



WISCONSIN
SCHOOL of BUSINESS

JAMES A.
GRAASKAMP CENTER
for
REAL ESTATE

Better Research, Better Appraisals?

*The gains from trade
between academics and practitioners*

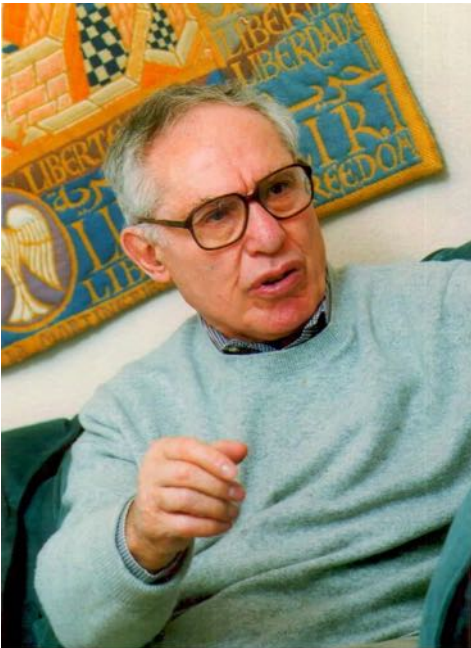
Stephen Malpezzi

July 27, 2017

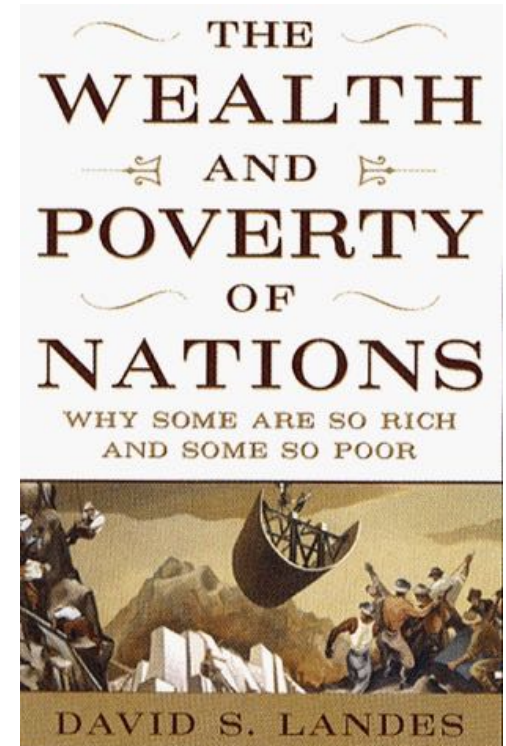
Contact information

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 - <http://smalpezzi.marginalq.com/>
 - <http://reudviewpoint.blogspot.com/>
- Research Associate, Rutgers Center for Real Estate
 - <https://www.rutgersrealestate.com/blog-re/>
- Dean, Weimer School of the Homer Hoyt Institute
 - <http://hoytgroup.org/>
- Email me for a pdf of today's slides

The gains from trade between academics and practitioners



“If the gains from trade in commodities are substantial, they are small compared to trade in ideas.”
David Landes



Today's talk

- Introduction
- ~~Some economic and statistical jargon~~
- Housing prices and the Great Financial Crisis/Great Recession
- Modeling housing prices
- Some implications of house price research for appraisals
- Possible topics for future conversations?
- Further reading

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A famous appraiser..



December 14, 1987

Mr. M. Danny Wall
Chairman
Federal Home Loan Bank Board
1700 G Street, N.W.
Washington, D.C. 20552

Dear Mr. Wall:

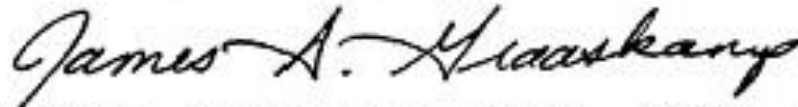
On October 2, the Federal Home Loan Bank Board withdrew its proposed revisions on R41-C which it had put forth in May of this year and replaced it with a new proposal that would "instruct the management of each insured institution to develop, implement, and maintain appraisal policies and practices." Presumably, this capitulation on efforts to improve appraisals was necessary to accomplish requirements of the Competitive Equality Banking Act.

I was appalled that the Federal Home Loan Board stated the new proposal "emphasizes the exercise of discretion by management rather than the individual components of an acceptable appraisal . . . and will foster both cost efficiency in the appraisal process and competitive policy with the banking industry."

More selections from Graaskamp letter

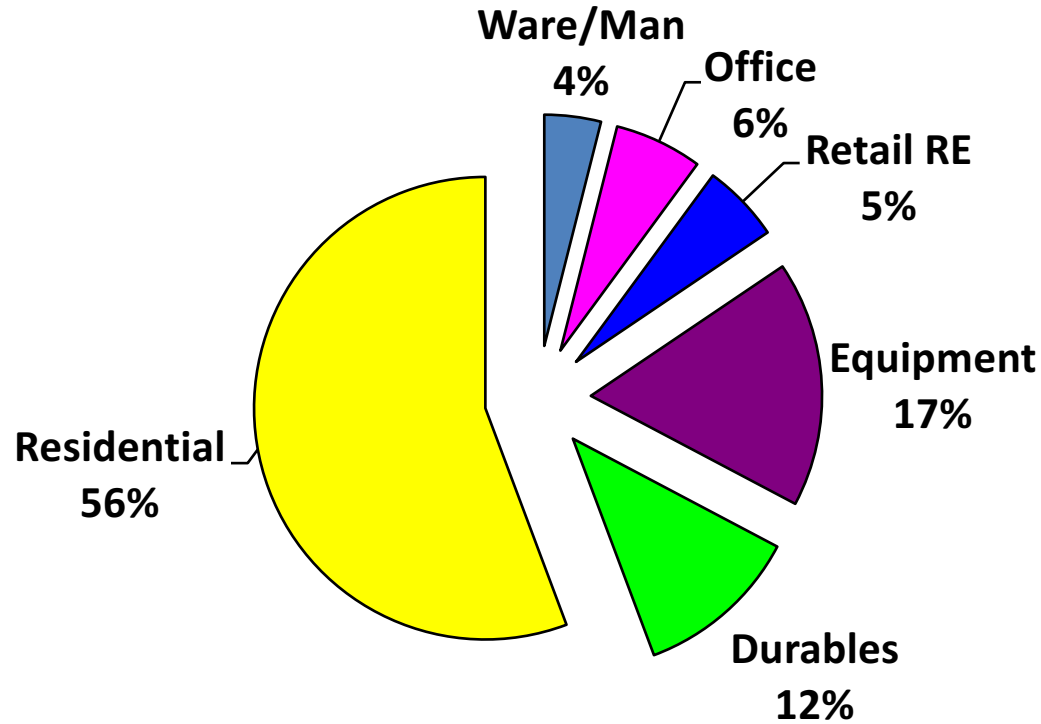
The banking industry has no appraisal standards, and pressure to reduce appraisal fees has driven the good appraisal firms from the mortgage lending business. Everywhere I go, appraisers complain of the unethical pressures brought by borrowers and bankers to accommodate loan requirements. Gresham's Law has driven quality real estate research out of the market. Good appraisal requires many hours of professional investigation, but good appraisals are essential if we are to protect the integrity of our financial institutions.

With deepest regret,

A handwritten signature in black ink that reads "James A. Graaskamp". The signature is written in a cursive, flowing style.

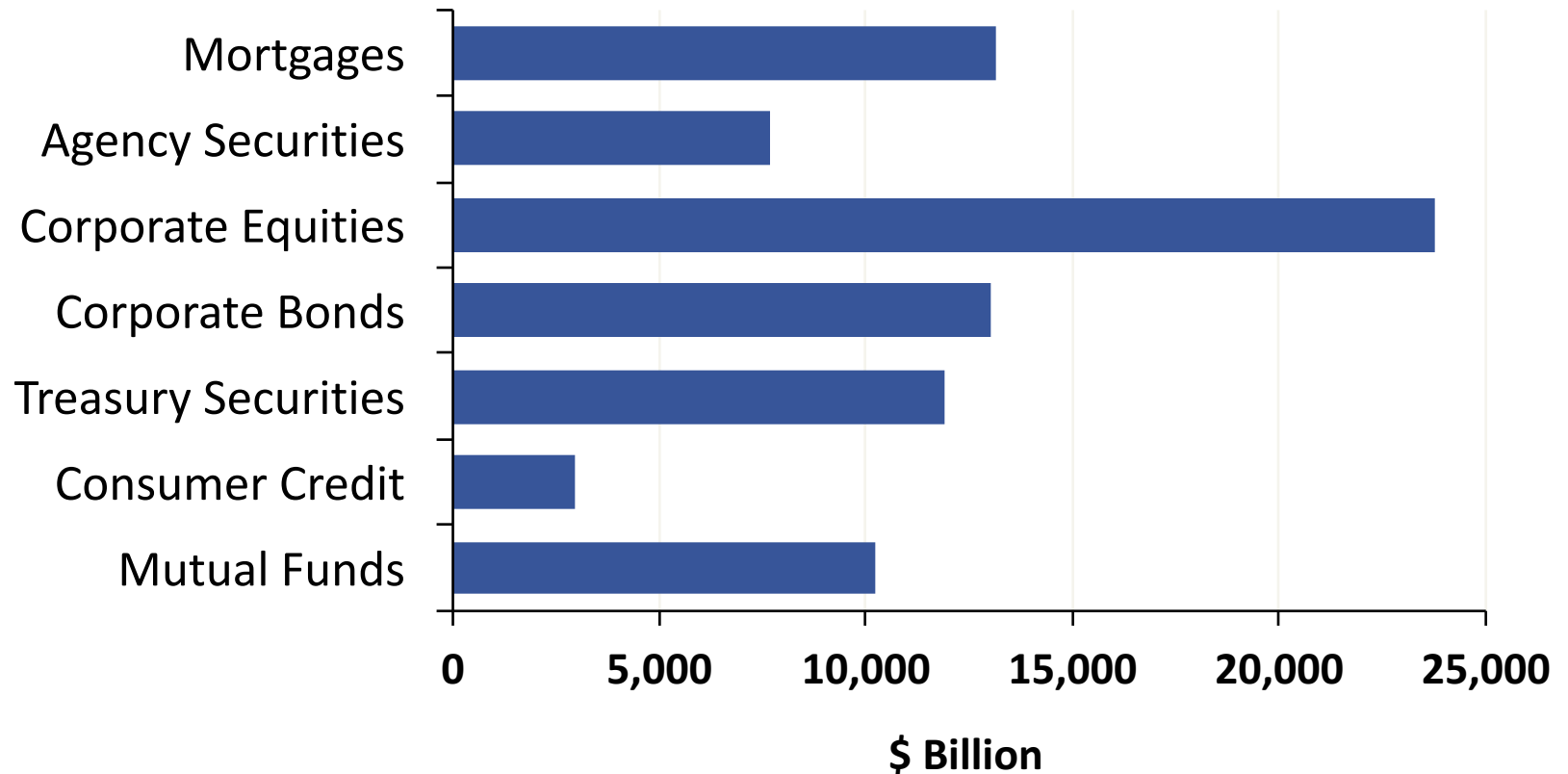
James A. Graaskamp, Ph.D., SREA, CRE,
Chairman, Real Estate and Urban Land Economics

U.S. Fixed Tangible Wealth



Source: Malpezzi and Shilling, data from Hartzell et al.

Selected U.S. Financial Assets, 2013



As of Q2 2013, Not seasonally adjusted.
Source: Federal Reserve Flow of Funds.

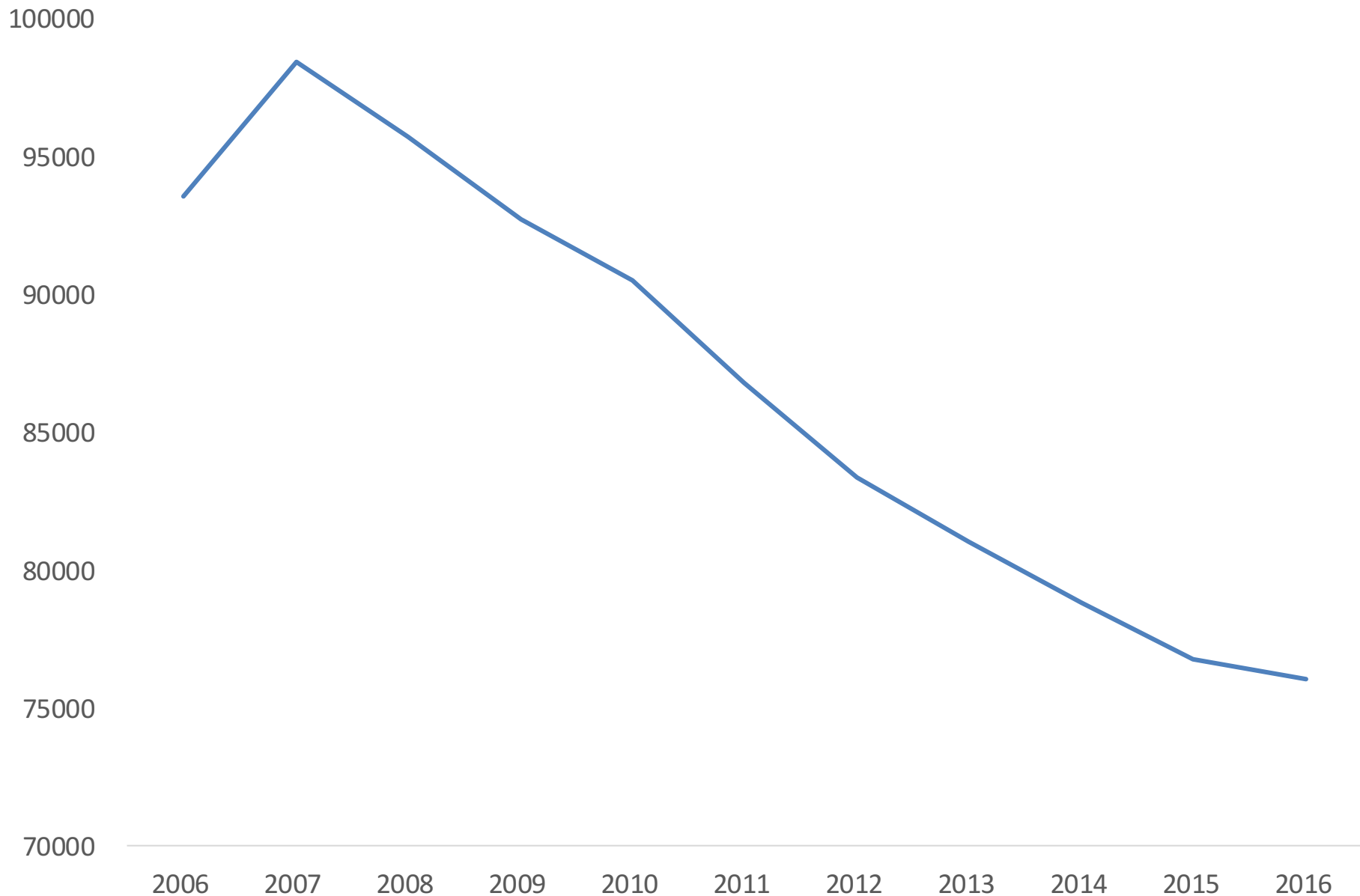
Mid-2009 Estimates of U.S. Commercial Real Estate, Major Food Groups

	Area	Average Price	Total Value
	Millions of Square Feet	Pper Square Foot	Millions of Dollars
Office	12,058	136	1,639,940
Industrial	23,855	45	1,073,457
Flex	2,908	91	264,595
Retail	17,336	172	2,981,810
Health Care	2,635	490	1,291,039
<i>Hospitality</i>	<i>2,557</i>	<i>350</i>	<i>894,854</i>
Mixed Use	108	95	10,227
Multifamily	22,644	62	1,403,897
Specialty, Sports, Entertainment			1,953,008
Total	84,099		11,512,827
Source: Florance, Miller, Spivey and Peng (2010)			
<i>Possible typo in hospitality data? Check.</i>			

Mid-2009 Estimates of U.S. Commercial Real Estate, Specialty Real Estate

		Building Count	Average Size	Average Price per	Total Value
		or Acres	Sq Feet or Acres	Sq Foot or Acre	Millions of Dollars
Prisons	Sq Ft	3,400	150,000	140	632,100
Schools	Sq Ft	147,197	22,205	160	522,962
Religious Buildings	Sq Ft	465,000	12,432	74	427,785
Movie Theaters	Sq Ft	5,561	37,000	324	66,665
Cemeteries	Acres	33,886	23	60,000	46,356
Sports	Acres	14,592	27	112,000	44,126
Vineyards	Acres	934,000		38,390	35,856
Marinas	Sq Ft	9,245	18,205	195	32,820
Police Stations	Sq Ft	54,000	4,400	120	28,512
Post Office Branches	Sq Ft	32,741	5,578	156	28,490
Golf	Acres	15,979	115	14,305	6,355
Convention	Sq Ft	620	313,000	90	17,465
Fire	Sq Ft	30,100	3,900	120	14,087
Trailer Parks	Acres	11,900	8	98,000	9,516
Libraries	Sq Ft	9,214	6,250	160	9,214
Recycling	Acres	8,900	2	400,000	7,120
Casinos	Sq Ft	1,350	25,100	98	3,321
Drive in Theaters	Acres	381	6	73,000	161
Pet Cemeteries	Acres	673	2	72,000	97
Source: Florance, Miller, Spivey and Peng (2010)					

Appraisal Institute Count of Active Appraisers



The Appraisal Industry?



Monty Python and the Holy Grail

https://www.youtube.com/watch?v=dGFXGwHsD_A

Why appraisal and valuation are important

- With an aggregate value estimated to be approximately \$x trillion, real estate comprises over 70 percent of America's tangible capital stock; housing alone is over 50 percent.
- Real estate transactions are large, and relatively infrequent. Many of these transactions are not optional investments, even though most market participants are not experts: businesses large and small must participate, since real estate is the second largest cost center for most businesses (second only to labor).
- Even after the ups and downs of the 2000s, housing equity remains the largest single component of middle income household savings.
- Real estate underlies a large fraction of the financial system (numbers?) and the Great Financial Crisis and its aftermath is just the latest example of how inadequate valuations can contribute to a deep recession.
- Furthermore, unlike, say, a share of common stock, or a quantity of some commodity like wheat or oil, real estate is extremely "heterogeneous;" that is, properties vary tremendously in their size, quality, location and so on, and therefore their value varies tremendously.
- For all these reasons, and others we describe below (e.g. prevention of fraud, stability of financial markets and indeed the entire economy), participants in real estate markets, including not only buyers and sellers, but also financiers, investors, governments (and at times, ultimately taxpayers), require expert advice on the value of these assets.
- Appraisers are professionals who provide this necessary advice and support.

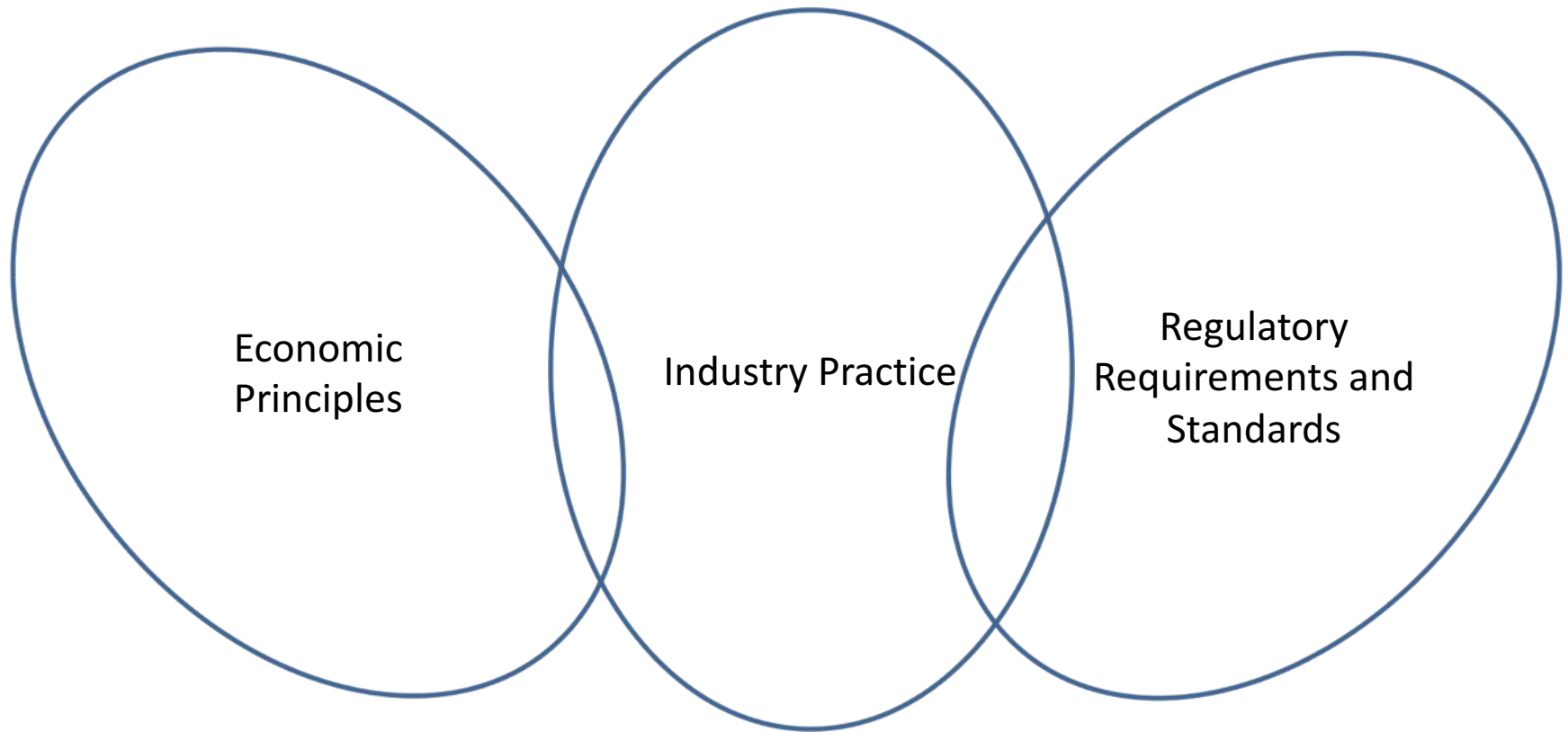


“Everything changes
and nothing stands
still.”

Heraclitus of Ephesus, cited by Plato

(Heraclitus from “The School of
Athens” by Raphael)

Valuation methods and techniques on a bad day

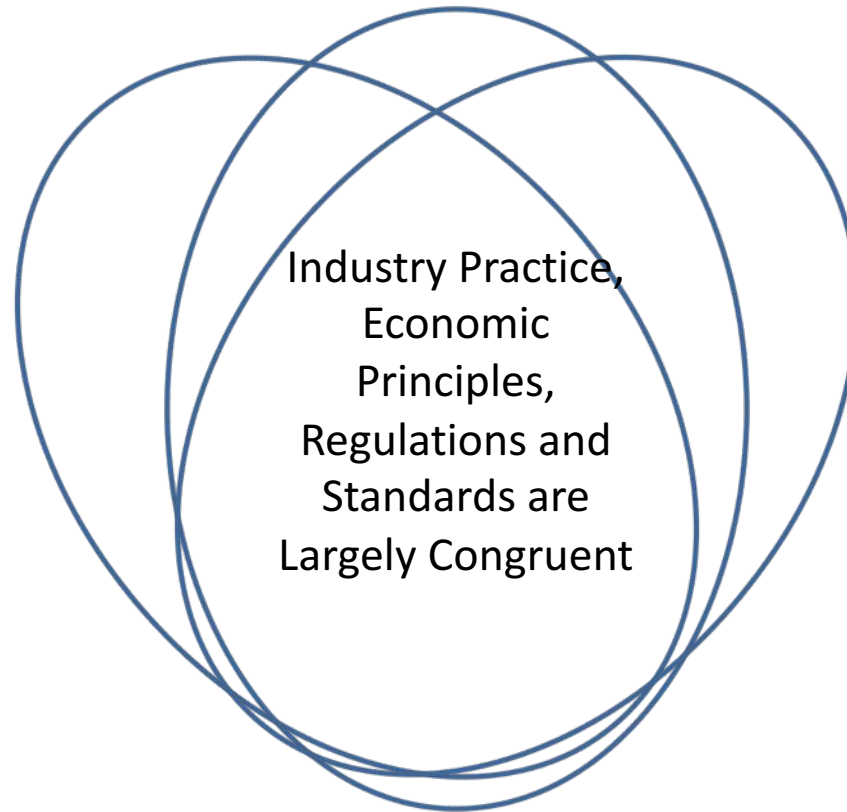


Economic
Principles

Industry Practice

Regulatory
Requirements and
Standards

Valuation methods and techniques on a good day

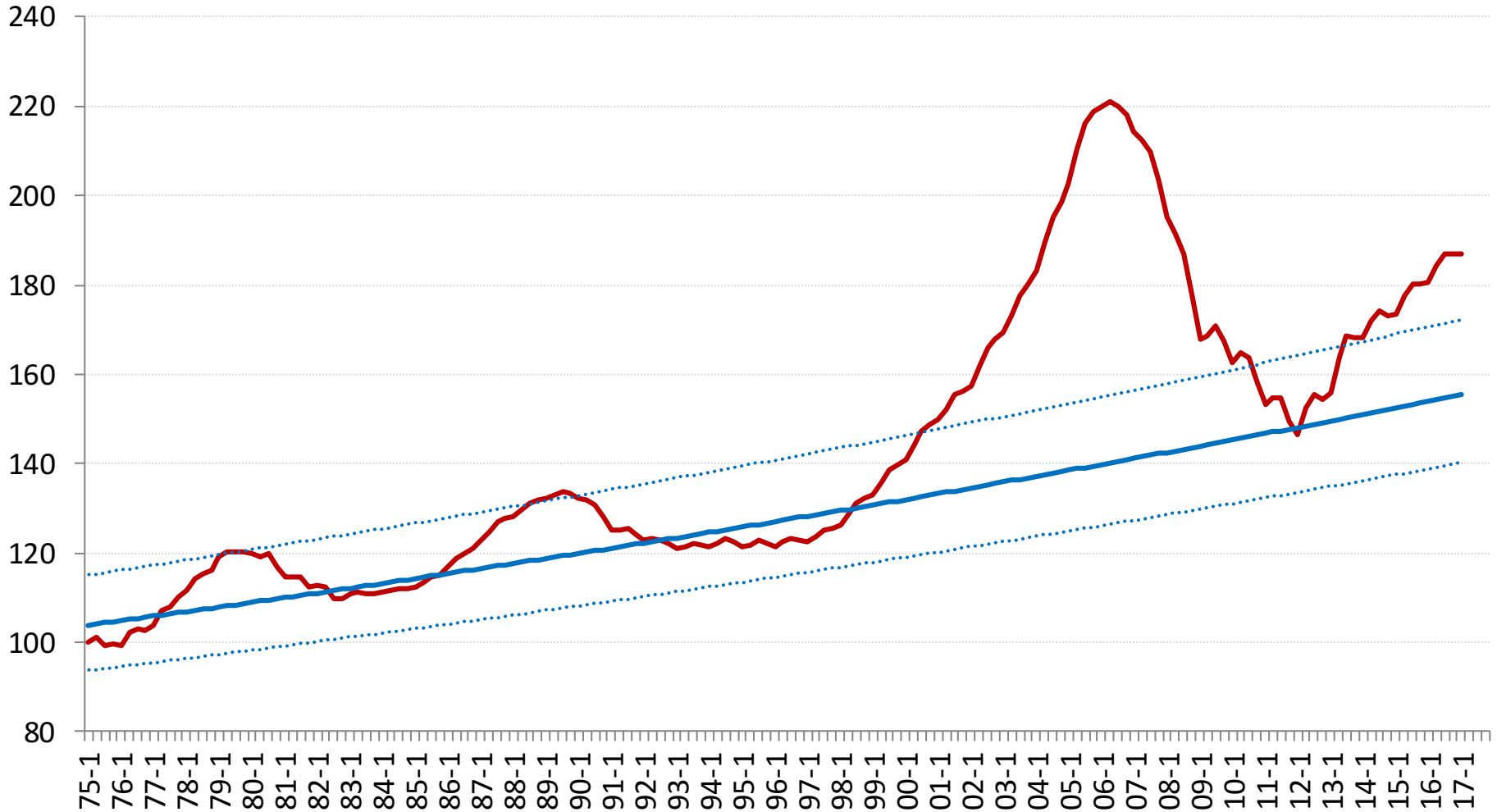


Today's talk

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- Some economic and statistical jargon
- **Housing prices and the Great Financial Crisis/Great Recession**
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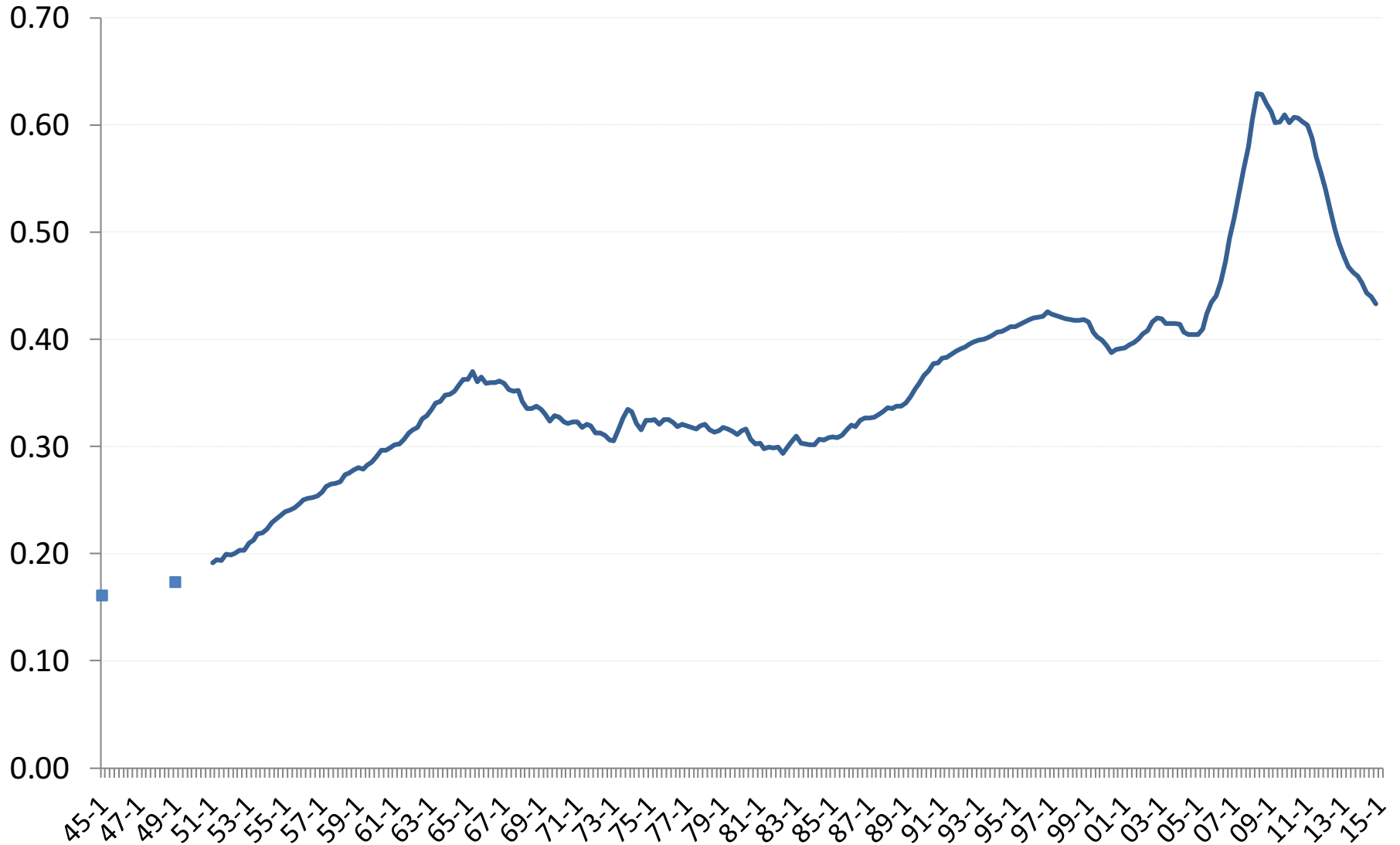
Spliced Quarterly Real House Price Index

FHFA Index 1975 to 1986; Case-Shiller 1987-2017(Q1)



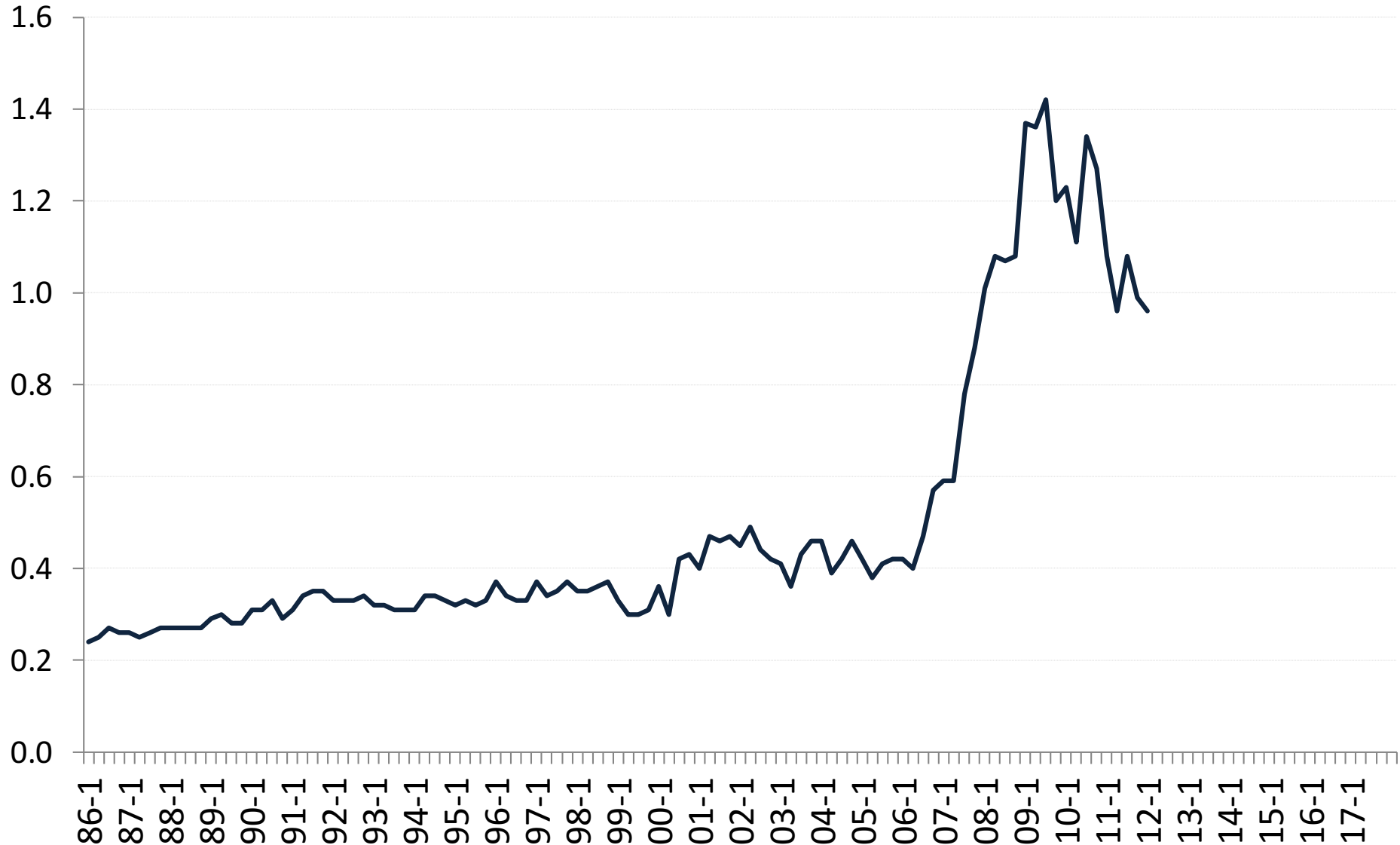
— Spliced FHFA/CS Real House Price Index ··· Prediction, minus 2 SEs
— Prediction from Log Trend, 1975-1995 ··· Prediction, plus 2 SEs

Aggregate Mortgage Loans to Homeowners House Value, 1945 to 2014 Q1

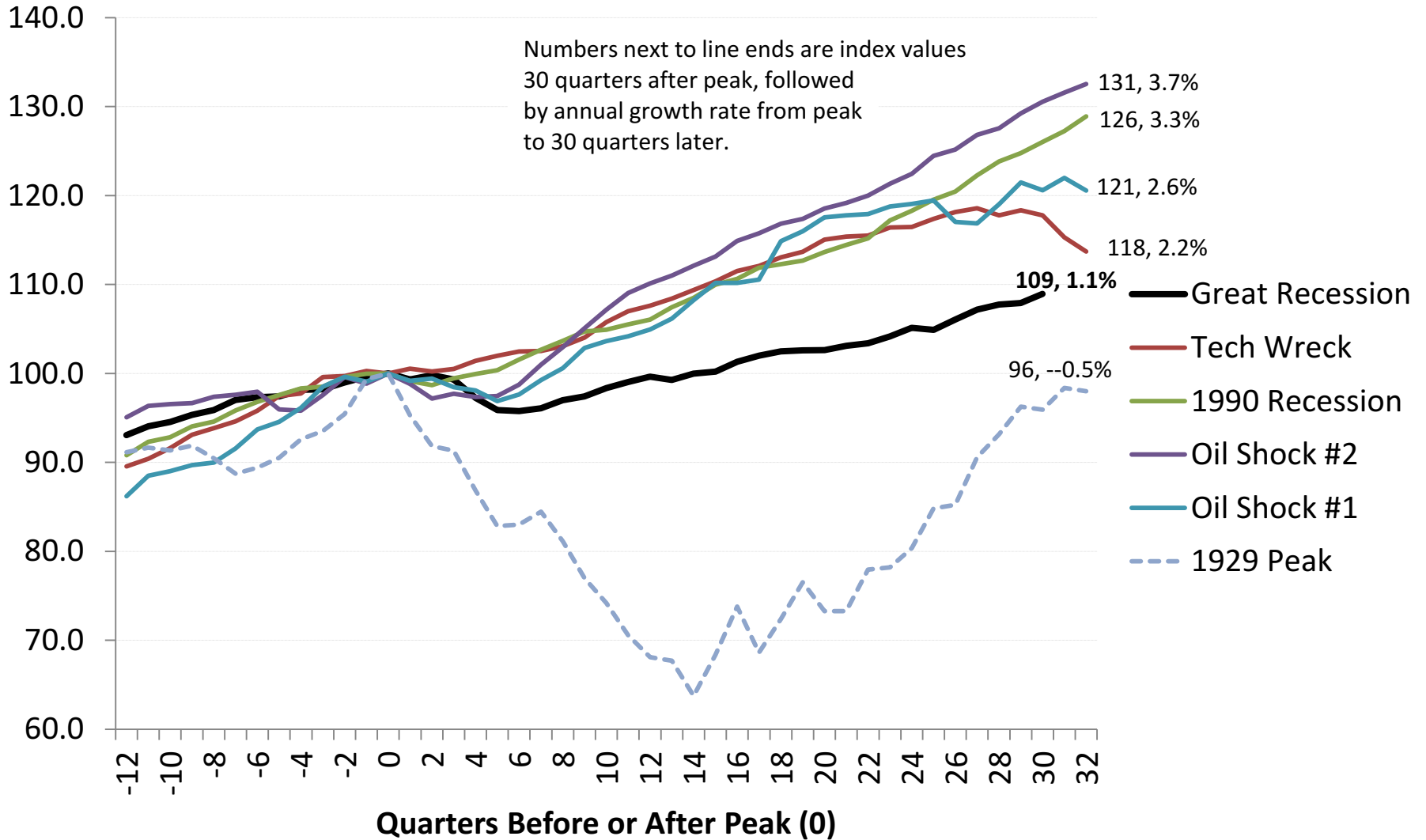


MBA Rate of Forelosures Started

Percent of All Loans, Not Seasonally Adjusted



Index of Real GDP Before and After Business Cycle Peak



**So, why did we have the Great Financial
Crisis and the Great Recession?**

Appraisals in the GFC

- From the 2011 report of the Financial Crisis Inquiry Commission:
 - “From 2000 to 2007, [appraisers] ultimately delivered to Washington officials a petition; signed by 11,000 appraisers...it charged that lenders were pressuring appraisers to place artificially high prices on properties. According to the petition, lenders were ‘blacklisting honest appraisers’ and instead assigning business only to appraisers who would hit the desired price targets” (FCIC 2011: 18).
- Cited by William Black,
<https://www.creditwritedowns.com/2013/07/housing-appraisers-warnings-fraud-crisis.html>

Candidate causes of the crisis (a partial list; not mutually exclusive; no special order)

- House price bubble
- The “Greenspan put”
- Global liquidity glut
- “Too Big to Fail” (TBTF), moral hazard
- Housing lobbies (NAR, MBA, NAHB, F&F)
- Gramm-Leach-Bliley and other deregulation of the financial sector
- Community Reinvestment Act
- Fannie Mae, Freddie Mac
- FHA
- Psychology, lemming behavior
- Non-recourse mortgages
- 19th century systems of lien recording
- 21st century systems of lien recording
- Policy of increasing homeownership
- Increasing income inequality/low growth of middle class incomes
- Increasingly stringent land use and development regulations
- Fixed rate mortgages
- Adjustable rate mortgages
- Rise of “private label” MBS
- General increase in financial leverage
- “Outgunned” and/or passive regulators/supervisors
- Fed, HUD, Treasury and other agencies asleep at the switch
- Regulatory arbitrage
- Financial sector concentration
- Rise of shadow banking

Candidate causes of the crisis (a partial list; not mutually exclusive; no special order)

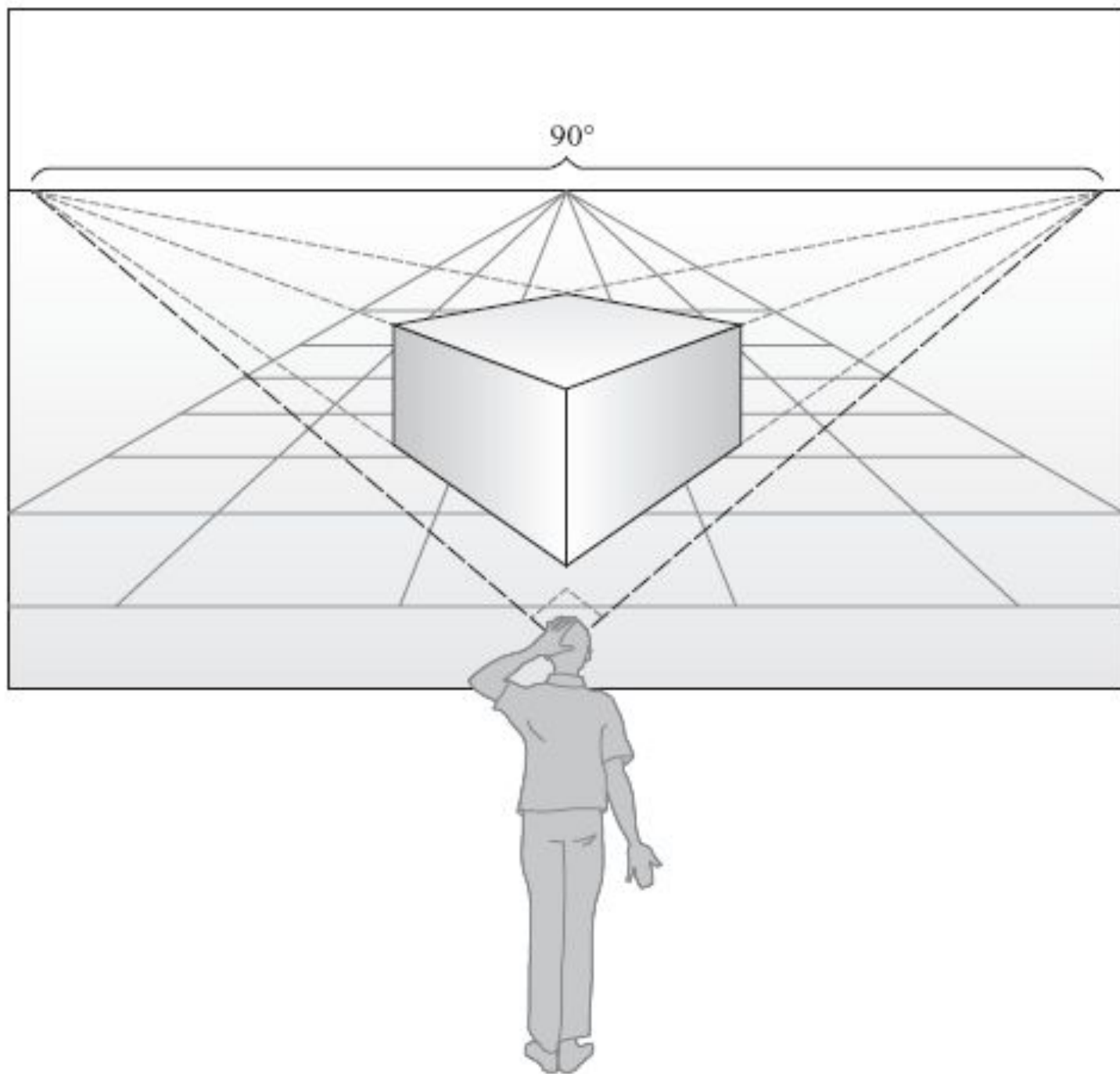
- Unbundling of the mortgage system: move from “It’s a Wonderful Life World” to “Wall Street World.”
- Mortgage bankers/brokers
- Mortgage servicers
- Ratings agencies
- Excessive financial engineering (CDOs, SIVs, CDS)
- Naïve implementation of prudent man rule (booming demand for “AAA” paper)
- Insufficient capital
- Growth of off-balance-sheet lending
- Rise of automated mortgage origination
- Predatory lending
- Dumb money (AIG?)
- Fraud
- Greed
- Fear
- “Stupid” mortgages (e.g. option ARMs)
- Decline of underwriting (Alt-A)
- Low inflation
- Bad appraisals
- Bad accounting
- Too much regulation
- Not enough regulation
- Stupid regulation
- Republicans
- Democrats

Candidate causes of the crisis (a partial list; not mutually exclusive; no special order)

- Ratings agencies
- Investors who use ratings agencies as a crutch
- Mortgage originators
- Mortgage servicers
- Mortgage investors
- Fed's decision to focus on CPI and PCE data, ignore asset prices
- Naïve analysis of geographic diversification
- Applications of Gaussian copula to MBS pricing
- High rates of unemployment
- High loan-to-value ratios
- High debt service-to-income ratios
- Overbuilding in the housing market
- “Rational” expectations that were, in retrospect, naïve
- Adaptive expectations
- Myopic expectations
- Dumb financial economists who failed to predict housing price crashes
- Dumb housing economists who failed to understand how leveraged markets had become
- Dumb risk managers who failed to properly stress-test their portfolios
- Increasing willingness of households to strategically default
- Basel I
- Basel II
- Basel III (anticipation of?)

Candidate causes of the crisis (a partial list; not mutually exclusive; no special order)

- Globalization
- Chinese trade surpluses
- The paradox of thrift
- Perverse incentives for financial executive compensation
- Oil prices, other commodity prices
- Political polarization, including Congress
- The death throes of capitalism/free markets
- Slowing wage growth, increasing income inequality
- International “carry trade”
- Derivative markets lose touch with their underlying assets; become casinos rather than insurance
- Second liens/HELOCs
- Borrowing short and lending long
- Runs on the bank
- Deposit insurance to prevent bank runs
- Repo markets, money market funds (runs on...)
- Inability to judge counter-party risk
- Inadequate capital requirements for banks and other financial institutions
- Credit default swaps that permitted investors to simultaneously increase the size of the b-piece market while betting against it
- Traders dominate risk managers within investment banks
- Political pressure to increase homeownership



Meta-thinking about the crisis: three classes of narratives

- “It’s complicated.”
 - But if we had paid attention, we could have mitigated, if not prevented, the crisis.
- “It’s complicated.”
 - So complicated, and path-dependent, that it was not foreseeable or preventable.
- “It’s the _____, stupid.”
 - While many related markets, policies, institutions contributed, there were one or two root causes.

Today's quote: Herbert Stein

- Longtime Professor of Economics at the University of Virginia.
- US Council of Economic Advisers 1969-74; Chair from 1972-74.
- “When something can’t go on forever, it will stop.”

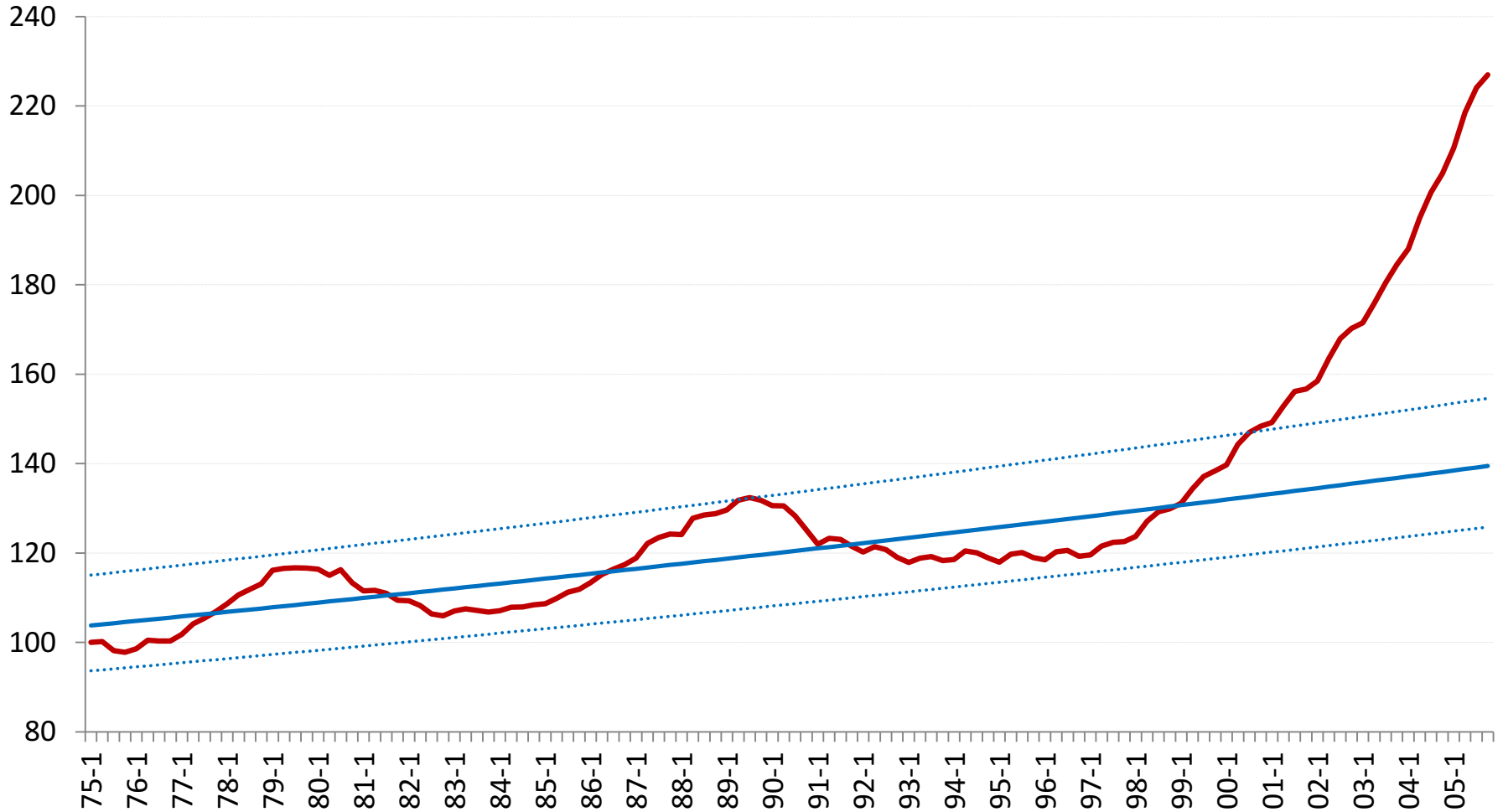




http://premierespeakers.com/ben_stein

Spliced Quarterly Real House Price Index

FHFA Index 1975 to 1986; Case-Shiller 1987-2005(Q4)



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"If past history was all there was to the game, the richest people would be librarians."

Warren Buffett

Lots of housing economists saw a downturn coming...



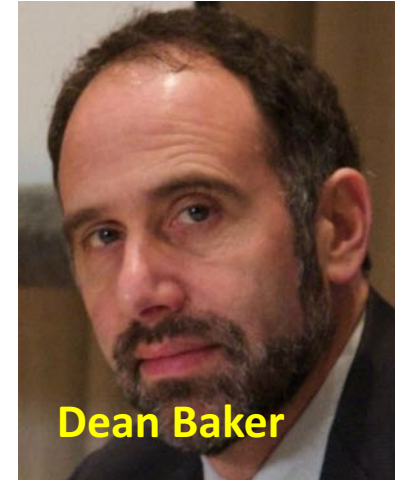
Morris Davis



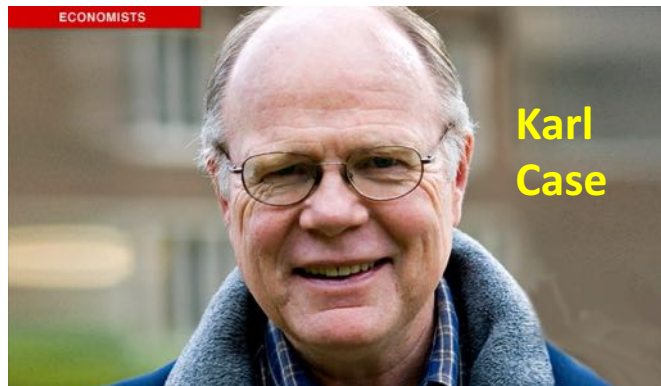
Robert Shiller



John Quigley



Dean Baker



Karl Case



Paul Willen



Liang & Malpezzi

But talk is cheap. (Academic talk – *really* cheap?)
What about investors?



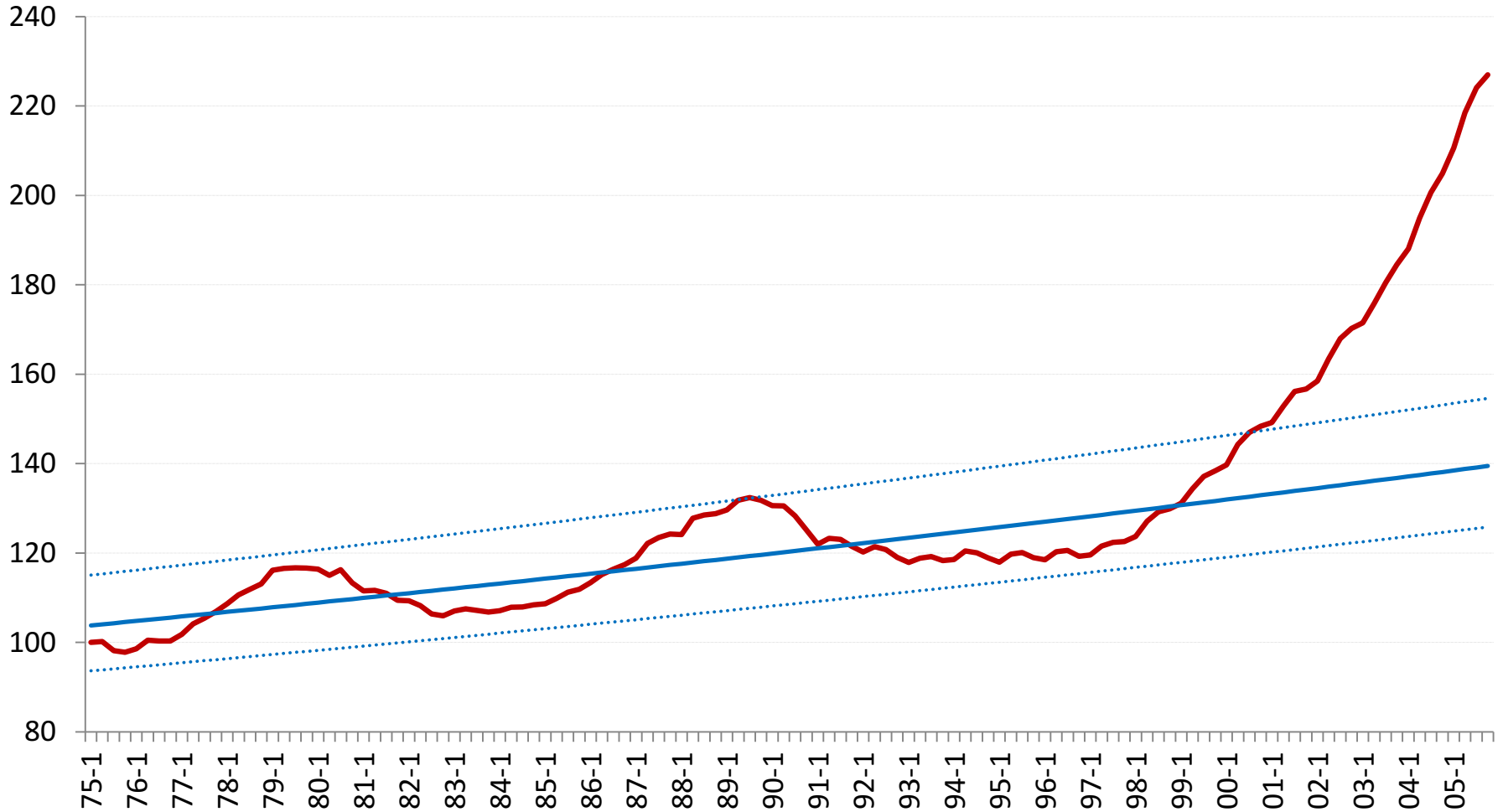
John Paulson



Paulo Pellegrini

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Is it better to be lucky, or to be good?

Is it better to be lucky, or to be good?



Is it better to be lucky, or to be good?



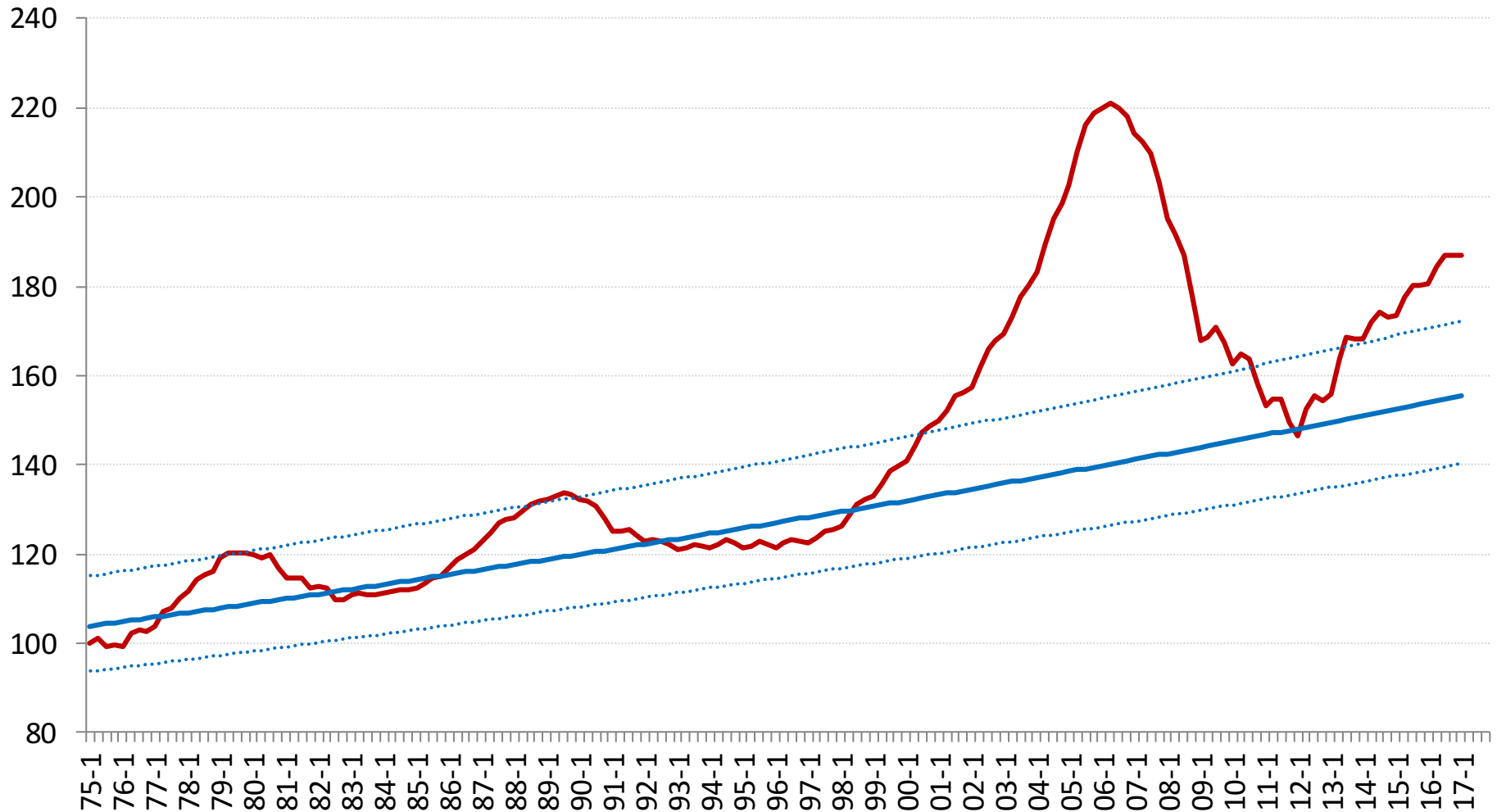
Yes.



The market can stay irrational longer than you can stay solvent.

Spliced Quarterly Real House Price Index

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Question

WHY DID YOU SHORT THE HOUSING MARKET?



Better Question

WHY DIDN'T YOU SHORT THE HOUSING MARKET?



Paulson's strategy

- Believing housing prices would fall, Paulson wanted to short Collateralized Debt Obligations that were backed by mortgages; falling house prices would result in higher defaults and lower the value of the CDOs.
 - CDOs are tranching securities based on the cash flows from some asset (here, mortgages). Risk is concentrated in the equity tranches.
- Generally, to short a common stock, you borrow shares and sell them at today's price; then when you need to return the shares, you buy them at the (you hope!) then lower price. Neglecting transaction costs, your profit is the difference between today's high price and the future lower price.
 - NB: if the price rises, you lose money.
 - You can leverage your positions to magnify your returns. And your losses!

Paulson's strategy

- But the market for CDOs works differently. So Paulson shorted them through the Credit Default Swap market.
 - CDS are bilateral contracts, bets on whether a security goes into default.
- Paulson shorted CDOs by buying CDS, betting the CDO would fail.

Paulson's strategy

- Going further, Paulson collaborated with Deutsche Bank and Goldman Sachs, requesting that those firms create new CDOs that Paulson could bet against.
 - The so-called ABACUS deal was packaged by Goldman Sachs; investors knew Paulson was involved in designing the package, but thought he was a transaction sponsor, taking a long position; GS failed to inform them that Paulson was actually shorting the securities.
 - The problem with having a sponsor who's shorting the CDO is that they have an incentive to choose the worst mortgages for the security, not the best, because that increases the expected return of their short.
- GS settled an SEC suit with a \$550M fine.
- All in, Paulson & Co. reportedly made \$15 billion in 2007, of which \$4 billion was Paulson's cut.



AN ADAM MCKAY FILM
**THE
BIG
SHORT**
THIS IS A TRUE STORY

CHRISTIAN
BALE
STEVE
CARELL
RYAN
GOSLING
BRAD
PITT



Michael Burry



PHOTO: DANIEL ACKER/BLOOMBERG VIA GETTY IMAGES

Steve Eisman

Meredith Whitney



Read the boilerplate!



*Past results
are not a guarantee
of future performance.*

Reading for life

- Gregory Zuckerman, *The Greatest Trade Ever: The Behind-the-Scenes Story of How John Paulson Defied Wall Street and Made Financial History.*
- Michael Lewis, *The Big Short: Inside the Doomsday Machine.*
- But beware ...
 - What did Paulson & co. do next?
 - Is it better to be *good*? Or to be *lucky*?

Some short readings on Paulson and Pellegrini, using CDS to bet against the housing bubble

- Nocera, Joe. "A Wall Street Invention Let the Crisis Mutate." New York Times April 17, (2010): B1.
 - http://www.teamsters952.org/a_wall_street_invention.pdf
- Story, Louise, and Gretchen Morgenson. "SEC Accuses Goldman of Fraud in Housing Deal." New York Times, April 17, 2010 2010.
 - https://sabew.org/wp-content/uploads/2011/08/NYT-S.E.C_vs_Goldman_Sachs-6095.pdf
- Zuckerman, Gregory. "Trader Made Billions on Subprime." Wall Street Journal, January 15, 2008 2008.
 - https://www.fpparchive.org/media/documents/economy/Trade%20Made%20Billions%20on%20Subprime_Gregory%20Zuckerman_Jan.%2015,%202008_The%20Wall%20Street%20Journal.pdf
- _____ . "Profiting from the Crash." Wall Street Journal, March 31, 2009 2009.
 - <http://www.wsj.com/articles/SB10001424052748703574604574499740849179448?cb=logged0.9680947522434236>

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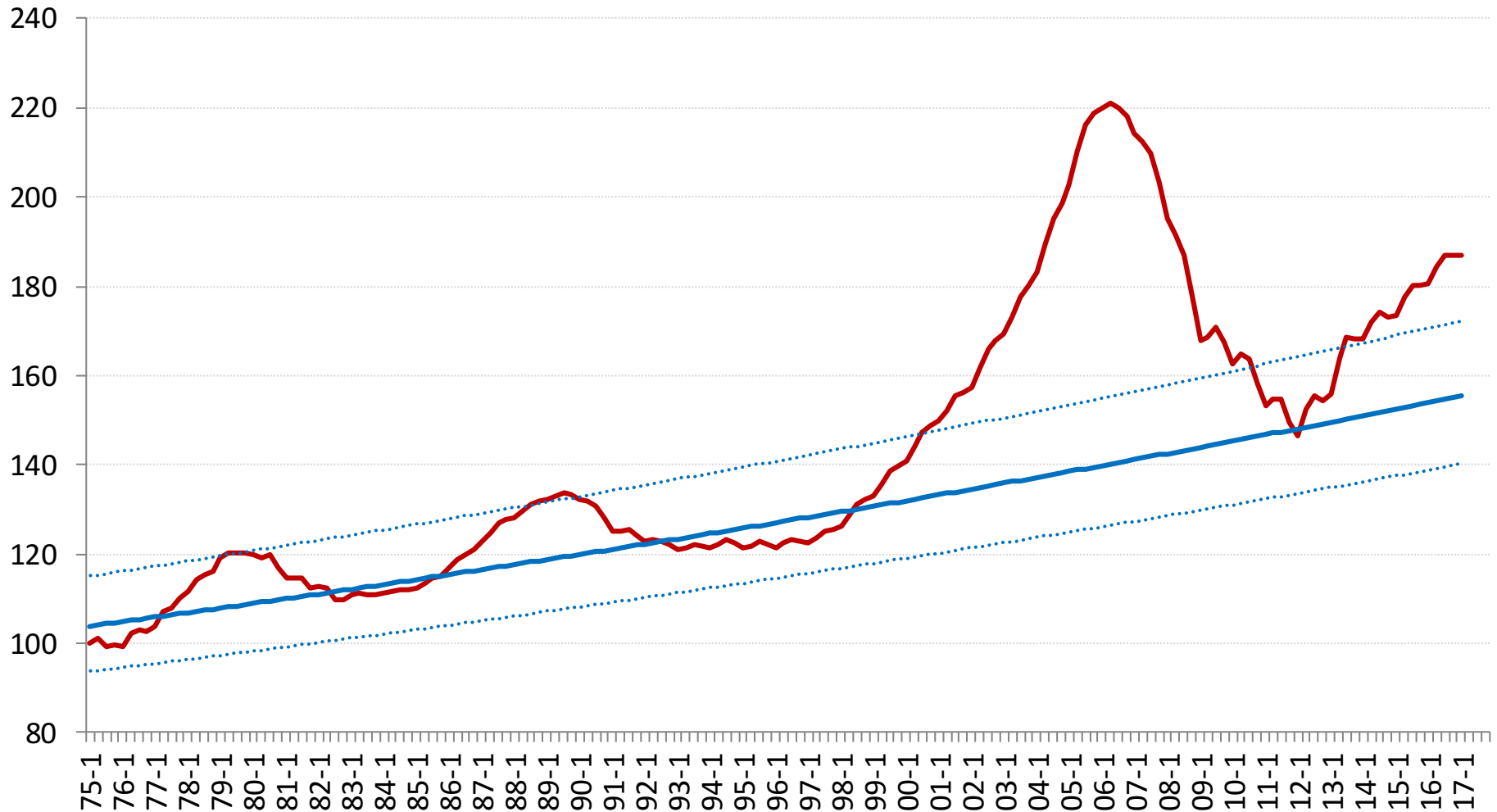


**It's getting a little
frothy out there!**

Tim Riddiough, Academic Director, Graaskamp Center for Real Estate

Spliced Quarterly Real House Price Index

FHFA Index 1975 to 1986; Case-Shiller 1987-2017(Q1)



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A close-up photograph of a white ceramic coffee cup filled with a beverage topped with a thick, golden-brown foam. The foam is piled high and has a slightly textured, bubbly appearance. The cup is set on a matching white saucer with a decorative black and gold border. A small red and white paper liner is visible under the cup. The background is plain white.

The housing market, circa 2017?

The housing market, circa 2006!



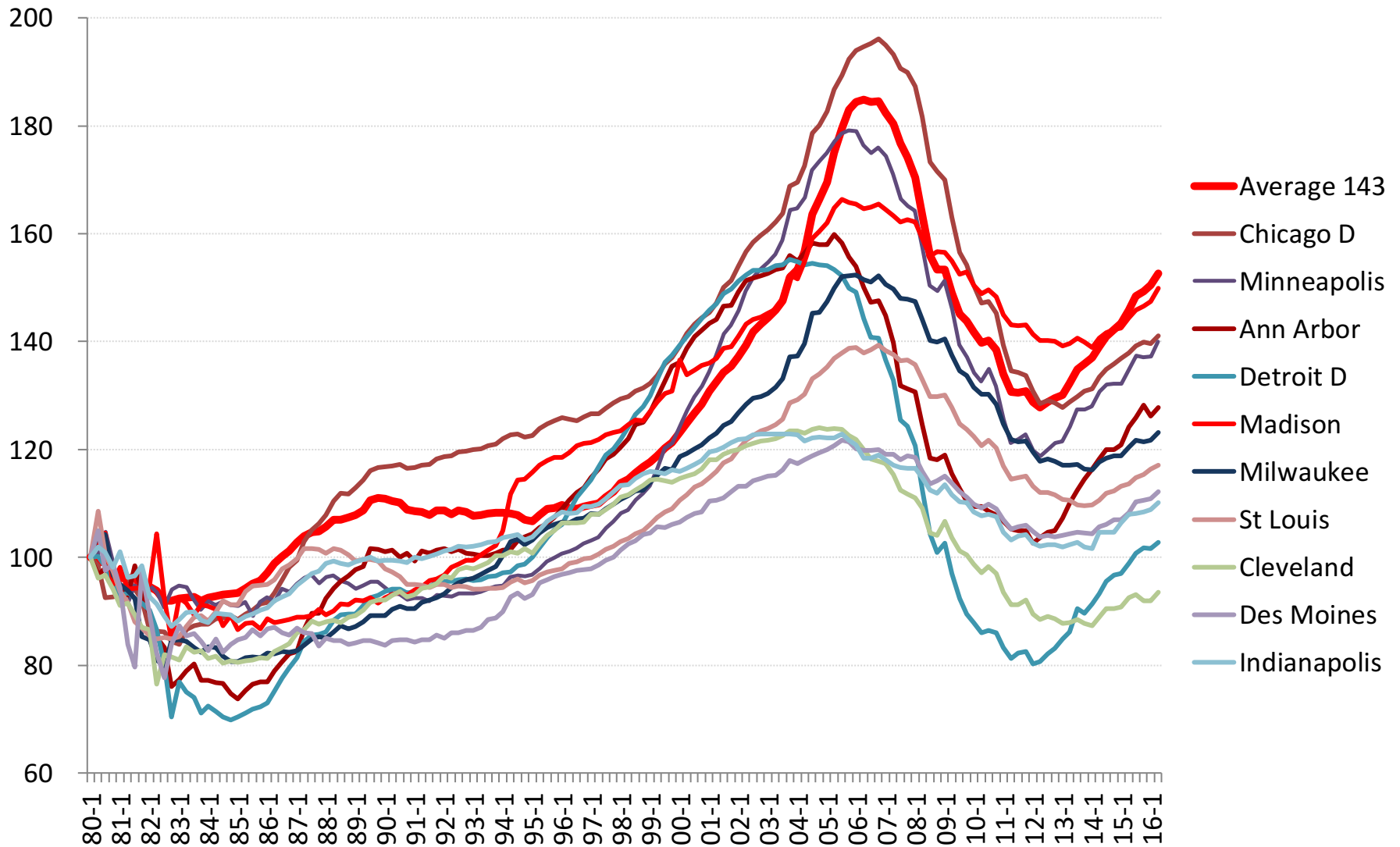
Nobody buys a house in the United States...



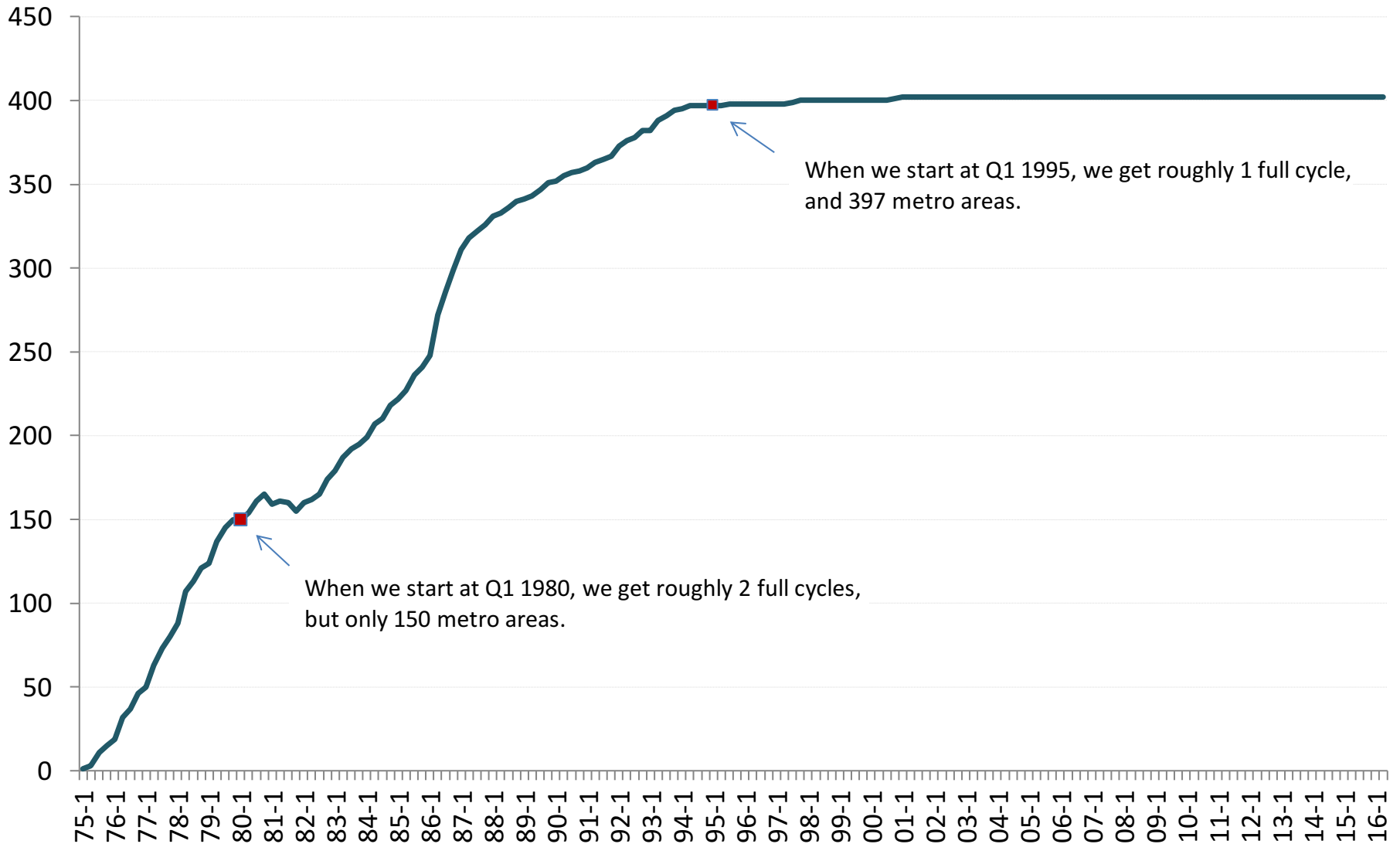
You buy a house in a metropolitan area.

Inflation-Adjusted FHFA House Price Indexes

Selected Midwest Markets

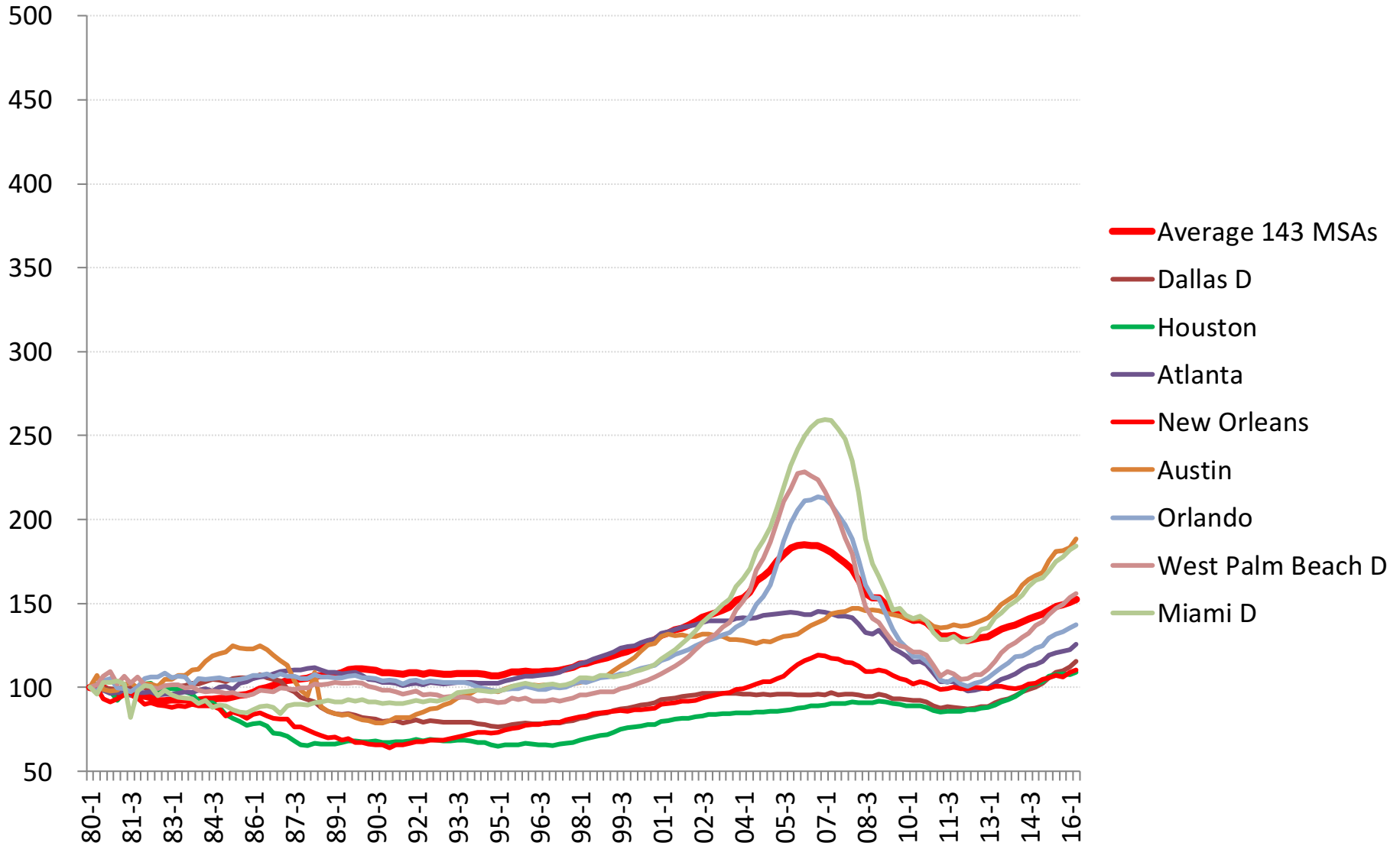


Number of FHFA Price Index Metro Area Observations, by Quarter

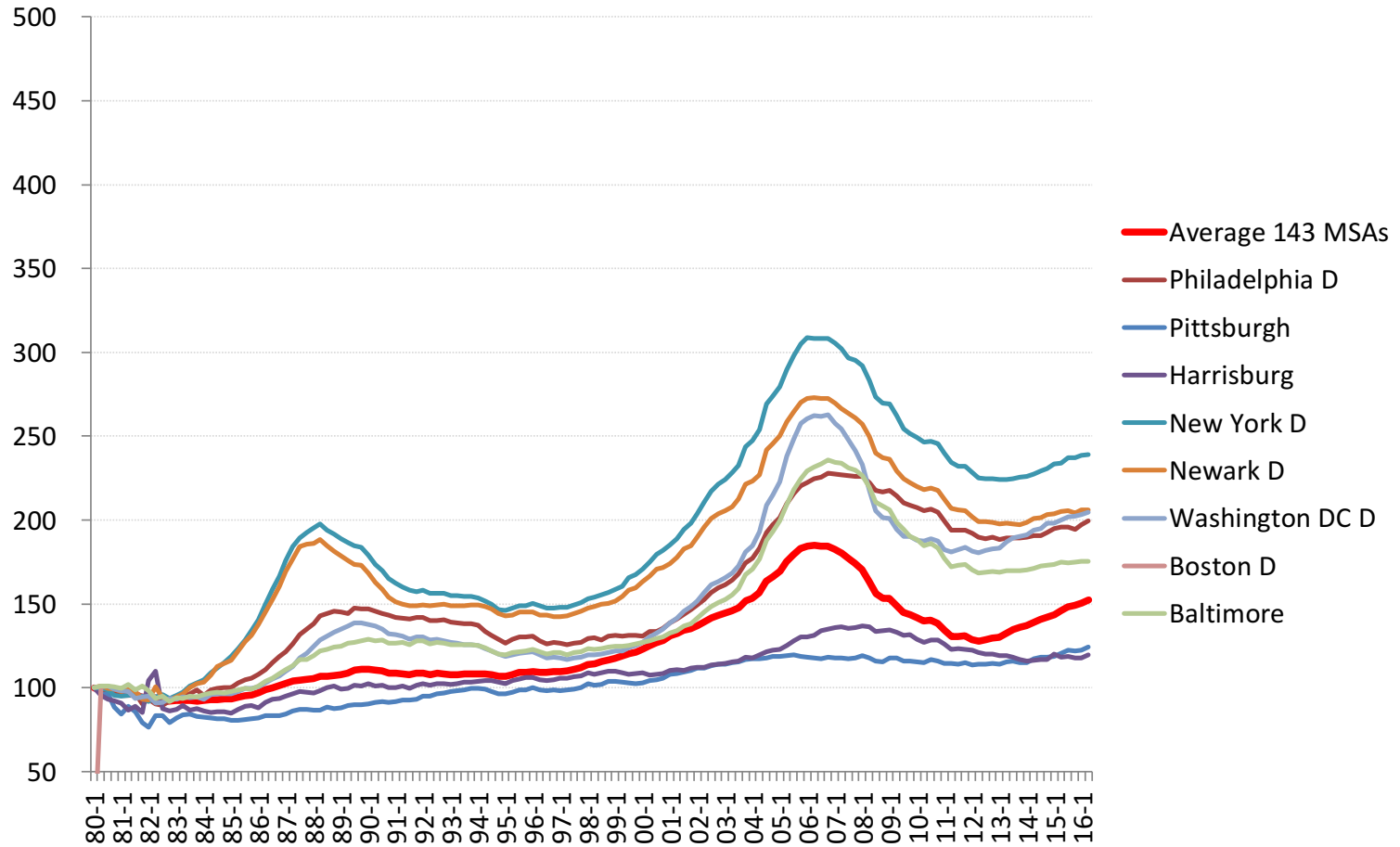


Inflation-Adjusted FHFA House Price Indexes

Selected Southern Markets

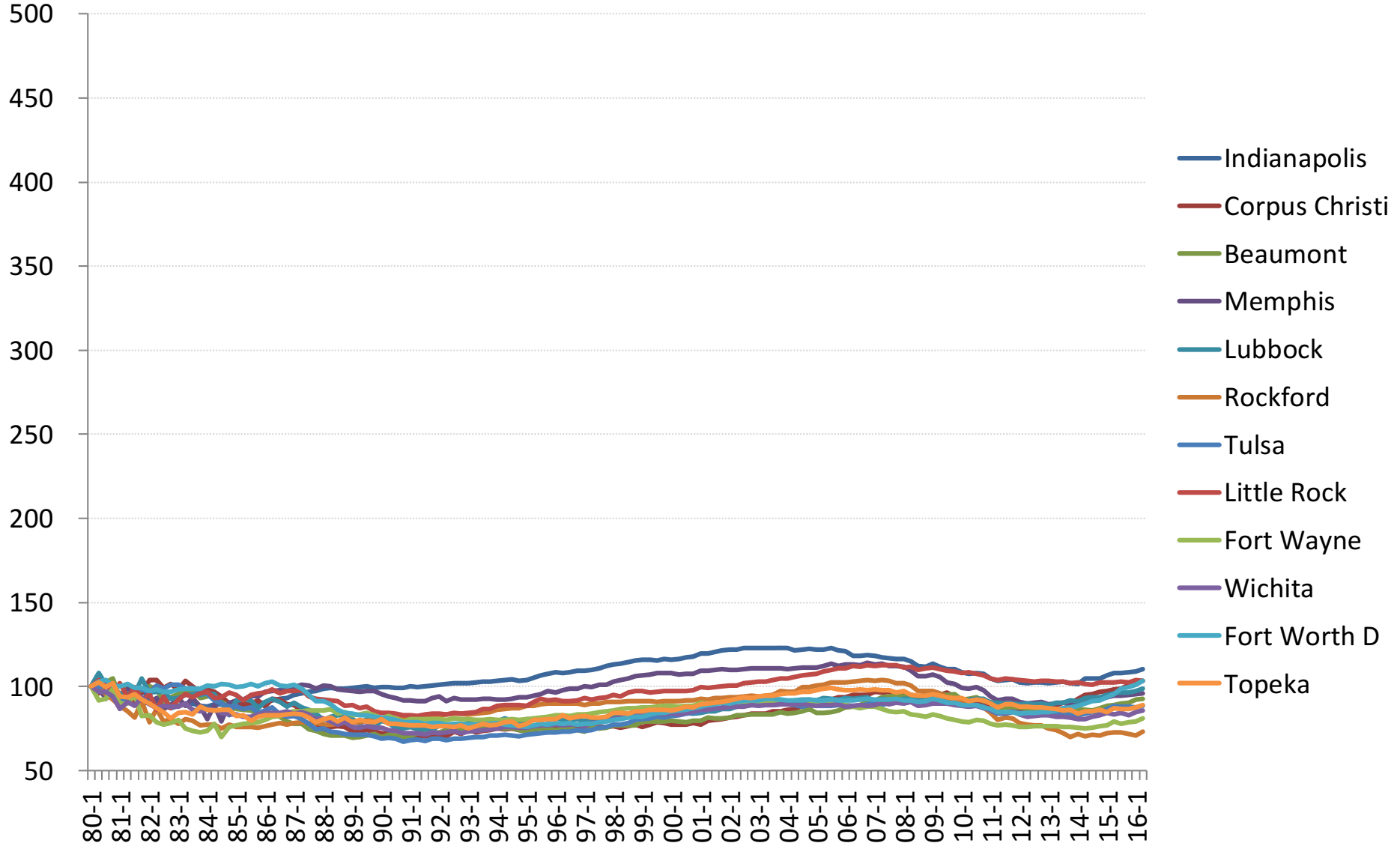


Inflation-Adjusted FHFA House Price Indexes Selected Northeastern Markets

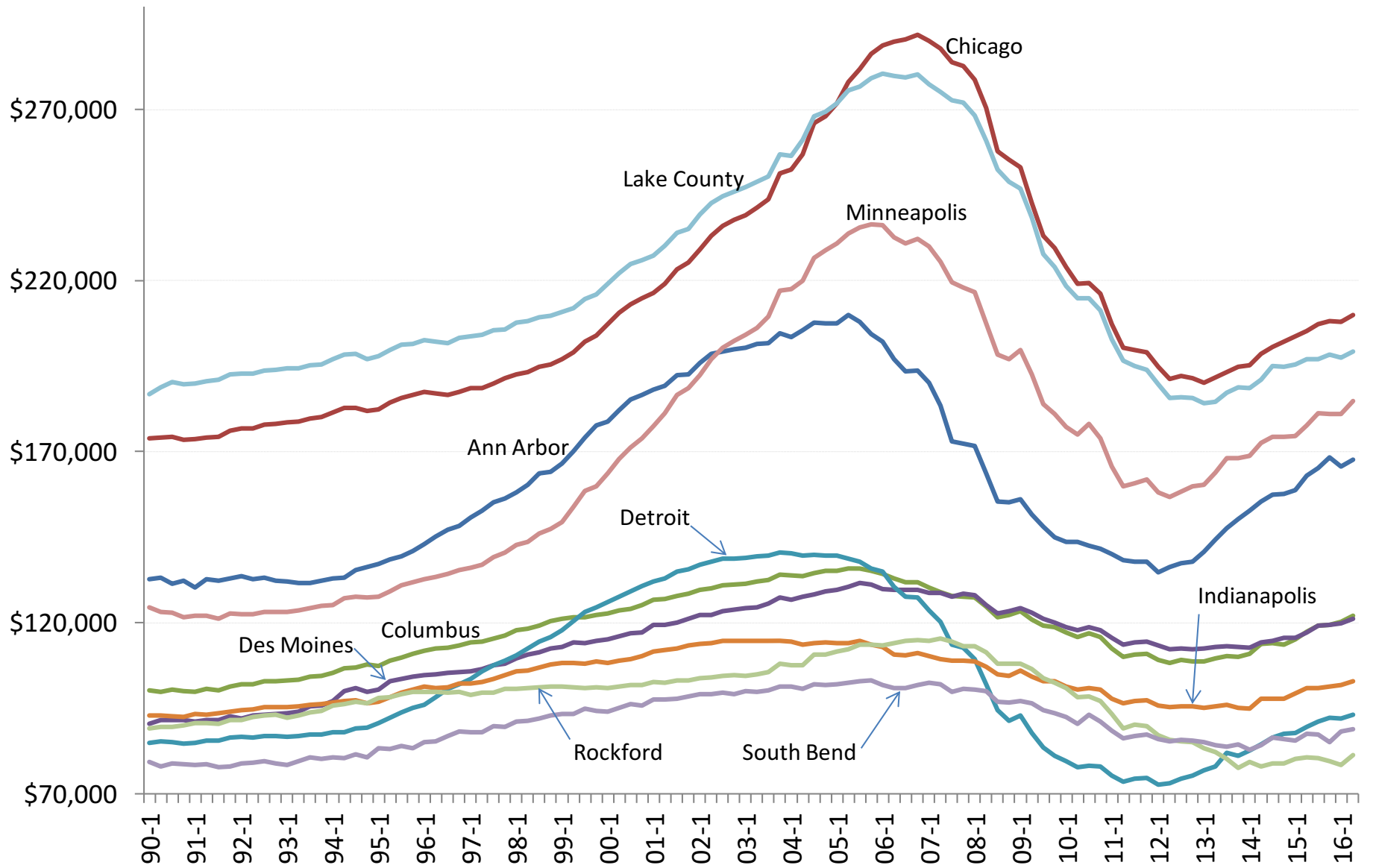


Inflation-Adjusted OFHEO House Price Indexes

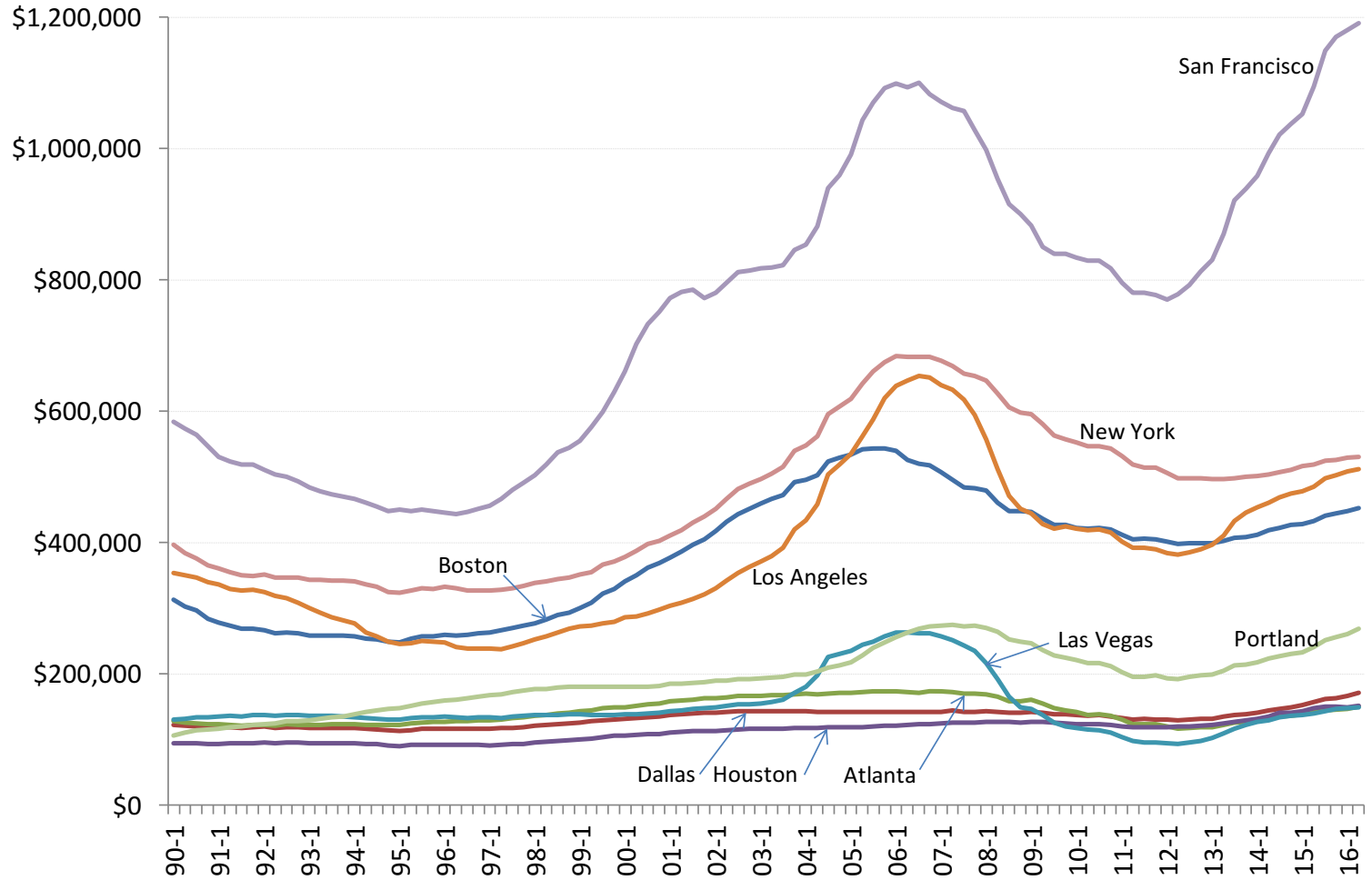
Twelve Low Volatility Markets



Constant Quality House Price Indexes, Inflation-Adjusted \$2016 Selected Midwest Metro Areas, Q1 1990 to Q2 2016



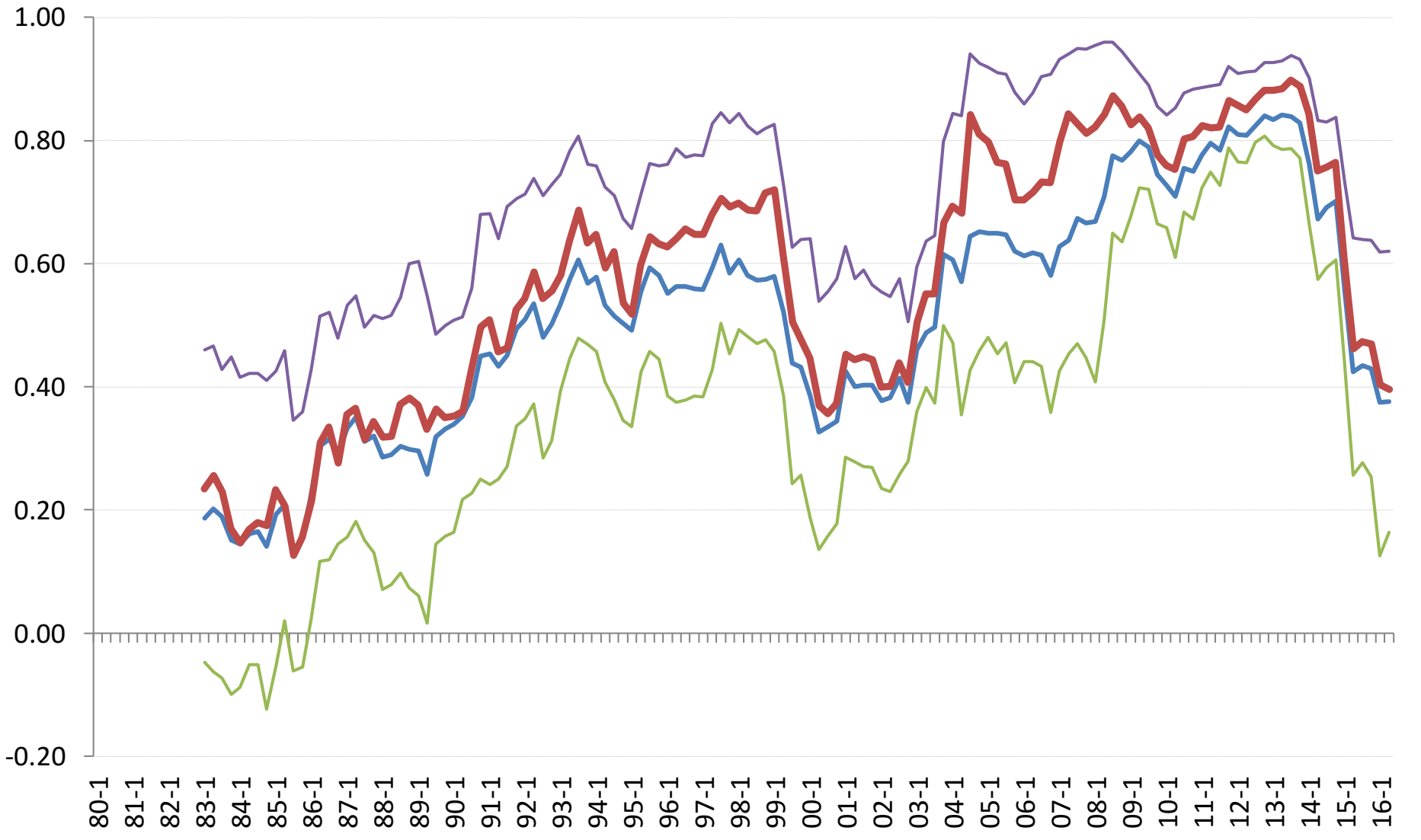
Constant Quality House Price Indexes, Inflation-Adjusted \$2016 "Newsworthy" Metro Areas, Q1 1990 to Q2 2016



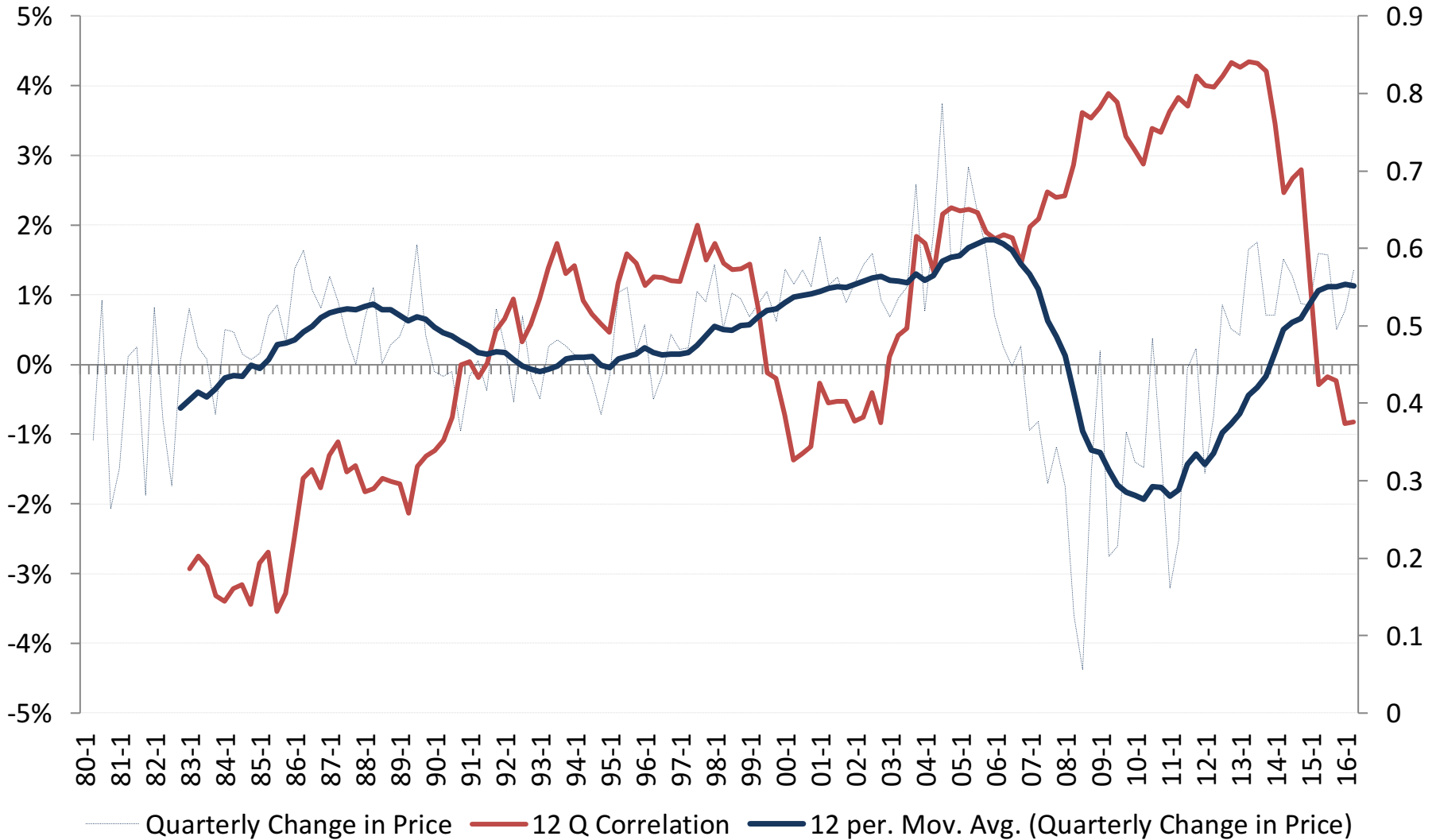
12 Quarter Rolling Correlations, Real FHFA House Price Changes

Summary Statistics for 143 MSA Correlations with Unweighted Average Change

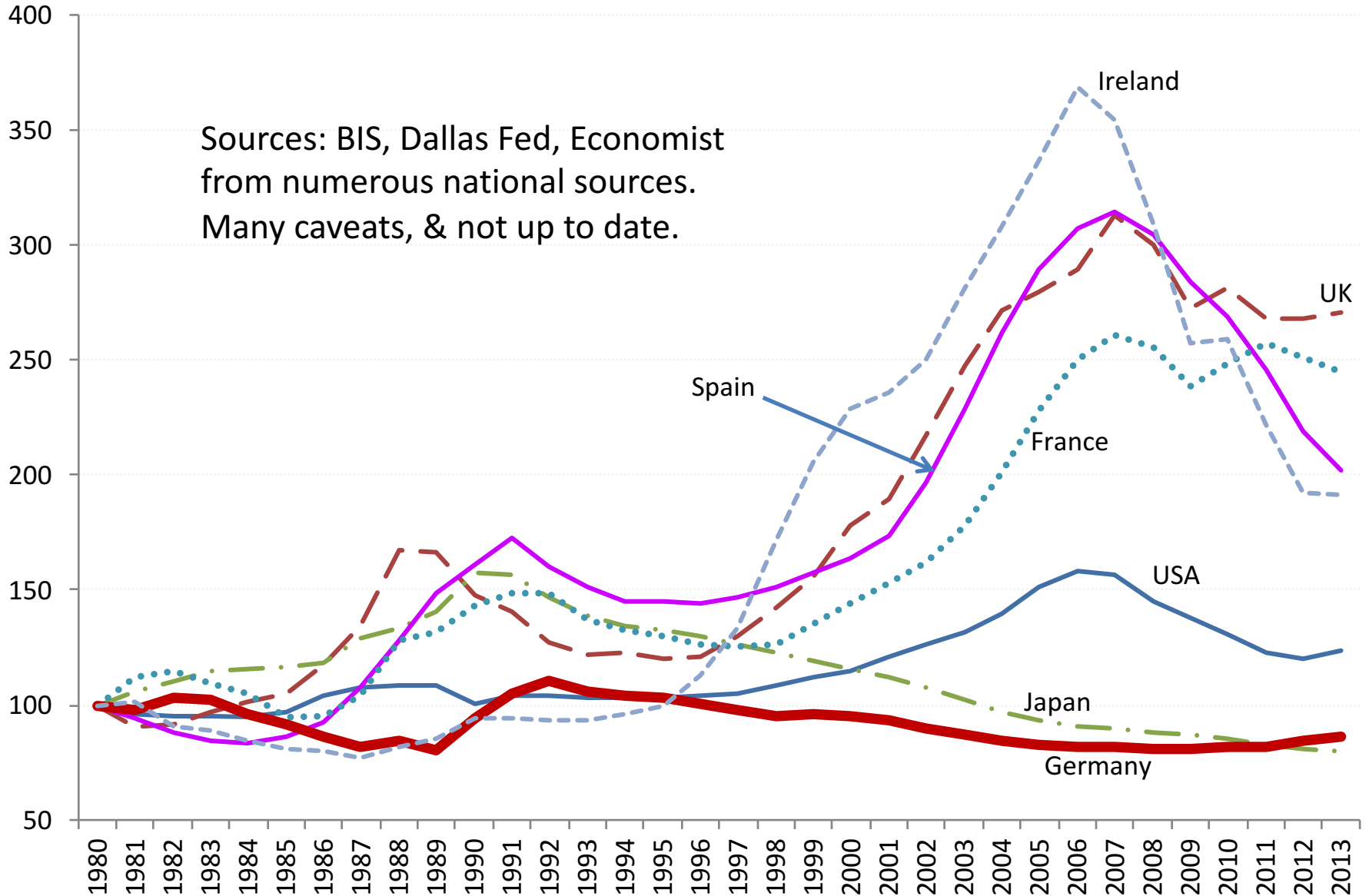
— Average — Median — 1st Quartile — 3rd Quartile



Change in Average Quarterly Real FHFA Price Changes; and Average 12 Quarter Correlation of 143 MSA Real Price Changes with Average Price Change



Real House Price Indexes, 1980=100

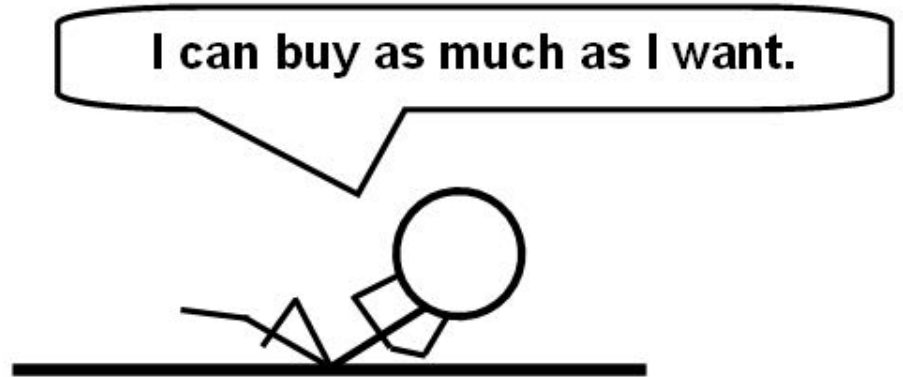
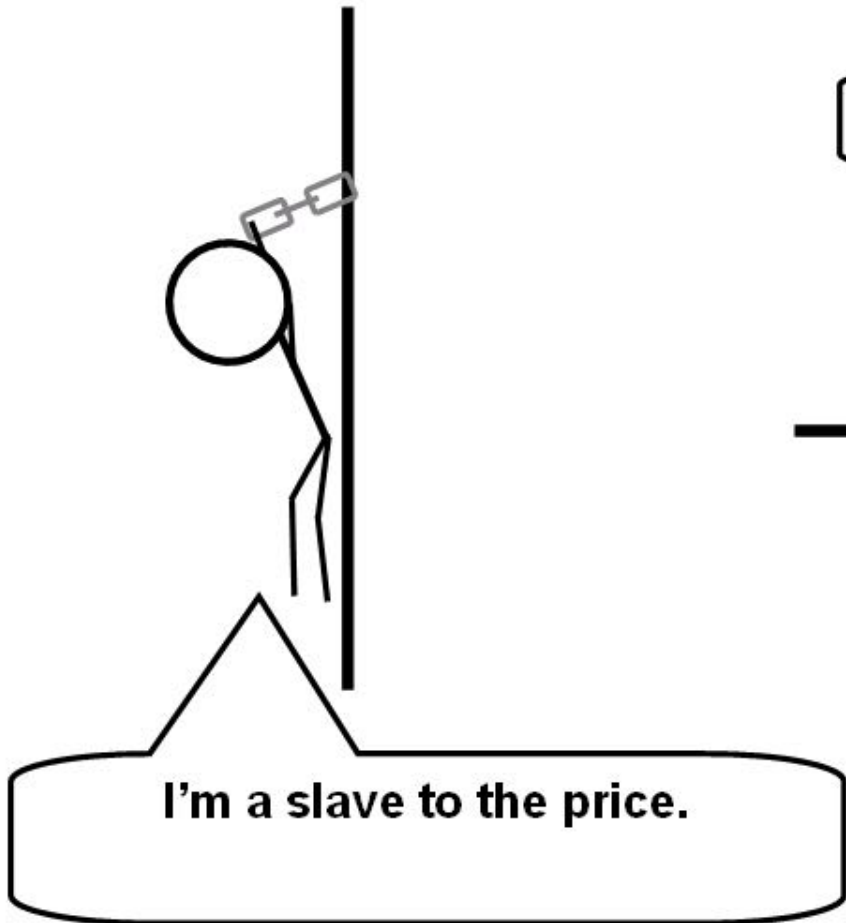


Ongoing research

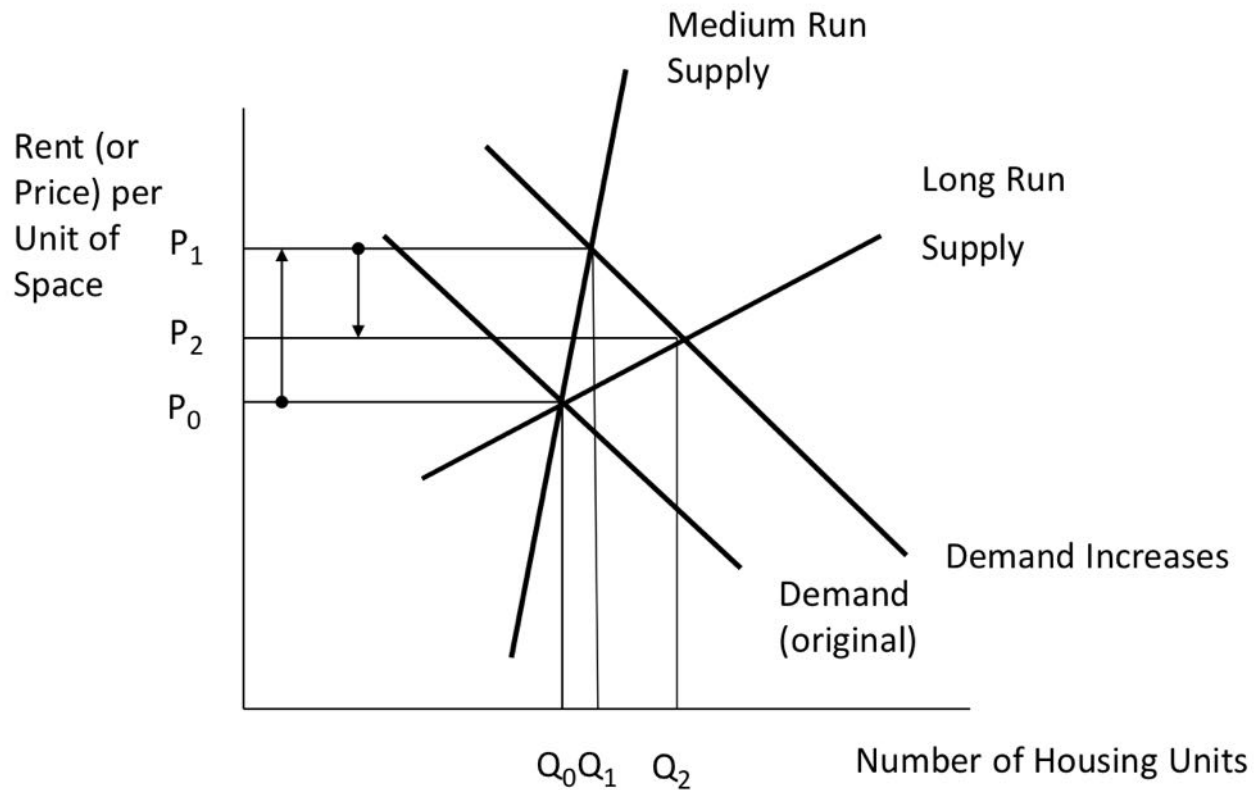


Slides below show work in progress. Results will change!

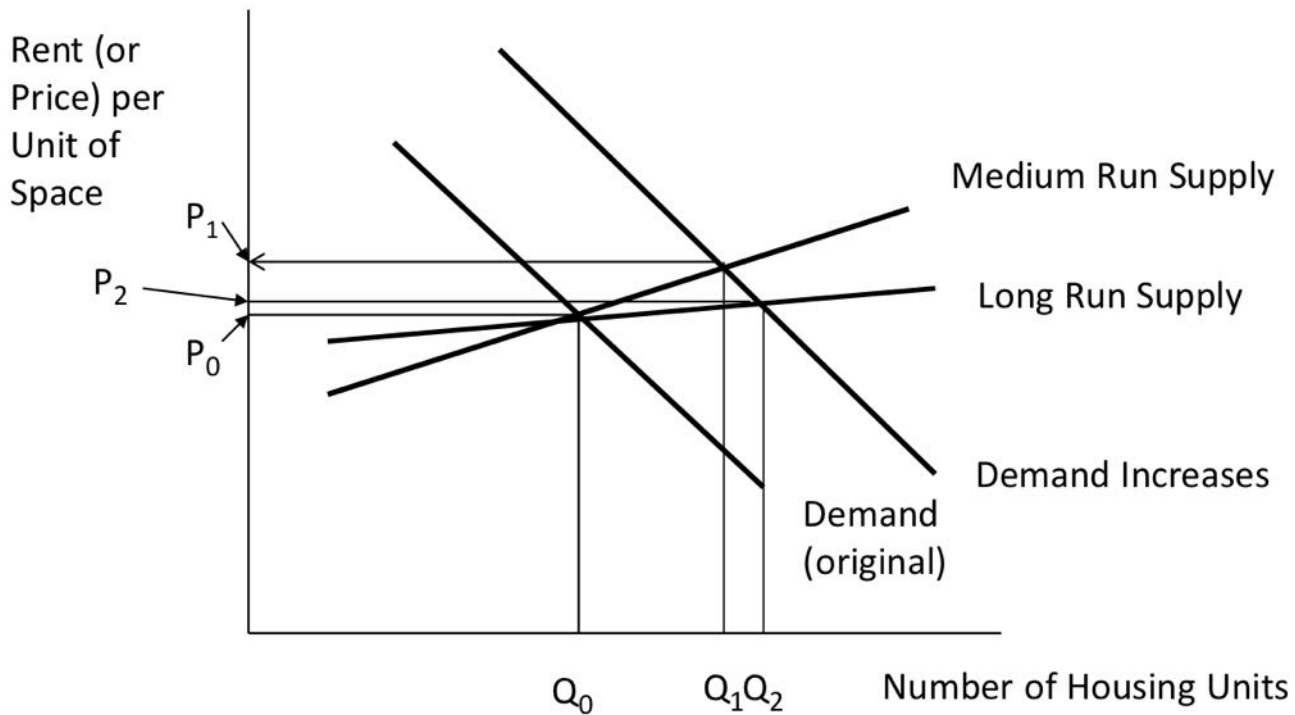
Elasticity



Demand Shocks with Inelastic Supply: Boom and Bust



Demand Shocks with Elastic Supply: More Construction, Lower Price Volatility



Next slides – work in progress from Liang and Malpezzi

- Extending our 2005 paper.
- Preliminary -- these results are not final, and will change. Not for citation or distribution beyond RE 415.
- We model prices as a function of demand determinants (income, demographics, mortgage rates, etc.) and supply conditions (physical geography, zoning and other land use and development regulations).
- Ditto for housing construction (proxied by number of building permits per 1000 population).
- The blue diamonds are predicted house prices or permits per 1000 in each metro area, by year, from our model.
- The red circles are actual prices.
- We present 6 of 147 metro areas for illustration.
- The model is still under development. Numerical results *will* change. Qualitative results *may* change.

Highly preliminary: DV is log real housing price

Analysis of Variance					
Source	DF	Sum of Squares	Mean Square	F Value	Pr > F
Model	9	922.1785	102.464	1818.26	<.0001
Error	6834	385.1155	0.05635		
Corrected Total	6843	1307.294			
Root MSE	0.2373	R-Square	0.7054		
Dependent Mean	11.269	Adj R-Sq	0.7050		
Coeff Var	2.1064				

Parameter Estimates					
Variable	Label	Parameter Estimate	Standard Error	t Value	Pr > t
Intercept	Intercept	-4.16547	0.18542	-22.47	<.0001
lpop	Log Population	0.09013	0.00344	26.22	<.0001
dpop	Annual Change in Population	0.76818	0.14331	5.36	<.0001
lypc	Log Real Per Capita Income	1.19252	0.01884	63.28	<.0001
dypc	Annual Change in Real Y Per Capita	-0.16712	0.05923	-2.82	0.0048
pdot	Annual Change in GDP Deflator	5.56206	0.19639	28.32	<.0001
mortr	Real Mortgage Interest Rate	2.18652	0.18775	11.65	<.0001
REGHAT	IV for Regulation from MCG	0.07498	0.00138	54.48	<.0001
ADJWTR	Adjacent Large Body of Water	0.06870	0.00684	10.04	<.0001
ADJPARK	Adjacent Natl Park or Mil Base	0.05193	0.00752	6.90	<.0001

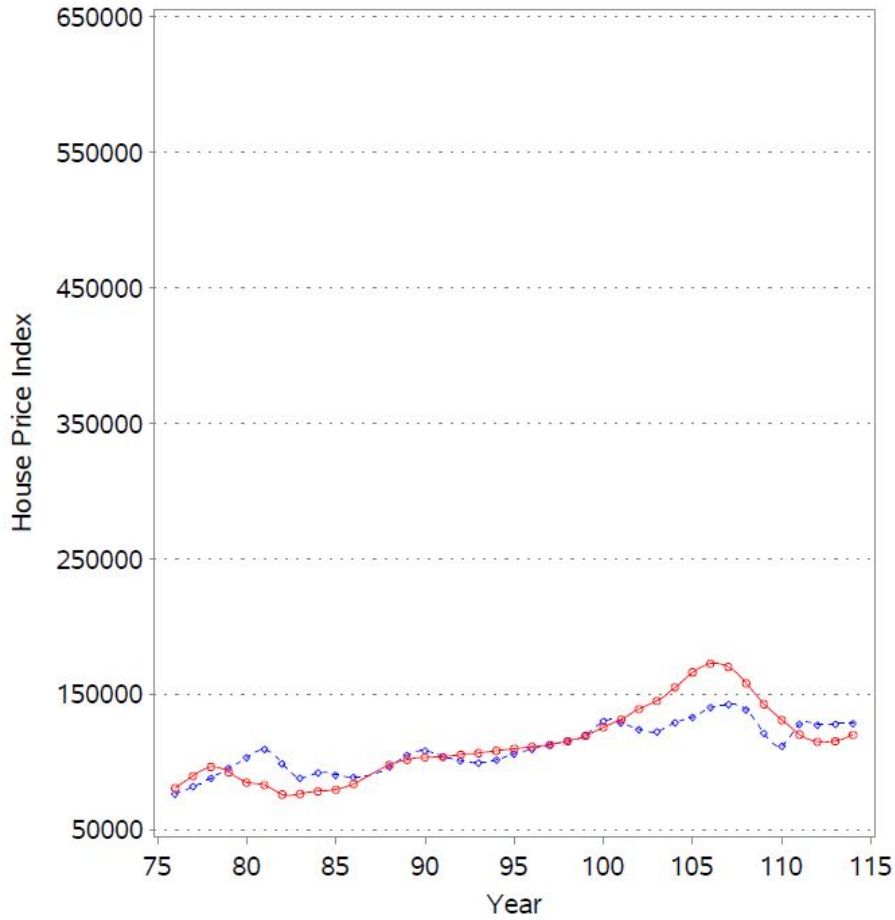
These results will change

Highly preliminary: DV is building permits per 1000 population

Analysis of Variance					
Source	DF	Sum of Squares	Mean Square	F Value	Pr > F
Model	9	30561	3395.6839	209.18	<.0001
Error	6635	107710	16.23362		
Corrected Total	6644	138271			
Root MSE	4.02910	R-Square	0.2210		
Dependent Mean	5.69496	Adj R-Sq	0.2200		
Coeff Var	70.7484				
Parameter Estimates					
Variable	Label	Parameter Estimate	Standard Error	t Value	Pr > t
Intercept	Intercept	-0.92921	3.25835	-0.29	0.7755
lpop	Log Population	0.12770	0.06059	2.11	0.0351
dpop	Annual Change in Population	83.45910	2.44924	34.08	<.0001
lypc	Log Real Per Capita Income	0.17962	0.33464	0.54	0.5914
dypc	Annual Change in Real Y Per Capita	9.41027	1.01145	9.30	<.0001
pdot	Annual Change in GDP Deflator	21.72429	3.38938	6.41	<.0001
mortr	Real Mortgage Interest Rate	40.68846	3.37514	12.06	<.0001
REGHAT	IV for Regulation from MCG	-0.04421	0.02388	-1.85	0.0641
ADJWTR	Adjacent Large Body of Water	-0.36646	0.11795	-3.11	0.0019
ADJPARK	Adjacent Natl Park or Mil Base	1.24822	0.12963	9.63	<.0001

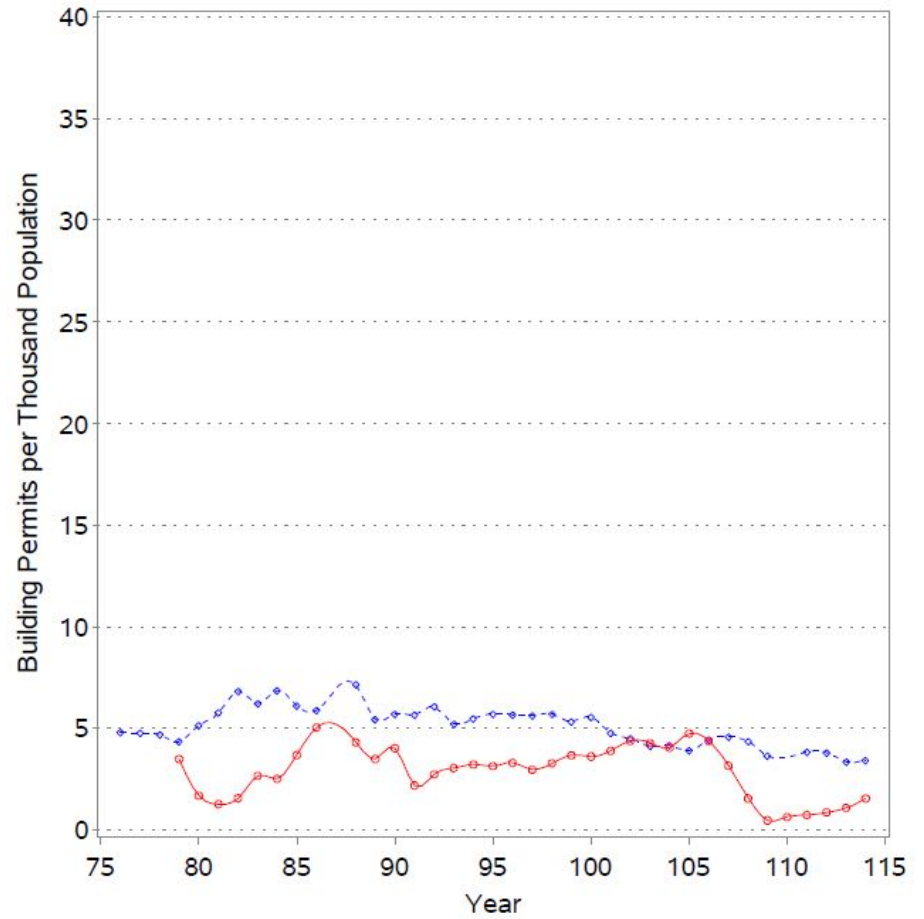
These results will change

NAME=Chicago-Naperville-Joliet, IL



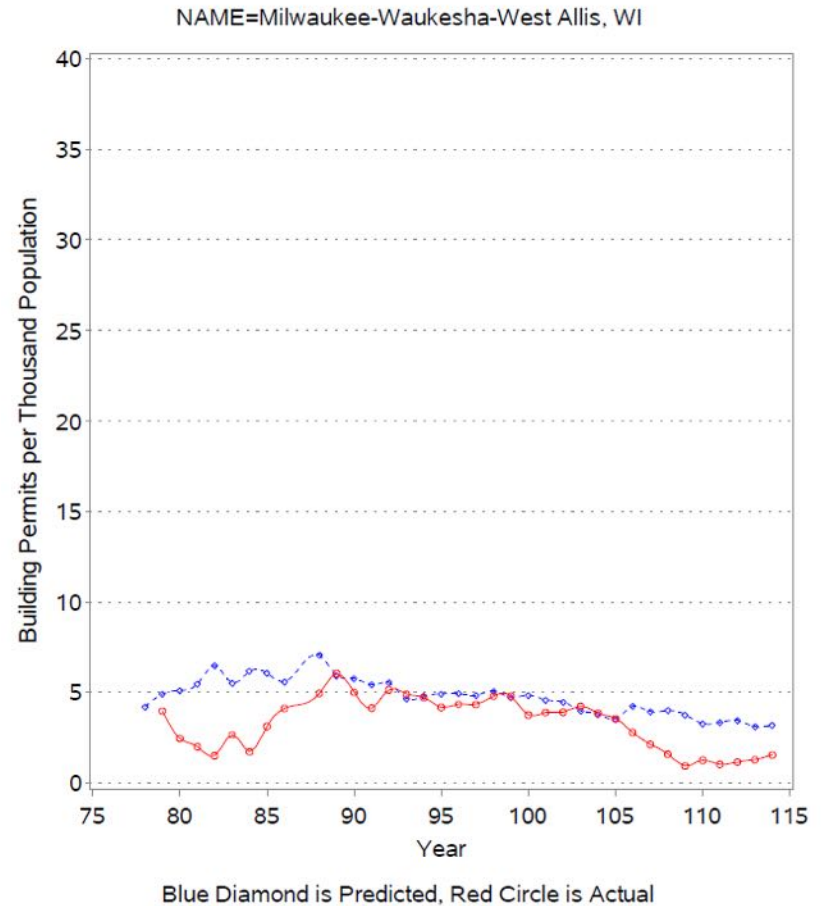
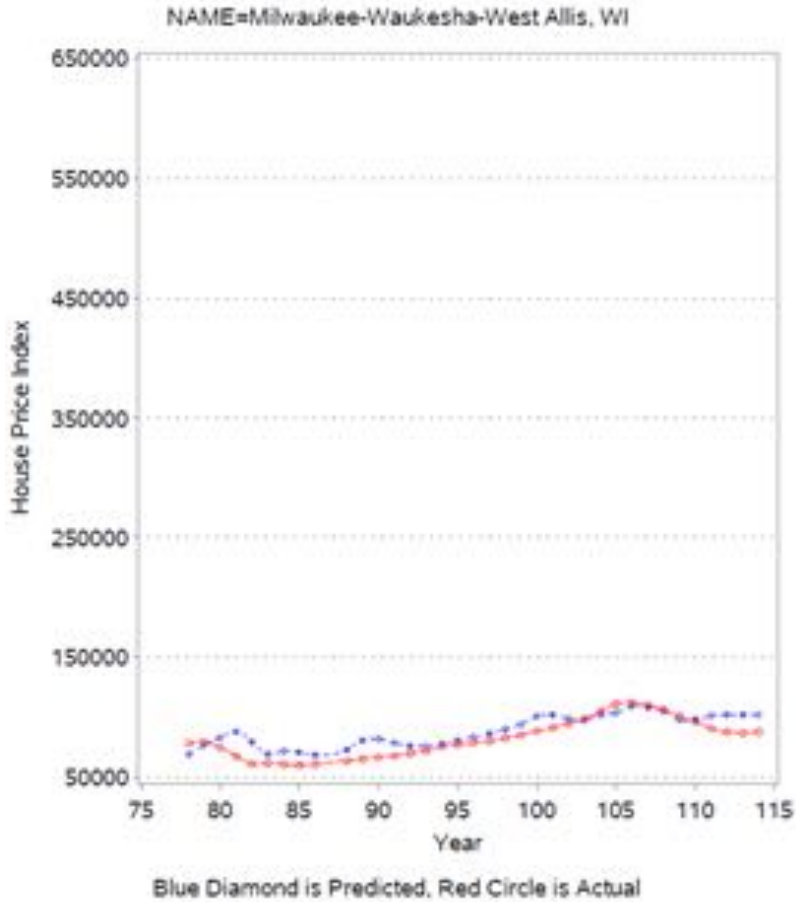
Blue Diamond is Predicted, Red Circle is Actual

NAME=Chicago-Naperville-Joliet, IL

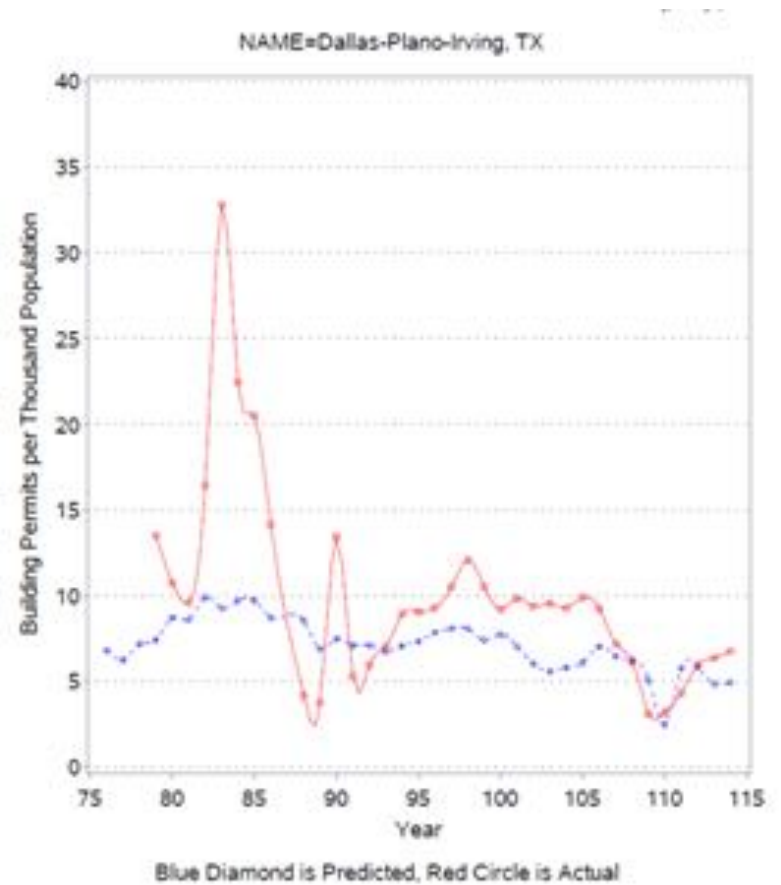
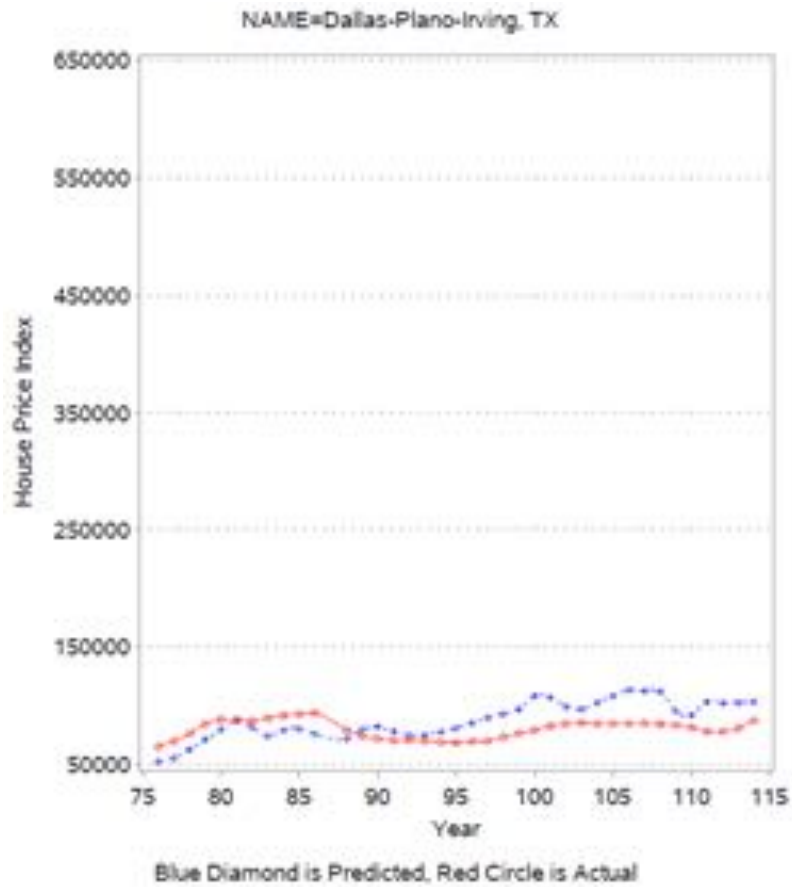


Blue Diamond is Predicted, Red Circle is Actual

Preliminary – results will change!

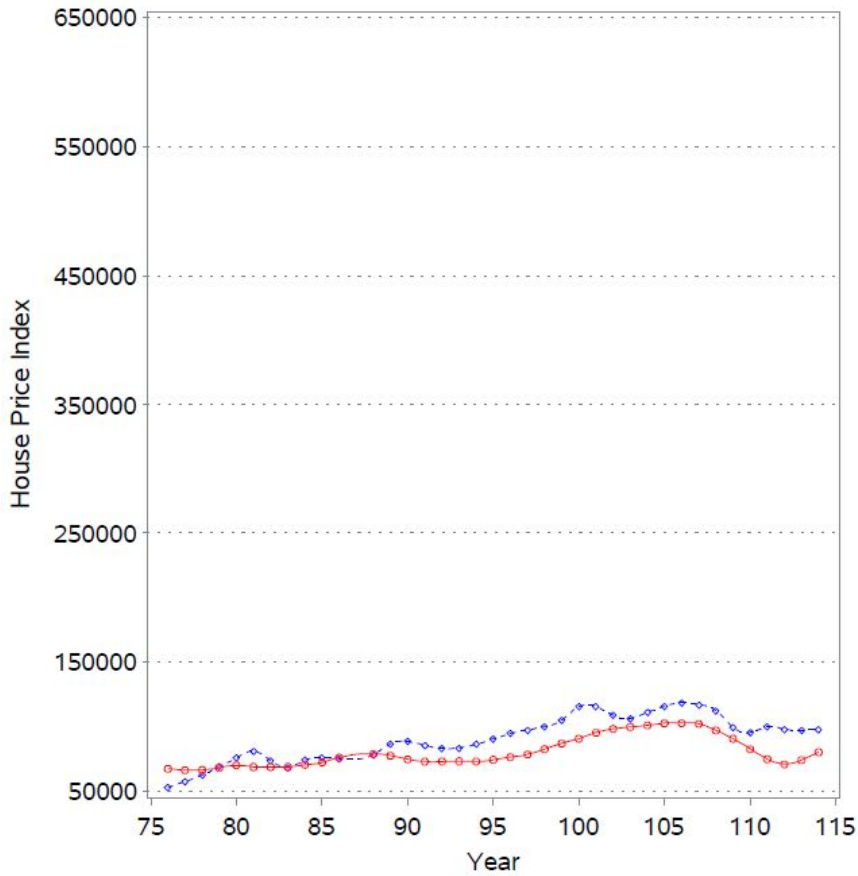


Preliminary – results will change!



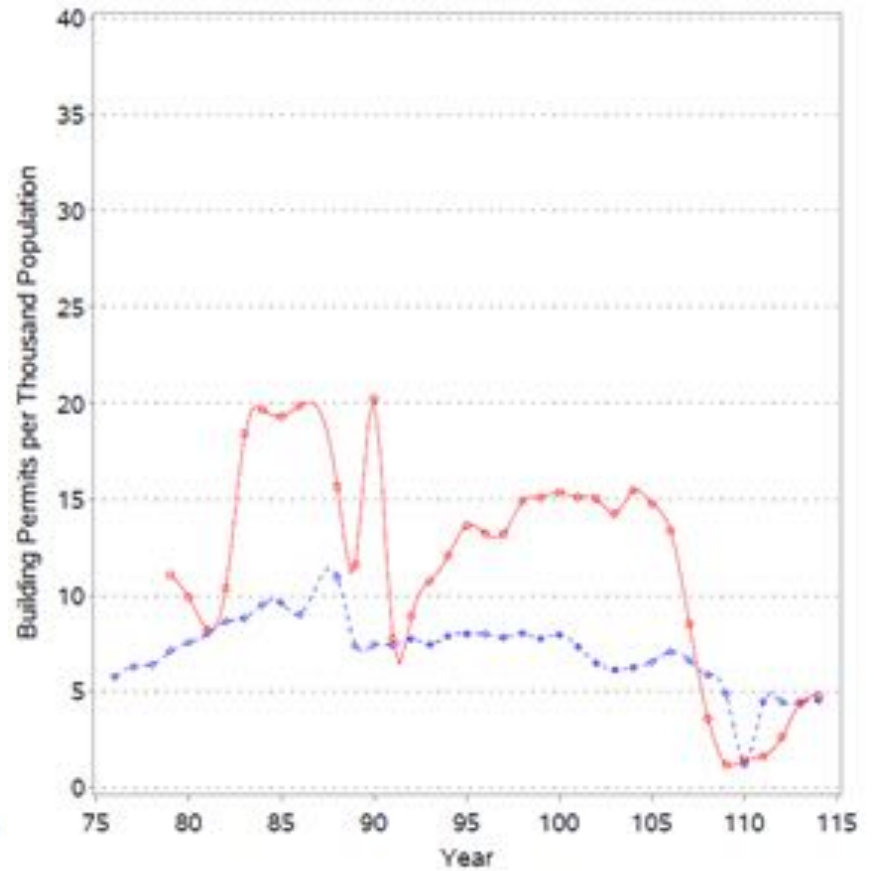
Preliminary – results will change!

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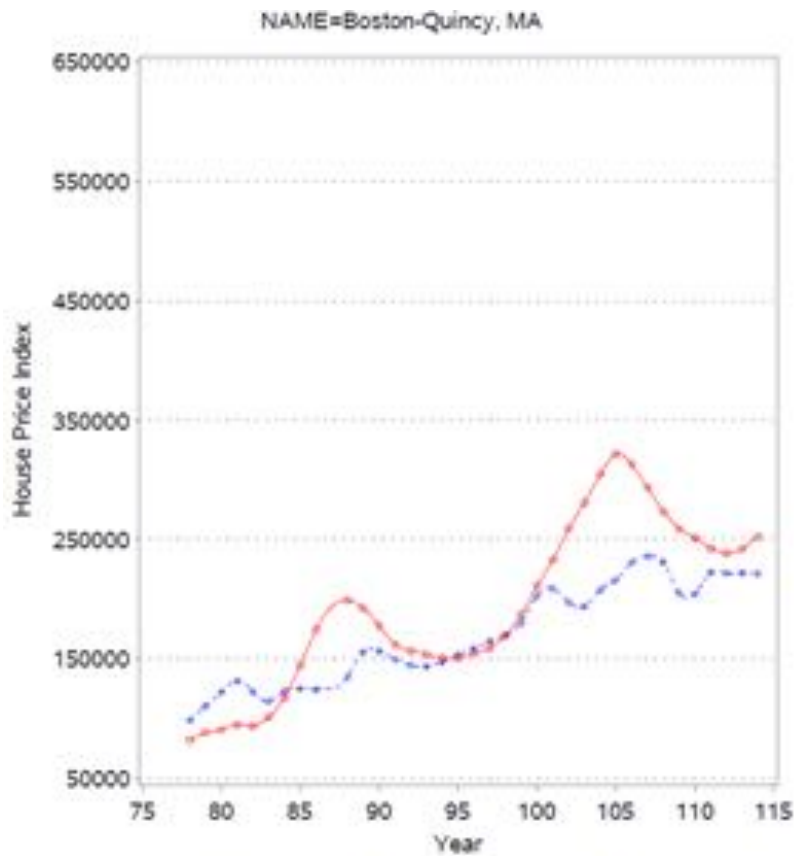
Blue Diamond is Predicted, Red Circle is Actual

NAME=Atlanta-Sandy Springs-Marietta, GA

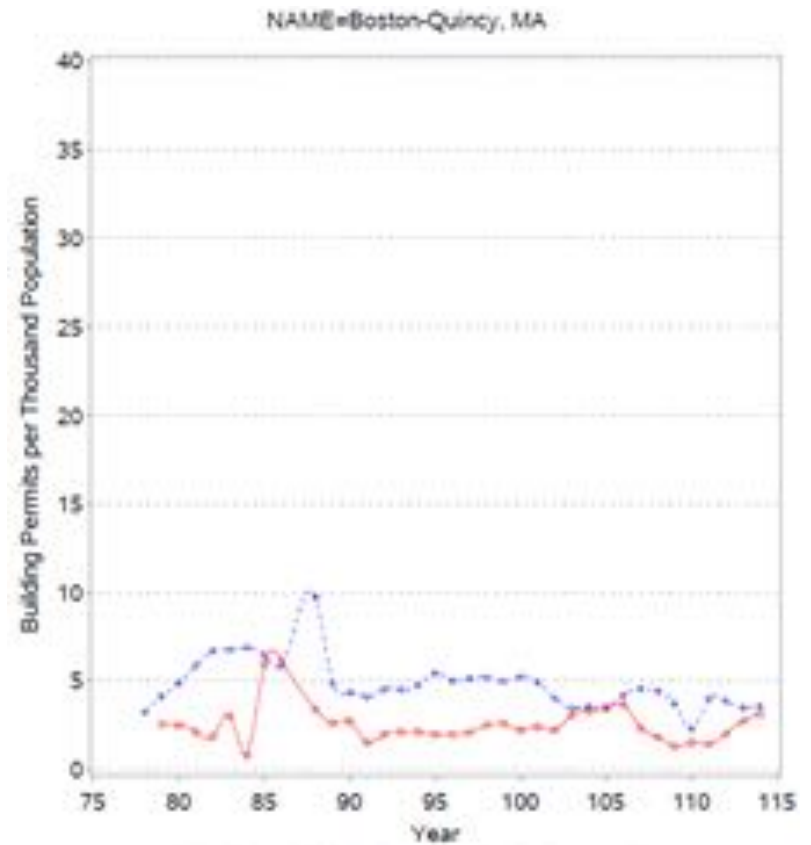


Blue Diamond is Predicted, Red Circle is Actual

Preliminary – results will change!

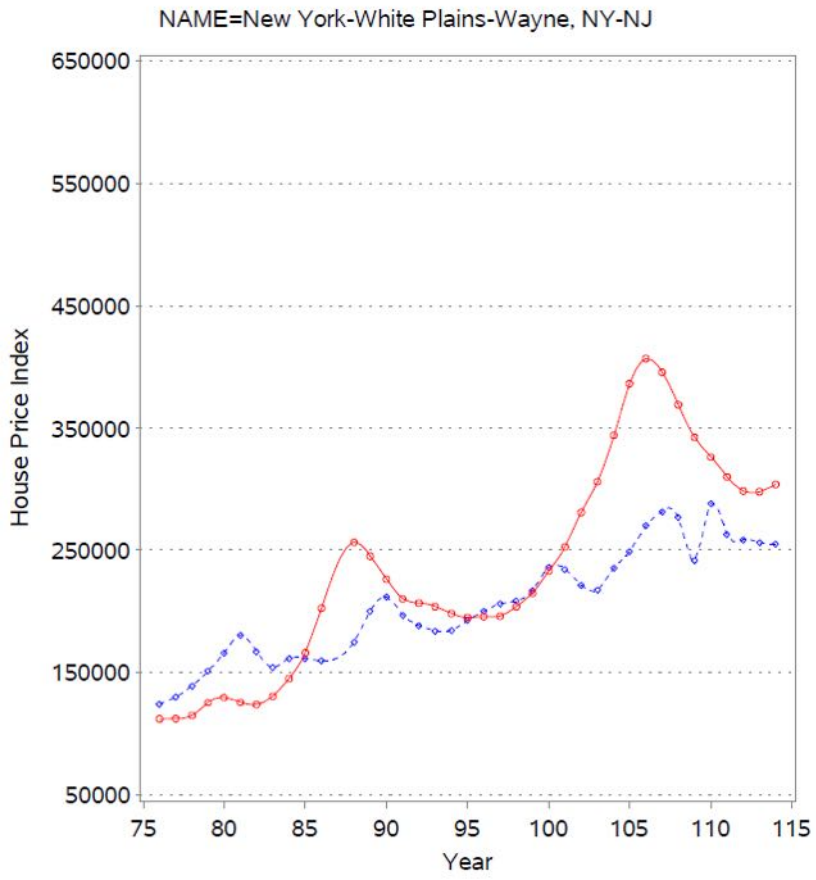


Blue Diamond is Predicted, Red Circle is Actual

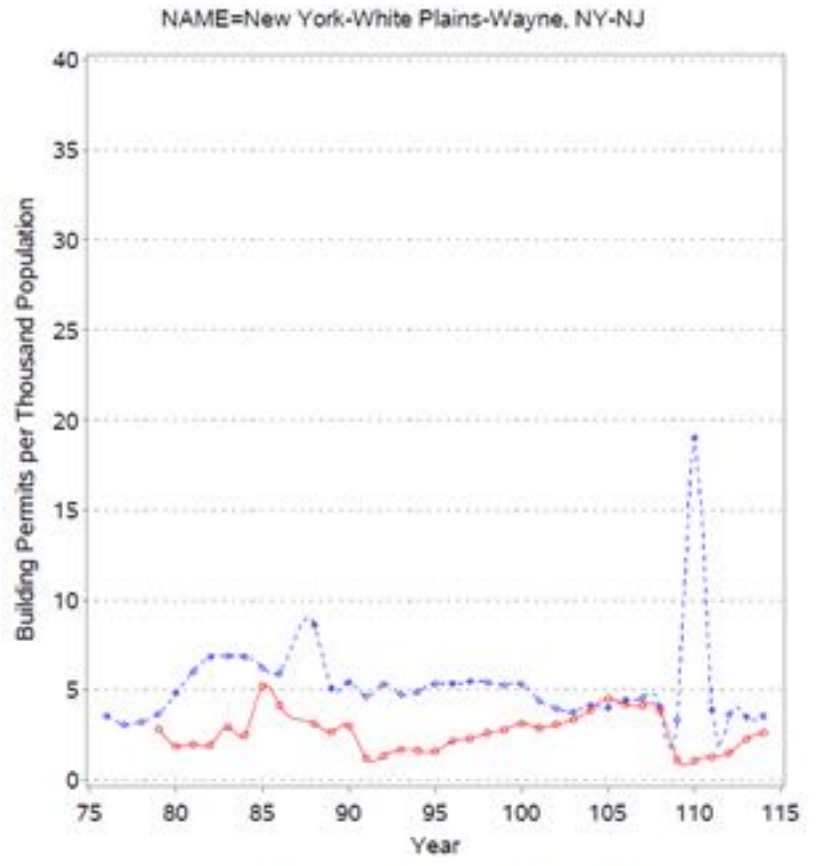


Blue Diamond is Predicted, Red Circle is Actual

Preliminary – results will change!

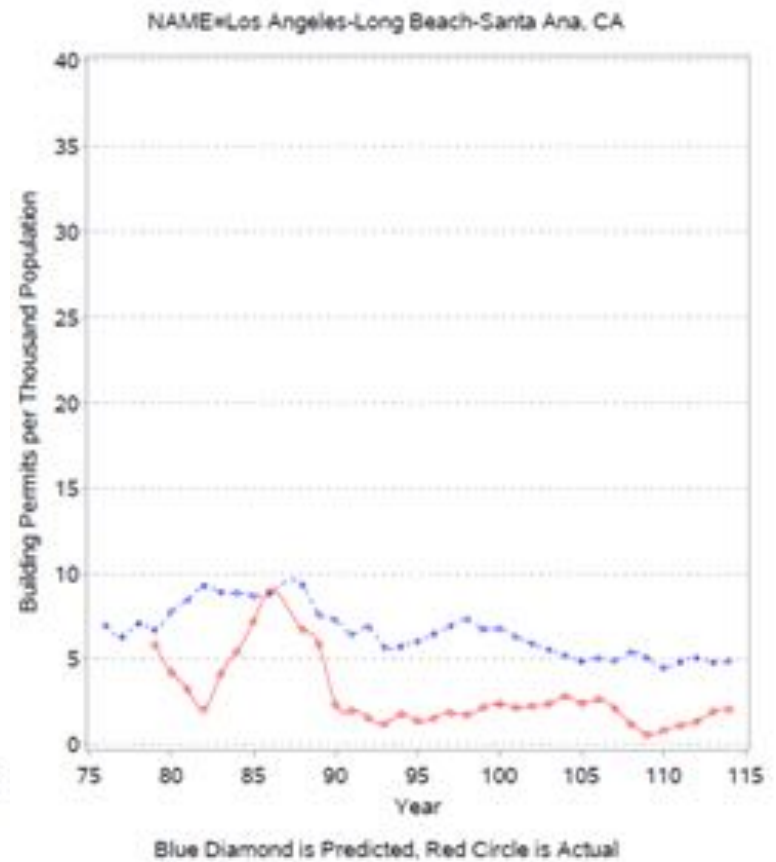
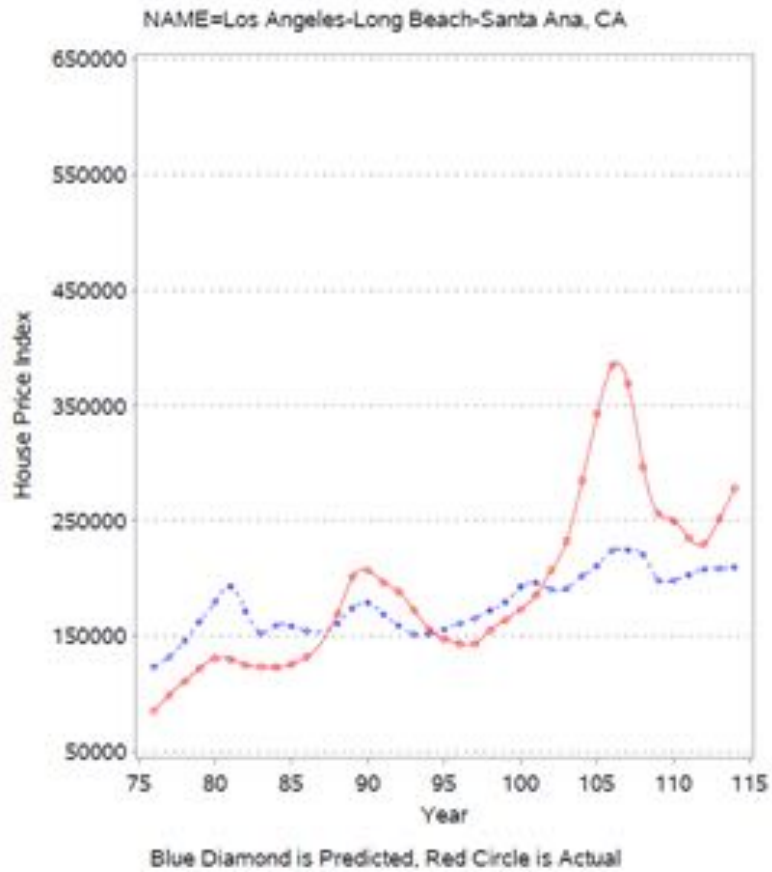


Blue Diamond is Predicted, Red Circle is Actual

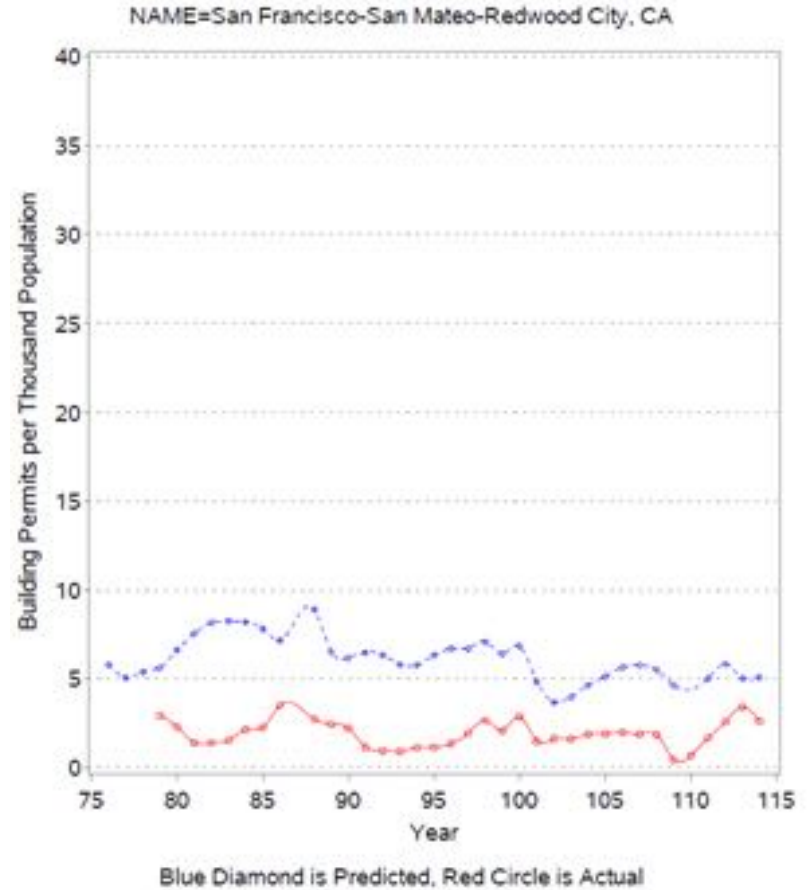
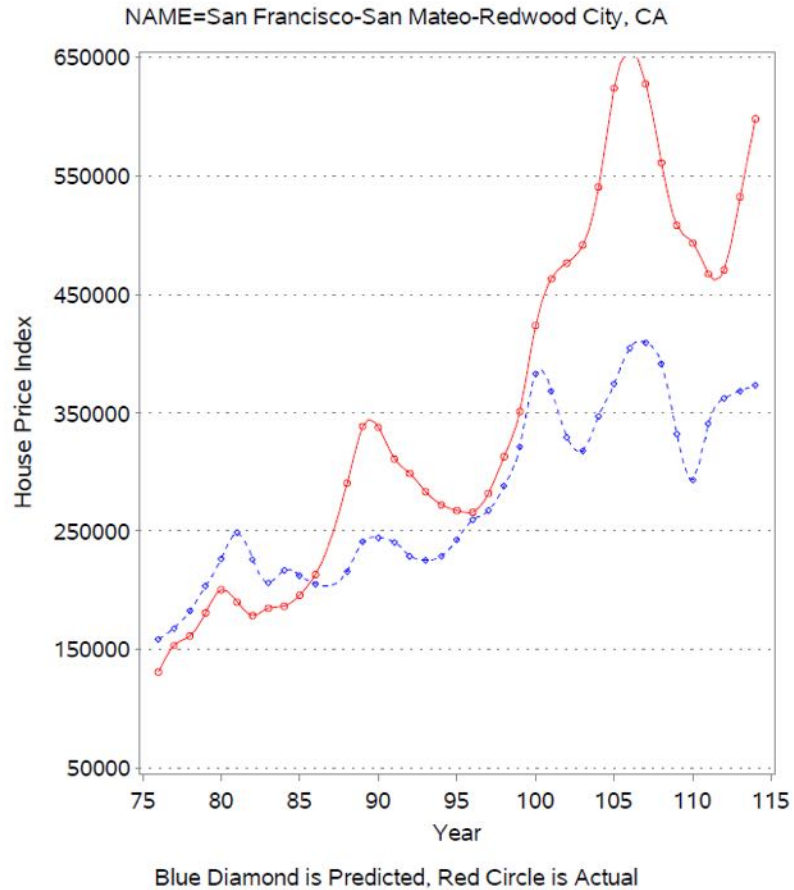


Blue Diamond is Predicted, Red Circle is Actual

Preliminary – results will change!



Preliminary – results will change!



Preliminary – results will change!

Some first results

- Preliminary results suggest that we are not anywhere near the distorted prices circa 2005-2006, but some markets are getting a little “frothy.”
- Both demand (incomes, demographics) and supply (regulatory constraints, physical geography) matter.
- Markets that build less than the permits model predicts tend to have volatile prices.
- Notice that some cities with lots of foreclosures had large price runups (e.g. some of the CA cities) but others (Miami, Phoenix, Las Vegas) had “boomlets” rather than huge price bubbles.
 - These were elastic markets where a lot of product was delivered (see Davidoff). Lots of price models, lots of starts/permits models. Need to integrate these better!
- There are a few data anomalies that need to be checked/corrected.
- Honolulu? Our models don’t explain it. More in-depth, in-person research needed. Someday.

Takeaways about housing prices

- Housing prices are not a “random walk,” or even close to it. They are much more forecastable than, say, stock price changes.
- Simple models like trend analysis (Paulson and Pellegrini) can be improved by more fundamental modeling. Large literature, research at Wisconsin and many other universities and elsewhere demonstrates this repeatedly.
- National level analysis is probably too crude. Need analysis at metro level, or even finer grained.
- ***Despite its importance, and the role it played in the 2007-9 financial crisis, the recession, and the slow recovery, the government (HUD, Treasury, etc.) does virtually no significant research on housing prices!***
 - The Fed does do some excellent research.
- ***Improving the modeling of housing prices, and disseminating results and how to use them appropriately, can serve as an early warning signal and could greatly improve the quality of appraisals.***

Next steps


- Model can be much improved.
 - Amenities!
 - Distribution of prices within the market? (Low-cost units often had bigger booms and busts).
 - Panel data issues need to be addressed, time series properties (see the Gallin critique of earlier research).
 - We want to model P and Q in a unified framework, but so far we have not fully addressed their joint determination.
- If we're so smart, why aren't we rich?
 - We still don't know everything about what caused the early 2000s run-up (over-identification!) and we still can't pick turning points.

Eventually...

- Using average/median house price indexes by metro area is much better than studying national prices, but still masks different results by submarket, e.g. by quality, intrametropolitan location
- “A house is not an index.” Need deeper understanding of how well indexes predict individual prices. (Or not.)

Today's talk

- Introduction
- Housing prices and the Great Financial Crisis/Great Recession
- Modeling housing prices
- **Some implications of house price research for appraisals**
- Possible topics for future conversations?
- Further reading

A young boy wearing a brown hat and a green shirt is looking through a telescope. The background is a bright, slightly blurred outdoor setting. The text is overlaid on the right side of the image.

Focusing too much
on the present

makes it harder
to see the future

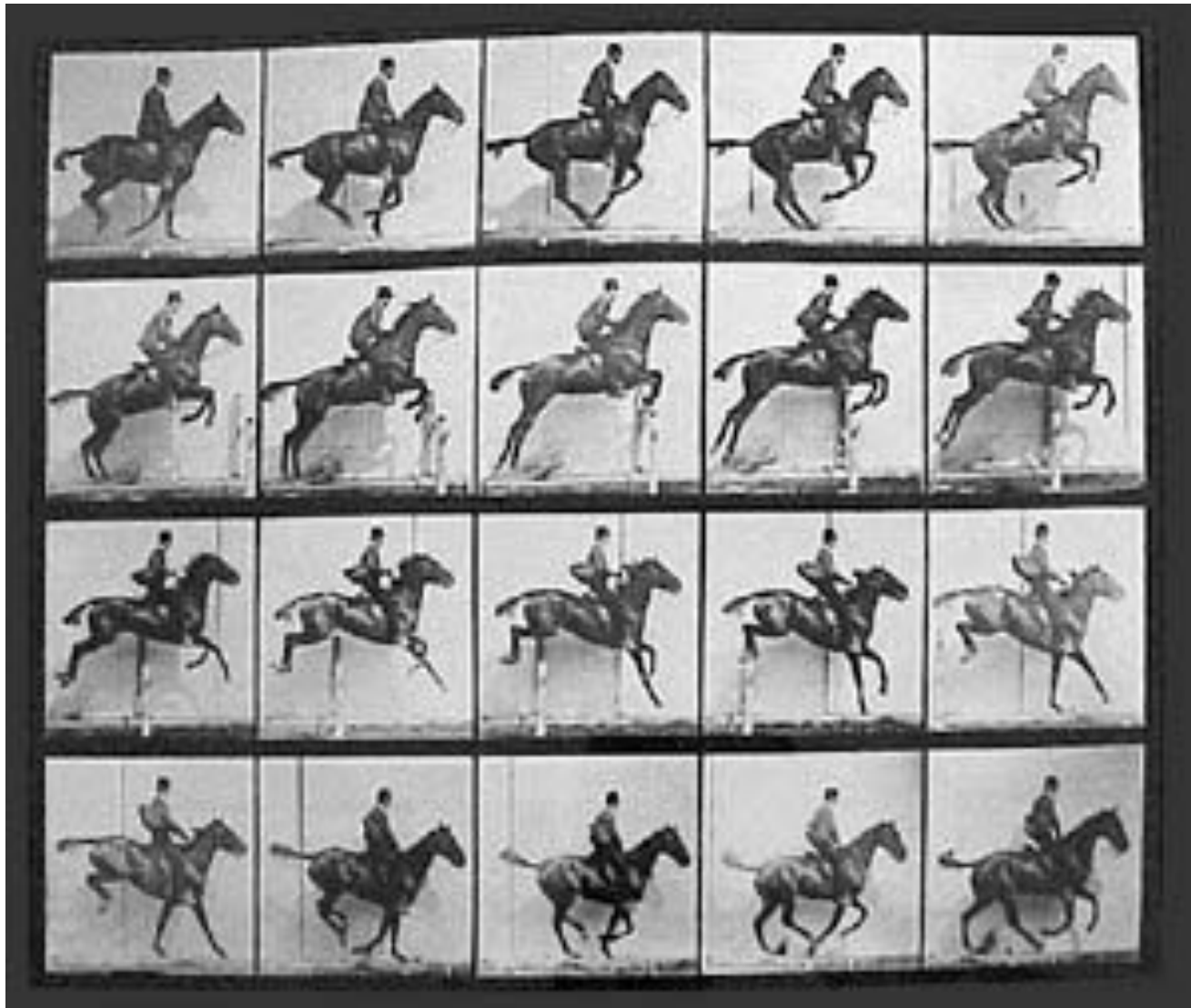
Do appraisal practices contribute to boom-and-bust cycles?

- Appraisal practice combines forward-looking and backward-looking analyses.
 - Forecasting NOI for commercial real estate is a forward-looking exercise. But selecting cap rates is backward looking.
 - Analyzing comparable sales, looking at recent cap rates is inherently backward-looking.
- Backward-looking elements often dominate our valuations.
- That's not entirely a bad thing.
 - Even economists who lean towards fundamental analysis, looking for mean reversion in cap rates or comps, admit it's subject to lots of error. (Otherwise, we'd be rich!)
 - ***Even worse: fundamental analysis can be manipulated, wittingly or unwittingly.***
- But our backward-looking analysis can create a feedback loop, build additional serial correlation into prices. Booms and busts, bubbles result.

Today's appraisals are snapshots...



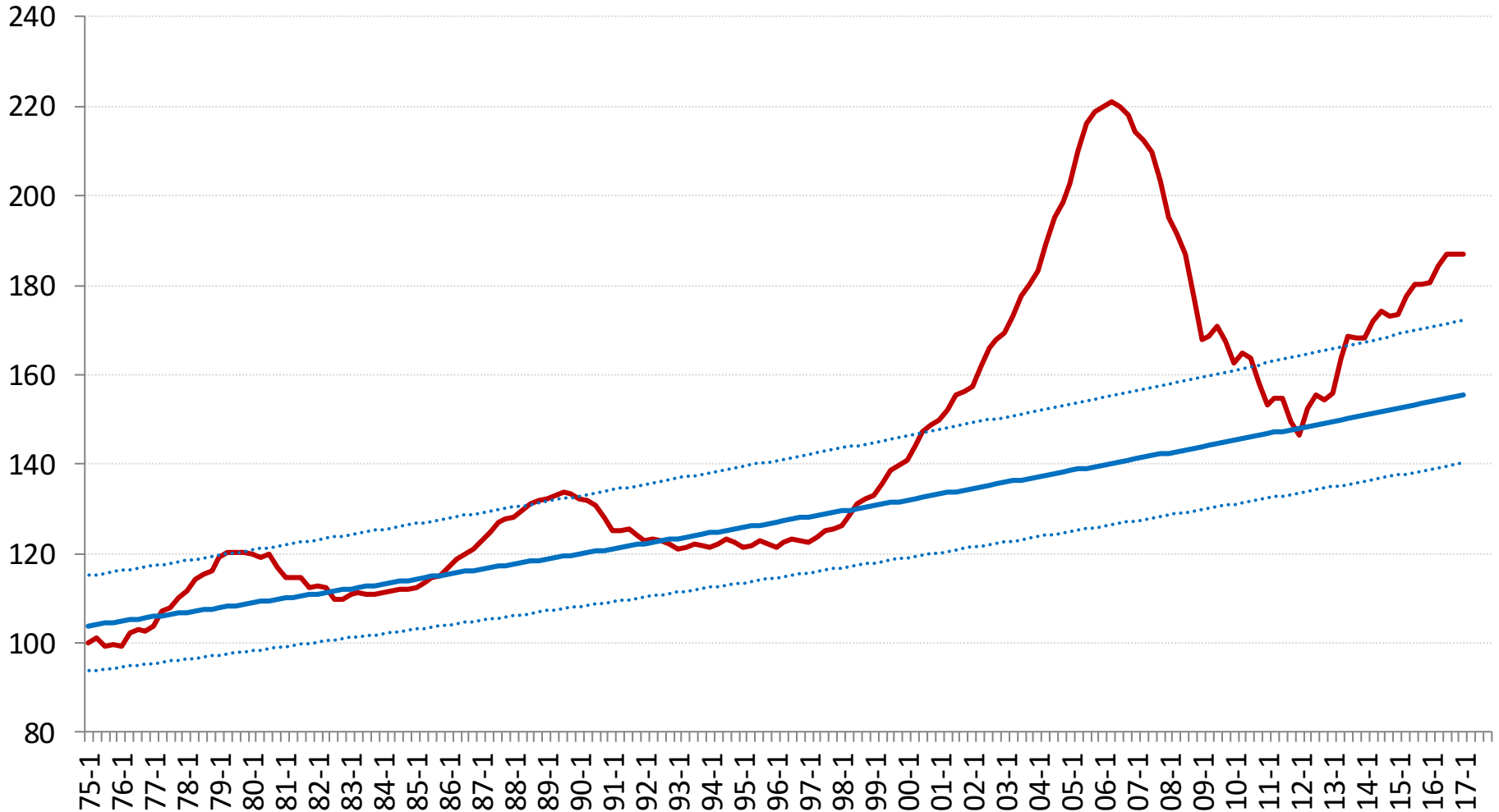
... but the market is more like a motion picture.





Spliced Quarterly Real House Price Index

FHFA Index 1975 to 1986; Case-Shiller 1987-2017(Q1)



— Spliced FHFA/CS Real House Price Index ··· Prediction, minus 2 SEs
— Prediction from Log Trend, 1975-1995 ··· Prediction, plus 2 SEs



DANGER
MORAL HAZARD

We can do better appraisals by considering dynamics – but beware moral hazard!

- Appraisals can be improved by considering market dynamics – where are prices relative to fundamentals.
 - Housing markets are not a random walk, they are *partly* forecastable.
- Note the *partly* part. Our knowledge of the future time path of house prices is probabalistic, not deterministic.
- We should not let individual appraisers, or financial institutions, appraise based on their own forecasts and models.
 - They don't have the expertise.
 - There are serious moral hazard problems – models can be manipulated to arrive at a predetermined answer.
- We need arms length, expert, unbiased forecasts, and a way to incorporate them into appraisals by those less expert.
- We need a trusted third party.



A few words from Professor Anthony Yezer

- *The problem with both human appraisal and the current automated appraisal systems is that they are essentially backward looking methods of valuation. They indicate the value of housing in the past. Given that house prices tend to cycle above and below their long run value (called mean reverting behavior) high rates of appreciation today are generally associated with lower rates of price appreciation in 3-5 years.*
- *The academic literature shows that statistical forecasting models can improve significantly on current appraisals ... As long as individual home buyers and mortgage lenders continue to rely on appraisal values to make long term housing investment and financing decisions, the necessary conditions to produce housing bubbles will remain.*

Professor Yezer's proposal

- *Simply have the public sector take forecasting the future value of local housing prices as seriously as it takes weather or climate or agricultural and industrial output forecasting.*
- *Assign a competent (but small) group of economists with the responsibility for preparation and dissemination of local area (perhaps census tract or ZIP code level) house price forecasts for the U.S. Entered on a website, dissemination by the media and use by realtors, lenders, and homebuyers would follow.*

Professor Yezer's proposal

- *There would be political resistance when forecasts showed that current house price appreciation was likely to slow, or indeed turn negative. Accordingly the group producing the forecasts would need to be shielded from political influence.*
- *It would still be necessary to assess the relation between a particular housing unit and other units in a local area. The condition of a each unit sold must be evaluated to determine its quality relative to other units in the area. Homebuyers need to know what the market value of each unit is if sold today (the spot price) but they also need information on the likely future market value.*

Default when Current House Values are Uncertain

Morris A. Davis and Erwan Quintin

Wisconsin School of Business, UW-Madison

June, 2014

Davis and Quintin



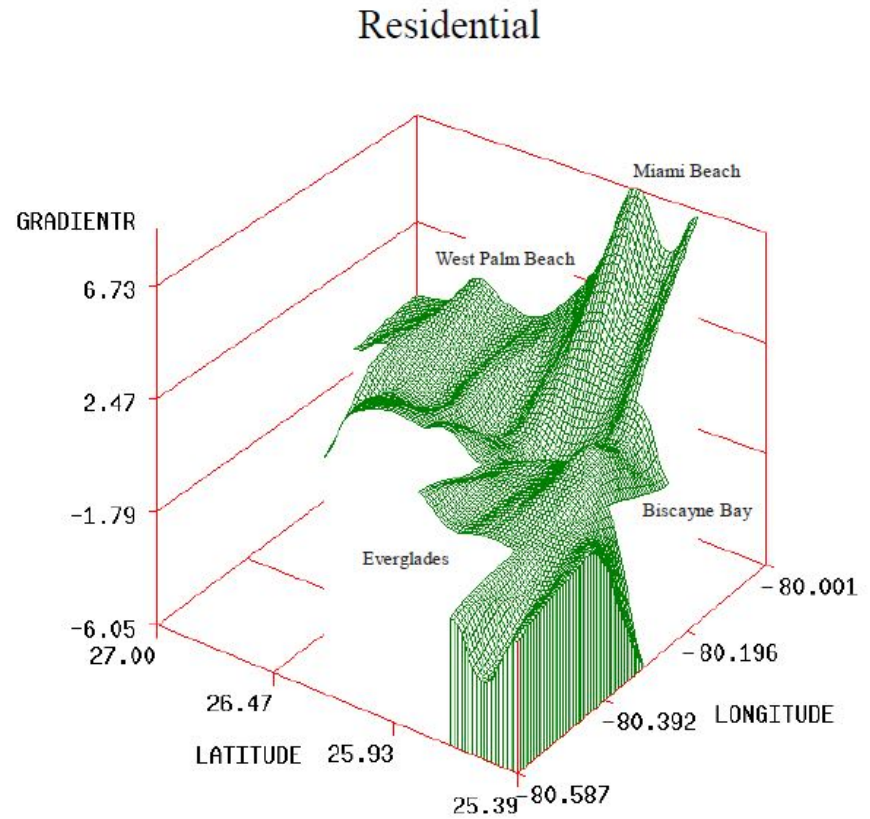
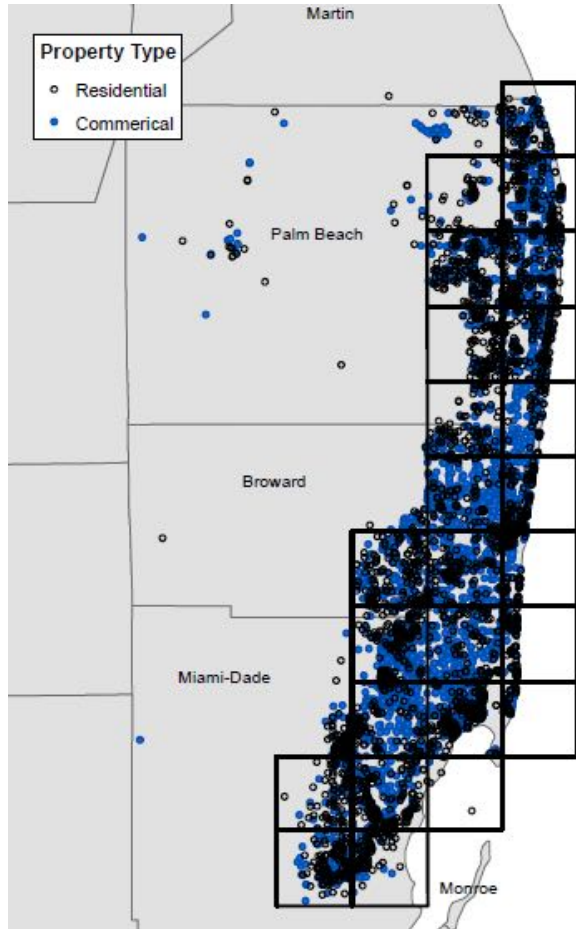
big data



Morris is on the job, too

- Recent work by Morris Davis and colleagues are also advocating more dynamic appraisals, using past research but also focusing on the need for government to apply “big data” approaches to the problem.
- HUD to maintain a national database of sales and appraisals.
- Instead of metro level price indexes for some larger MSAs, slice MSAs into smaller grids (neighborhoods? Census tracts?) and analyze house prices on a small area scale. Make the analyses freely available.
- Each grid gets a risk rating by an arms-length analytic committee. Report this risk.
- Appraisers, lenders, etc. use these as inputs into their valuations.
- Use a probabilistic approach instead of the current outdated point estimate.
 - A little complicated but we can build software that uses these inputs correctly.

Small area price analysis from South Florida



Nichols, Oliner and Mulhall (2012)

The idea of making appraisals “forward looking” is catching on...

- European concept of “sustainable value” for lending
- Joan Trice’s mortgage value (yesterday’s discussion)
- Joe Tracy’s price-to-rent threshold (this morning’s discussion)

- But the devil will be in the details, in the execution.
 - EG what kind of model? Metro level? Tiered by submarket? Or small area spatial models?
 - How to avoid “model monopoly risk?”

Possible third parties?

- HUD?
- FHFA, other regulators?
- Ratings agencies?
- Feds?
- Academics?
- Panel of “experts?”

Once we have the forecast(s), how do we apply to appraisals?

- Use as a “flag,” add to the appraisal.
 - So what? Will borrowers, lenders care?
- Come up with a formula to give first draft appraisals a “haircut.”
 - What formula? Will first drafts simply shift up as haircut increases?
- Joe Tracy’s approach: use as a hard threshold: lend min (90% LTV or 30 P/R).
- Apply at the portfolio level, e.g. MBS incorporate metro-specific risk adjustments when pricing securities.
- Incorporate as part of a larger reform to report confidence intervals in addition to a point estimate.
 - NB don’t mis-specify by assuming a symmetric normal or bell-shaped “standard error.”

Let's finish with another word from my illustrious predecessor

- “Appraisers would do well to always remember that real property prices are simply a reflection of the market's optimism or pessimism (aka greed or fear) of the future. Prices do not always, and more likely rarely, coincide with the value of the underlying asset.” James Graaskamp

Today's talk

- Introduction
- Housing prices and the Great Financial Crisis/Great Recession
- Modeling housing prices
- Some implications of house price research for appraisals
- **Possible topics for future conversations?**
- Further reading



**Our time is limited today.
What questions should we address?**

Any questions?

- I've selected a few questions about research and valuation/appraisal.
 - I've selected some slides that speak to them.
- What would ***you*** like to talk about?
 - Today, if we can; or perhaps in my blog, or a future conversation.

Some possible future topics?

- Commercial real estate prices
- Options/optionality and valuation
- Mass appraisal/regression and statistical models
- Interest rates and capital flows
- The distribution of income and wealth (including real estate)
- Housing affordability; low income housing policy
- Natural versus man-made constraints on supply
- Tips and traps in data presentation
- Psyche! Behavioral economics and real estate
- Research on fraud – how common was/is it?
- Cap rates and user cost models
- Values: ranges and intervals, “second moments”
- Appraisal in the S&L crisis, the Great Financial Crisis
- Demographics: destiny?
- Macro indicators: GDP, income and wealth, inflation, employment
- Macro policy: The Fed, fiscal policy
- Micro policy: taxation, subsidies, regulatory policy
- Common errors in real estate analysis
- It’s not easy being green (in real estate)
- Econ-o-speak for appraisers: learning the jargon, how the jargon sometimes helps

Today's talk

- Introduction
- Some economic and statistical jargon
- Housing prices and the Great Financial Crisis/Great Recession
- Modeling housing prices
- Some implications of house price research for appraisals
- Possible topics for future conversations?
- **Further reading**

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