

Economic Overview Testimony

of

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*before a joint informational briefing of the
Hawaii State House Finance Committee
and*

Hawaii State Senate Ways and Means Committee

Thursday, January 21, 2016

Good afternoon and thank you for this opportunity to join my colleagues in presenting an economic outlook for Hawaii. My name is Paul Brewbaker and I am the Principal of TZ Economics, a Hawaii economics consultancy. This testimony provides a narrative to the accompanying slideshow (slide numbered 1).

Three years ago in my testimony to this economic overview informational briefing I observed that Hawaii's current expansion was approaching "a plausible halfway point." Three years later, as with Mark Twain observing that news of his death was greatly exaggerated, the next recession is not imminent. Still, risks to continued Hawaii economic growth *are* rising, even as expansion continues. Falling crude oil prices have boosted Hawaii's momentum.¹ I will focus on influential drivers of Hawaii macroeconomic outcomes. My colleagues will have numerical forecasts (slide 2).

Wikipedia describes the China Syndrome as "a nuclear meltdown scenario so named for the fanciful idea that there would be nothing to stop the meltdown tunneling its way to the other side of the world ('China')." ² A popular American movie by that name in 1979 about nuclear safety coincided with the Three Mile Island catastrophe. Thirty-five year later, a meltdown is tunneling its way *from* China's equity markets *to* U.S. stocks (slide 3). Now unwinding a second stock price bubble in the last decade, China's recent equity market sell-off is partly an adjustment to slower real economic growth. China real GDP growth was 6.9 percent in 2015, slow for China. Collapse in the Shanghai Composite Index in June 2015 accelerated in August when the People's Bank of China depreciated the Chinese yuan and intervened directly in Chinese equity markets to stem its precipitous decline (slide 4). These events triggered a highly-correlated drop in U.S. equity valuations. Early weeks of 2016 brought forth renewed equity valuation declines in China, again precipitating global co-movement.

¹ The last U.S. economic expansion, from trough to peak, extended from November 2001 to December 2007. See <http://www.nber.org/cycles/cyclesmain.html>.

² See https://en.wikipedia.org/wiki/China_Syndrome.

The August 2015 and January 2016 equity market meltdowns underscore global interdependence of capital markets and global transmission of financial contagion. They recall that emphasized.³ Asset prices may have to “overshoot” before reaching constellations from which real variables like output and employment reset macroeconomic equilibrium (slide 5). Recent financial contagion—in which asset price volatility jumps across asset classes or across national economic boundaries—was a phenomenon evident in the U.S. financial crisis of 2007-2008, in the Asian Financial Crisis of 1997-98, and in the collapse of Japan’s asset price bubble in 1989. Each of these were significant exogenous influences on Hawaii economic performance in their times.⁴ China’s financial market turbulence has yet to have as profound an impact on Hawaii, but its resolution bears watching (slide 6).

China’s preference for exchange rate stability and limited convertibility of the Chinese yuan suggest that its currency’s value may not have adjusted enough to sustain export-led economic growth. China’s central bank is believed to have spent hundreds of billions of dollars in foreign currency reserves to defend the yuan, but further depreciation could occur (slide 7).

Divergent monetary policies have induced the U.S. dollar to appreciate more broadly, rising in value against the Japanese yen and the Euro over the last 2-3 years. As anticipated, U.S. monetary policy has been moving towards normalization and higher interest rates, delayed somewhat by the China Syndrome.⁵ At the same time, Japan and Europe continue to pursue quantitative easing, implemented as late as 2013 in Japan and 2014 in Europe, to augment low interest rates. In recent weeks, the Japanese yen has emerged as something of an investment safe haven, rising to 117.60 ¥/\$ and 128.30 ¥/€ (January 19, 2016). However, yen depreciation from around 80 ¥/\$ at end-2012 to 120 ¥/\$ at end-2015 raised destination costs for Japanese tourists in Hawaii by as much as fifty percent. The Euro’s depreciation from around 1.35 \$/€ to 1.10 \$/€ raised destination costs in Hawaii for Europeans by more than 20 percent.⁶ These have been challenging headwinds for Hawaii international tourism performance.

Other currencies’ depreciation against the U.S. dollar has been associated with a collapse in global commodity prices, itself to some degree a monetary phenomenon (slide 8). Because many

³ This point was developed by Rudiger Dornbusch and emphasized in a popular macroeconomics textbook he co-authored with current Federal Reserve Vice Chair Stanley Fischer. See Rudiger Dornbusch, Stanley Fischer, Richard Startz (2013), *Macroeconomics*, 12th ed., McGraw-Hill Economics.

⁴ People in Hawaii are often surprised to hear that Japan’s stock market valuations peaked at the end of 1988 because its adverse influence on Japanese investment in Hawaii and on Hawaii’s subsequent economic stagnation of the early- and mid-1990s took so long to unfold—not unlike problems in Greece coming to a head in 2015 long after the U.S. recession of 2008-2009 had ended. See <http://indexes.nikkei.co.jp/en/nkave>.

⁵ In reaffirming the federal funds rate target at its September 2015 meeting, members of the Federal Open Market Committee (FOMC) of the Federal Reserve following the August 2015 China and international stock market meltdown explicitly referred to global financial conditions. “This assessment will take into account a wide range of information, including measures of labor market conditions, indicators of inflation pressures and inflation expectations, and *readings on financial and international developments* [emphasis added].” See <http://www.federalreserve.gov/newsevents/press/monetary/20150917a.htm>.

⁶ From about 0.75 €/€ to about 0.90 €/€. By convention the Euro is quoted in U.S. dollars per Euro, unlike the yen.

global commodities like petroleum are commonly priced in U.S. dollars, appreciation of the U.S. dollar lengthens the measuring stick by which commodity-producing countries gauge the value of their exports, shrinking them in domestic currency terms like the Loonie and Aussie dollar. Falling prices of crude petroleum and other commodities fundamentally have been rooted in their increased global supplies. Countries like Canada and Australia and specific regions like the Dakotas and Alberta which export primary commodities have seen their fortunes reverse from only a few years ago. The Canadian dollar's depreciation from 1:1 parity with the U.S. dollar a few years ago to 0.70 Canadian dollars this winter combines commodity pricing influences with divergent monetary policies.^{7,8}

Normalization of monetary policy in the U.S. is expected to be reaffirmed next week without any changes (slide 9). That is, the anticipated rise in short-term interest rates, which commenced in December 2015, is expected to follow the trajectory revealed by forecasts last month of participants in the Federal Reserve's Federal Open Market Committee (FOMC). Their forward guidance suggests that a longer-run equilibrium interest rate target around 3.5 percent, up from 0.5 percent currently, could be approached by 2018. Quite apart from global influences of stock prices, exchange rates, and commodity prices, rising interest rates would constitute a mild headwind for Hawaii's continuing economic expansion (slide 10). Anticipating normalization, longer-term U.S. interests already have been in a slow, gradual climb. The FOMC's own forecast for U.S. real GDP growth of 2.3-2.5 percent during 2016, given gradual improvement in the U.S. economy, is consistent with initiation of monetary policy normalization last month.⁹

Further complexity regarding longer-term interest rate movements is posed by the size of the Fed's balance sheet (slide 11). Three rounds of quantitative easing followed an initial injection of liquidity during the intensification of financial crisis in the wake of the collapse of Lehman Brothers in 2008, exploding the balance sheet. The Fed is "maintaining its existing policy of reinvesting principal payments from its holdings of agency debt and agency mortgage-backed securities in agency mortgage-backed securities and of rolling over maturing Treasury

⁷ A recent Bank of Canada update on monetary policy in a low-interest rate environment sets the stage for further easing (<http://www.bankofcanada.ca/wp-content/uploads/2015/12/framework-conducting-monetary-policy.pdf>). Further Canadian monetary policy easing may be announced on January 20, 2016.

⁸ Declining commodity prices also contributed to the shutdown of HC&S sugar plantation on Maui and to diminution of Hawaii's largest agricultural activity—by far—the seed corn industry, but both cases are existentially more complex. HC&S also was denied by regulators a \$19 million annual contract to sell to Maui Electric surplus electricity generated at its mill by blending biomass (bagasse) with coal backhauled on the otherwise empty ship on which its sugar was fronthauled to the West Coast. (The State's Jihad on nonrenewable energy for electricity generation thus extends to disabling renewable energy as a joint product in agriculture.) Three (of four) County electorates' (not the same thing as governments') hostility to advanced biotechnology in maize agronomy has not been lost in a context in which Hawaii courts recently superferried the \$1.4 billion Thirty-Meter Telescope investment, policies seeming to seek *disinvestment* in two, 50 year-old, science-based industries in Hawaii.

⁹ Median FOMC forecasts in December 2015 for the U.S. economy in 2016 were: (1) 2.4 percent real GDP growth up from 2.1 percent in 2015; (2) 4.7 percent unemployment, down from 5.0 percent; (3) 1.6 percent inflation in the core personal consumption deflator, up from 1.3 percent; and (4) a 1.4 percent fed funds rate at 2016 year-end, up from 0.4 percent in the committee's median forecast prior to the December 2015 meeting at which the target was raised. See (<http://www.federalreserve.gov/monetarypolicy/fomcproptabl20151216.htm>).

securities at auction, and it anticipates doing so until normalization of the level of the federal funds rate is well under way.” Eventually assets would mature off the Fed’s balance sheet over time if not replaced. Liabilities would diminish if commercial banks were to reduce excess reserves from levels held at the Fed as a massive liquidity buffer. The Fed will use reverse repurchase agreements to manage reserves and to keep reserve deposit rates in synch with the rising overnight interbank lending rate target (the fed funds rate). Higher interest rates on trend should be expected in any event.

A final asset price trajectory worth noting is that of local home prices (slide 12). On Oahu, nominal existing home sales prices have, since mid-2011, converged to longer-term rates of appreciation of 4.5-5.0 percent, roughly consistent with nominal rates of price appreciation since the early-1980s. Statewide indexes of house prices, after adjustment for inflation, have been recovering from prior valuation cycles as in the past, but without exhibiting the inflection points preceding the Japan Bubble in the 1980s, or the Subprime Bubble in the 2000s (slide 13). It is possible that house price appreciation might converge to longer-term trends during the current investment upswing, rather than accelerating as in two previous housing cycles. That this might have changed with resurgent homebuilding commitments in 2015 remains an open question: one year does not a trend make.

Of special note among financial asset and commodity prices are crude petroleum prices, which have been declining for about a year and a half (slide 14). I’m keeping a list of people who assured me during the last ten years that oil prices were going to rise to \$200/barrel (slide 15). In inflation-adjusted terms, oil prices today are about the same as they have been on average for the last seventy years. Recent oil price declines have contributed to measured disinflation in the Honolulu consumer price index and an acceleration of real GDP growth in the early quarters of 2015 for which data are available. I’m not sure what to say to the Mullahs of Clean Energy who are still holding out for \$200/barrel, but I don’t begrudge any investor in renewable energy who does not require a State subsidy.¹⁰ Go For Broke (no pun intended).

In the meantime (slide 16), I can only point to the evidence that natural resource economics repeatedly has presented to debunk \$200/barrel Doomsday Prophets (in constant 2014 dollars). Even if the long descent of real crude petroleum prices since the 1860s is over when deflated using *wages* instead of prices (in which case real crude petroleum prices haven’t changed in 150 years), the recent crude petroleum price supercycle is the sixth in a century and a half. Every time the same thing happens. The TV show *Dallas* is revived and then cancelled. Doomsday Prophets advocate failed economic policy prescriptions like, “subsidize [fill-in-the-blank] because *eventually* it will be cheaper.” Investors overcome uncertainty about whether an oil price rise will stick, and initiate a process of exploration and discovery that finds even more oil. Last time it was in the North Sea and Alaska, this time it’s in Canada and the Fracking Dakotas. Innovators figure out even more efficient ways to make pick-up trucks, which comprise the majority of new motor vehicles sold in the United States,¹¹ along with everything else that uses energy. Renewable energy alternatives to fossil fuels also get a stimulus from higher oil prices.

¹⁰ The Mullahs should read Appendix 2 to the accompanying slideshow.

¹¹ Approximately 55 percent of all new motor vehicles sold in America today are on light truck chassis, up from 20 percent in 1980. See Appendix 2 to the accompanying slideshow for references.

Still (slide 17): (a) *nobody* in Hawaii is paying to emit atmospheric carbon and other greenhouse gases; and (b) *nobody* is getting paid for innovative ways to sequester emissions. In a world in which the next FTC auction will allow participants to buy *and sell* spectrum, policy-makers in Hawaii still avoid creating markets in which emissions are capped and traded. The idea has been around since the 1970s, *two* supercycles ago.

(Skip past slide 18 to slide 19.)

Turning from exogenous, national and global forcing factors on Hawaii's economic performance, consider basic macroeconomic metrics and the durability of Hawaii's current construction upswing (slide 20). A new quarterly data set on state real GDP through second quarter 2015 helps a lot in understanding Hawaii economic performance since the end of the Great Recession in 2009. Generalizing, real Hawaii GDP growth has failed to sustain its 2 percent real economic growth performance of the economic expansion in the early-2000s.

Tourism-led recovery in Hawaii in 2010 was stalled in 2011 by a combination of three things: (1) rising oil prices with political upheaval in North Africa and the Middle East—the Arab Spring; (2) the March 2011 Northeast Japan Tohoku seismic event; and (3) rising lodging utilization on Oahu. By 2012 much of the growth in Oahu tourism was burning up in higher room rates, but not so much in overall tourism receipts. In 2013, a Soft Patch in economic growth accompanied federal government job cuts in Hawaii and budget sequestration, symptomatic of leadership failures in the U.S. Congress. This left real GDP in Hawaii barely higher at the start of 2014 than it had been in summer 2012.

The Soft Patch undermined the Council on Revenues forecast.¹² An investment-led reacceleration of economic growth in Hawaii, turbocharged by the global decline in crude petroleum prices, most recently has validated a long-awaited expectation that construction would take the hand-off from tourism and extend Hawaii's economic expansion into the late 20-teens (slide 21). So, the Soft Patch stands out as an interval after tourism's premature flame-out and before construction's resurgence.

For the record, Hawaii's compound annual real GDP growth rate from fourth quarter 2009 through second quarter 2015 (latest published data), was only 1.4 percent, well below the contemporaneous U.S. real GDP growth rate of 2.1 percent (slide 22).¹³ Part of the drag on U.S. and Hawaii growth in the early years of economic expansion can be attributed to government austerity, notwithstanding the fiscal stimulus of 2009, some of the initially positive effects of which may have been muted by austerity at state and county government levels. The challenge

¹² In May 2013, the Council Revenues forecast +8.0 percent Hawaii general fund revenue growth for fiscal year 2014, before the Soft Patch had fully unfolded, its last projection prior to FY2014 (http://files.hawaii.gov/tax/useful/cor/2013gf05-28_with0530_Rpt2Gov.pdf). Actual FY2014 Hawaii general fund revenue growth was -1.8 percent (<http://files.hawaii.gov/tax/stats/monthly/201406collec.pdf>).

¹³ U.S. real GDP grew at a 2.135 percent annualized rate, fourth quarter 2009 through second quarter 2015. U.S. real GDP grew at a 2.083 percent annualized rate, second quarter 2009 through third quarter 2015.

to sustaining Hawaii economic growth as the tailwind from falling oil prices subsides are the headwinds from other global factors.

Most other macroeconomic variables in Hawaii have settled into the long-run equilibrium paths long sought by monetary policy makers (slide 23). Inflation in Honolulu, which in the past has drifted below the national average when missing out (late-1990s), and above the national average when booming (early-2000s), in the 20-teens has largely matched the U.S. All-City average. This also has been true during the recent, transitory disinflation associated with the drop in oil prices. Disinflation will fade assuming that oil prices either stabilize or, as widely expected, eventually rebound partway between recent highs and lows. In such an environment, Hawaii inflation measured by the Honolulu CPI-U should converge to the neighborhood of the 2 percent target rate of Federal Reserve monetary policy.¹⁴

Employment conditions are good (slide 24). Nothing buried in any one of the six measures of unemployment—numbers of *underemployed* or persistence of unemployment among older men since the recession—reveals much about the business cycle that isn't obvious from the six measures' co-movement. Monthly unemployment rates have subsided to or just below 4.0 percent on the Neighbor Islands, and to or below 3.0 percent on Oahu, both below the U.S. unemployment rate of 5.0 percent. They'll keep falling.

Hawaii's labor market conditions will tighten further if the economy grows, bidding up wages and dampening employment effects of newer investments (slide 25). Job growth has been stronger on Oahu than on the Neighbor Islands since the Great Recession, which had a more severe impact on the Neighbor Islands. Additional non-stop scheduled seats from North America to the Neighbor Islands, by-passing constraints on interisland travel capacity, helped sustain growth in constant-dollar Neighbor Island tourism receipts even after tourism stalled on Oahu. Tourism growth helped overcome the Soft Patch for the Neighbor Islands. On Oahu, getting over the Soft Patch meant overcoming federal government job loss. Still, unlike Oahu, Neighbor Island employment hasn't exceeded the prior cyclical peak, and lagging economic expansion on the Neighbor Islands points to deeper structural challenges (slide 26).

Not everything has been working for Hawaii (slide 27), which largely explains Hawaii's below national average real GDP growth. Constant-dollar statewide visitor expenditure stopped rising in 2012, as many of the forces described above (*e.g.* exchange rates, capacity constraints) conspired to cap Hawaii's principal export. Federal civilian employment reductions since 2012 reflect more than Congressional impasse (slide 28), although a recent budget deal has relieved some of that pressure. Longer-term constraints on discretionary expenditure from obligatory growth of federal health expenditure, Social Security, and interest on the federal debt do not bode well for the federal government as growth driver to which Hawaii grew accustomed in the

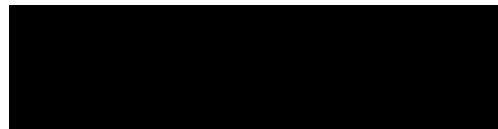
¹⁴ The Fed's target is stated in terms of the U.S. personal consumption deflator which, by construction, should exhibit slightly lower inflation than contemporaneously measured by the U.S. consumer price index, hence the relevance of a "neighborhood" of the 2 percent Fed goal. (See http://www.federalreserve.gov/monetarypolicy/files/FOMC_LongerRunGoals.pdf.)

past.¹⁵ Because tourism and the federal defense sector have been Hawaii's largest sources of external (export) income, combining to make up about one-quarter of Hawaii value-added, their constraints on Hawaii's future economic potential are most acute.

Finally, while I remain optimistic about the future of construction and investment in Hawaii (slide 29), like the old Paul Samuelson joke that the stock market has predicted 9 out of the last 5 recessions, we have forecast 4 years of the last 2 years' increases in construction. The good news is that construction job counts did achieve greater lift-off in 2015. The bad news is that we've been holding our breath since about 2010. What happened in-between was a head fake. A temporary rise in contracting receipts in 2011 and 2012 was followed by temporary fall in 2013 and 2014. The culprit was probably photovoltaic (PV) and renewable energy equipment investment, showing up in contracting receipts while the party lasted.

Unfortunately, equipment investment is not investment in new structures (slide 30). We who use building permit values and government construction contracts to forecast construction spending and employment got faked out. Slapping PV panels on a roof is faster, and yields contracting receipts sooner, than when Ala Moana Center builds another Ala Moana Center, which takes more time. The rise in private sector commitments to build since 2010 took place largely in permits for additions and alterations—used buildings—but not as much for new buildings. Commitments to build new buildings *did* rise in 2015, which bodes well for extending the construction upswing. Even then, one should not underestimate the importance of redevelopment at Ala Moana or International Marketplace, which are transformative qualitatively as well as significant quantitatively. Net-net, however, some of this is replacement capacity, even if all of it involves construction (slide 31). (What happens when *they're* done?) Building TheTrain is impressive, or an affront, depending on your aesthetic point of view and whether you wanted to get to UH. Still, Hawaii in the 1960s and 1970s invested more in public capital formation than at any time in the last two decades, multiples in terms of public investment as a percent of GDP. The crowning achievement for residential construction recently is that in 2015 (slide 32), for the first year in the last seven, more new houses in Hawaii probably were authorized for construction than during world war, which was the only time on Oahu that it was worse than the previous six years, on average. I summarize on slide 33.

Mahalo,



Paul H. Brewbaker, PhD, CBE

¹⁵ The Congressional Budget Office will be publishing updated long-term projections on January 25, 2016 (see <https://www.cbo.gov/publication/51129>, and a summary was published on January 19, 2016 at https://www.cbo.gov/sites/default/files/114th-congress-2015-2016/reports/51129-2016_Outlook_Summary.pdf).



Uncertainties facing Hawaii's economy entering the late 20-teens

slides prepared for the

**Hawaii Senate Committee on Ways and Means
Hawaii House Committee on Finance**

Economic Overview (Informational Briefing)

Hawaii State Capitol Auditorium

by Paul H. Brewbaker, PhD, CBE

TZ Economics, Kailua, Hawaii

January 21, 2016

1. Asset prices

- Stock indexes
- Exchange rates
- Interest rates
- Home prices
- Commodity prices (petroleum)

2. Hawaii macro indicators: real GDP, inflation, employment

3. A mixed bag: tourism, federal government, construction

4. Summary

5. Appendixes

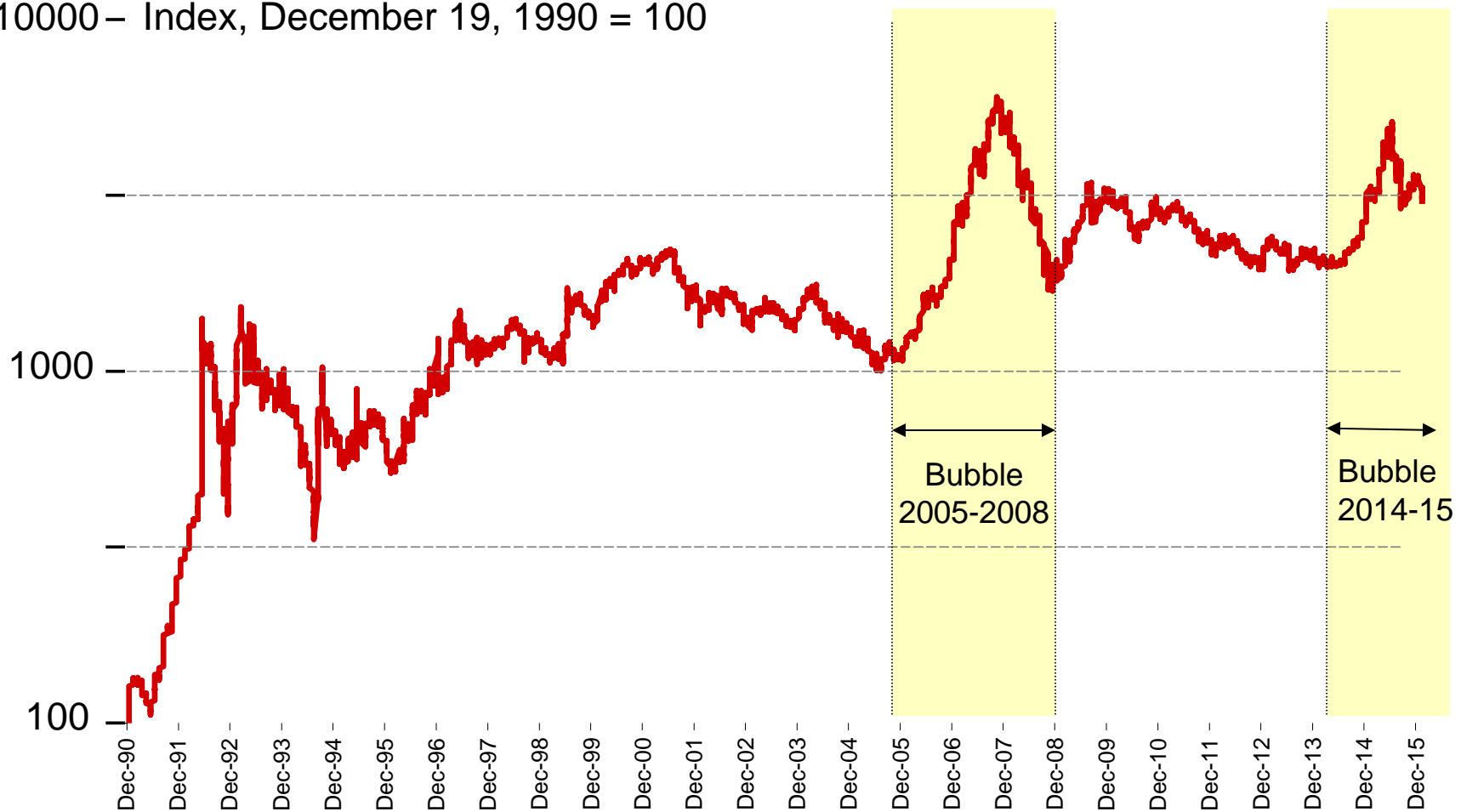


The China Syndrome

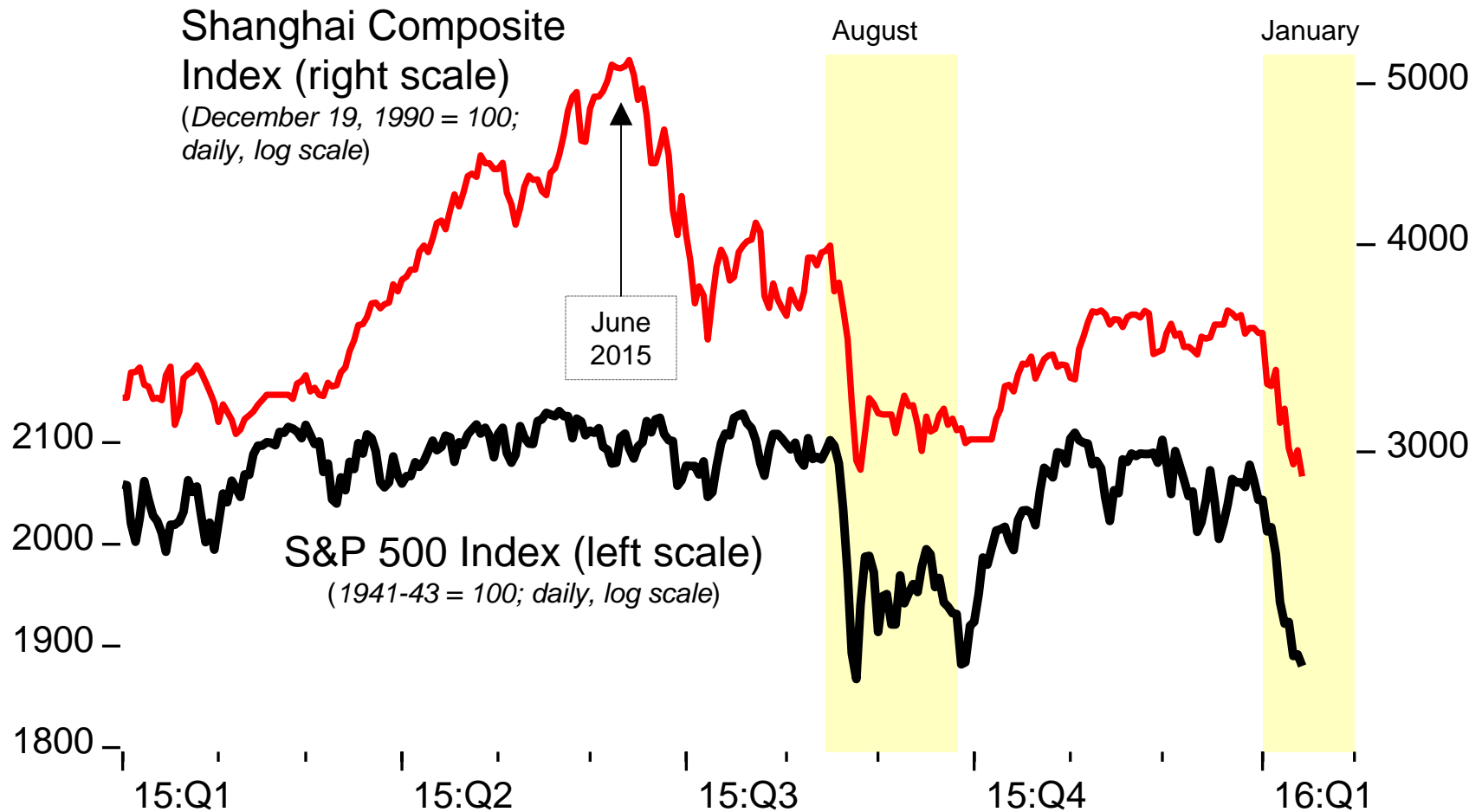
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Today's "China Syndrome" an equity bubble, risk of global financial contagion: daily Shanghai Composite closing values

10000 – Index, December 19, 1990 = 100



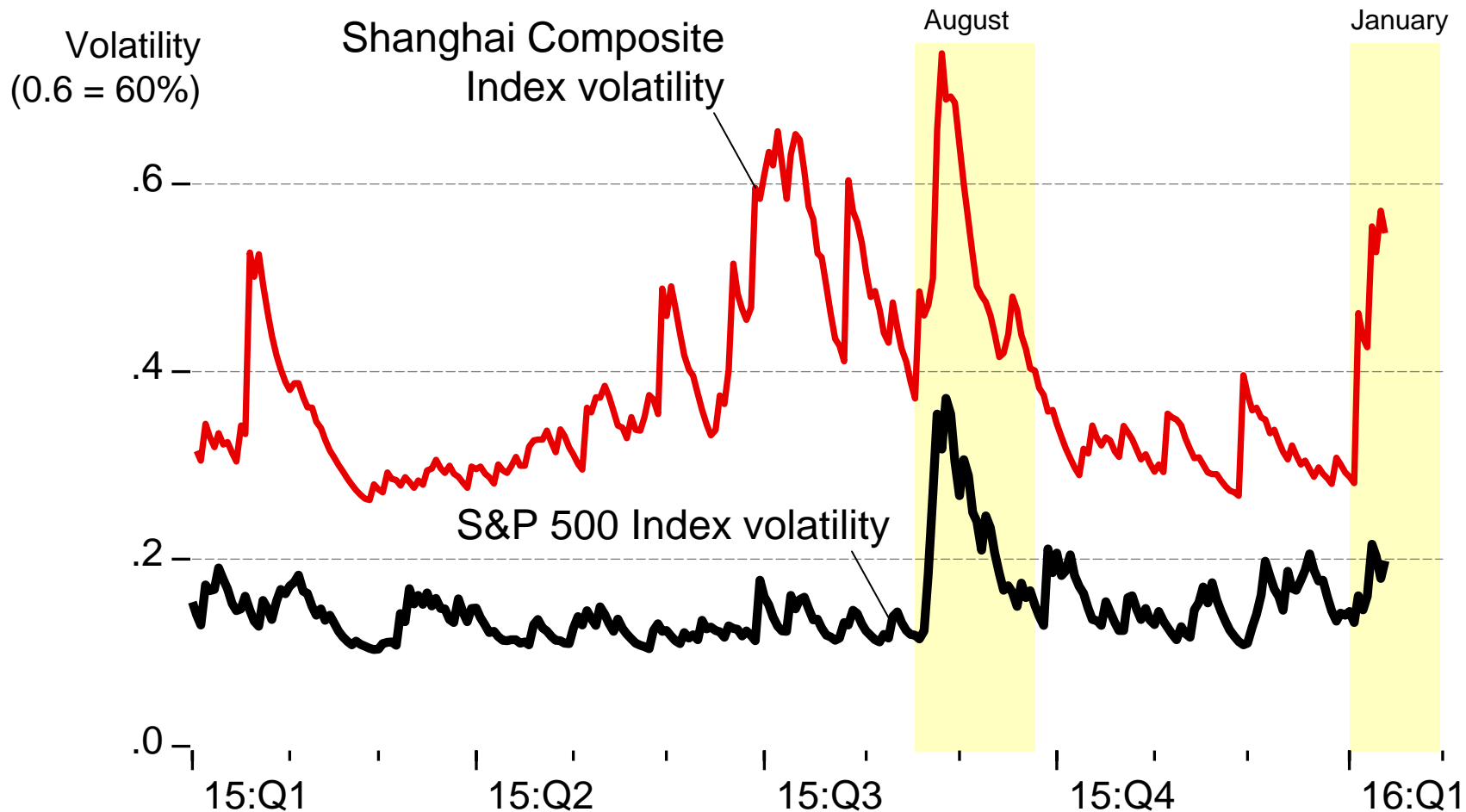
Stock market bubble unwinding in China became global shock in August 2015 when the yuan depreciated; New Year second shock



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Source: Yahoo Finance, Standard & Poor's, Federal Reserve Bank of St. Louis (<https://research.stlouisfed.org/fred2/series/SP500>) (daily to January 14, 2016)

Stock market volatility emanating from China: all quiet on the S&P 500 until August 2015 (conditional annualized daily volatility)



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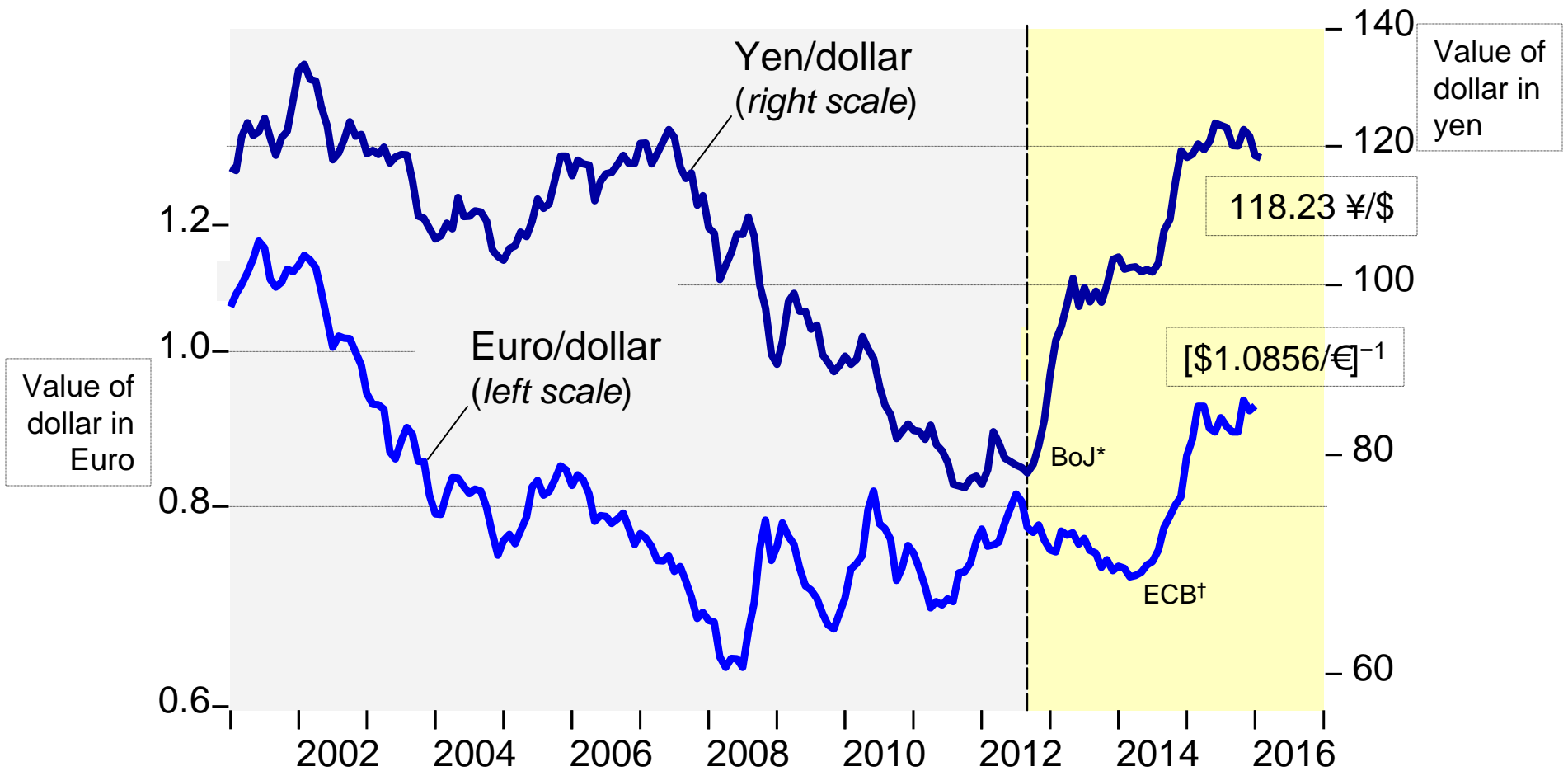
Source: Yahoo Finance, Standard & Poor's, Federal Reserve Bank of St. Louis (<https://research.stlouisfed.org/fred2/series/SP500>) (daily to January 14, 2016); generalized autoregressive conditional heteroskedasticity standard deviations (annualized volatility) of daily log changes by TZE



Other recent asset pricing trends

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Divergence: quantitative easing (QE) depreciated the yen and the Euro as U.S. concluded QE; fed funds lift-off confirms expectations



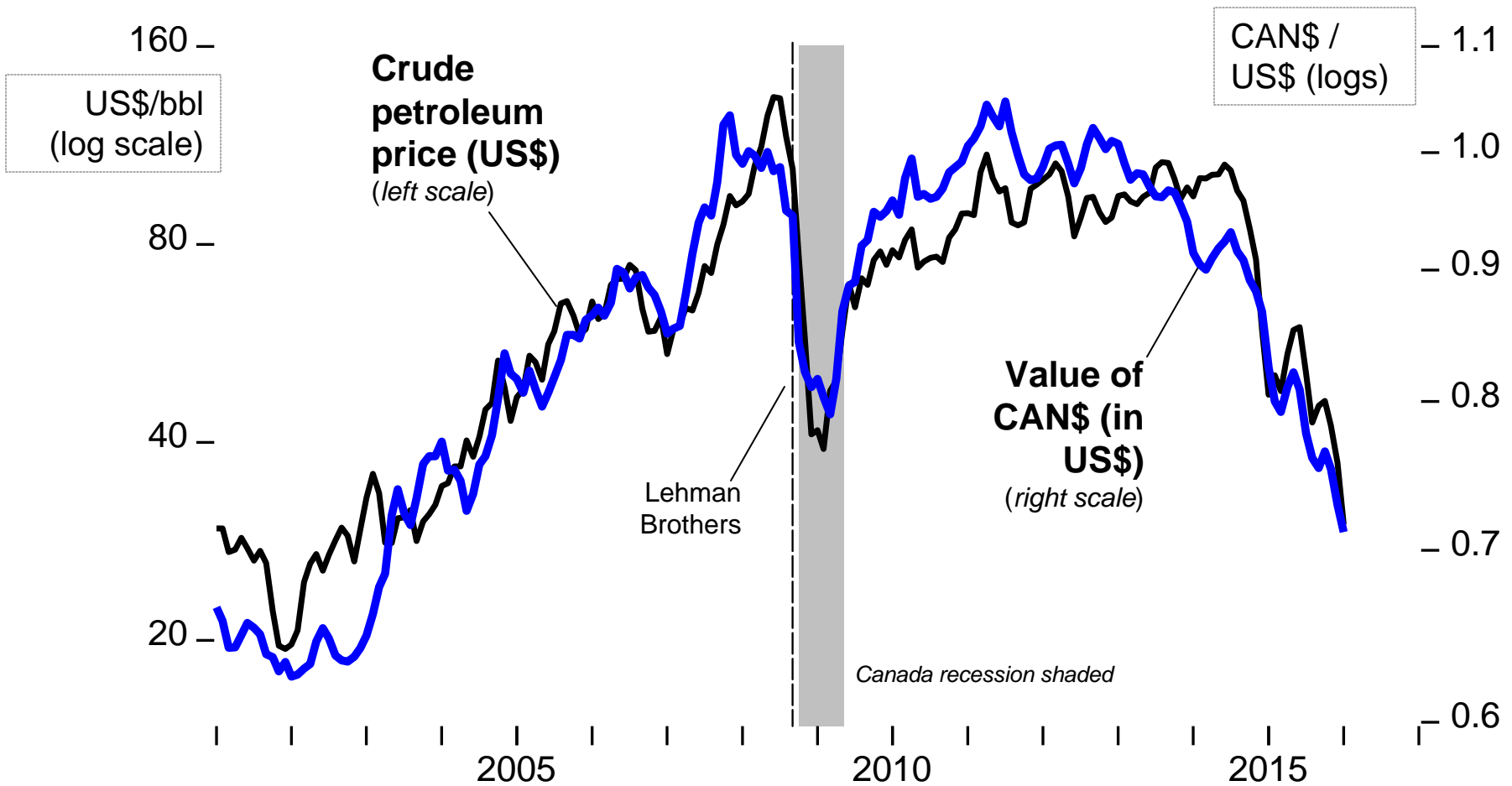
* Prime Minister Abe re-elected December 16, 2012, initiates "Abenomics," endorsing Quantitative Easing.

† QE widely anticipated in financial markets; announced by ECB President Draghi January 22, 2015.

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Source: Federal Reserve Bank of St. Louis; data through January 13, 2016 (prior monthly averages) (<http://research.stlouisfed.org/fred2/series/EXUSEU> and <http://research.stlouisfed.org/fred2/series/EXJPUS>); exchange rates noted are U.S. market close

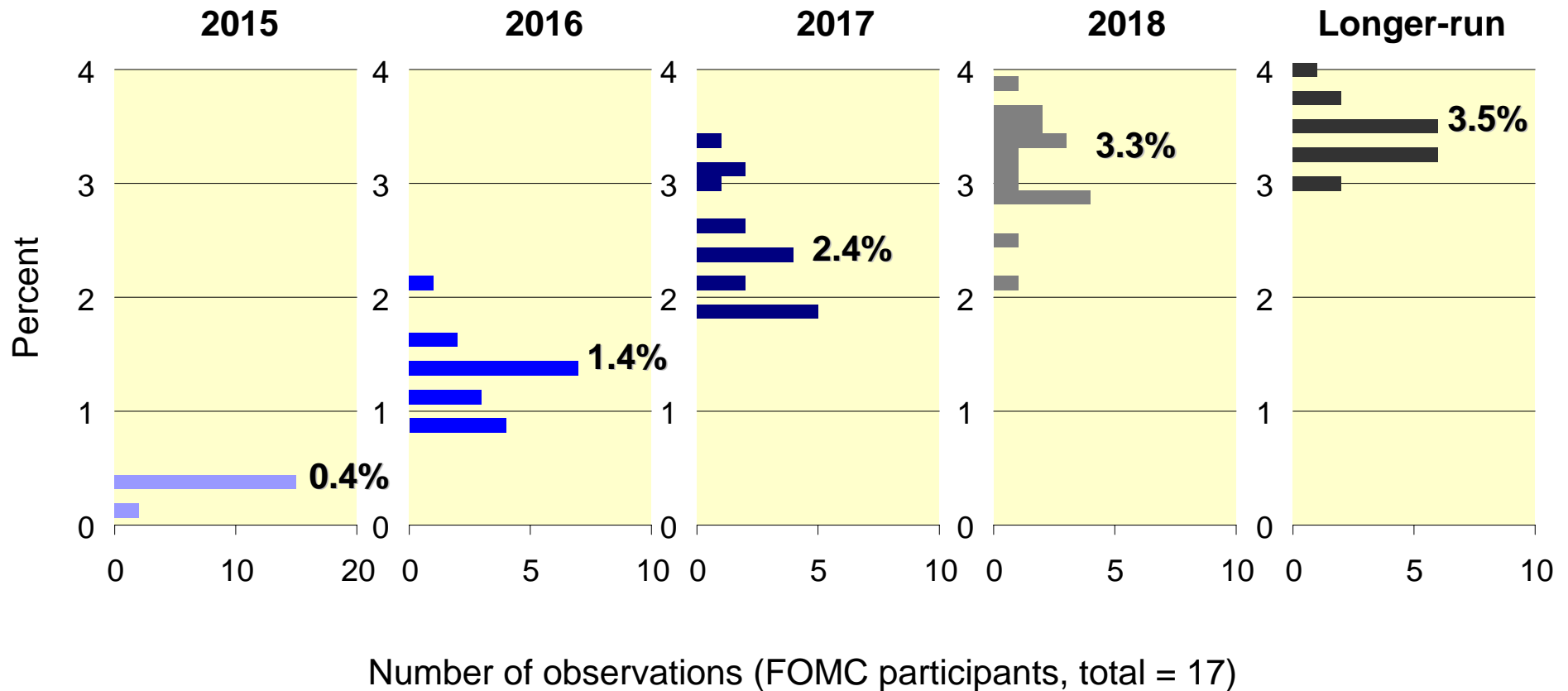
Falling global oil prices: windfall for consumers, tough on producers (Canada, Dakotas) and on sugarcane, corn seed industries



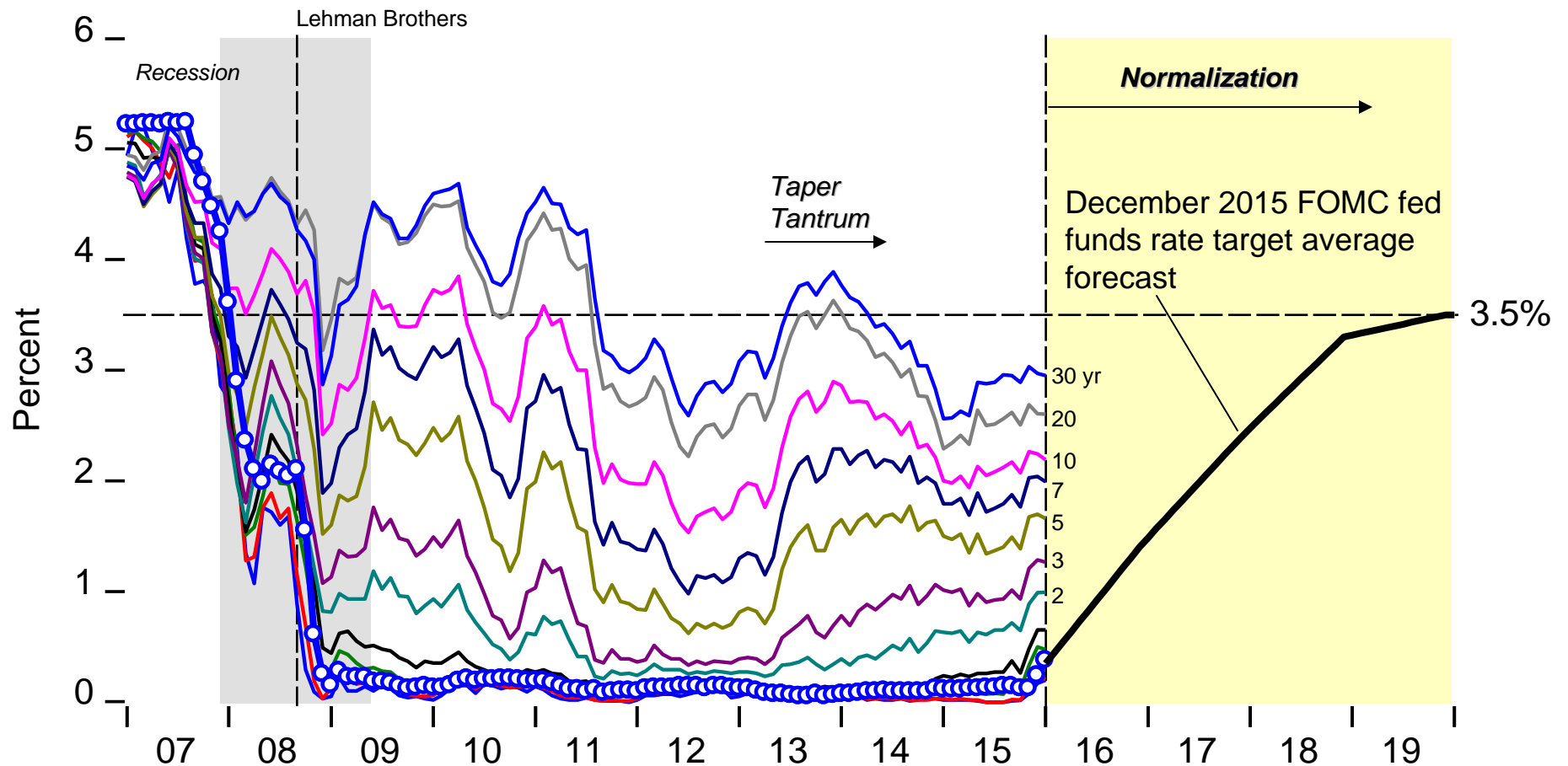
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Source: CD Howe Institute (https://www.cdhowe.org/pdf/Commentary_366.pdf), Federal Reserve Bank of St. Louis; data through December 2015 (monthly averages) and first two weeks of January 2016 (<http://research.stlouisfed.org/fred2/series/EXCAUS> and <http://research.stlouisfed.org/fred2/series/MCOILWTICO/>)

FOMC members' forecasts for fed funds target rates, and medians (December 16, 2015): light headwinds from interest rate normalization



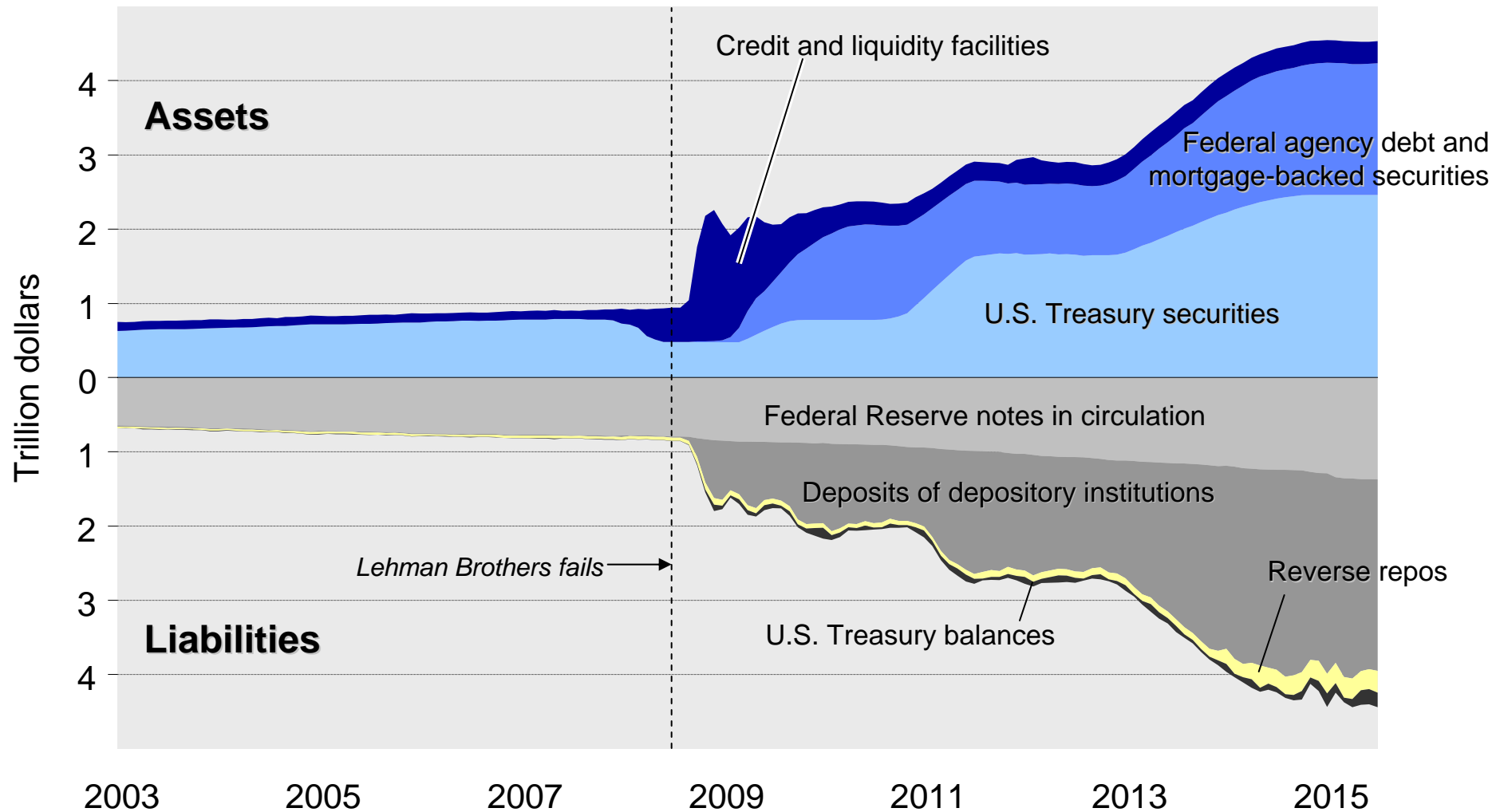
U.S. Treasury yields, fed funds normalization path implied by Federal Open Market Committee (FOMC) members' individual forecasts



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Source: Federal Reserve Board (H.15) and December 16, 2015 projections (<http://www.federalreserve.gov/monetarypolicy/fomcprojtbl20151216.htm>).

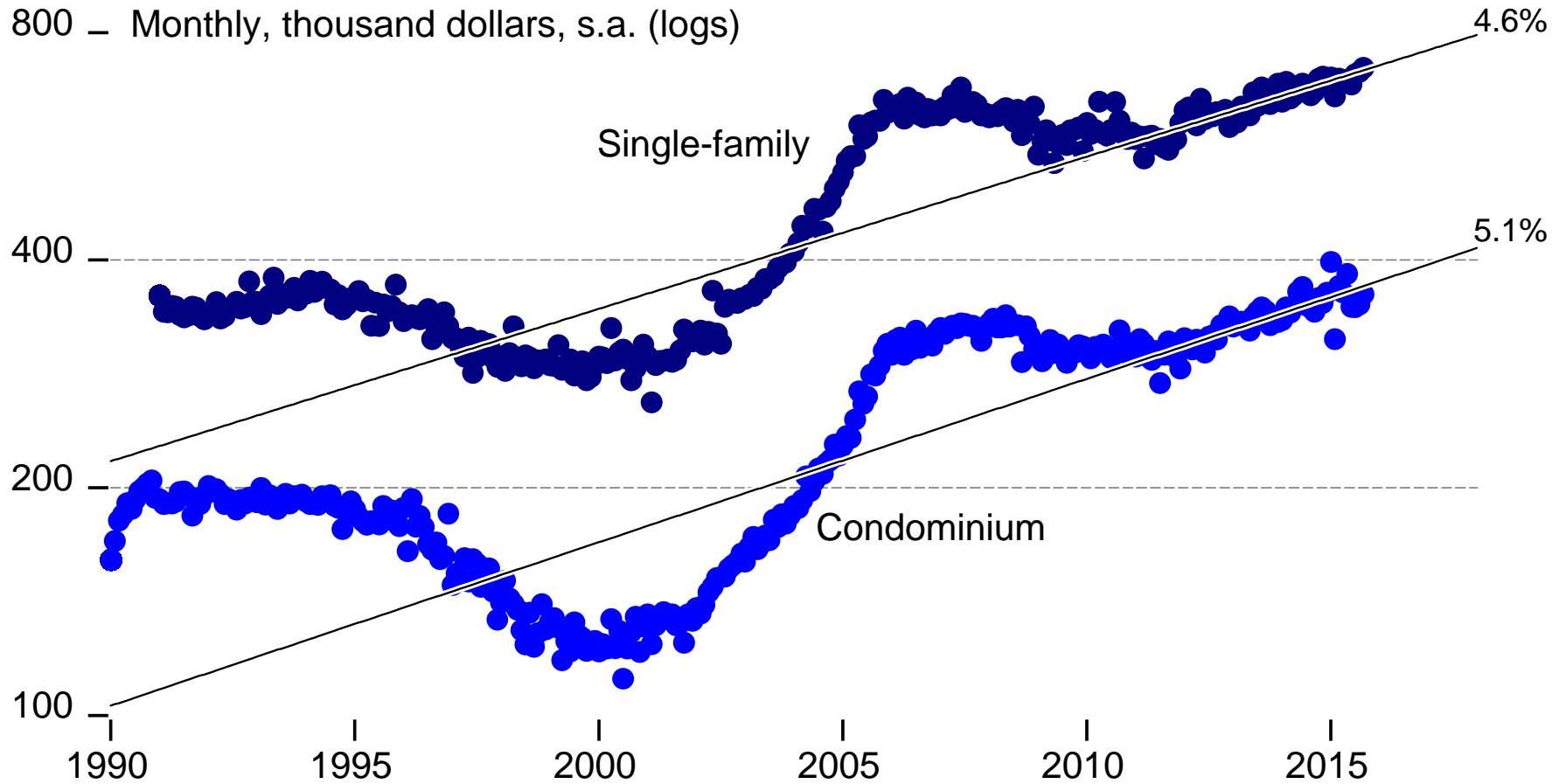
Federal Reserve assets, liabilities: as fed funds rates rise; balance sheet should shrink, how may affect longer-run yields



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Sources: Monthly data for last Wednesday of the month from Federal Reserve Board (various, including Statistical Release H.4.1); compiled by TZE through January 16, 2016

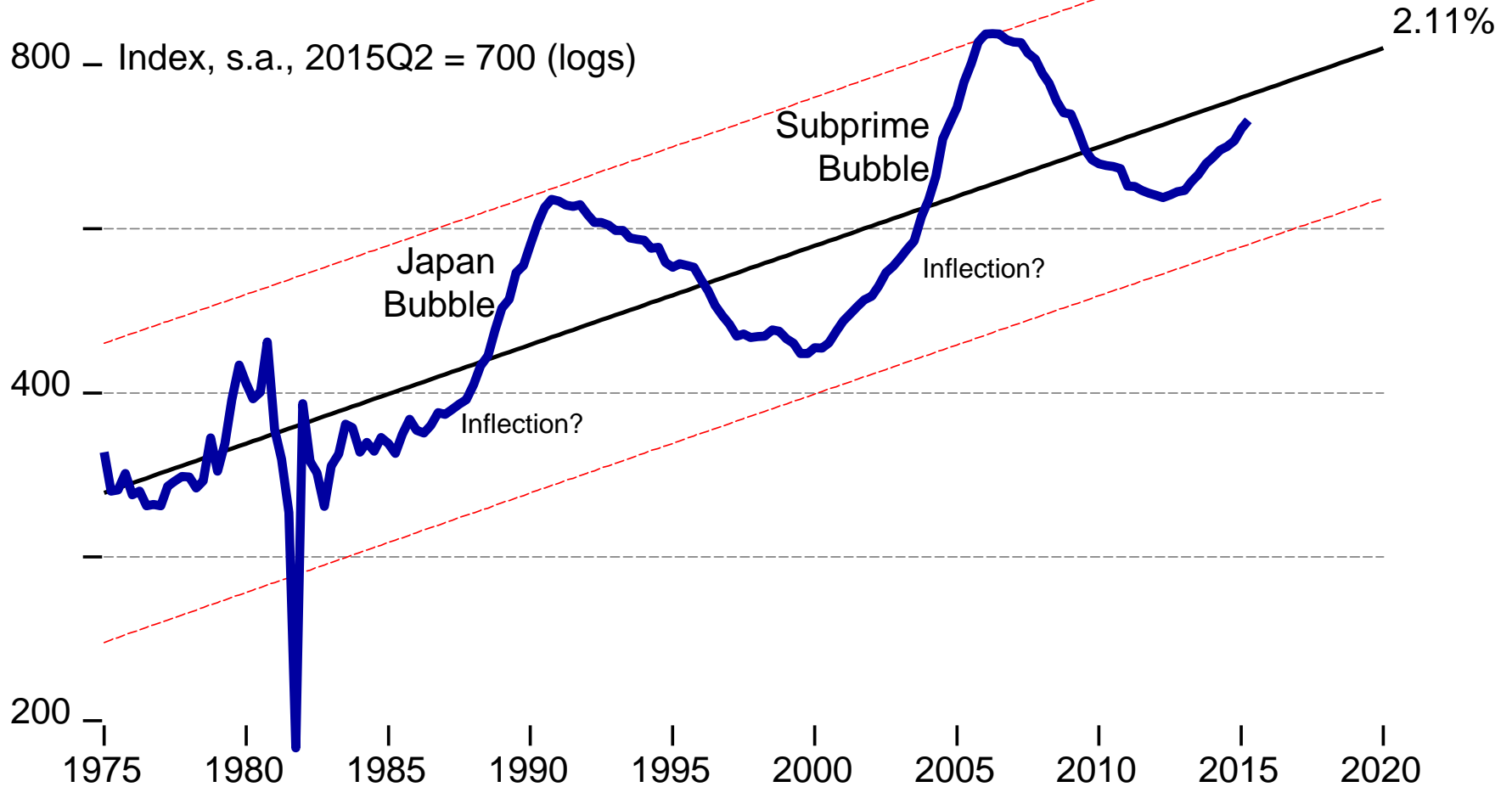
Oahu median home prices since mid-2011: converging to 4.5-5.0% appreciation (through December 2015)



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Source: Honolulu Board of Realtors; seasonal adjustment, trend regressions from June 2011 through December 2015 by TZE

Real (inflation-adjusted) Hawaii (statewide) FHFA home price index on 2% LR trend



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Sources: Federal Housing Finance Association, Bureau of Economic Analysis, Federal Reserve Bank of St. Louis. Data through second quarter 2015; seasonal adjustment, deflation using PCE deflator by TZE. Bandwidth shown is two standard errors of regression projection

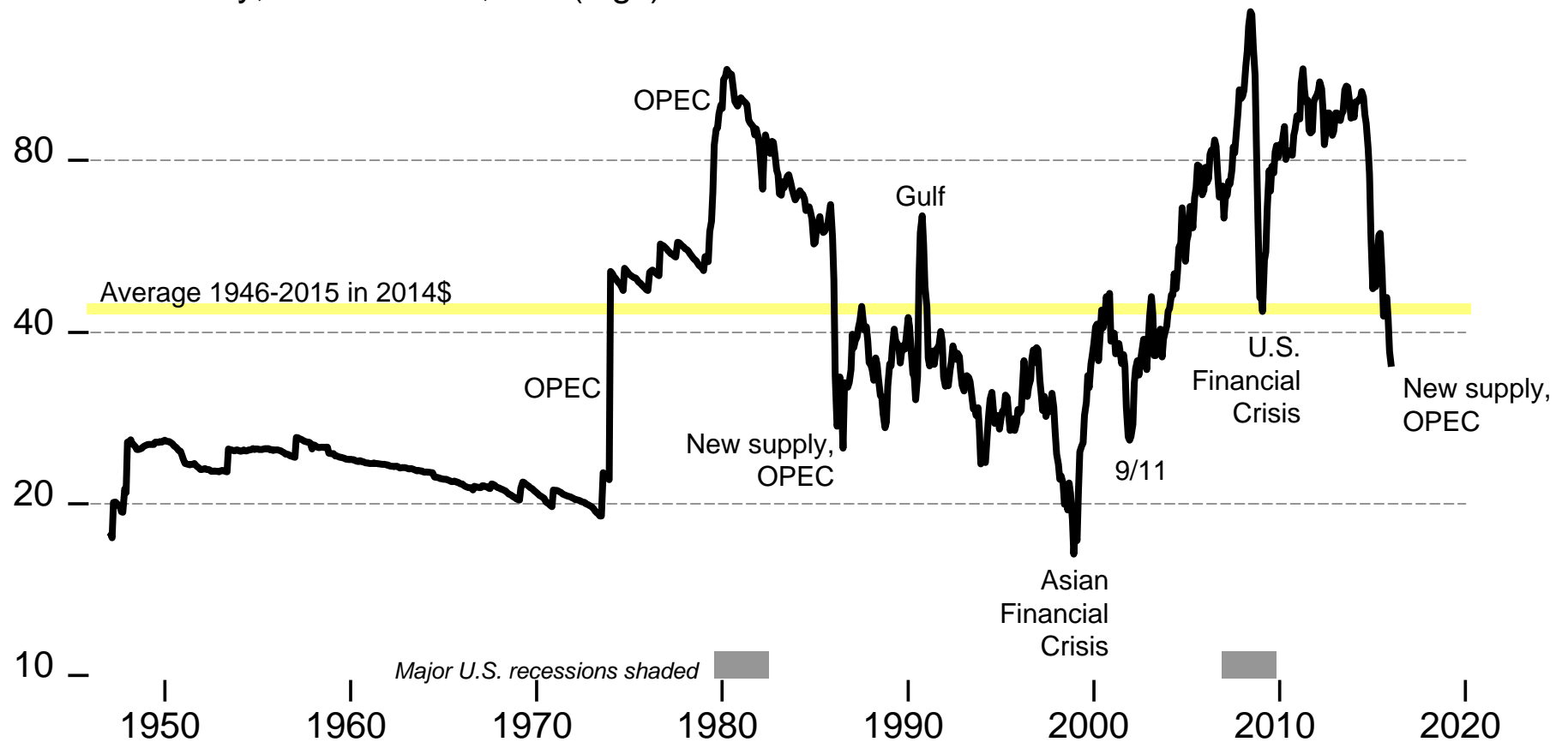


Petroleum prices: unwinding a supercycle

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CPI-adjusted real crude petroleum price near inflation-adjusted average, \$43.90 (1947-2015): unwinding another supercycle?

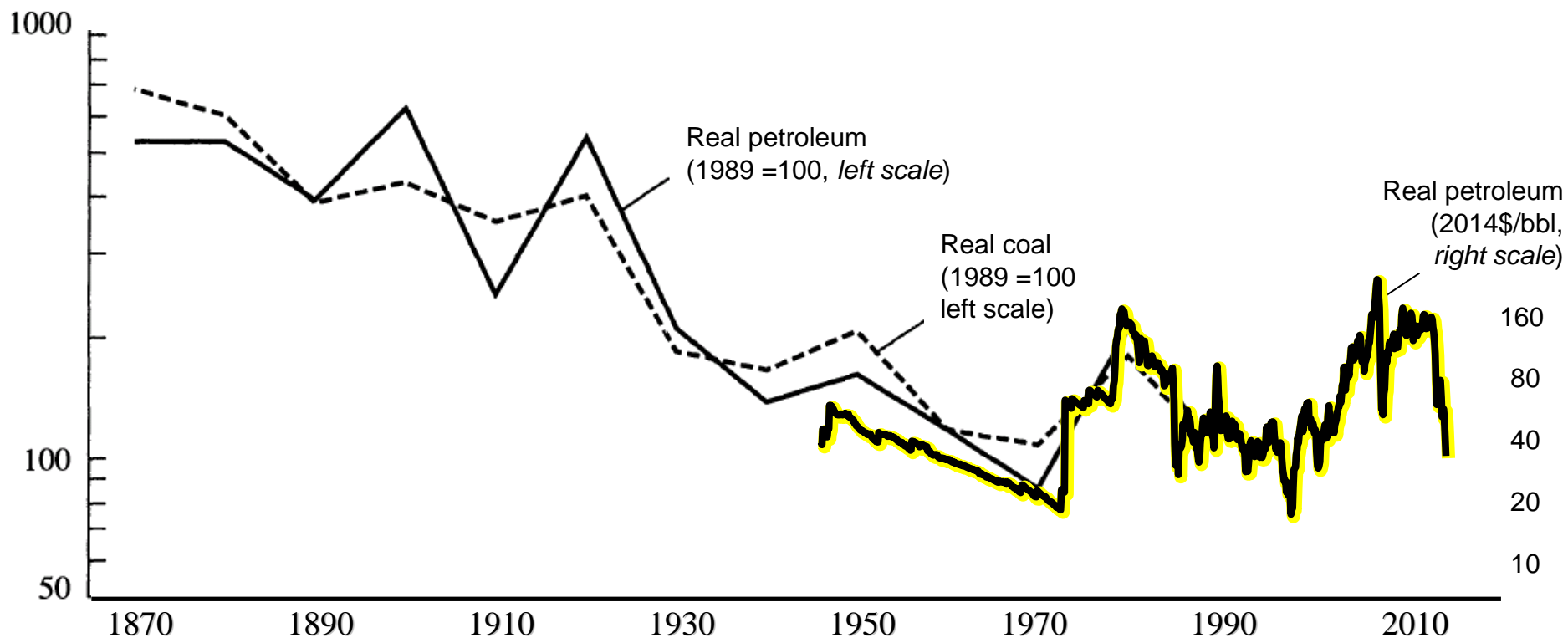
160 – Monthly, 2014\$/barrel, s.a. (logs)



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Sources: Federal Reserve Bank of St. Louis, Energy Information Administration, U.S. Department of Energy; monthly data through early-January 2016 combining West Texas Intermediate benchmark with earlier published crude prices, deflated using U.S. CPI-U

Real U.S. energy product prices, 1870-1989 by decade, monthly real oil prices 1947-2016(Jan), deflated with wages

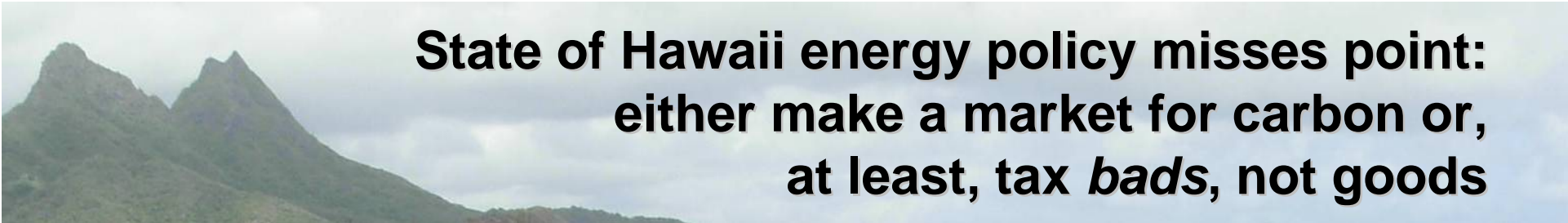


Decade graph source: “[Nordhaus, Stavins, Weitzman “Lethal Model” (1992)] calculations based on Manthy (1978, p. 11), *Statistical Abstract of the United States, 1991* (table 669, p. 408, and table 1221, p. 698); and U.S. Bureau of the Census (1975, pp. 165, 169-70). Real price is an index of the product price divided by an index of average hourly earnings in manufacturing.”

Monthly data: Federal Reserve Bank of St. Louis, Energy Information Administration, Bureau of Labor Statistics; monthly data through early-January 2016 combining West Texas Intermediate benchmark with earlier published crude prices, deflated using average hourly wages in good-producing industries

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Source: Figure 2. in William D. Nordhaus, Robert N. Stavins, Martin L. Weitzman, “Lethal Model 2: The Limits to Growth Revisited,” *Brookings Papers on Economic Activity*, Vol. 1992, No. 2 (1992), pp. 1-59, over which graphic by this author is superimposed, to scale.



State of Hawaii energy policy misses point: either make a market for carbon or, at least, tax *bads*, not goods

Oil price data interpretation FAIL leads to energy portfolio misallocation:

- Policy presumes real oil prices will rise when they have not, *not even on average*—shorter-term price rise mistaken for medium-term supercycle
- Perversely: policy shuts down base power (HC&S Maui) in favor of intermittent power (wind), *increasing volatility and cost* (excess capacity)
- Outcome: the poor cross-subsidize the rich for PV, electric cars

Optimal policy recommendation:

- “Do the most efficient thing” *not* “Do the right [*sic*] thing” (Pono)
- *Everybody* should pay to emit atmospheric carbon (prices, taxes)
- *Anybody* should get paid to sequester atmospheric carbon (prices)



References for UH undergraduates in Econ 311

- Jeffrey A. Frankel (December 2006), “The Effect of Monetary Policy on Real Commodity Prices,” *NBER Working Paper 12713* (<http://www.nber.org/papers/w12713.pdf>)
- David S. Jacks (March 2013), “From Boom to Bust: A Typology of Real Commodity Prices in the Long Run,” *NBER Working Paper No. 18874* ([http://www.sfu.ca/~djacks/papers/workingpapers/w18874\(typology\).pdf](http://www.sfu.ca/~djacks/papers/workingpapers/w18874(typology).pdf))
- José Antonio Ocampo (March 2013), “Super Cycles of Commodity Prices Since the Mid-Nineteenth Century,” *Presentation at the International Monetary Fund* (<https://www.imf.org/external/np/seminars/eng/2012/commodity/pdf/Ocampo.pdf>)
- Nerd extra credit: Lawrence Christiano and Terry Fitzgerald (2003), “The Band Pass Filter,” *International Economic Review* **44**(2): 435

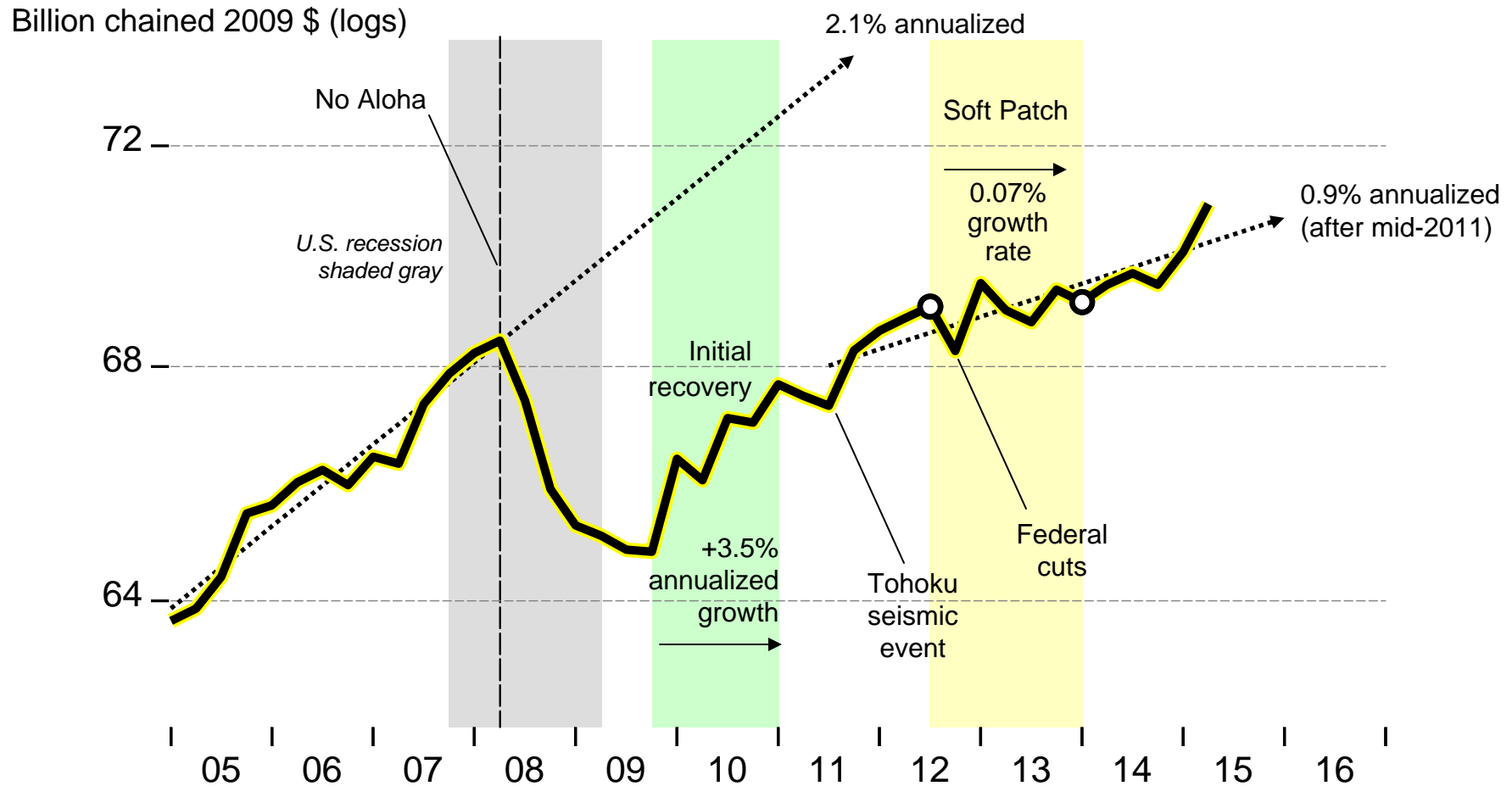
My illustration did not use the asymmetric band-pass filter suggested by Christiano and Fitzgerald (2003) (as in above references) which distinguishes three orthogonal components: a long-term trend at frequencies of 70 years or more, and medium-term supercycle from 20-70 years, and shorter-run boom-bust episodes. Instead, *for illustrative purposes*, a Hodrick-Prescott nonlinear filter with a tuning parameter of 25 was applied to annual real crude petroleum prices (Robert Hodrick and Edward C. Prescott (1997). "Postwar U.S. Business Cycles: An Empirical Investigation," *Journal of Money, Credit, and Banking* **29**(1): 1–16.)



Hawaii macroeconomic roundup

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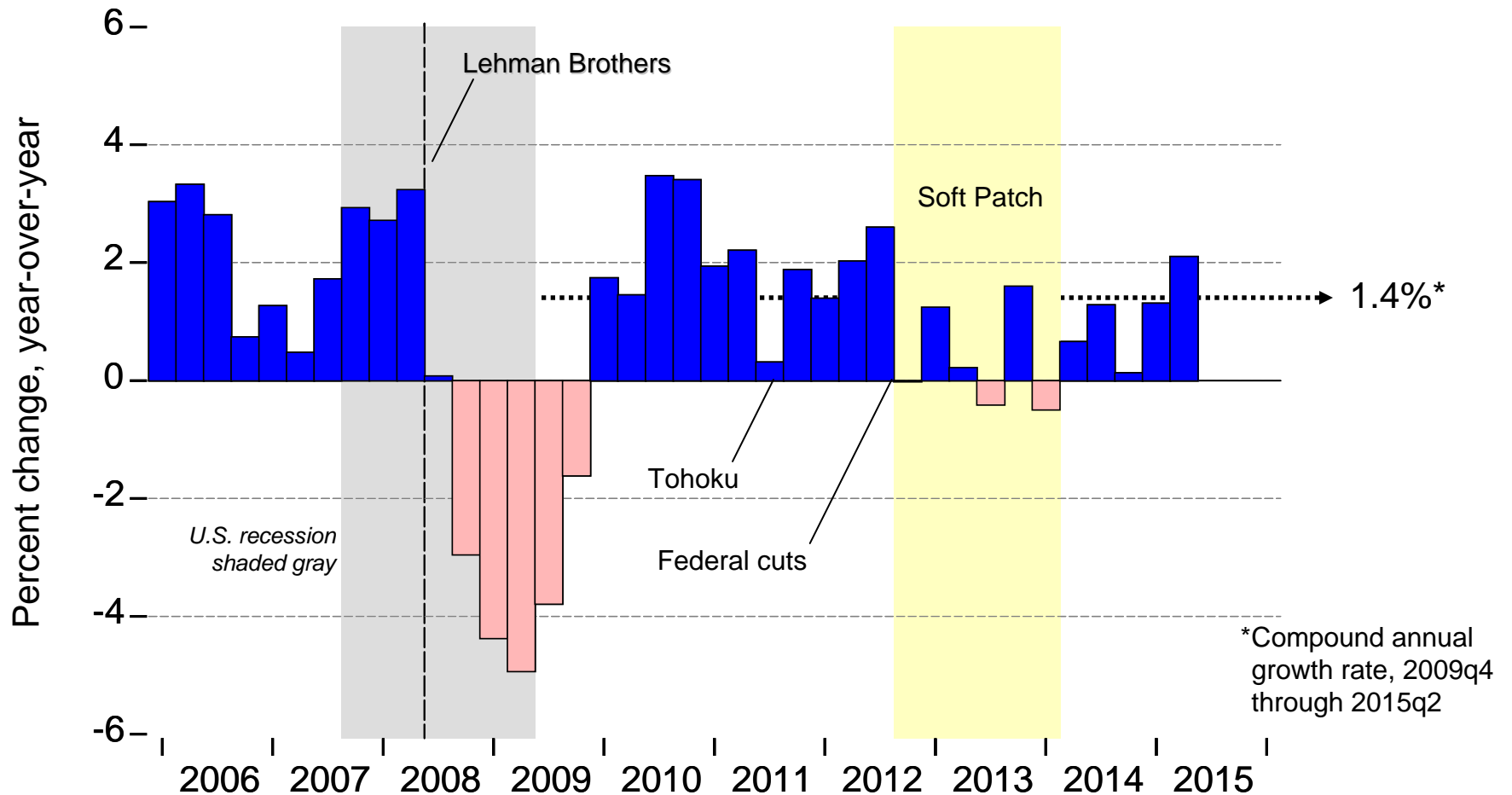
Quarterly real Hawaii GDP through mid-2015: strong initial recovery, 2013 Soft Patch, 2014 re-acceleration into last year



Slide copyright 2016 TZ E C VO N O M I C S

Sources: U.S. Bureau of Economic Analysis (<http://bea.gov/regional/index.htm>); see BEA Quarterly Gross Domestic Product by State (Prototype Statistics) (http://bea.gov/newsreleases/regional/gdp_state/qgsp_newsrelease.htm): "BEA continues to evaluate its methodology based on data users' comments and evaluations received after the first release of prototype quarterly GDP by state statistics last September [2014]."

Quarterly Hawaii annualized real GDP growth rate below U.S. potential; was 2015 surge a second wind, or oil price tailwind?



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Sources: U.S. Bureau of Economic Analysis (<http://bea.gov/regional/index.htm>); see BEA Quarterly Gross Domestic Product by State (Prototype Statistics) (http://bea.gov/newsreleases/regional/gdp_state/qgsp_newsrelease.htm)

Economic growth would have been higher but for austere fiscal postures, federal contraction: growth in value-added by sectors

Compound annual growth rates (%) 2009-2013 2009-2014

Private industries

U.S.	2.21	2.28
U.S. (Metropolitan Portion)	2.22	2.31
Hawaii	2.05	1.76
Urban Honolulu (a.k.a. Oahu)	2.41	2.10
Kahului-Wailuku-Lahaina MSA (a.k.a. Maui County)	1.43	0.59

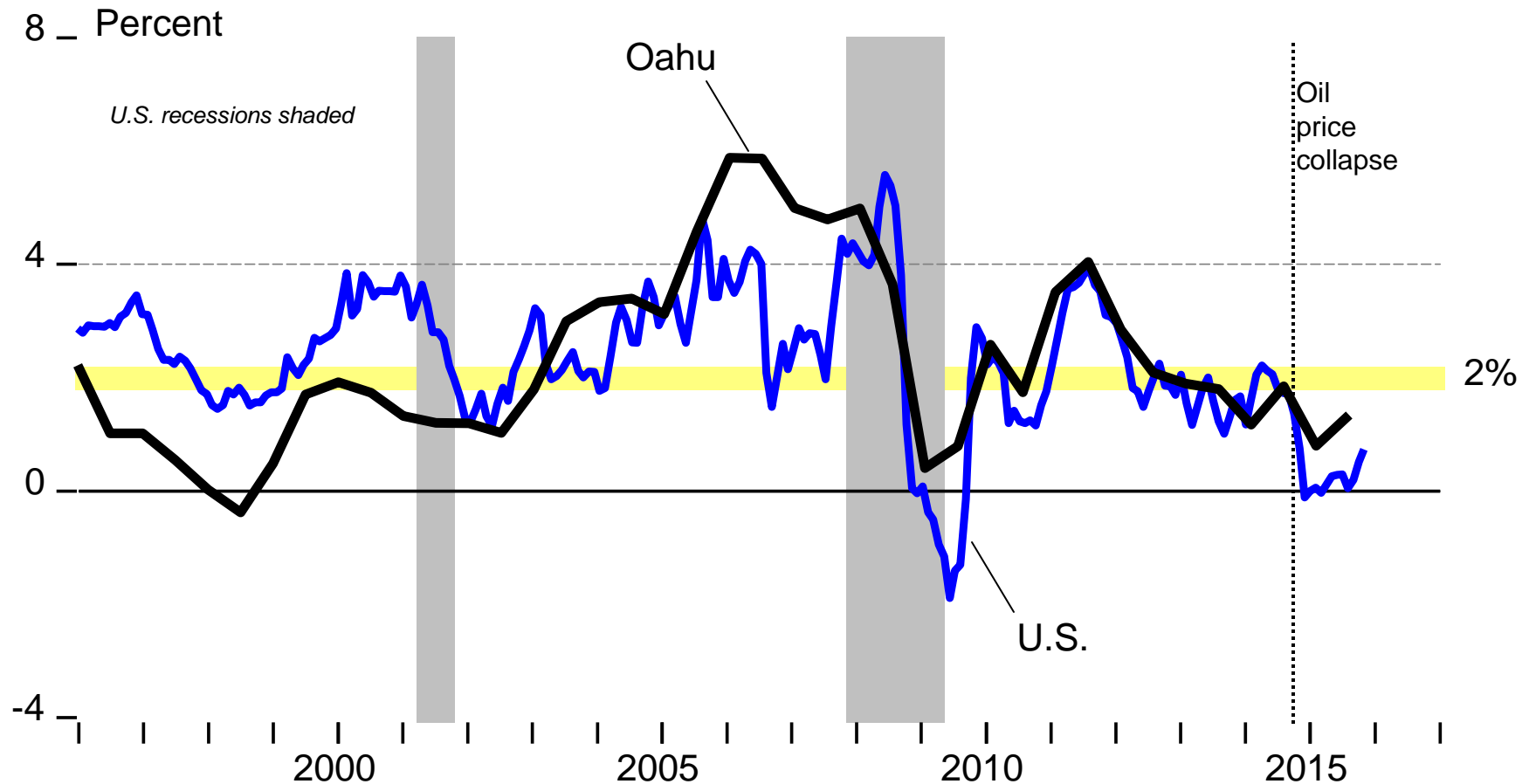
Government

U.S.	-0.34	-0.30
U.S. (Metropolitan Portion)	-0.31	-0.27
Hawaii	0.72	0.89
Urban Honolulu (a.k.a. Oahu)	0.73	0.86
Kahului-Wailuku-Lahaina MSA (a.k.a. Maui County)	0.81	1.10

*In 2013, state and local government comprised 9.0 percent of U.S. value-added and 9.2 percent of Hawaii value-added; federal government shares were 3.6 and 12.9 percent, respectively

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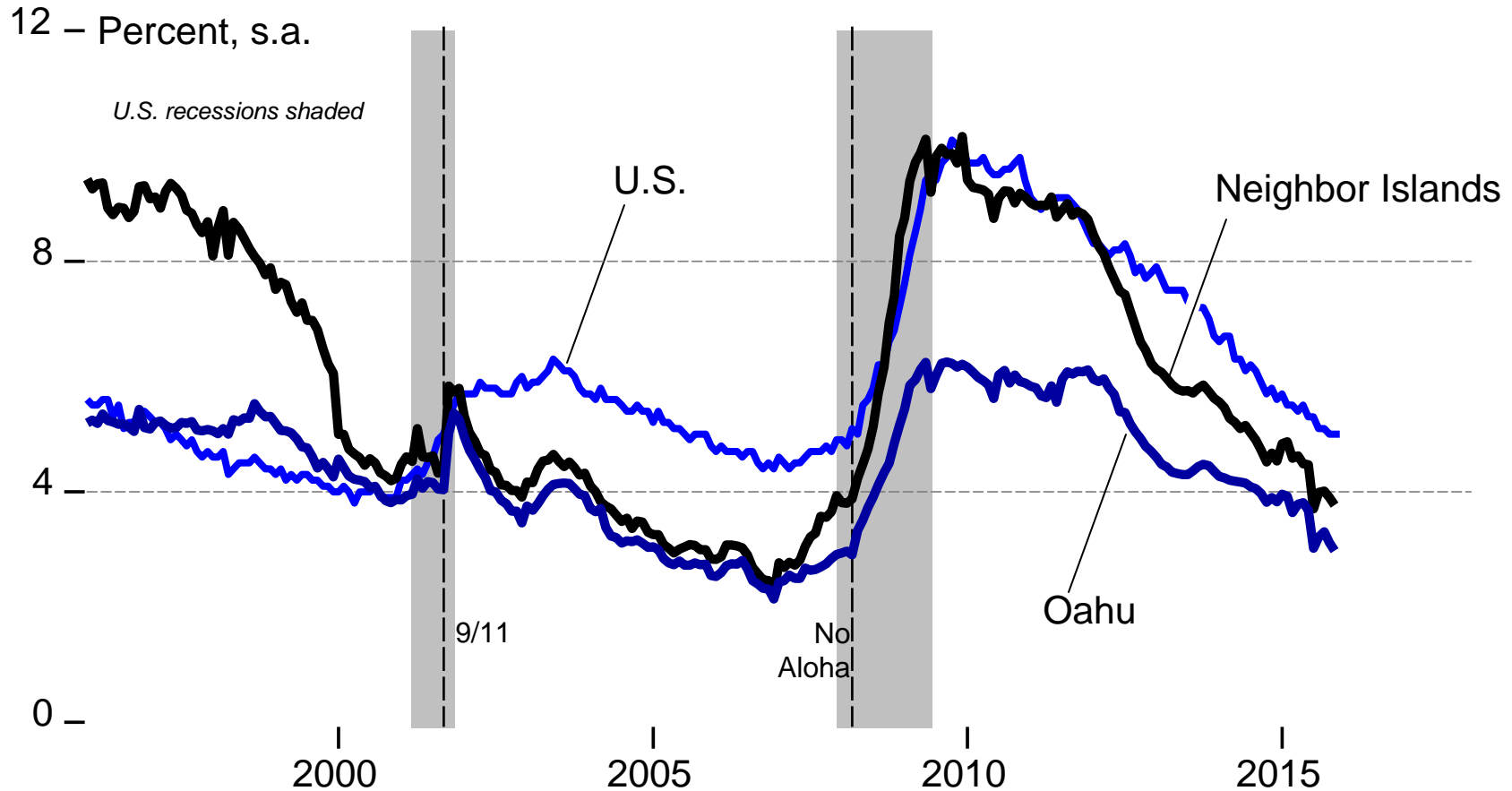
Consumer price inflation in Honolulu (semi-annual) and all U.S. cities (monthly) likely to remain close as it returns to 2 percent



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Source: Hawaii DLIR, DBEDT; BLS, U.S. Department of Labor; data through end-2015

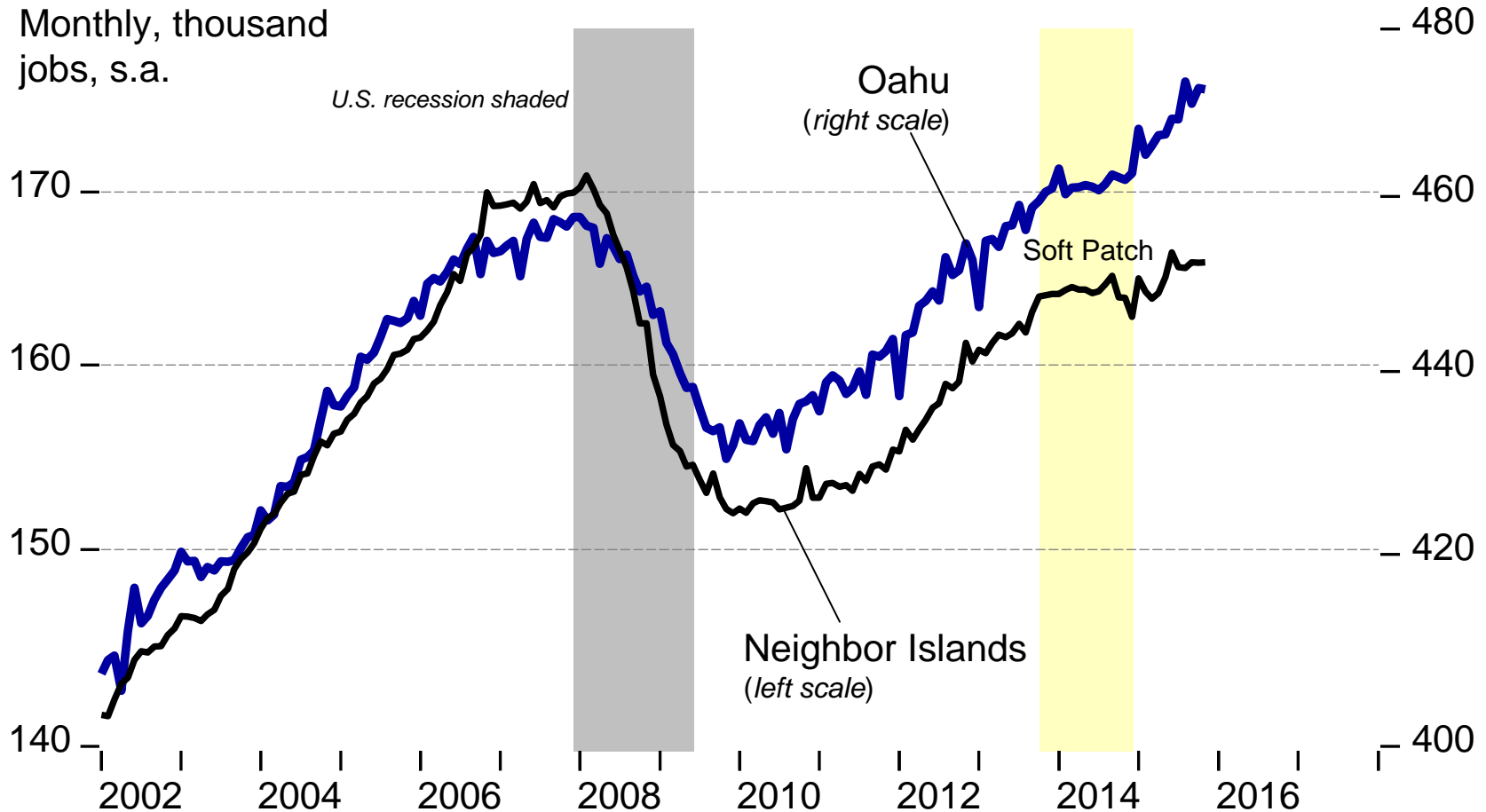
Unemployment rates back to full-employment levels; question is whether the next downturn will matter (2001 really didn't in HI)



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Source: Hawaii DLIR, DBEDT; BLS, U.S. Department of Labor; seasonal adjustment calculations for Oahu, Neighbor Islands by TZE

Non-agricultural payroll employment (jobs) trends have generally been upward, less on Neighbor Islands, with a Soft Patch



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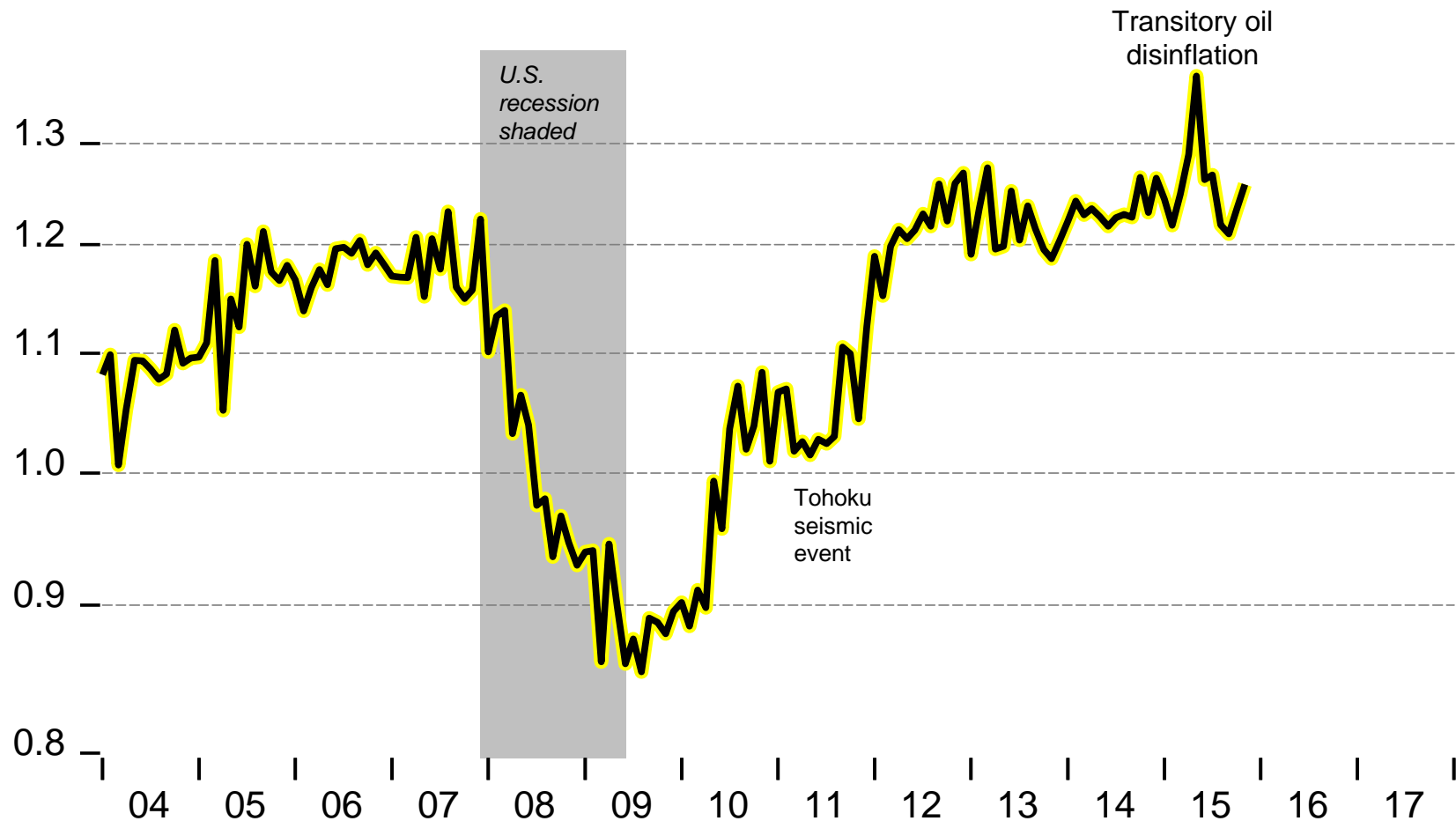
Source: Hawaii DLIR, DBEDT; BLS, U.S. Department of Labor; seasonal adjustment calculations for Oahu, Neighbor Islands by TZE



Things that weren't working for Hawaii

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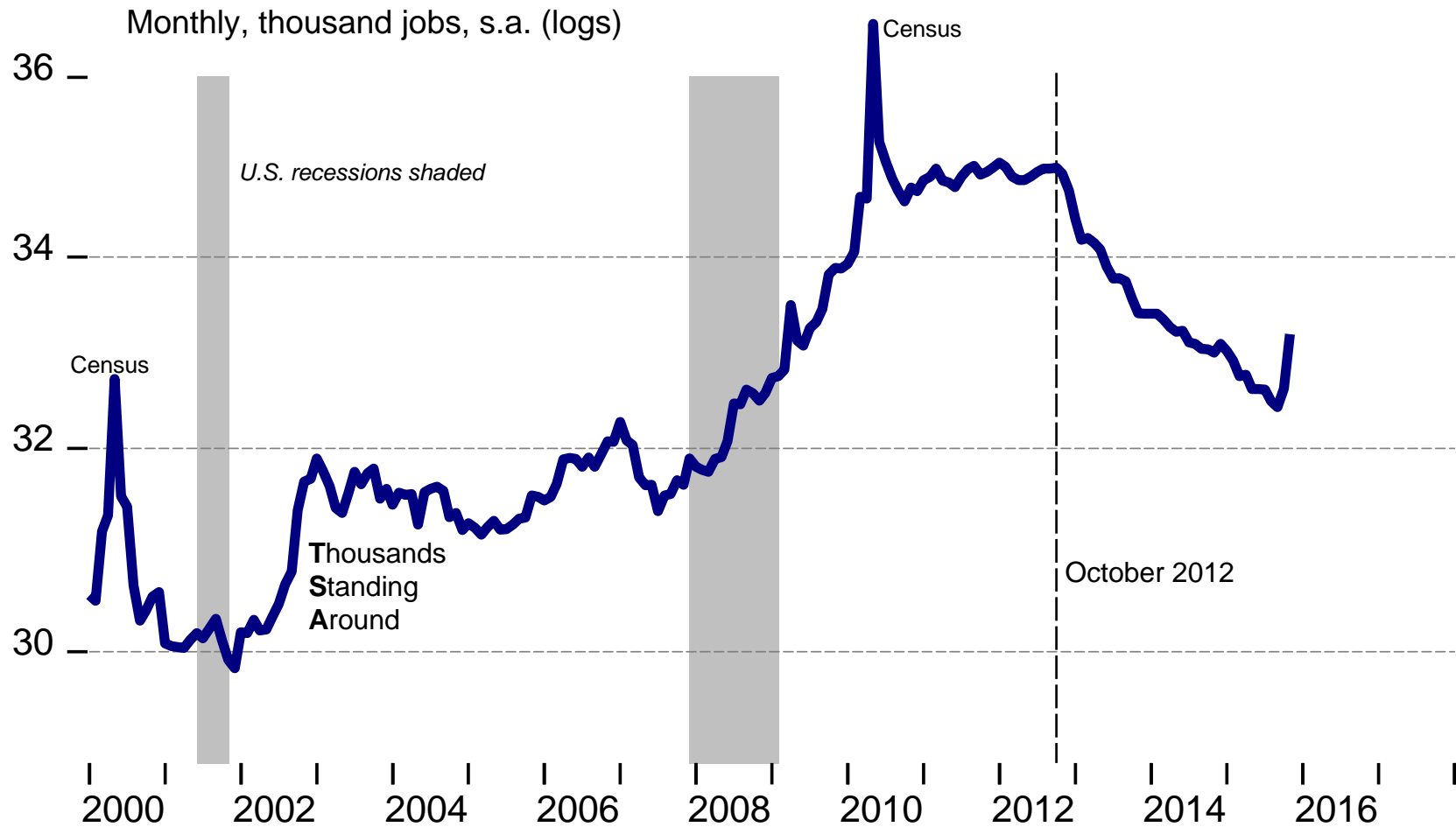
Hawaii monthly constant-dollar tourism receipts have been trendless since summer 2012 save for effects of recent disinflation



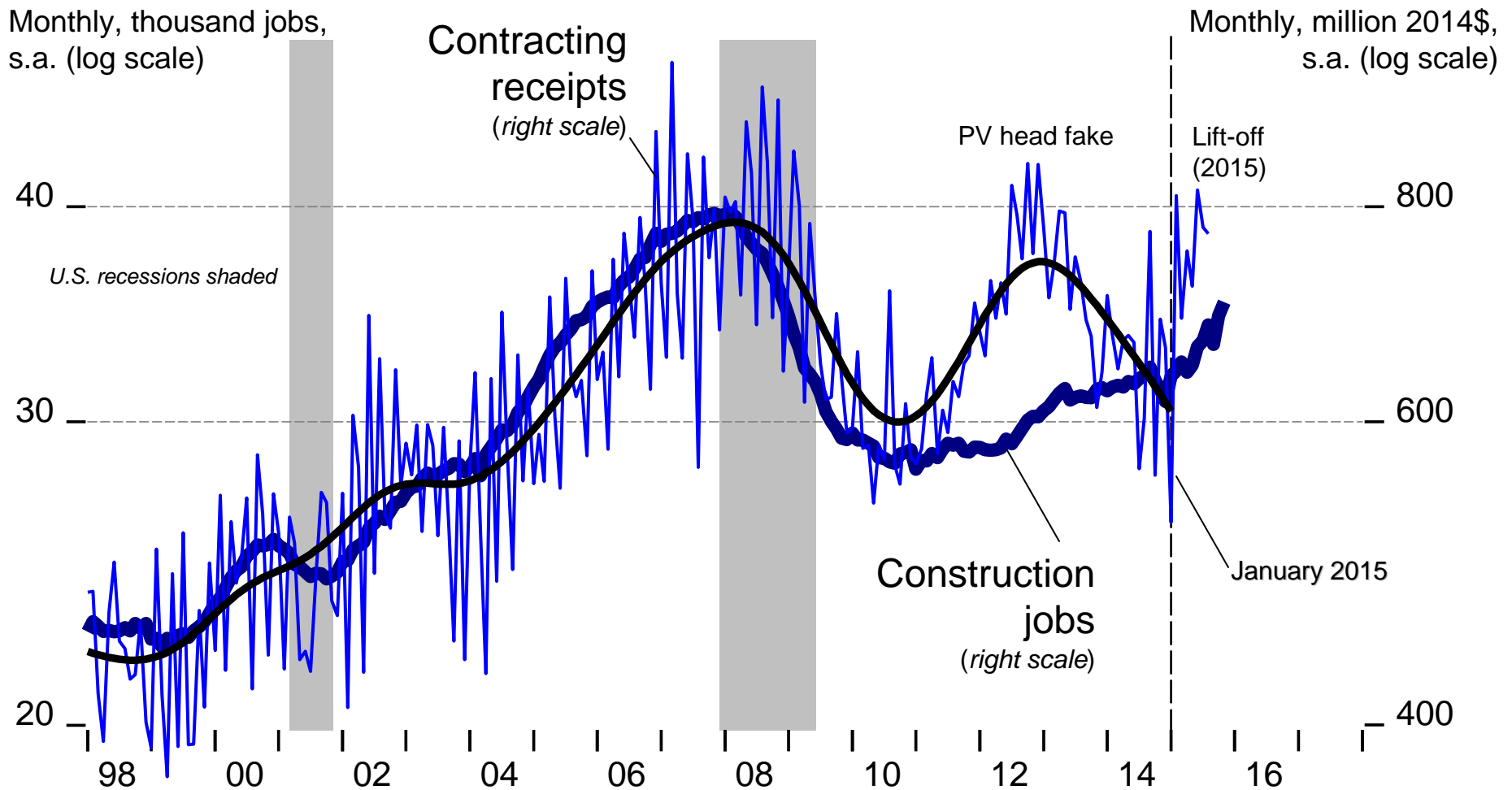
Slide copyright 2016 TZ E C VO N O M I C S

Source: Hawaii Tourism Authority, Hawaii DBEDT, U.S. Bureau of Economic Analysis; monthly averages through November 2015, seasonal adjustment and deflation using U.S. personal consumption deflator by TZE.

Federal jobs in Hawaii declined after 2012(Sep): sequester, withdrawal of fiscal stimulus, realities of Medicare, Social Security



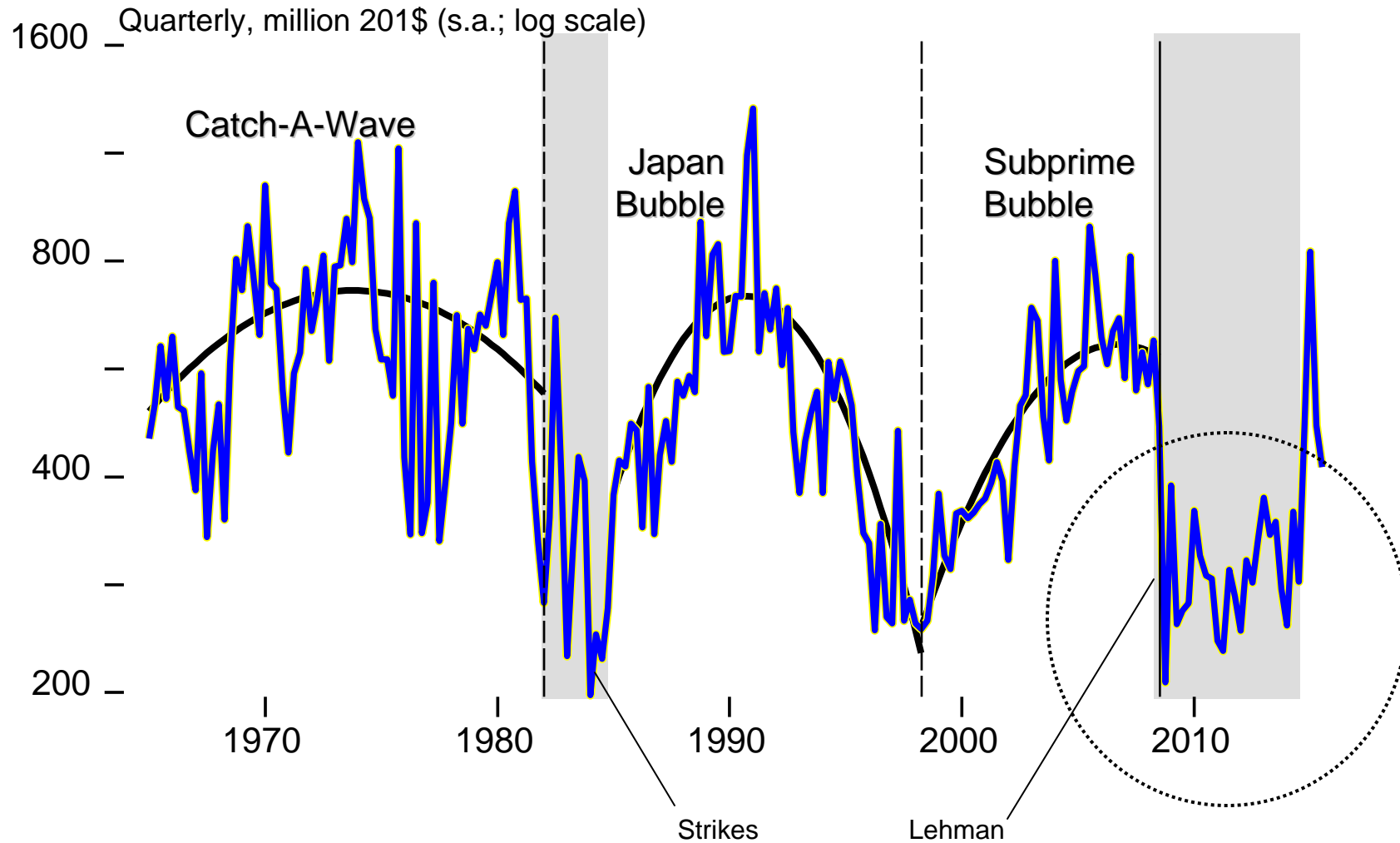
Real contracting receipts revived lift-off in early 2015, following 2-year decline; durability an open question



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Sources: Hawaii Department of Taxation, Hawaii DBEDT, U.S. Bureau of the Census; seasonal adjustment, deflation using construction cost deflator and trend extraction through August 2015 by TZE

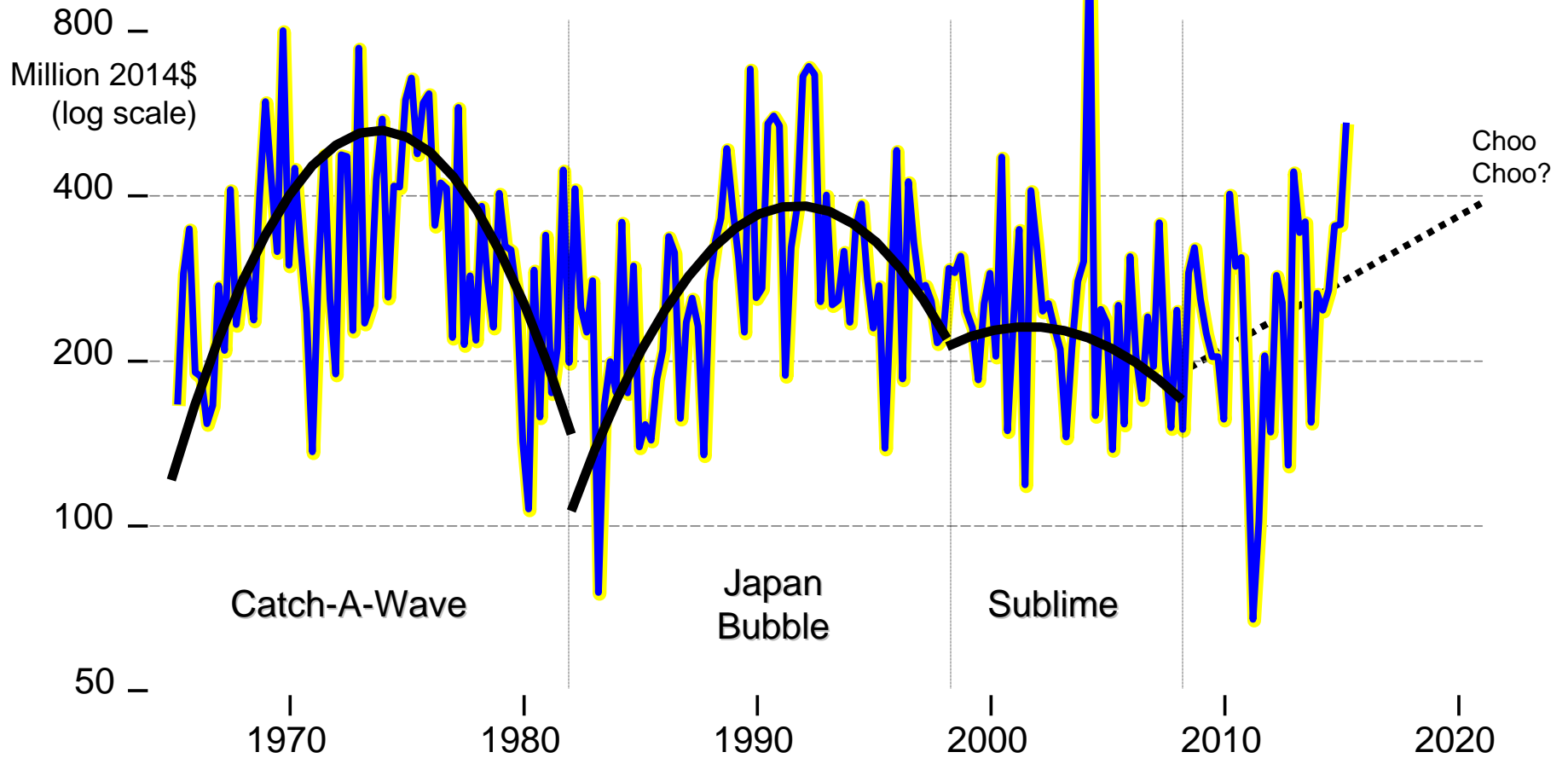
Recent permits for new buildings 2009-2014 (post-Lehman) were at low ebb; finally lifting off (one year is not a cycle)



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Source: County building departments, U.S. Bureau of the Census; seasonal adjustment and deflation of private building permit data *excluding* permits for additions and alterations, along with interval trend regressions by TZE

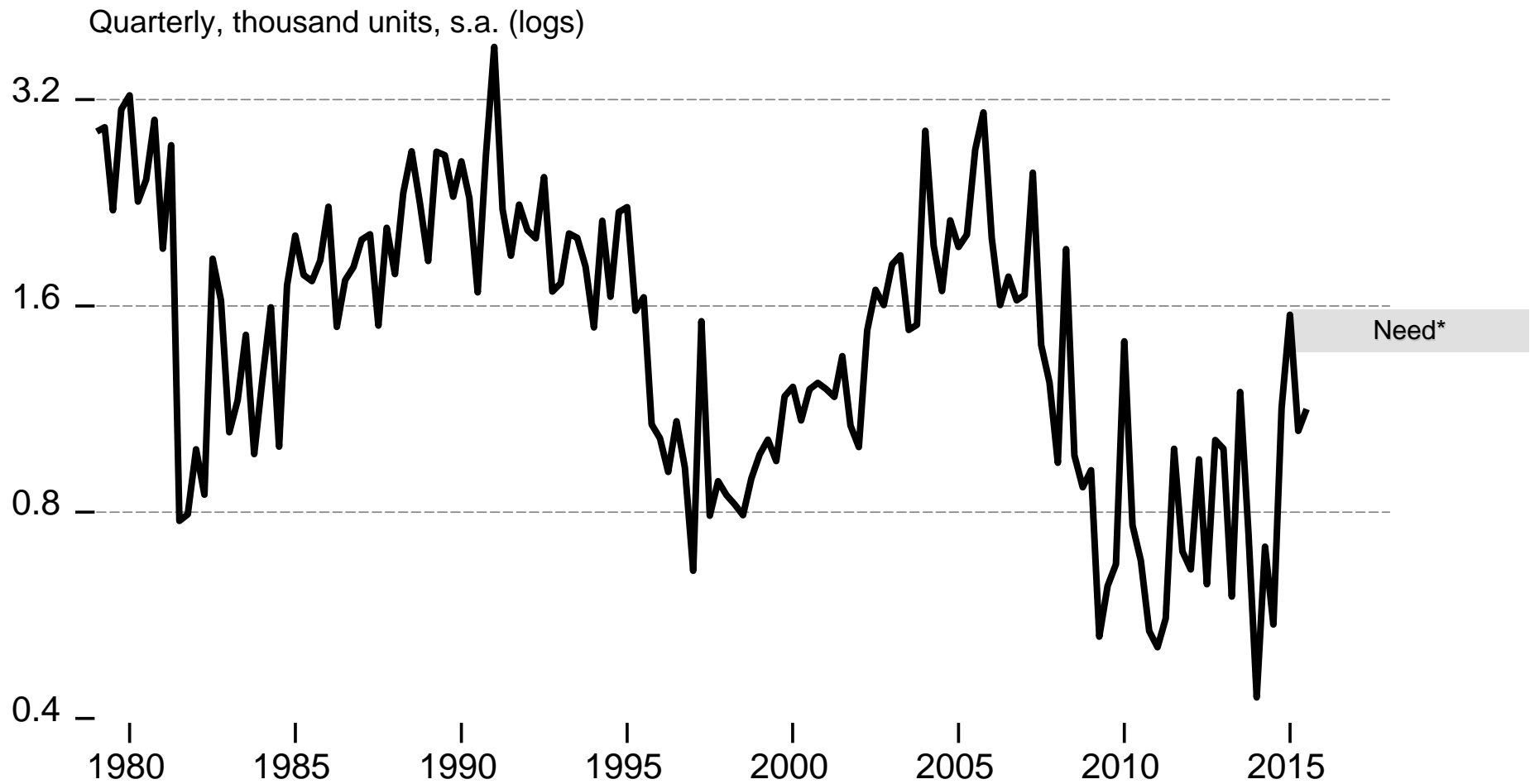
Quarterly real government contract data through third quarter 2015 consistent with upward trend (got funding?)



Slide copyright 2016 TZEconomics.com

Source: Hawaii DBEDT, U.S. Bureau of the Census; seasonal adjustment and deflation of government construction contract data at federal, state, and country levels, along with interval trend regressions by, TZE

New housing units authorized statewide shy of DBEDT need estimate 2015-2025



Slide copyright 2016 TZ Economics

Source: County building departments, Hawaii DBEDT; *See Hawaii DBEDT Research and Economic Analysis Division (April 2015), *Measuring Housing Demand in Hawaii, 2015-2025* (<http://files.hawaii.gov/dbedt/economic/reports/2015-05-housing-demand.pdf>)



Summarizing

- Housing market is in low-energy mode uncharacteristic of last 2 cycles but, despite low price appreciation and low new home production, remains balanced
- Hawaii real GDP growth has run well below potential (1.4% vs. 2.0-2.5%)
- Early, tourism-led recovery faded during the 2012-2014 “Soft Patch”
- Construction/investment-led second wind appears to have boosted Hawaii growth in 2015 and could extend the expansion into the late 20-teens
- Durability of investment-led growth facing some headwinds:
 1. U.S. interest rate rise over next several years programmed by Fed
 2. Strong dollar dampening export performance (e.g. tourism)
 3. Emerging Market financial volatility generating contagion risks
 4. Stronger U.S. expansion not matched by recent asset pricing trends
- This is not a recession forecast, but the expansion is vulnerable to breakdown

Mahalo!

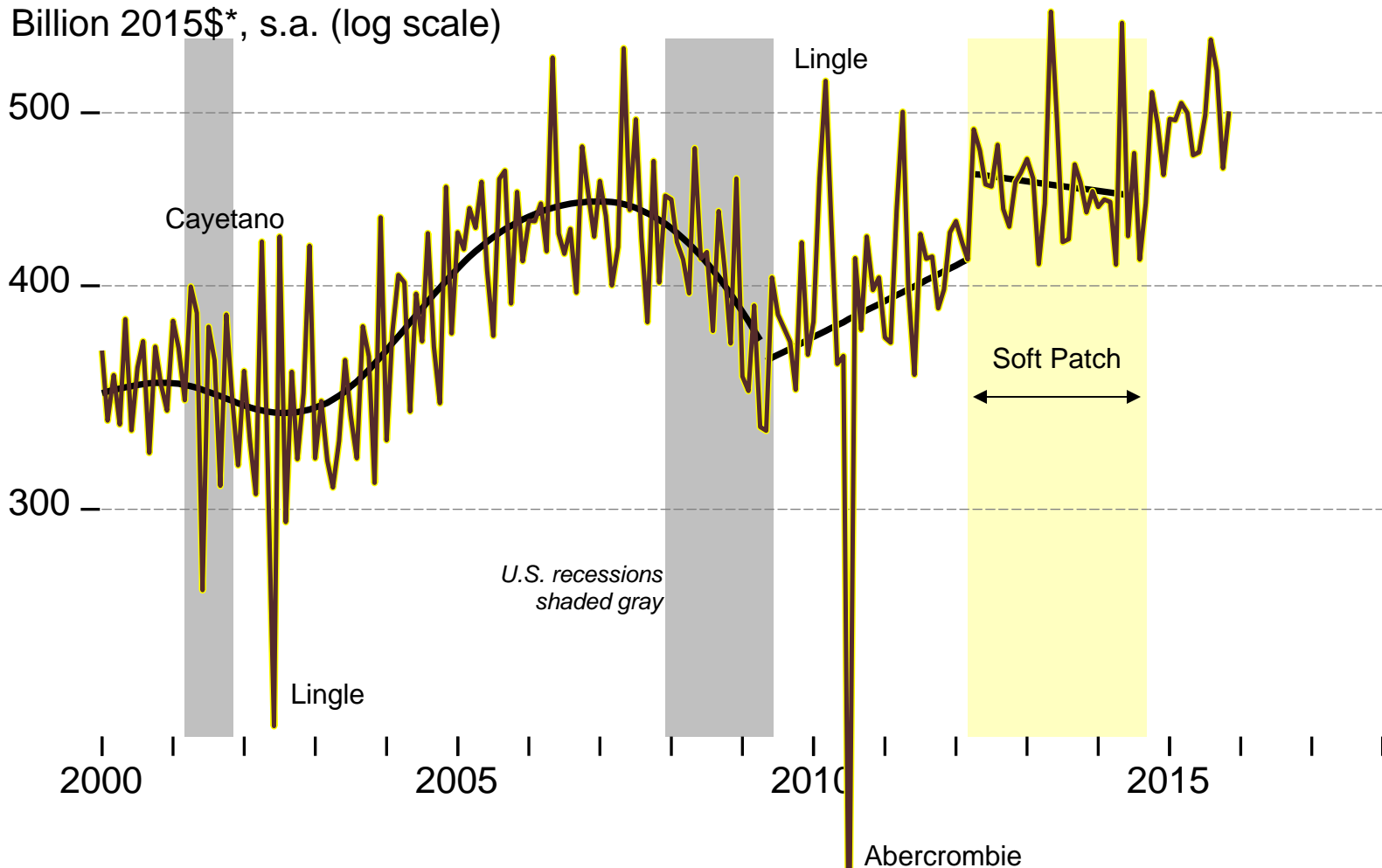
Slides available from:
Paul H. Brewbaker, Ph.D.
Principal, TZ Economics
606 Ululani St.
Kailua, Hawaii 96734-4430
paulbrewbaker@tzeconomics.com



Appendix 1: Hawaii general fund revenue

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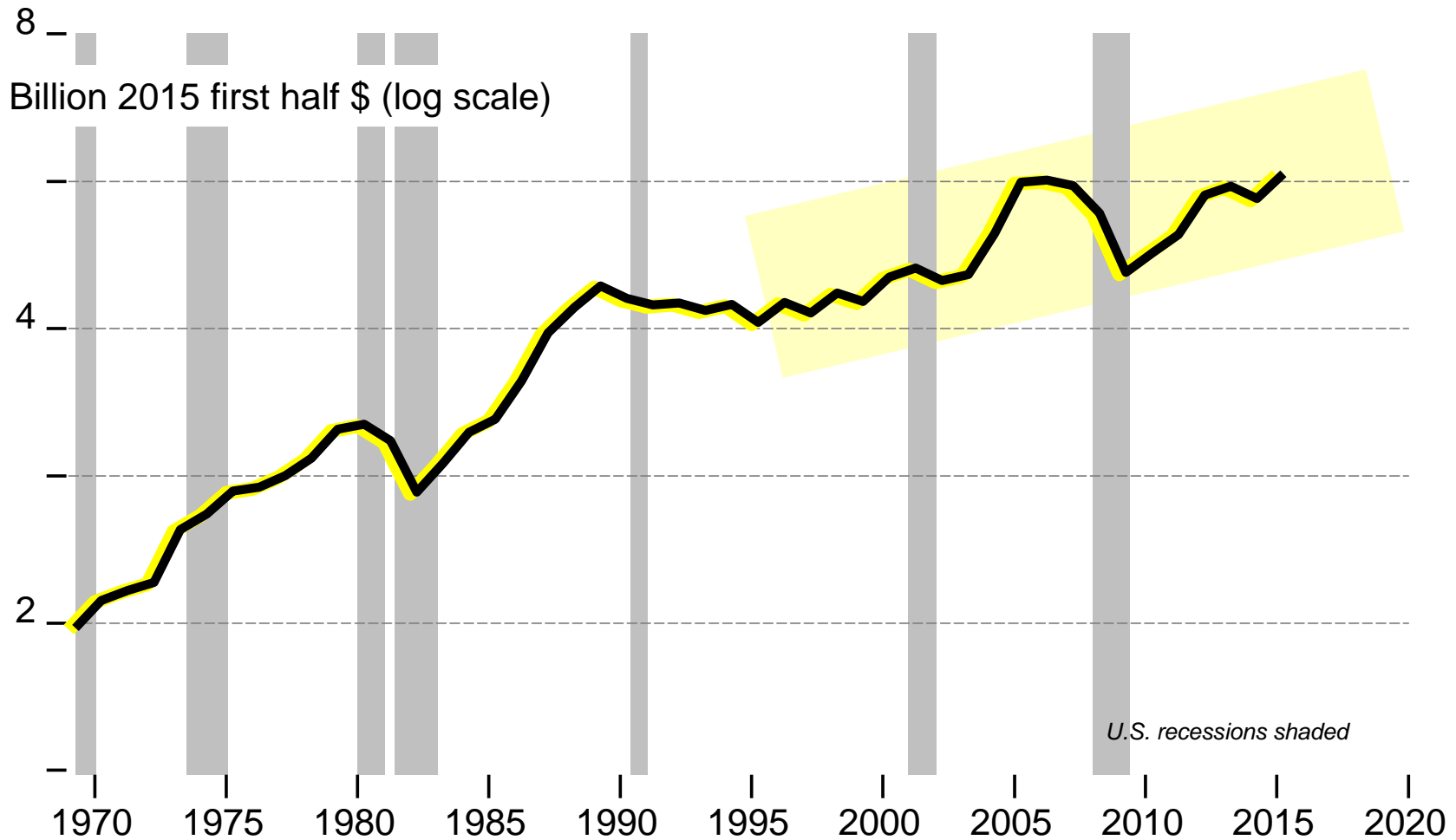
Hawaii real monthly General Fund Revenues: Soft Patch after 2012 (momentum loss), flat in real terms since end-2014



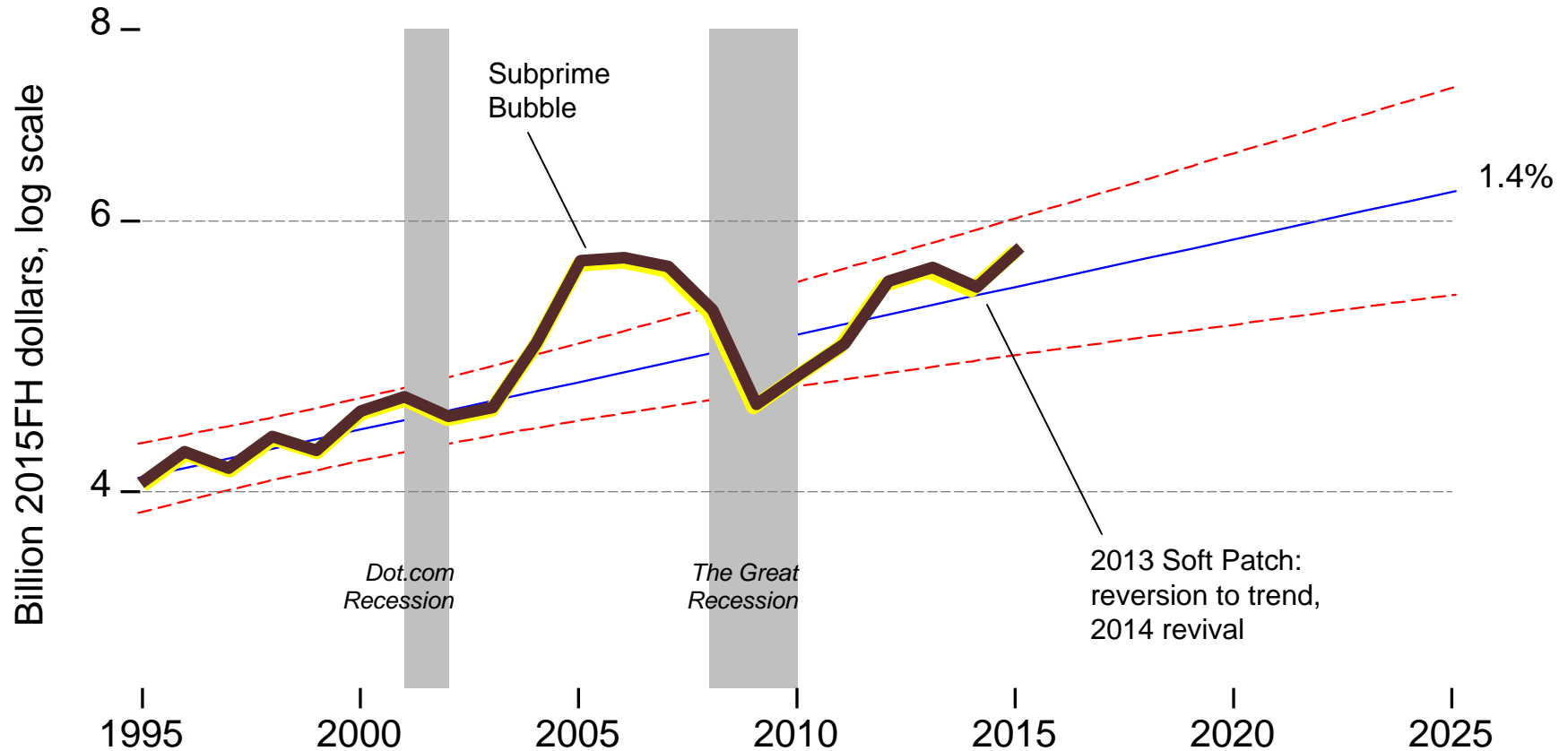
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Sources: Hawaii Department of Taxation, Hawaii DBEDT (monthly data through November 2015); seasonal adjustment, deflation using U.S. CPI-U, and piecewise trend regressions by TZ Economics

Hawaii real general fund revenues (fiscal years) through June 2015 (FY2015)



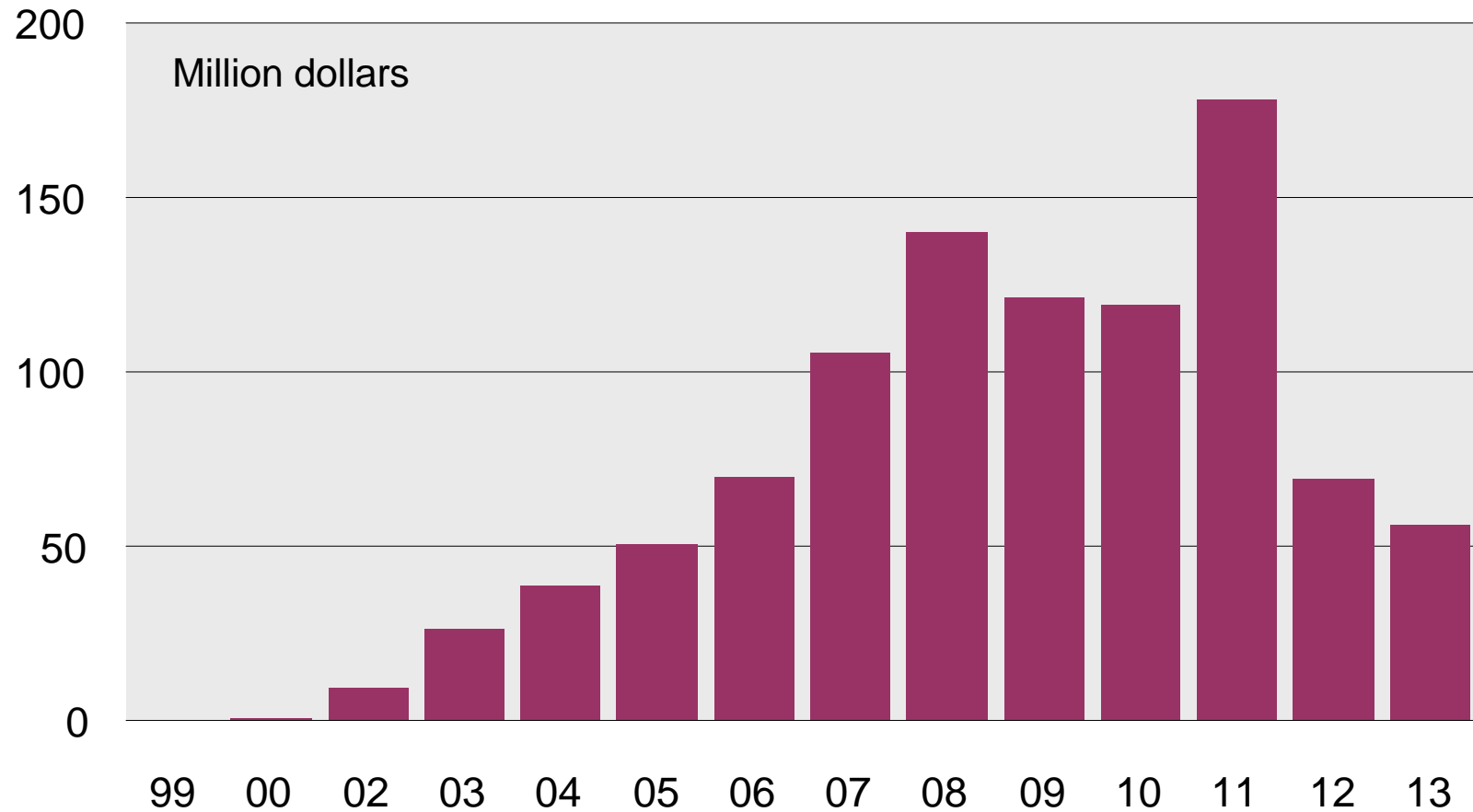
Hawaii General Fund revenues (bil. 2015FH\$) (fiscal years) and the longer-term trend path



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Sources: Hawaii Department of Taxation, Hawaii DBEDT; deflation using Honolulu CPI-U, and trend regression calibrated to the 1995-2003 trend (pre-Subprime Bubble; no dot.com Bubble; post-Japan Bubble), includes fiscal year 2015 data ending June 2015

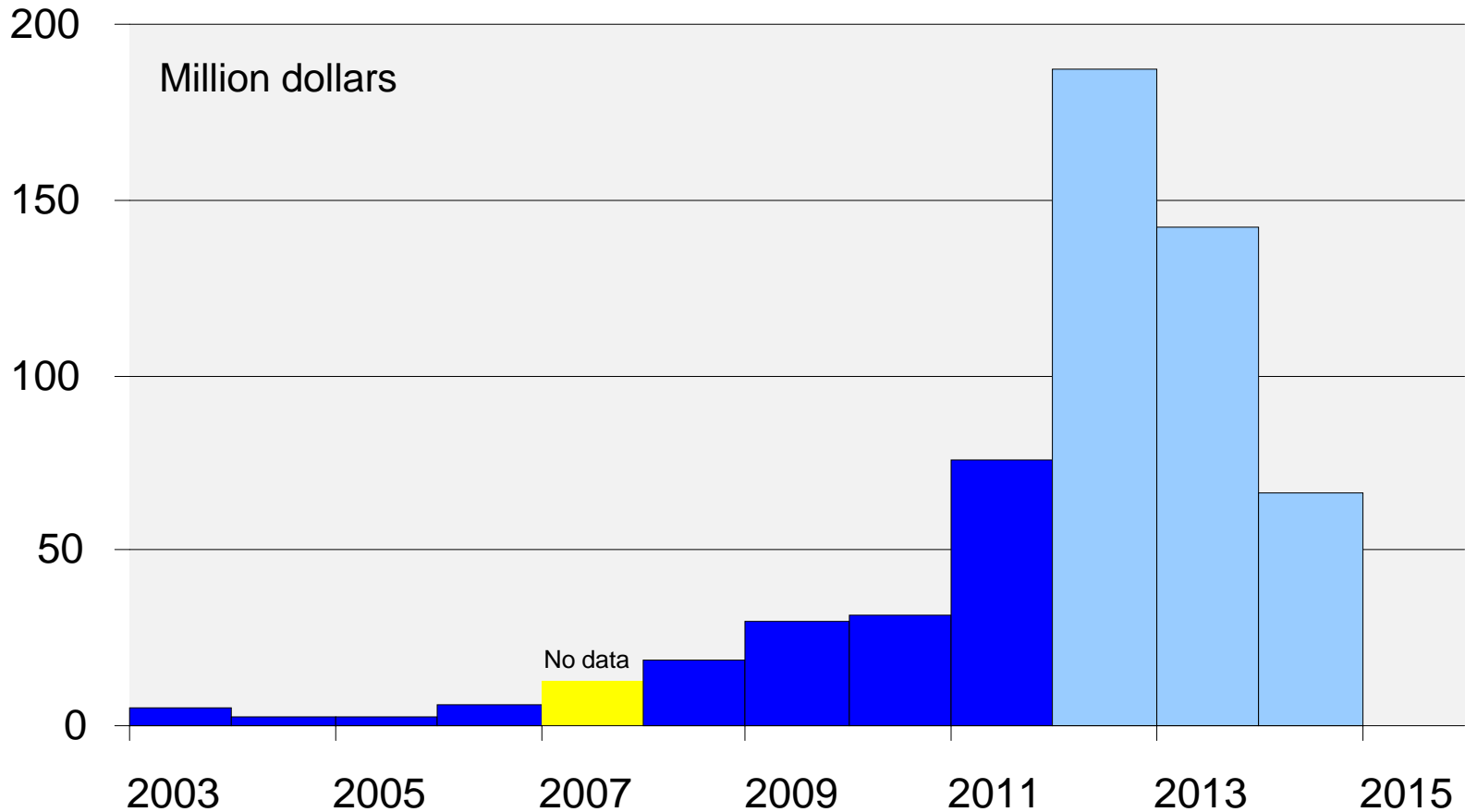
State of Hawaii High Technology Business Tax Credits, FY 1999-2012 (cum. c. \$986mil)



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Sources: Hawaii State Auditor "Credits Continue to Tax the State" Report No. 15-11 (September 2015) (<http://files.hawaii.gov/auditor/Reports/2015/15-11.pdf>).

Reported and estimated annual State of Hawaii renewable energy tax credits (cum. c. \$570mil)



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Sources: Hawaii Department of Taxation (<http://files.hawaii.gov/tax/stats/stats/credits/2011credit.pdf>), correspondence with Don Rouslang and Yvonne Chow (DoTax); 2007 estimate averages 2006 and 2008; 2012-2014 estimates based on weekly PV permits published by Hawaii DBEDT, assumes 0.3 of estimated installation cost recoverable through state tax credit and excludes all other renewables (e.g. wind)



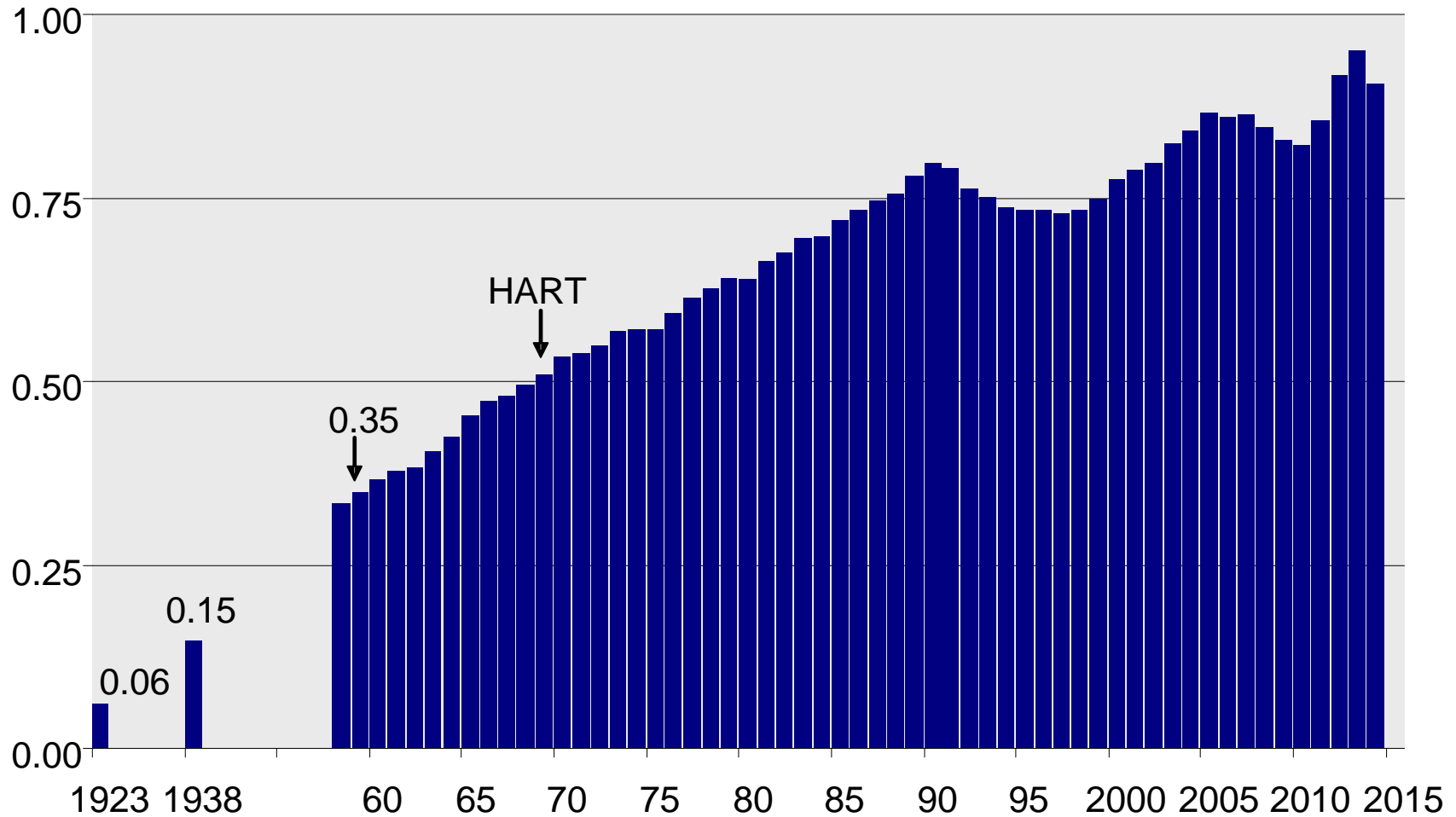
Appendix 2: Hawaii energy policy fail

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1. Hawaii motor vehicles/resident are 30% higher than
2. Hawaii resident population is 35% higher than
3. Hawaii real GDP is 85% higher than
4. Global oil prices, adjusted for inflation, *are the same as*
5. Hawaii *total* petroleum consumption (Btu) *is the same as*
...when *Back To The Future* (1985) came to the present

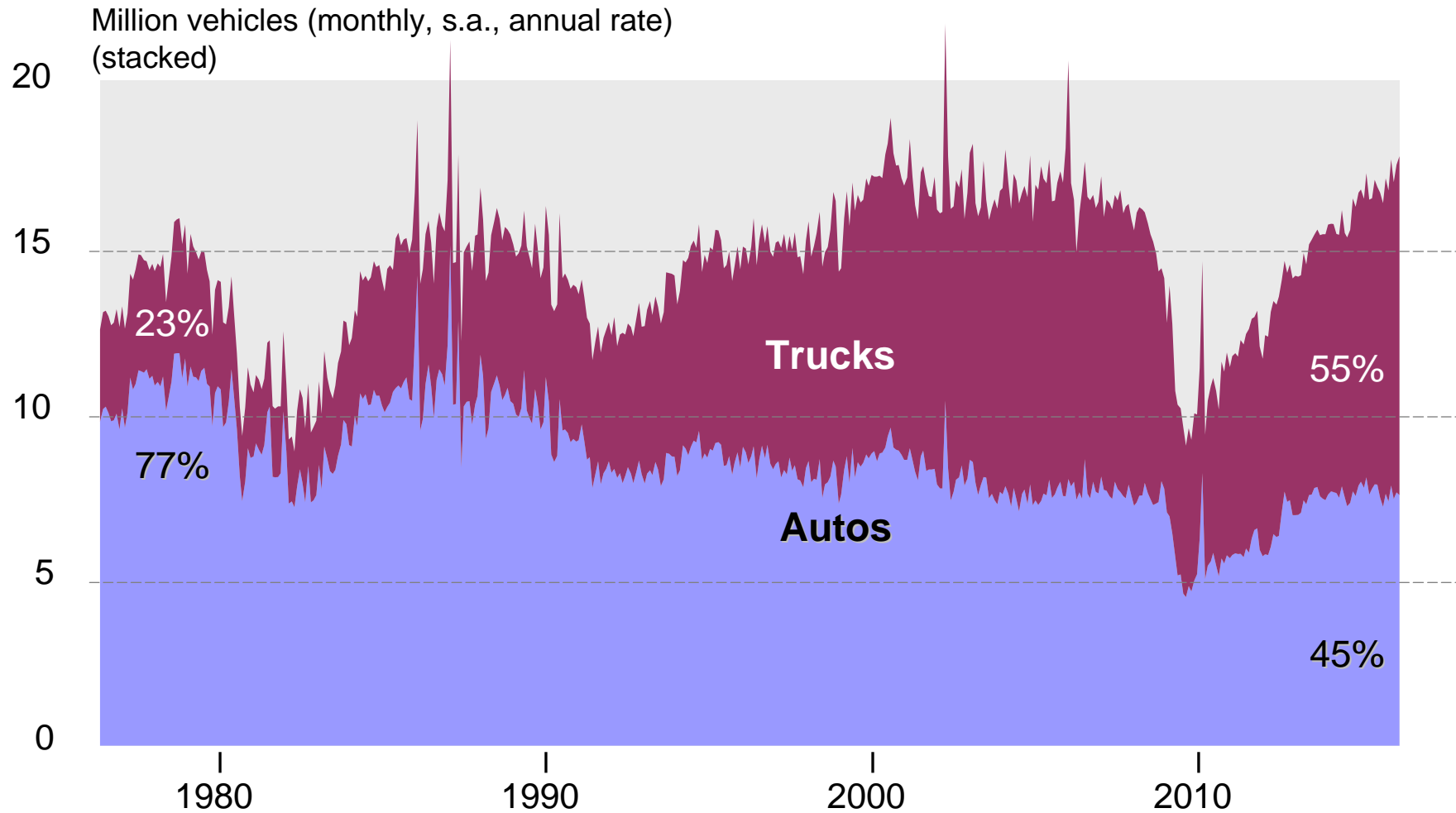
Registered motor vehicles per Hawaii resident: *tripled since statehood* (why there is traffic)



Slide copyright 2016 TZ E.C.V.O.N.O.M.I.C.S.

Source: Robert C. Schmitt (1977), *Historical Statistics of Hawaii*, UH Press; Hawaii DBEDT State of Hawaii Data Book Table 18.06

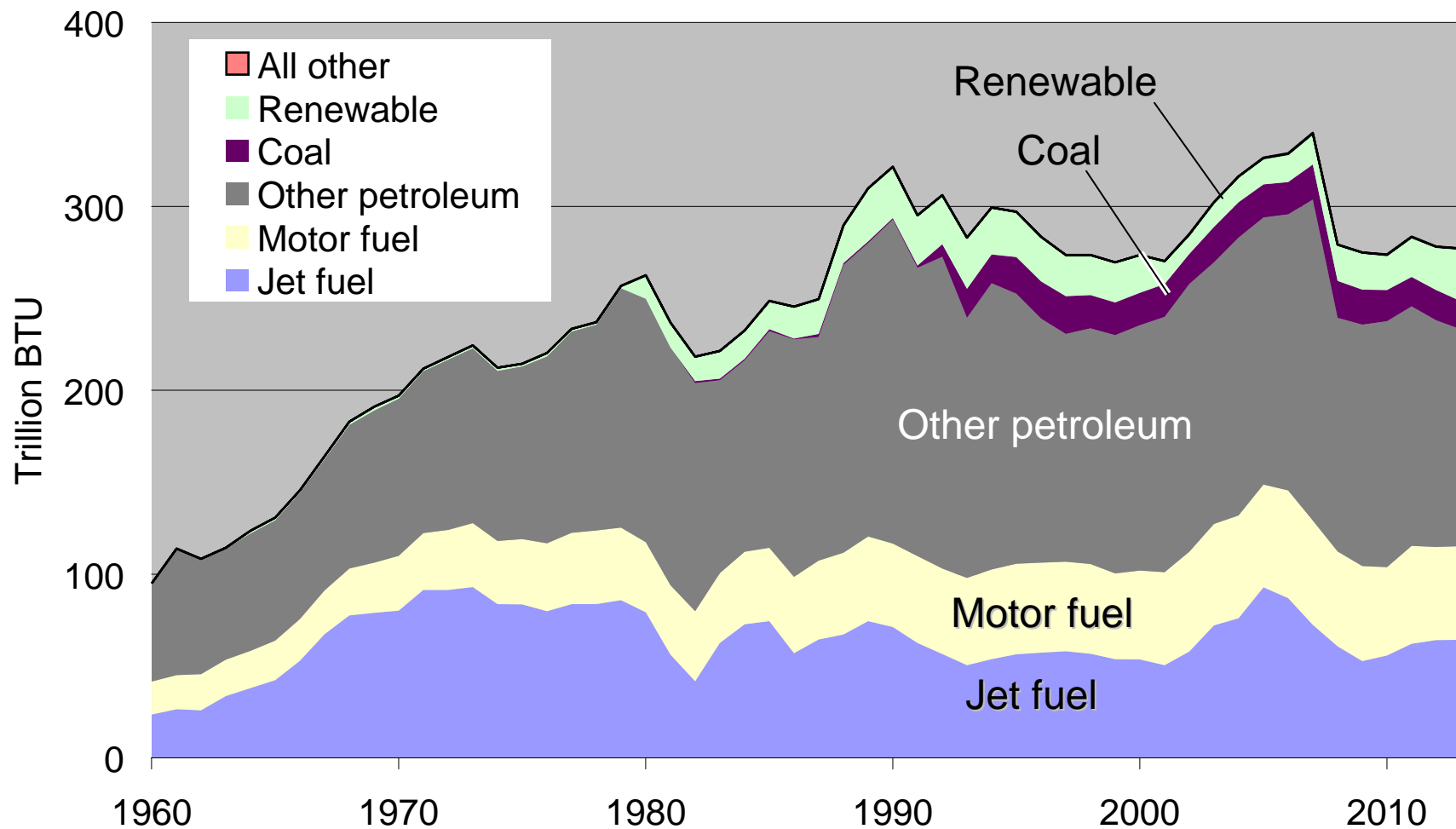
U.S. new car and light struck sales (monthly): gas so “expensive” most people buy trucks



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Sources: Federal Reserve Bank of St. Louis (<https://research.stlouisfed.org/fred2/series/LTRUCKSA>), data through August 2015.

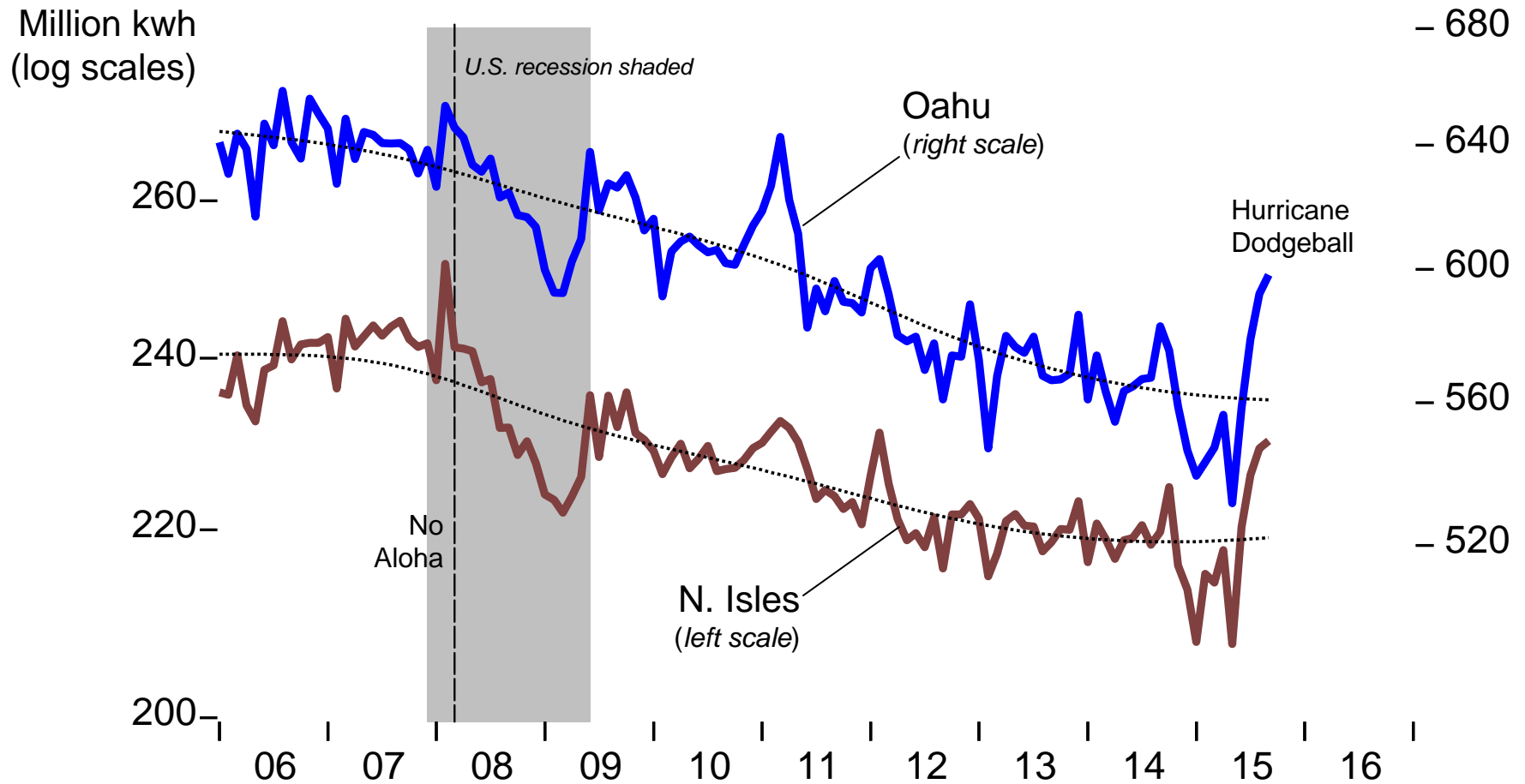
Hawaii petroleum consumption unchanged: 1985 232.1 tril. petroleum Btu (same 1977) 2013 233.0 tril. petroleum Btu



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Source: U.S. Energy Information Administration (<http://www.eia.gov/state/seds/seds-data-complete.cfm?sid=HI#Consumption>)

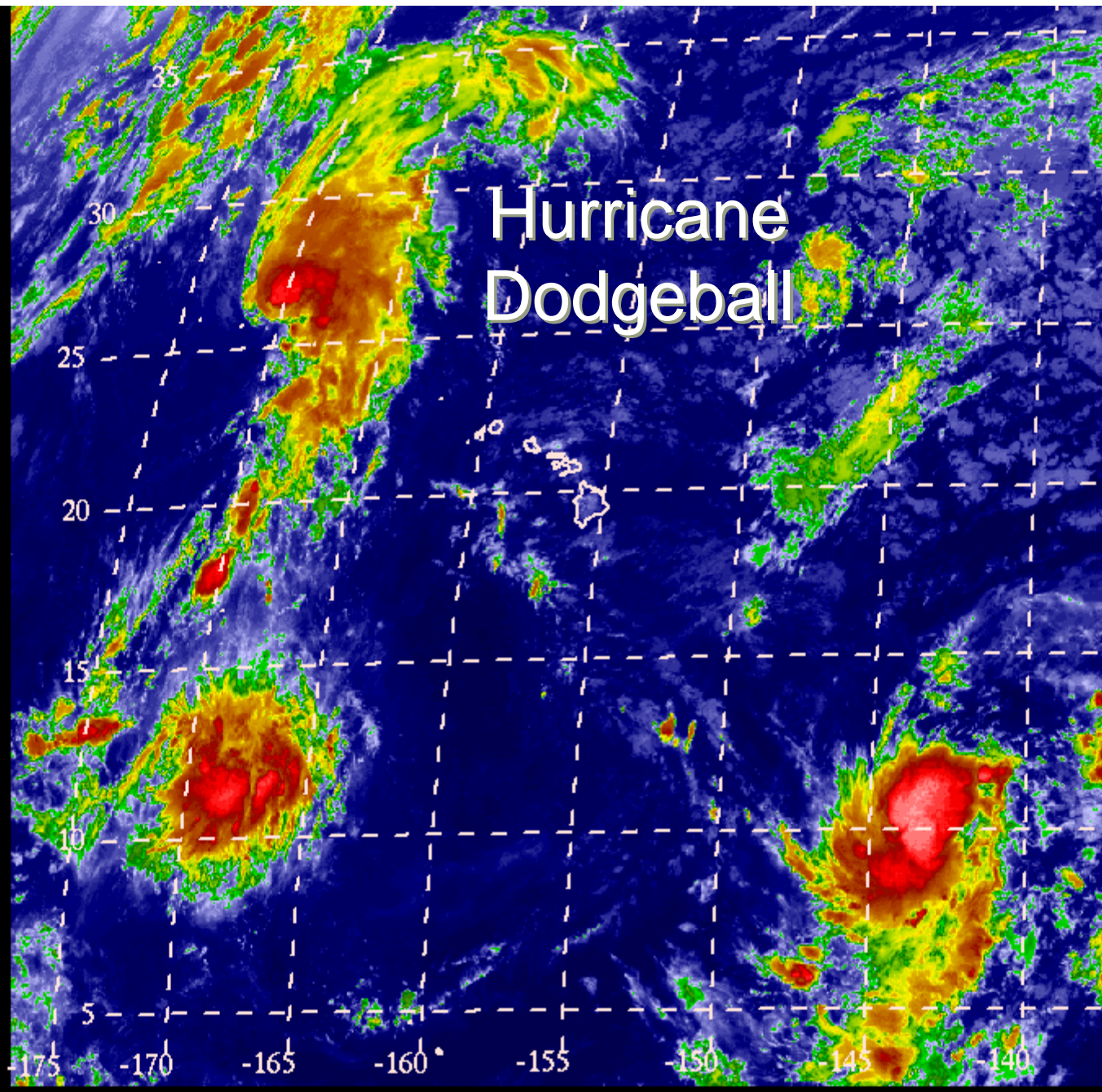
Oahu (-13.0%) and Neighbor Island (-8.9%) monthly electricity sales through September 2015 (s.a.)



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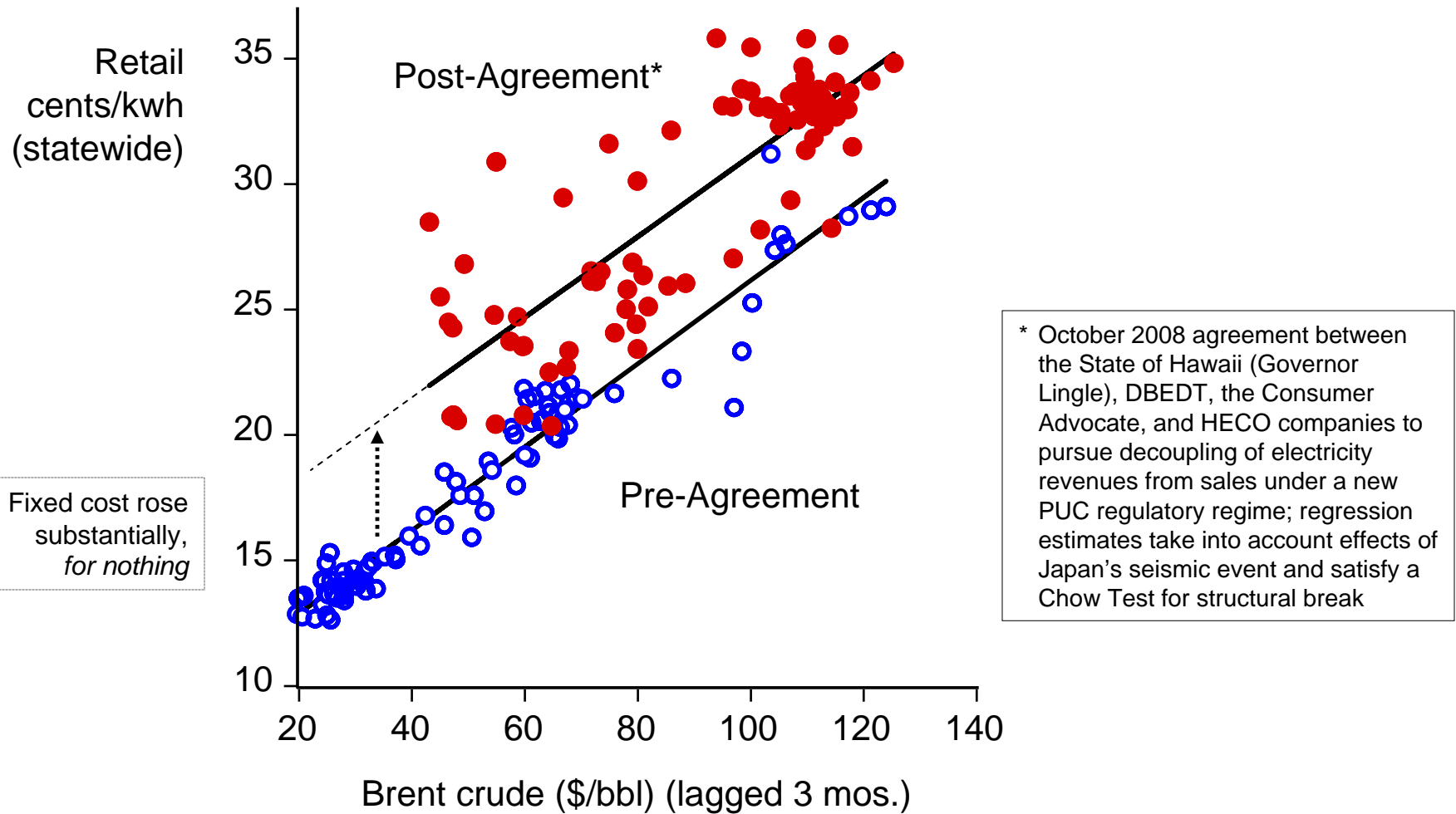
Source: Hawaii DBEDT (http://files.hawaii.gov/dbedt/economic/data_reports/energy-trends/Monthly_Energy_Data.xlsx), seasonal adjustment, trend and other calculations by TZE; percent changes are the total (cumulative) decreases over 117 months in the trend components at Hodrick-Prescott (1997) calibrations

Deg C




4km IR 08:00 am HST Mon 21 Sep 2015 (1800 UTC Mon 21 Sep 2015)

“Decoupling” raised Hawaii electricity prices/kwh: electricity cost an increasing function of crude oil prices, but policy raised *fixed* cost



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Sources: Monthly through September 2015, Hawaii DBEDT and U.S. Energy Information Administration; two regressions break after September 2008, taking into account Japan's seismic event on fuel oil prices, estimated by TZE (approximately half of increase in fixed cost is attributable to the seismic event)



Is automotive technological progress emPHAsis on the wrong syLLAble? Fuel is so cheap you drive a truck

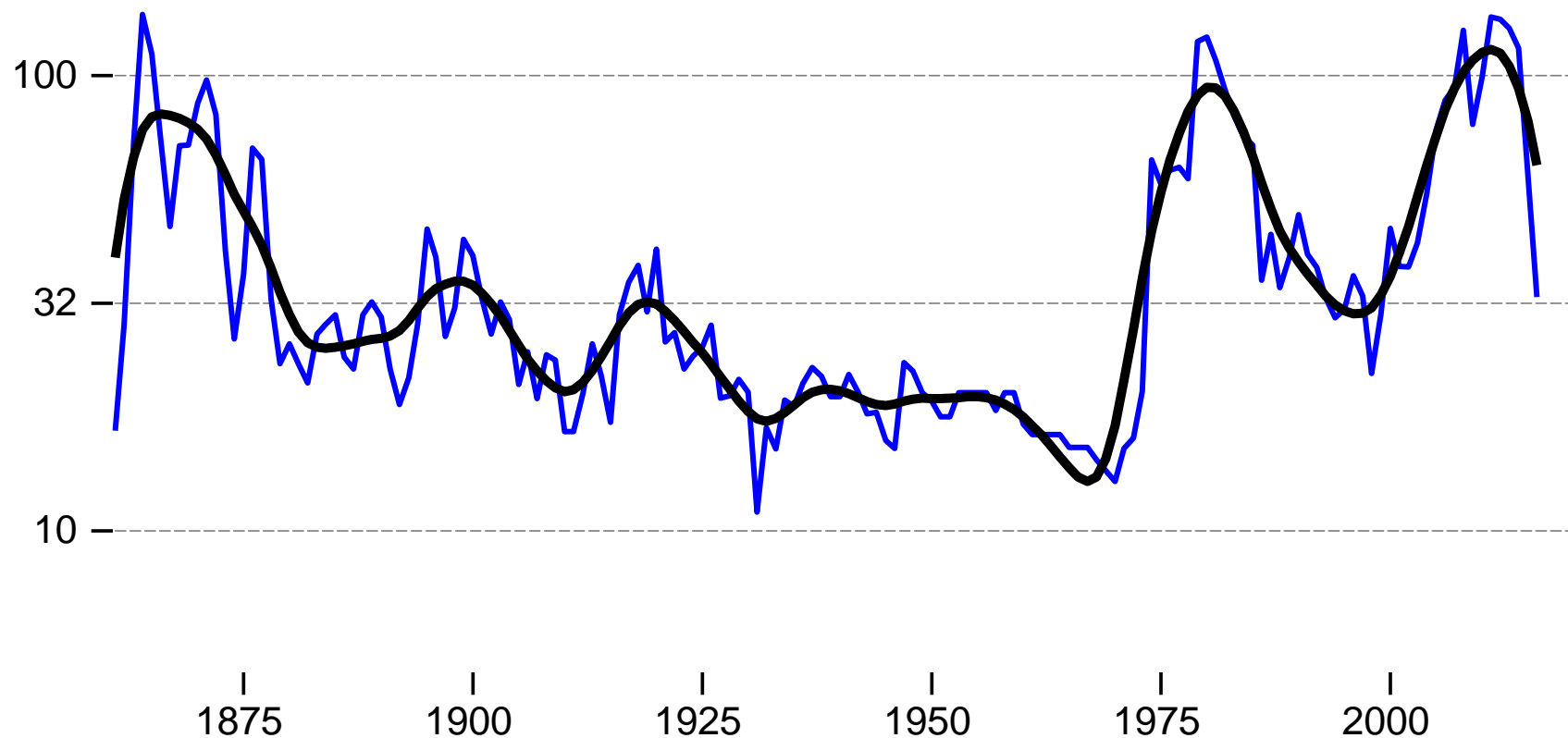
Q: *Why do so many people drive pick-up trucks and SUVs in Hawaii?*

A: Because driving in Hawaii *is* an off-road experience (LOL)

- Transportation accounts for almost 1/3 of U.S. greenhouse gas emissions, but policymakers won't incentivize carbon reductions through taxes or pricing
- Constant-dollar petroleum prices lower today than in late-1970s, probably overshooting to downside, stabilizing at roughly same level as in late-1970s
- Quarter century 1980-2004 (before oil price rise, "Emerging Markets" overshoot):
 1. Average fuel economy +6.5 percent (new U.S. passenger automobiles)
 2. Average horsepower +80 percent, autos (+99 percent, light trucks)
 3. Average curb weight +12 percent, autos (+26 percent, light trucks)
- *If weight, horsepower, and torque were held at 1980 levels, fuel economy could have increased by nearly 60 percent from 1980 to 2006 (Knittel (2011))*

Petroleum prices deflated with CPI (1913-2015), index of general price level (1860-1912): end of a supercycle \Rightarrow decades of lower prices

Annual, 2014\$/barrel, s.a. (logs)



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Sources: Goldman Sachs, BP, Federal Reserve Bank of St. Louis; (oil prices 1861-1944 U.S. average, 1945-1983 Arabian Light posted at Ras Tanura, 1984-2015 Brent (including January 14, 2016 ICE close)) deflated using NBER Index of The General Price Level for United States (<https://research.stlouisfed.org/fred2/series/M04051USM324NNBR>) and U.S. CPI-U (<https://research.stlouisfed.org/fred2/series/CPIAUCSL>)



Petroleum: you had to know this would happen

- Every 20-25 years, real oil prices rise, bringing forth Doomsday Prophecies more ridiculous than before; each and every time the same results from high oil prices:
 1. Exploration and discovery of new sources of petroleum
 2. Energy efficiency-enhancing technological progress
 3. Substitution from oil to alternative energy sources
- Uncertainty + irreversibility *delay* responses to prices, but eventually supply rises
- Recent collapse of oil prices: new sources of supply, OPEC “pass,” weak demand from macroeconomic slowdown (Japan, EU, especially China), stronger dollar
- Dismiss Clean Energy propaganda and Doomsday scenarios, and abandon (*all*) Black Hole energy subsidies: name an exhaustible resource that was exhausted

The Stone Age did not end because we ran out of stone



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AT THE UNIVERSITY OF HAWAI'I

Forecast Project

EXPANSION WILL CONTINUE, DESPITE GLOBAL CHALLENGES

DR. CARL BONHAM
EXECUTIVE DIRECTOR, UHERO

**Senate Ways & Means + House Finance
Briefing**

January 21, 2016

OVERVIEW

Issues for 2016 and beyond

- ▶ Can US grow faster than 2%? China by even 6%?
- ▶ Oil price free fall— weak demand vs. strong supply.
- ▶ Fed tightening, how big a deal is it?
- ▶ Currencies, equities not quite in free fall.

Where Things Stand:

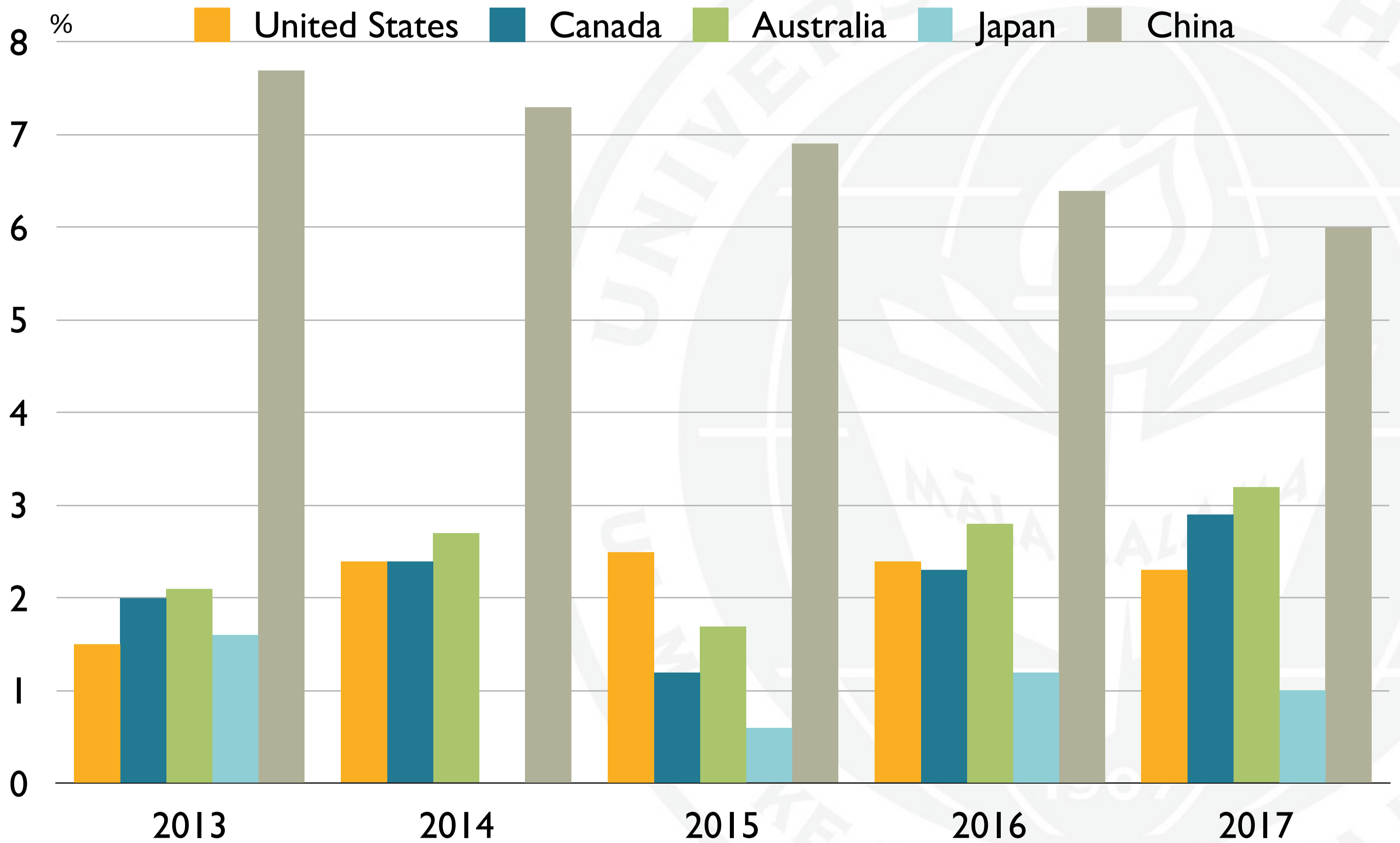
- ▶ Hawaii in context.
- ▶ Record year for arrivals, real spending still catching up.
- ▶ Construction cycle has legs.
- ▶ Is this as good as it gets?

Risks:

- ▶ Climate, geopolitical events.
- ▶ Rent seeking, and policy, policy, policy.

ISSUES FOR 2016 ...

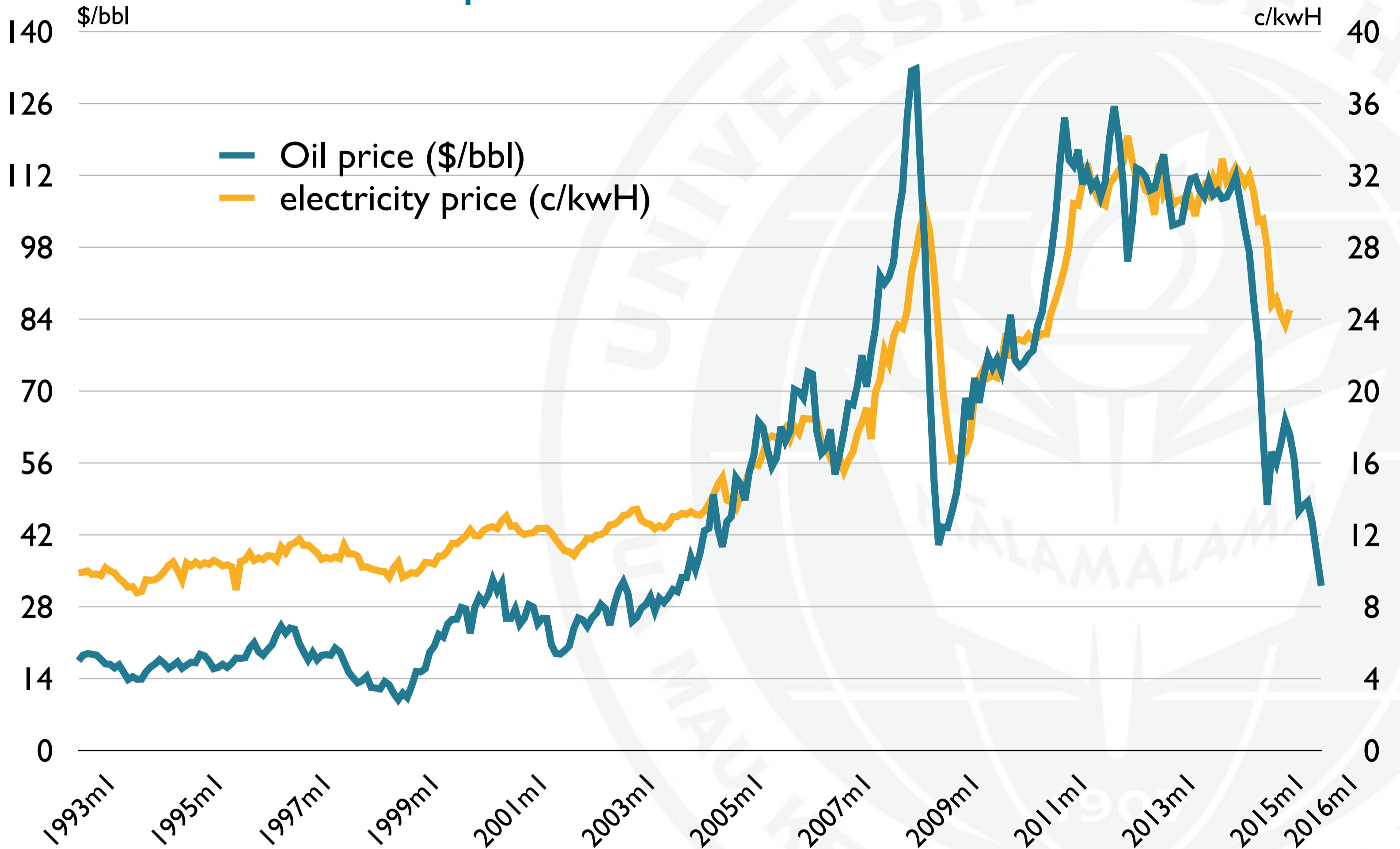
Can the US grow faster than 2%?



Source: UHERO

ENERGY PRICES CONTINUE TO FALL

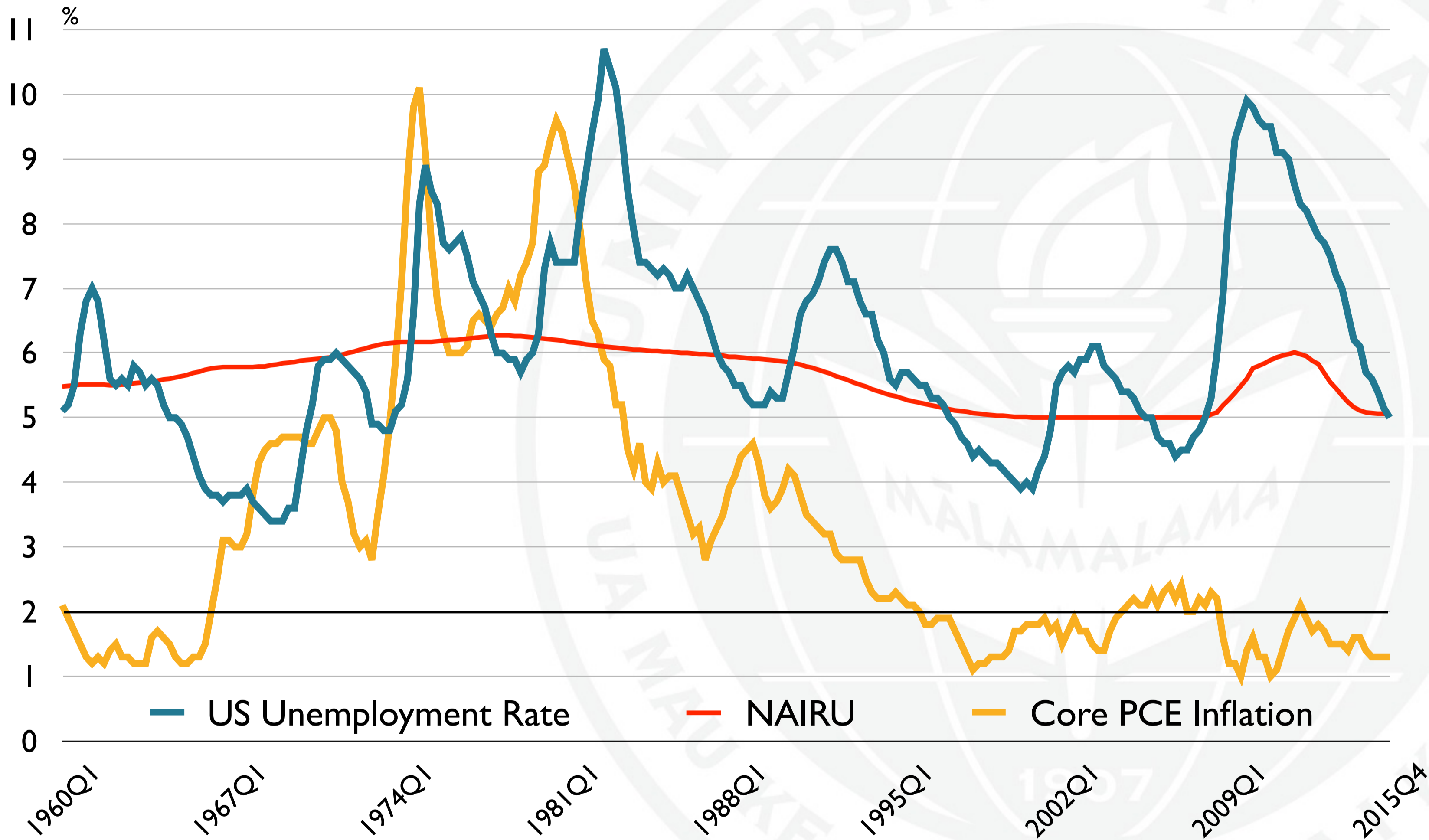
oil price and Oahu electric rates



Source: UHERO Energy Policy and Planning group, Michael Roberts and Karl Jandoc. Oil price is Brent Crude, Electricity Price and Sales are for Oahu only.

FED POLICY INFLATION DEPENDENT?

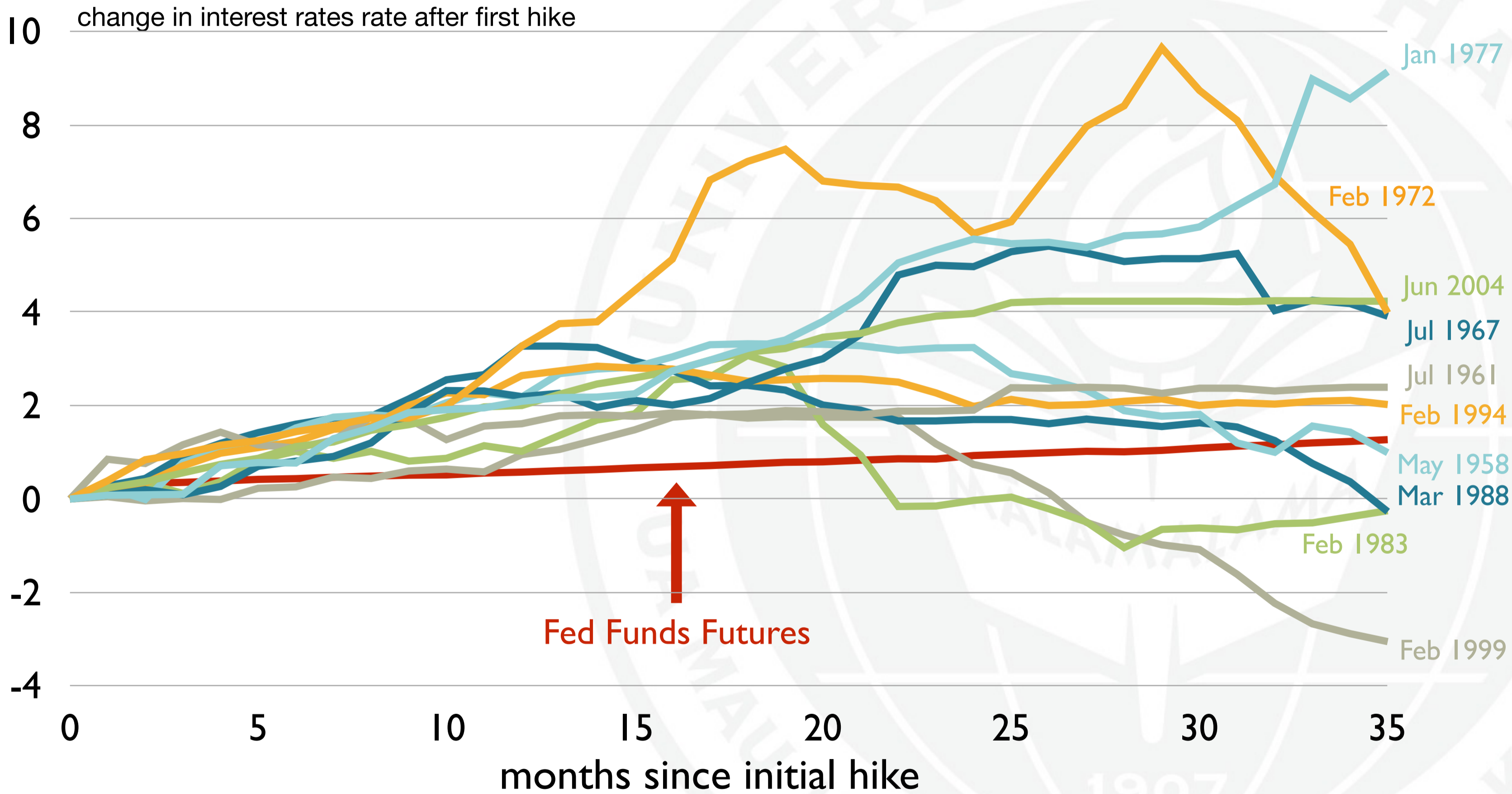
Is the labor market tight? Where is the inflation?



Source: CBO, BLS

HOW BIG A DEAL IS THE LIFTOFF?

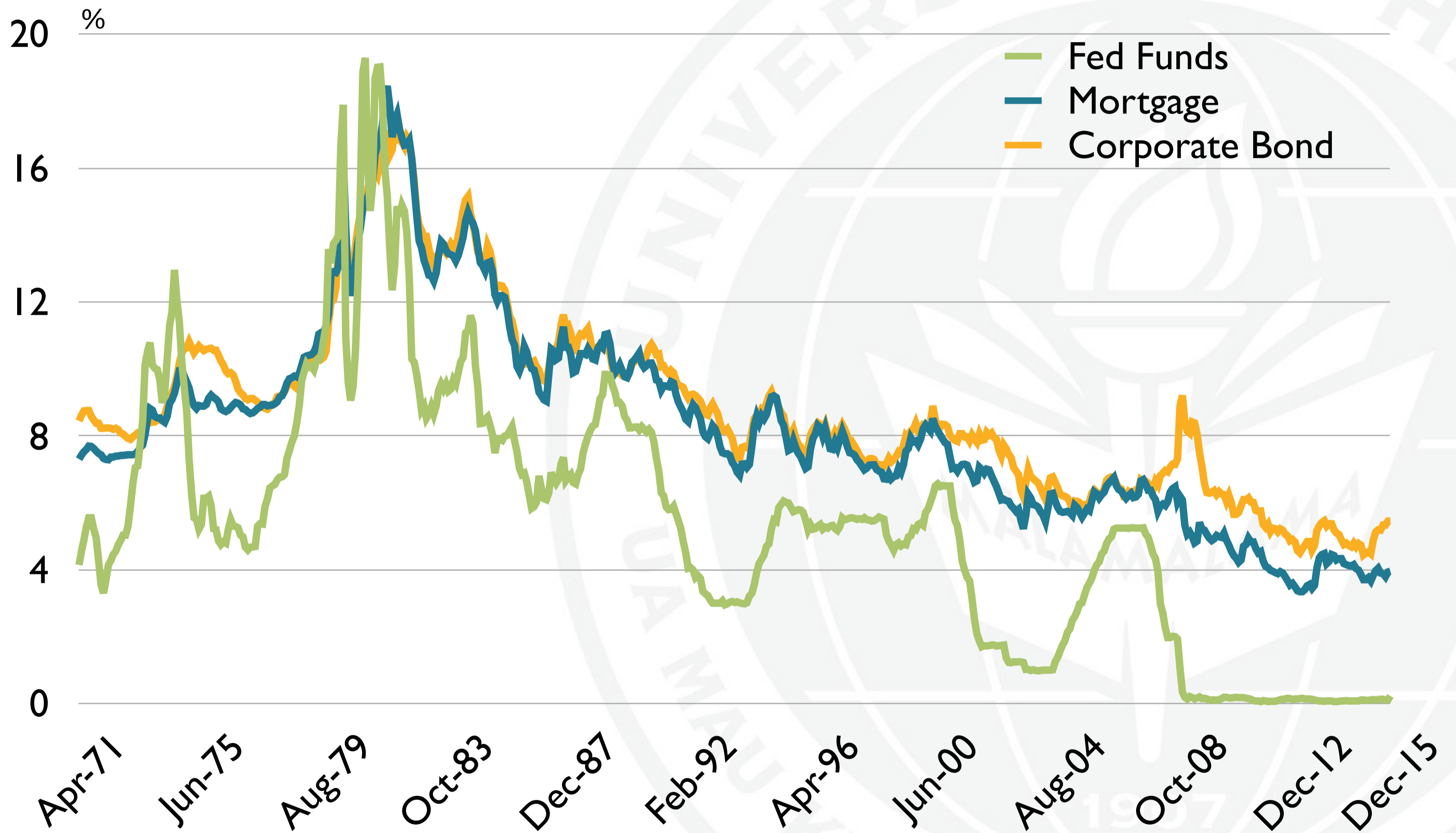
rates will rise, but not much



Source: Federal Reserve Bank of St. Louis, CME

HOW BIG A DEAL IS THE LIFTOFF?

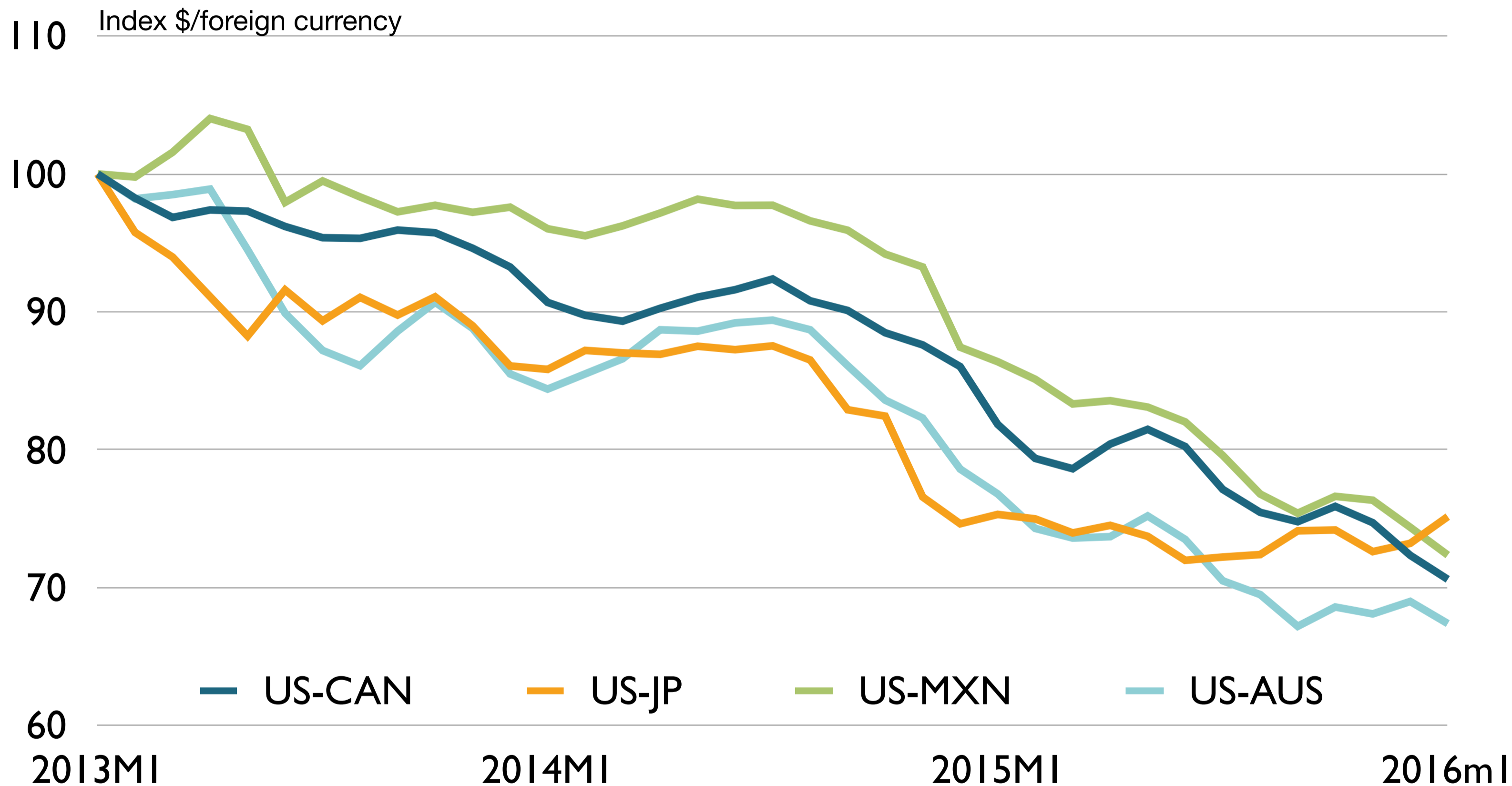
as short rates rise spreads will tighten



Source: Federal Reserve Bank of St. Louis

EXPORTS FACE CURRENCY HEADWIND

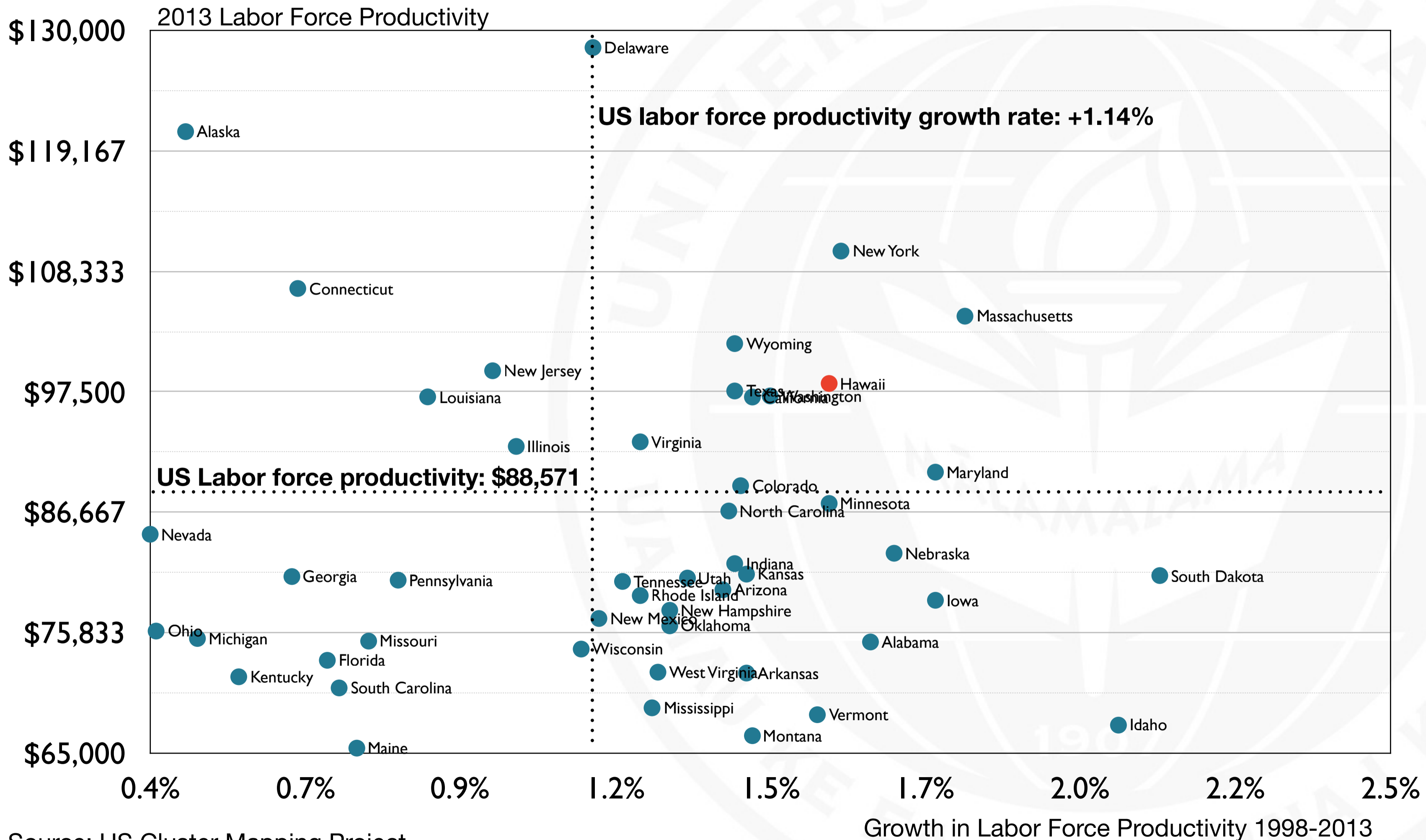
Will fed keep tightening as currencies fall?



Source: Federal Reserve Bank of St. Louis

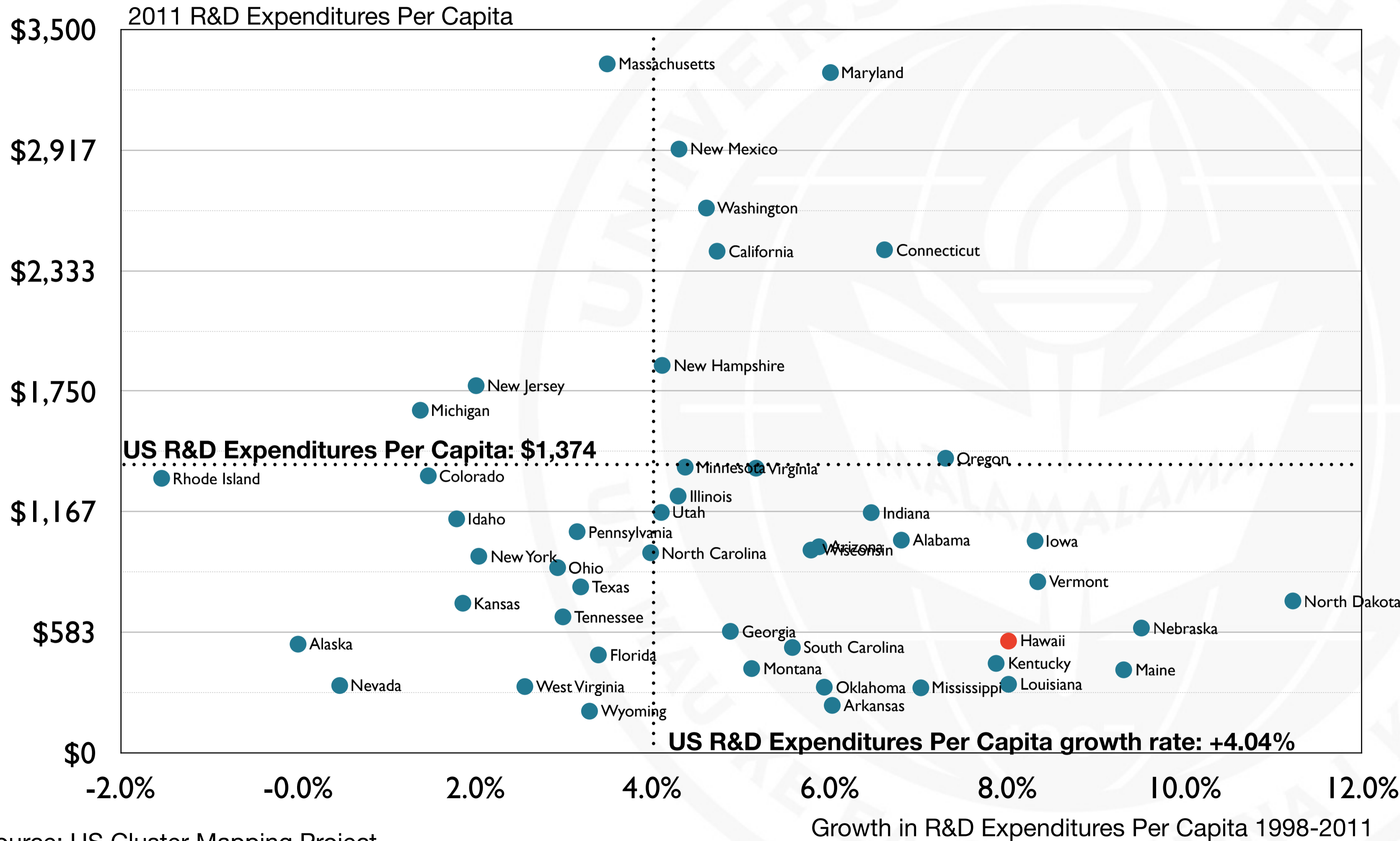
HAWAII IN CONTEXT: ABOVE AVERAGE GROWTH

GDP Per Labor Force Participant, 2005 dollars (98-2013)



HAWAII IN CONTEXT: R&D SMALL BUT GROWING

Total R&D Expenditures Per Capita, 1998-2011



Source: US Cluster Mapping Project

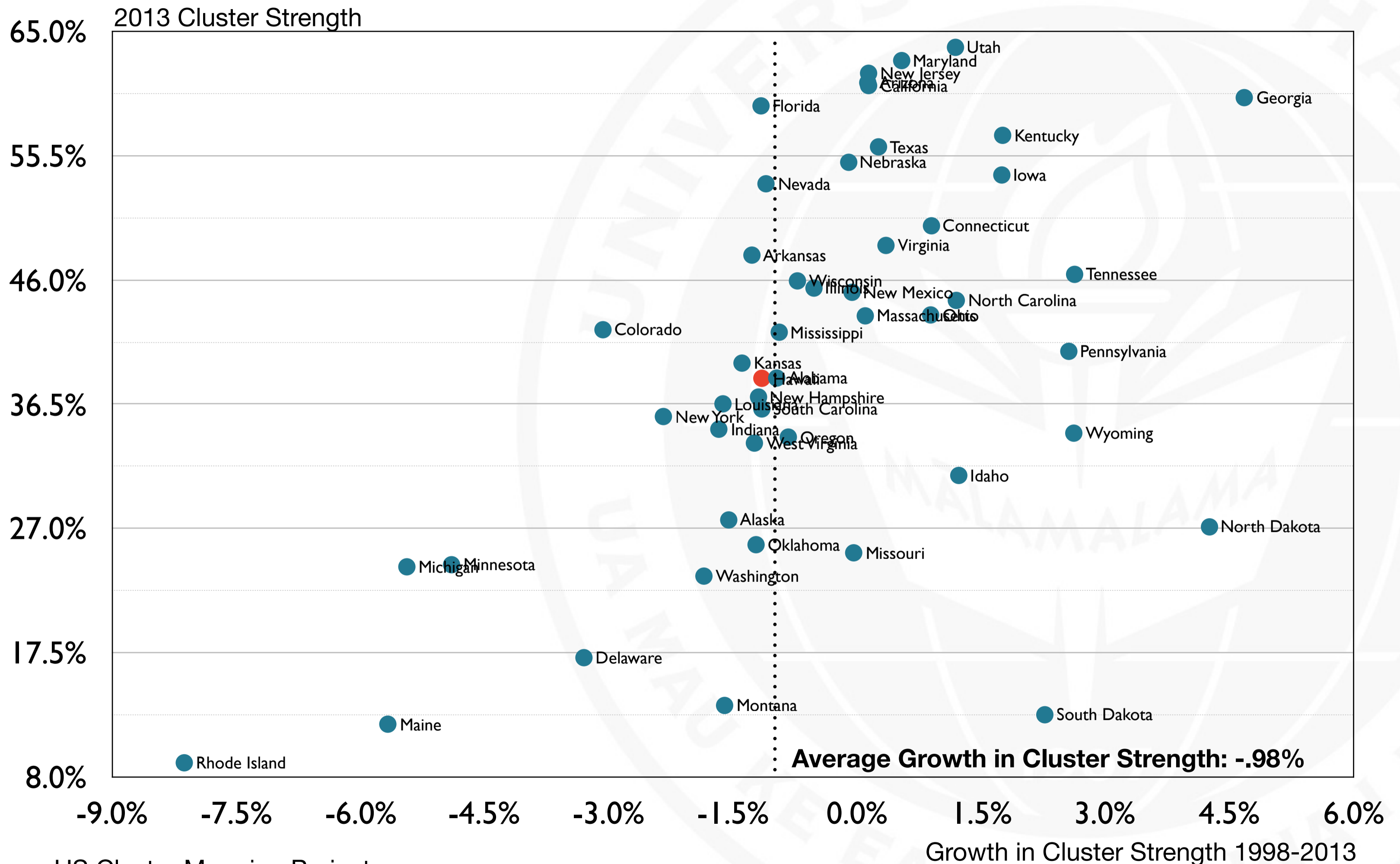
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HAWAII IN CONTEXT: CLUSTER STRENGTH

Percent of Traded Employment in Strong Clusters, 1998-2013



Source: US Cluster Mapping Project

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ARRIVALS WILL BREAK RECORD AGAIN

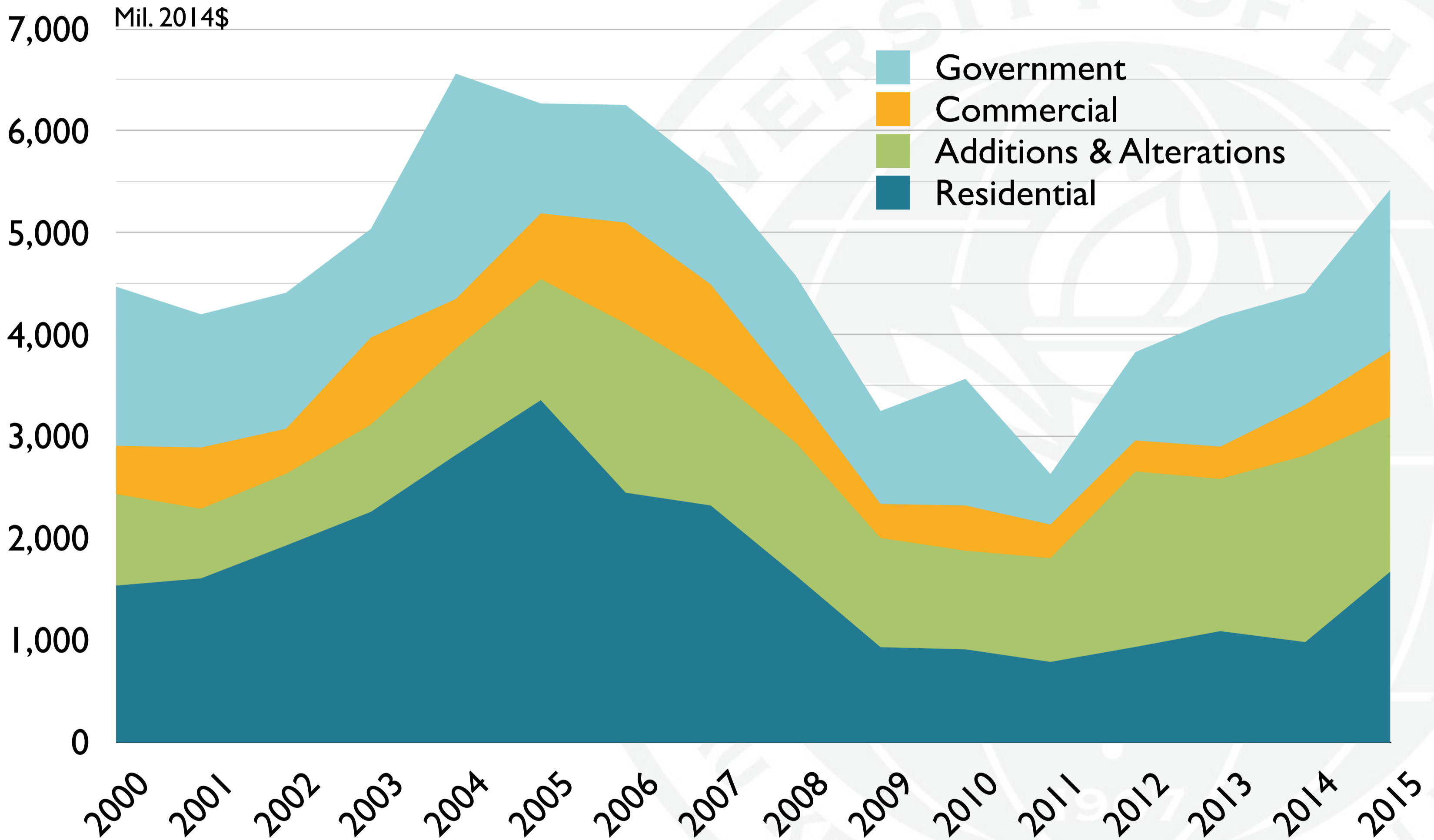
but, not a long-run growth engine



Source: HTA, BLS, UHERO. Nominal visitor spending deflated using Honolulu CPI.

INVESTMENT NEARING PEAK?

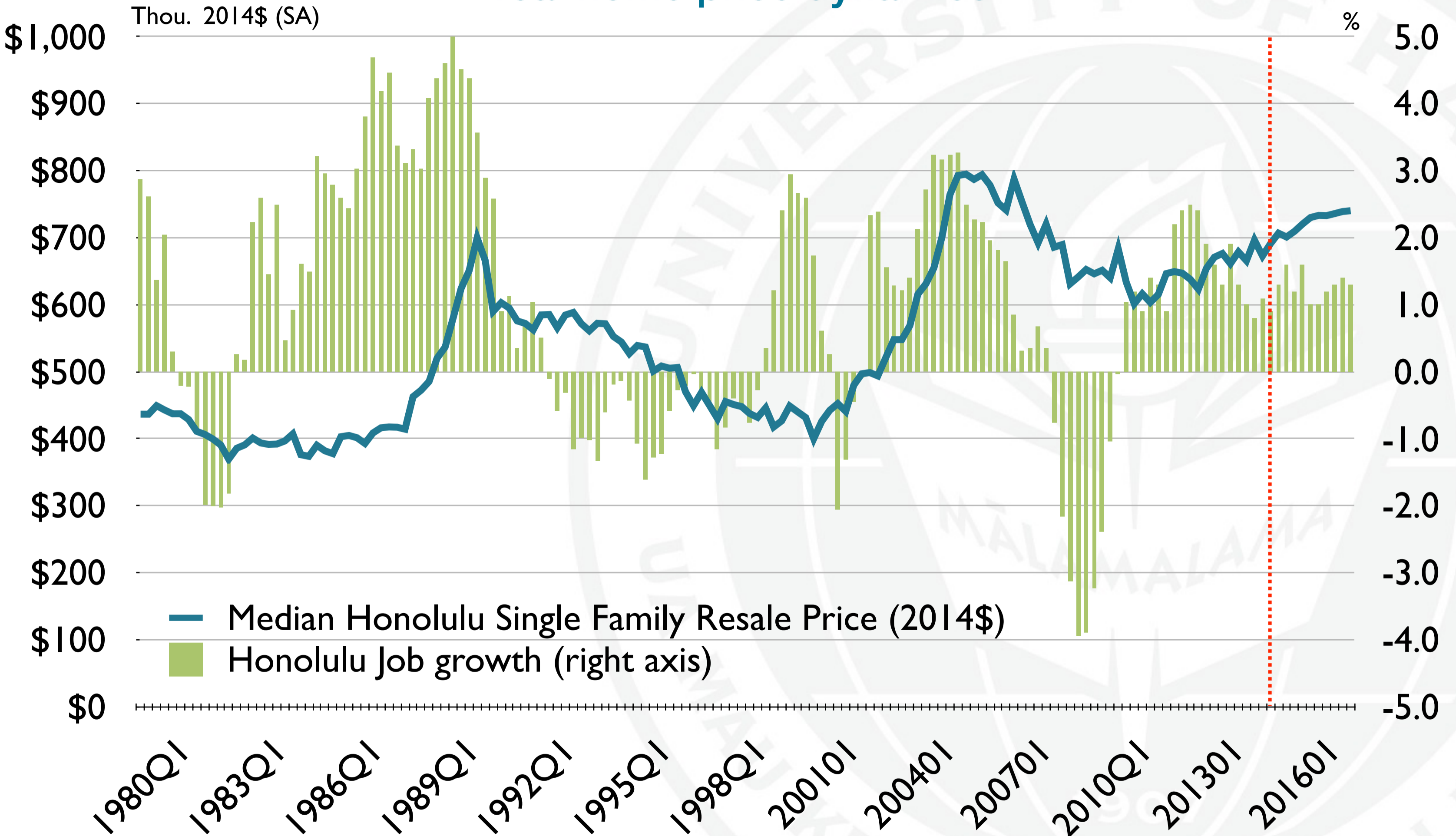
statewide authorizations to build



Source: DBEDT, UHERO

DO VALUES KEEP UP WITH COSTS?

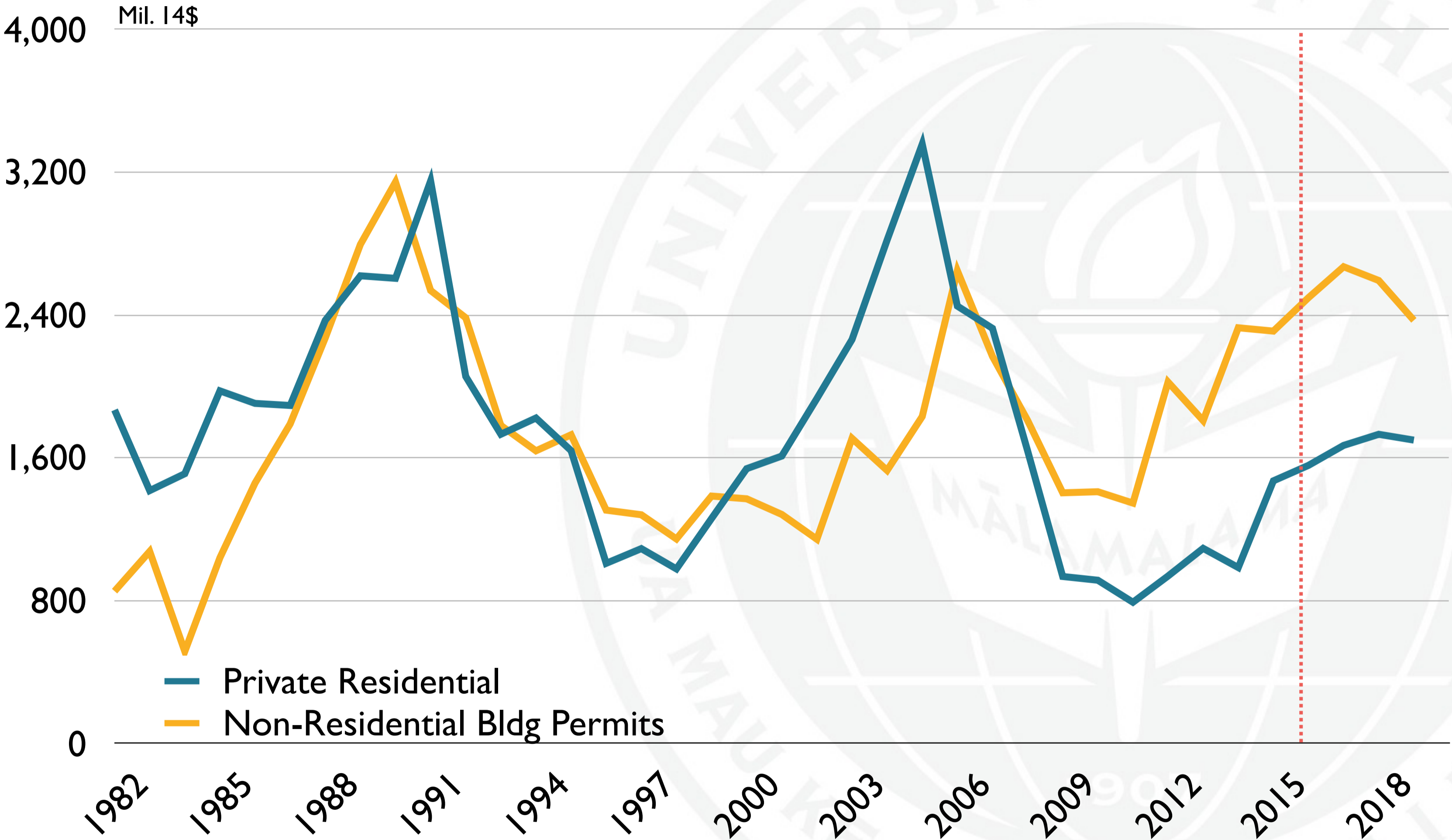
real home price dynamics



Source: Honolulu Board of Realtors, BLS, UHERO, median home price deflated by Honolulu CPI.

DOES SLOW START PROLONG THE CYCLE?

still waiting on single family home building



Source: DBEDT, UHERO

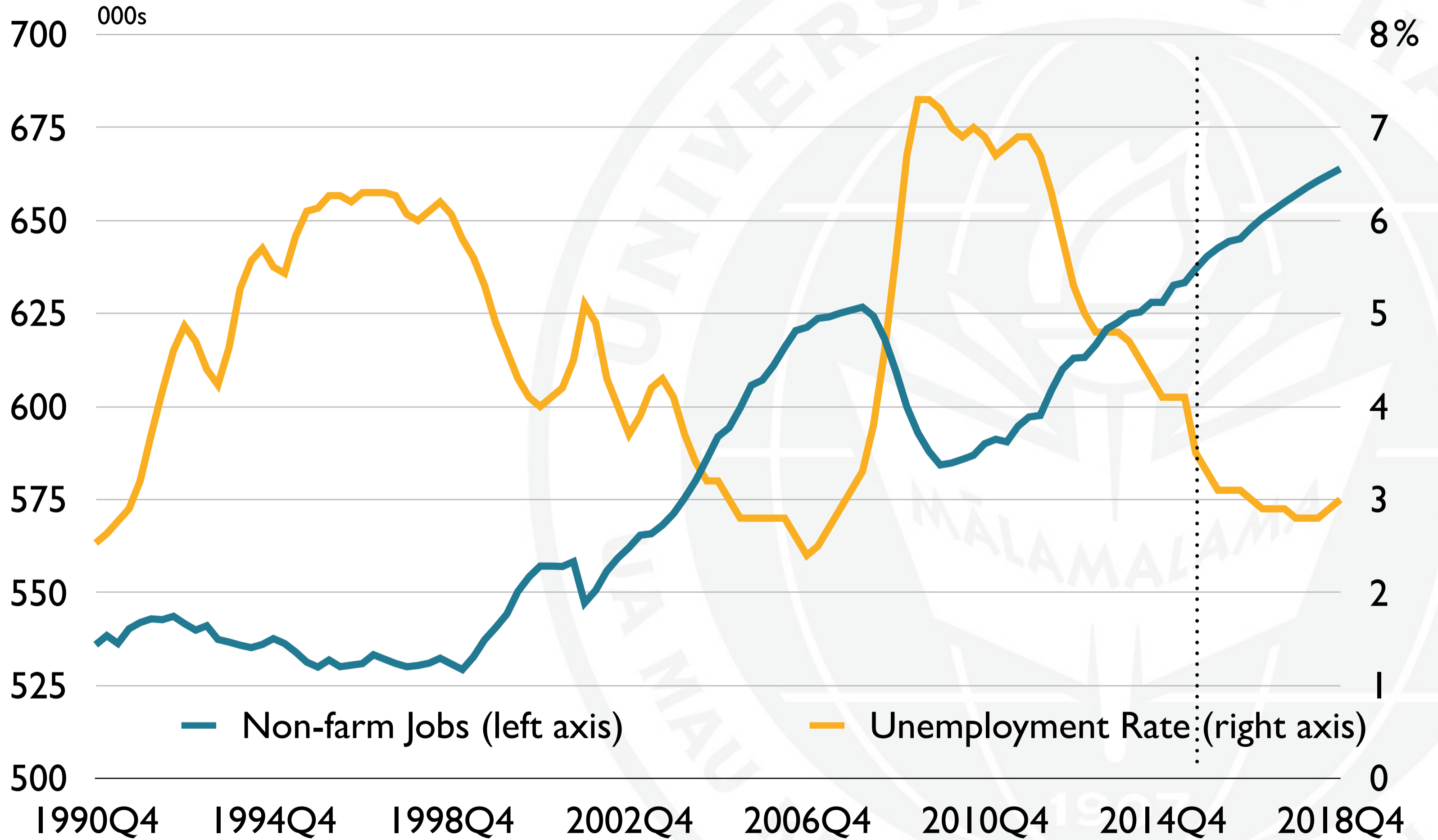
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IS THIS AS GOOD AS IT GETS?

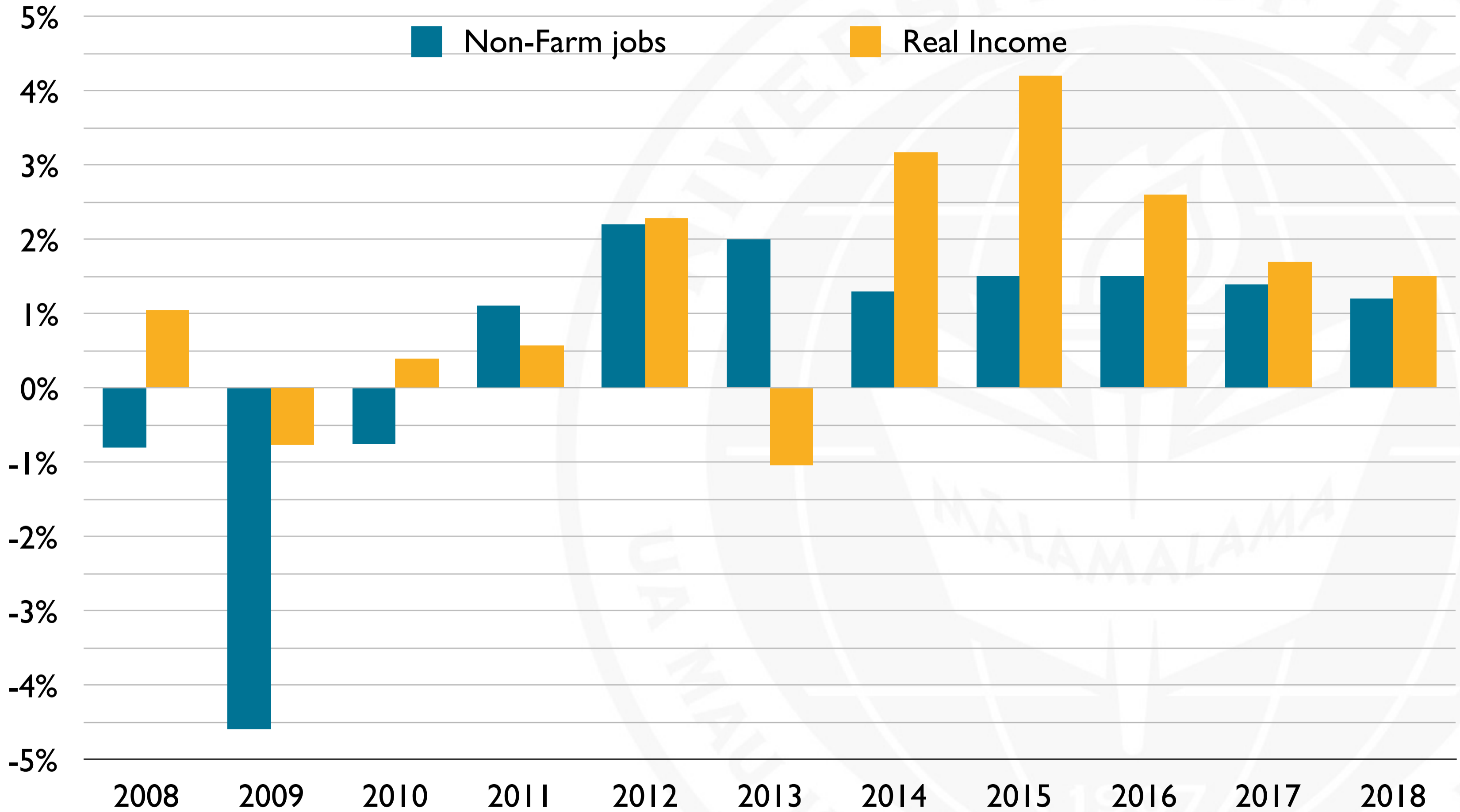
Hawaii jobs and unemployment



Source: BLS, UHERO.

IS THIS AS GOOD AS IT GETS?

Hawaii jobs and unemployment



Source: BLS, BEA, UHERO



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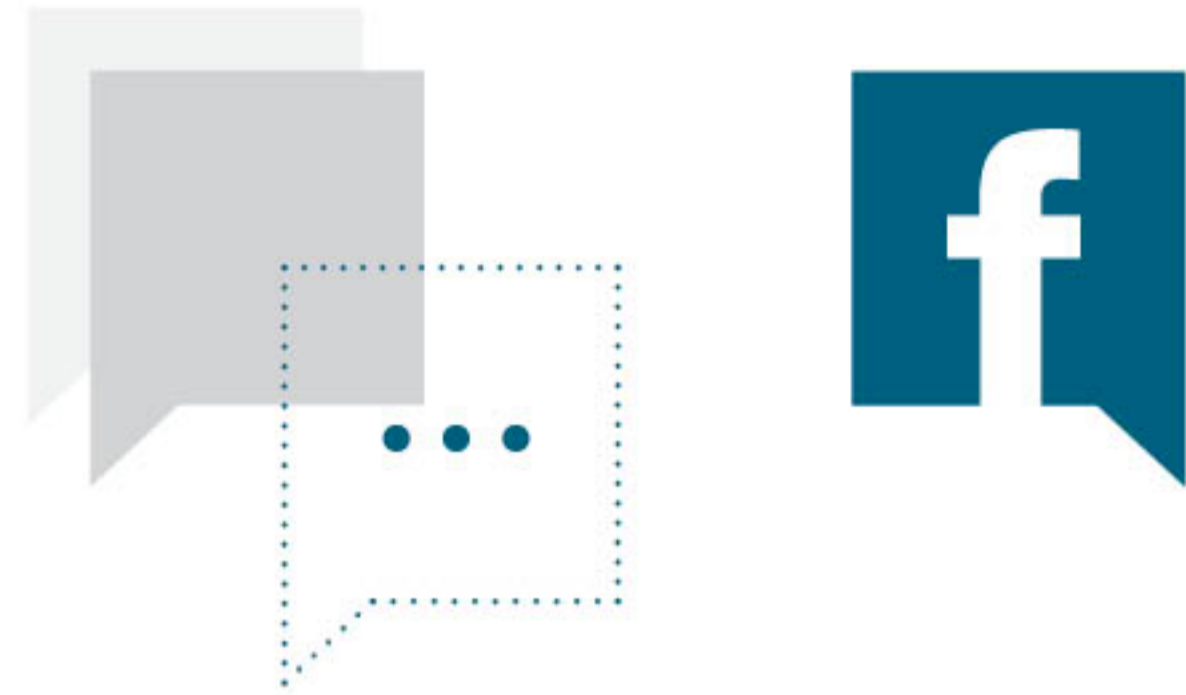
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RESEARCH DRIVEN DIALOGUE

The Inaugural UHERO Forum, held on October 29, was a success with more than 160 people in attendance. Critical issues facing the State of Hawai'i were highlighted, including energy policy, economic development, and sustainability.

VIEW PROGRAM

LATEST FORECAST

Developing Countries Buoy Asian Growth

December 7, 2012

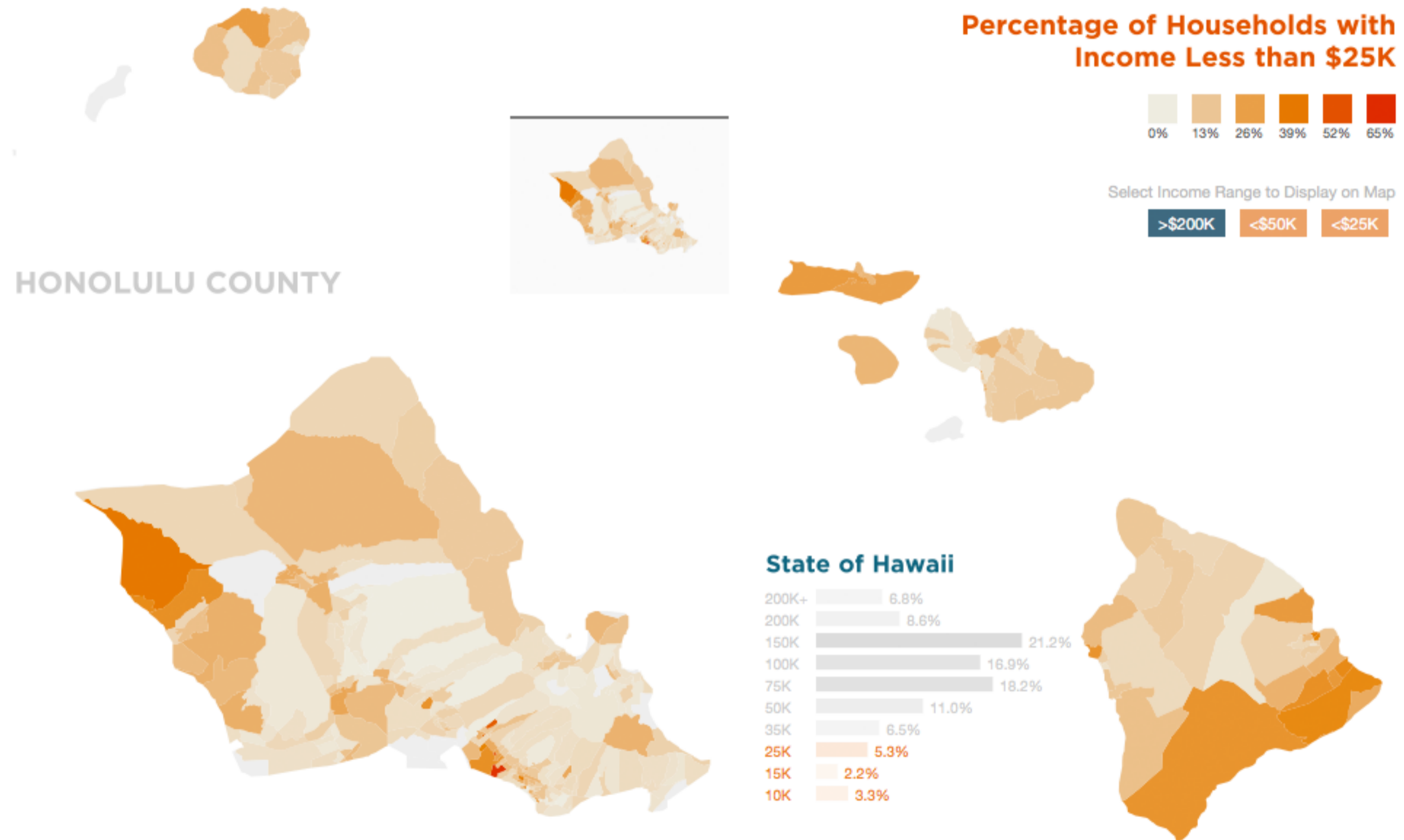
[Read the Public Summary](#)



MORE UHERO FORECASTS

HAWAII INCOME DISTRIBUTION MAP [BETA]

COMPARING HOUSHOLD INCOMES



CENSUS TRACT INCOME DISTRIBUTIONS

Map showing census tract income distributions across the state of Hawaii. The map is currently set to display data for the state of Hawaii. The legend indicates that the percentage of households with income less than \$25K is 5.3% for the selected income range.



MAHALO

January 21, 2016

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UHERO

Current Hawaii Economic Conditions

Eugene Tian

Department of Business, Economic Development & Tourism
to the

Committee on Ways and Means
and
Committee on Finance

January 21, 2016

Presentation Layout

- **A Review on Economic Growth**
- **Labor Market**
- **Construction and Real Estate**
- **Tourism**

A Historical Review of Hawaii's Economic Growth

Indicator	Annual average growth, %			
	30 years, 1984 - 2014	20 years, 1994 -2014	2015	2016
Real GDP	2.0	1.2	2.0	2.3
Real personal income	1.9	1.7	3.6	3.0
Honolulu inflation rate	3.2	2.3	1.0	2.3
Non-Ag wage and salary jobs	1.3	0.8	1.3	1.2
Unemployment rate 1/	4.7	5.0	3.8	3.7
Visitor arrivals by air	1.8	1.3	4.4	1.8
Real visitor expenditures 2/	1.0	-0.07	2.1	1.2

1/ Average of 30 years, 1983 – 2013.

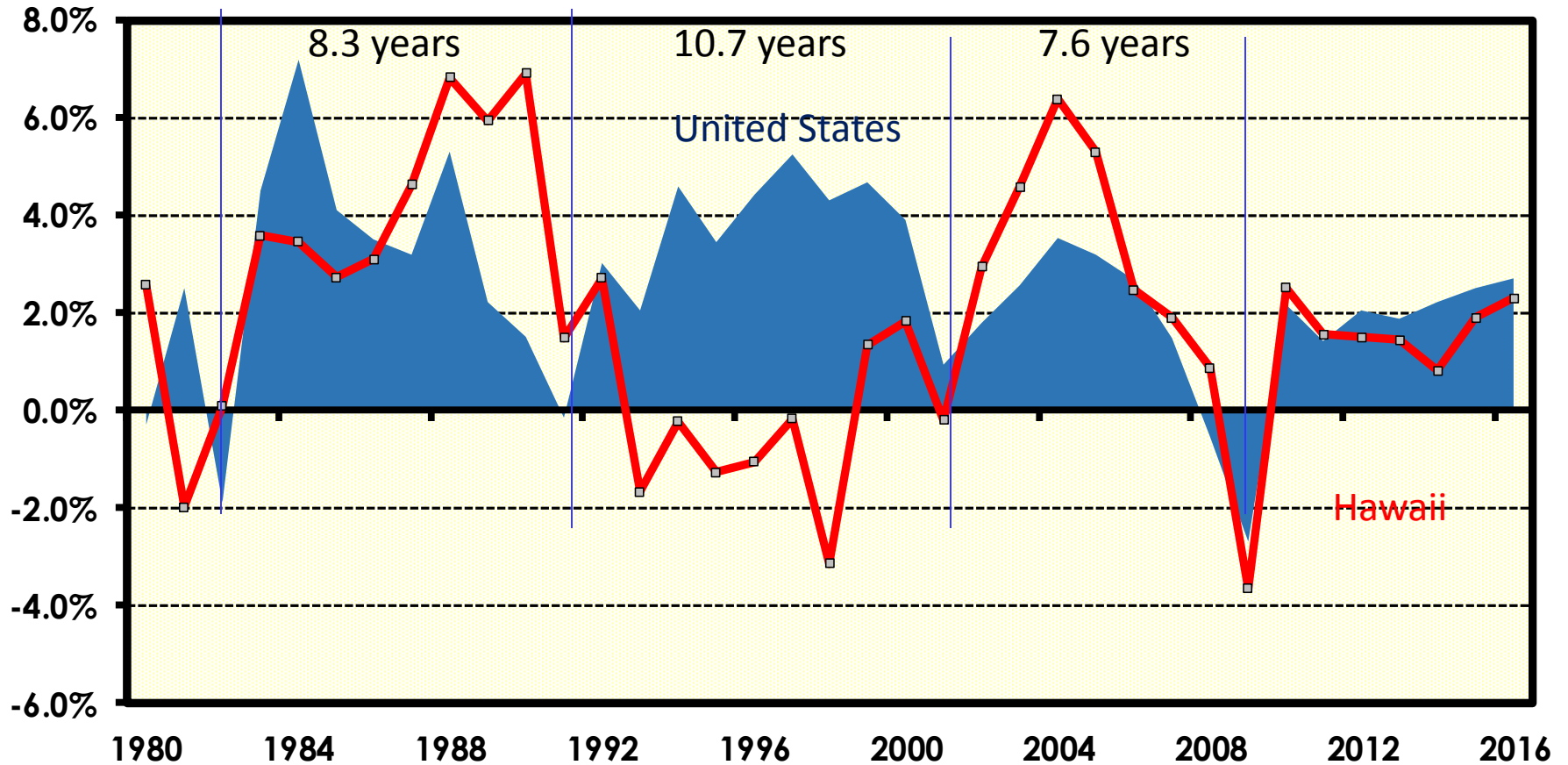
2/ Deflated by Honolulu CPI.

Many of the Economies of Hawaii Visitor Origin Countries Will Experience Slowing Down

	2013	2014	2015	2016
USA.	1.5	2.4	2.5	2.5
Canada	2.0	2.4	1.1	2.1
Japan	1.6	-0.1	0.6	1.1
S. Korea	2.9	3.3	2.6	2.8
Hong Kong	3.1	2.5	2.3	2.2
Taiwan	2.2	3.8	1.1	2.1
China	7.7	7.3	6.9	6.4
United Kingdom	1.7	3.0	2.4	2.2
Germany	0.2	1.6	1.5	1.8
France	0.7	0.2	1.1	1.4
Eurozone	-0.3	0.5	1.5	1.7
Australia	2.1	2.7	2.3	2.5
Brazil	2.7	0.1	-3.3	-2.4

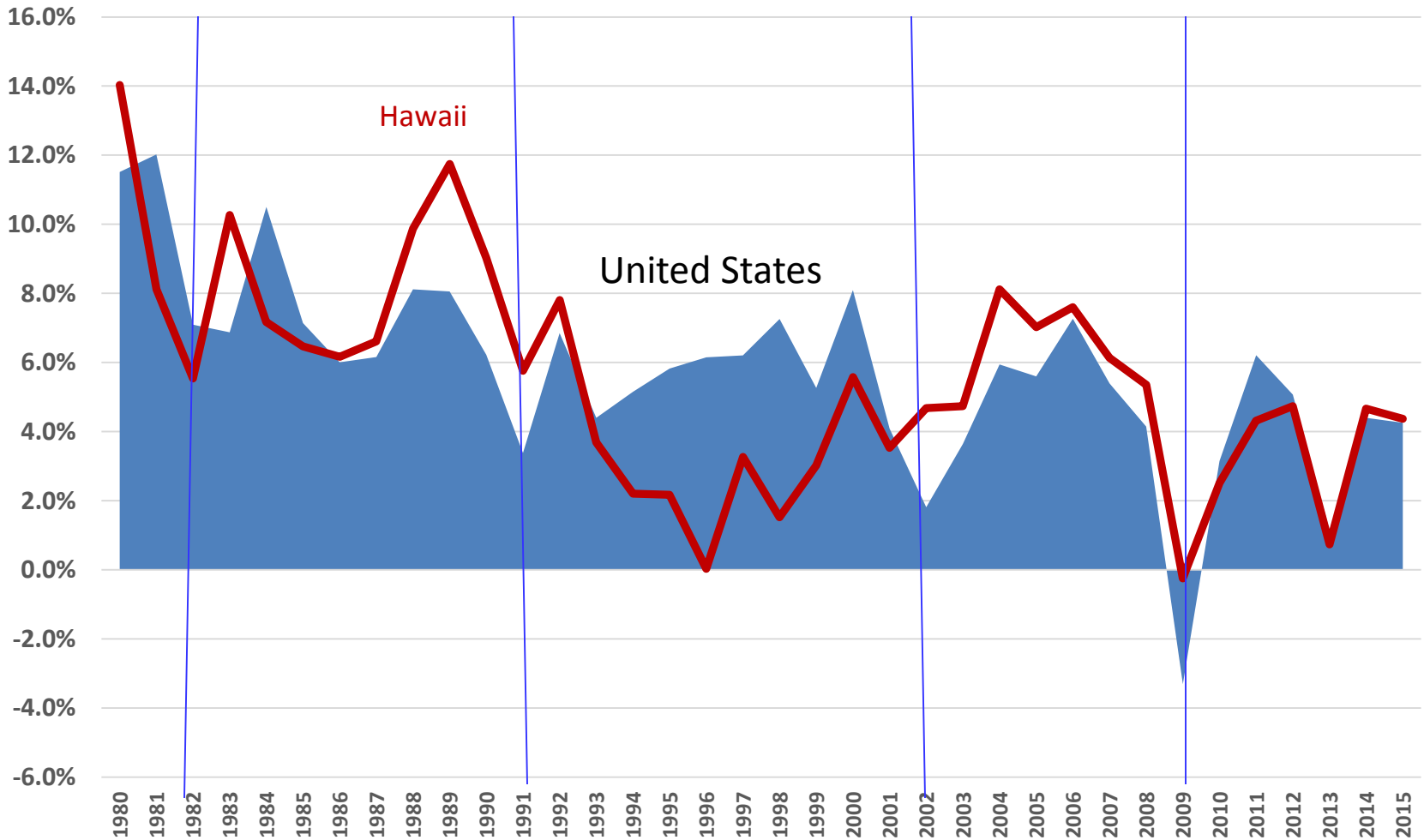
Hawaii's economy has been following the U.S. in the most recent two business cycles

Real GDP growth, % change from previous year



Source: US BEA, DBEDT, NBER, and Blue Chip Economic Indicators

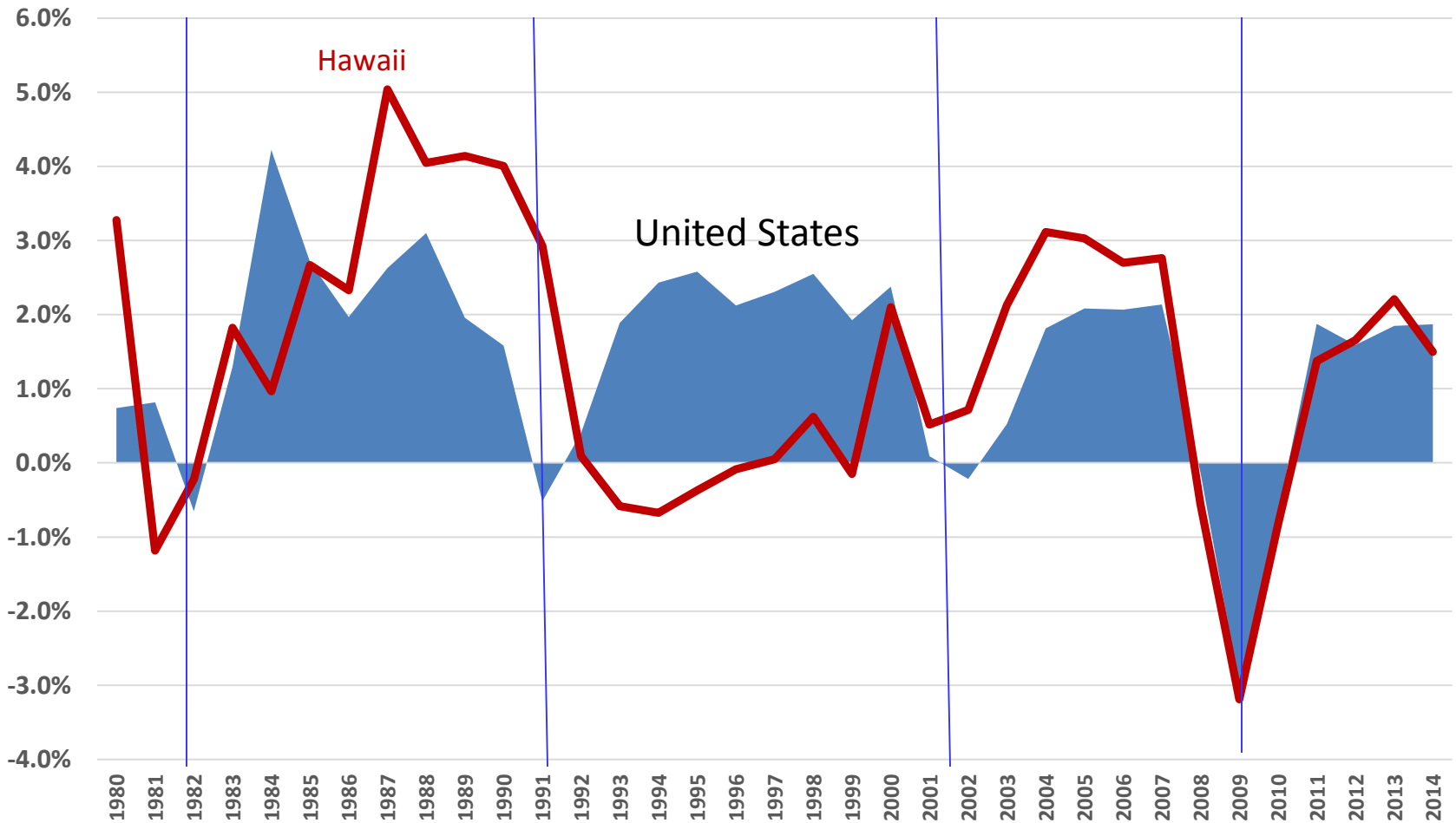
Personal Income Growth: U.S. and Hawaii



Source: U.S. Bureau of Economic Analysis

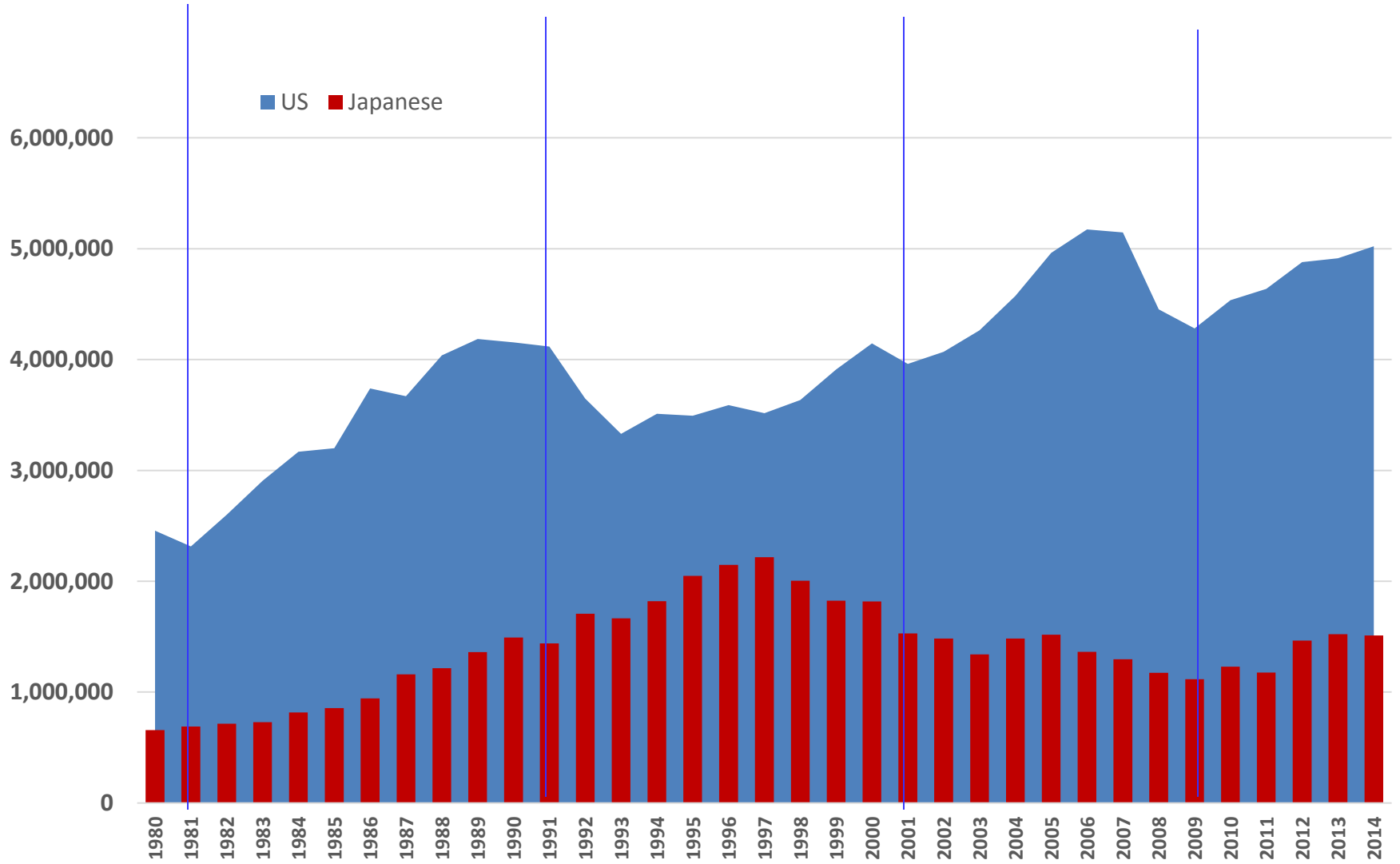
Total Job Growth: U.S. and Hawaii

Total jobs including payroll jobs and proprietors, both full-time and part-time



Source: U.S. Bureau of Economic Analysis

U.S. and Japanese Visitor Arrivals to Hawaii: 1980 - 2014

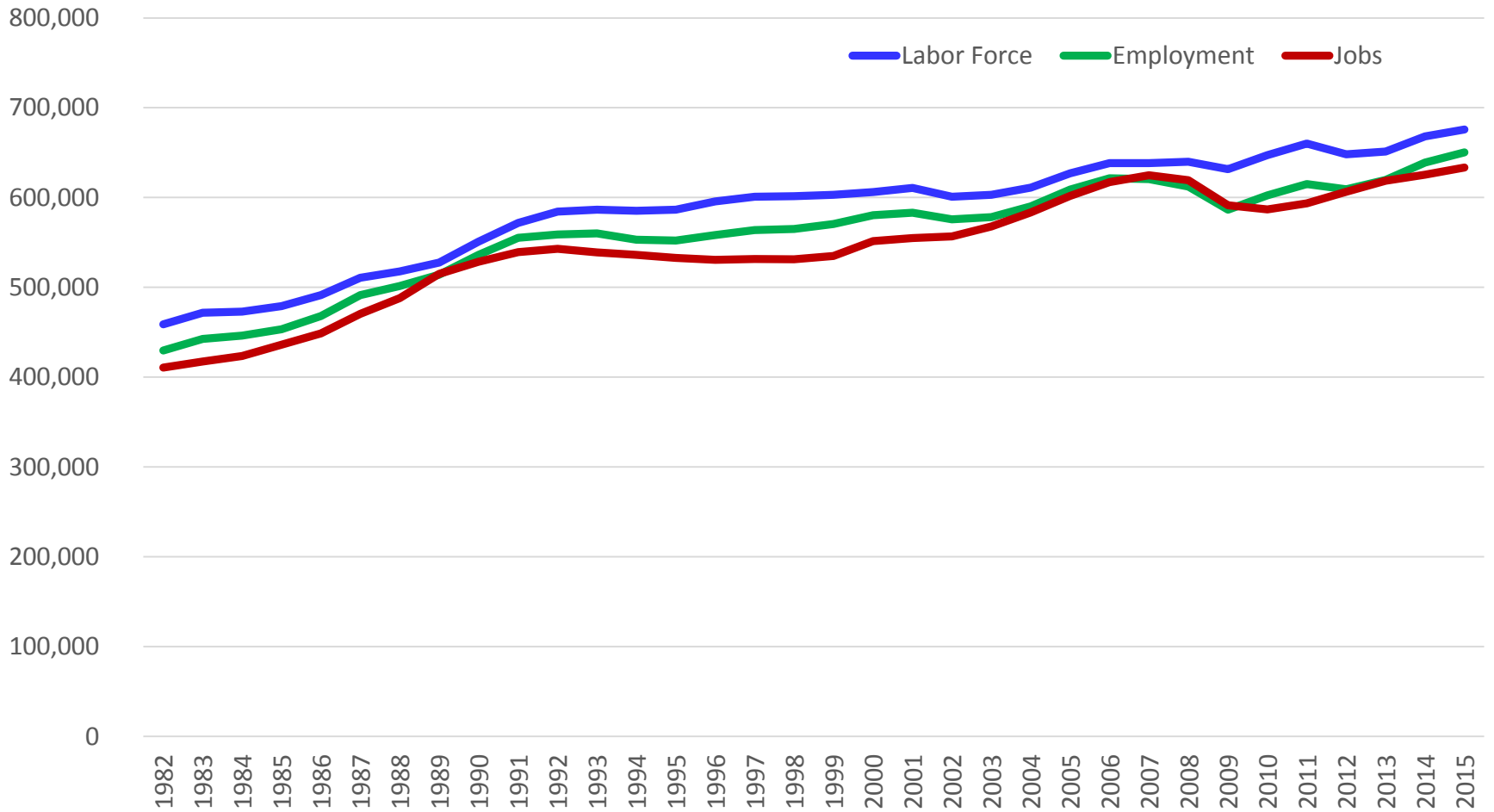


Source: HVB, DBEDT, and HTA

Labor Market

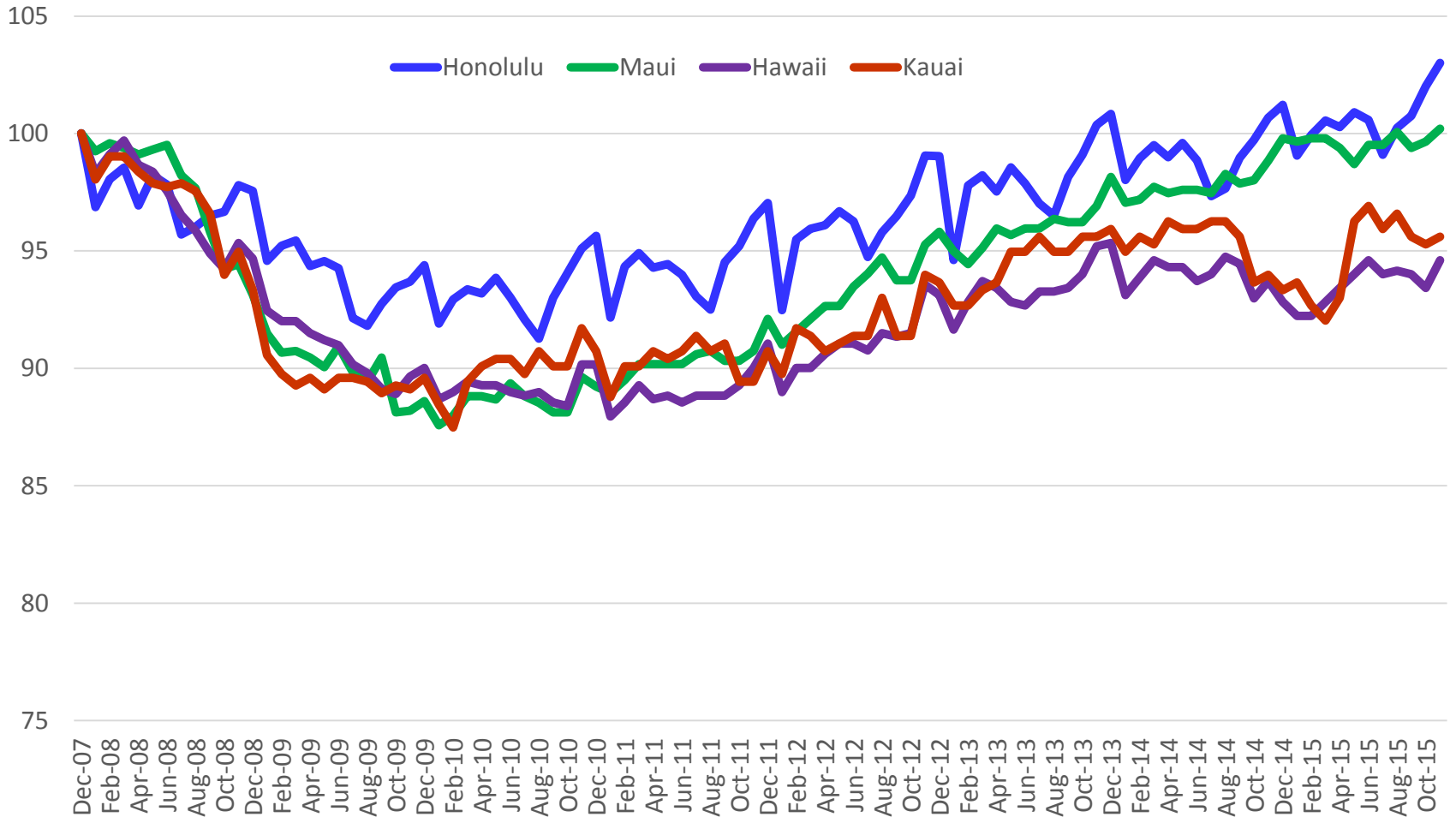


Statewide Labor Force, Employment, and Job Count Reached Record High Levels During the First 11 Months of 2015



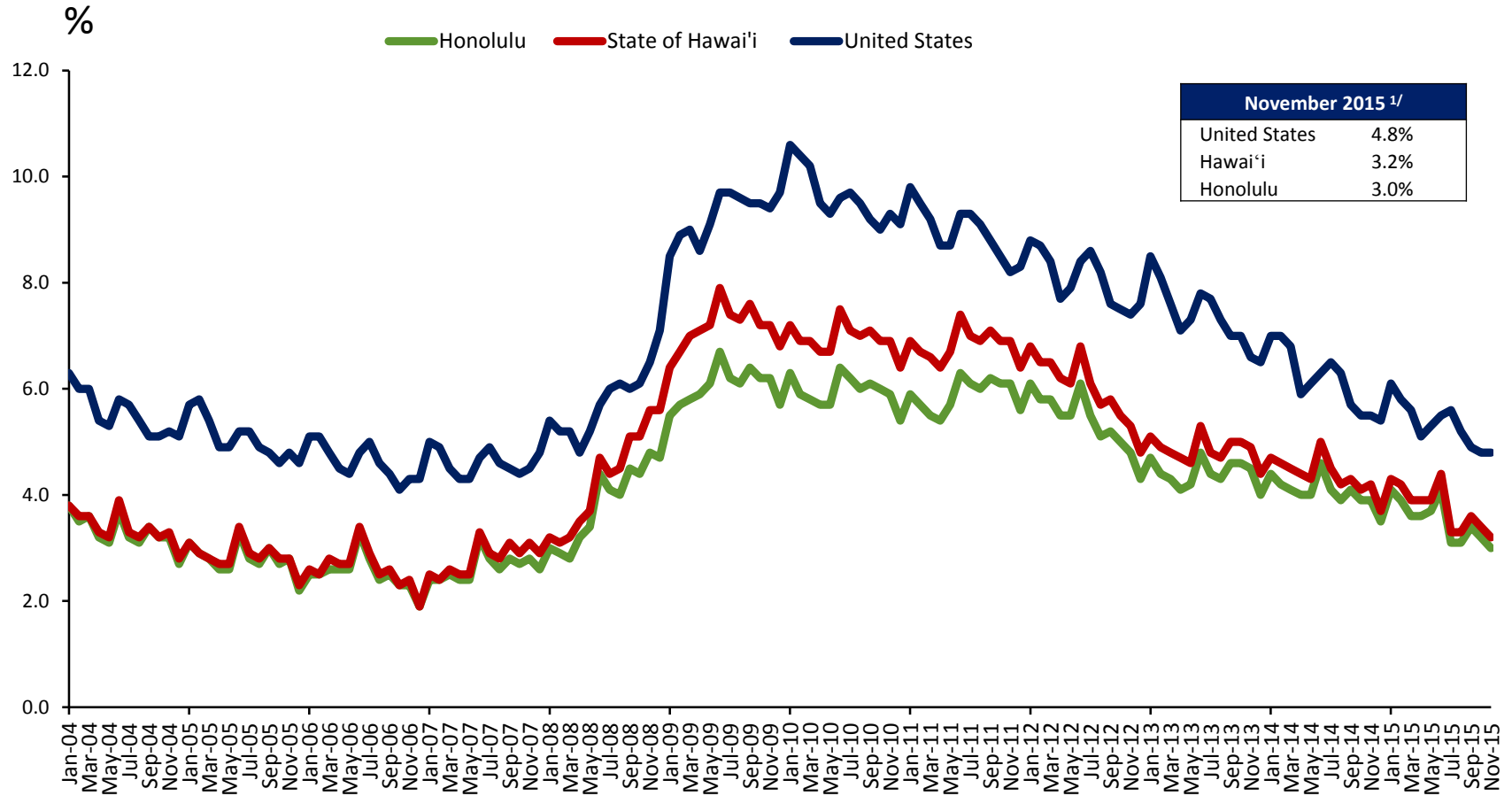
For Job Count, Honolulu and Maui Counties Have Fully Recovered From Great Recession But Hawaii and Kauai Counties Are Still Recovering

(% recovery from December 2007)



Source: DILR and calculations by DBEDT

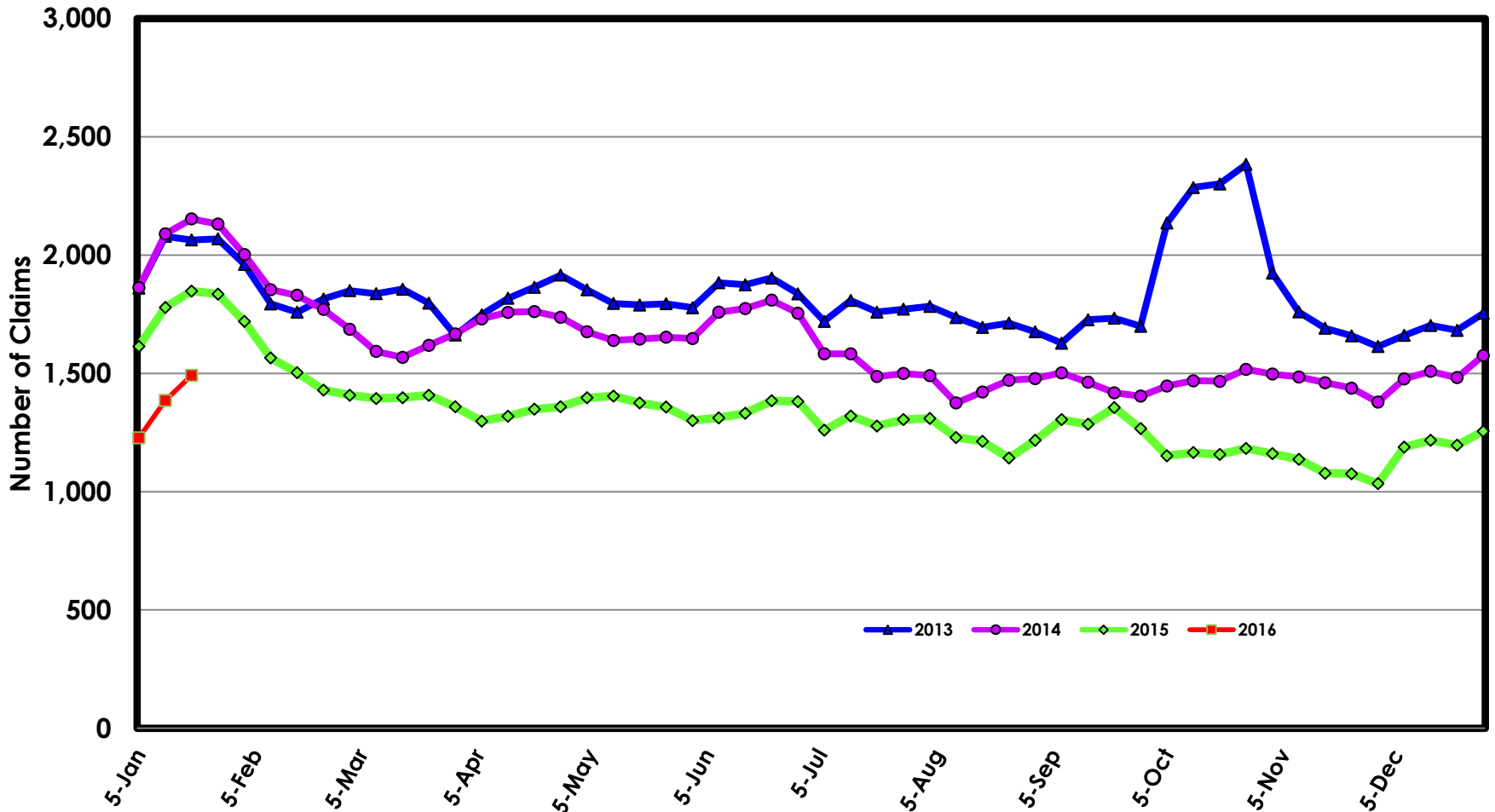
Unemployment Rate



Source: Bureau of Labor Statistics
 * Not seasonally adjusted.

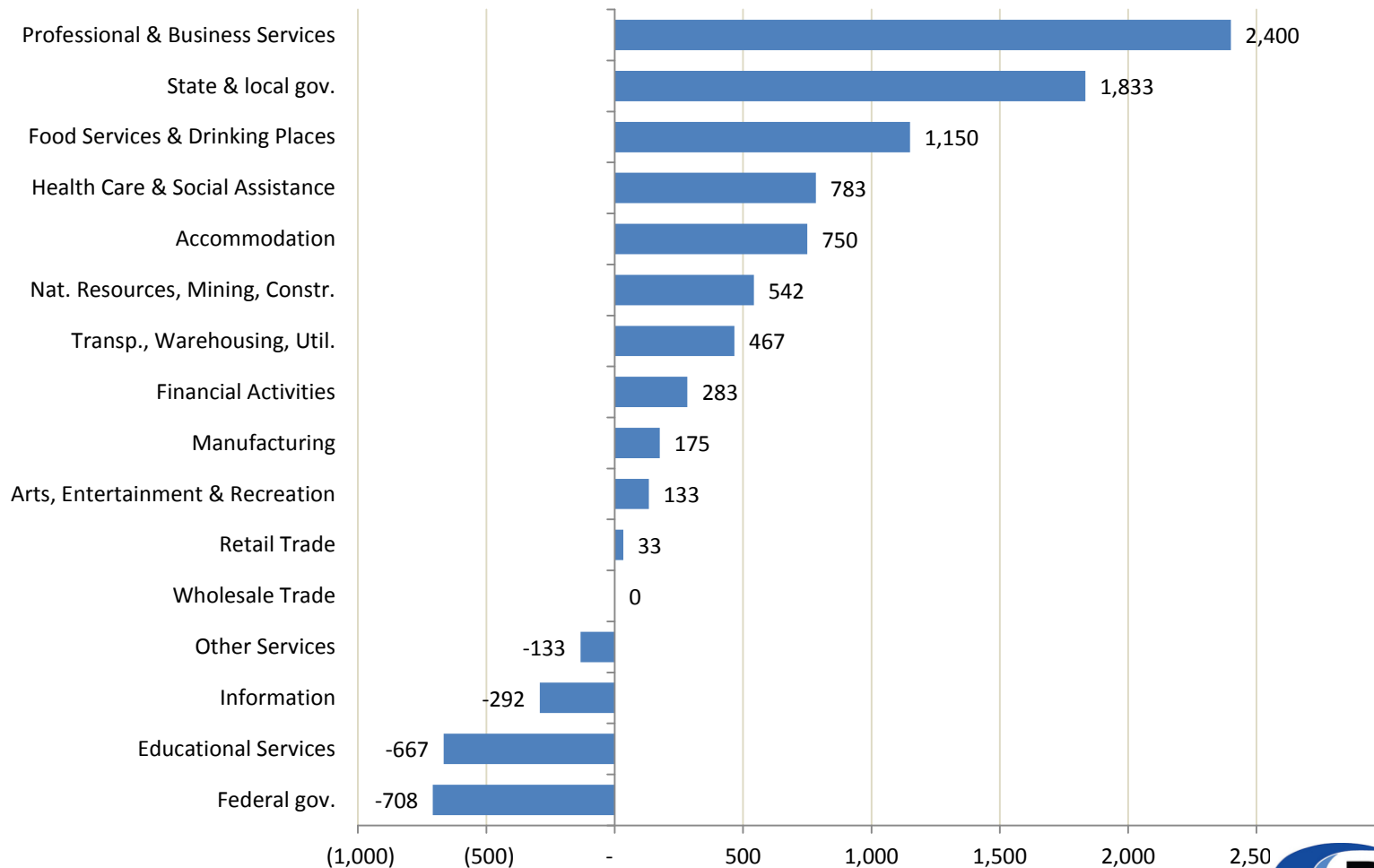
In 2015, unemployment claims dropped 18.4%

Comparison of Initial Unemployment Claims



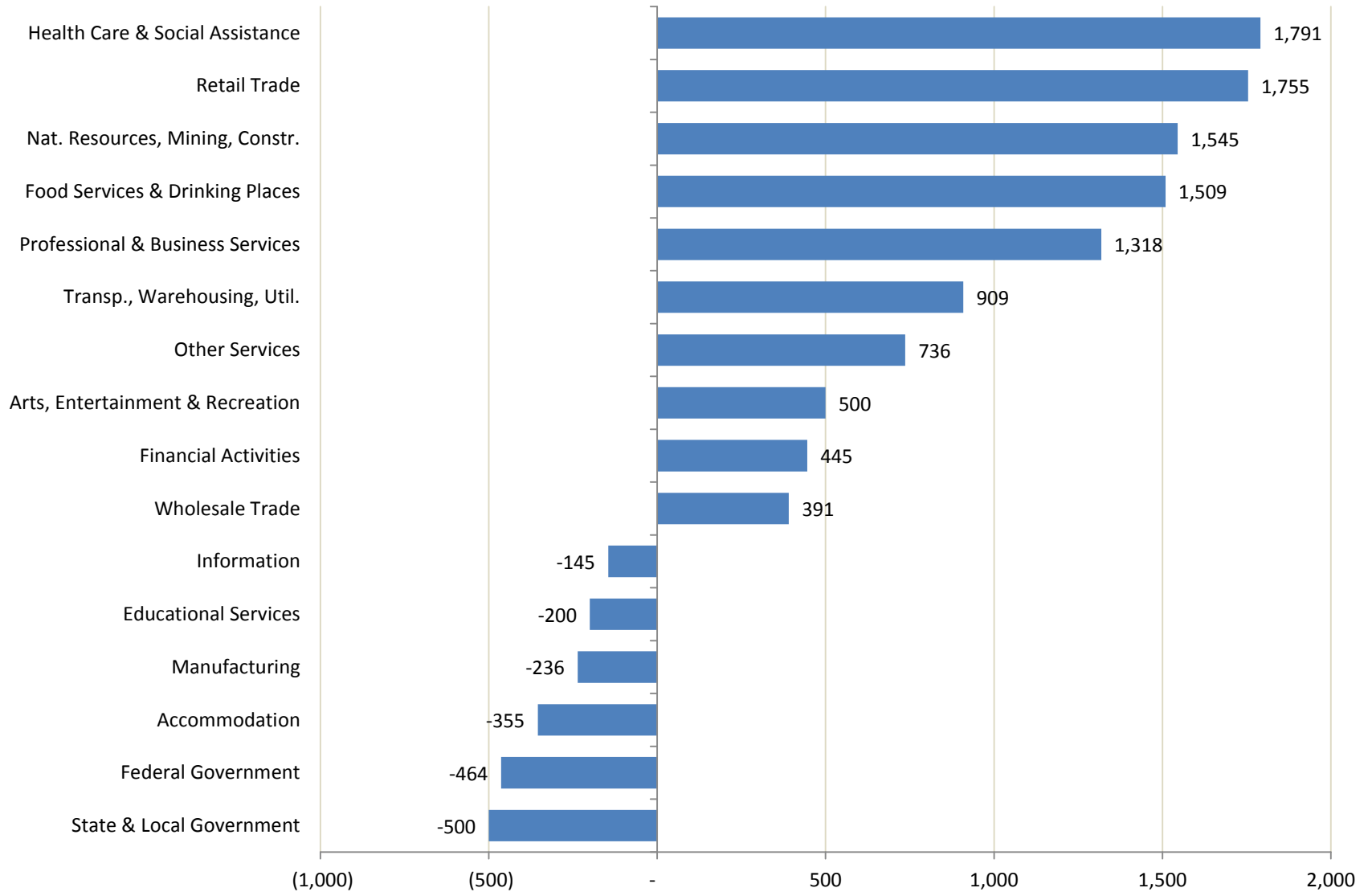
Statewide Job Count Changes: 2014

Hawaii Gained 6,750 Payroll Jobs in 2014



Source: Hawaii State Department of Labor and Industrial Relations

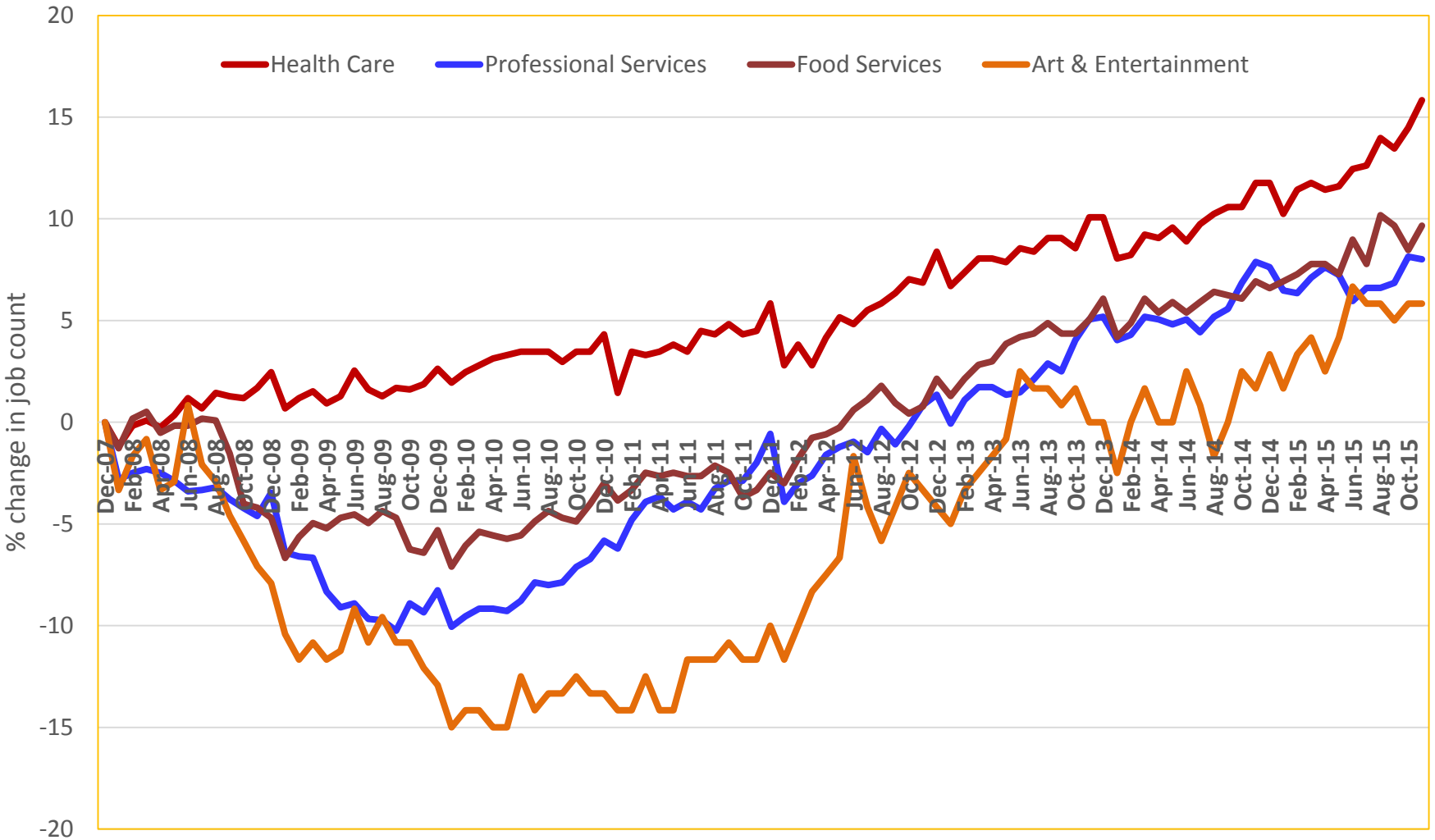
Hawaii Gained 9,000 Payroll Jobs in First 11 months of 2015



Source: Hawaii State Department of Labor and Industrial Relations

Hawaii Industrial Winners

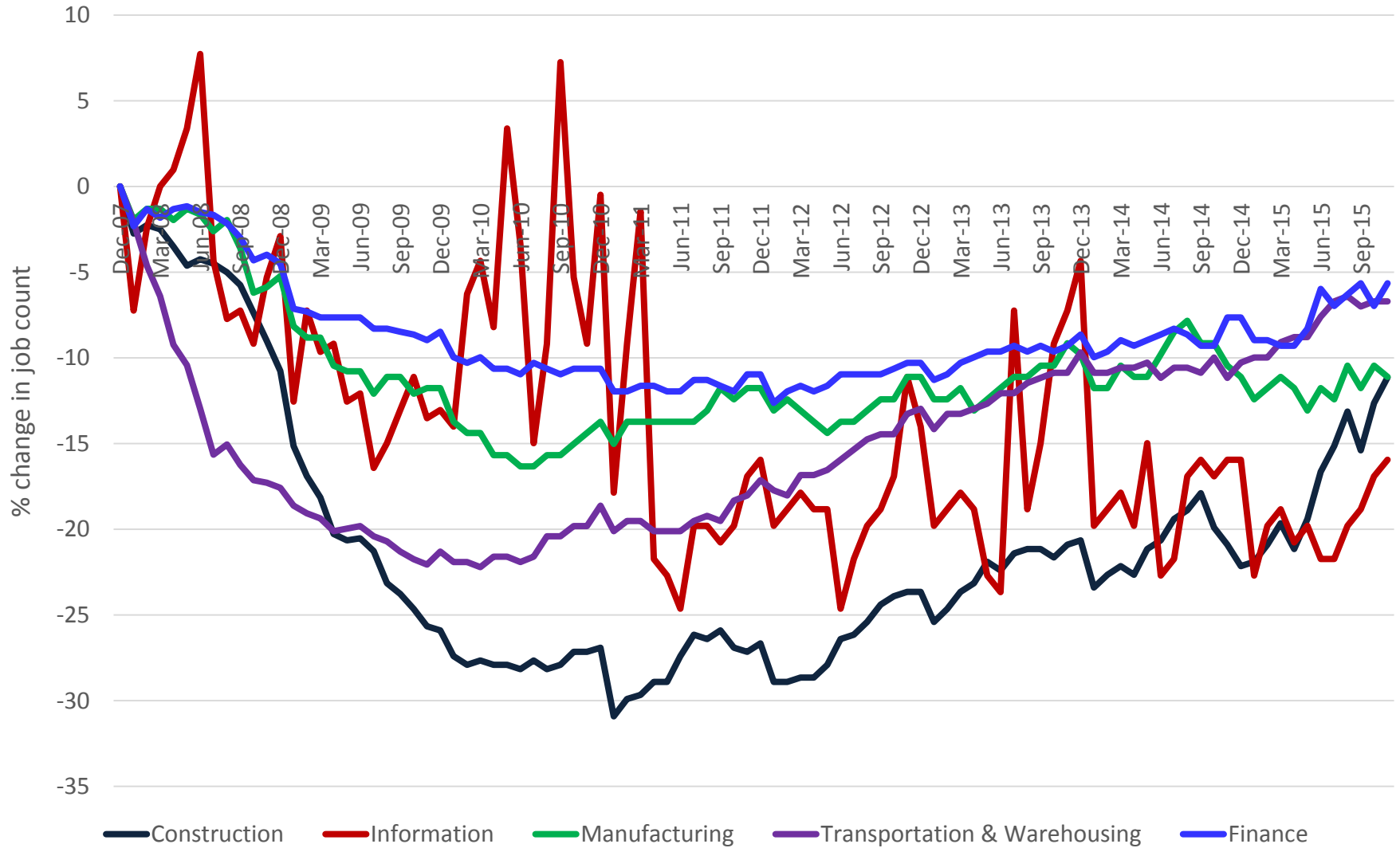
Percent Change in Employment From December 2007 through November 2015



Source: DLIR

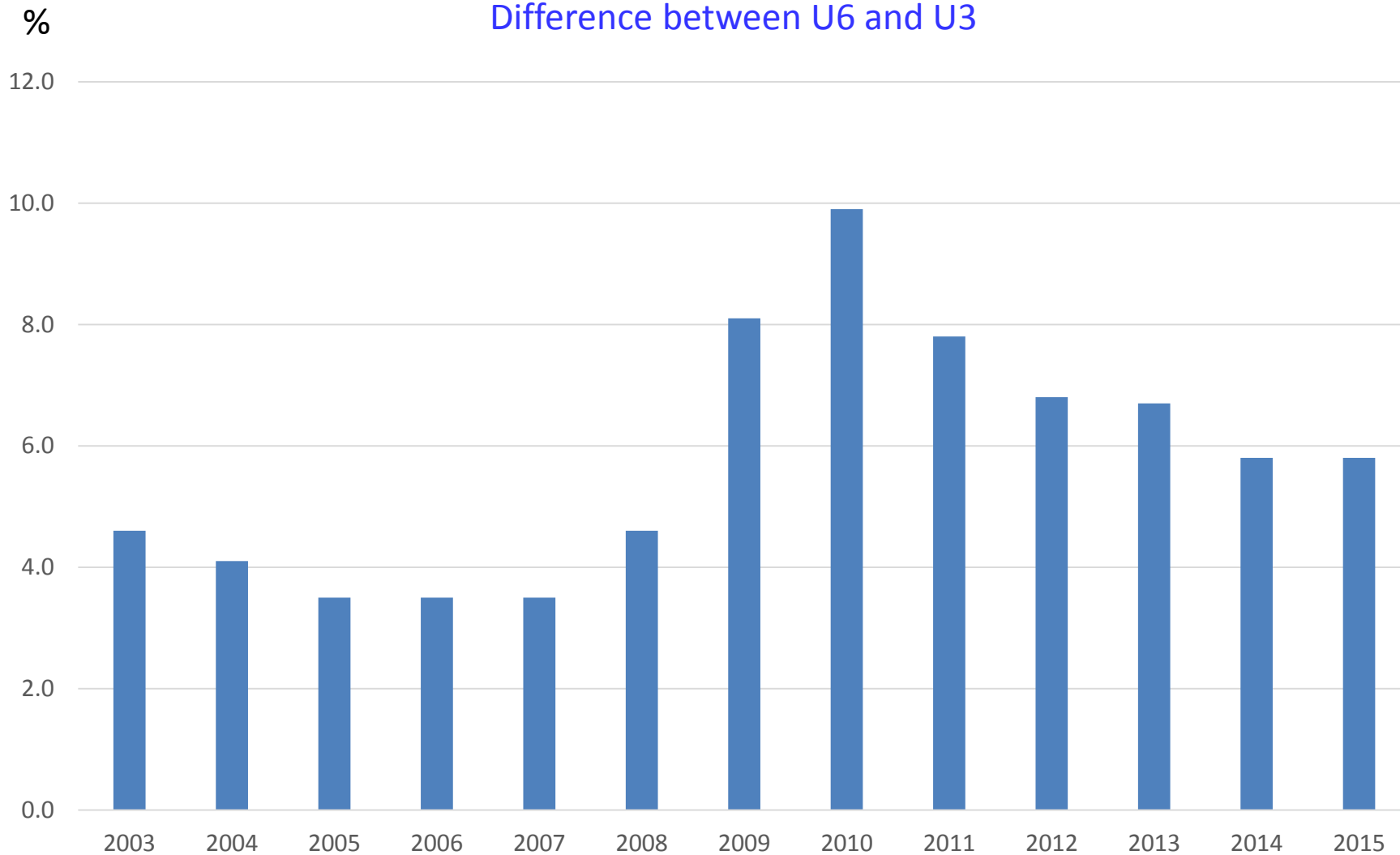
Hawaii Industrial Losers

Percent Change in Employment Since December 2007 through November 2015



Unemployment Rate Due to Economic Reasons

Difference between U6 and U3



Source: U.S. Bureau of Labor Statistics

Construction and Real Estate



CURRENT DEVELOPMENTS

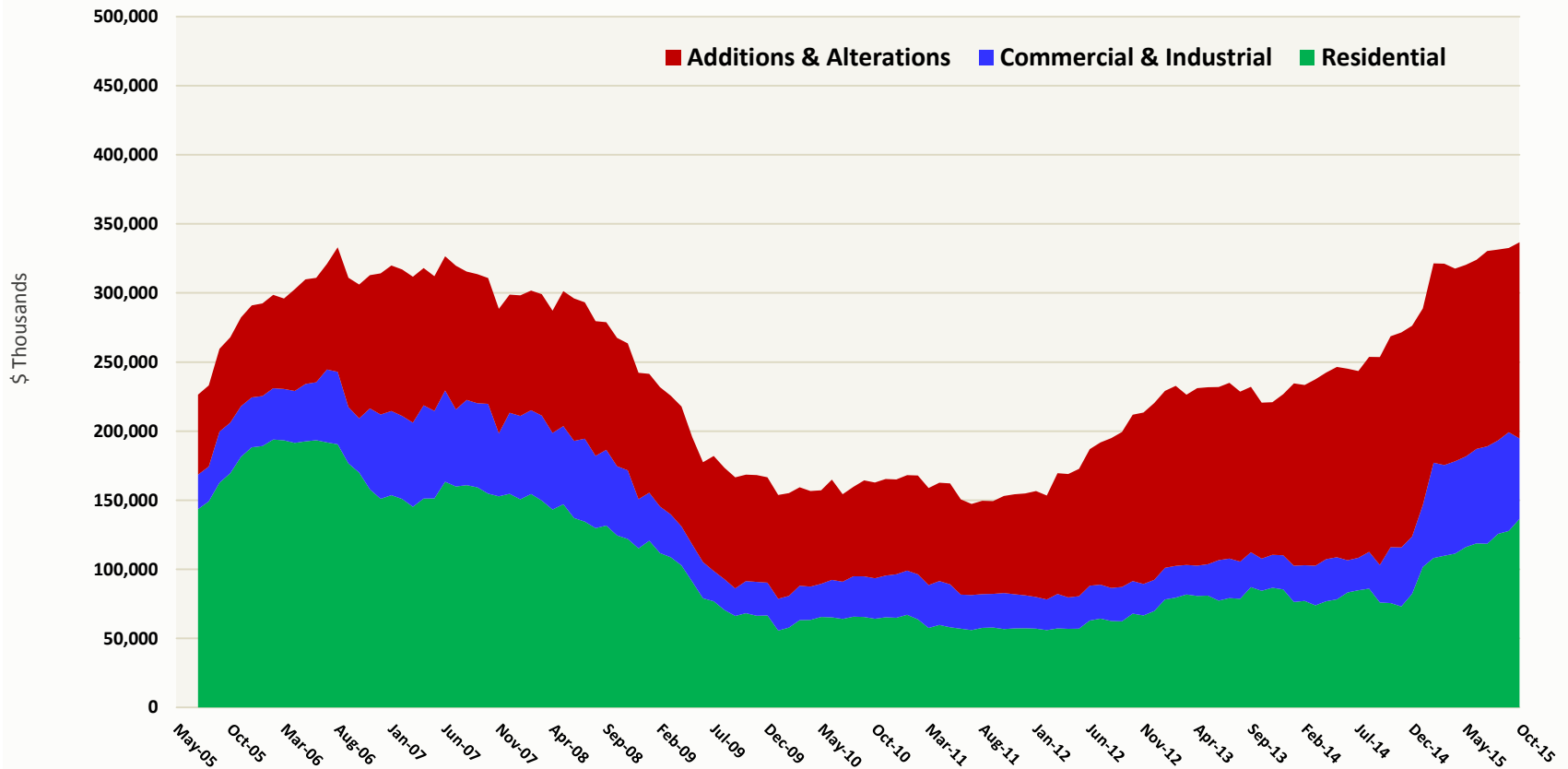
- A. The Collection
- B. Halekauwila Place
- C. 801 South Street - Building 'A'
- D. Ward Village, Land Block 5 - Project 1
- E. Symphony Honolulu
- F. Ward Village, Land Block 2 - Project 1
- G. Ward Village, Land Block 3 - Project 1
- H. Waihonua

ANTICIPATED DEVELOPMENTS

- 1. Keauhou Lane
- 2. 801 South Street - Building 'B'
- 3. Art Space

Private Construction Continues Recovering

12-Month Moving Average of Building Authorization Components*



*Additions and Alterations and Commercial & Industrial data do not include Kauai. All data through October 2015

Source: County building departments and U.S. Census Bureau

Selected Construction Projects Permitted During Last 12 Months

Commercial/Residential Developments

Island	Property	Type	Est. Amount (\$mm)
Oahu	Collection	Residential	151.3
Oahu	605 Kapiolani, 801 South	Residential	91.3
Oahu	Park Lane at Ala Moana	Residential	95
Oahu	DR Horton Schuler Homes	Townhomes	89.3
Oahu	1108 Auahi, Ward Village	Residential	55
Oahu	Kapolei properties	Town homes	54.1
Oahu	Kapiolani Medial Center	Hospital	53
Oahu	City & County Traffic Management Center	Government	50
Oahu	Hawaii Kai residential housing	Residential	34
Oahu	Island Paradise	Nursing homes	33.8
Oahu	Ala Moana Shopping Center	Commercial	80
Oahu	Hawaii Pacific University	Education	25
Oahu	Plaza at Waikiki	Senior housing	20
Oahu	Waikiki Intl Market Place	Commercial	119.8
Hawaii	Kohanaiki Shores	Residential	93.6
Hawaii	Mauna Lani	Residential	22.1

Hospitality Development

Island	Property	Type	Est. Amount (\$mm)
Maui	Westin Kaanapali Ocean Resort Villas	Hotel	305.5
Maui	West Maui Village	Hotel	47.6
Maui	Four Seasons Manele Bay Hotel	Hotel	85.7
Maui	Wailea Residence Inn	Hotel	29.9
Hawaii	Hilton Resort	Hotel	50.7
Hawaii	Hilo Municipal Golf Course	Golf Course	16.8
Oahu	Hilton Hawaiian Village	Hotel	170.0
Oahu	Lai Ventures Marriott Hotel	Hotel	13.8

Construction Project Approved/Pending Approvals

Island	Property	Type	Est. Amount \$mm
Oahu	Center for West Oahu	Commercial	500
Oahu	Hoopili	11,750 residential homes	4,600
Oahu	Koa Ridge	3,500 residential homes	2,200
Oahu	Kakaako Technology Park	Commercial	73
Oahu	Kings Village	Condo Hotel	NA
Oahu	Keauhou Place	388-unit residential high rise building	300
Oahu	Aeo Tower	466-unit residential high rise building with Whole Food store	390

Real Estate Sales

(% change 2014 to 2015)

Island	Single Family Homes		Condo Homes	
	Closed sales	Median price	Closed sales	Median price
Honolulu	5.2%	3.7%	4.5%	2.9%
Maui	15.0%	2.0%	0.0%	-1.0%
Hawaii	6.5%	4.3%	0.8%	-1.8%
Kauai	4.5%	15.1%	10.1%	7.1%

Source: Hawaii Information Service, the Honolulu Board of Realtors, and Realtors Association of Maui.

2015 Home Median Prices

Island	Single Family Homes	Condo Homes
Honolulu	\$700,000	\$360,000
Maui	\$580,000	\$410,000
Hawaii	\$328,500	\$275,000
Kauai	\$613,500	\$370,000

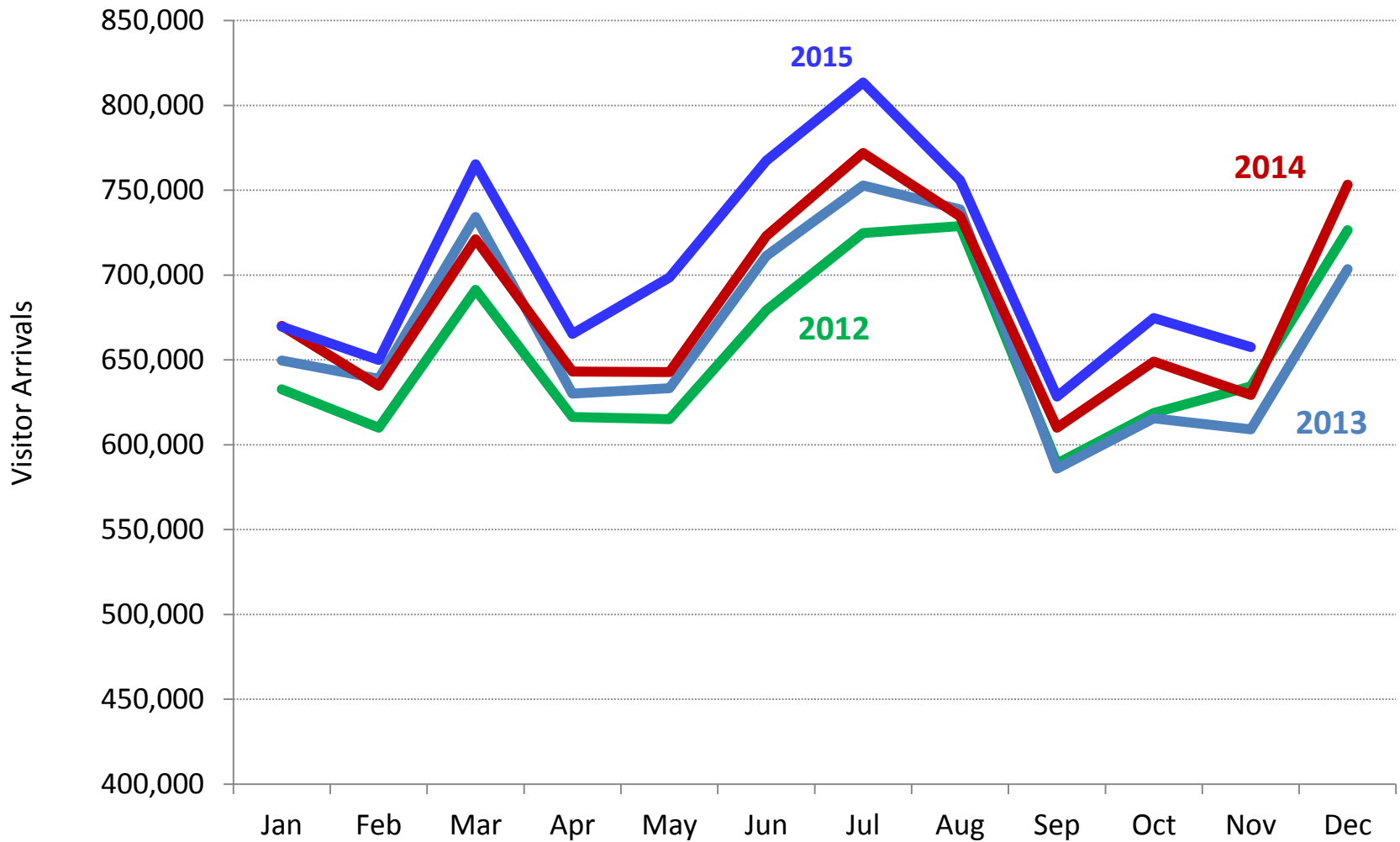
Source: Hawaii Information Service, the Honolulu Board of Realtors, and Realtors Association of Maui.



Tourism Industry



2015 Visitor Arrivals are on Track for a New Record Year



Source: Hawai'i Tourism Authority

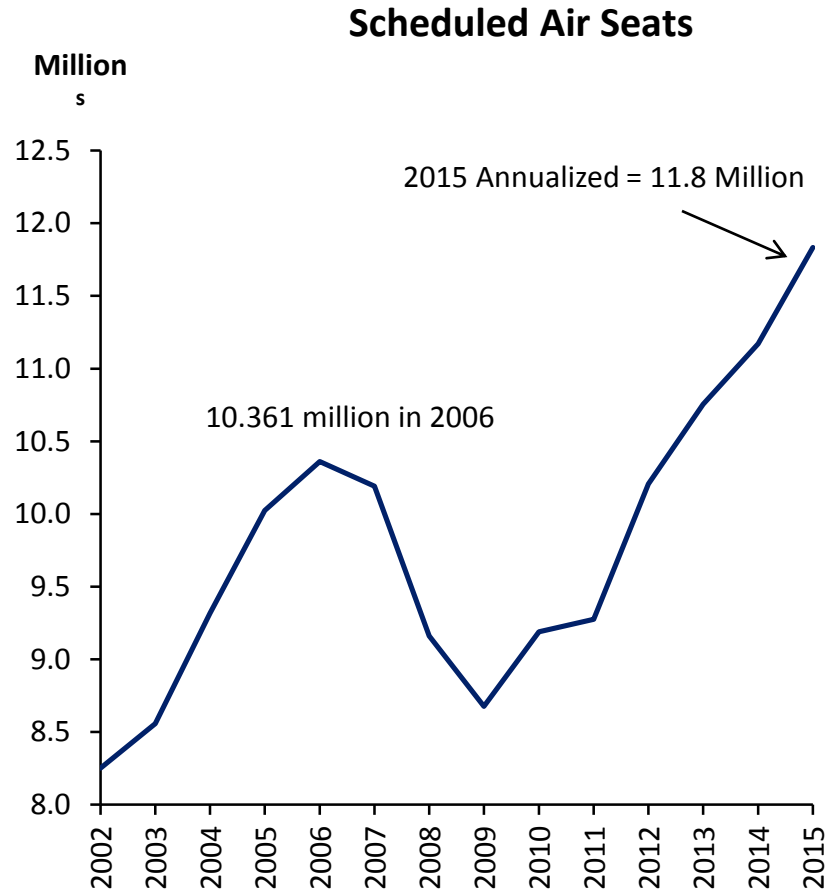
Diversification of Visitor Market

Region	2006 Arrivals	% of Total	Arrivals in Last 12 Month ⁽¹⁾	% of Total
US Mainland	5,173,624	68.7	5,233,684	62.1
Japan	1,362,878	18.1	1,500,274	17.7
Canada	280,920	3.7	526,291	6.2
Australia	117,043	1.6	333,319	4.0
China	54,924	0.7	167,754	2.0
Korea	37,912	0.5	168,422	2.0
Europe	106,032	1.4	143,337	1.7
Latin America	19,020	0.3	29,332	0.3
Others	375,753	5.0	343,531	4.2
Total	7,528,106	100.0	8,445,948	100.0

(1) December 2014 to November 2015
Source: DBEDT and HTA

Added Air Seats in 2015

Arrival City	Air Seats Added in 2015	% Increase
Beijing, CHN	19,349	27.6%
Brisbane, AUS	47,669	89.3%
Chicago, IL	23,767	16.9%
Dallas, TX	22,454	8.6%
Los Angeles, CA	83,929	3.4%
Manila, PHL	26,518	53.1
Oakland, CA	26,601	7.3%
Phoenix, AR	18,740	3.9%
Portland, OR	14,853	4.8%
San Diego, CA	16,183	6.0%
San Francisco, CA	211,786	22.7%
San Jose, CA	44,362	14.2
Seattle, WA	142,862	20.0%
Sydney, AUS	13,795	5.6%
Tokyo – NRT, JPN	17,226	1.8
Vancouver, CAN	54,432	16.1%
Other ⁽²⁾	-121,894	-3.8%
Total	662,632	5.9%



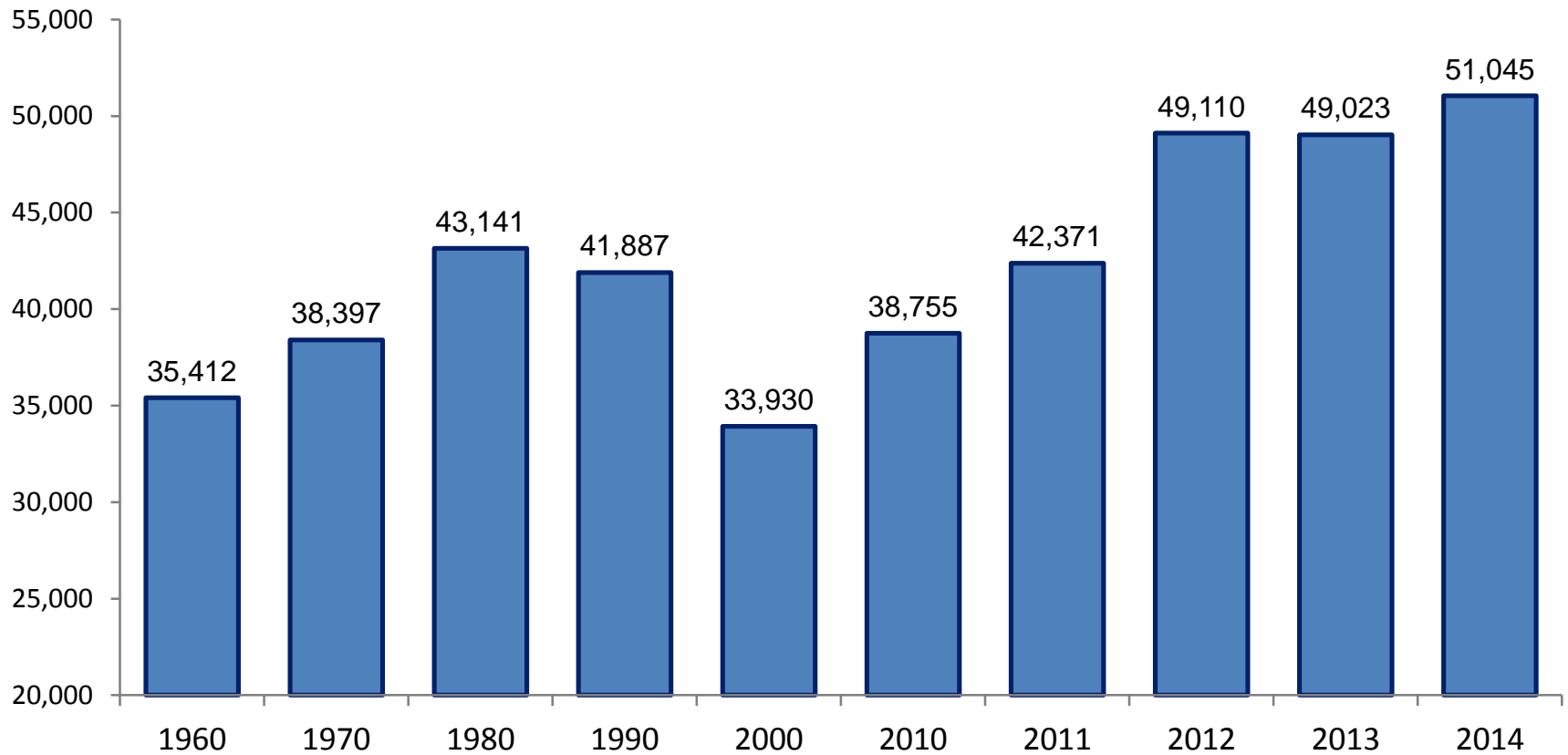
Virgin America started new daily flights from SFO to HNL on November 2, 2015 and started SFO flights to OGG on December 3, 2015; Jin Air started new 5 flights per week from Seoul to HNL on December 19, 2015

Source: Hawai'i Tourism Authority and DBEDT.

Military Presence in Hawaii is the Highest Since WWII



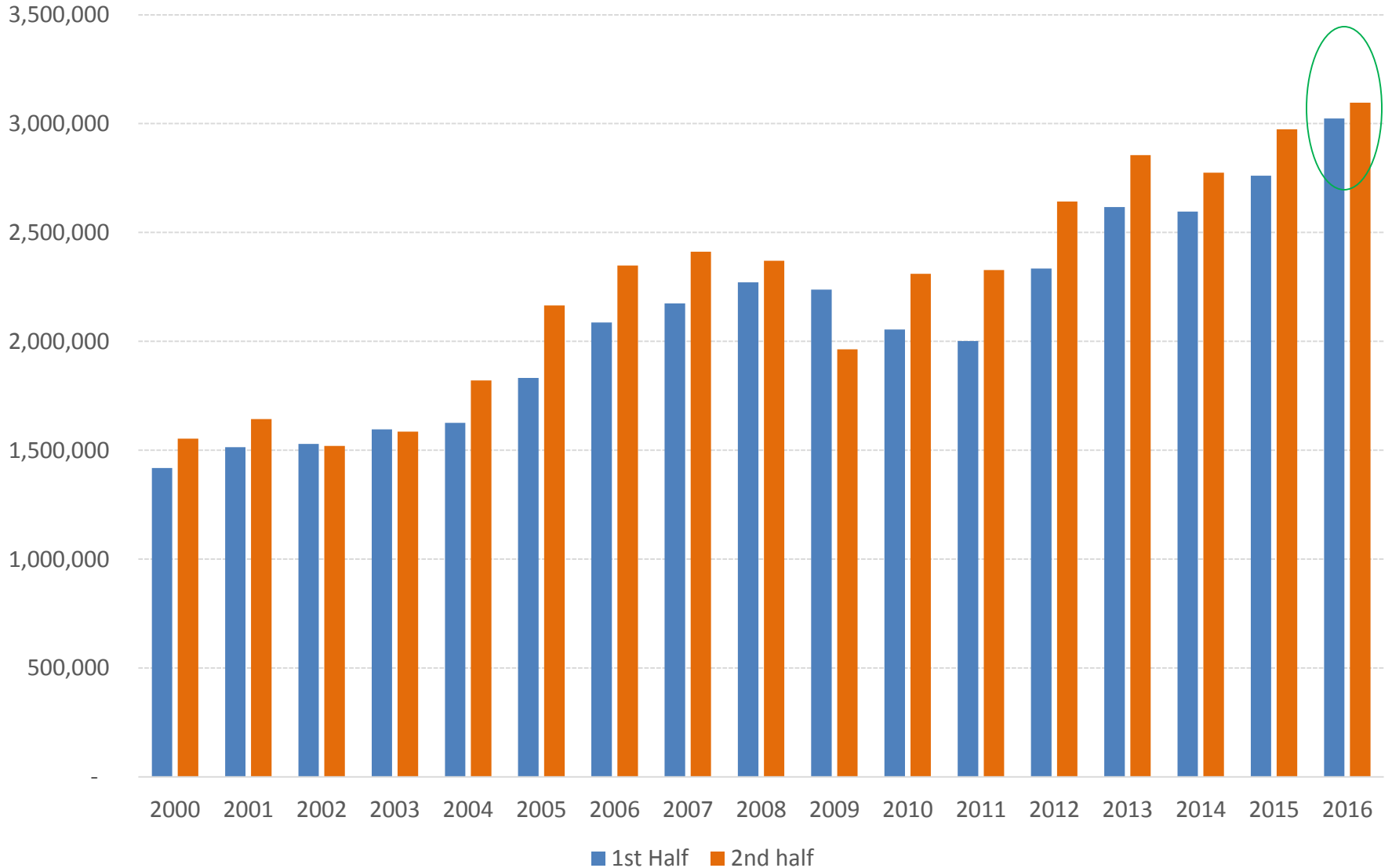
Active Duty Personnel in Hawai'i



Source: U.S. Department of Defense.

State General Fund Tax Revenue

COR's January 7, 2016 forecast might be conservative



Summary

- All the economic indicators show that Hawaii's economy is on a normal growth path
- Visitor industry growth will be slowing down due to capacity limit but arrivals will create new record in 2015 and 2016
- Labor market will continue to improve in 2016
- Construction industry will continue to expand in 2016
- Hawaii's economy will grow at the similar rate as the nation in 2016
- Hawaii's unemployment rate will still be better than the nation in 2016