<td>High school diploma</td>
<td>30.6</td>
<td>18.2</td>
<td>26.2</td>
<td>24.1</td>
</tr>
<tr>
<td>&lt; High school</td>
<td>9.0</td>
<td>12.6</td>
<td>12.6</td>
<td>12.6</td>
</tr>
</tbody>
</table>

Because all the bucks-for-lolo stay in Hawaii (right?): look at the data; Q. Does this look like Brain Drain or Brain Gain? (A: Yes)

<table>
<thead>
<tr>
<th>percent of total</th>
<th>Domestic in-migrants</th>
<th>Domestic out-migrants</th>
<th>International in-migrants</th>
<th>Among domestic out-migrants, marginal relative odds (logistic regression model)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Aged ≥18 and not in school</td>
<td>100.0</td>
<td>100.0</td>
<td>100.0</td>
<td>100.0</td>
</tr>
<tr>
<td>&lt; High school diploma</td>
<td>9.0</td>
<td>2.5</td>
<td>5.1</td>
<td>12.6</td>
</tr>
<tr>
<td>High school diploma</td>
<td>30.6</td>
<td>18.2</td>
<td>26.2</td>
<td>24.1</td>
</tr>
<tr>
<td>Some college</td>
<td>30.1</td>
<td>36.2</td>
<td>30.2</td>
<td>28.4</td>
</tr>
<tr>
<td>Bachelor's degree</td>
<td>20.4</td>
<td>28.2</td>
<td>23.9</td>
<td>24.8</td>
</tr>
<tr>
<td>≥ Master's degree</td>
<td>9.8</td>
<td>14.9</td>
<td>14.7</td>
<td>10.2</td>
</tr>
</tbody>
</table>

**significant at the 0.01 level

Note: Hawaii 5-year totals, 2013-2017, American Community Survey, excluding military personnel and families. Domestic in-migrants numbered 36,500 and domestic out-migrants numbered 49,700, for a net loss of 13,200 persons. Including the military, in-migrants numbered 54,100, out-migrants 61,700, and the net loss was 7,600 persons.
Selected characteristics of Hawaii statewide domestic migrants, 2010 and 2019

<table>
<thead>
<tr>
<th>Percent shares, except totals</th>
<th>2010</th>
<th>2019</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>In</td>
<td>Out</td>
</tr>
<tr>
<td><strong>Marital status</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Unmarried</td>
<td>60.9</td>
<td>58.5</td>
</tr>
<tr>
<td>Single, never married</td>
<td>48.0</td>
<td>40.1</td>
</tr>
<tr>
<td>Divorced or separated</td>
<td>10.3</td>
<td>16.1</td>
</tr>
<tr>
<td>Widowed</td>
<td>2.6</td>
<td>2.3</td>
</tr>
<tr>
<td>Married</td>
<td>39.1</td>
<td>41.5</td>
</tr>
<tr>
<td><strong>Educational attainment</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Up to high school</td>
<td>20.7</td>
<td>26.6</td>
</tr>
<tr>
<td>Some college</td>
<td>37.0</td>
<td>37.3</td>
</tr>
<tr>
<td>Bachelor's degree</td>
<td>31.4</td>
<td>21.5</td>
</tr>
<tr>
<td>Graduate, professional degree</td>
<td>11.0</td>
<td>14.7</td>
</tr>
<tr>
<td><strong>Prior housing tenure</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Homeowner</td>
<td>22.4</td>
<td>38.6</td>
</tr>
<tr>
<td>Renter</td>
<td>77.6</td>
<td>61.4</td>
</tr>
<tr>
<td><strong>ACS sample</strong> (number)</td>
<td>53,581</td>
<td>49,218</td>
</tr>
</tbody>
</table>

*Source: American Community Survey and Hawaii DBEDT State of Hawaii Data Book Table 1.65 (2010) and Table 1.64 (2019) (https://dbedt.hawaii.gov/economic/databook/2020-individual/01).*
Age distribution of Hawaii migrants, 2011-15: young adults, families (Figure 2-4, DBEDT Hawaii “2045” long-range population forecasts)

Cumulative population age cohort changes during the 2010s: aging still significant, transition from 25-40s to 41-56ers forthcoming

Distribution of Hawaii population by mostly 10-year age cohorts in 2010: Baby Boomers prominent in late middle-aged cohorts

<table>
<thead>
<tr>
<th>Age Group</th>
<th>Women</th>
<th>2010</th>
<th>Men</th>
<th>100 thousand persons (change)</th>
</tr>
</thead>
<tbody>
<tr>
<td>76+</td>
<td></td>
<td>0</td>
<td></td>
<td>0</td>
</tr>
<tr>
<td>66-75</td>
<td></td>
<td>0</td>
<td></td>
<td>0</td>
</tr>
<tr>
<td>56-65</td>
<td></td>
<td>0</td>
<td></td>
<td>0</td>
</tr>
<tr>
<td>46-55</td>
<td></td>
<td>0</td>
<td></td>
<td>0</td>
</tr>
<tr>
<td>36-45</td>
<td></td>
<td>0</td>
<td></td>
<td>0</td>
</tr>
<tr>
<td>26-35</td>
<td></td>
<td>0</td>
<td></td>
<td>0</td>
</tr>
<tr>
<td>16-25</td>
<td></td>
<td>0</td>
<td></td>
<td>0</td>
</tr>
<tr>
<td>6-15</td>
<td></td>
<td>0</td>
<td></td>
<td>0</td>
</tr>
<tr>
<td>0-5</td>
<td></td>
<td>0</td>
<td></td>
<td>0</td>
</tr>
</tbody>
</table>

In 2010 it was obvious that the breaking wave of Boomer migration into retirement-age cohorts was coming and, when combined with continued increases in longevity, were dominating the public conversation focused on health care and insurance policies.

In 2020 it has become clearer how important household formation among Millennials, who entered the workforce in an uncertain environment following the Great Recession and experienced much more horizontal mobility across employers than prior generations, will influence homebuilding and capital formation during the 2020s.

Oahu household composition shifted towards independent living

Older population, smaller households, fewer family-with-children households, more independent living: 2020-50 reversal of mid-20th century “youthing” and late-20th century stabilization of average household size

Proportions of populations under 20 and 65 and older, divided by population 20-64

Old-age dependency expected to continue to rise while youth dependency remains relatively constant through mid-century

Ultra-long demographic dynamics of old-age dependency: flip the ratio, Hawaii “workers/old peeps”
30+ (1920)
11 (1960)
4 (2010)
2 (2030)

Appendix: new resorts or renovations?

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Entire net increase in Hawaii’s visitor plant inventory for last 25 years comprised vacation rentals—political decision: constrain capacity

Thousand Hawaii statewide lodging units


Vacation rental

Hotel, condo hotel, timeshare, apartment hotel, B&B, hostels, other units

These days are probably over

Hosting apps reduce search/matching cost (demand), entry barriers are binding (supply); Hawaii mostly renovates, replaces *existing* inventory

**Sources:** Hawaii DBEDT, 2020 Visitor Plant Inventory [link](https://files.hawaii.gov/dbedt/visitor/visitor-plant/2020VPI.pdf) and prior issues