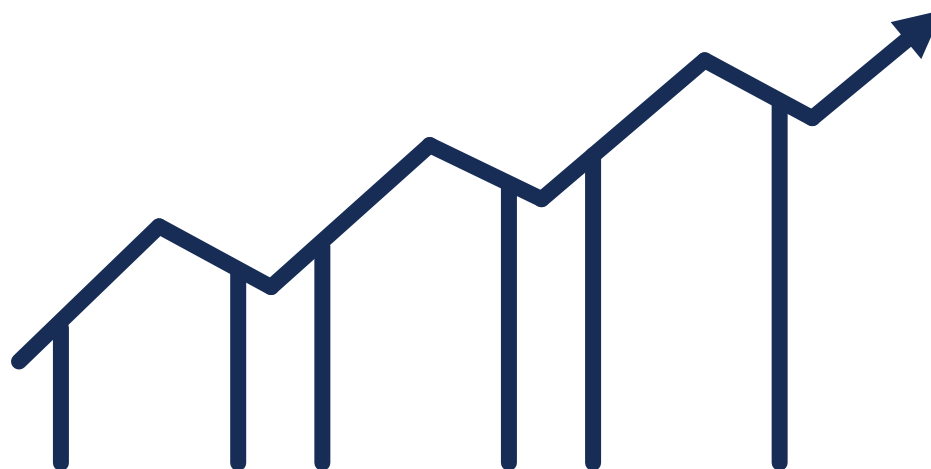


Finding Shelter:
Affordability Squeeze in a Tight Texas Housing Market
Federal Reserve Bank of Dallas and RECENTER
February 23, 2018

“HOMING IN ON HOUSING AFFORDABILITY AROUND THE WORLD”

ENRIQUE MARTÍNEZ GARCÍA (FEDERAL RESERVE BANK OF DALLAS)
VALERIE GROSSMAN (FEDERAL RESERVE BANK OF DALLAS)

THE VIEWS EXPRESSED IN THIS PRESENTATION ARE THOSE OF THE AUTHORS AND DO NOT NECESSARILY REFLECT THE VIEWS OF THE FEDERAL RESERVE BANK OF DALLAS OR THE FEDERAL RESERVE SYSTEM.

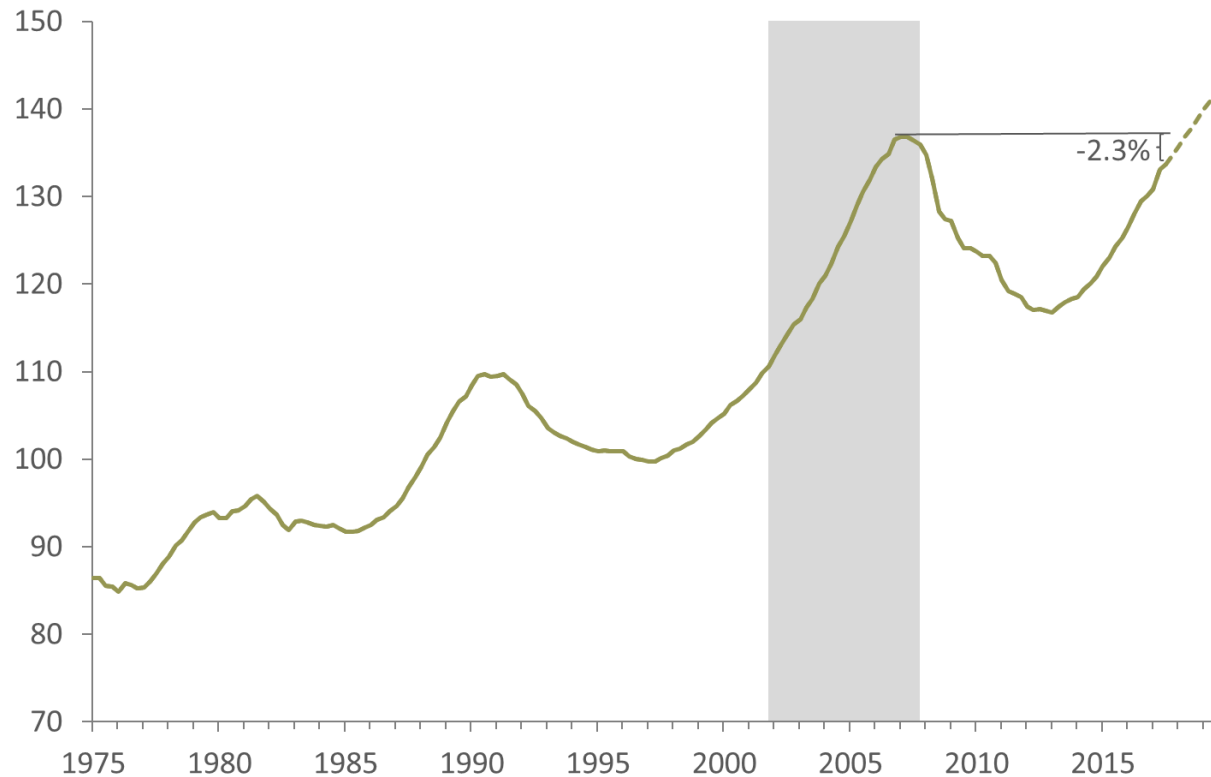


A CROSS-COUNTRY PERSPECTIVE ON HOUSING

AGGREGATE HOUSE PRICES ALMOST BACK TO 2007 PEAK

Aggregate Real House Prices

Index, 1997=100



SOURCES: Federal Reserve Bank of Dallas' International House Price Database; authors' calculations. Shaded area denotes a period of global exuberance as in Pavlidis et al. (2015).

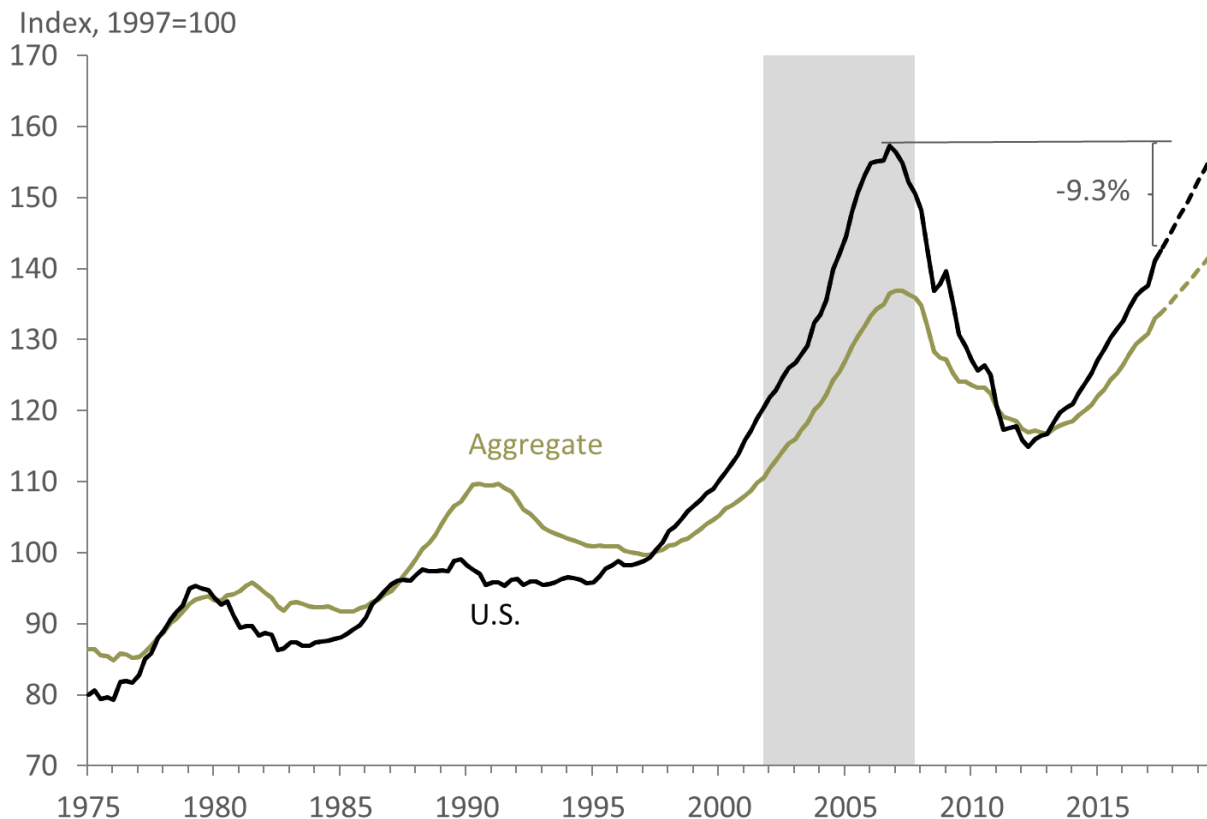
A CLOSER LOOK AT HOUSING MARKETS AROUND THE WORLD

- **The latest housing boom and bust was widespread, yet the *recovery* since 2013 has proven to be more uneven**
 - Robust recovery after the 2007-08 bust (U.S., U.K., Ireland, Netherlands, Spain, Denmark)
 - Booming markets (Australia, Canada, New Zealand, Switzerland, Belgium, Luxembourg, Norway, Sweden, Israel)
 - Largely stagnant markets (Germany, France, Finland, Croatia, South Korea, South Africa)
 - Declining markets (Japan, Italy)
- **Whether these divergent patterns will continue depends on the balance between supply and demand, which varies greatly across countries**

U.S. OUTPACES AGGREGATE DURING THE RECOVERY

- ...but remains well below previous peak

U.S. and Aggregate Real House Prices



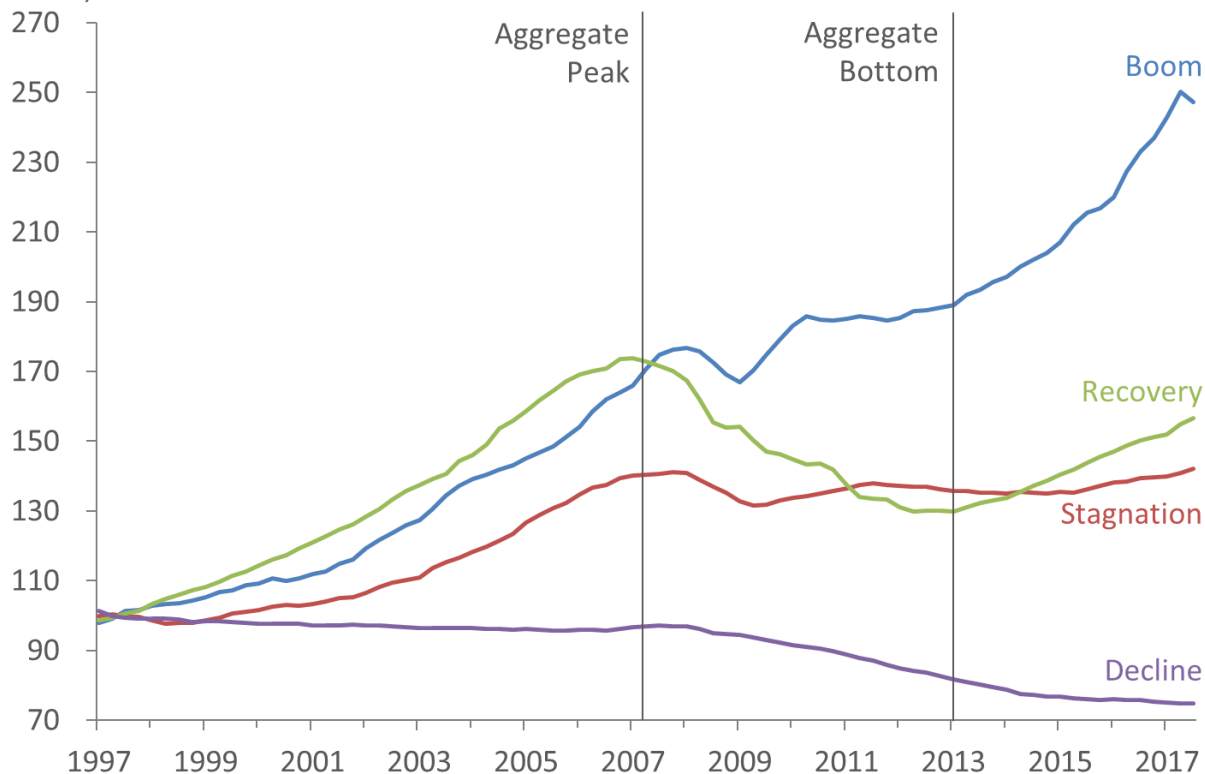
SOURCES: Federal Reserve Bank of Dallas' International House Price Database; authors' calculations. Shaded area denotes a period of global exuberance as in Pavlidis et al. (2015).

UNEVEN HOUSING RECOVERY AFTER 2008 RECESSION

- The unevenness of recovery illustrates deeper differences

Real House Prices

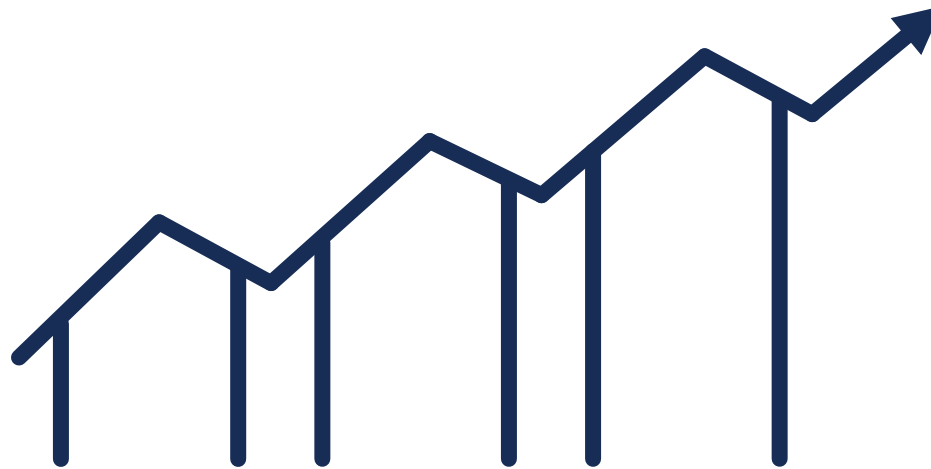
Index, 1997=100



SOURCES: Federal Reserve Bank of Dallas' International House Price Database; authors' calculations.

FUNDAMENTAL DETERMINANTS

- **Fundamental determinants of house prices:**
 - housing supply:
 - land availability
 - regulation, zoning, taxation
 - construction costs
 - public housing
 - housing demand:
 - demographics
 - housing rents
 - returns on alternative assets
 - affordability—household disposable income, mortgage rates, credit availability and method of financing
- **...But can we tell whether real house prices have actually moved out of sync with fundamentals?**



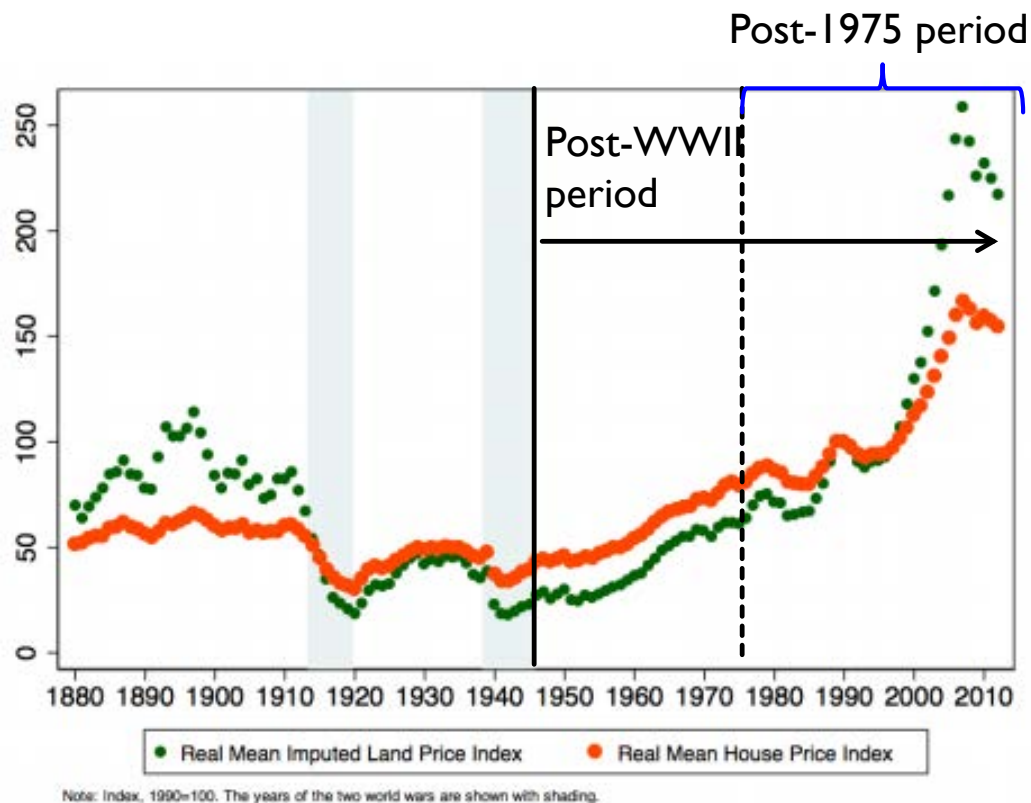
SUPPLY CONSTRAINTS



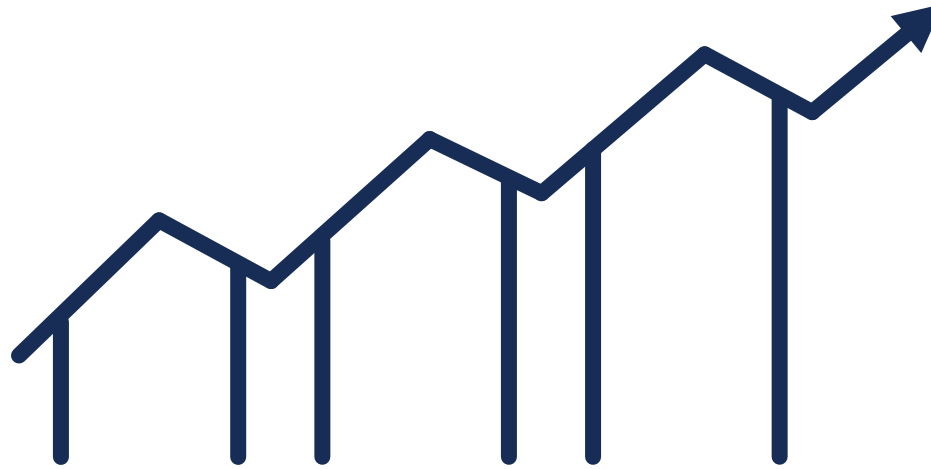
A LONG-RUN PERSPECTIVE ON HOUSE PRICES AND LAND PRICES

- **Long-run view of housing markets:**
 - long-run real house price appreciation is a feature of the post-WWII period, not of the preceding period
 - construction costs contribute most to house price appreciation between the 1940s and 1970s
 - housing prices markedly outpace GDP per capita since the 1970s
 - land prices contribute most to house price appreciation since the 1970s (together with greater urbanization)
- **Strong real house price appreciation since the 1950s...**

...BUT LAND PRICES ARE KEY IN HOUSE PRICE APPRECIATION



SOURCES: K. Knoll, M. Schularick and T. Steger (2017): "No Price Like Home: Global House Prices, 1870–2012." American Economic Review, vol. 107 (2), pp. 331–353.



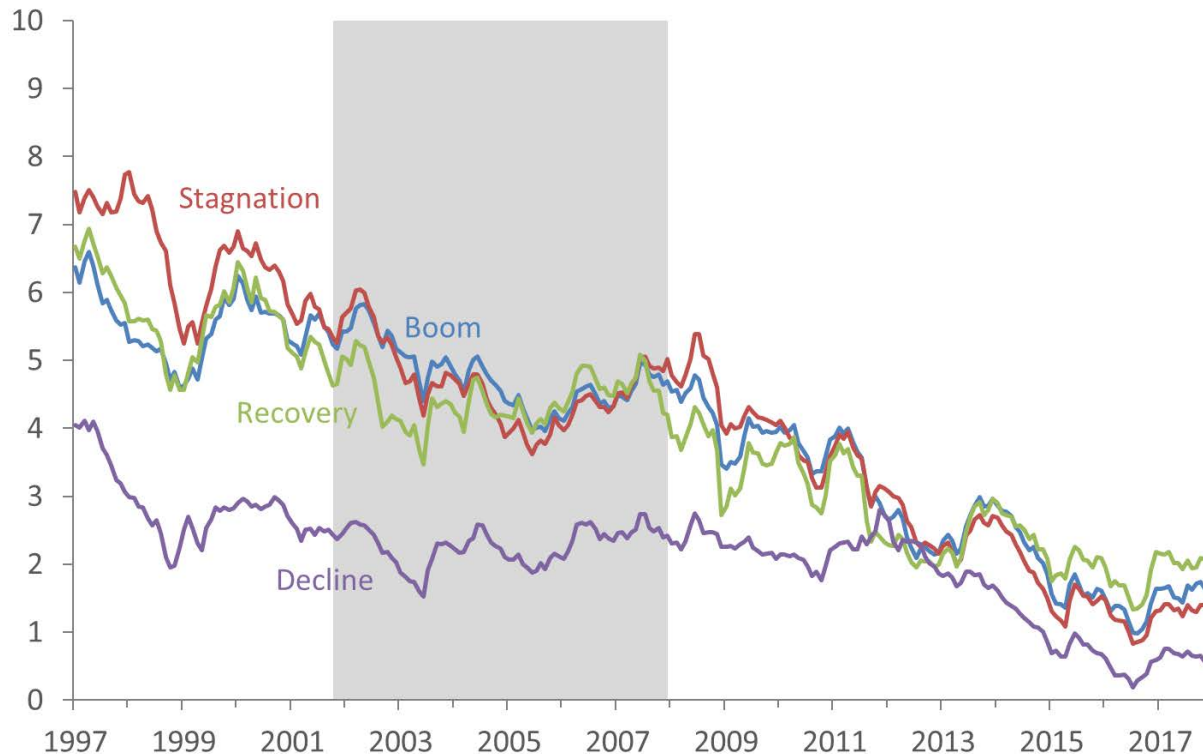
DEMAND FACTORS AND AFFORDABILITY

LONG-TERM INTEREST RATES HAVE DRIFTED DOWNWARDS SINCE 2008-09

- The decline is widespread and largely synchronized across countries

10-Year Government Bond Yields

Percent



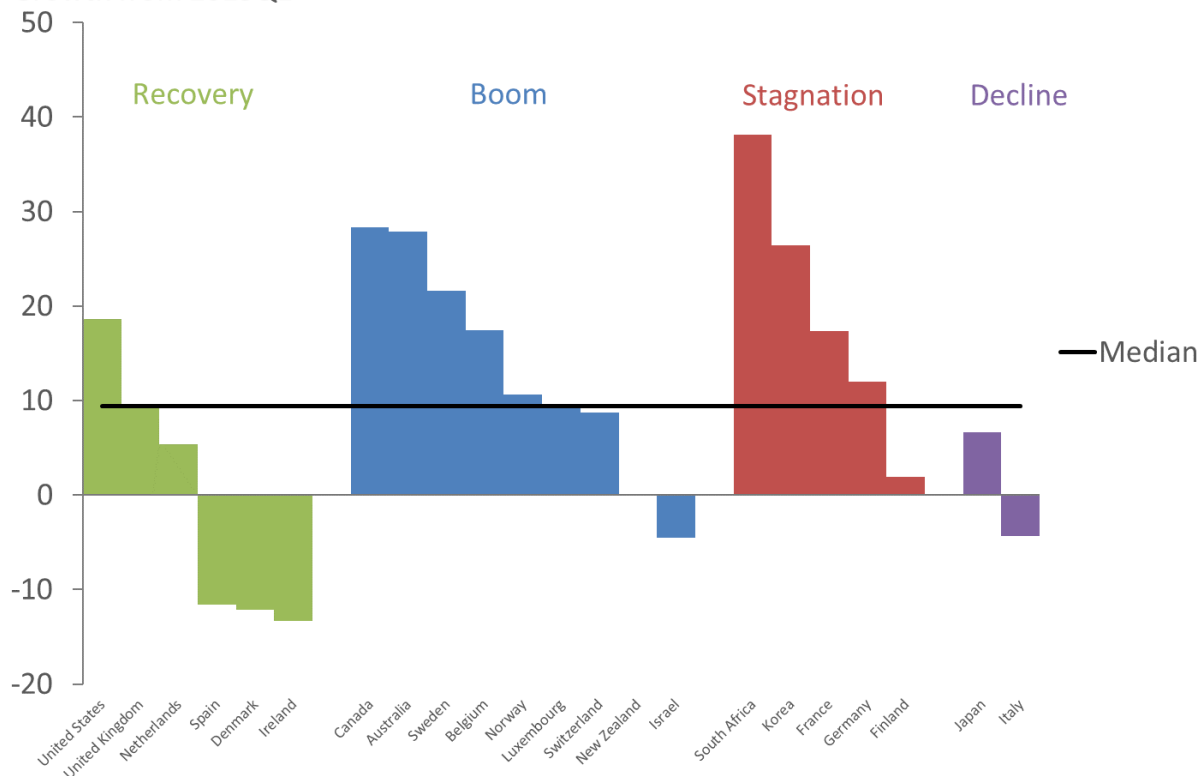
SOURCES: Federal Reserve Bank of Dallas' Database of Global Economic Indicators; authors' calculations. Shaded area denotes a period of global exuberance as in Pavlidis et al. (2015).

THE RECOVERY IS NOT ALWAYS ASSOCIATED WITH STRONG CREDIT GROWTH

- Apart from U.S., most credit growth occurred among booming/stagnant countries

Credit to the Private Nonfinancial Sector

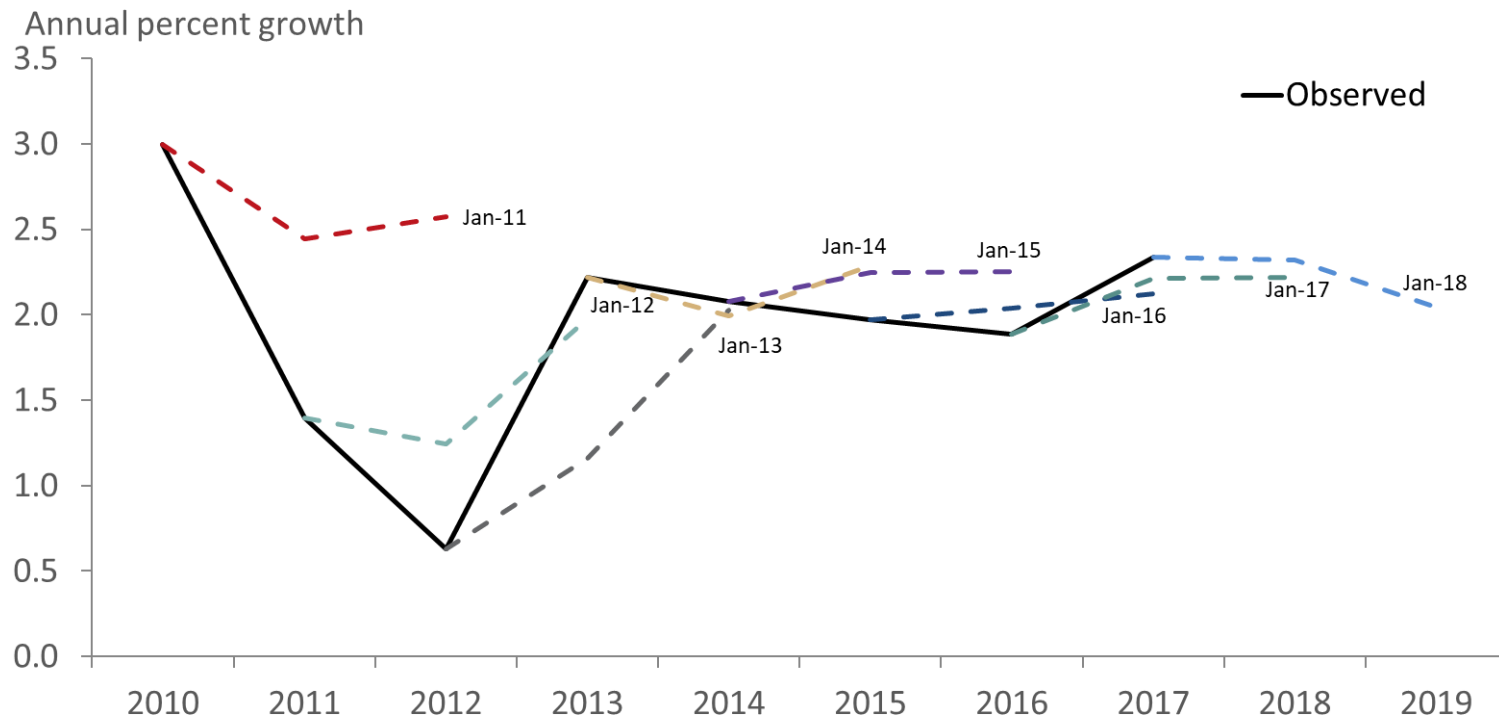
Growth from 2013Q1



SOURCES: Bank for International Settlements; authors' calculations.

THE OUTLOOK FOR ECONOMIC GROWTH REMAINS STEADY SINCE 2013

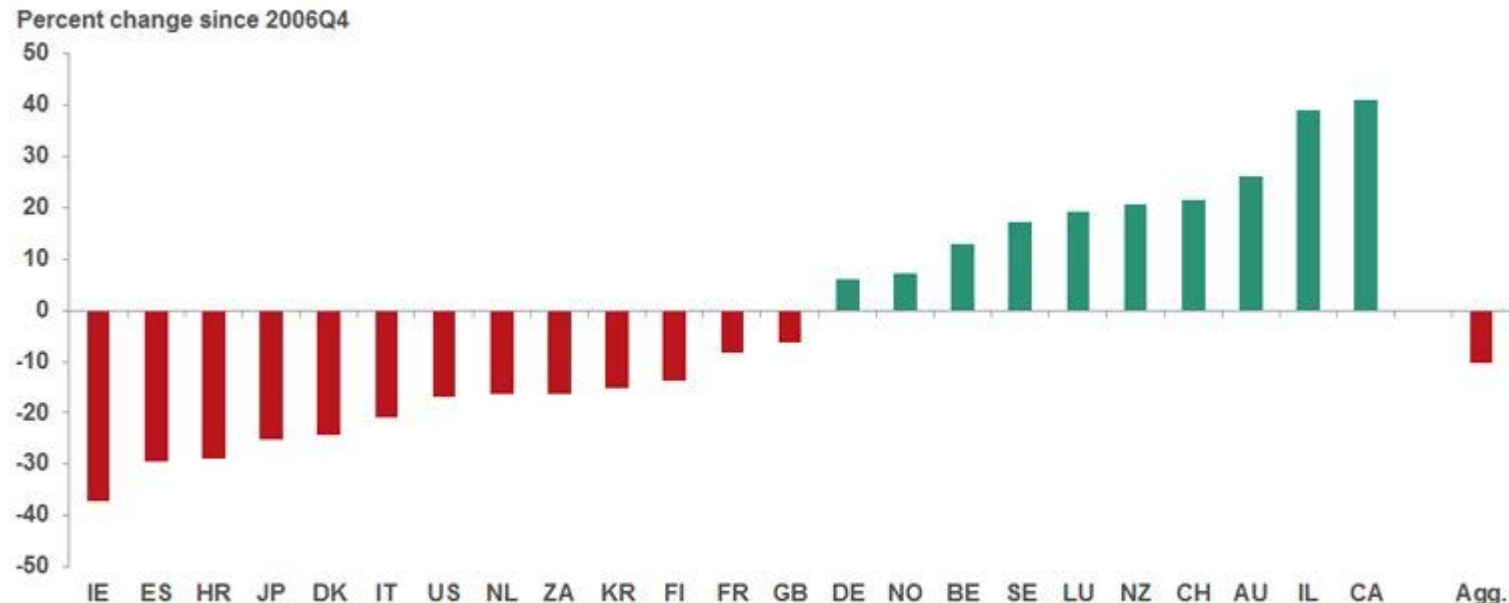
Actual and Expected Growth for the Aggregate



NOTE: 2017 Observed data is an estimate calculated using Quarter 1 through 3 data combined with forecasts for the fourth quarter for countries with missing Quarter 4 data. Dotted lines represent forecasts. Data is aggregated using PPP adjusted GDP weights.
SOURCES: IMF World Economic Outlook; Consensus Forecasts; Local Sources.

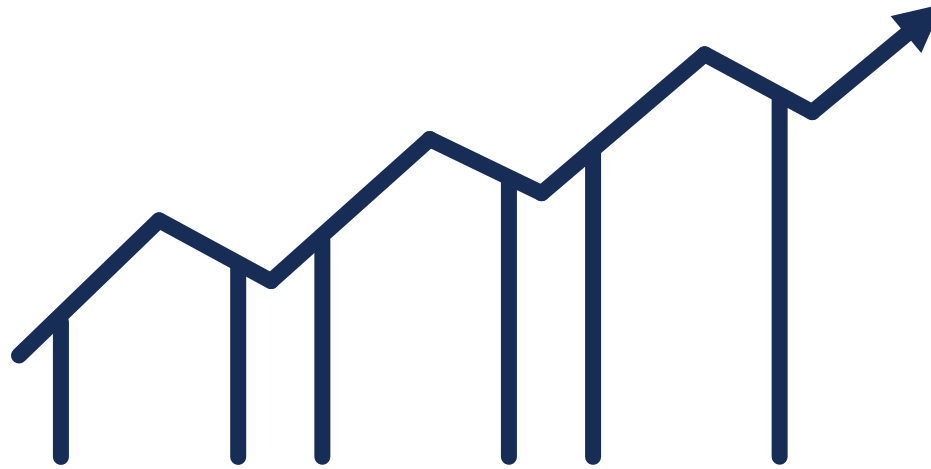
HOUSE PRICES HAVE OUTSTRIPPED INCOME MOSTLY IN BOOMING COUNTRIES

House-Price-to-Income Ratio Still Below 2006Q4 Peak in Aggregate in 2017Q2



NOTES: The chart plots the percent change in real house prices relative to real personal disposable income since the 2006Q4 peak in the aggregate. A high growth rate in this ratio indicates that house prices outpace disposable income which is a key fundamental driver of the housing market. Green indicates an increase, and red indicates a decrease.

SOURCE: Federal Reserve Bank of Dallas.



WHAT DOES THIS MEAN FOR HOUSING AROUND THE WORLD?



INSPECTING LONG-RUN HOUSING ANCHORS

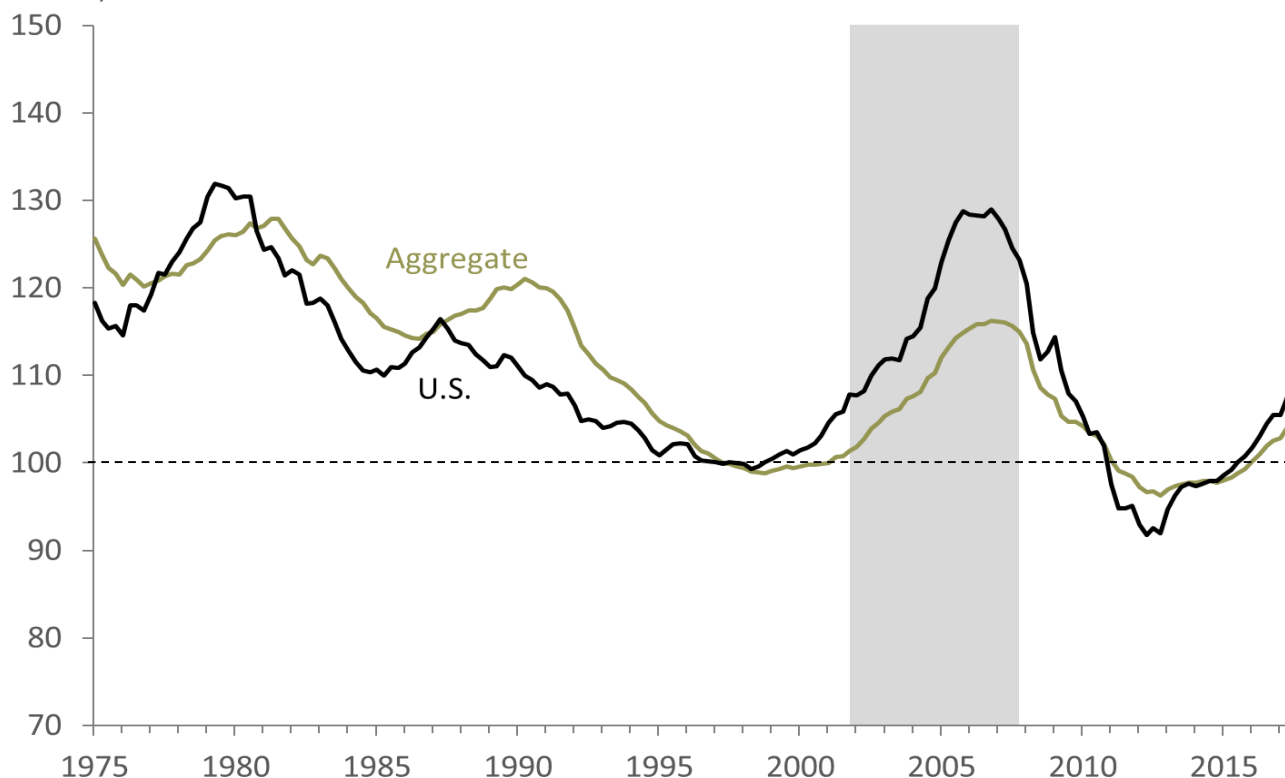
- **Interpreting long-run valuation ratios:**
 - price-to-rent ratio—if house prices and rents become disconnected, households will switch between buying and renting bringing them back in line
 - price-to-income ratio—if house prices become too far apart from household income (or more generally from households' means to afford housing), demand will adjust bringing prices back in line
- **Long-run valuation ratios can act as long-run anchors, yet house prices can still deviate for long periods of time:**
 - in particular, when supply is restrained and cannot catch up with demand fast enough

PRICE-TO-INCOME RATIO'S LONG SWINGS

- Price-to-income ratio recovered above mid-1990s level

U.S. and Aggregate House-Price-to-Income Ratios

Index, 1997=100

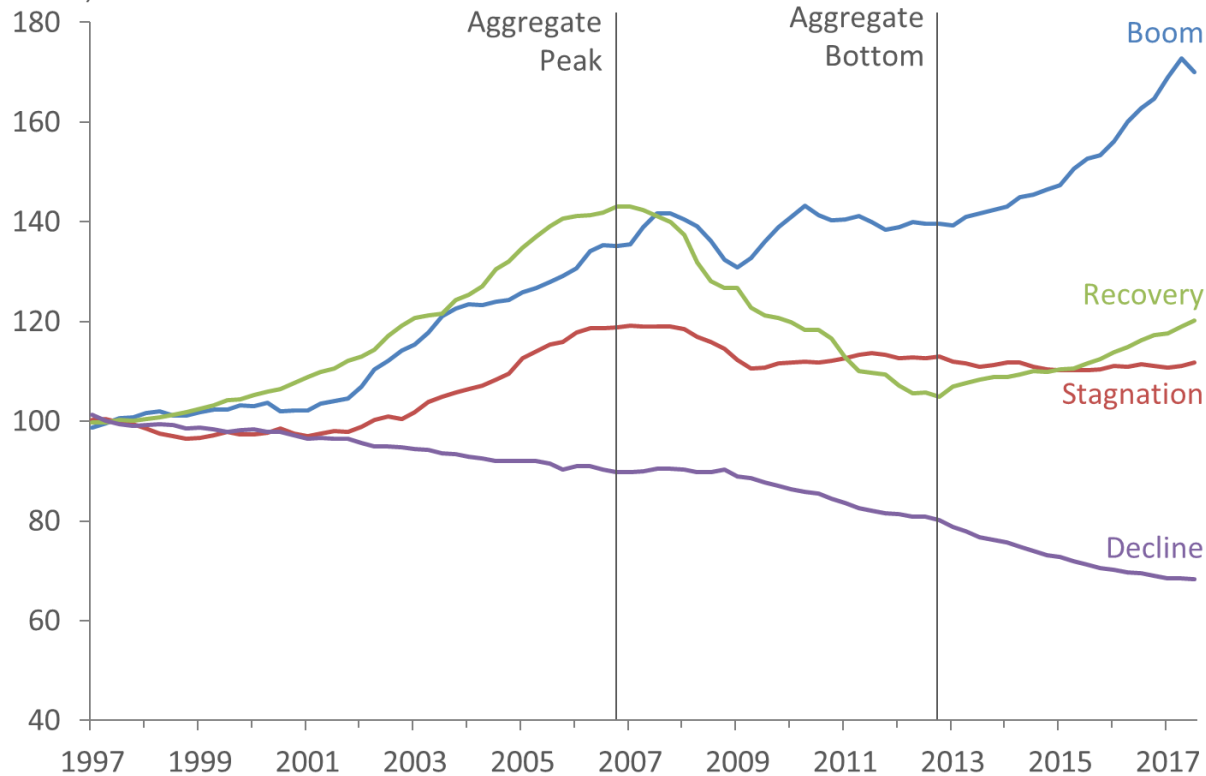


SOURCES: Federal Reserve Bank of Dallas' International House Price Database; authors' calculations. Shaded area denotes a period of global exuberance as in Pavlidis et al. (2015).

PRICE-TO-INCOME RATIO DIVERGENCE ACROSS COUNTRIES LARGELY DRIVEN BY HOUSE PRICES

House-Price-to-Income Ratios

Index, 1997=100



SOURCES: Federal Reserve Bank of Dallas' International House Price Database; authors' calculations.

WHAT DOES THE EVIDENCE TELL US ABOUT THE RECOVERY?

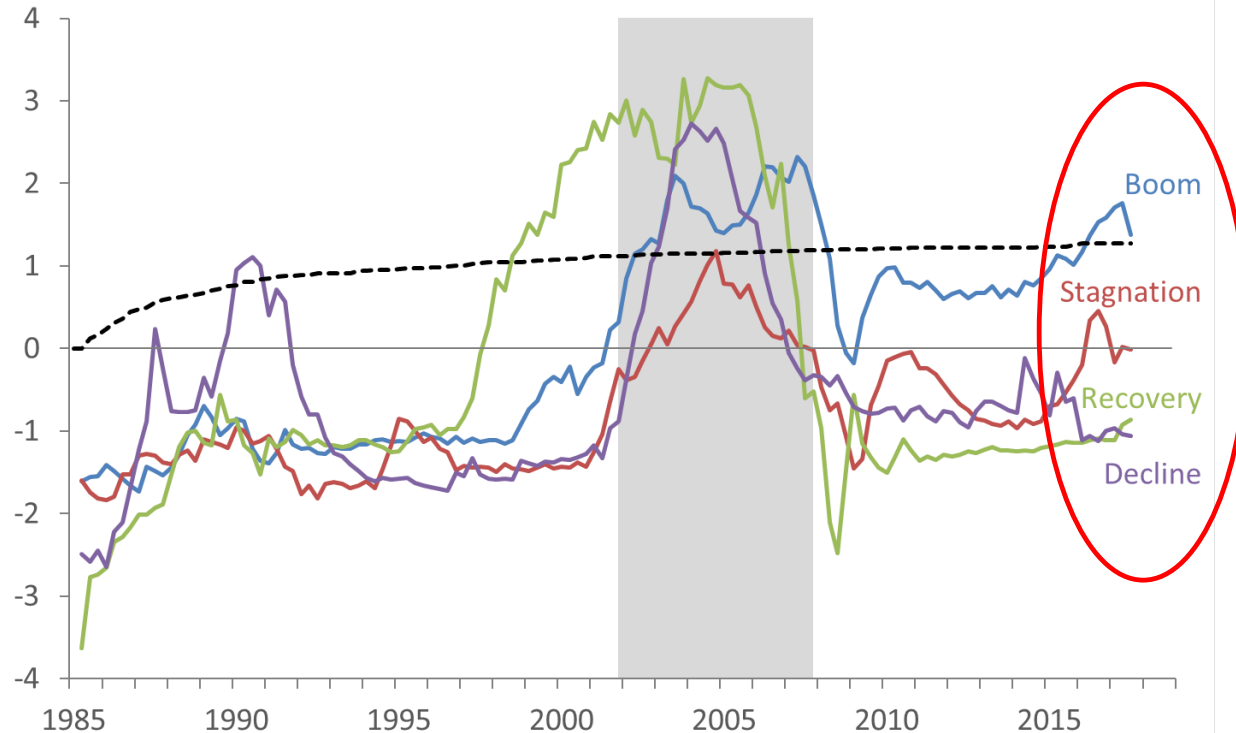
- **Real house prices may deviate from long-run anchors over extended periods, then rapidly collapse:**
 - long-run anchors may appear unrelated to the actual housing cycle
 - boom-bust patterns can occur for multiple reasons (fundamental- and non-fundamental-based) – which are difficult to model
- **We propose a test (*exuberance indicator*) that aims to detect periods in which the data appears inconsistent with its historical characteristic:**
 - "Episodes of Exuberance in Housing Markets: In Search of the Smoking Gun" (Efthymios Pavlidis, Alisa Yusupova, Ivan Paya, David Peel, Adrienne Mack, Enrique Martínez-García, and Valerie Grossman), *The Journal of Real Estate Finance and Economics*, Vol. 53(4), pp. 419-449, 2016.

EXUBERANCE TESTS FLAGGED OVERHEATING IN BOOMING COUNTRIES SINCE LATE 2016

- ...yet these are not as widespread as during the preceding housing boom

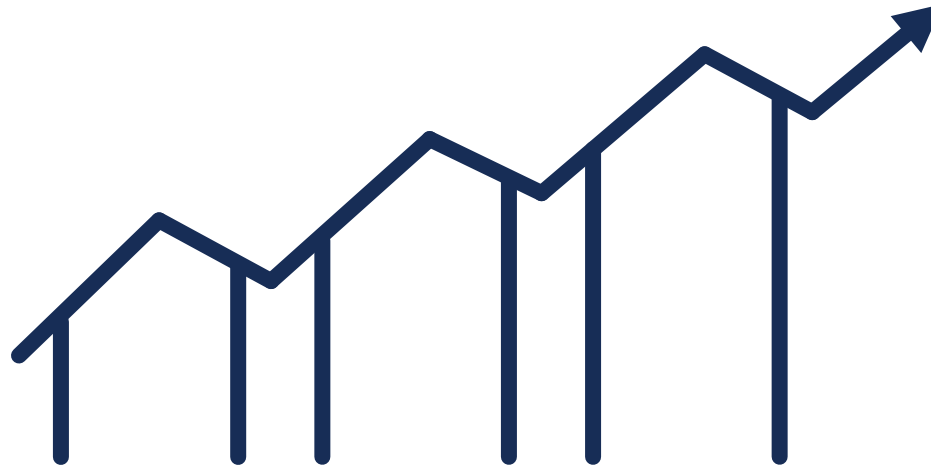
Exuberance in Real House Prices

Test Statistic and Critical Value



NOTE: Black line indicates 95% test statistic critical values.

SOURCES: Federal Reserve Bank of Dallas' International House Price Database; authors' calculations. Shaded area denotes a period of global exuberance as in Pavlidis et al. (2015).



CONCLUDING REMARKS



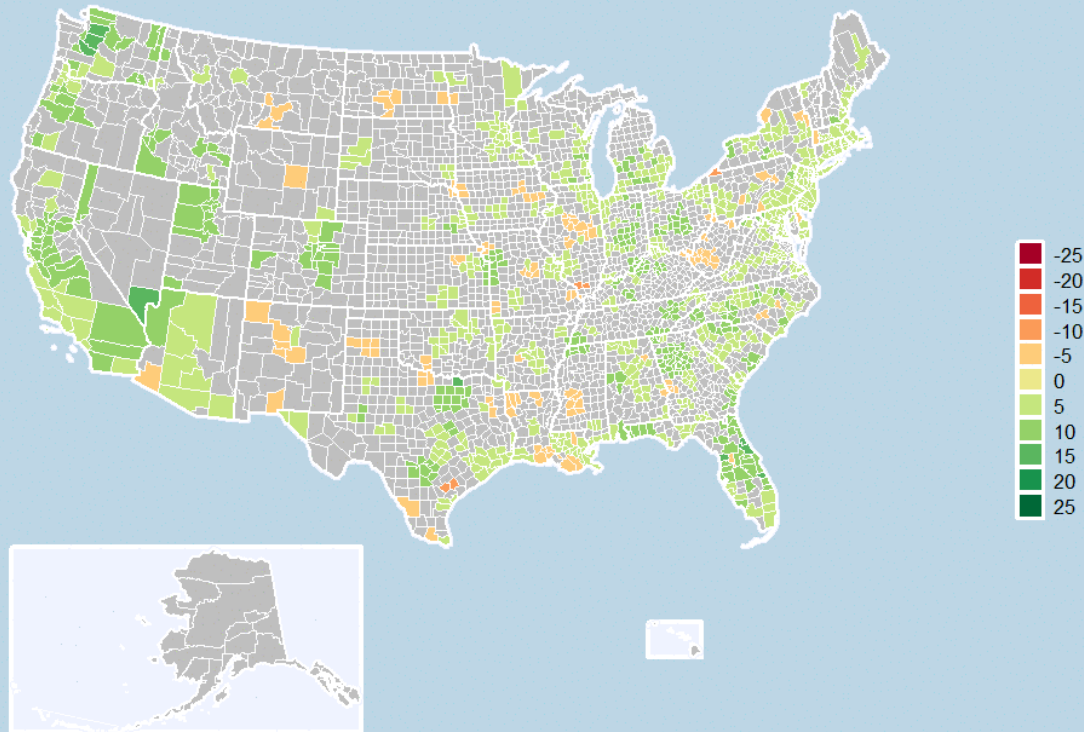
CONCLUDING REMARKS

- **Housing poses a risk to financial and macroeconomic stability:**
 - due to its strong linkages to other sectors of the economy...
 - ...and because it can be a source of vulnerabilities reaching into the broader economy
 - large misallocation of resources and efficiency losses can result from over-valuation (under-valuation) in housing markets
- **Housing affordability is eroding in the U.S. and across countries:**
 - ...but the evidence suggests the recovery from the last bust is rather uneven across countries, with concerns mostly in a few countries
- **Not only are there differences across countries, but housing markets differ greatly also within countries. The U.S. offers a good example of this.**

HETEROGENEITY WITHIN COUNTRIES:

GROWTH RATE OF REAL HOUSE PRICES (Y-O-Y) ACROSS U.S. MSAs

DEC 2017

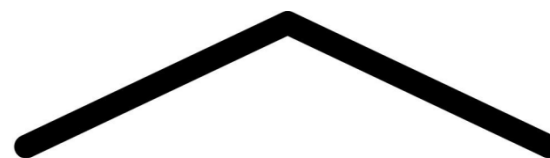


NOTE: Insets containing Alaska and Hawaii are not drawn to scale.

SOURCES: Freddie Mac; U.S. Bureau of Labor Statistics; authors' calculations.

THANK YOU!!





International House Price Database
www.dallasfed.org/institute/houseprice/index.cfm

Where house prices live.

FOR QUESTIONS/FEEDBACK, CONTACT THE AUTHORS AT:

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VALERIE.GROSSMAN@DAL.FRB.ORG

FURTHER READINGS ON THE DATA AND THE INDICATORS MENTIONED IN THIS PRESENTATION:

"THROUGH THE ROOF" – WEBSITE ON HOUSING ECONOMICS (ENRIQUE MARTÍNEZ-GARCÍA)

"A CROSS-COUNTRY QUARTERLY DATABASE OF REAL HOUSE PRICES: A METHODOLOGICAL NOTE" (ADRIENNE MACK, ENRIQUE MARTÍNEZ-GARCÍA, AND VALERIE GROSSMAN), GLOBALIZATION AND MONETARY POLICY INSTITUTE WORKING PAPER NO. 99, DECEMBER 2011 (REVISED: JANUARY 2018)

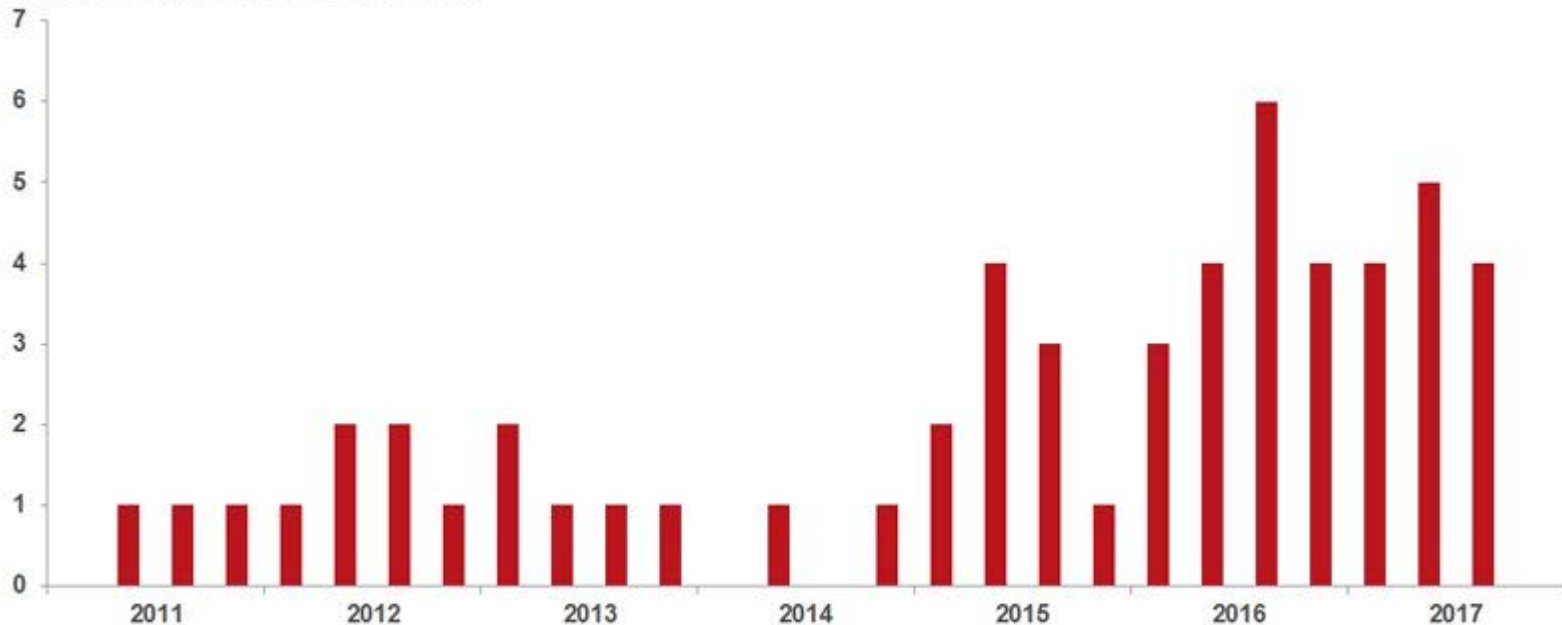
"EPISODES OF EXUBERANCE IN HOUSING MARKETS: IN SEARCH OF THE SMOKING GUN" (EFTHYMIOS PAVLIDIS, ALISA YUSUPOVA, IVAN PAYA, DAVID PEEL, ADRIENNE MACK, ENRIQUE MARTÍNEZ -GARCÍA, AND VALERIE GROSSMAN), *THE JOURNAL OF REAL ESTATE FINANCE AND ECONOMICS*, VOL. 53(4), PP. 419-449, 2016.

APPENDIX

SUMMARY OF LATEST EVIDENCE ON EXUBERANCE (I)

2017Q3 Real House Prices Signal Overheating in Several Countries

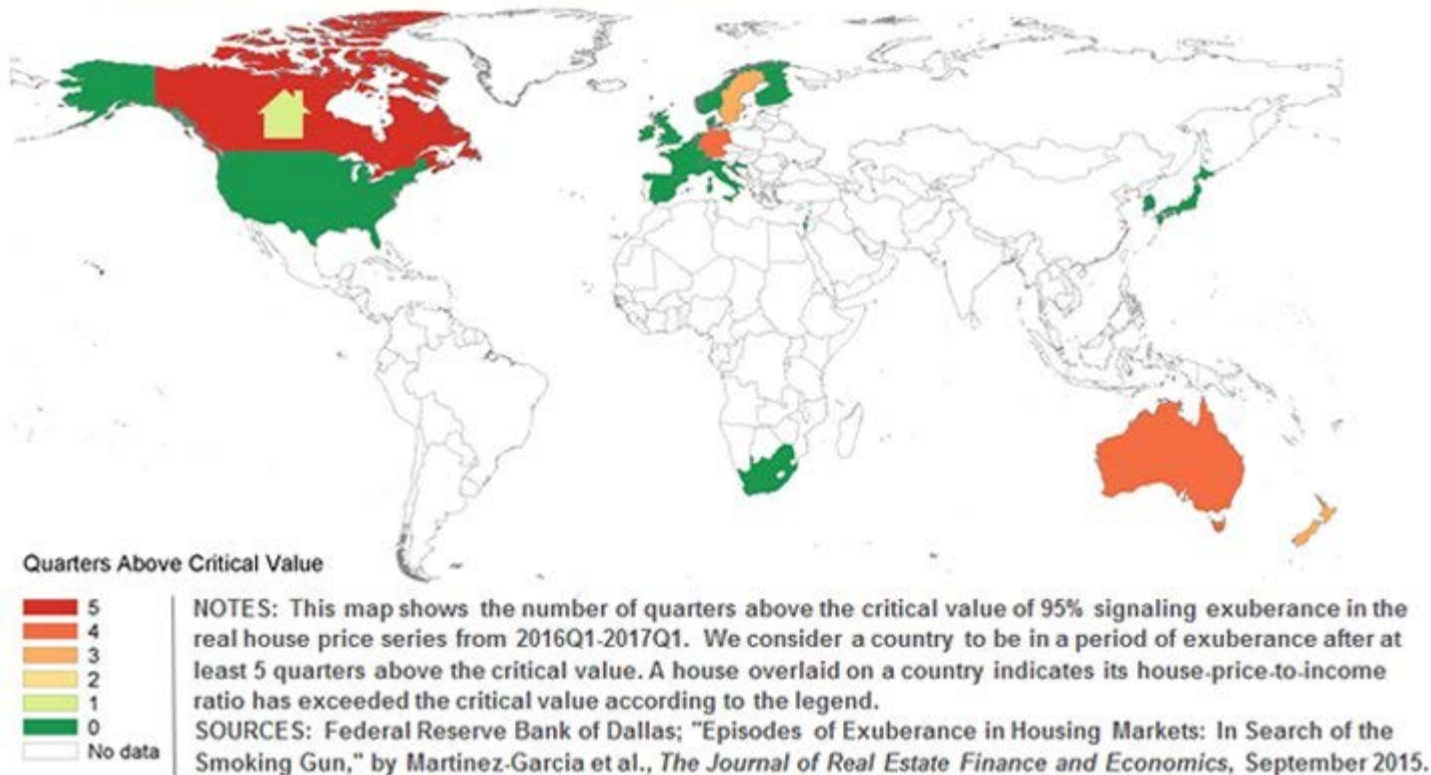
Number of Countries above Critical Value



NOTE: This chart shows the number of countries above the critical value of 95% signaling exuberance in the real house price series (RHPI) during a given quarter.
SOURCES: Federal Reserve Bank of Dallas; "Episodes of Exuberance in Housing Markets: In Search of the Smoking Gun," by Martinez-Garcia et al., *The Journal of Real Estate Finance and Economics*, September 2015.

SUMMARY OF LATEST EVIDENCE ON EXUBERANCE (2)

Housing Shows Signs of Overheating in Some Places in 2017Q1



BUILDING A CONSISTENT DATASET

- **Dallas Fed International House Price Database**

- 23 countries – more countries to be added in the future
- starting data: 1975Q1; updates quarterly
- benchmark: the FHFA quarterly price series for the U.S.
- data is publicly available at: <https://www.dallasfed.org/institute/houseprice.aspx>
 - House prices (real and nominal)
 - Personal disposable income (real and nominal)

- **Methodology:** Adrienne Mack and Enrique Martínez-García with Valerie Grossman (2011): "A Cross-Country Quarterly Database of Real House Prices: A Methodological Note." Federal Reserve Bank of Dallas, Globalization and Monetary Policy Institute Working Paper No. 99 (Revised: January 2018).
<http://www.dallasfed.org/assets/documents/institute/wpapers/2011/0099.pdf>