

Big Island housing economics

slides prepared for the
Hawaii Island REALTORS®

DHHL Waimea Hale

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TZ Economics, Kailua, Hawaii
with research assistance
by Max Alexander

July 18, 2013

TZ E C O N O M I C S



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1. [Macroeconomic snapshot](#)
2. [Big Island housing market trends](#)
3. [Evolving Big Island home price distributions](#)
4. [Longer term housing valuation trends](#)

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5. [Question about inflation](#)

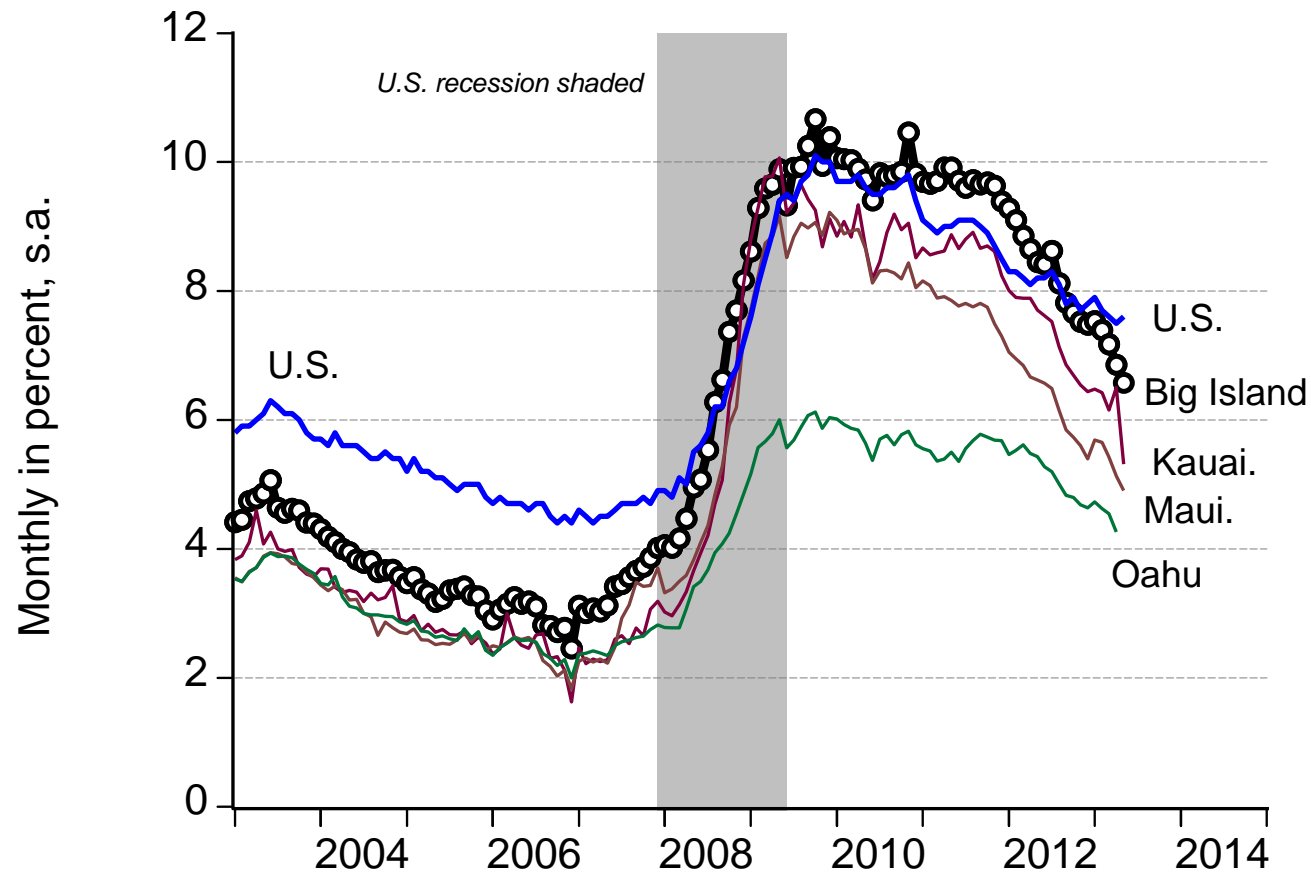


Big Island macroeconomic snapshot

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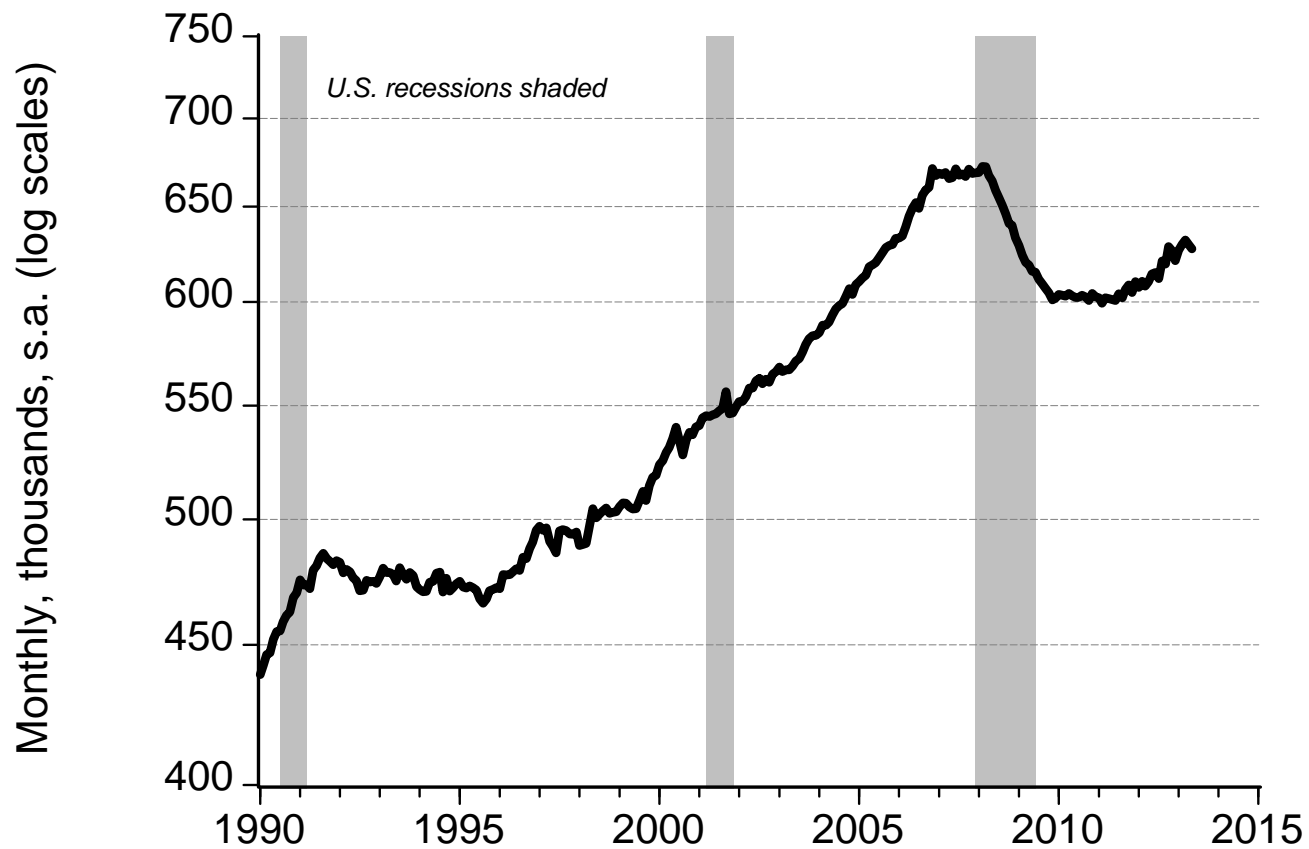
Hawaii unemployment rates



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Source: Hawaii DLIR, Hawaii DBEDT; seasonal adjustment by TZ Economics

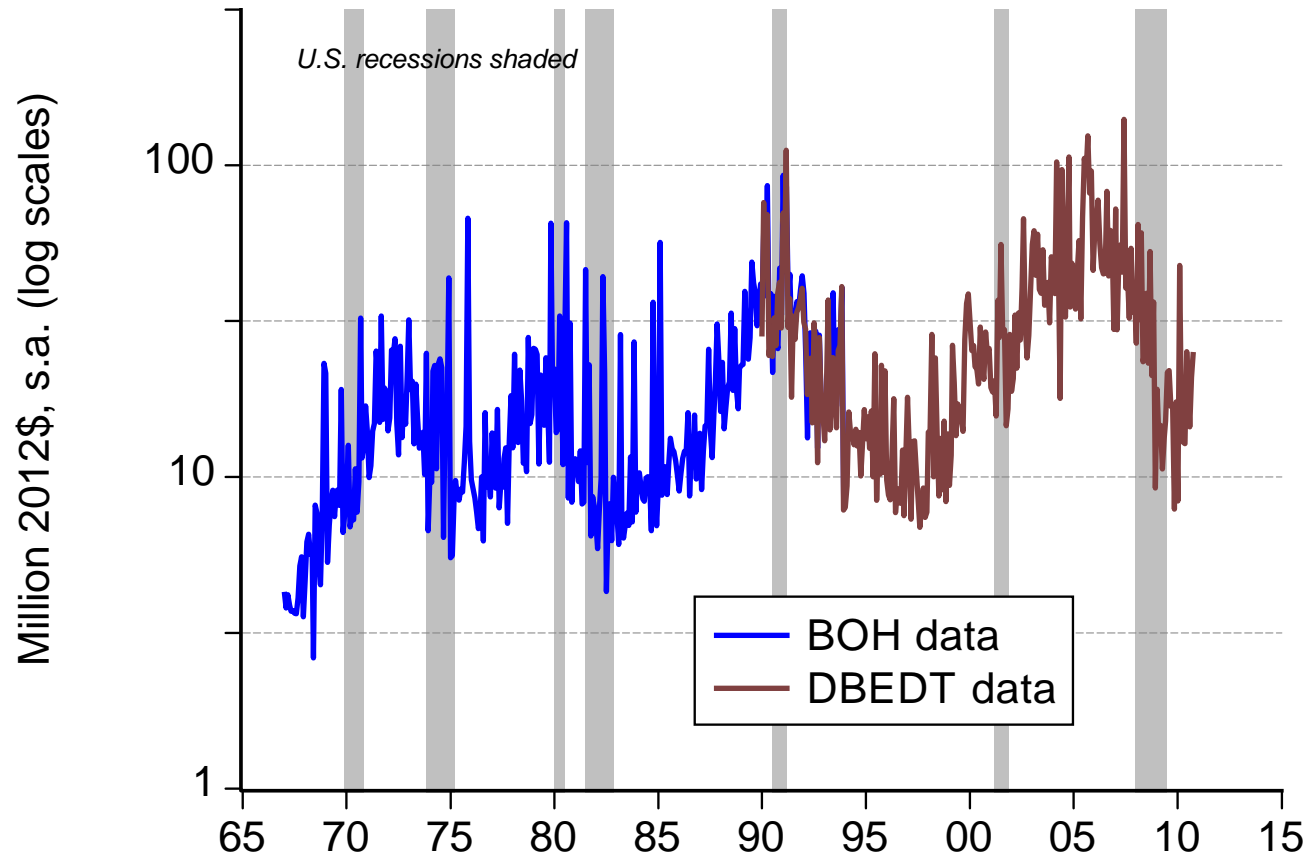
Big Island non-agricultural payroll employment



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Source: Hawaii DLIR, Hawaii DBEDT; seasonal adjustment by TZ Economics

Big Island real monthly residential building permits: coming out of the low ebb of the cycle

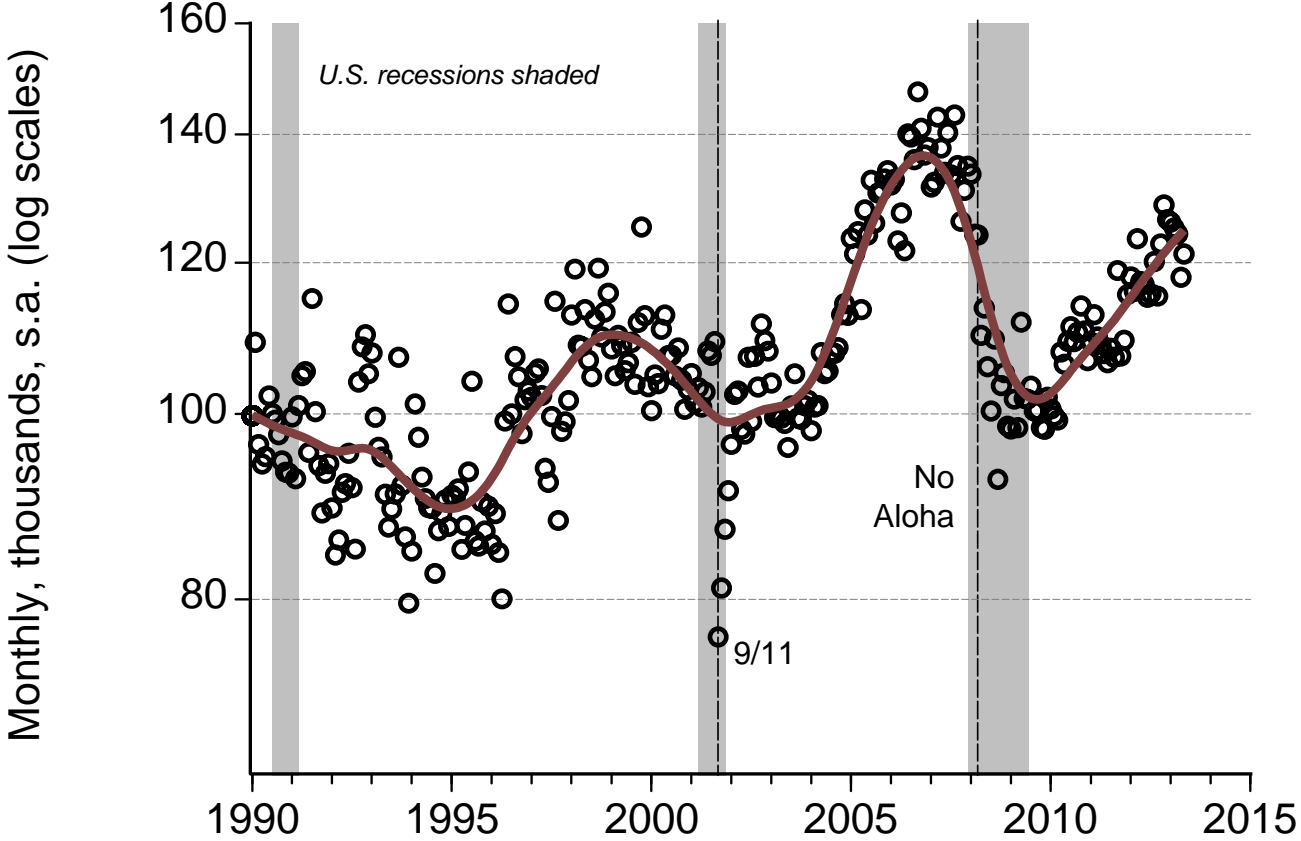


Slide copyright 2013, TZ Economics

Source: County building department, Hawaii DBEDT, Bank of Hawaii, TZE database; seasonal adjustment, trend extraction by TZ Economics



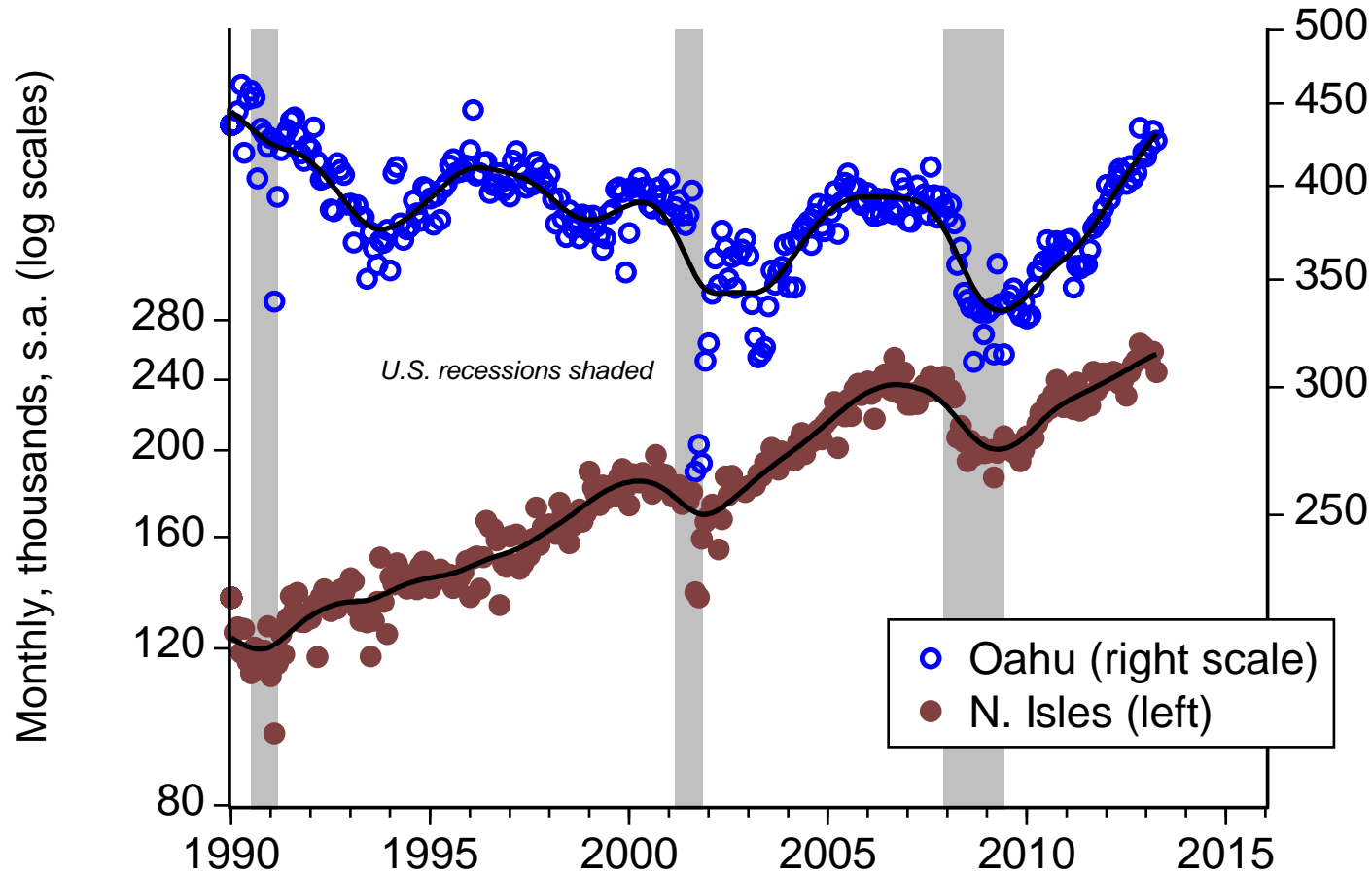
Big Island monthly total visitor arrivals



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Source: Monthly data through May 2013 from Hawaii Tourism Authority, Hawaii DBEDT; seasonal adjustment, trend extraction by TZ Economics

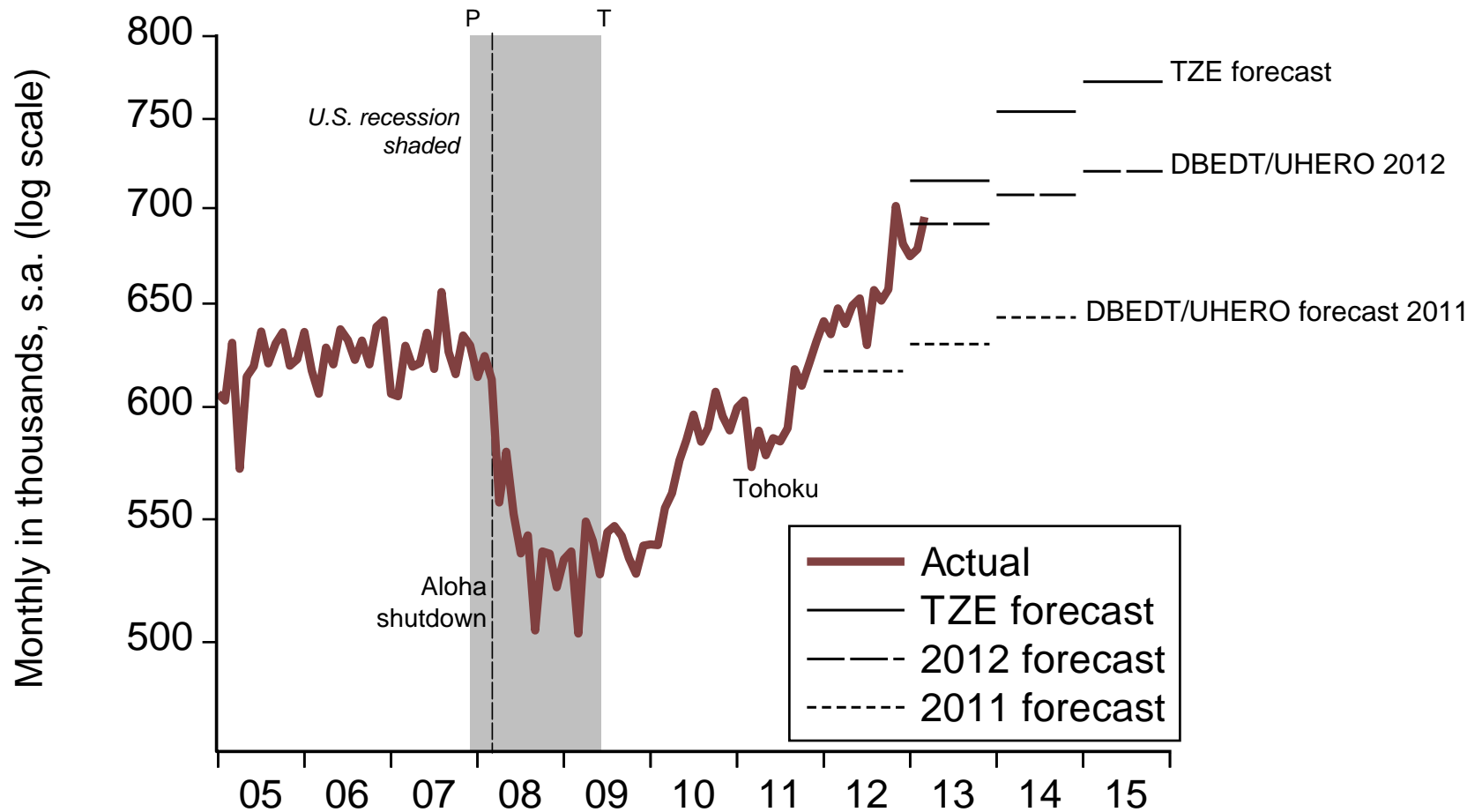
Visitor arrivals: reversing 20 years of Oahu decline; extending the Neighbor Island's emergence



Slide copyright 2013, TZ Economics

Source: Monthly data through April 2013 from Hawaii Tourism Authority, Hawaii DBEDT; seasonal adjustment, trend extraction by TZ Economics

Published 2013 forecasts for total Hawaii visitor arrivals seem likely to be too low

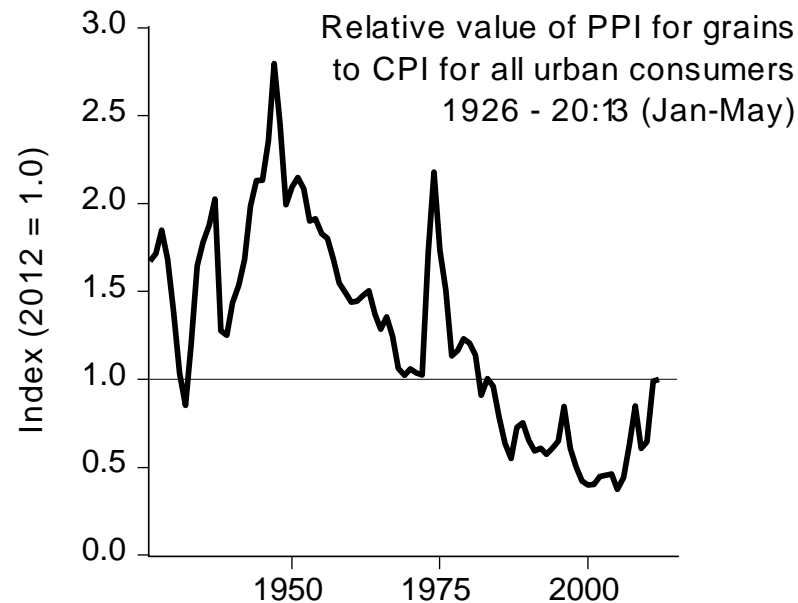


Slide copyright 2013, TZ Economics

Source: Data through March 2013 from HTA, Hawaii DBEDT; forecasts from DBEDT and UHERO (FHB 2011 only); TZE is source of seasonal adjustment (Census X-12 ARIMA filter) and forecast from *trend components* of tax revenue model for January 2013 HIPA conference

Hawaii statewide macroeconomic fundamentals

- *Tourism:* volumes never have been better—this year’s visitor count 8.3-8.5 million will be up to a million higher than previous all-time highs (2006-2007) but real tourism expenditure yields not quite a peak; Big Island pulling up the rear
- *Employment:* except for construction, near complete jobs recovery—jurisdictions are slow to allocate sufficient entitlement, but construction will recover; again Big Island slower comeback
- *Inflation:* aside from 2001 oil/commodity shock (transitory inflation impulse), on track in Hawaii for Honolulu CPI-U inflation to match or run slightly above the Fed’s U.S. monetary policy goal of 2 percent inflation (see appendix on inflation)



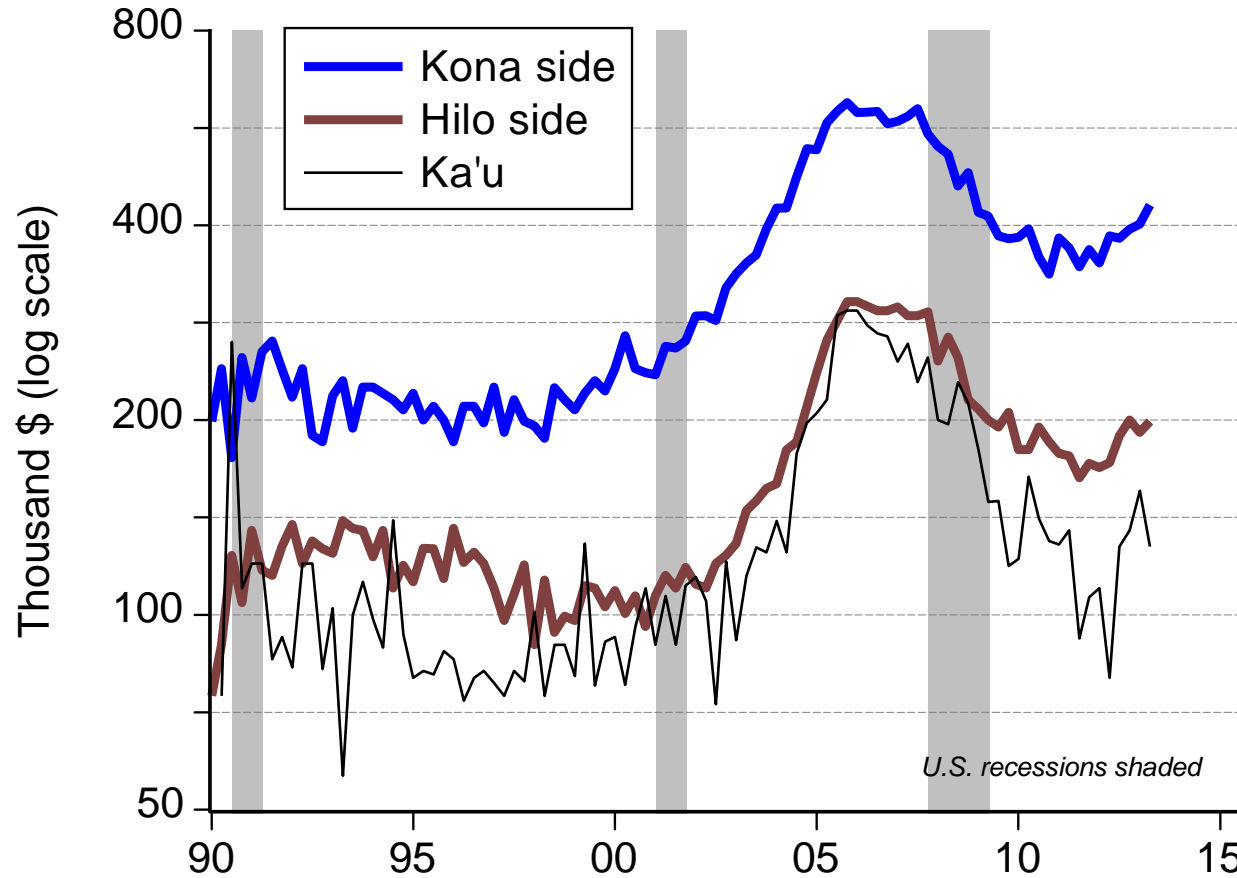
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Big Island housing market trends

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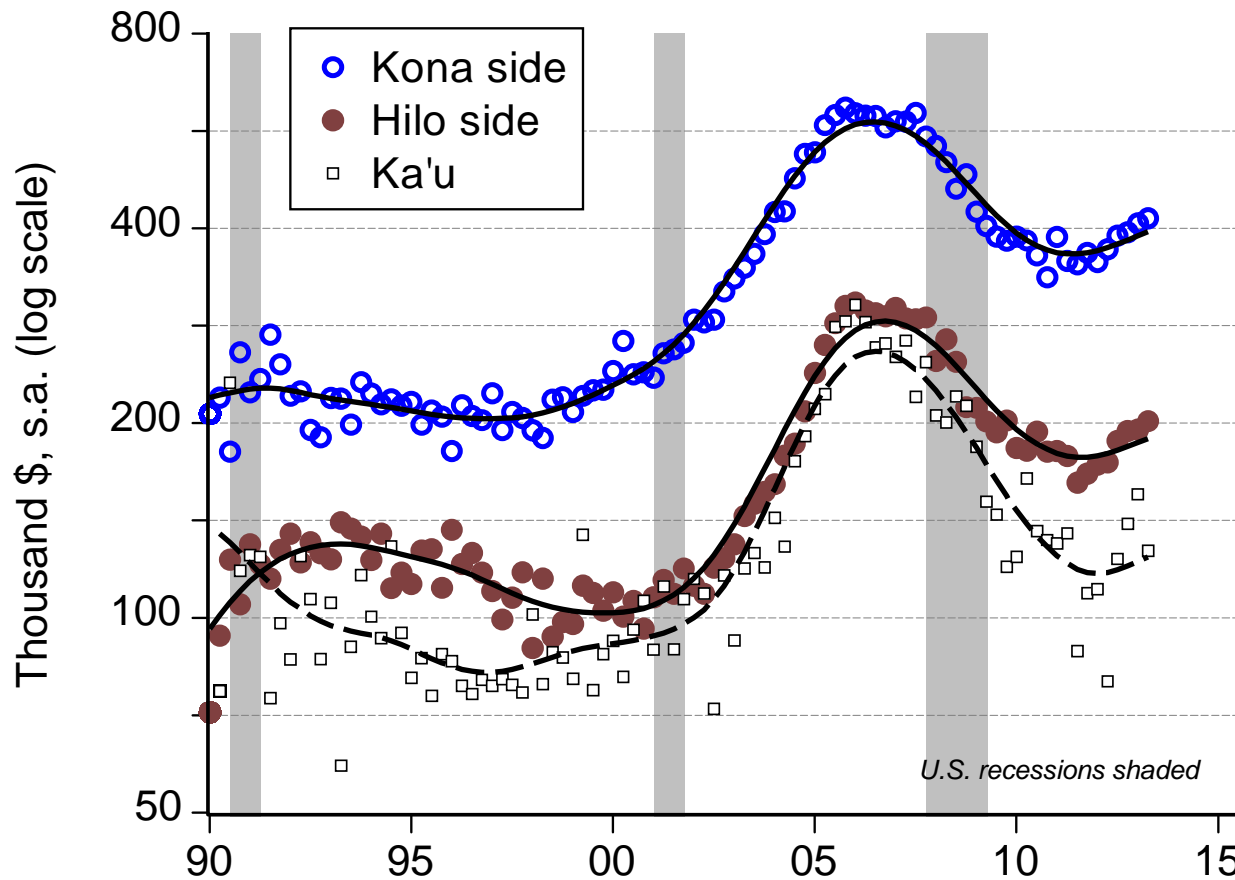
Big Island quarterly single-family median existing home sales prices (raw data, n.s.a.)



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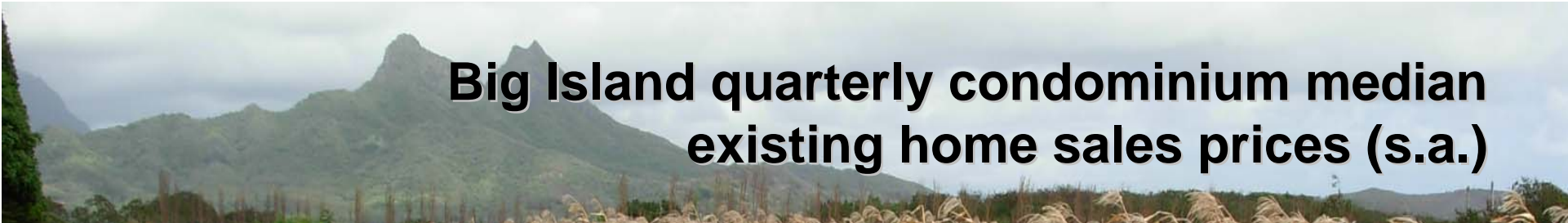
Source: Hawaii Island Board of Realtors, Hawaii Information Service; aggregations by TZ Economics with assistance from Max Alexander

Big Island quarterly single-family median existing home sales prices (seasonally-adjusted)

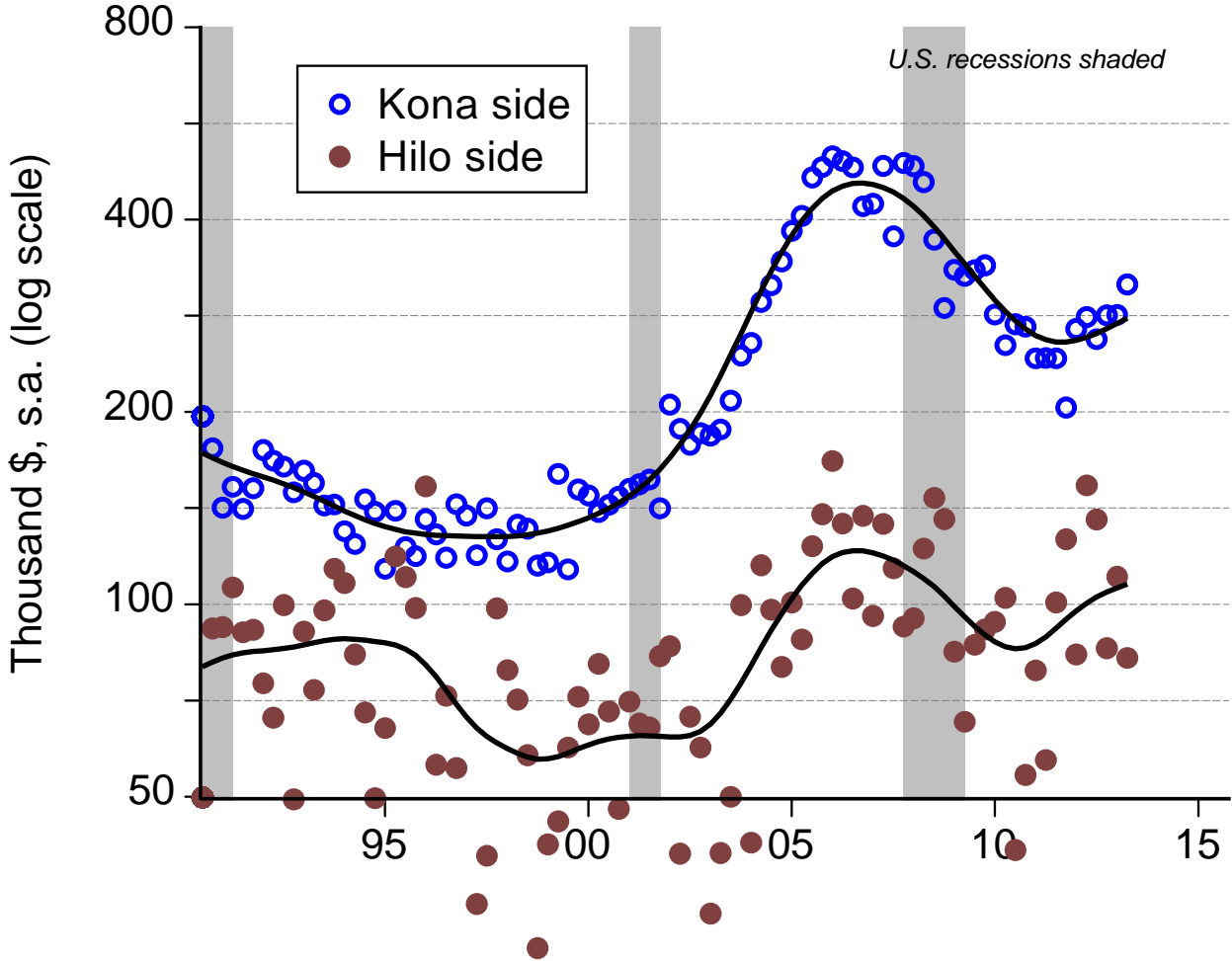


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Source: Hawaii Island Board of Realtors, Hawaii Information Service; aggregations with assistance from Max Alexander, seasonal adjustment and trend extraction by TZE



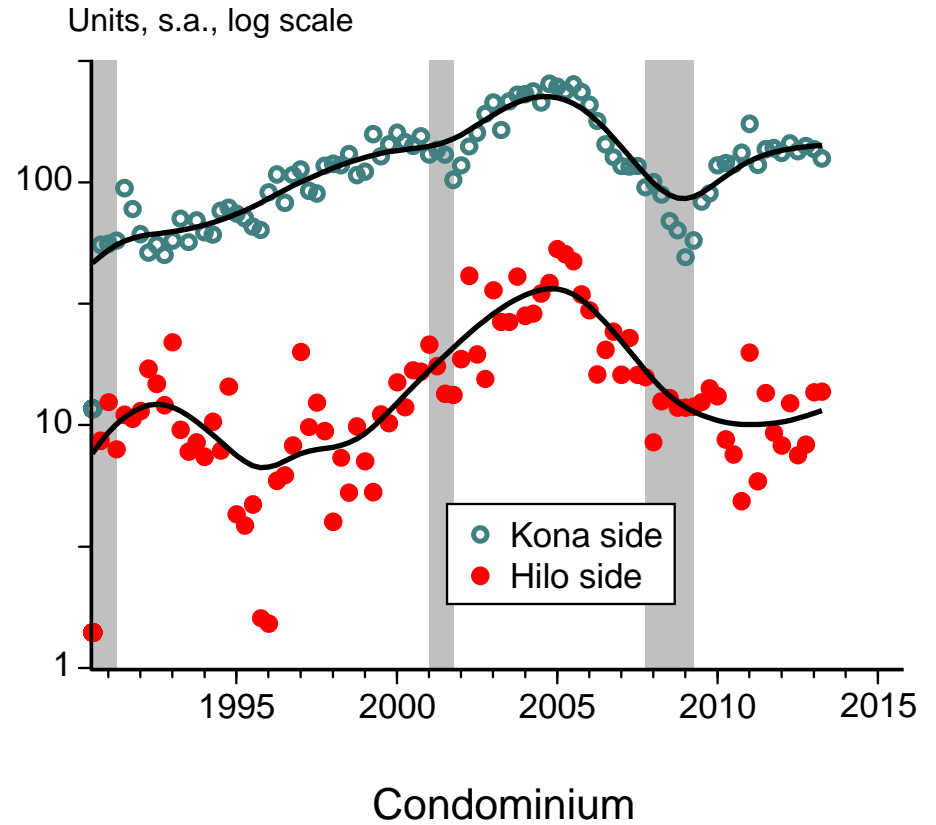
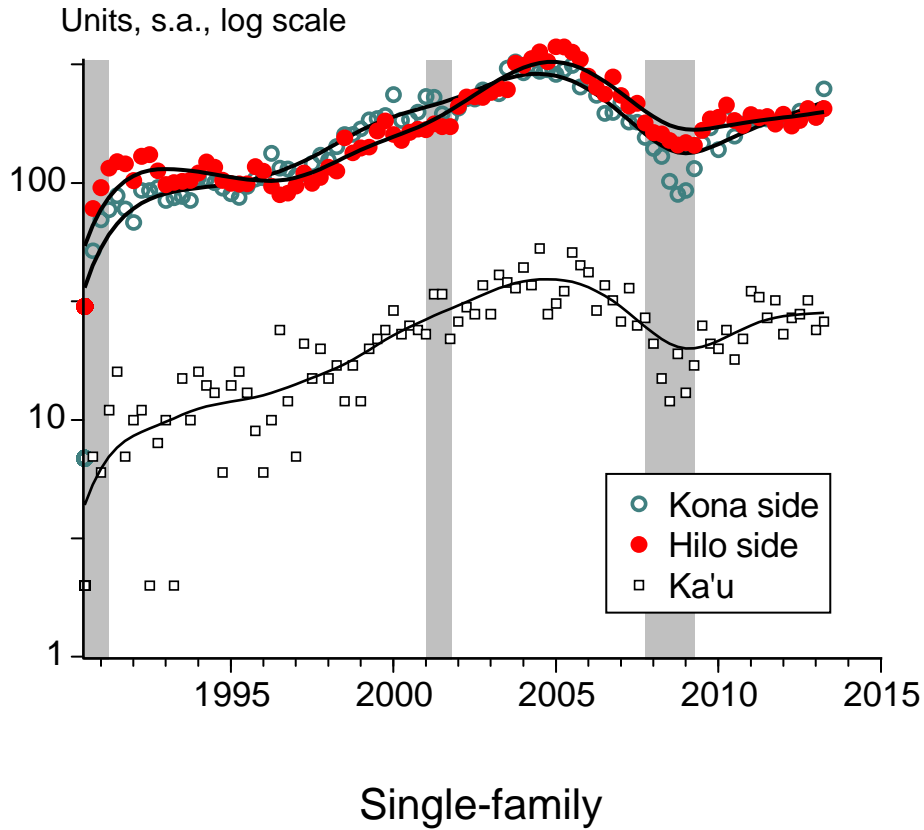
Big Island quarterly condominium median existing home sales prices (s.a.)



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Source: Hawaii Island Board of Realtors, Hawaii Information Service; aggregations with assistance from Max Alexander, seasonal adjustment and trend extraction by TZE

Quarterly Big Island existing home sales volumes



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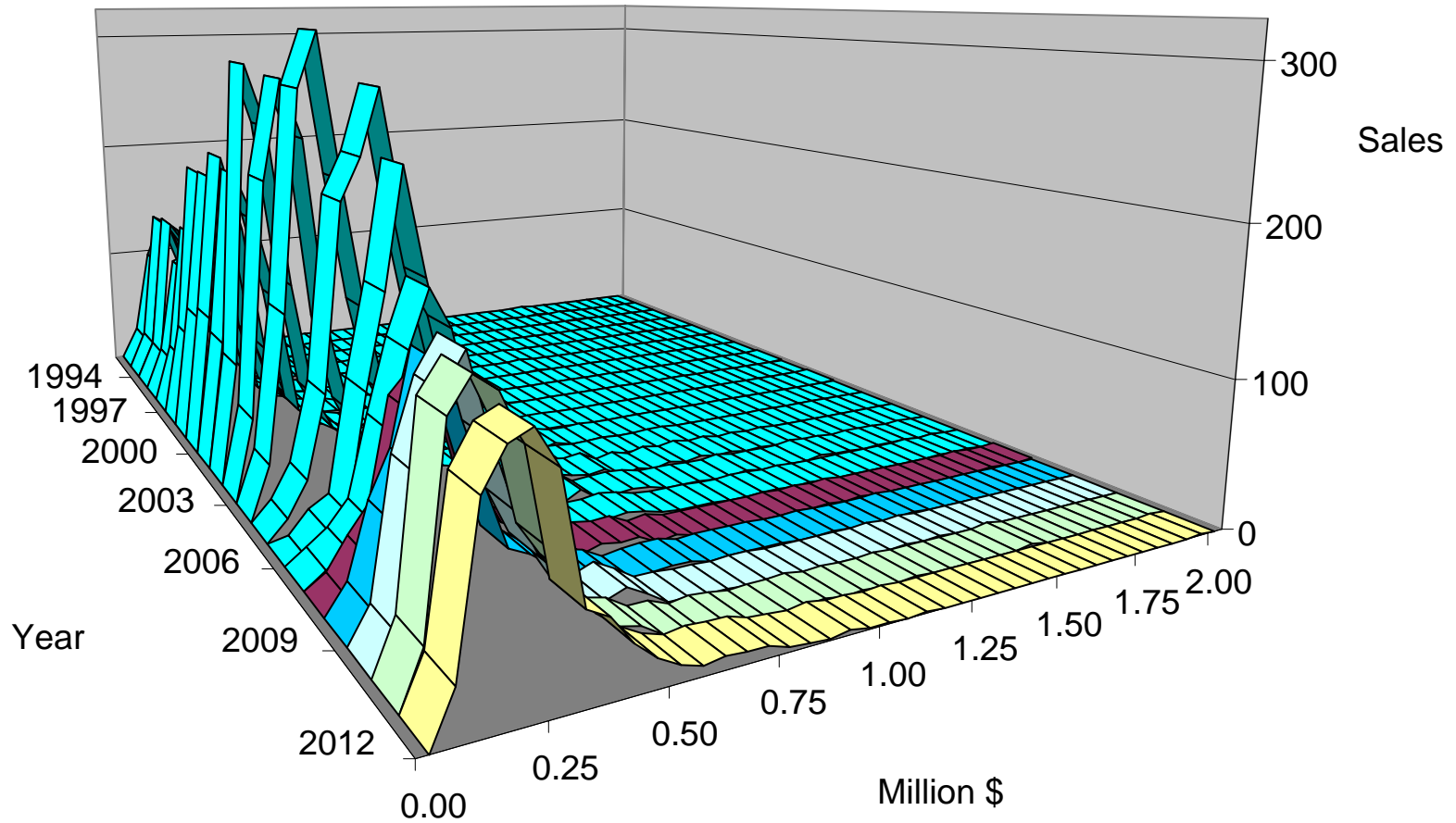
Source: Hawaii Island Board of Realtors, Hawaii Information Service; aggregations with assistance from Max Alexander, seasonal adjustment and trend extraction by TZE



Home price distributions, higher-order moments

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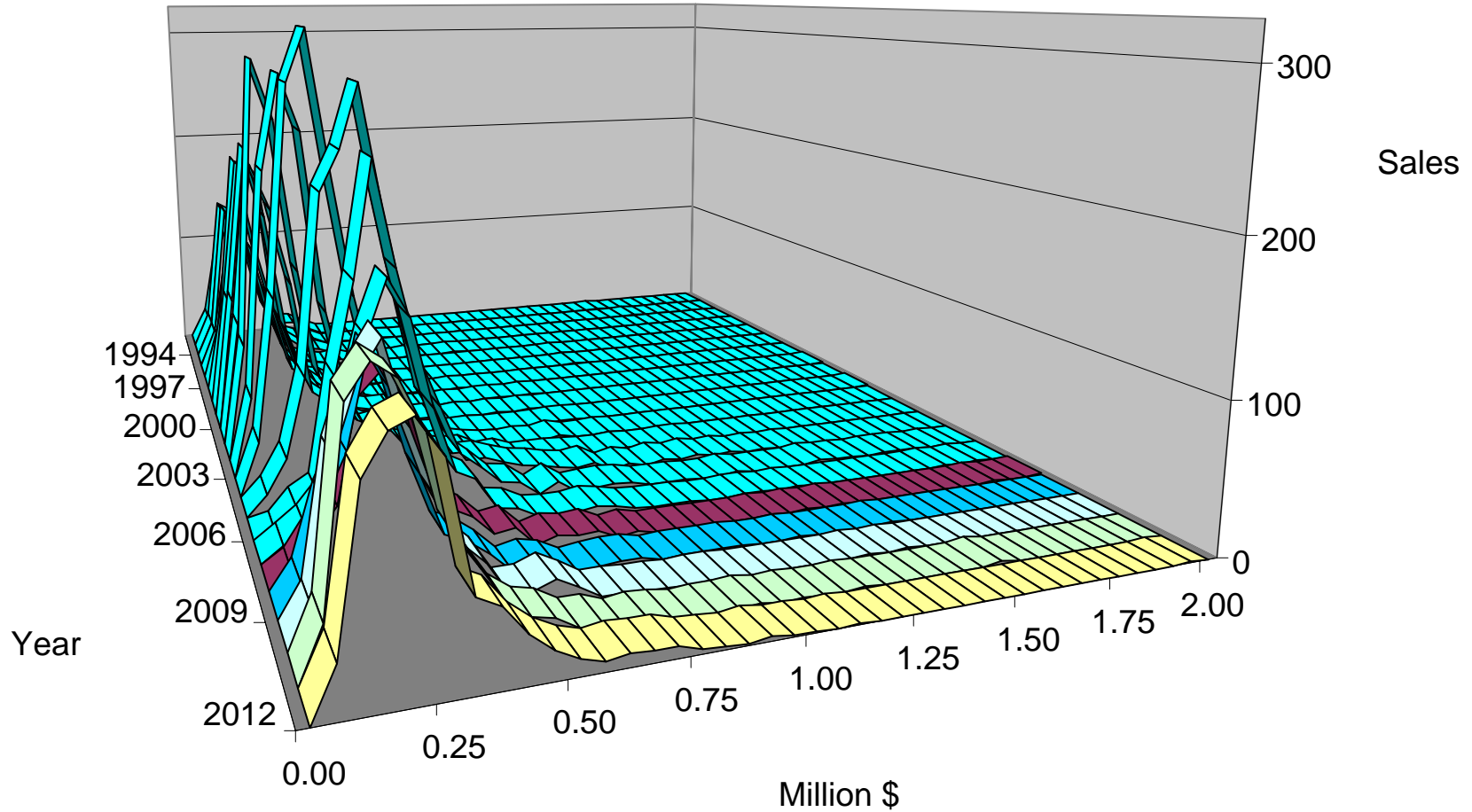
Hilo-side single-family annual home price distributions



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Source: Hawaii Island Board of Realtors, Hawaii Information Service; aggregations with assistance from Max Alexander, histograms and summary statistics calculated by TZE

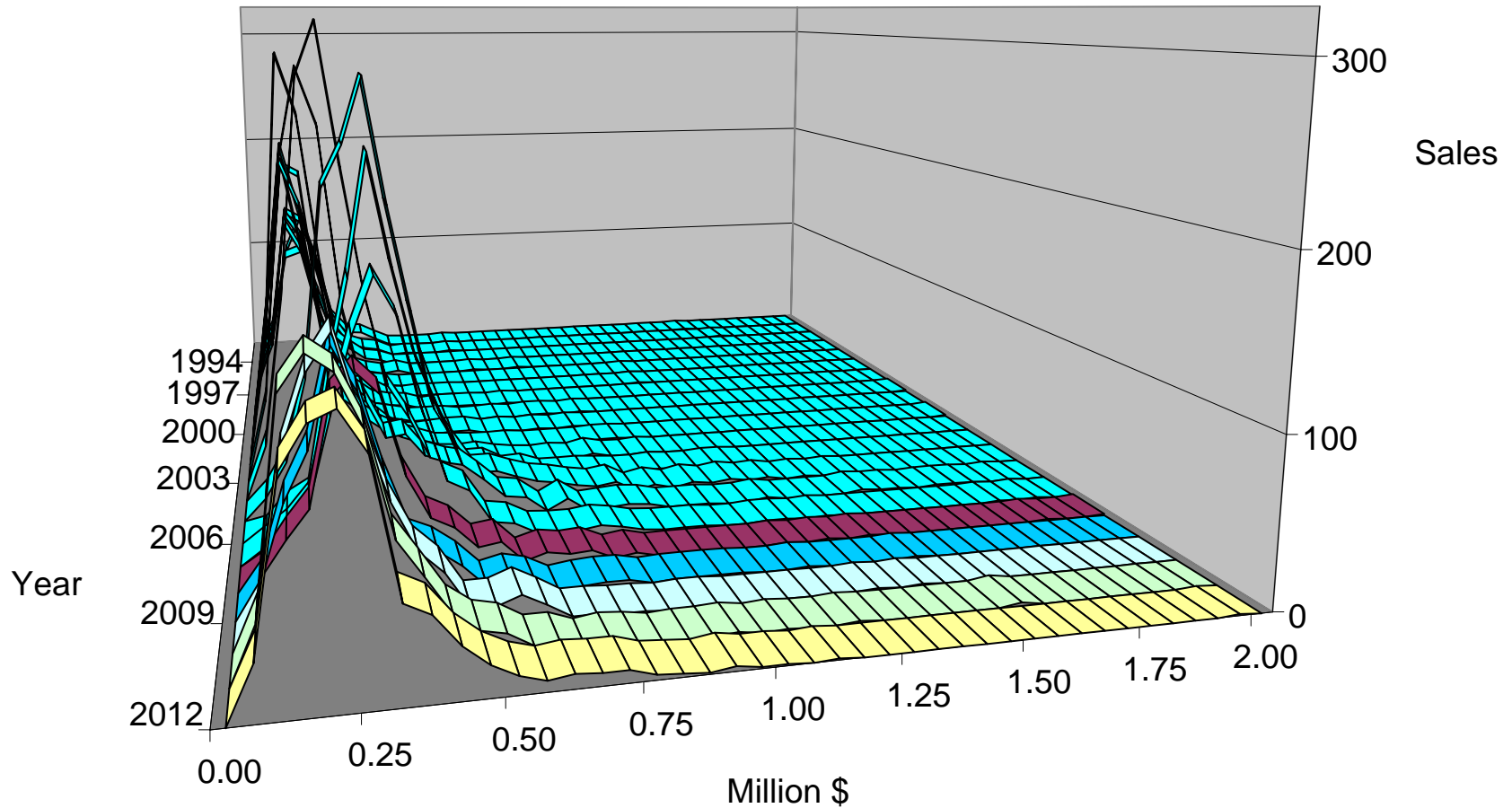
Hilo-side single-family annual home price distributions



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Source: Hawaii Island Board of Realtors, Hawaii Information Service; aggregations with assistance from Max Alexander, histograms and summary statistics calculated by TZE

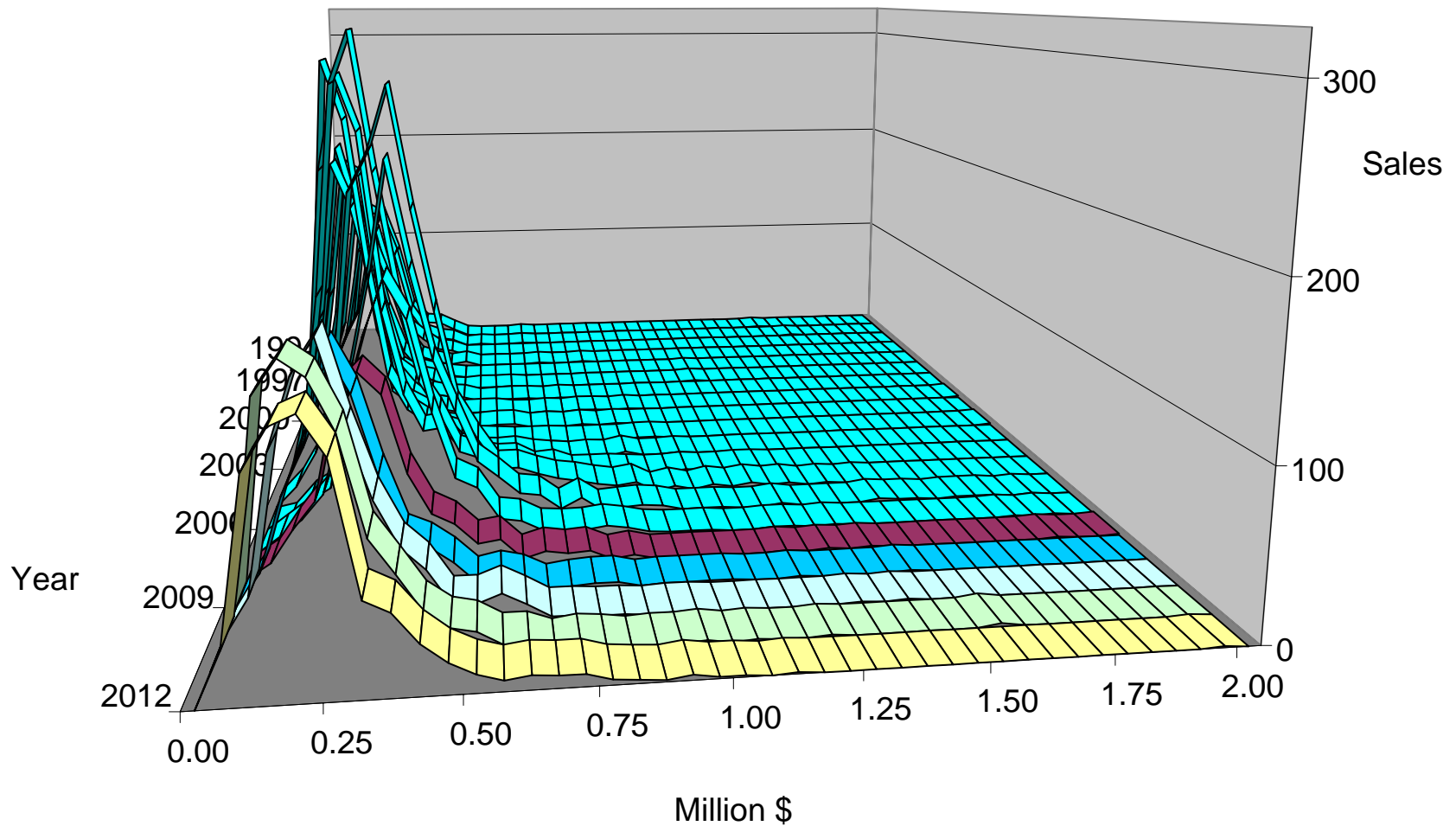
Hilo-side single-family annual home price distributions



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Source: Hawaii Island Board of Realtors, Hawaii Information Service; aggregations with assistance from Max Alexander, histograms and summary statistics calculated by TZE

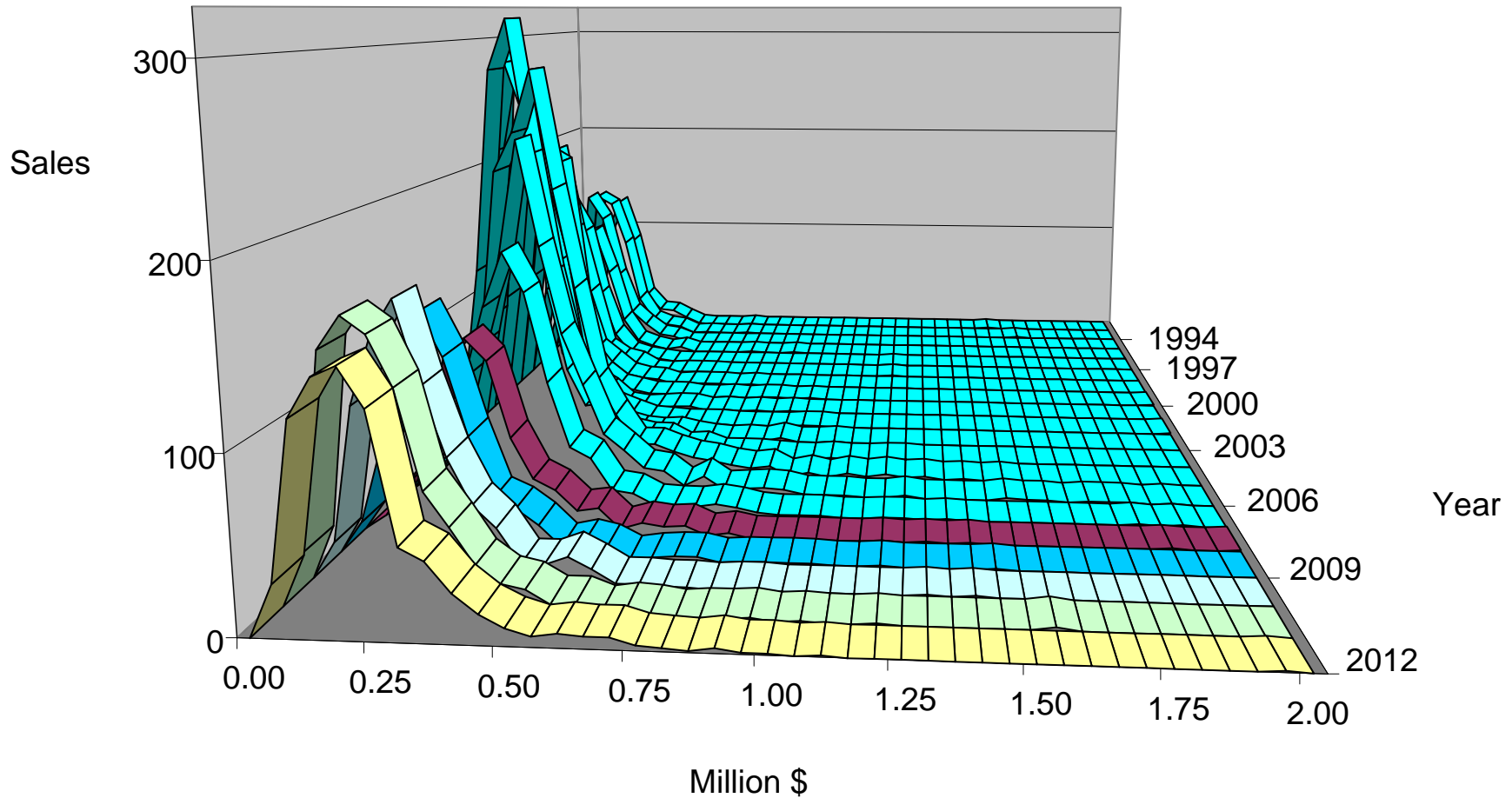
Hilo-side single-family annual home price distributions



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Source: Hawaii Island Board of Realtors, Hawaii Information Service; aggregations with assistance from Max Alexander, histograms and summary statistics calculated by TZE

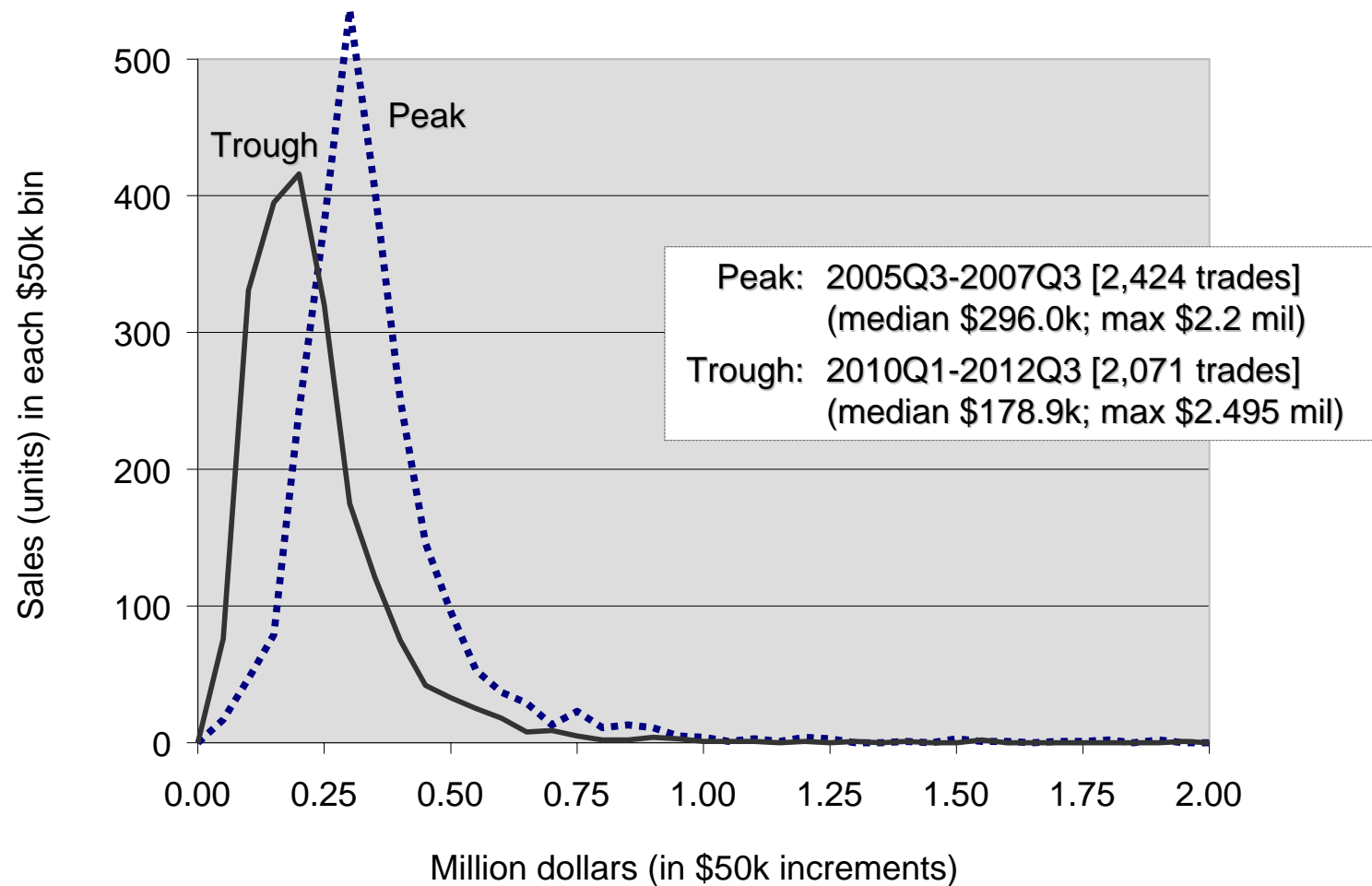
Hilo-side single-family annual home price distributions



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Source: Hawaii Island Board of Realtors, Hawaii Information Service; aggregations with assistance from Max Alexander, histograms and summary statistics calculated by TZE

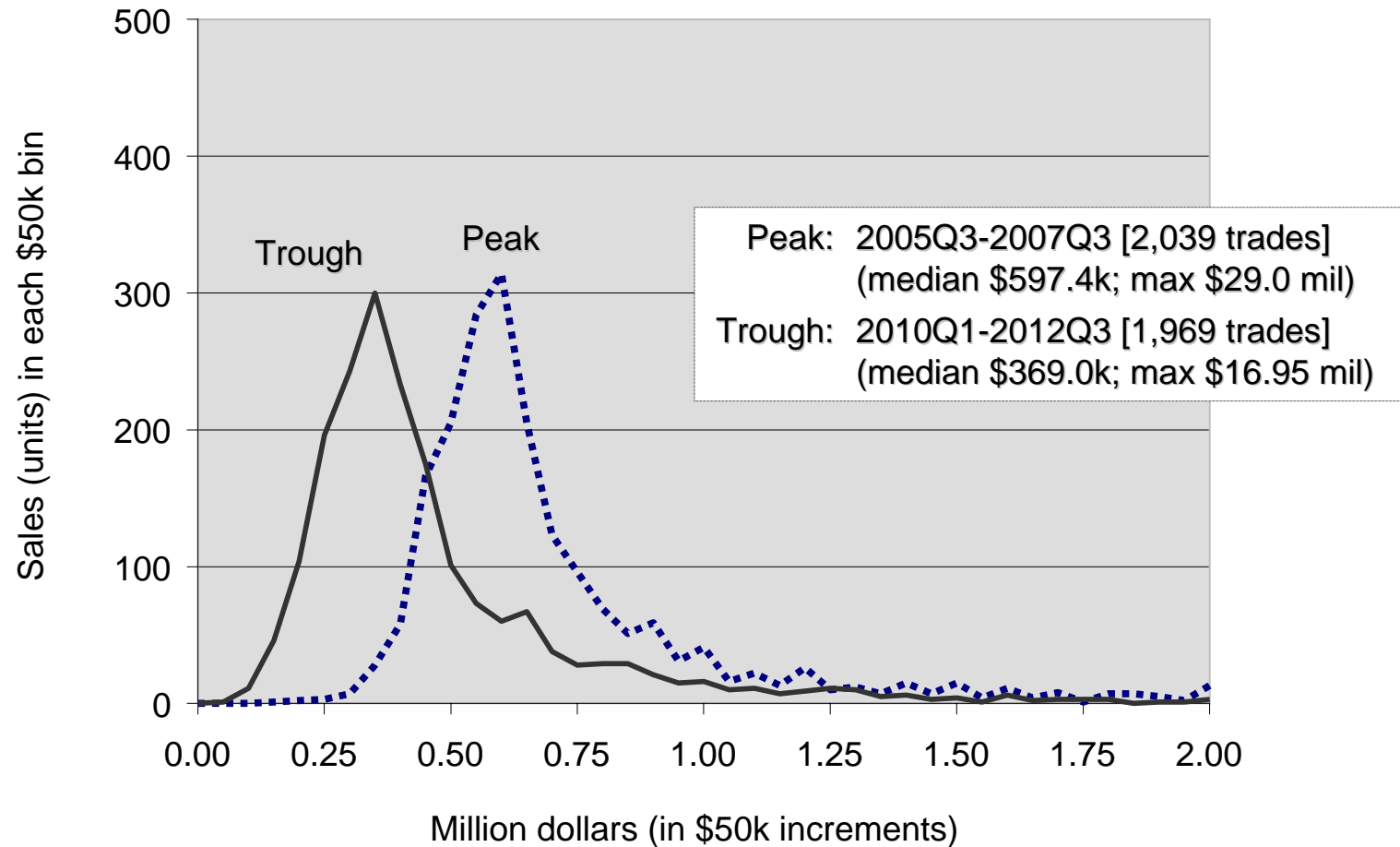
Hilo-side peak and trough SF valuation distributions



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Source: Hawaii Island Board of Realtors, Hawaii Information Service; aggregations with assistance from Max Alexander, histograms and summary statistics calculated by TZE

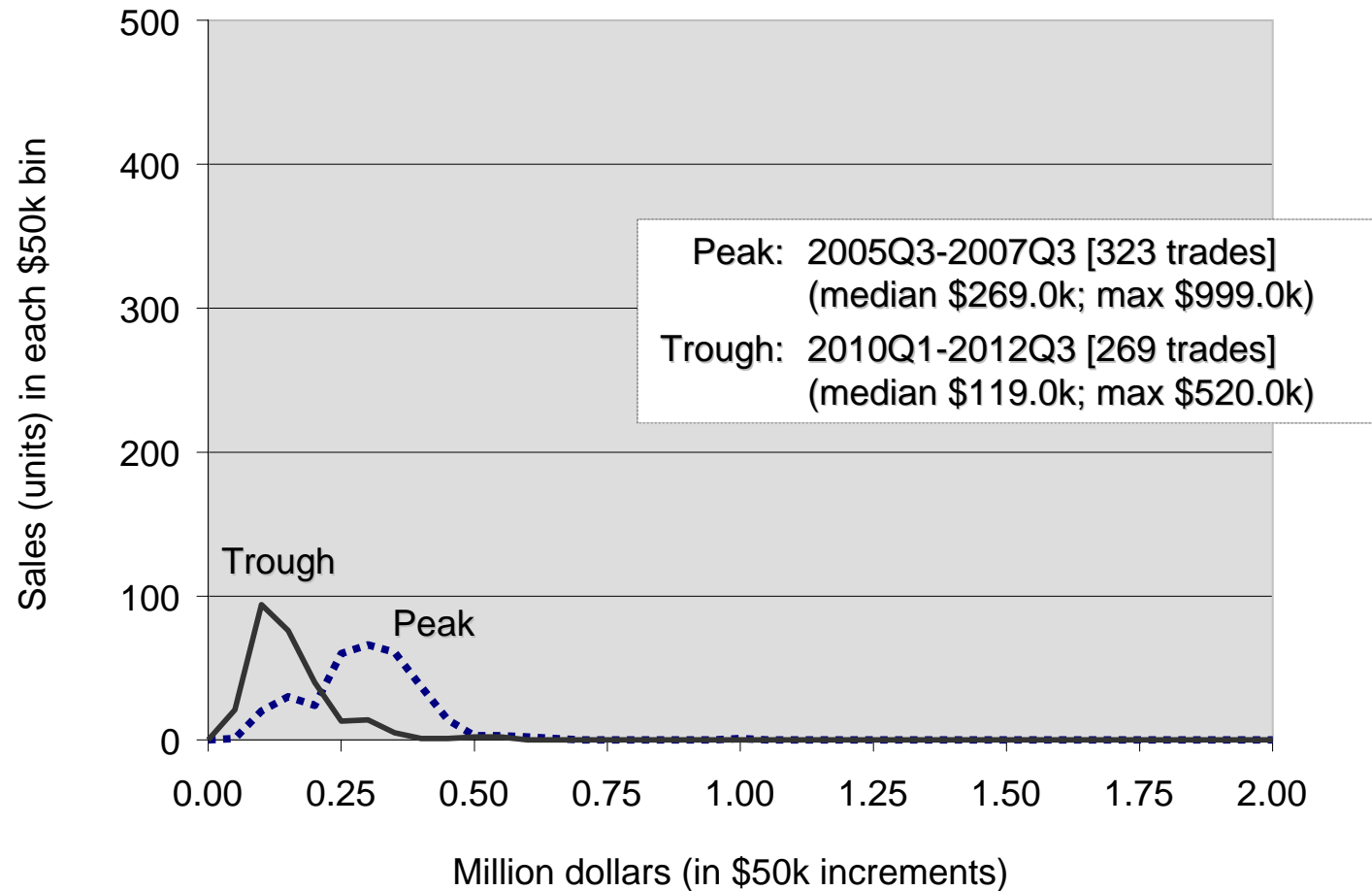
Kona-side peak and trough SF valuation distributions



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Source: Hawaii Island Board of Realtors, Hawaii Information Service; aggregations with assistance from Max Alexander, histograms and summary statistics calculated by TZE

Ka'u peak and trough SF valuation distributions

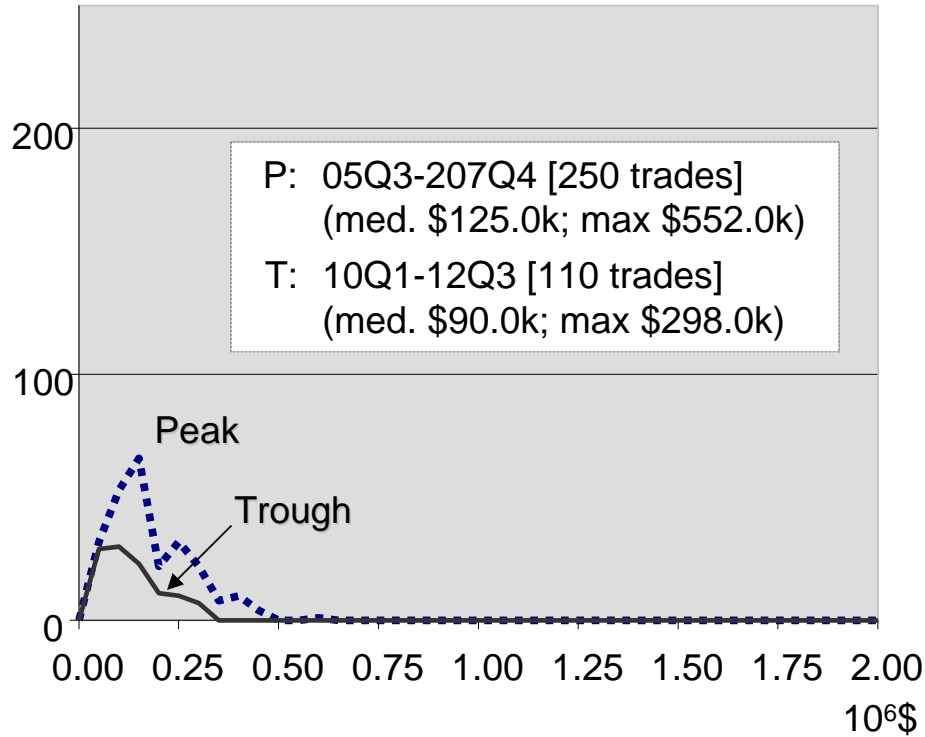


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Source: Hawaii Island Board of Realtors, Hawaii Information Service; aggregations with assistance from Max Alexander, histograms and summary statistics calculated by TZE

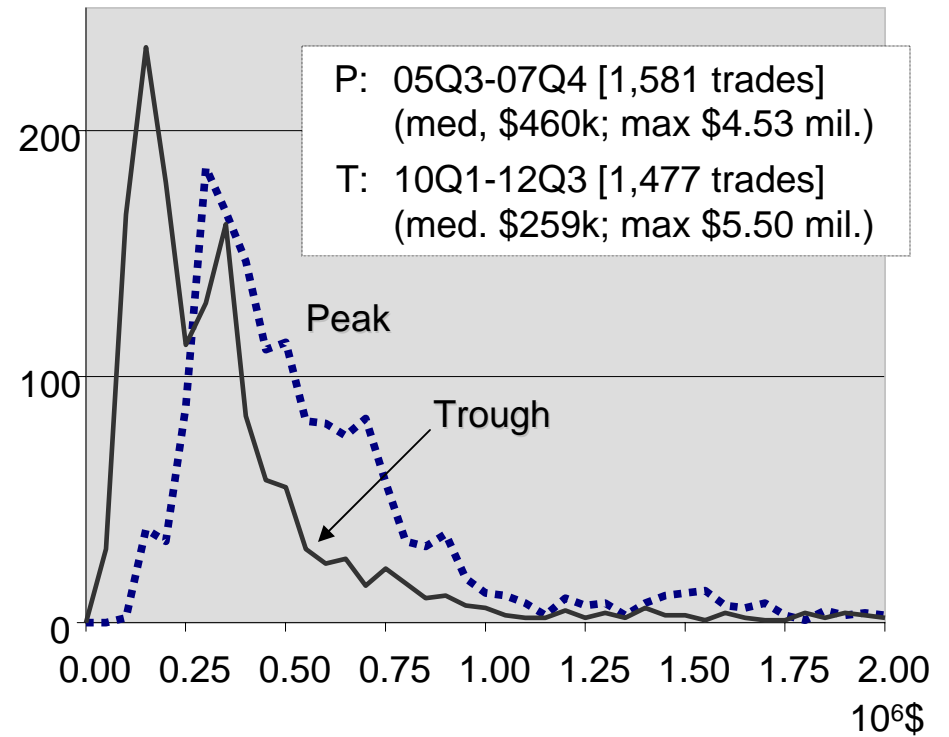
Condominium peak and trough valuation distributions

Sales
(units)



Hilo

Sales
(units)

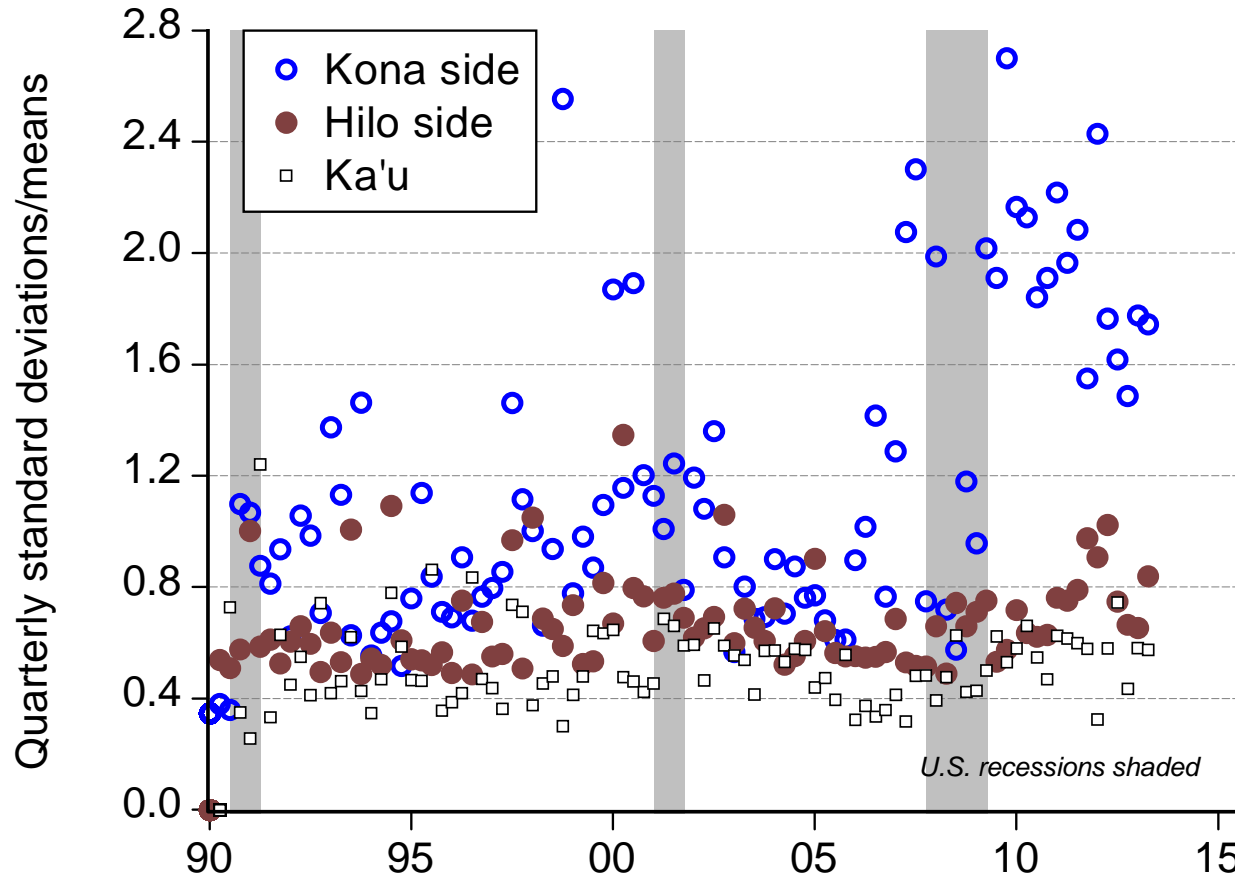


Kona

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Source: Hawaii Island Board of Realtors, Hawaii Information Service; aggregations with assistance from Max Alexander, histograms and summary statistics calculated by TZE

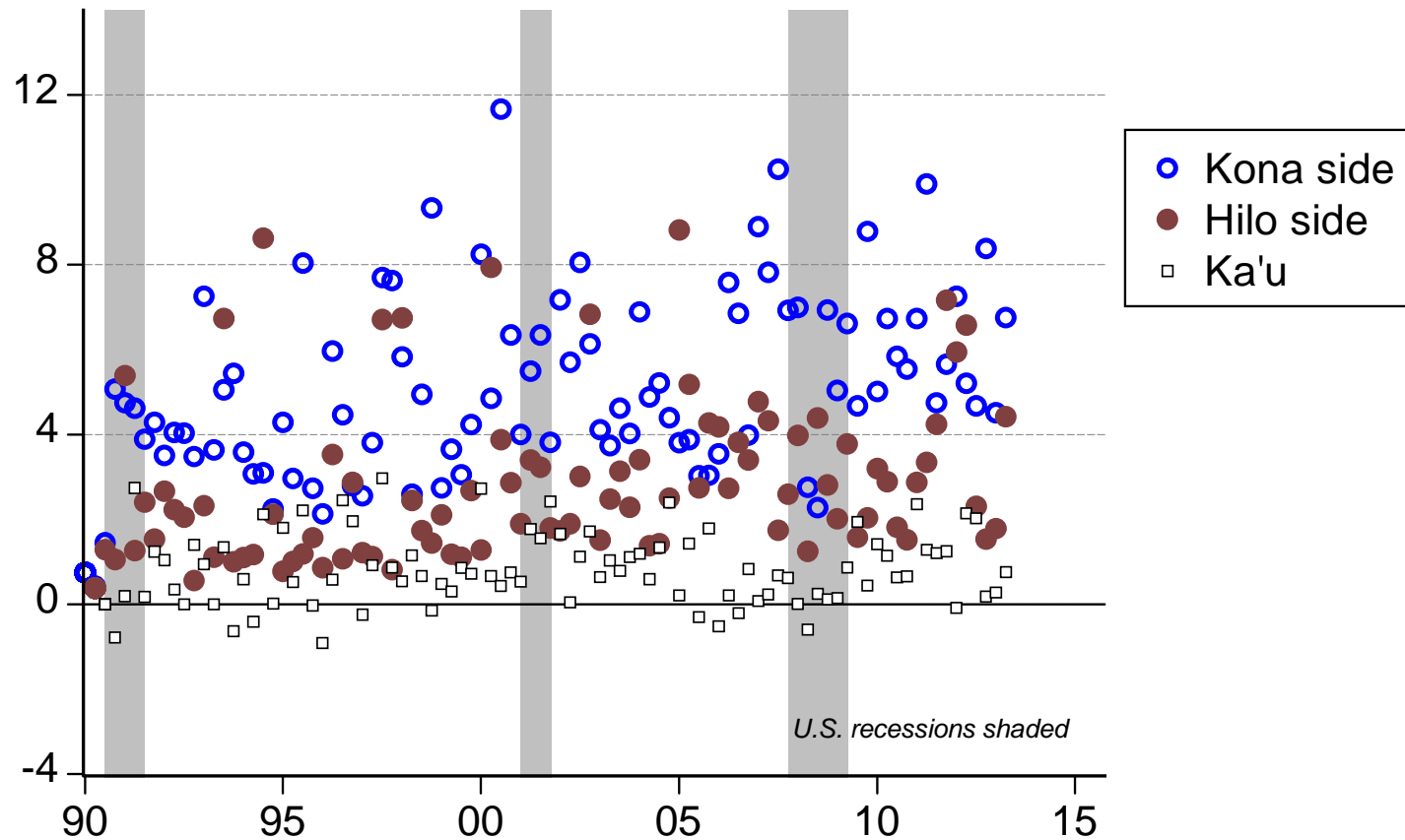
Big Island single-family existing home sales prices: normalized standard deviations



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Source: Hawaii Island Board of Realtors, Hawaii Information Service; aggregations with assistance from Max Alexander, ratios of second to first moments calculated on seasonally-adjusted prices by TZE

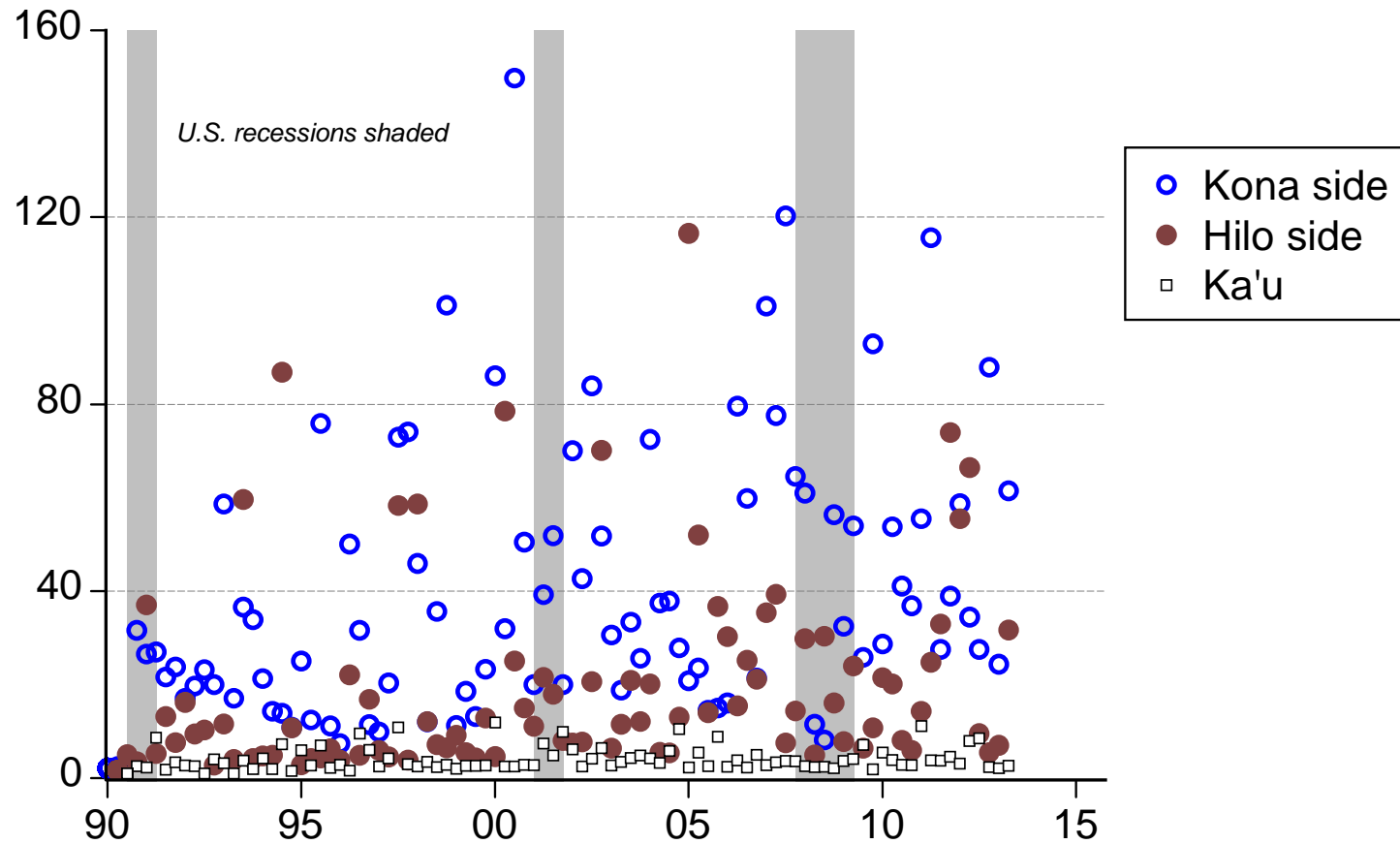
Big Island single-family existing home sales prices: skewness



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Source: Hawaii Island Board of Realtors, Hawaii Information Service; aggregations with assistance from Max Alexander, third moments calculated on seasonally-adjusted prices by TZE

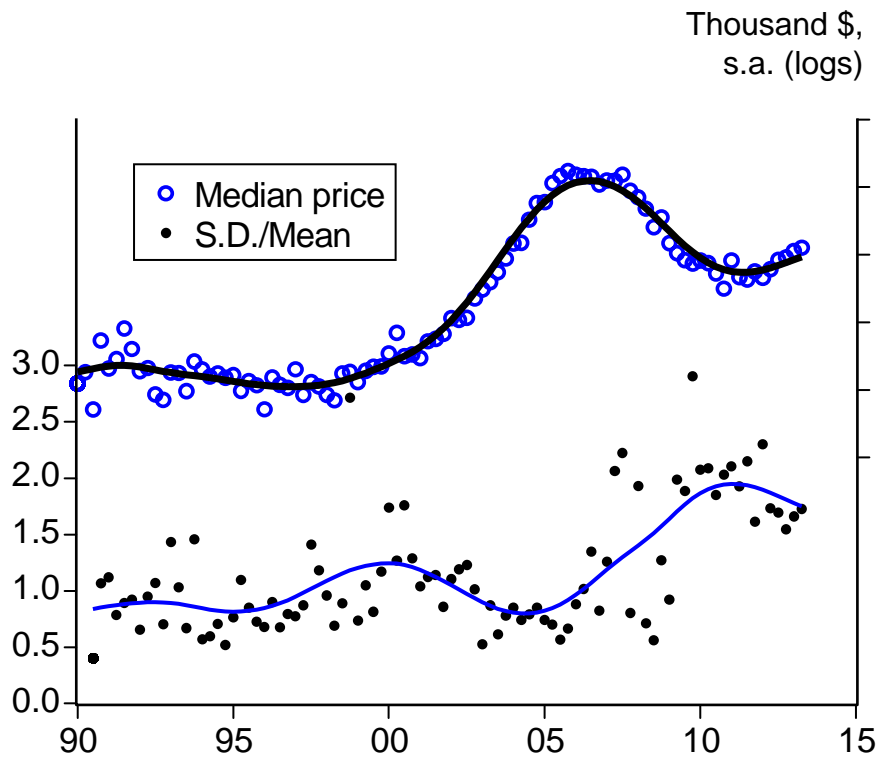
Big Island single-family existing home sales prices: kurtosis



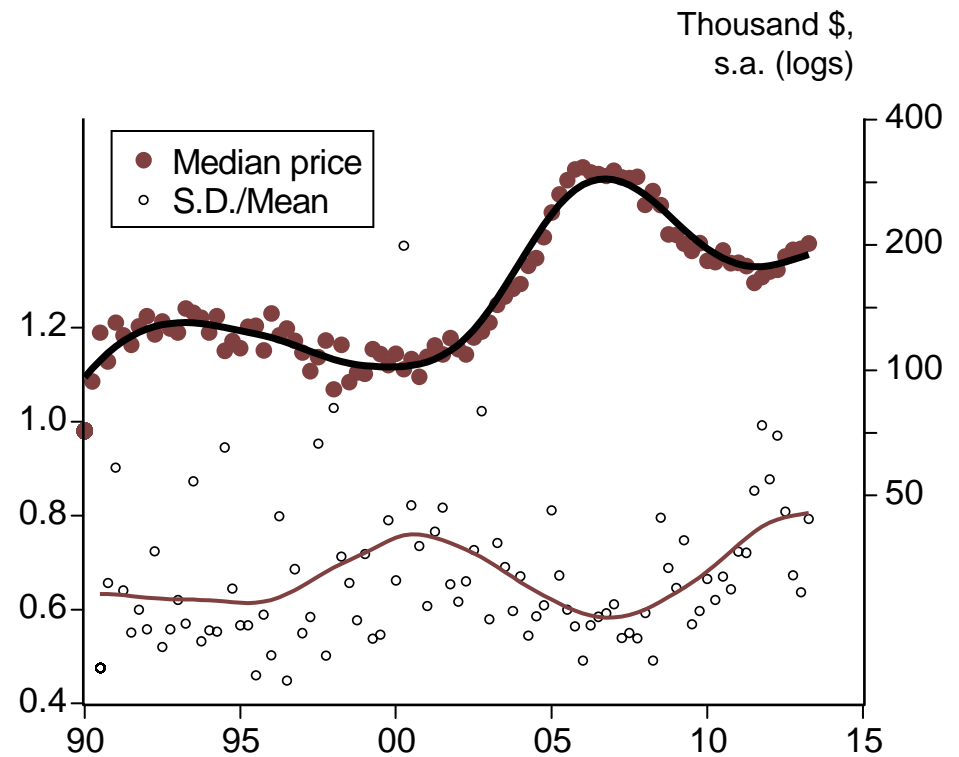
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Source: Hawaii Island Board of Realtors, Hawaii Information Service; aggregations with assistance from Max Alexander, fourth moments calculated on seasonally-adjusted prices by TZE

Some weak evidence that dispersion *widens* through the trough of the valuation cycle



Kona-side, single-family

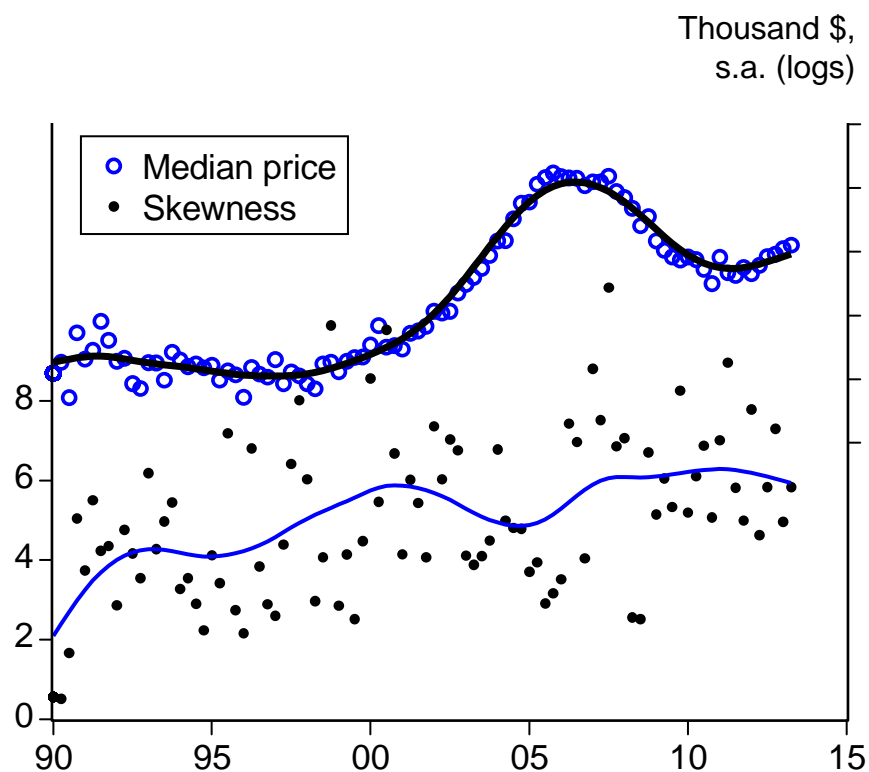


Hilo-side, single-family

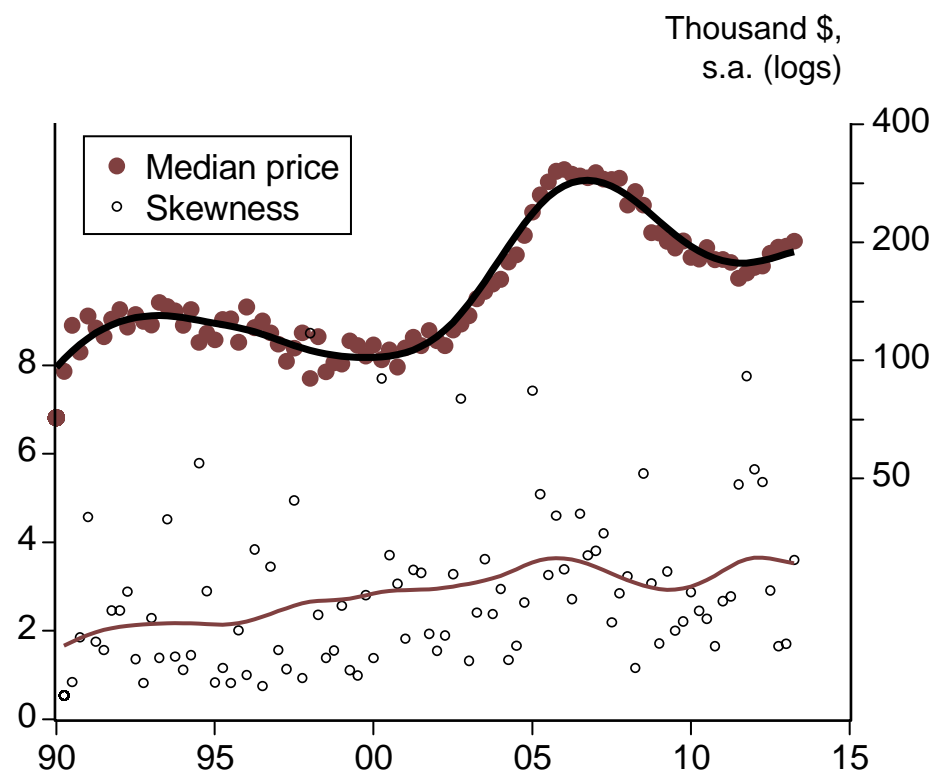
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Source: Hawaii Island Board of Realtors, Hawaii Information Service; aggregations with assistance from Max Alexander, prices and some moments calculated on seasonally-adjusted basis, and trend extractions, by TZE

Some weak evidence that skewness trends upward and *widens* through the trough

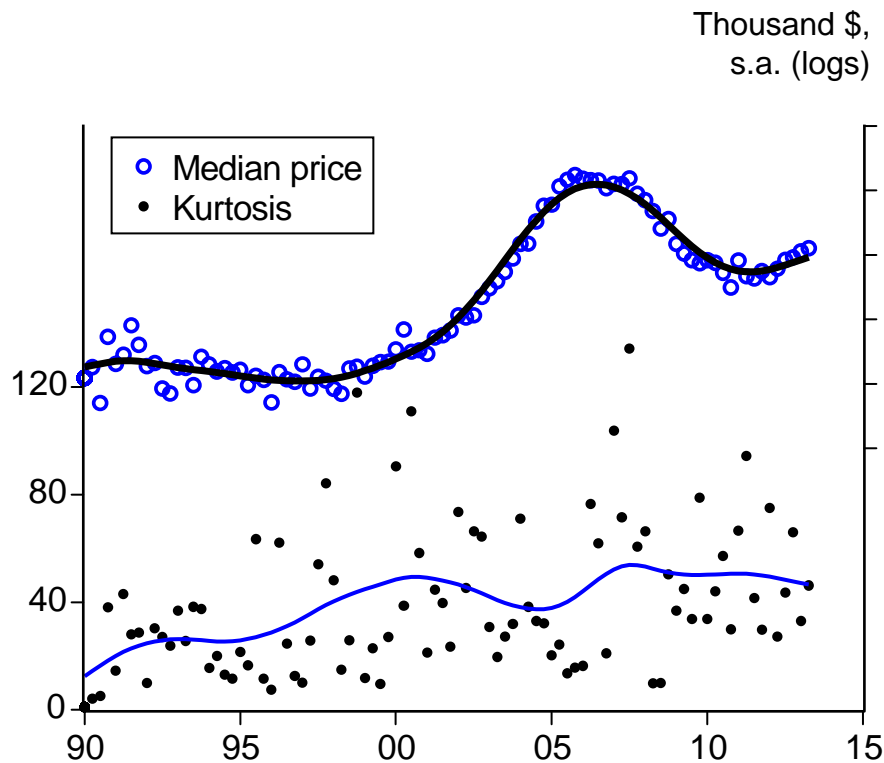


Kona-side, single-family

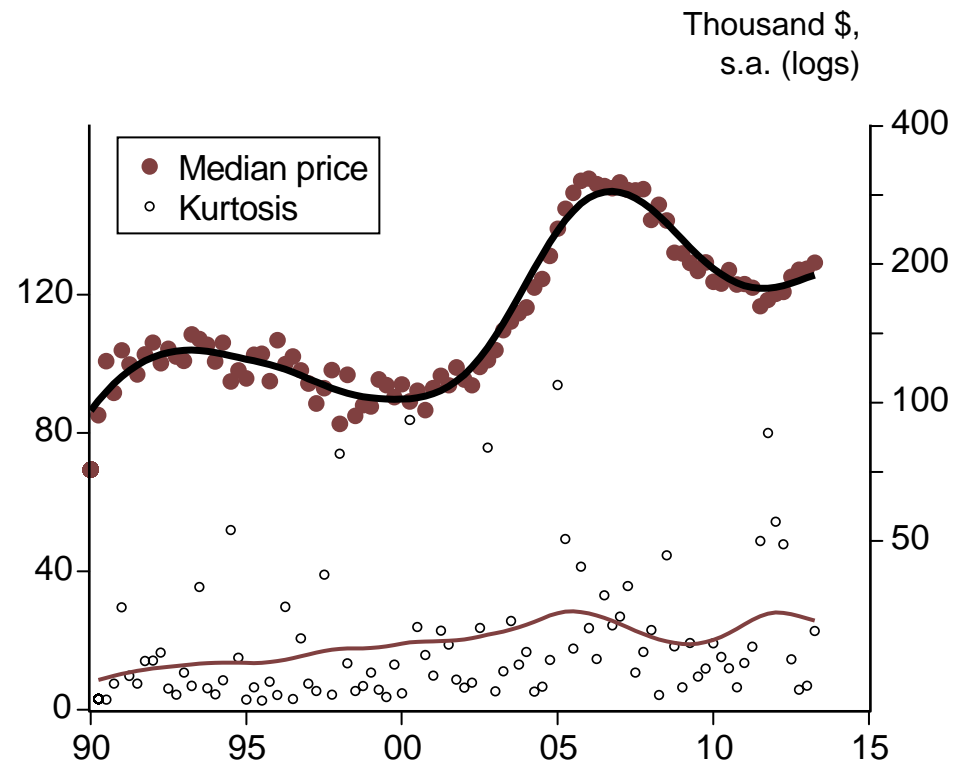


Hilo-side, single-family

Some weak evidence that kurtosis trends upward and *widens* through the trough



Kona-side, single-family

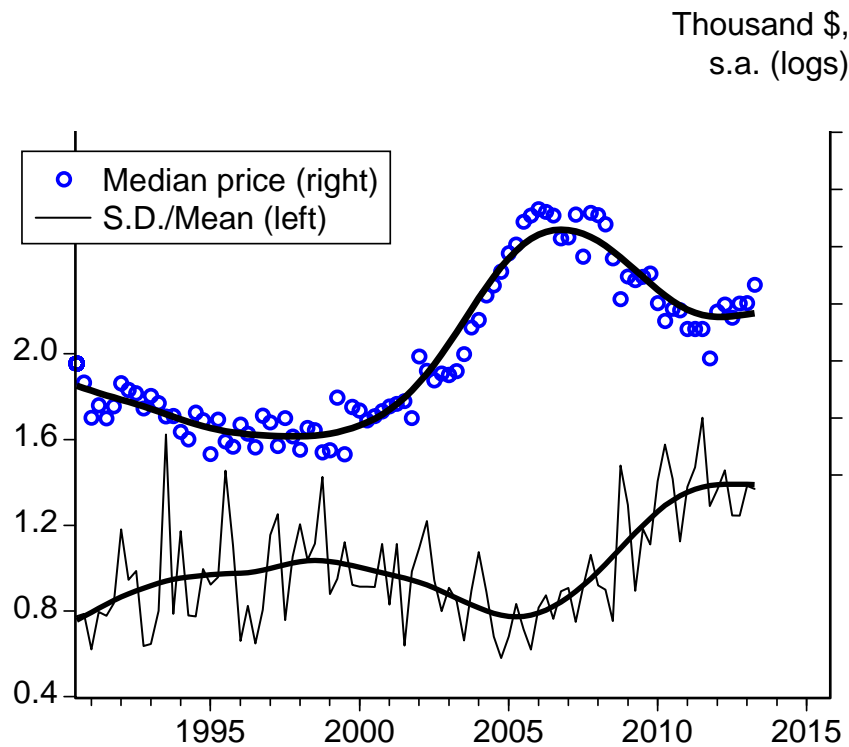


Hilo-side, single-family

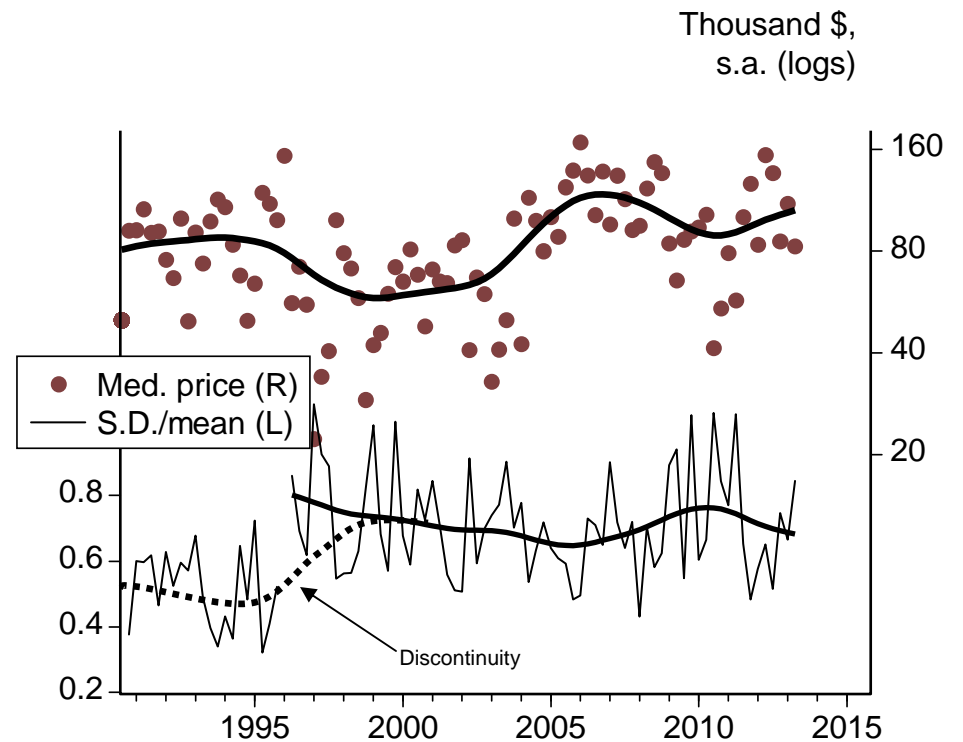
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Source: Hawaii Island Board of Realtors, Hawaii Information Service; aggregations with assistance from Max Alexander, prices and some moments calculated on seasonally-adjusted basis, and trend extractions, by TZE

Some evidence of widening dispersion in valuation trough from condominium transactions



Kona-side, condominium

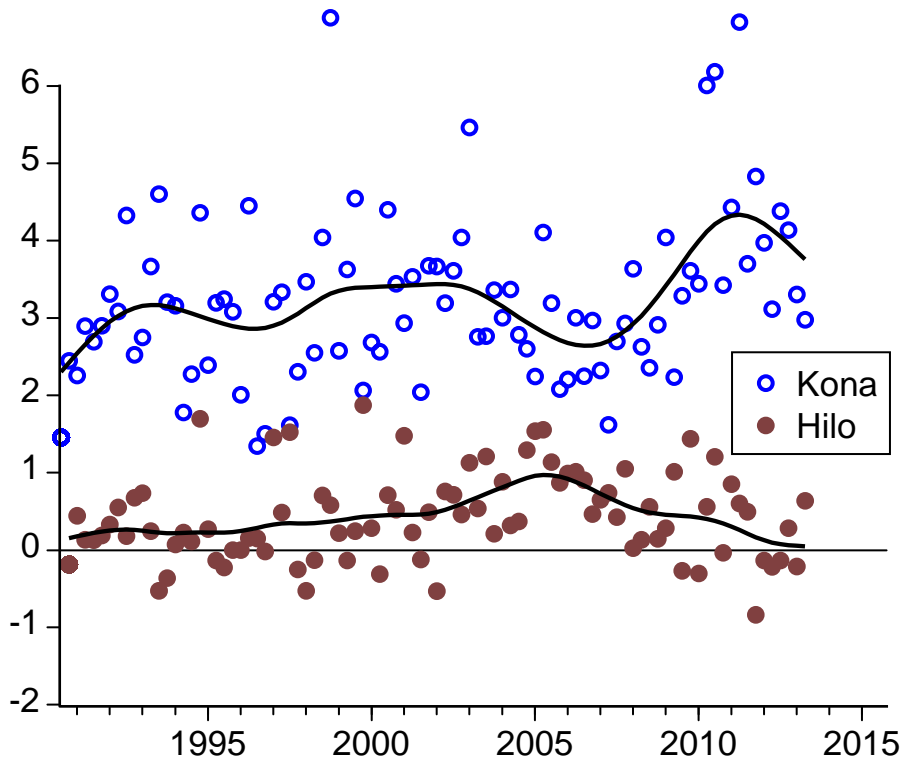


Hilo-side, condominium

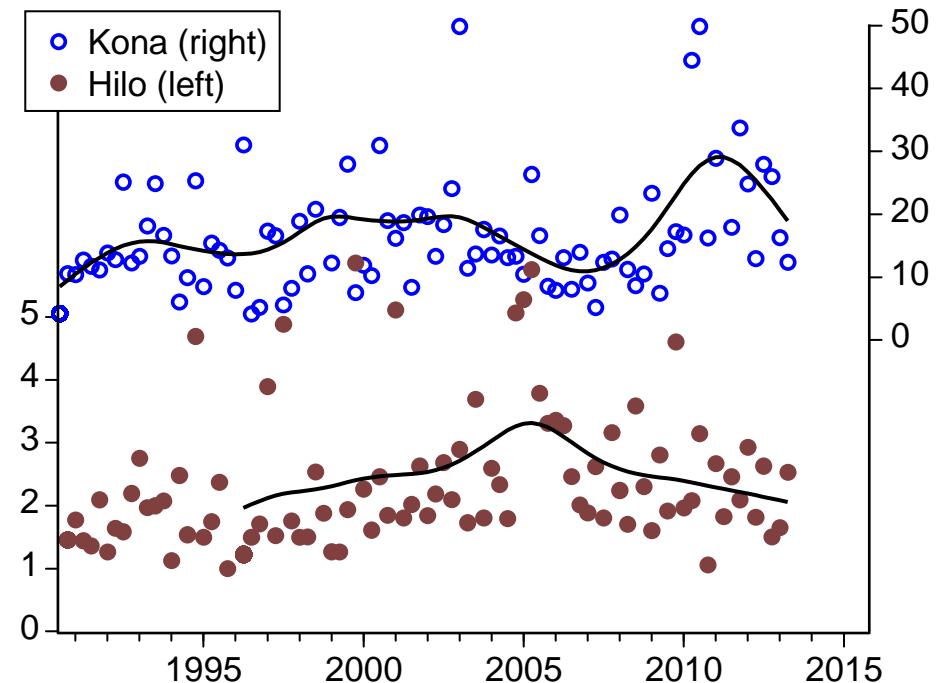
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Source: Hawaii Island Board of Realtors, Hawaii Information Service; aggregations with assistance from Max Alexander, prices and some moments calculated on seasonally-adjusted basis, and trend extractions, by TZE

Condominium higher-order moments (3rd and 4th): after bubble burst, the low-end dredged downward



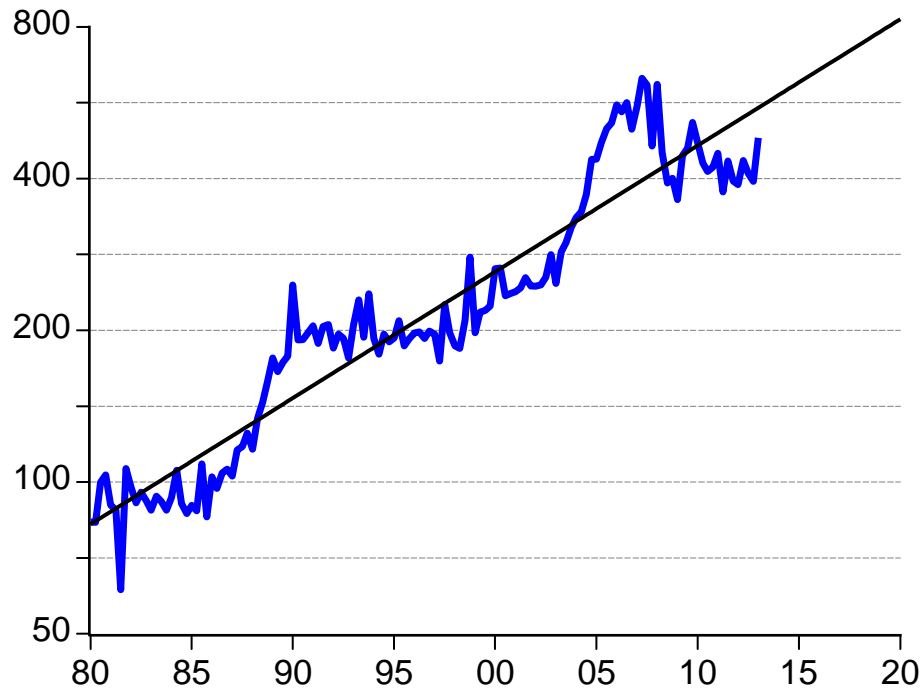
Skewness, condominium



Kurtosis, condominium

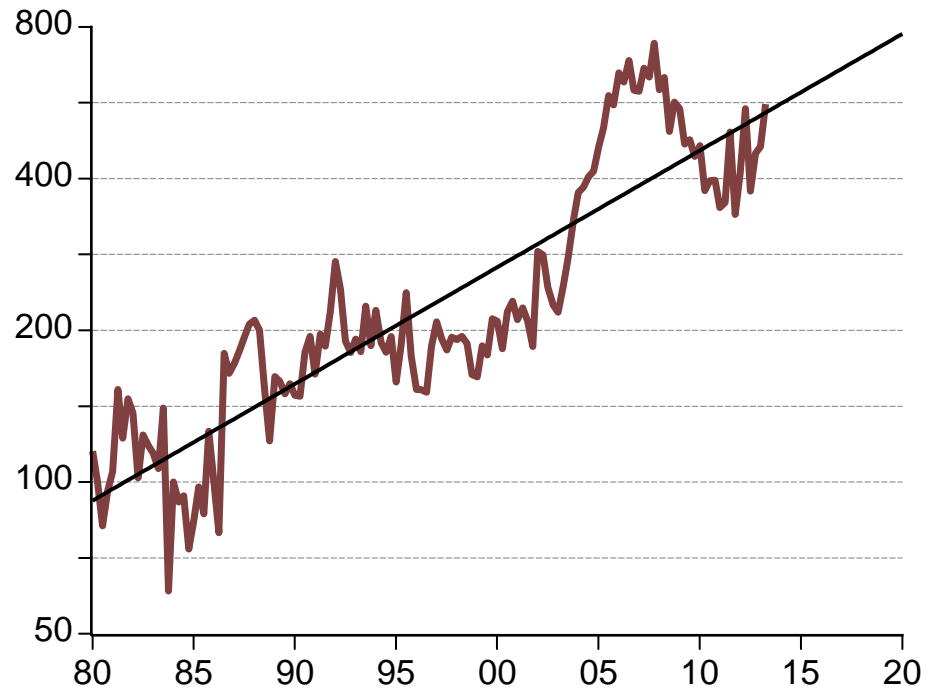
Longer-term Big Island mean home price trends: 5-6% annual appreciation—aggregation bias?

Thousand \$, s.a. (log scale)



Single-family

Thousand \$, s.a. (log scale)

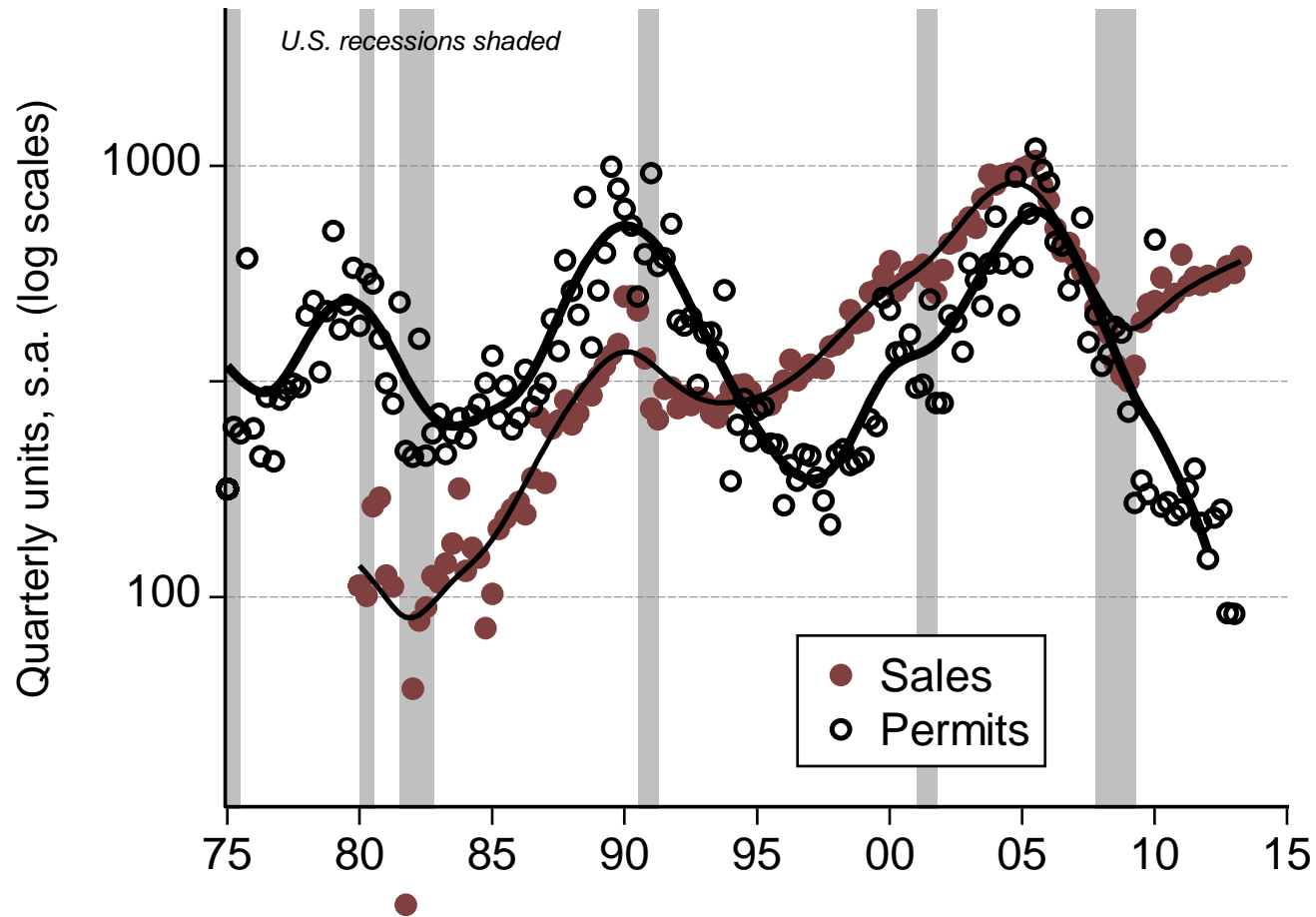


Condominium

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Source: Hawaii Island Board of Realtors, Hawaii Information Service, Prudential Locations, UHERO; seasonal adjustment and regressions by TZE

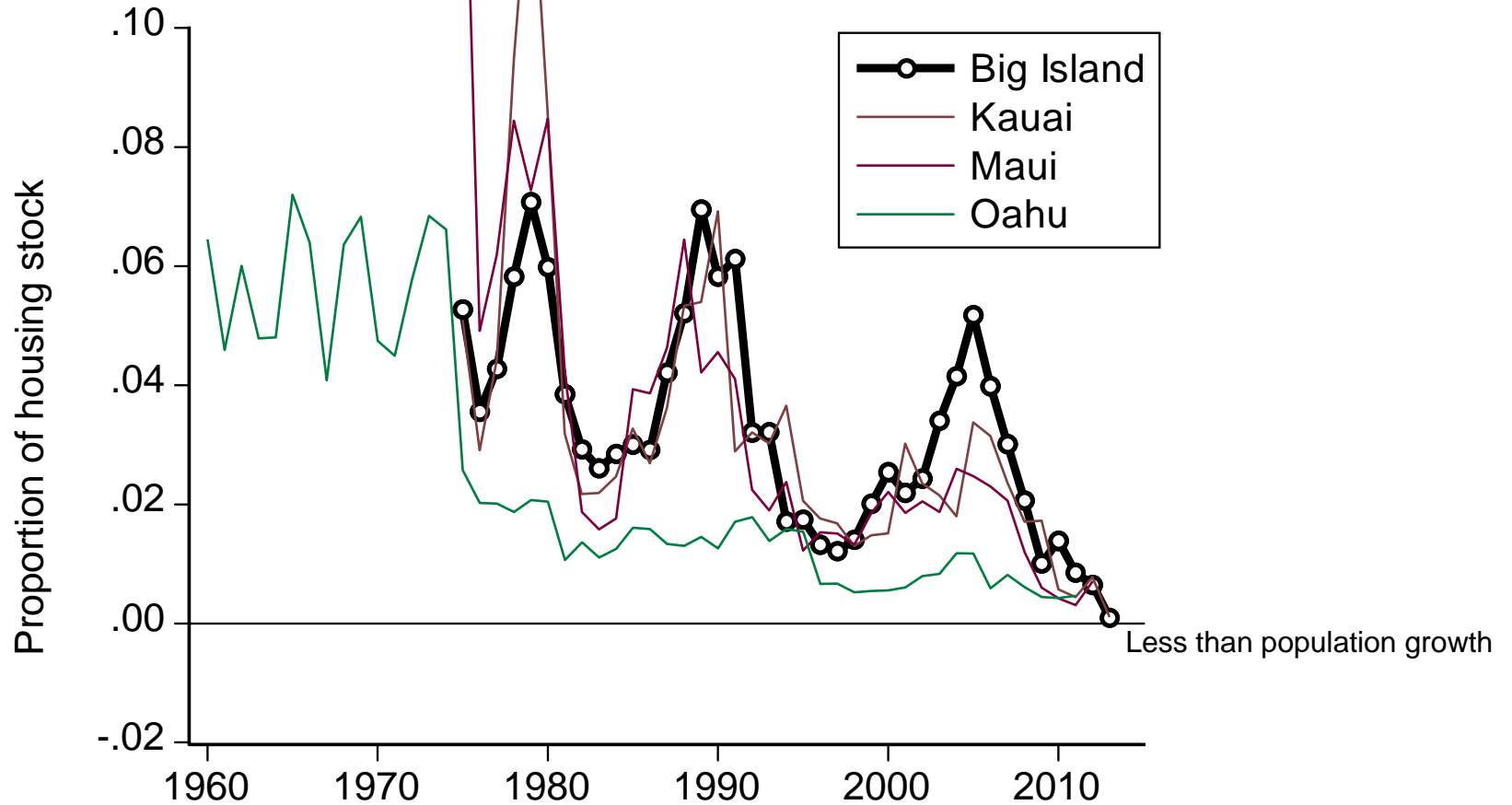
Hawaii Island quarterly existing home sales and new home production entitlement



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Source: Hawaii Island Board of Realtors, Hawaii Information Service, Prudential Locations, UHERO, Bank of Hawaii, Hawaii DBEDT, TZE database; seasonal adjustment and trend extraction by TZE

Incremental capital ratios for housing: new units (building permits) as % of (prior year) housing stock



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Source: Bureau of the Census, U.S. Department of the Census, Hawaii DBEDT, Kauai Building Department, TZE database



Longer-term housing valuation trends

- Collapse of asset-pricing bubble an example of overshooting:* prices must fall “too far” before investors expect future appreciation sufficient to willingly hold the asset class
 1. Bubblicious: Phoenix, Las Vegas, much of Central and Coastal California
 2. Not as precipitous, still caught in downdraft: Maui
 3. An island of resilience: Oahu
- Long-run arbitrage (economic union, capital and labor mobility) drives total returns towards equality: price appreciation and the dividend (you get to live in the house)
 1. Iowa has log-linear appreciation (no mountains, no oceans, minimal regulatory obstacles to new development) while Hawaii gets the *same* long-run return with cyclical variation
 2. Long-term log-linear trends in Arizona, Nevada disrupted by demand event: sub-prime lending “singularity”
 3. Honolulu and Coastal California cities—never perfectly in-phase, always on consistent long-term trajectories, suggesting that another cyclical up-phase is coming
- Neighbor Islands (6%) have *outperformed* Oahu (4.5%), 1983-2013: does this reflect investor preferences, perception of stronger economic fundamentals, both? Either way, home price distributions are “drifting to the right” faster on the Neighbor Isles

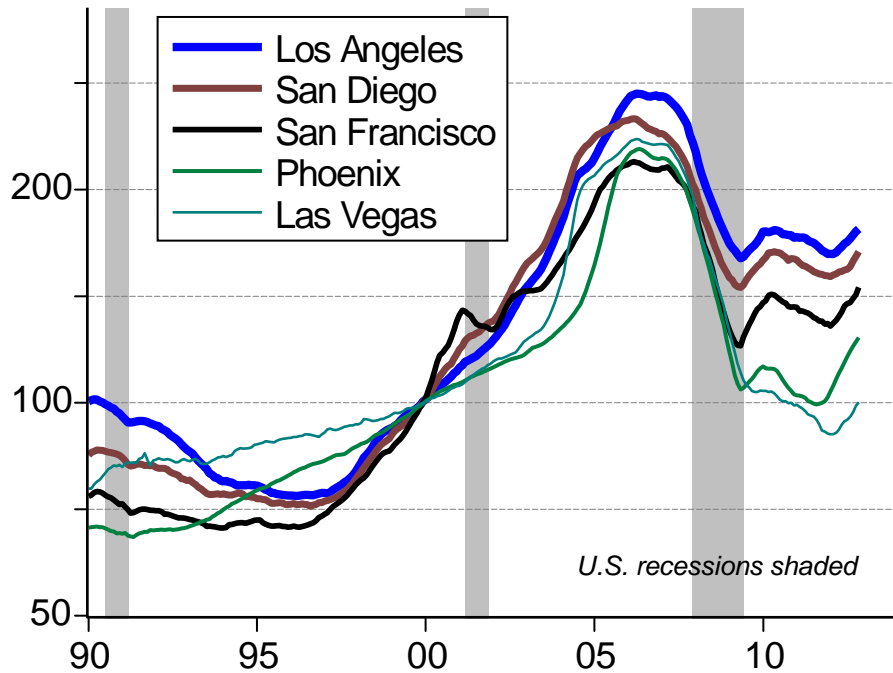
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*Variation on the same theme: Stanford Professor Darrel Duffie's Presidential Address to the American Finance Association on “Slow-Moving Capital” in *The Journal of Finance* 65:4 (August 2010) (<http://www.darrellduffie.com/uploads/pubs/DuffieAFAPresidentialAddress2010.pdf>)

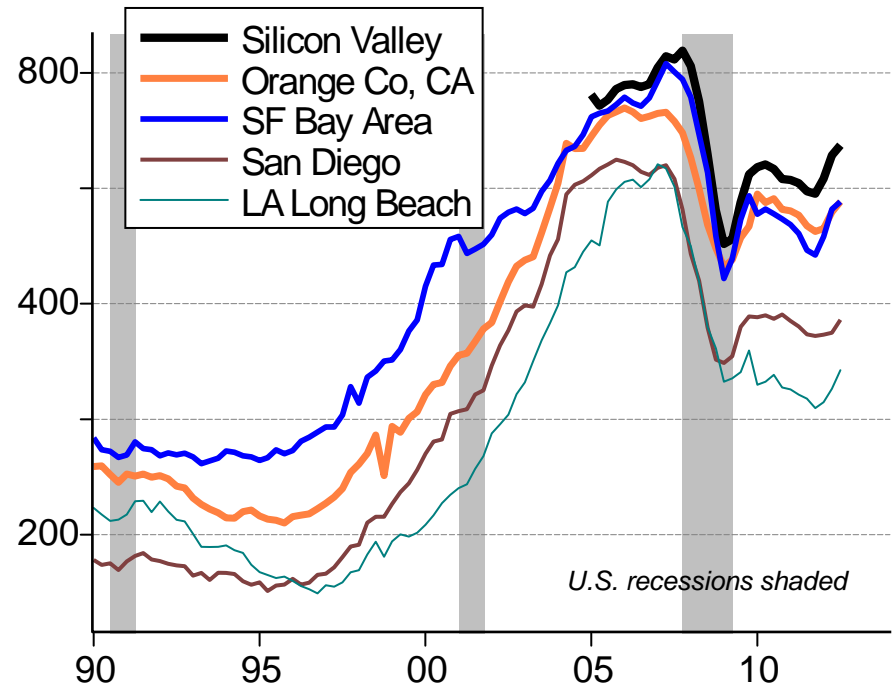
Recent home price movements on the mainland: “asset price overshooting (with oscillation)”

Monthly index (s.a.), January 2000 = 100, log scale



S&P Case Shiller same home price indexes

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

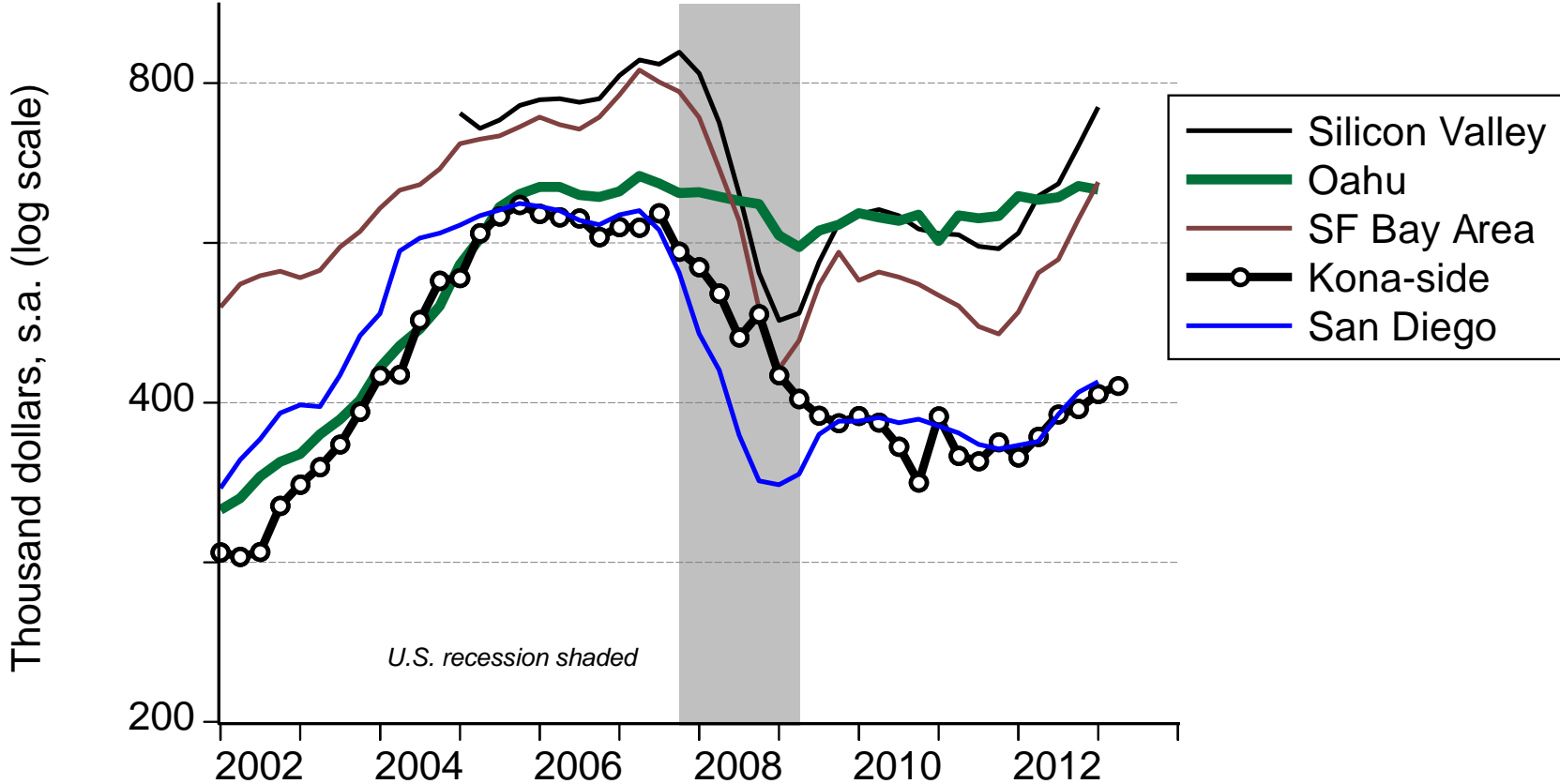


Median single-family home prices

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Sources: Standard & Poor's, National Association of Realtors; seasonal adjustment and Hodrick-Prescott filter trend calculations by TZE

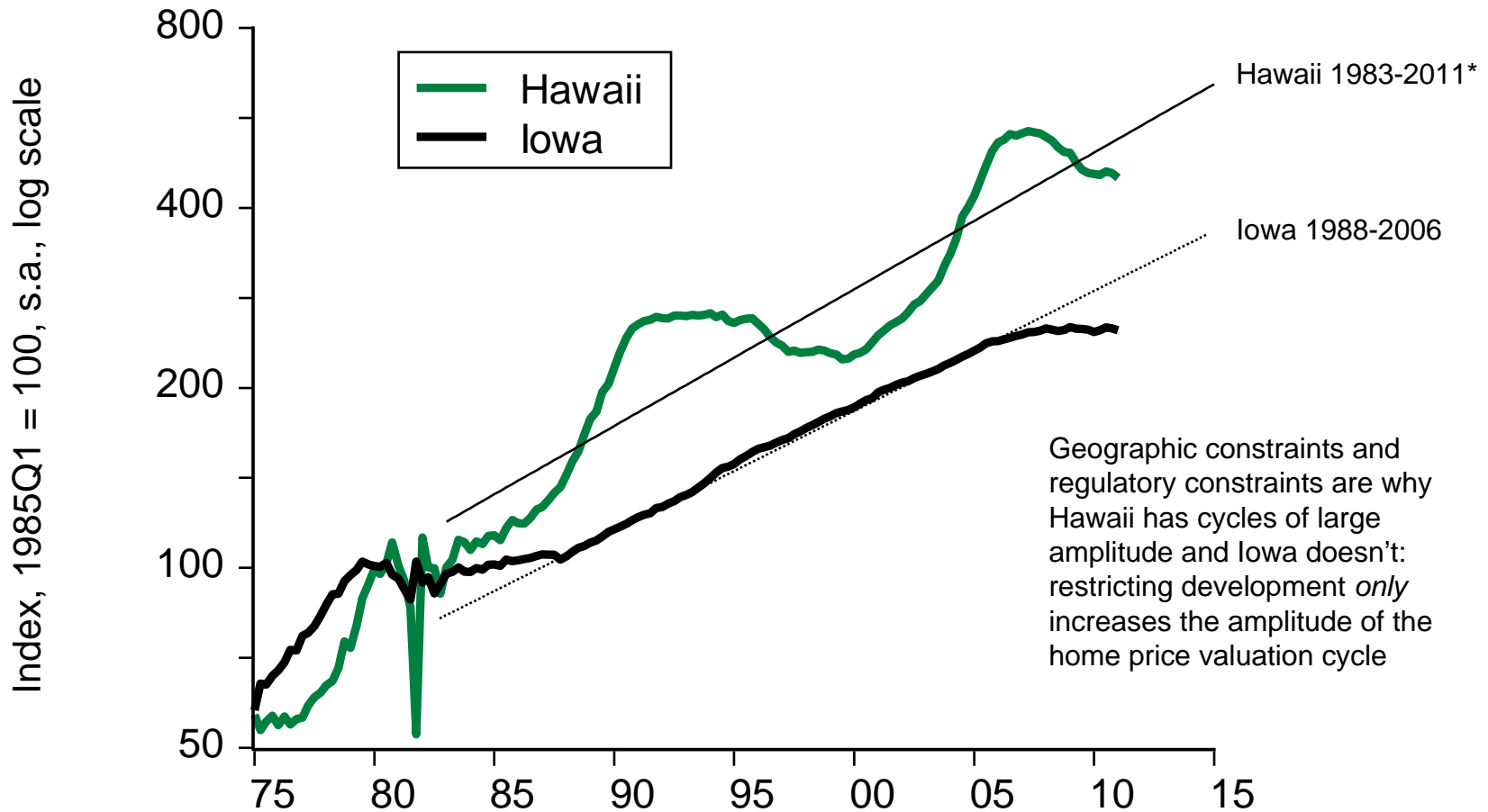
Quarterly median single-family home sales prices



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Sources: Hawaii Island Board of Realtors, Hawaii Information Service, Honolulu Board of Realtors, National Association of Realtors; seasonal adjustment by TZE

Arbitrage assures that longer-term house price trajectories share common trend (Hawaii vs. Iowa)

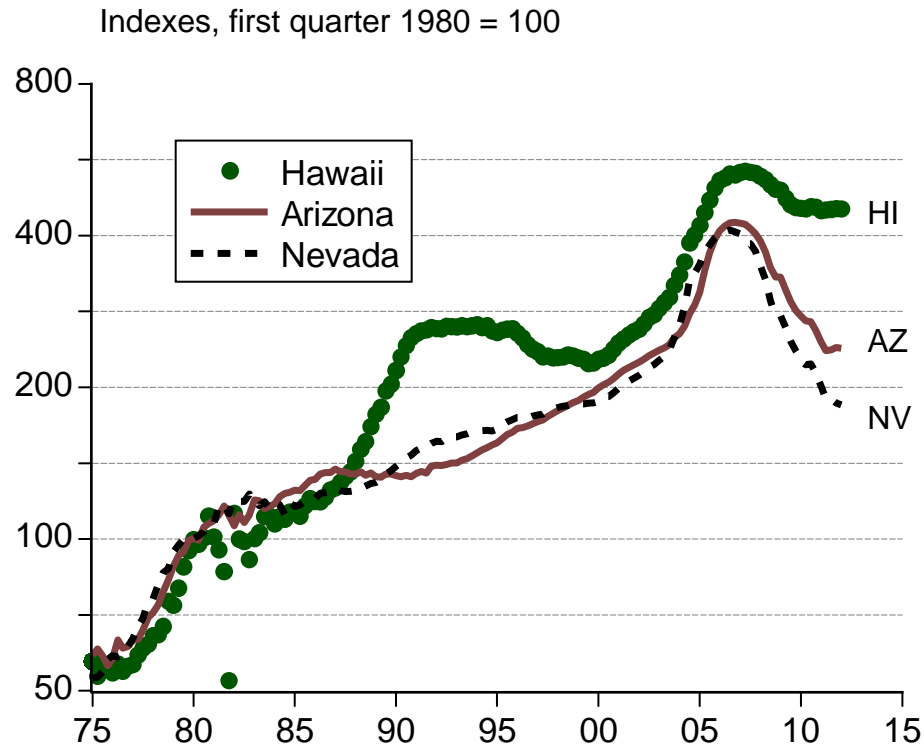


*Regressions of the natural logarithm of individual state FHFA indexes on a time trend

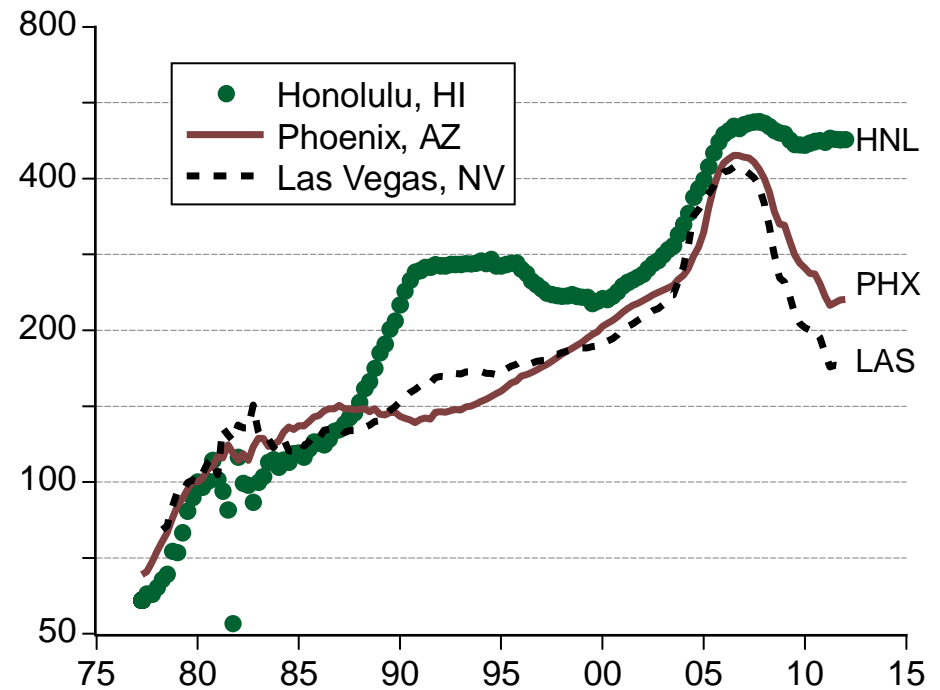
Slide copyright 2013, TZ Economics

Sources: Federal Housing Finance Agency (<http://www.fhfa.gov/Default.aspx?Page=87>) from sales prices and appraisals; seasonal adjustment, index rebasing and regressions by TZ Economics

FHFA price indexes: despite cycles, bubbles, inflation-hedging, prices “arb” to same long-run paths

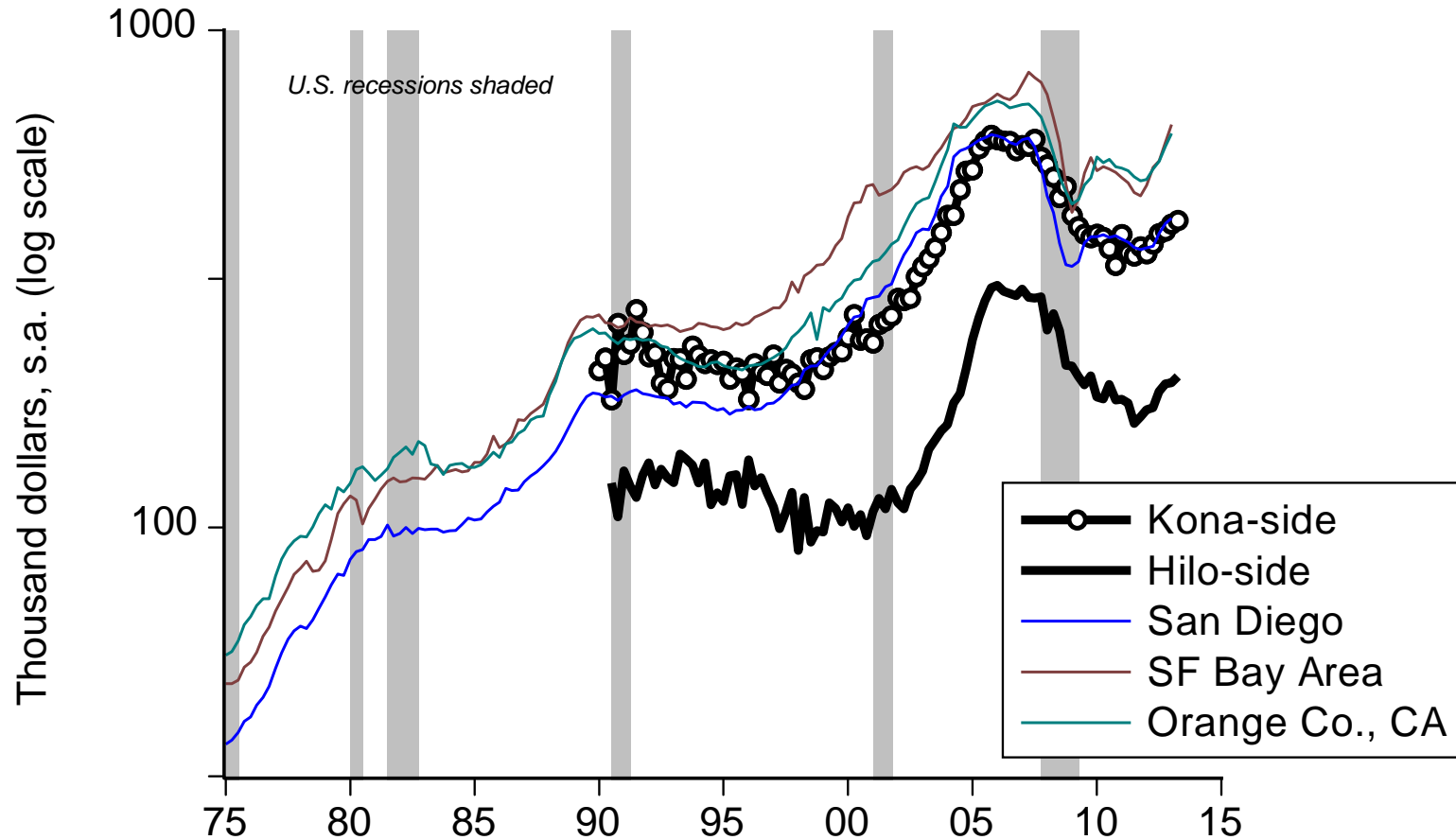


FHFA state house price indexes



FHFA metropolitan house price indexes

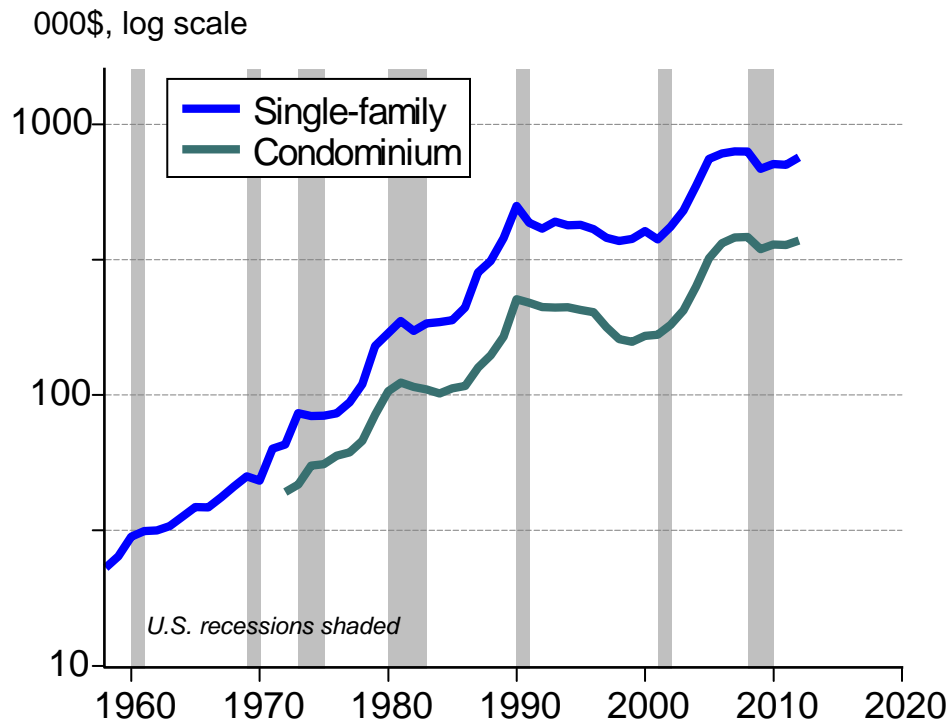
Kona single-family median price cycles probably follow California in LR, with Hilo at lower level



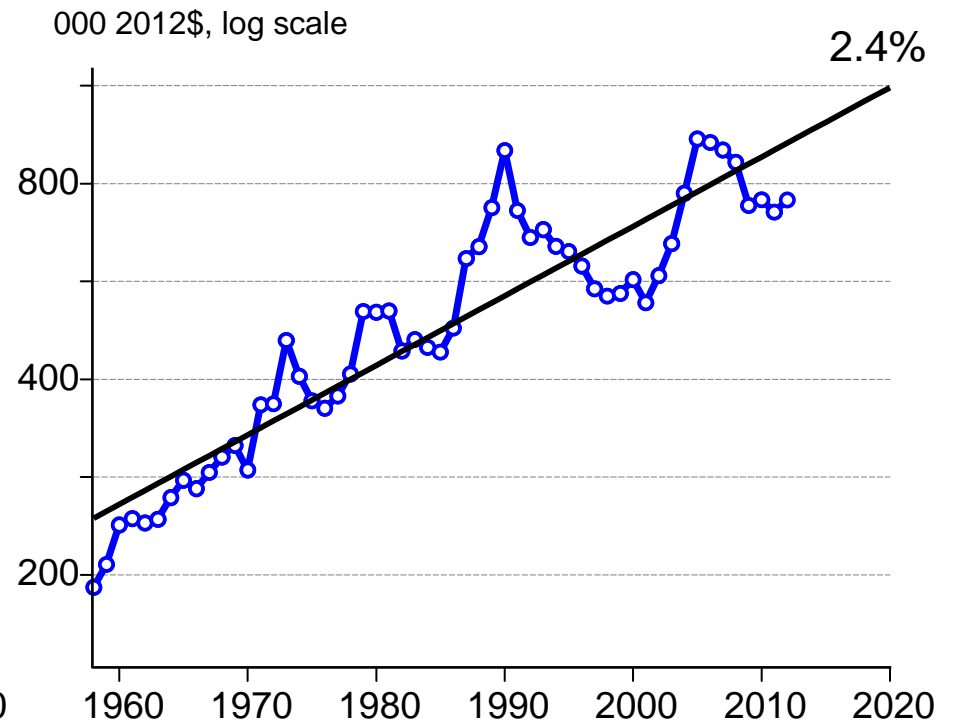
Slide copyright 2013, TZ Economics

Sources: Hawaii Island Board of Realtors, Hawaii Information Service, National Association of Realtors; seasonal adjustment by TZE

Average (mean) Oahu single-family and condominium home sales prices; real single-family price trends



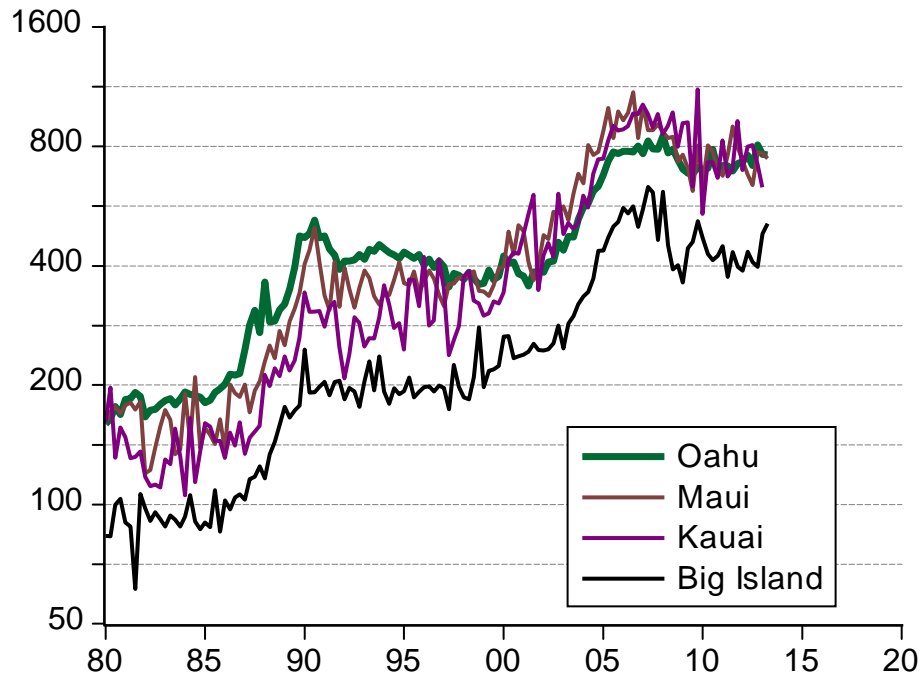
Mean nominal existing home prices



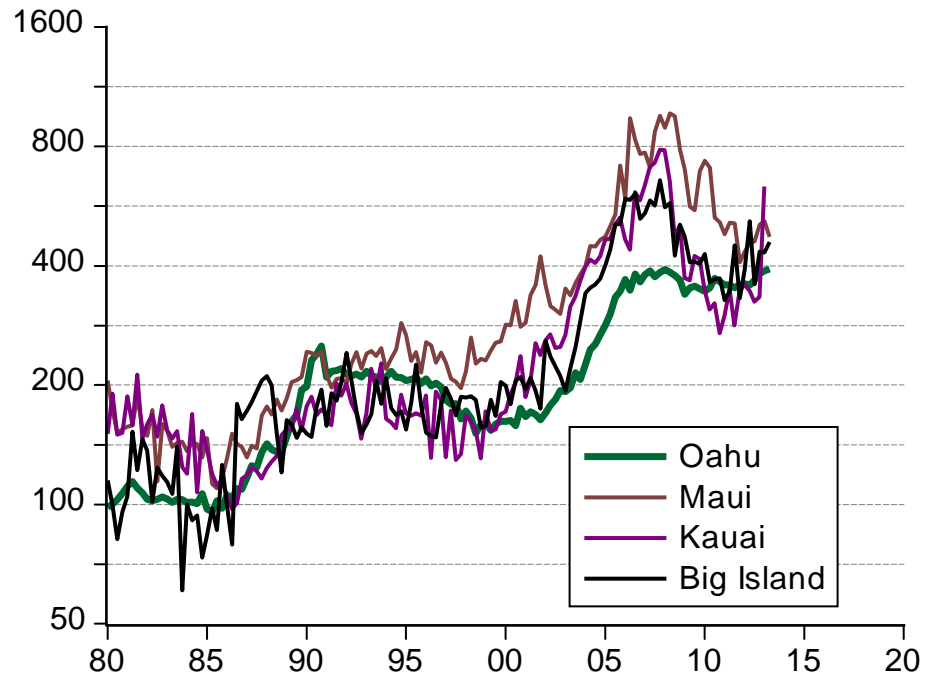
Real single-family home prices

Long-term average home price trends across the Hawaiian islands also converge (THINK: arbitrage)

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



Single-family

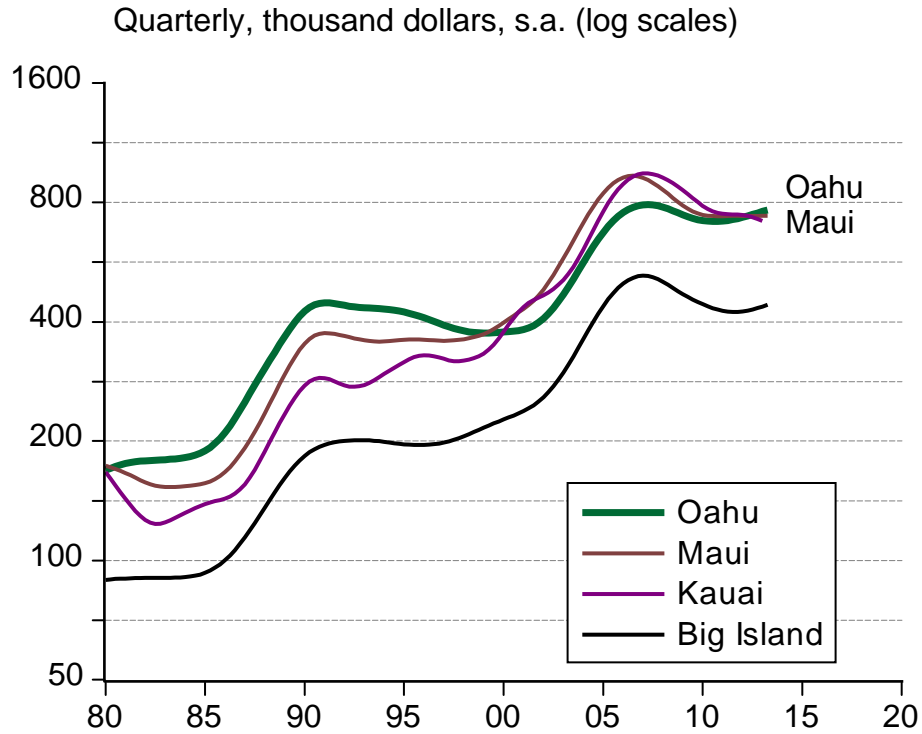


Condominium

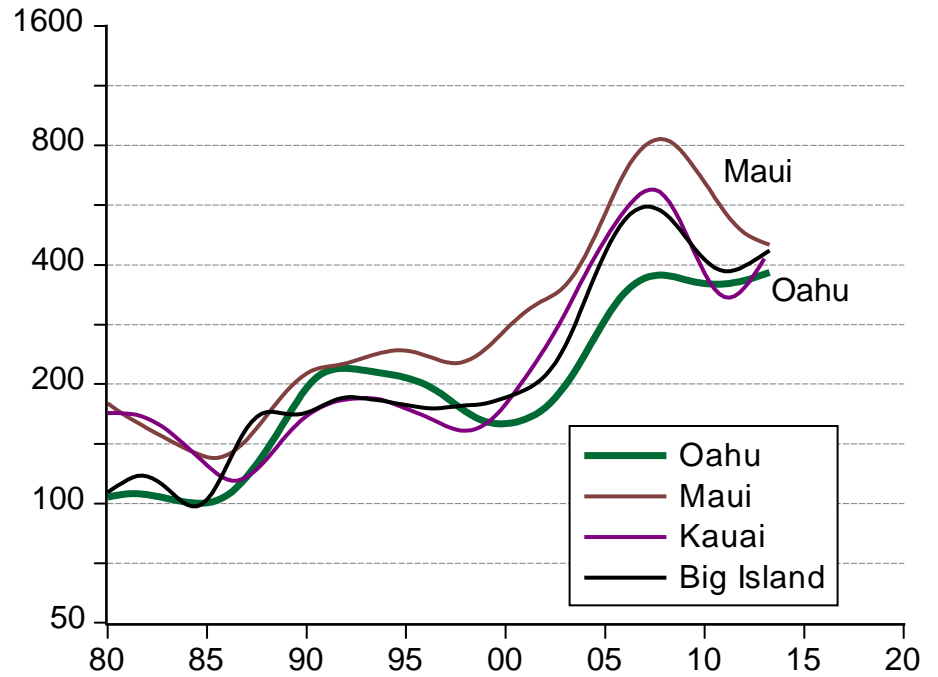
Slide copyright 2013, TZ Economics

Source: Prudential Locations, UHERO; seasonal adjustment by TZ Economics

Extracting the trend-cycle component from the data

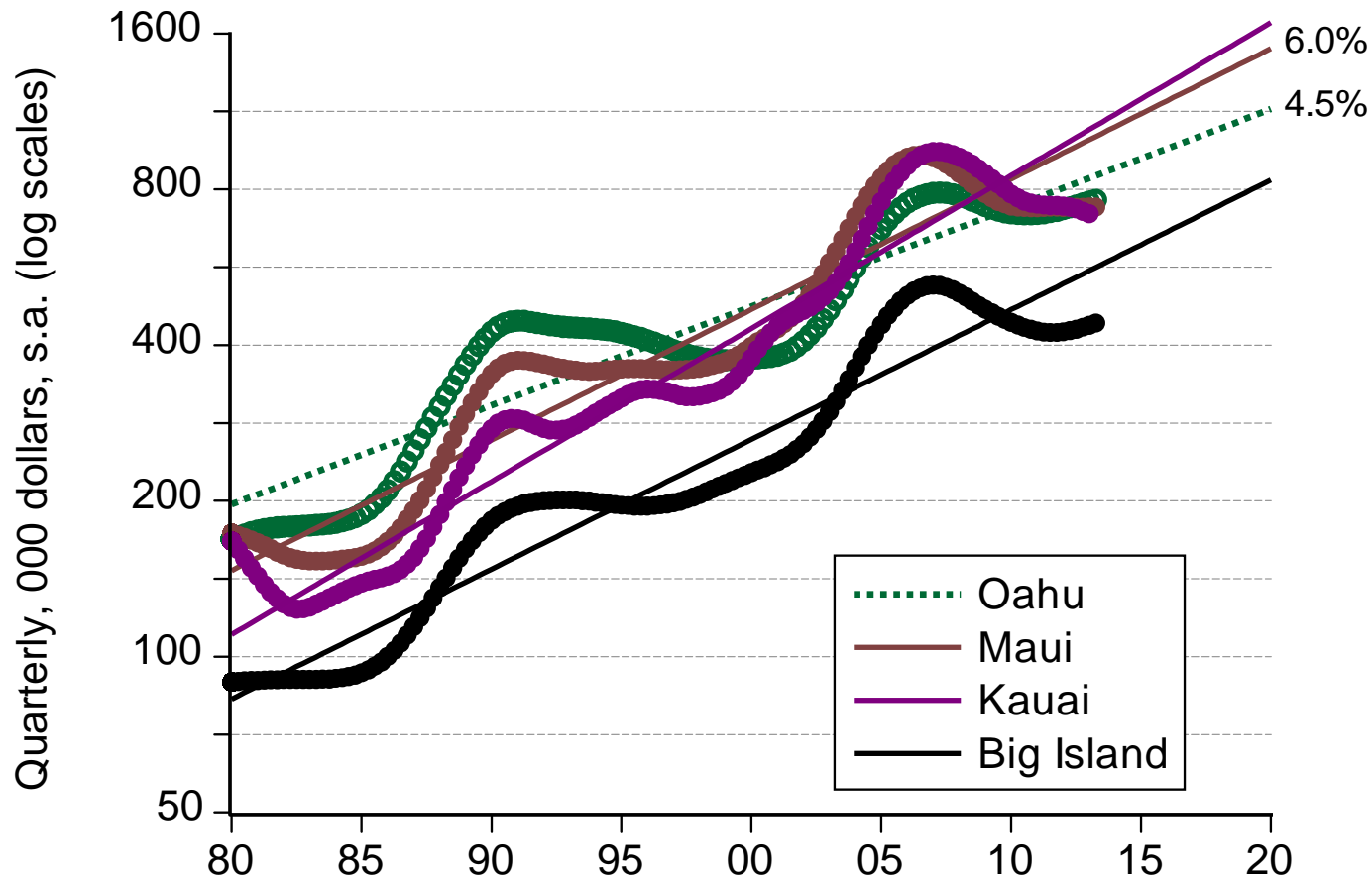


Single-family



Condominium

Neighbor Islands (6.0%) vs. Oahu (4.5%): past price trends reflected investor preferences—more to come?



Slide copyright 2013, TZ Economics

Source: Prudential Locations, UHERO; seasonal adjustment, trend-cycle extraction and 1983-2012 trend regression estimates by TZ Economics (underlying distributions are skewed; consequently, means will rise faster than medians when higher-order moments rise)

Mahalo!



Aloha!

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A wide landscape photograph showing a range of mountains under a cloudy sky. In the foreground, there is a field of tall, dry grasses. The text 'Appendix 1: Inflation, should we be concerned?' is overlaid in the center of the image.

Appendix 1: Inflation, should we be concerned?

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A new inflation environment

- For thirty years, under Paul Volker, Alan Greenspan and Ben Bernanke, the Federal Reserve and other major central banks worldwide have pursued disinflationary monetary policies informed by:
 1. Research reviving a classical tradition placing growth of the money stock squarely at the center as a determinant of long-term inflation
 2. Research integrating this tradition with a neoclassical tradition informed by various kinds of “stickyness” in wage or price adjustment, and the role of inflation expectations
 3. Recognition that hard-won credibility in the anti-inflationary pre-commitments of the monetary authority, once achieved, can lay the basis for low, stable inflation over time
 4. Recognition that transitory shocks to commodity prices—grains or oil (in recent years, not unrelated because of biofuels)—do *not* have permanent impacts in *inflation* even if they permanently raise the price level (understand the difference!)
- We are the inheritors to this hard-won achievement, and the Fed’s 2 percent inflation goal (under the leadership of the author of the influential book *Inflation Targeting*) is a shared objective of central banks in Europe, Asia and Down Under.
- It may be useful to ignore the screeching voices on television financial “news” networks since the financial *market’s* bet is that 2 percent inflation is a credible, well-anchored expectation



Federal Reserve QE + communication strategy + twist: explicit thresholds for monetary policy regime change

- “The Committee judges that inflation at the rate of 2 percent, as measured by the annual change in the price index for personal consumption expenditures, is most consistent over the longer run with the Federal Reserve's statutory mandate.” (January 2012)
- “FOMC participants' estimates of the longer-run normal rate of unemployment had a central tendency of 5.2 percent to 6.0 percent.”
- “In setting monetary policy, the Committee seeks to mitigate deviations of inflation from its longer-run goal and deviations of employment from...its maximum level. ... Under circumstances in which...the objectives are not complementary, [the FOMC] follows a balanced approach in promoting them.”
- “The Committee decided to keep the target range for the federal funds rate at 0 to 1/4 percent and currently anticipates that this exceptionally low range for the federal funds rate will be appropriate *at least as long as the unemployment rate remains above 6-1/2 percent*, inflation between one and two years ahead is projected to be no more than a half percentage point above the Committee's 2 percent longer-run goal, and longer-term inflation expectations continue to be well anchored [emphasis added].” (December 2012)



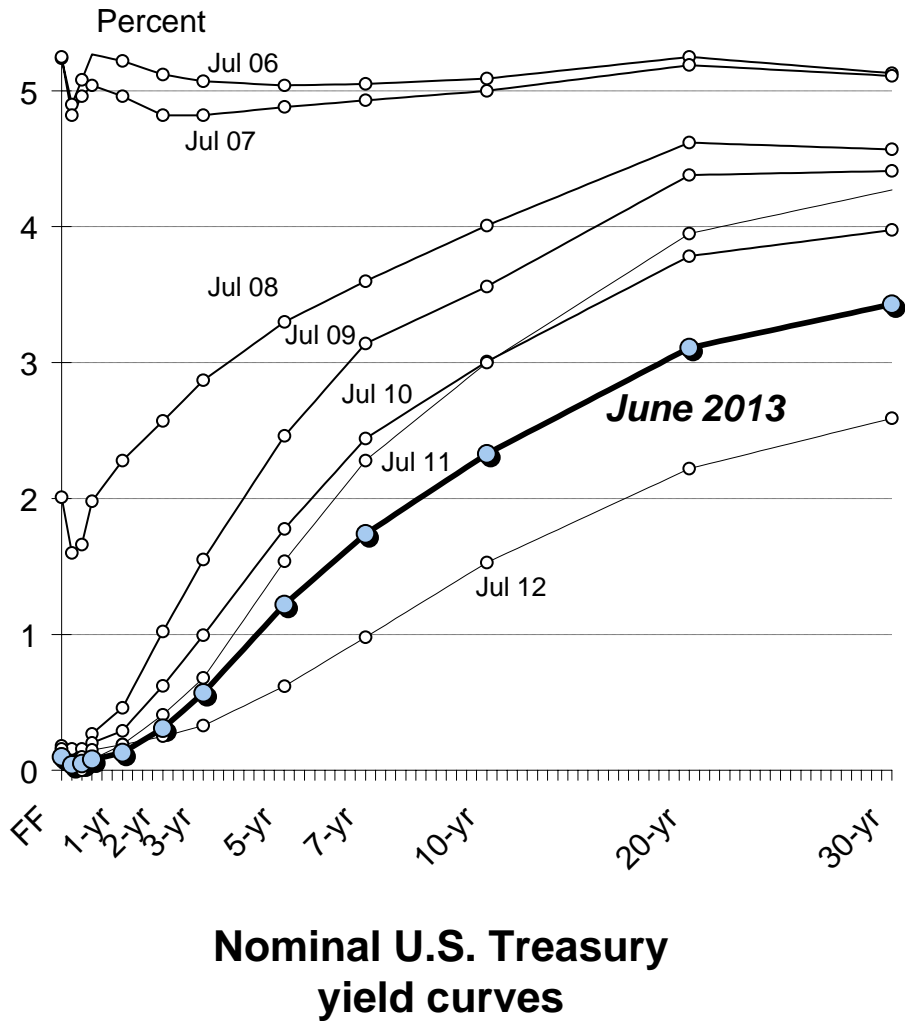
Contingent on economic conditions, asset purchases end and then the fed funds rate rises

- “The Committee will continue purchasing additional agency mortgage-backed securities at a pace of \$40 billion per month and longer-term Treasury securities at a pace of \$45 billion per month, [reinvest] principal payments from its holdings of agency debt and agency mortgage-backed securities in agency mortgage-backed securities and [roll] over maturing Treasury securities at auction. Taken together, these actions should maintain downward pressure on longer-term interest rates.” (January 2013)
- “When the Committee decides to begin to remove policy accommodation, it will take a balanced approach consistent with its longer-run goals of maximum employment and inflation of 2 percent.” (March 2013)
- “A highly accommodative stance of monetary policy will remain appropriate for a considerable time after the asset purchase program ends and the economic recovery strengthens.” (June 2013)
- “The Committee will continue its purchases of Treasury and agency mortgage-backed securities, and employ its other policy tools as appropriate, until the outlook for the labor market has improved substantially in a context of price stability. The Committee is prepared to increase or reduce the pace of its purchases to maintain appropriate policy accommodation as the outlook for the labor market or inflation changes.” (June 2013)

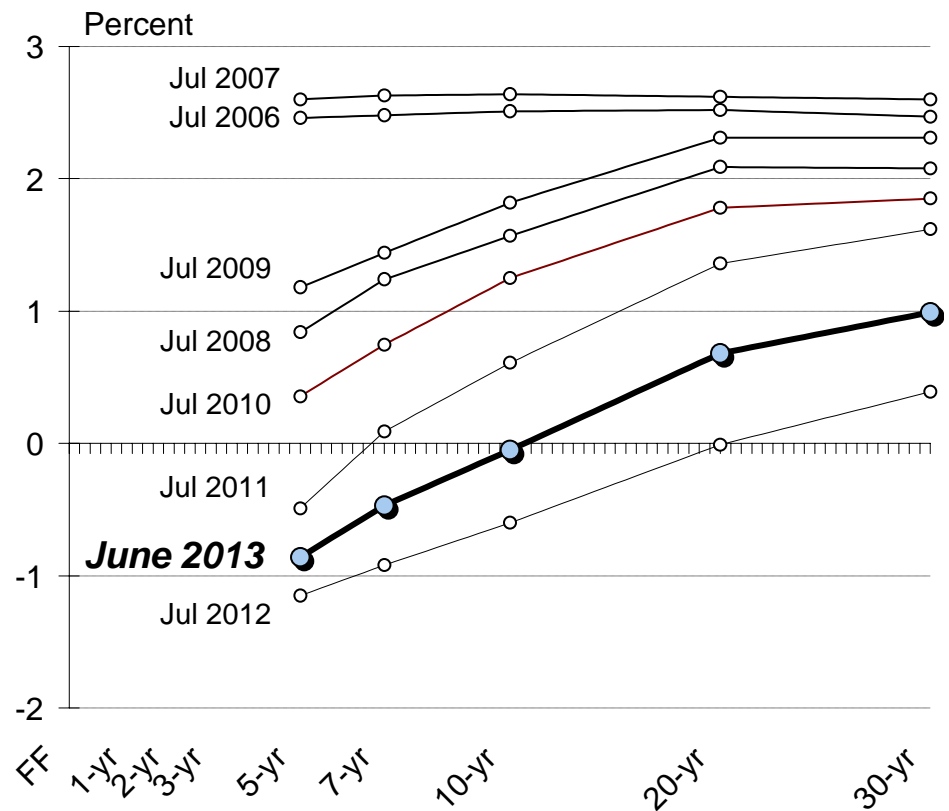
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Source: Federal Reserve Board <http://www.federalreserve.gov/newsevents/press/monetary/20130619a.htm> and earlier announcements.

Difference between nominal and real yield curves imply LR expected inflation



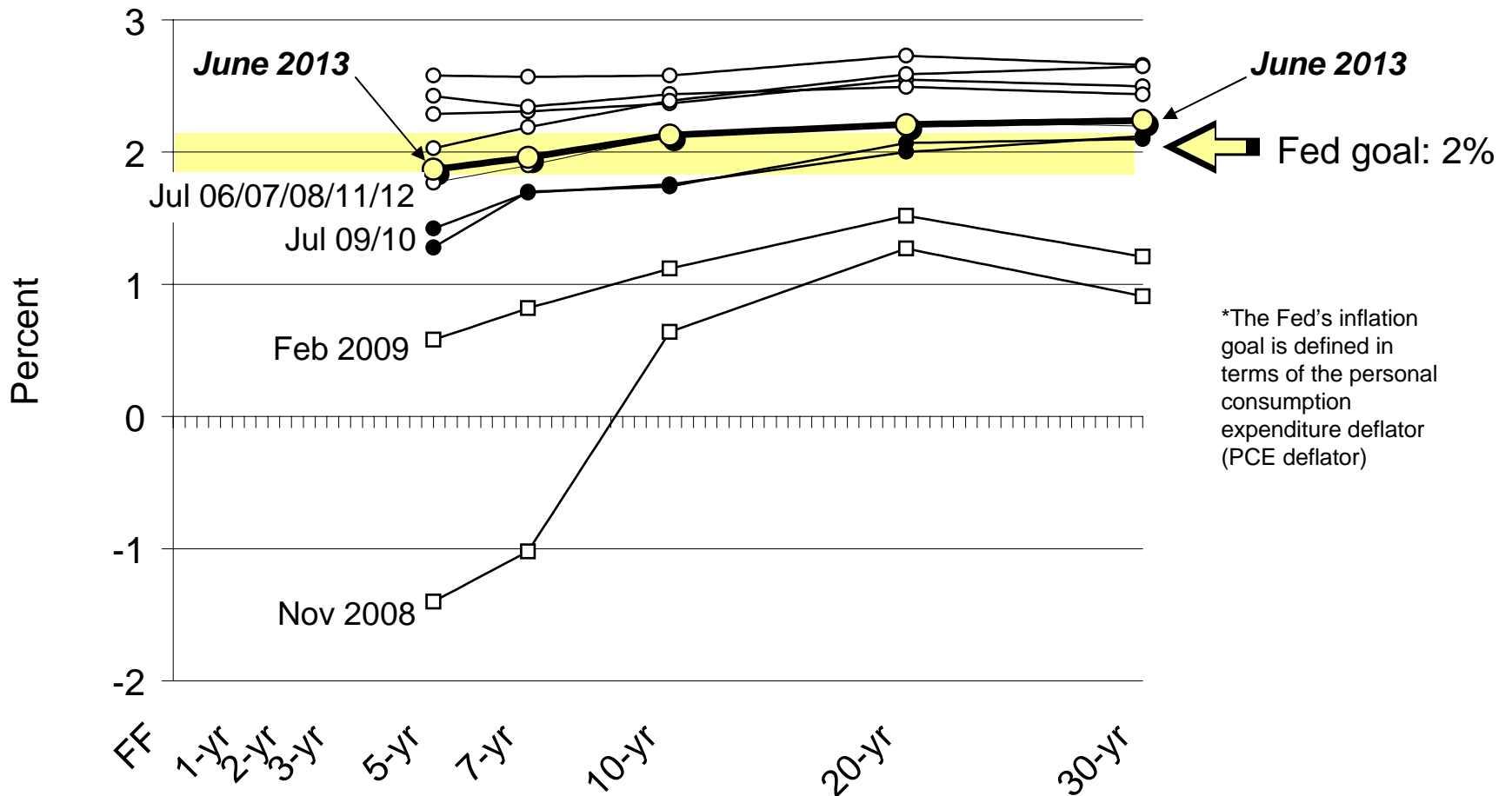
(Real) U.S. Treasury Inflation-Protected Security (TIPS) yield curves



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Term structure of long-run inflation expectations well-anchored in Fed's PCE* deflator goal (break-even rate)

Implied long-term inflation expectations

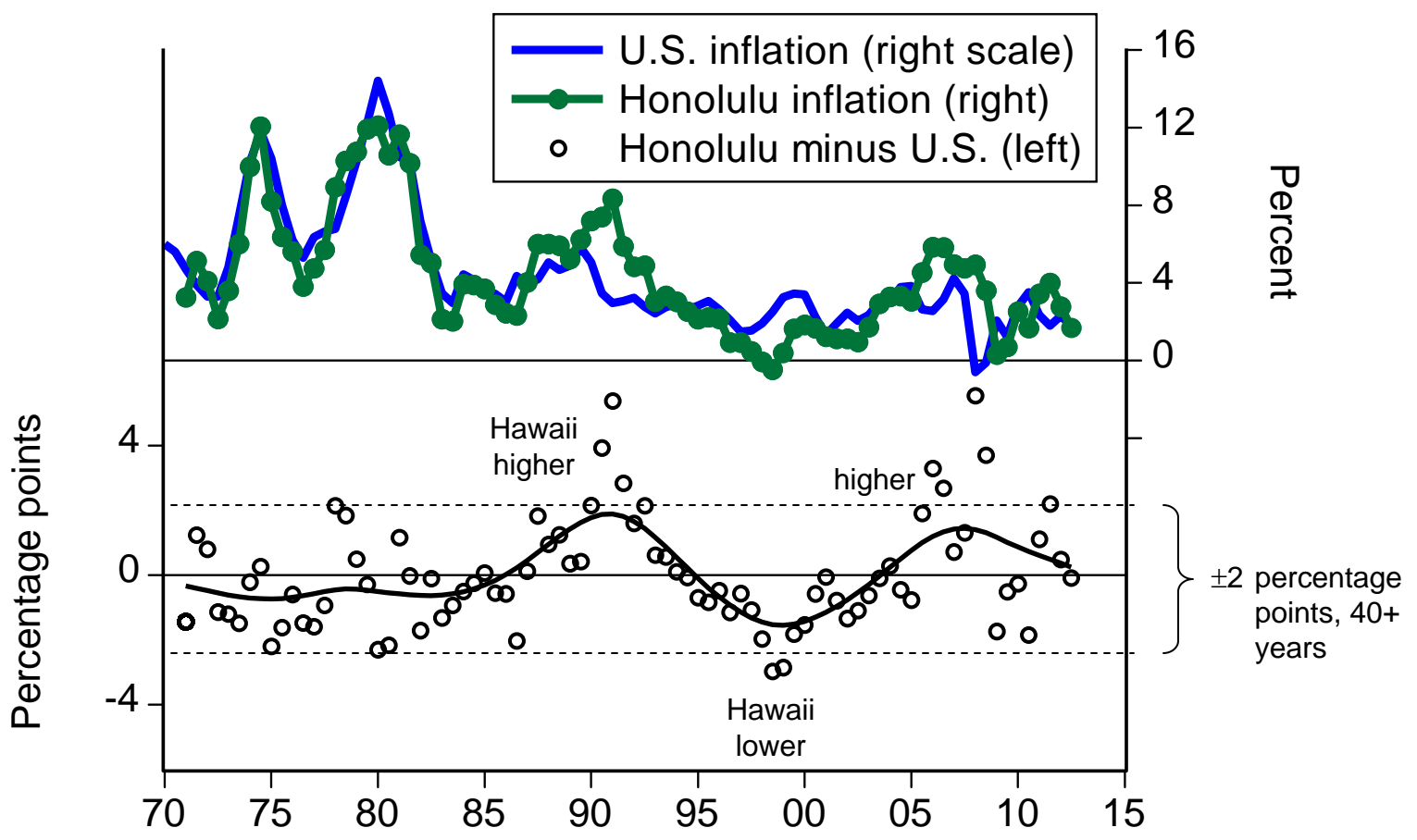


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Source: Federal Reserve Board (<http://www.federalreserve.gov/releases/h15/current/>); calculated by TZE; break-even rate essentially equals the FOMC goal up to an unobservable inflation risk premium and an unobservable liquidity premium (both likely small)



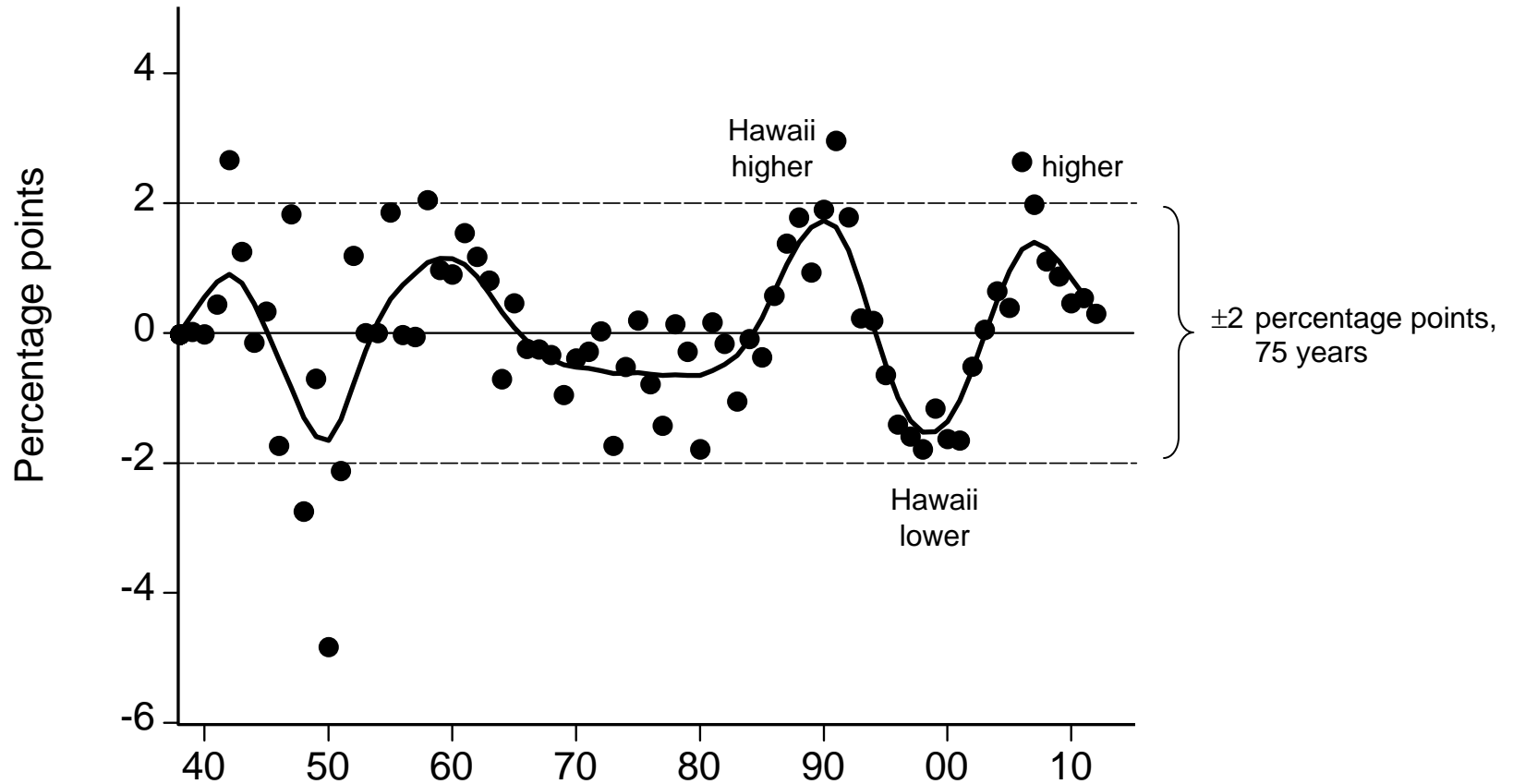
Inflation trends since the 1960s



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Source: Bureau of Labor Statistics (<http://data.bls.gov/cgi-bin/surveymost?r9>); semi-annual data, differential calculation by TZE

Honolulu minus U.S. urban annual inflation since the 1930s (average: 0.06 percentage points)



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Source: Bureau of Labor Statistics (<http://data.bls.gov/cgi-bin/surveymost?r9>); annual data, differential calculation by TZE



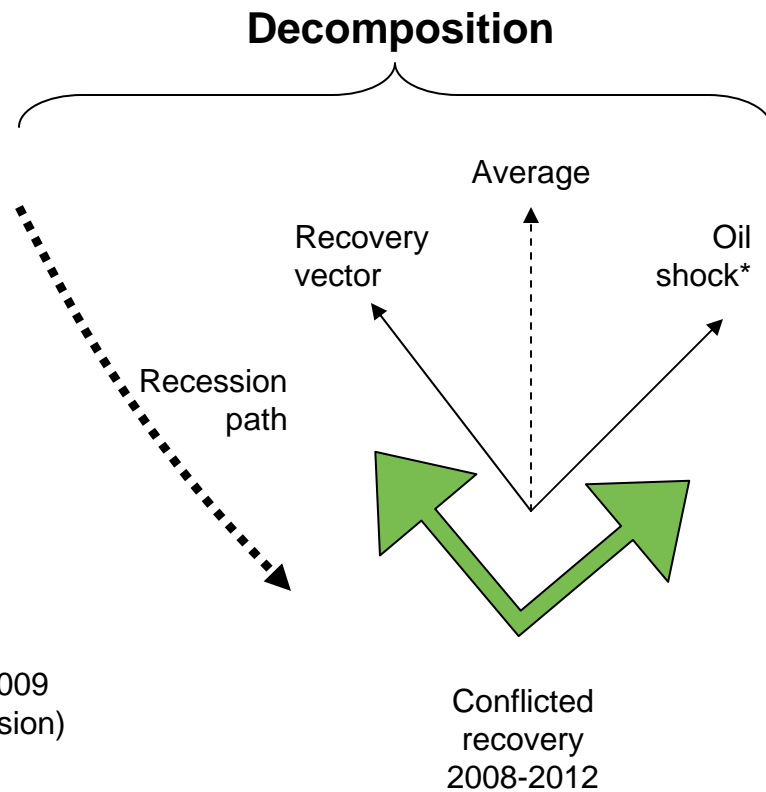
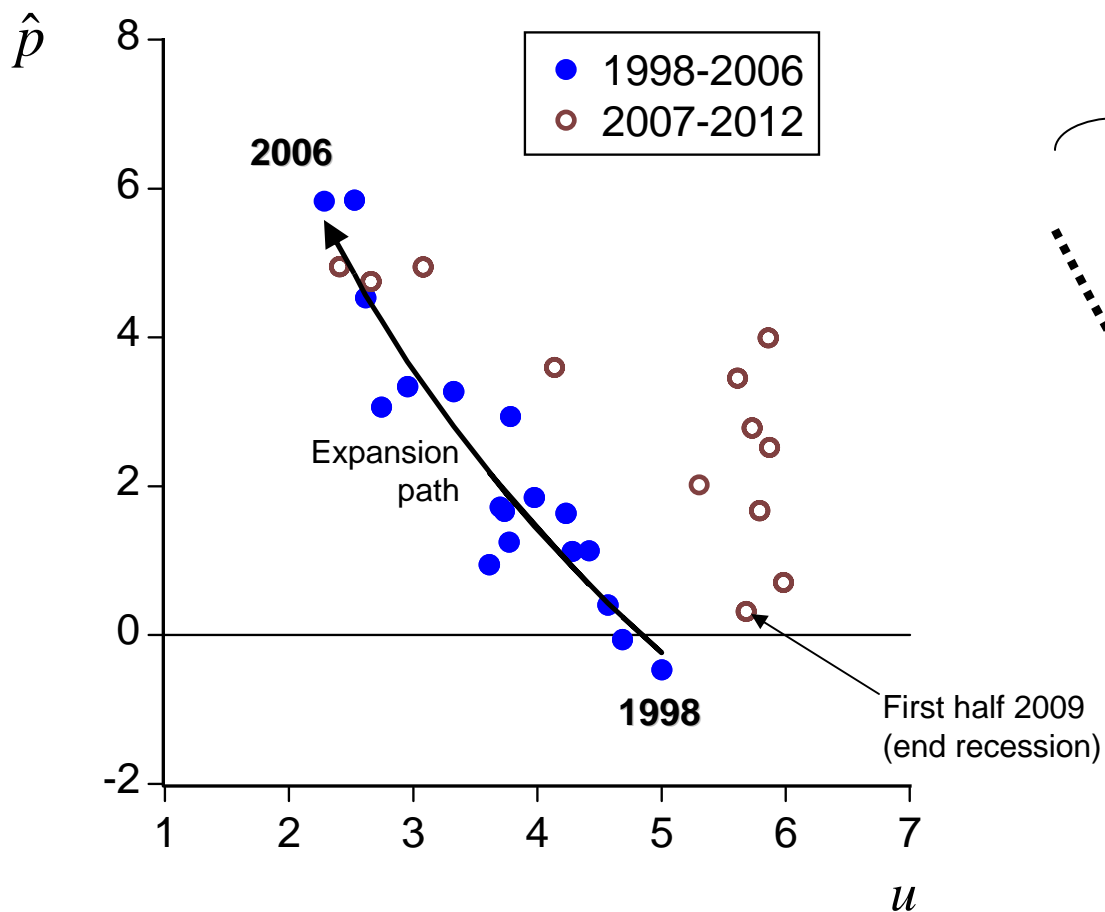
Thinking in two dimensions: inflation, unemployment

- In January 2012 the FOMC explicitly identified a target inflation rate (2 percent) and cited FOMC participants' estimates of the “longer-run normal rate of unemployment” (5.2-6.0 percent) in a statement of “longer-run goals and policy strategy” identifying its monetary policy strategy as seeking to “mitigate deviations of inflation from its longer-run goal and deviations of employment from the Committee’s assessments of its maximum level.” The latter principle embodies a key feature of what is called the Taylor Rule of monetary policy.*
- In December 2012 the FOMC explicitly committed to a low target Federal Funds rate, “at least as long as the unemployment rate remains above 6-1/2 percent, inflation between one and two years ahead is projected to be no more than a half percentage point above the Committee’s 2 percent longer-run goal, and longer-term inflation expectations continue to be well anchored.”

i.e. for U.S., steady state combination of inflation (\hat{p}) and unemployment rate (\bar{u}):

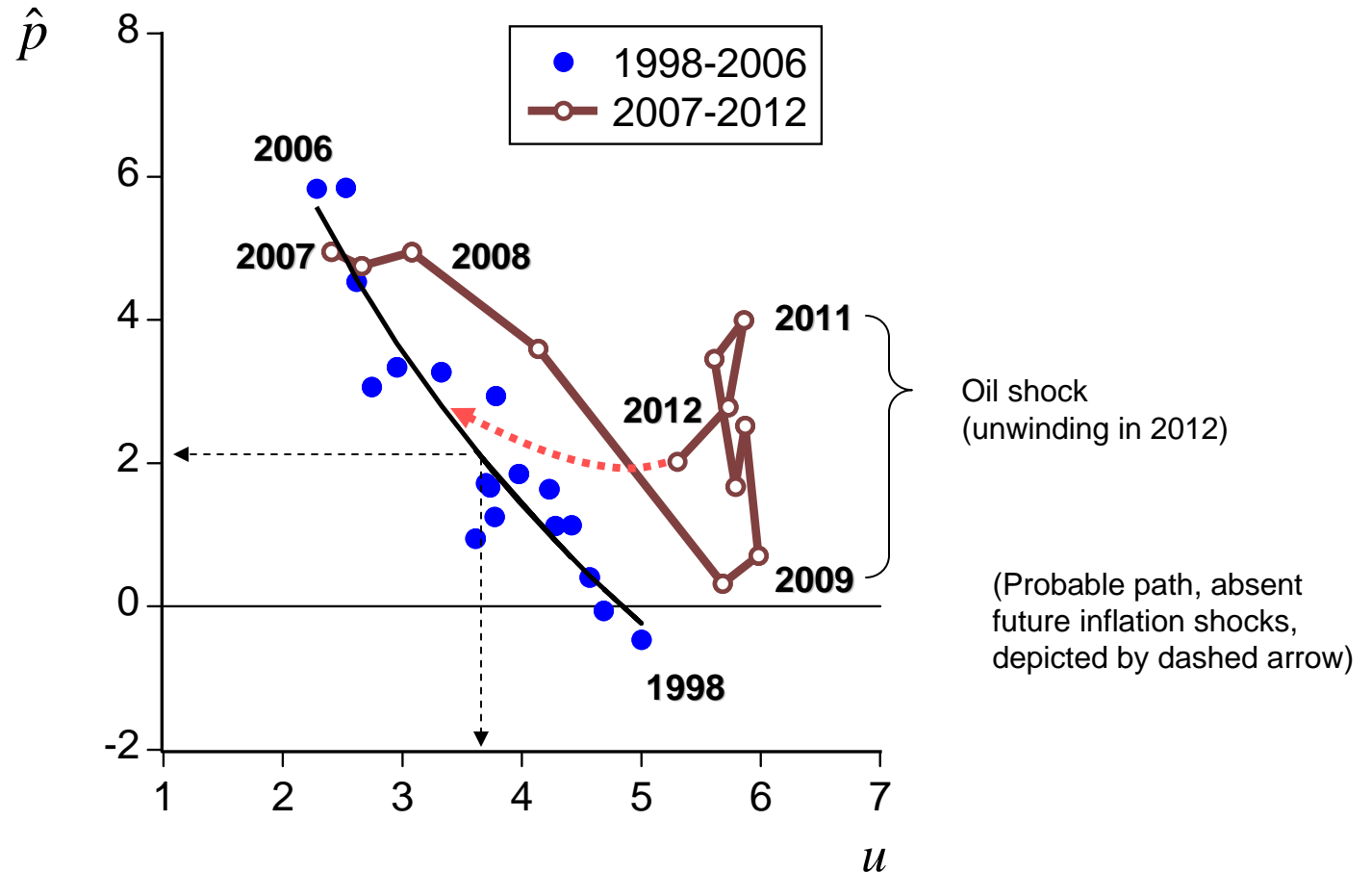
$$(\hat{p}^*, \bar{u}) = [2\%, (5.2 - 6.0)\%]$$

Honolulu inflation, unemployment in the recent cycle



*First oil shock was commodity bubble (2008); second, Arab Spring (2009-11)

Honolulu inflation and unemployment since 2007: oil shocks (2008, 2010-11); accelerating expansion



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Source: Bureau of Labor Statistics, U.S. Department of Labor, Hawaii DBEDT and DLIR; data through second half 2012, all calculations by TZE