Housing, the Economy, and COVID-19

Presentation prepared for the Honolulu Board of REALTORS® Mahalo: Leeward Region

Livestream via ZOOM

by Paul H. Brewbaker, Ph.D., CBE TZ Economics, Kailua, Hawaii March 18, 2020

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COVID-19 in the United States

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COVID-19 cases in the United States by date of illness onset, January 12, 2020, to March 16, 2020, at 16:00 ET (n = 1,295)



*Does not include U.S.-identified cases where the date of illness onset has not yet been reported; excludes cases among persons repatriated to the United States from Wuhan, China (3) and Japan aboard the *Diamond Princes* cruise ship (46).

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Cumulative COVID-19 cases in U.S. by date of illness onset, 1/12 - 3/18, (known date n = 1,295; total known U.S. cases 7,038) vs. WHO U.S. total



persons repatriated to the United States from Wuhan, China (3) and Japan aboard the *Diamond Princes* cruise ship (46).

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Date of report

Number of specimens tested for SARS CoV-2 through March 11, 2020 by CDC labs (n = 4,255), U.S. public health laboratories (n = 27,623)[†]



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Number of confirmed coronavirus cases, by days since 100th case



https://www.vox.com/policy-and-politics/2020/3/13/21178289/confirmed-coronavirus-cases-us-countries-italy-iran-singapore-hong-kong

A snapshot of early Covid-19 testing per capita



Source: Covid Tracking Project, Business Insider, The Atlantic, Taiwan CDC (ttps://www.vox.com/policy-and-politics/2020/3/13/21178289/confirmed-coronavirus-cases-us-countriesitaly-iran-singapore-hong-kong)

Murphy's Law, meet COVID-19

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Daily S&P 500 Index closing values through March 17, 2020: displaced by Trump's Trade War, now by a novel coronavirus



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 $+2\sigma$

95%

 -2σ

Sources: S&P Dow Jones Indices LLC, S&P 500 [SP500], from FRED, Federal Reserve Bank of St. Louis (<u>https://fred.stlouisfed.org/series/SP500</u>), daily closing values through March 17, 2020; trend regression on natural logarithm of daily closing values, April 1, 2016 – November 25, 2017, and two standard-error bandwidth by TZ Economics, projected forward through 2020 as if bad trade policy never happened after the tax cut.

Conditional annualized daily volatility of the S&P 500 Index through March 17, 2020



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Sources: S&P Dow Jones Indices LLC, S&P 500 [SP500], from FRED, Federal Reserve Bank of St. Louis (<u>https://fred.stlouisfed.org/series/SP500</u>), daily closing values through March 17, 2020; conditional annualized standard deviations of log changes of daily closing values of the S&P 500 Index estimated in a Threshold Autoregressive Conditional Heteroskedasticity (TARCH) model by TZ Economics.

Economists' expectations for next recession better only one month ago; Q: "When will the U.S. economy enter the next recession?"



Your mileage may vary: because Hawaii had hit a couple *idiosyncratic* headwinds, its real GDP growth lagged the U.S. average twice in 2010s



Sources: Bureau of Economic Analysis, U.S. Department of Commerce (https://www.bea.gov/data/gdp/gross-domestic-product, https://www.bea.gov/data/gdp/gdp-state); U.S. quarterly data through 2019Q4, Hawaii quarterly data through 2019Q3 including revisions, year-over-year growth rate calculations by TZE

Oahu visitor arrivals were engaged in the first breakout in 25 years following years exposed to Japan's persistent economic stagnation



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Conditional monthly annualized volatility of domestic Oahu arrivals: Oh snap, you picked *this* moment for a vacation rental clampdown?



Sources: Monthly data through December 2019 from Hawaii Tourism Authority, Hawaii DBEDT (<u>http://dbedt.hawaii.gov/economic/mei</u>), Threshold Autoregressive Conditional Heteroskedasticity (TARCH) estimates of annualized standard deviation of log changes of seasonally-adjusted monthly visitor arrivals by TZE

Oahu visitor arrivals, at the tail end of a long run, were gifted entry by Southwest Airlines, and a lump of coal from Honolulu's City Council



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Through January 2020: monthly Oahu visitor arrivals (staying in a rental house, private room, or shared room in a private house)



Source: Hawaii Tourism Authority (https://www.hawaiitourismauthority.org/research/monthly-visitor-statistics/); monthly data through December 2019, seasonal adjustment using, nonlinear trend regression through July 2019 by TZE [In(VREVOVR3_D11) = -34.2837734267 + 0.0508333271106*t - 1.20633926677e-14*t⁵]; trend growth rate through July 2019 was 20.2 percent p.a. (2.2 percent p.a. for hotel-condo-timeshare visitors)

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Oahu traditional lodging capacity growth ended 34 years ago; capacity growth since was in vacation rentals subverting exclusionary zoning



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Neighbor Isle traditional lodging capacity growth ended 28 years ago; one-quarter now vacation rentals contesting global brands' oligopoly



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Tourism as a channel of transmission of economic impacts

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Hawaii international passenger counts (excluding Canada) help predict visitor arrivals, monthly estimates based on daily data through March 9



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Sources: Monthly arrivals through January 2020, daily passengers through March 9, 2020 (at monthly rates) from Hawaii Tourism Authority and Hawaii DBEDT (<u>http://dbedt.hawaii.gov/economic/mei</u>, <u>http://dbedt.hawaii.gov/visitor/daily-passenger-counts/</u>), Federal Reserve Bank of St. Louis, OECD-based Recession Indicators for Japan from the Peak through the Period preceding the Trough [JPNRECP] (<u>https://fred.stlouisfed.org/series/JPNRECP</u>); seasonal adjustment by TZE

Statewide international visitor arrivals estimates from daily passenger arrivals data through March 16, 2020: a 35-40 percent drop, so far



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Sources: Hawaii Tourism Authority (<u>https://www.hawaiitourismauthority.org/research/</u>), Hawaii DBEDT (<u>http://dbedt.hawaii.gov/economic/mei/</u>): monthly data estimated through March 2020 based on dailiy passenger counts through March 16, 2020; seasonal adjustment by TZ Economics

International visitor arrivals' history for the last thirty years provide several precedents from which to calibrate the current Sudden Stop



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Sources: Hawaii Tourism Authority (<u>https://www.hawaiitourismauthority.org/research/</u>), Hawaii DBEDT (<u>http://dbedt.hawaii.gov/economic/mei/</u>): monthly data estimated through March 2020 based on dailiy passenger counts through March 16, 2020; seasonal adjustment by TZ Economics

Domestic visitor arrivals have more muted reactions to Black Swan events (less information asymmetry); COVID-19 could be the winner



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Sources: Hawaii Tourism Authority (<u>https://www.hawaiitourismauthority.org/research/</u>), Hawaii DBEDT (<u>http://dbedt.hawaii.gov/economic/mei/</u>): monthly data estimated through March 2020 based on dailiy passenger counts through March 16, 2020; seasonal adjustment by TZ Economics

Domestic visitor arrivals, elevated by Southwest Airlines' entry, set up like a bowling pin by HNL vacation rental crackdown for COVID-19



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Oahu housing market reactions

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Looks like a pile-up in the condominium resale market: Oahu months of inventory remaining at current absorption broke link after Clampdown



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Remember: existing home prices on Oahu were already stagnating before last summer's vacation rental clampdown; no obvious impacts



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Oahu median existing home sales prices: last two valuation cycles (bubbles?) in 2010s returned to longer-term, stable appreciation



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FHFA all-transactions index of Oahu housing valuations, adjusted for inflation, converged to trend during 2010s but slipped after mid-2018



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Source: Federal Housing Finance Agency (https://www.fhfa.gov/DataTools/Downloads/Documents/HPI/HPI_AT_metro.csv), Bureau of Labor Statistics (https://data.bls.gov/cgi-bin/surveymost?r9); quarterly data through 2019Q3, seasonal adjustment, deflation, and trend regression on the stationary component (change in the natural logarithm) of constant-dollar valuations by TZE.

FHFA all-transactions index of Oahu housing valuations, adjusted for inflation, converged to trend during 2010s but slipped after mid-2018



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Source: Federal Housing Finance Agency (https://www.fhfa.gov/DataTools/Downloads/Documents/HPI/HPI_AT_metro.csv), Bureau of Labor Statistics (https://data.bls.gov/cgi-bin/surveymost?r9); quarterly data through 2019Q3, seasonal adjustment, deflation, and trend regression on the stationary component (change in the natural logarithm) of constant-dollar valuations by TZE.

De-trended real Oahu housing valuations give you the best feel for the nature of the housing cycle over four decades, absence in late-2010s



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Source: Federal Housing Finance Agency (<u>https://www.fhfa.gov/DataTools/Downloads/Documents/HPI/HPI_AT_metro.csv</u>), Bureau of Labor Statistics (<u>https://data.bls.gov/cgi-bin/surveymost?r9</u>); quarterly data through 2019Q3, seasonal adjustment, deflation, and deviations from projections based on trend regression on the stationary component (change in the natural logarithm) of constant-dollar valuations estimated by TZE.

Interest rates and monetary policy

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U.S. Treasury yields, FOMC fed funds rate projections *reversed* paths from September 2018-2019, long-run "neutral" fed funds rate slipped



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Source: Federal Reserve Board, monthly average constant-maturity yields through August 2019 (<u>https://www.federalreserve.gov/releases/h15/</u>) and FOMC Summary of Economic Projections (September 2019) (<u>https://www.federalreserve.gov/monetarypolicy/fomcprojtabl20190918.htm</u>) (median long-run rate is 2.5 percent), along with earlier S.E.P. postings in September 2018, December 2018, March 2019, and June 2019).

Fed's actions over the weekend, *this week*: take fed funds rate to zero, restore CP funding facility (CPFF), primary dealer credit facility (PDCF)



Spreads between yields on 10-year and 2-year U.S. Treasury Notes narrowed to near zero; past reliable precursor of incipient recession



Source: Federal Reserve Board, monthly averages through March 2020 (https://www.federalreserve.gov/releases/h15)

U.S. average 30-year fixed rate mortgage rates (+0.7 fees/points) actually up slightly from record low 3.29% (week ending March 5)



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Sources: Freddie Mac, 30-Year Fixed Rate Mortgage Average in the United States (http://www.freddiemac.com/pmms/) and FRED, Federal Reserve Bank of St. Louis; (https://fred.stlouisfed.org/series/MORTGAGE30US).

Oahu conventional mortgage debt service-to-income ratio, a measure of housing affordability, *currently among the most affordable* ever



Sources: Bank of Hawaii, Honolulu Board of Realtors, U.S. Department of Housing and Urban Development, Federal Reserve Bank of St. Louis (<u>https://fred.stlouisfed.org/series/MORTGAGE30US</u>; annual average of weekly rates); TZE calculations on annual data for single-family homes, 1976-2018 (full-year calculation) and estimate for first half 2019, under conventional mortgage lending assumptions

Same as it ever was? Life after the 1918-19 Spanish Flu pandemic, etc.

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Monthly Hawaii visitor arrivals in the 1920-30s—excluding passengers on ships in transit—exhibited business cycle and jumps just as now



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Sources: George T. Armitage, Hawaii Tourist Bureau, "Hawaii's Tourist Business," Hawaii Territorial Planning Board An Historic Inventory of the Physical, Social and Economic and Industrial Resources of the Territory of Hawaii (February 8, 1939), p. 317; U.S. Bureau of Labor Statistics "The Maritime Strikes of 1936-37." Monthly Labor Review 44, no. 4 (1937): 813-27. Accessed January 29, 2020 (www.jstor.org/stable/41815101)

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Domestic arrivals 6-months before and 6-months after the 9/11 event ("month 7"), and after that: "is it L-shaped, U-shaped, or V-shaped?"



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Sources: Hawaii Tourism Authority, Hawaii DBEDT (<u>http://dbedt.hawaii.gov/economic/mei/</u>), seasonal adjustment using Census X-13 ARIMA filter; seasonally-adjusted data may be downloadable from UHERO and the DBEDT Data Warehouse. Simply translating month six values to a base period (divide all other months by its values) will index proportionate impacts to that starting point.

International arrivals 6-months before and 6-months after the 9/11 event ("month 7"), and after that: "is it L-shaped, U-shaped, or V-shaped?"



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Sources: Hawaii Tourism Authority, Hawaii DBEDT (http://dbedt.hawaii.gov/economic/mei/), seasonal adjustment using Census X-13 ARIMA filter; seasonally-adjusted data may be downloadable from UHERO and the DBEDT Data Warehouse. Simply translating month six values to a base period (divide all other months by its values) will index proportionate impacts to that starting point.

Dependent Variable: Hawaii international visitor days (millions, s.a.) Method: Least Squares Date: 02/05/20 Time: 15:02 SARS episode, March Sample: 2002M06 2005M12 through July 2003 Included observations: 43 Variable Coefficient Std. Error t-Statistic Prob. 30.08115 С 71.04634 2.361823 0.0233 @TREND -0.092303 0.0255 0.039725 -2.323561 @TREND^4 2.25E-11 9.64E-12 2.330655 0.0250 DUMMYSARS -0.208211 0.026497 -7.857914 0.0000 R-squared 0.678778 Mean dependent var 1.201553 0.089668 Adjusted R-squared 0.654069 S.D. dependent var S.E. of regression 0.052739 Akaike info criterion -2.958507Sum squared resid 0.108475 -2.794675Schwarz criterion 67.60791 Hannan-Quinn criter. -2.898091 Loa likelihood F-statistic 27.47049 Durbin-Watson stat 2.236366 Prob(F-statistic) 0.000000 1.4 1.3 -1.2 -1.1 -1.0 -Int. visitor days, s.a. (model) ± 2 standard errors 0.9 -0.8 -2002 2003 2004 2005

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Hawaii international visitor days (millions, s.a., log scale)



Sources: Hawaii DBEDT Monthly Economic Indicators (<u>http://dbedt.hawaii.gov/economic/mei/</u>) and State of Hawaii Data Book (2004) (<u>http://dbedt.hawaii.gov/economic/databook/db2004/</u>), U.S. BLS (<u>https://data.bls.gov/cgi-bin/surveymost?r9</u>)

International visitor days before and after two famous Black Swans; SARS associated with \$360 million foregone tourism receipts (2019\$)



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Sources: Monthly data from Hawaii Tourism Authority and Hawaii DBEDT (<u>http://dbedt.hawaii.gov/economic/mei</u>), Federal Reserve Bank of St. Louis, OECD-based Recession Indicators for Japan from the Peak through the Period preceding the Trough [JPNRECP] (<u>https://fred.stlouisfed.org/series/JPNRECP</u>); seasonal adjustment by and polynomial regression estimates by TZE

Hawaii real General Fund tax revenues now are headed for Sudden Stop of a magnitude at least as large as experienced several times before



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Sources: Quarterly data from Hawaii Department of Taxation and Hawaii DBEDT (<u>http://dbedt.hawaii.gov/economic/mei</u>), U.S. Bureau of Labor Statistics (<u>https://data.bls.gov/cgi-bin/surveymost?r9</u>); seasonal adjustment, deflation, and regression estimate on the stationary component of real General Fund revenues by TZE

Hawaii real General Fund tax revenues and post-Great Recession trajectory through calendar 2019: set up like a bowling pin?

Quarterly, million constant 2019\$, s.a. (log scale)



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Sources: Quarterly data from Hawaii Department of Taxation and Hawaii DBEDT (<u>http://dbedt.hawaii.gov/economic/mei</u>), U.S. Bureau of Labor Statistics (<u>https://data.bls.gov/cgi-bin/surveymost?r9</u>); seasonal adjustment, deflation, and regression estimate on the stationary component of real General Fund revenues by TZE

Hawaii real General Fund revenues, seasonally adjusted, indexed to "Quarter 2 = 100 (in parentheses)" and six episodes of "compression"



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Sources: Quarterly data from Hawaii Department of Taxation and Hawaii DBEDT (<u>http://dbedt.hawaii.gov/economic/mei</u>), U.S. Bureau of Labor Statistics (<u>https://data.bls.gov/cgi-bin/surveymost?r9</u>); seasonal adjustment, deflation, and regression estimate on the stationary component of real General Fund revenues by TZE

