"Lessons From a Lifetime of Running Housing Models"

by Norm Miller, PhD

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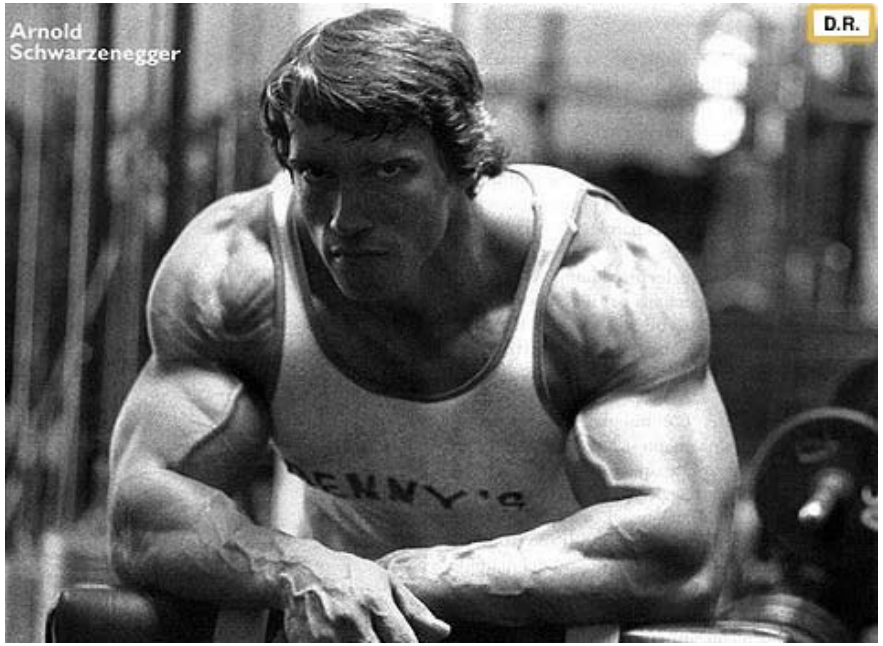
UC San Diego

Economics Roundtable, July 24th, 2024

Some background

- PhD at The Ohio State University (Finance and Economics)
- Professor at the University of Georgia, University of Cincinnati, and most recently University of San Diego, while always doing some work in the private sector.
- Head of Analytics at CoStar and significant work for NAA, NMHC, FDIC and with the Hoyt Institute, a think tank based in FL.
- Over 35 years of private sector consulting.
- **Note: We stopped publishing our state-of-the-art research in academic journals on AVMs, such as specific influences and models, several years ago as they were being picked up by competitors.**
- Personal interest in sustainability.

BTW: famous people who started out in economics…

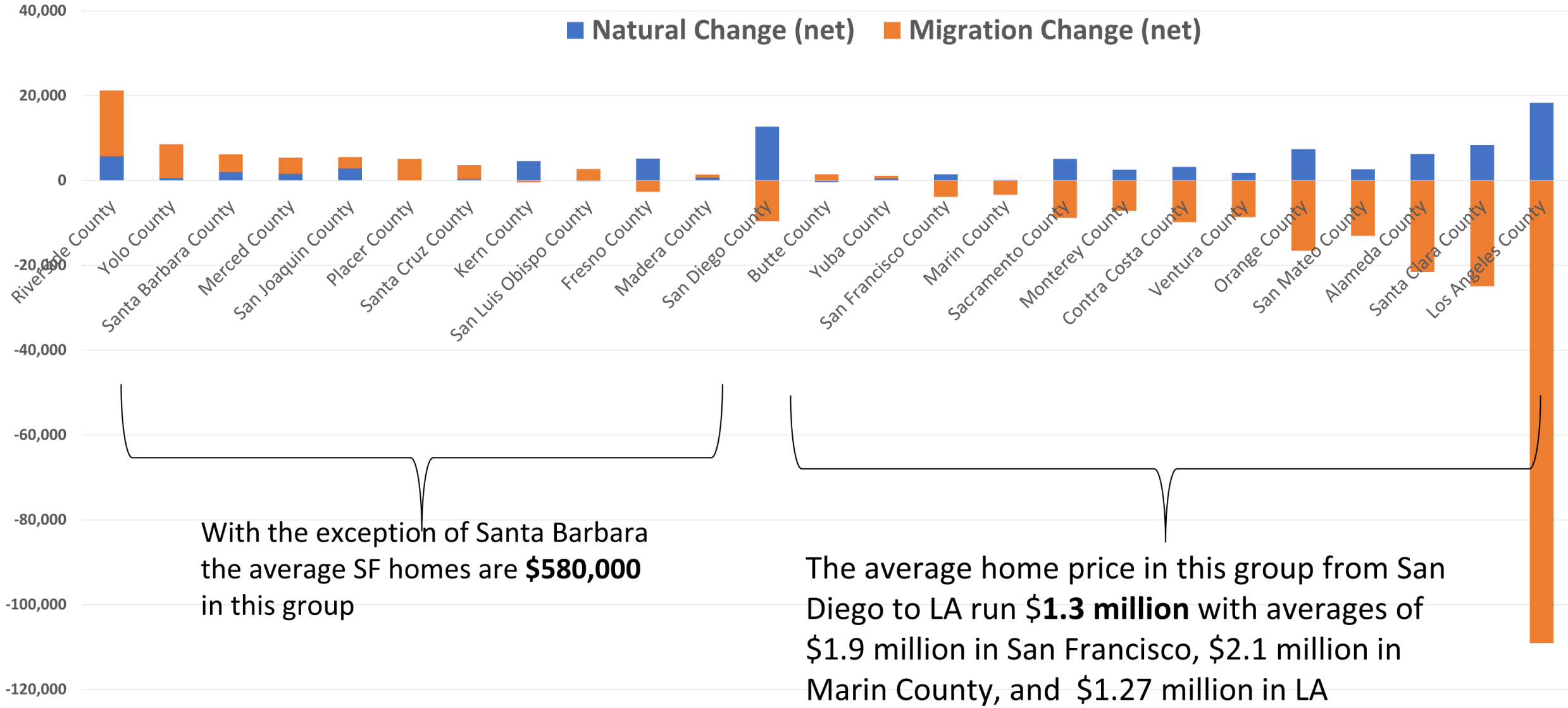


Today: A Few Potential Owned Housing Research Questions (Prerequisite to a rental market analysis)

- A few quick discussions on leaving CA, affordability and property taxes
- Then the “art” of valuation and why is valuation uncertainty is important?
- More topics if we have time.

Is everyone really leaving California ?

Counties in CA Net Population Change 2022



With the exception of Santa Barbara the average SF homes are **$580,000** in this group

The average home price in this group from San Diego to LA run $**1.3 million** with averages of $1.9 million in San Francisco, $2.1 million in Marin County, and $1.27 million in LA

From the UT on June 18, 2024: Protesting Housing Investment Buyers

San Diego residents protest the unfair practices of Blackstone, the nation's largest corporate landlord, at Bay Apartments, one of their local properties in Pacific Beach. (Courtesy of Paul Valdivia)

- Is housing a social good to be provided by government?

Yet it seems the media **never** says housing is affordable, even when it is…or was…

Affordability

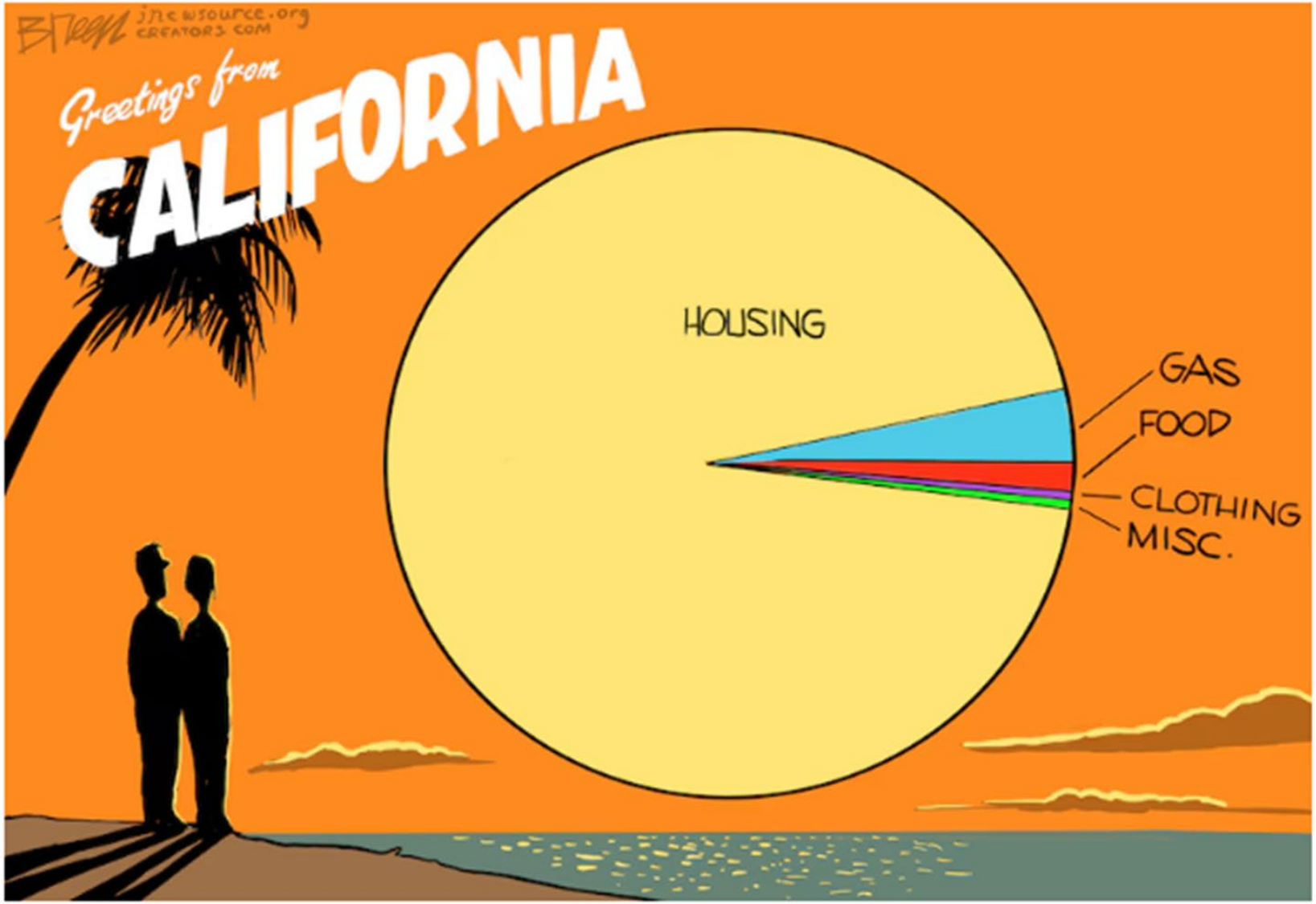
A function of demand

- Households
- Income
- Employment
- Interest Rates
- Property Taxes
- Property Insurance

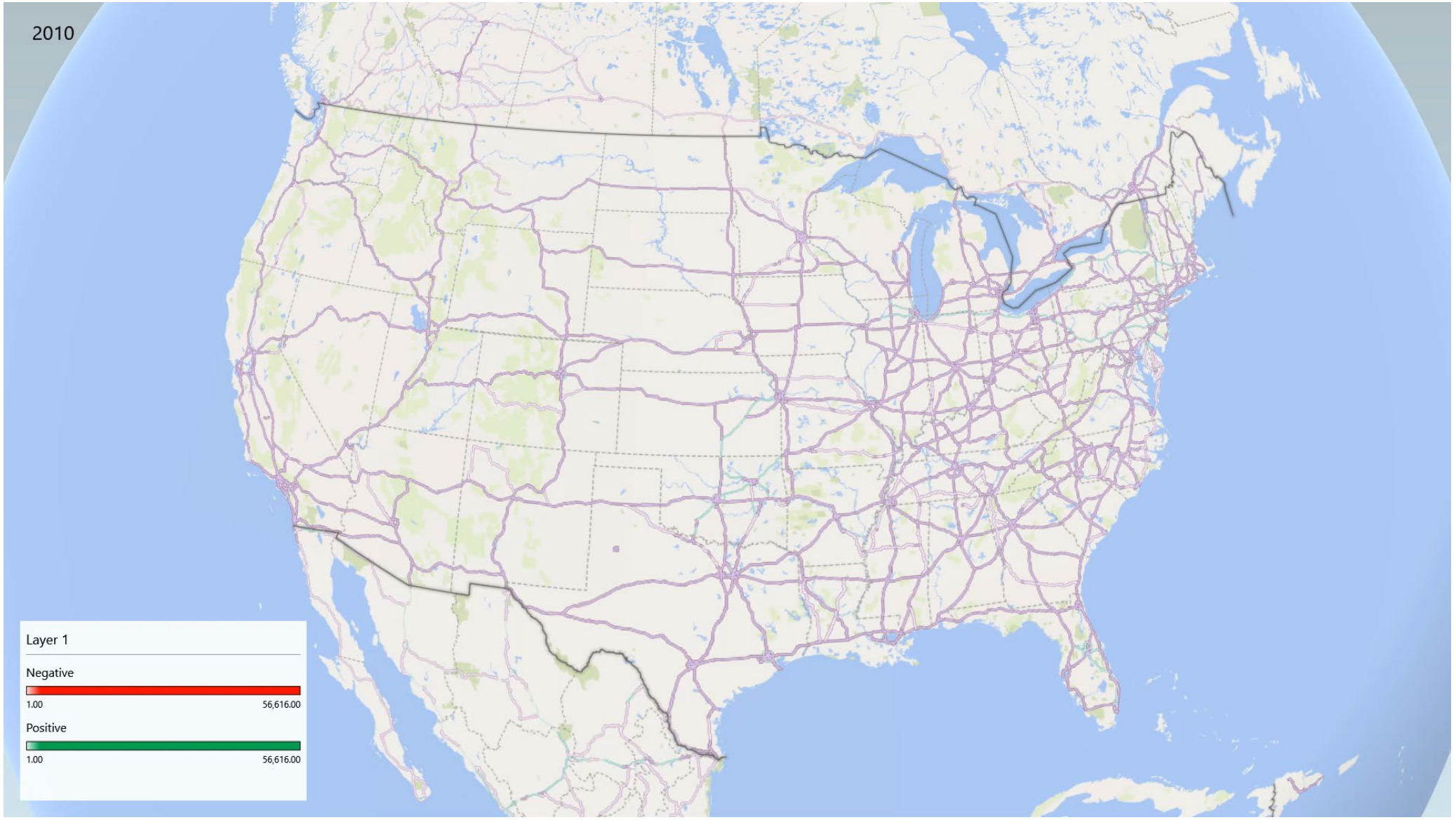
A function of supply

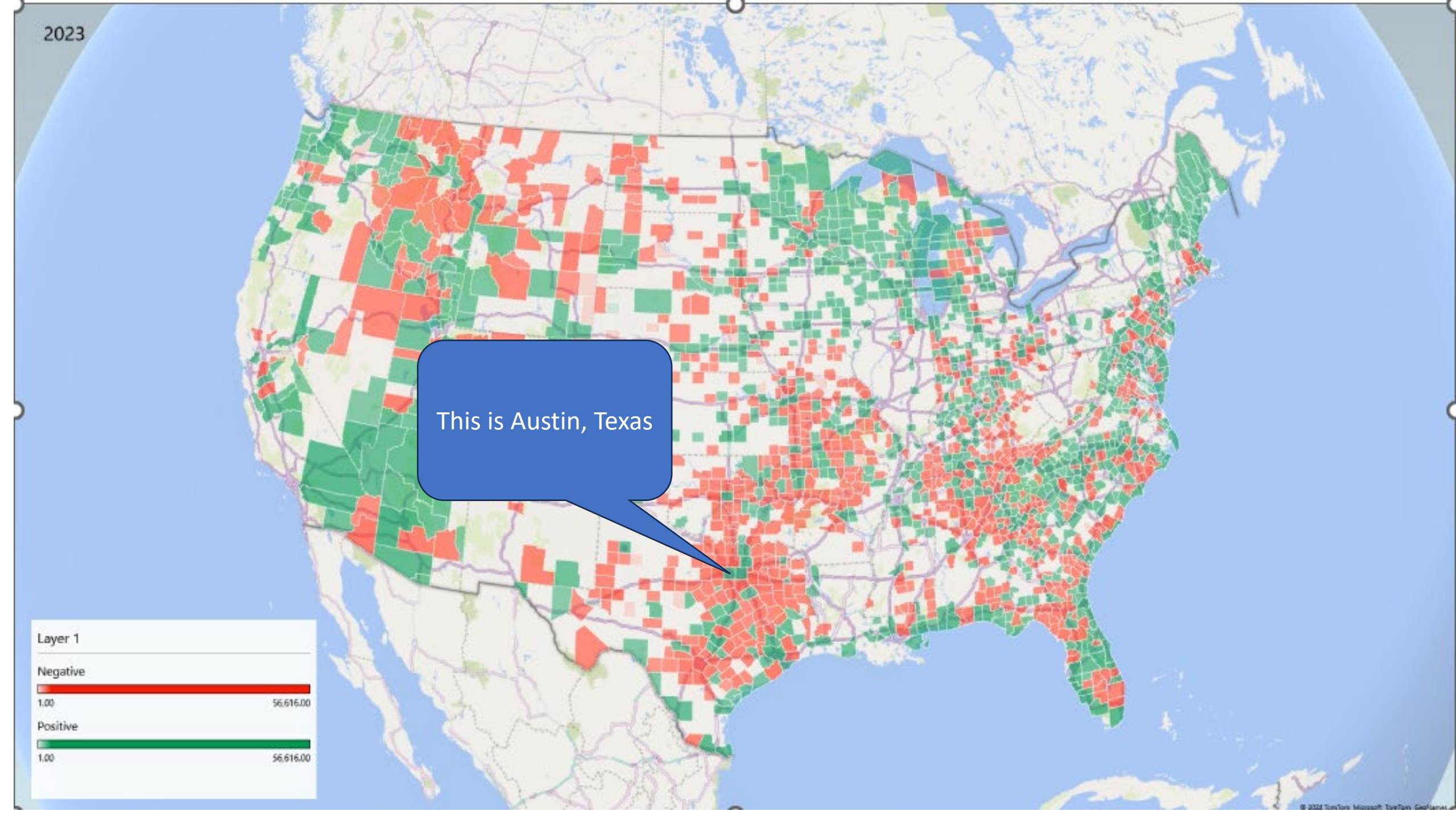
- land
- labor
- Regulation and speed to entitle
- NIMBYs
- Cost of capital

Housing Affordability in California

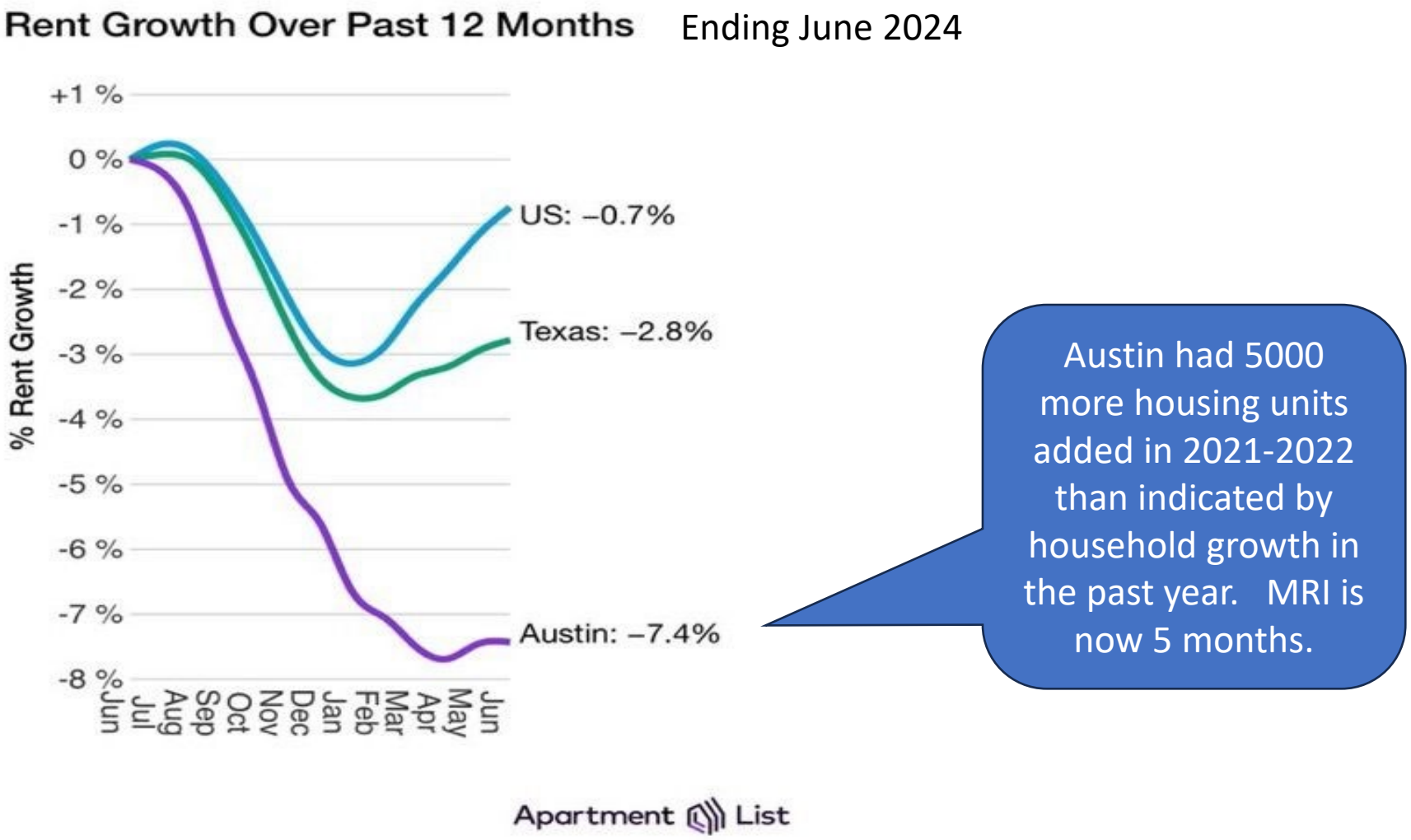


Supply and demand are local not national by Jared Rodio




2023
This is Austin, Texas
Layer 1
Negative
1.00
56,616.00
Positive
1.00
56,616.00

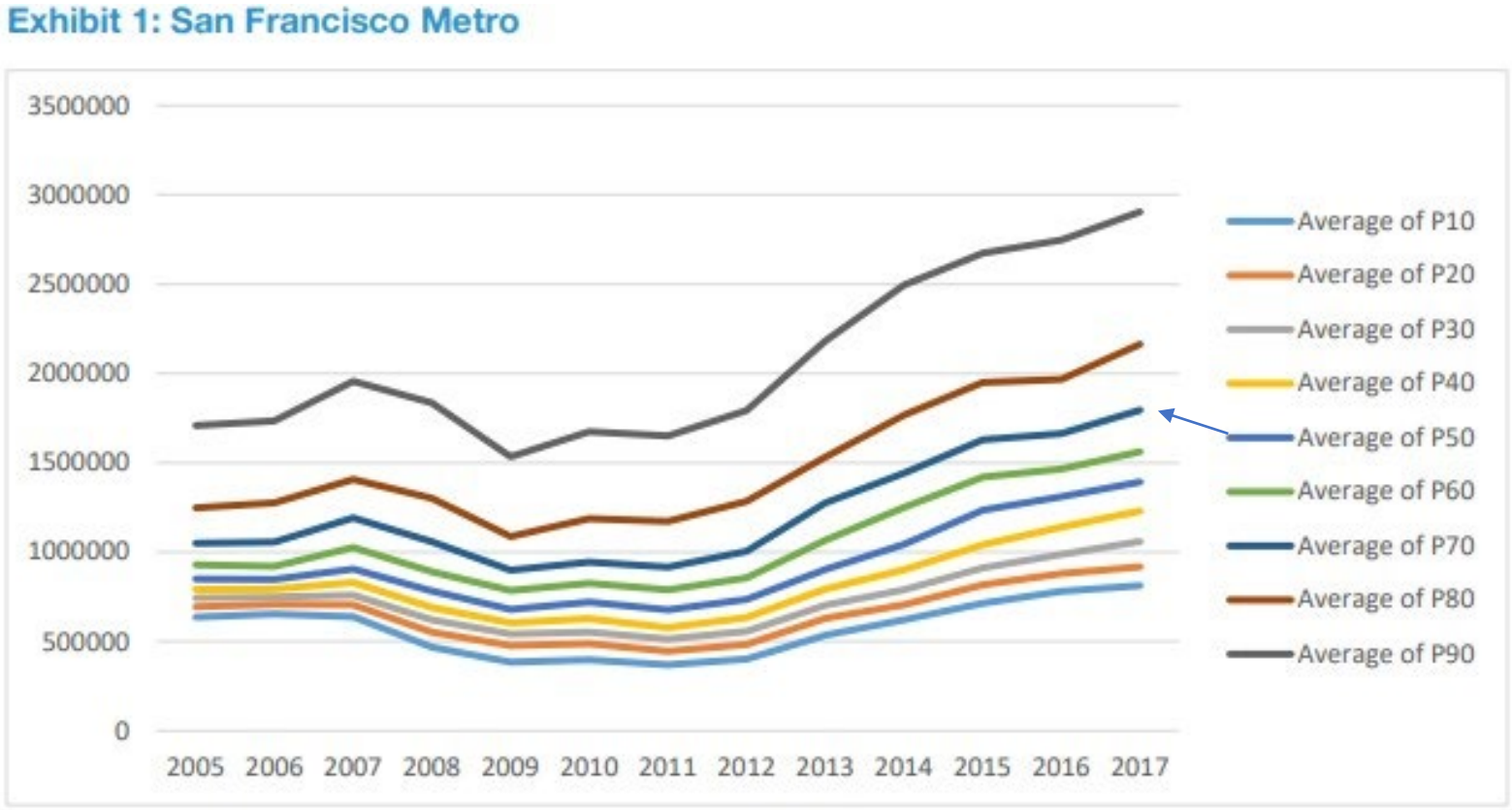
Supply Matters for home prices and rents

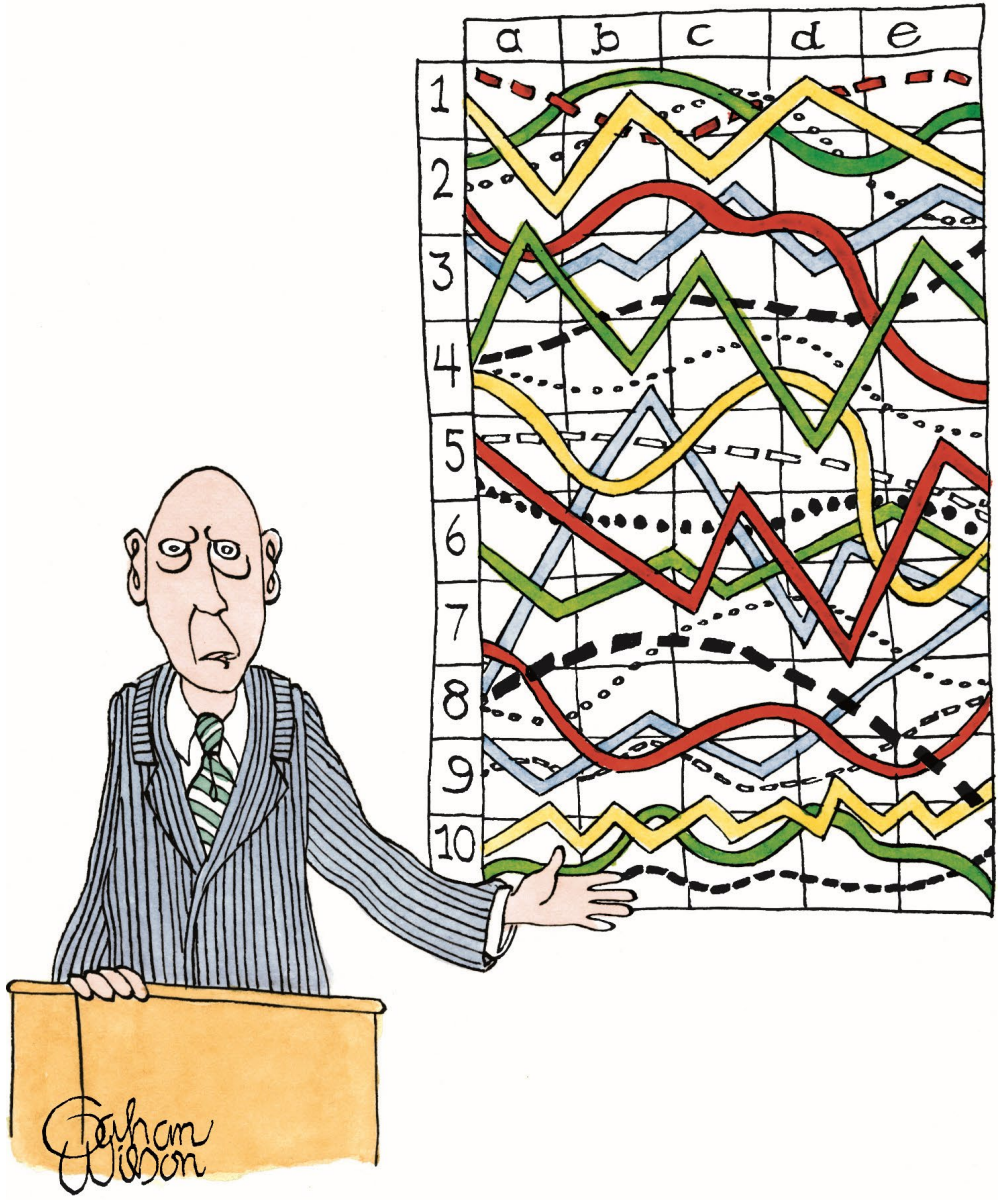


Austin had 5000 more housing units added in 2021-2022 than indicated by household growth in the past year. MRI is now 5 months.

How have we historically measured affordability?

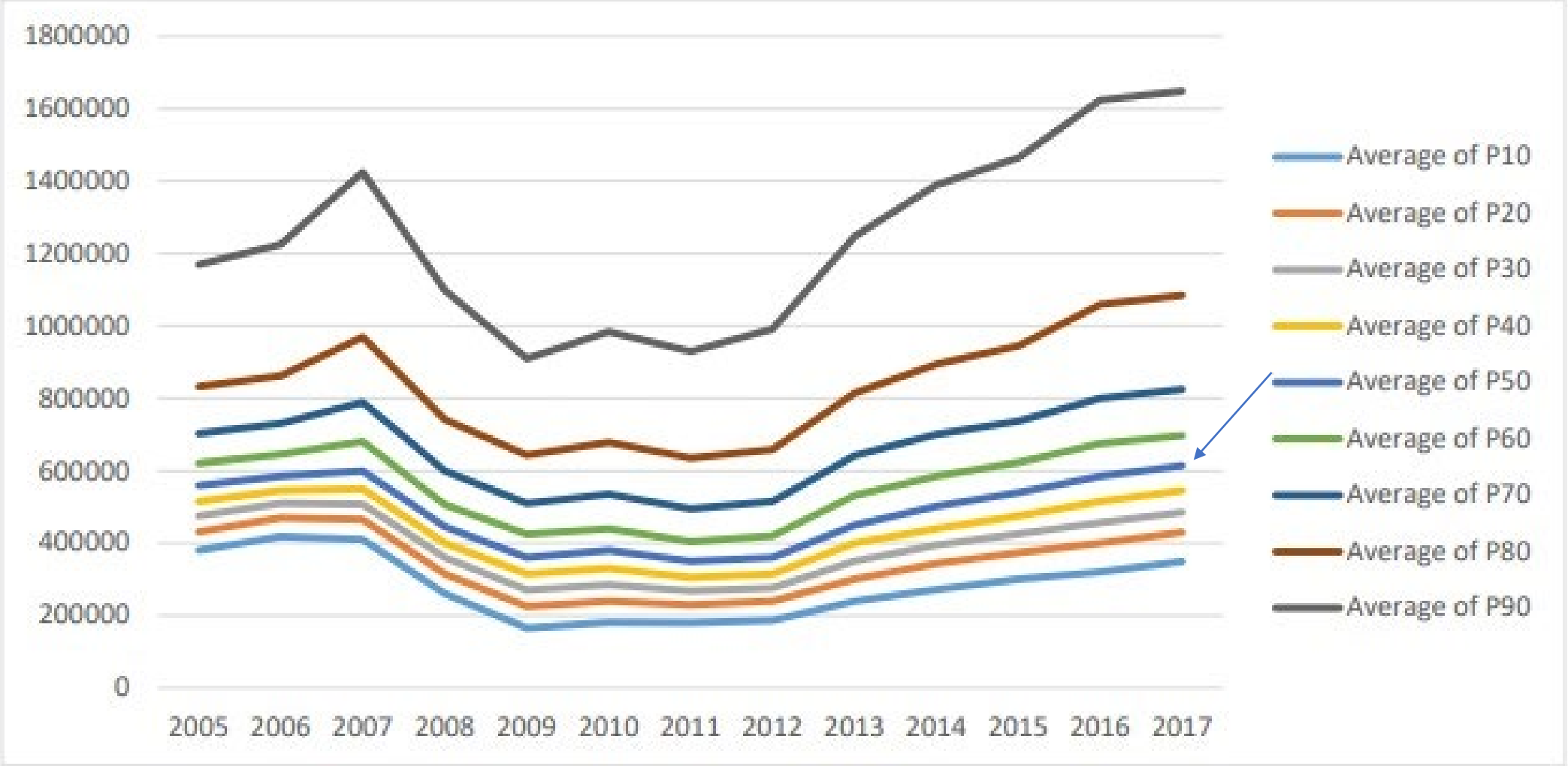
- We always discuss affordability based on a model that uses **median home** prices and **median incomes** and then asks what percentage can afford the median home, given current interest rates and prices. We usually ignore property taxes and property insurance. Maybe we should use "starter" homes?





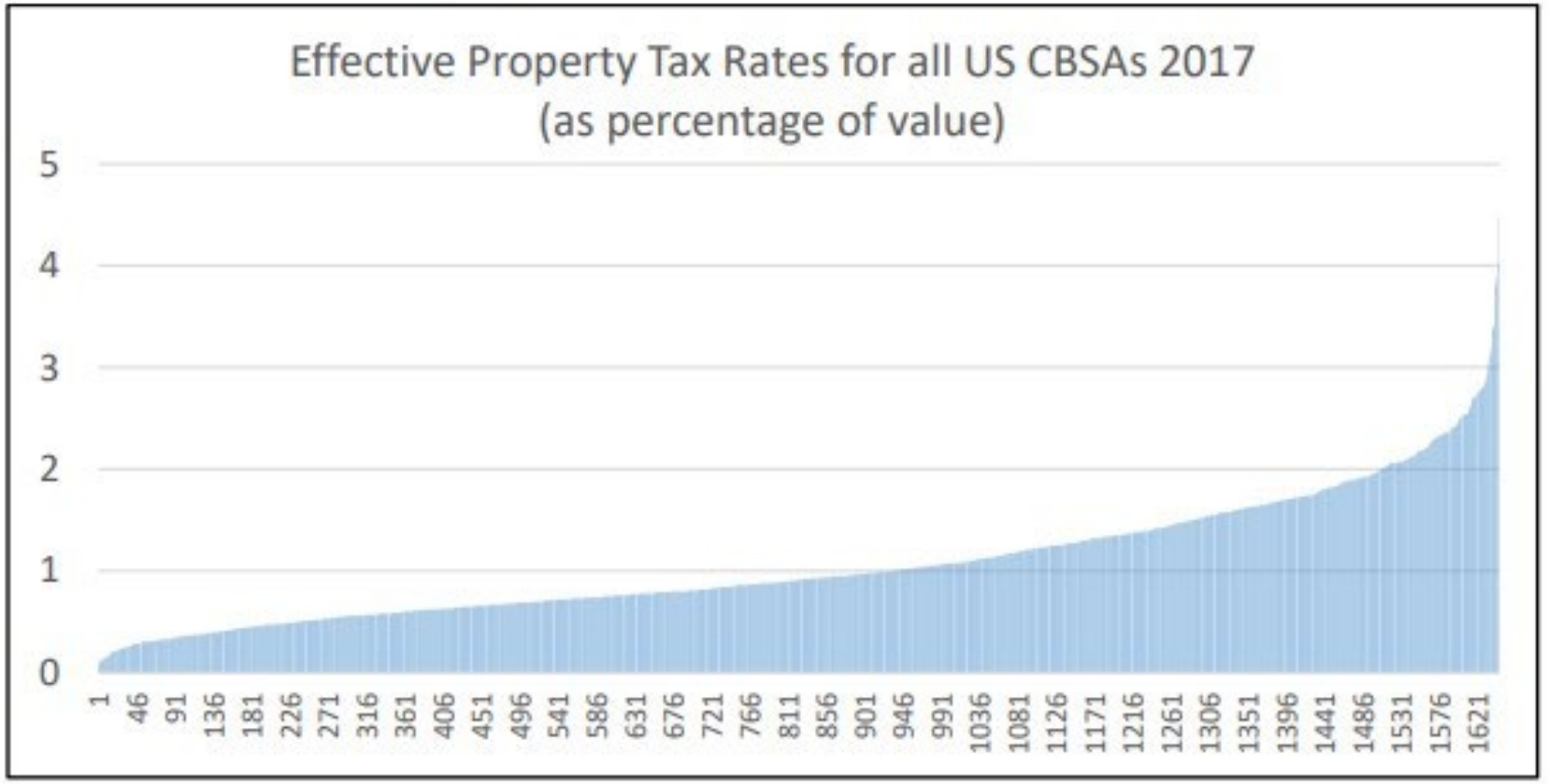
"I'll pause for a moment so you can let this information sink in."

Exhibit 2: Los Angeles Metro

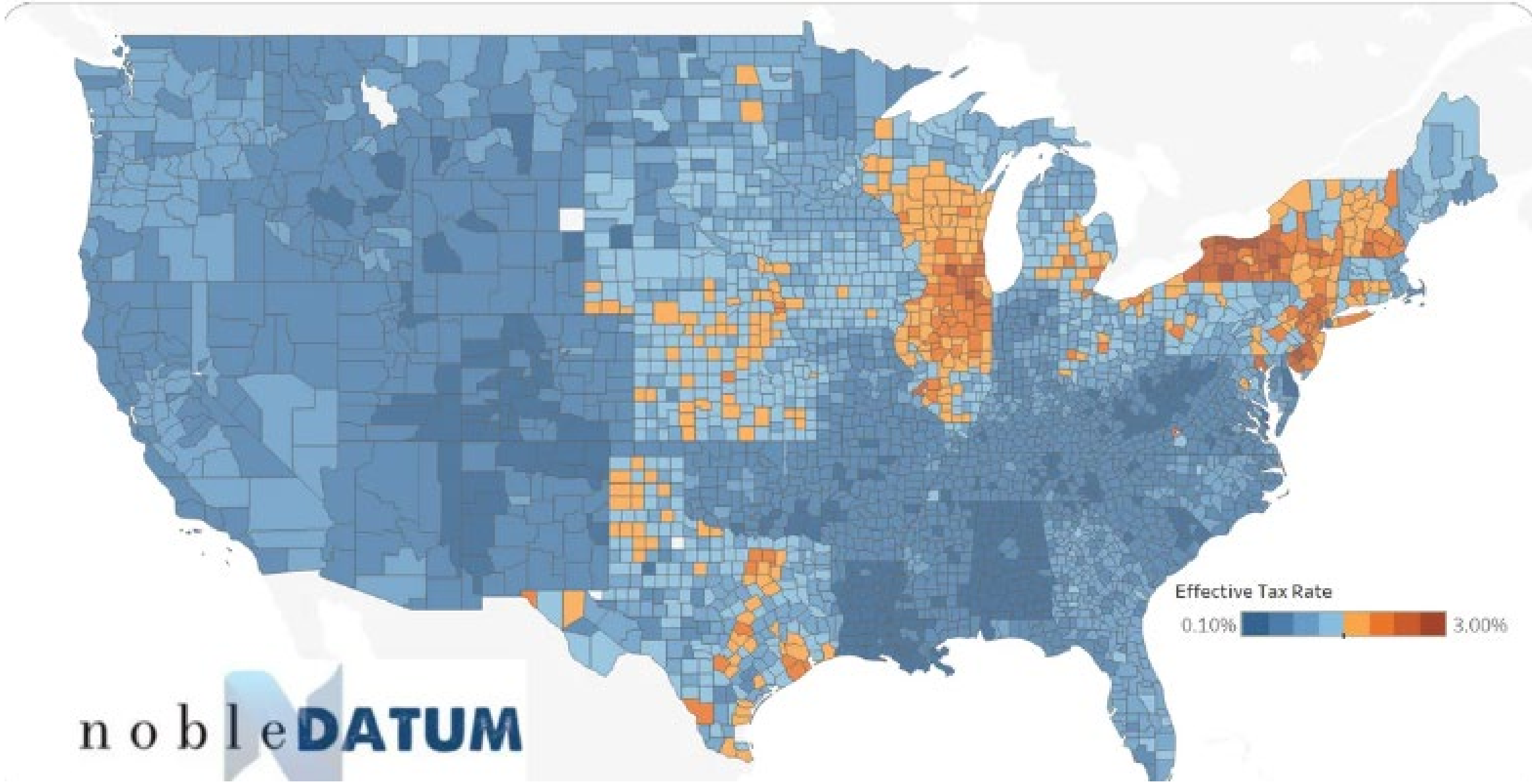


Maybe we should also include **property taxes** and property **insurance** in the cost to own? Property taxes vary around the country from .25% (Hawaii) to 2% in Chicago and 4%+ in parts of New Jersey. The US average is about 1.2%

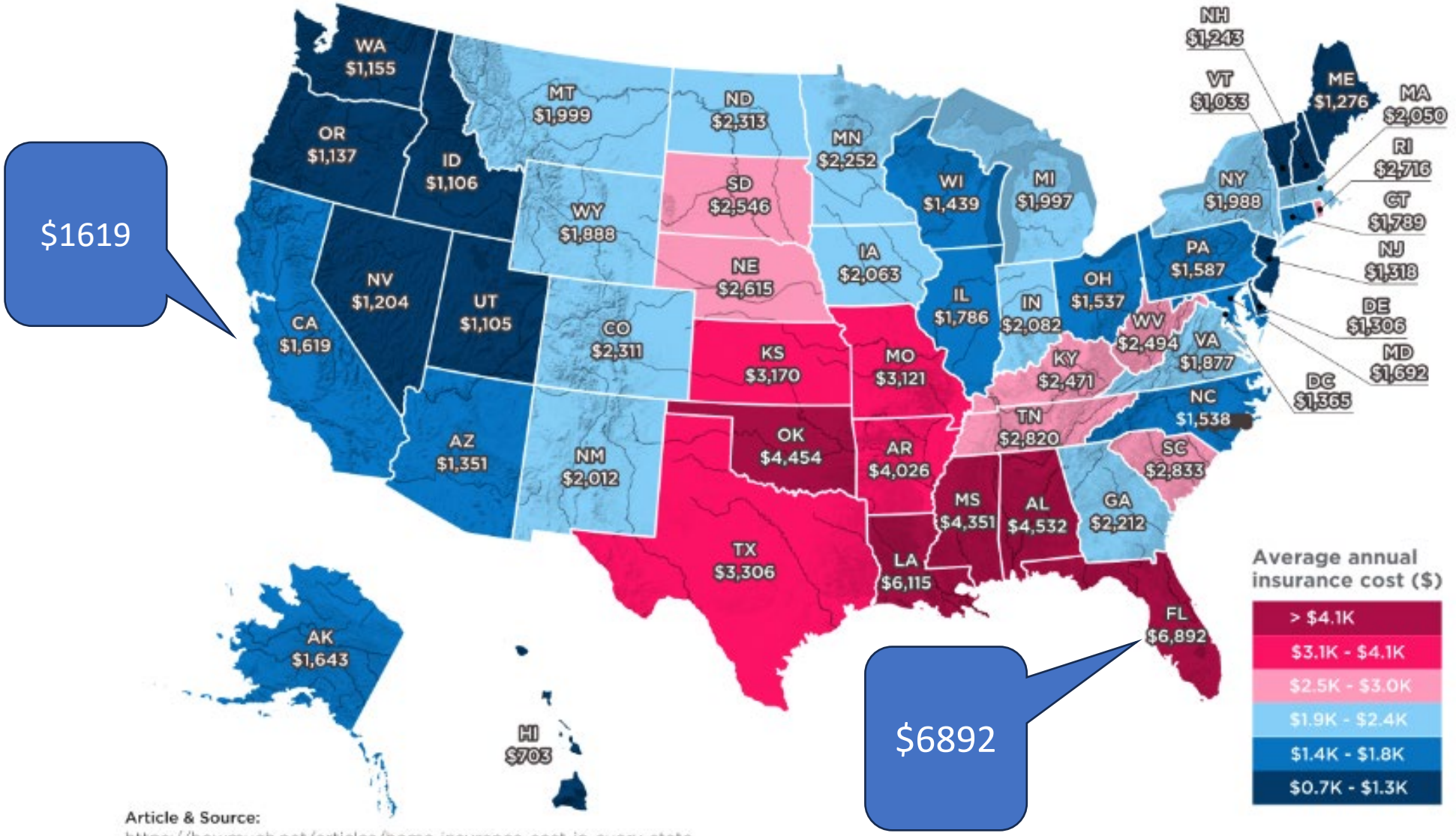
Exhibit 15: Effective Property Taxes for US Cities



	CBSA	
1	Fort Polk South, LA	13.7
2	Altoona, PA	9.03
3	Kinston, NC	7.65
4	Connersville, IN	7.52
5	Great Bend, KS	4.48
6	Mountain Home, ID	4.02
7	Atlantic City-Hammonton, NJ	4.01
8	Junction City, KS	3.88
9	Centralia, IL	3.86
10	East Stroudsburg, PA	3.83
11	Indianola, MS	3.8
12	Reading, PA	3.8
13	Freeport, IL	3.4
14	Binghamton, NY	3.39
15	East Stroudsburg, PA	3.38
16	Cortland, NY	3.22
17	Carbondale-Marion, IL	3.15
18	Atlantic City-Hammonton, NJ	3.12
19	Vineland-Bridgeton, NJ	3.08
20	Freeport, IL	3


Effective Tax Rate
0.10%
3.00%
nobleDATUM

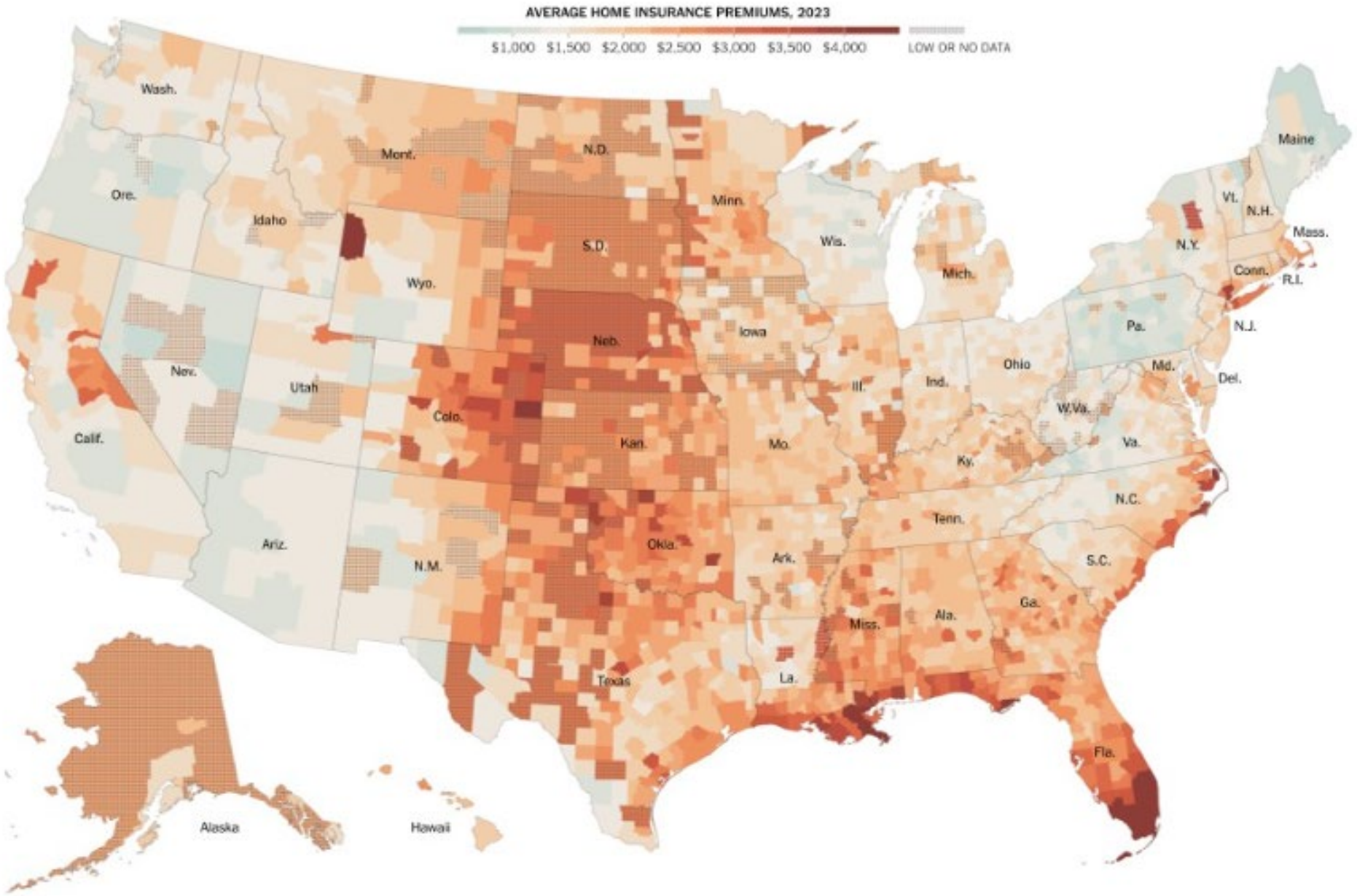
Home Insurance Cost in Every State



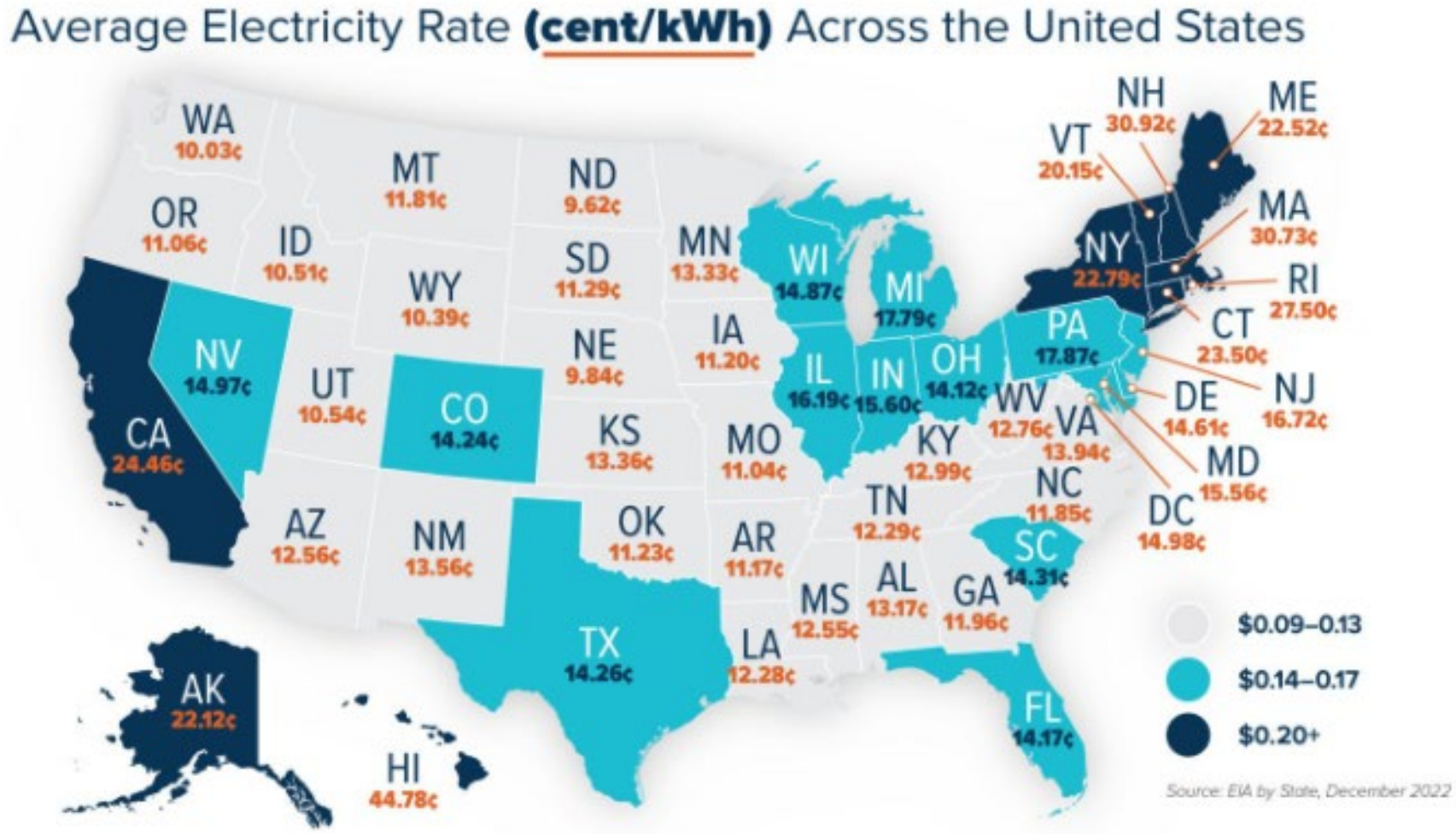
Article & Source:
https://howmuch.net/articles/home-insurance-cost-in-every-state
https://www.insurance.com
https://www.gobankingrates.com/

howmuch.net

More detail shows darkest areas paying the most



Add electric rates and we can generate a better home affordability index (using days of heat or AC use)



Source: EIA by State, December 2022

Note markets are/were less affordable, in part because of strong economies or desirability (2017)

Table 5: Combined Property Taxes and Home Prices

CBSA NAME	Percent of Med Income Required to Buy the Med Priced Home with Property Taxes and a limit of 30% of Income	Percentage required for the 30% Lowest Tier	Percentage required for the 20% Lowest Tier	Percentage required for the 10% Lowest Tier
San Francisco-Redwood City-South San Francisco, CA	290%	221%	191%	169%
Santa Maria-Santa Barbara, CA	281%	172%	131%	113%
Santa Cruz-Watsonville, CA	274%	227%	193%	158%
San Rafael, CA	260%	203%	179%	160%
San Jose-Sunnyvale-Santa Clara, CA	223%	174%	156%	134%
Los Angeles-Long Beach-Glendale, CA	216%	171%	151%	123%
San Francisco-Redwood City-South San Francisco, CA	214%	166%	148%	122%
Anaheim-Santa Ana-Irvine, CA	208%	176%	160%	142%
Santa Rosa, CA	197%	167%	156%	140%
Salinas, CA	193%	153%	133%	114%
Napa, CA	191%	160%	142%	124%
Kahului-Wailuku-Lahaina, HI	189%	159%	144%	121%
Urban Honolulu, HI	186%	159%	144%	124%
San Luis Obispo-Paso Robles-Arroyo Grande, CA	186%	155%	139%	118%
Oakland-Hayward-Berkeley, CA	182%	146%	130%	109%
Santa Cruz-Watsonville, CA	181%	153%	137%	117%
Santa Maria-Santa Barbara, CA	179%	126%	108%	78%
San Diego-Carlsbad, CA	171%	146%	135%	121%

But note that even in expensive metros, if we used lowest 10% or 20% tier of home prices, we get a slightly less gloomy result.

PS We need some low quality housing because it is more affordable.

And the **majority** of the US was **VERY affordable** in 2017 especially for less than median priced homes.

CBSA	Ratio of Med Income to Income Req for Med Price	Ratio for 30% Decile	Ratio for 20% Decile	Ratio for 10% Decile
Bloomsburg-Berwick, PA	7%	7%	7%	7%
Alexandria, LA	20%	20%	20%	20%
Bay City, MI	20%	12%	8%	6%
Danville, IL	25%	19%	18%	10%
Altoona, PA	27%	26%	26%	25%
Midland, MI	31%	20%	16%	9%
Lima, OH	31%	30%	30%	30%
East Stroudsburg, PA	32%	26%	21%	17%
Jackson, TN	32%	25%	21%	17%
Youngstown-Warren-Boardman, OH-PA	32%	21%	14%	9%
Decatur, IL	32%	22%	16%	9%
Weirton-Steubenville, WV-OH	32%	23%	18%	11%
Gary, IN	33%	24%	19%	13%
Michigan City-La Porte, IN	33%	25%	18%	12%
Kokomo, IN	34%	23%	18%	12%
Ithaca, NY	35%	34%	34%	33%
Saginaw, MI	35%	23%	16%	10%
Peoria, IL	35%	25%	20%	13%
Muncie, IN	36%	26%	18%	12%
Scranton--Wilkes-Barre--Hazleton, PA	37%	24%	18%	10%
Springfield, IL	37%	25%	20%	12%
Fayetteville-Springdale-Rogers, AR-MO	38%	26%	22%	18%
Lawton, OK	38%	20%	12%	7%
Fond du Lac, WI	38%	29%	24%	18%
Rockford, IL	38%	26%	20%	12%

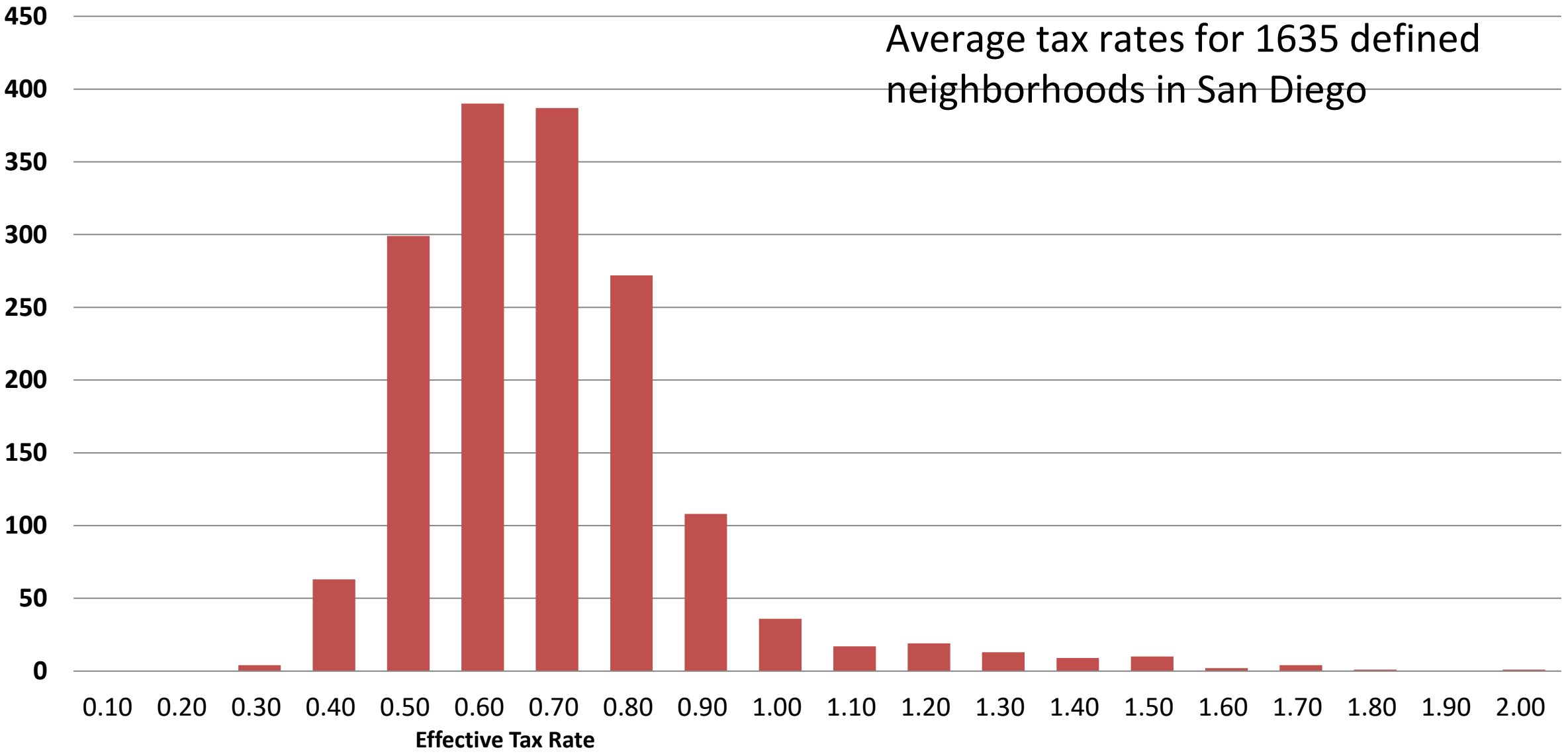
Some markets remain cheap, but who wants to live in Gary, IN or Bay City, MI or Youngstown, OH?

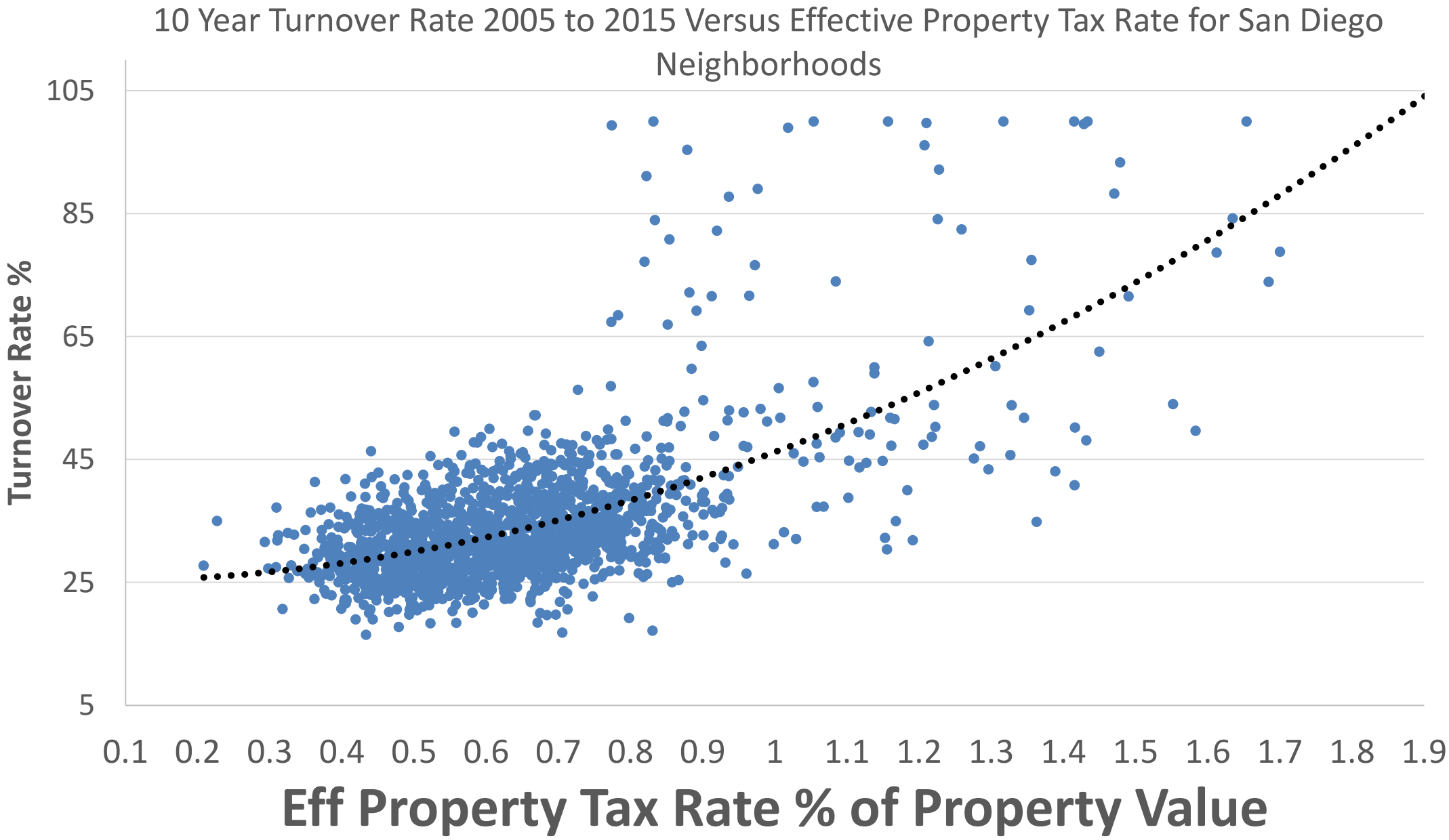
Drilling down more on Property Tax Impacts on Affordability and Home Prices

Do property taxes hold down home prices? Back in 2018 we noticed a pattern of home prices vs property tax rates

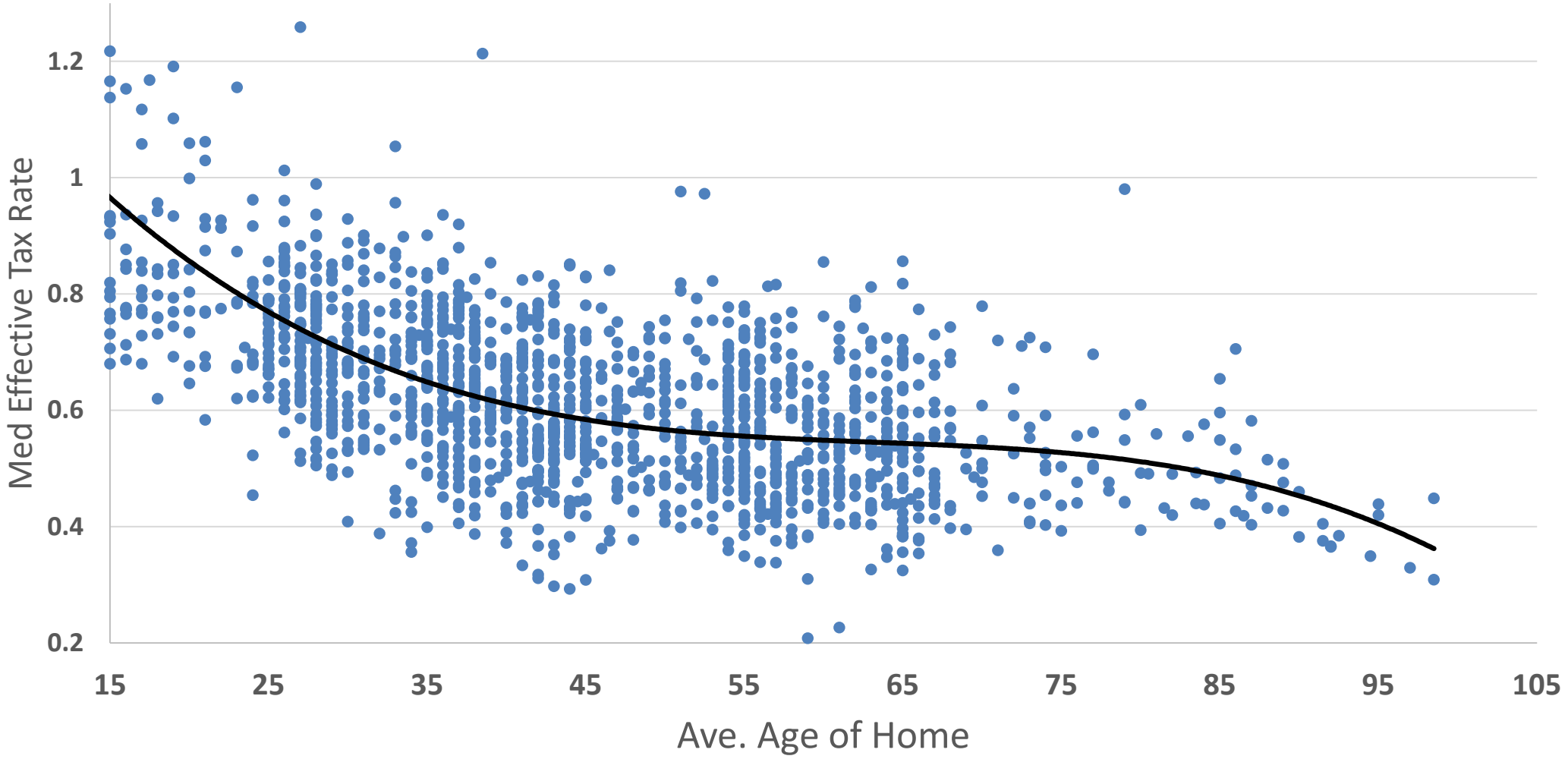
Property Tax Rate (%)	Average Price
ptr<0.5	$438,483
0.7> ptr >=0.5	$455,149
0.9> ptr >=0.7	$404,460
1.1> ptr >=0.9	$380,774
1.3> ptr >=1.1	$298,776
1.5> ptr >=1.3	$268,981
1.7> ptr >=1.5	$270,651
1.9> ptr >=1.7	$288,044
2.1> ptr >=1.9	$294,508
2.3> ptr >=2.1	$289,393
2.5> ptr >=2.3	$254,783
2.7> ptr >=2.5	$259,093
ptr >=2.7	$242,520

Does Prop 13 reduce supply and turnover?

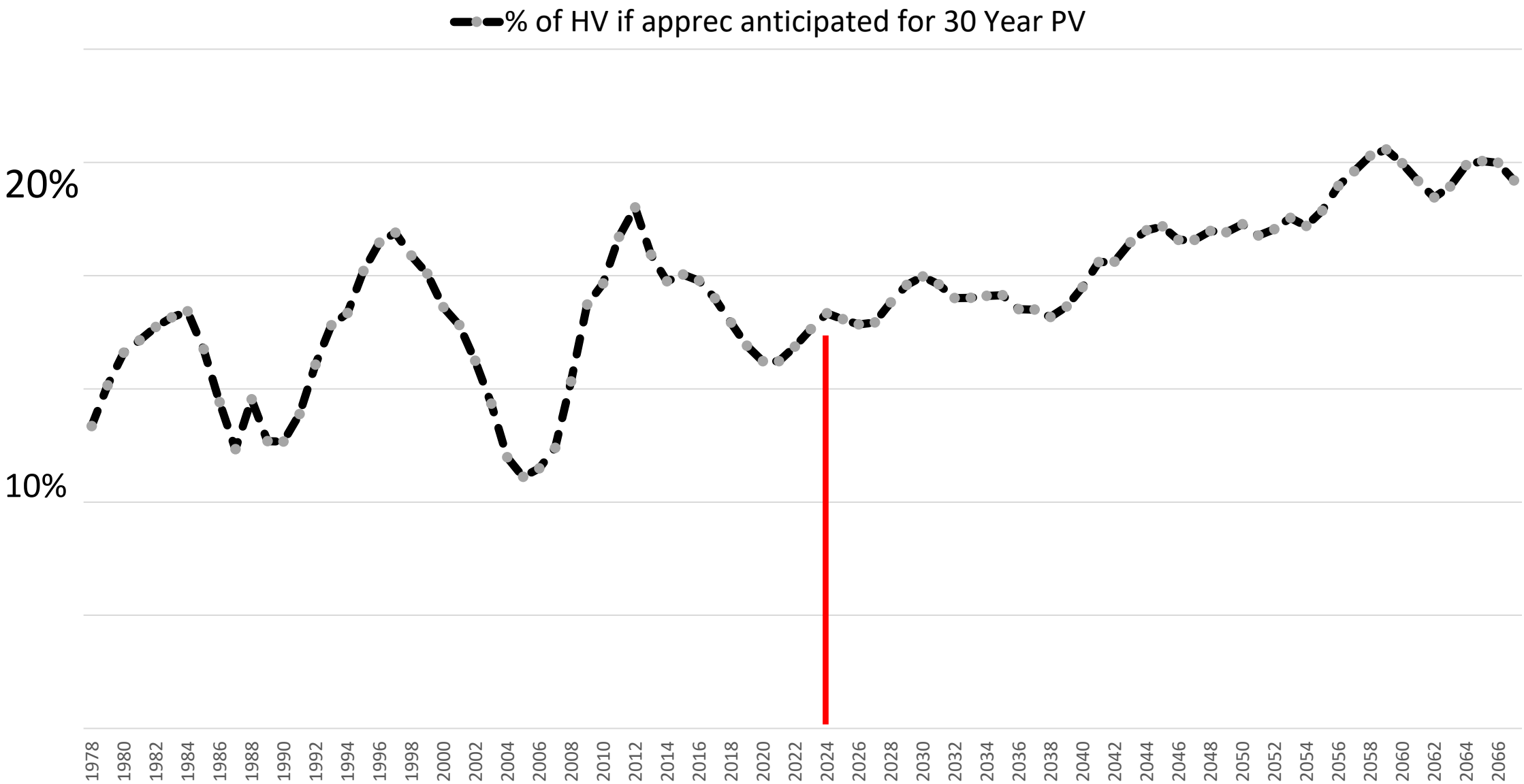



10 Year Turnover Rate 2005 to 2015 Versus Effective Property Tax Rate for San Diego Neighborhoods
Turnover Rate %
105
85
65
45
25
5
0.1
0.2
0.3
0.4
0.5
0.6
0.7
0.8
0.9
1
1.1
1.2
1.3
1.4
1.5
1.6
1.7
1.8
1.9
Eff Property Tax Rate % of Property Value

San Diego County Neighborhoods
Median 'Tax/AVM' Versus Ave. Age of Home



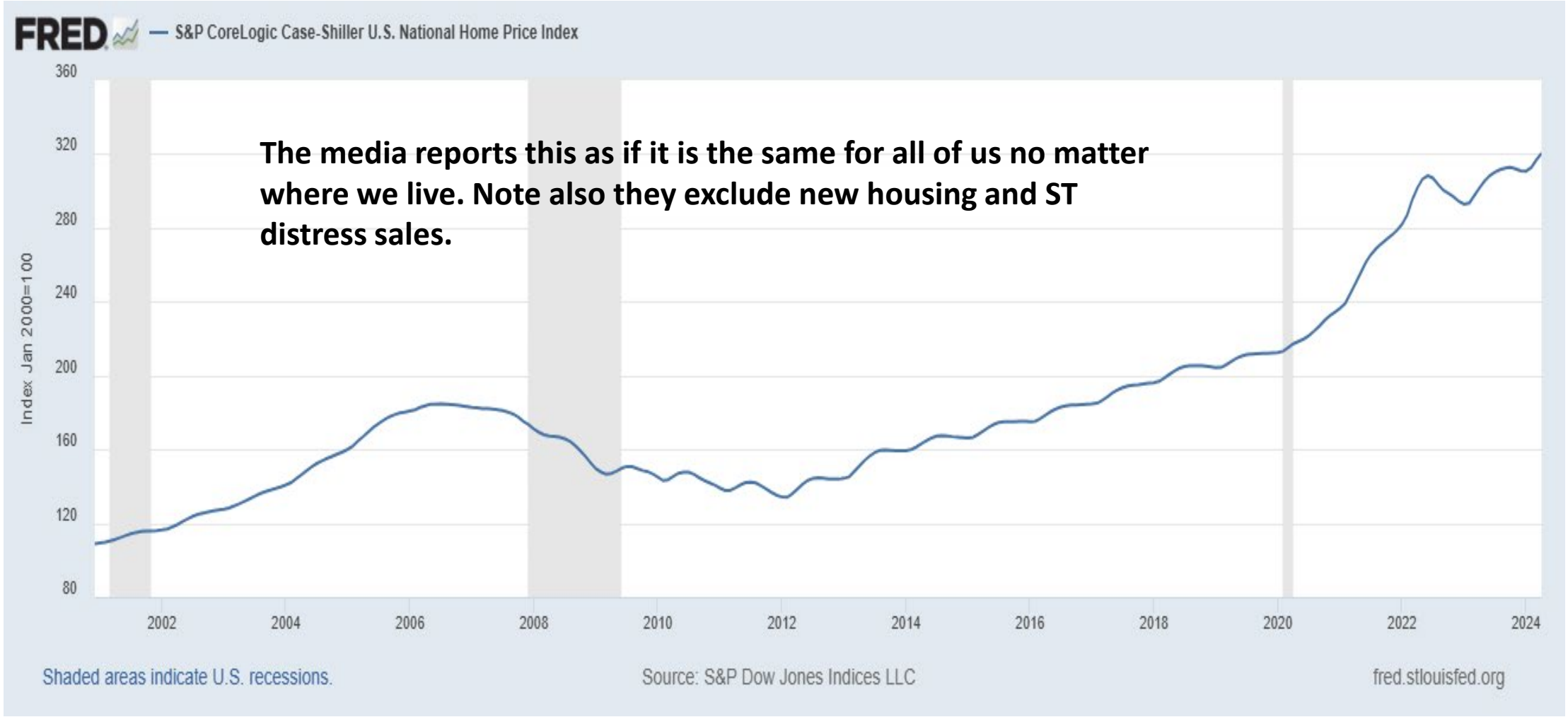
Present Value of Property Tax Savings as % of Home Value



When Prop 19 passed around 2020 that allowed those 55+ to move and keep their basis intact for property tax purposes, some expected this to free up inventory. It didn't. Why?

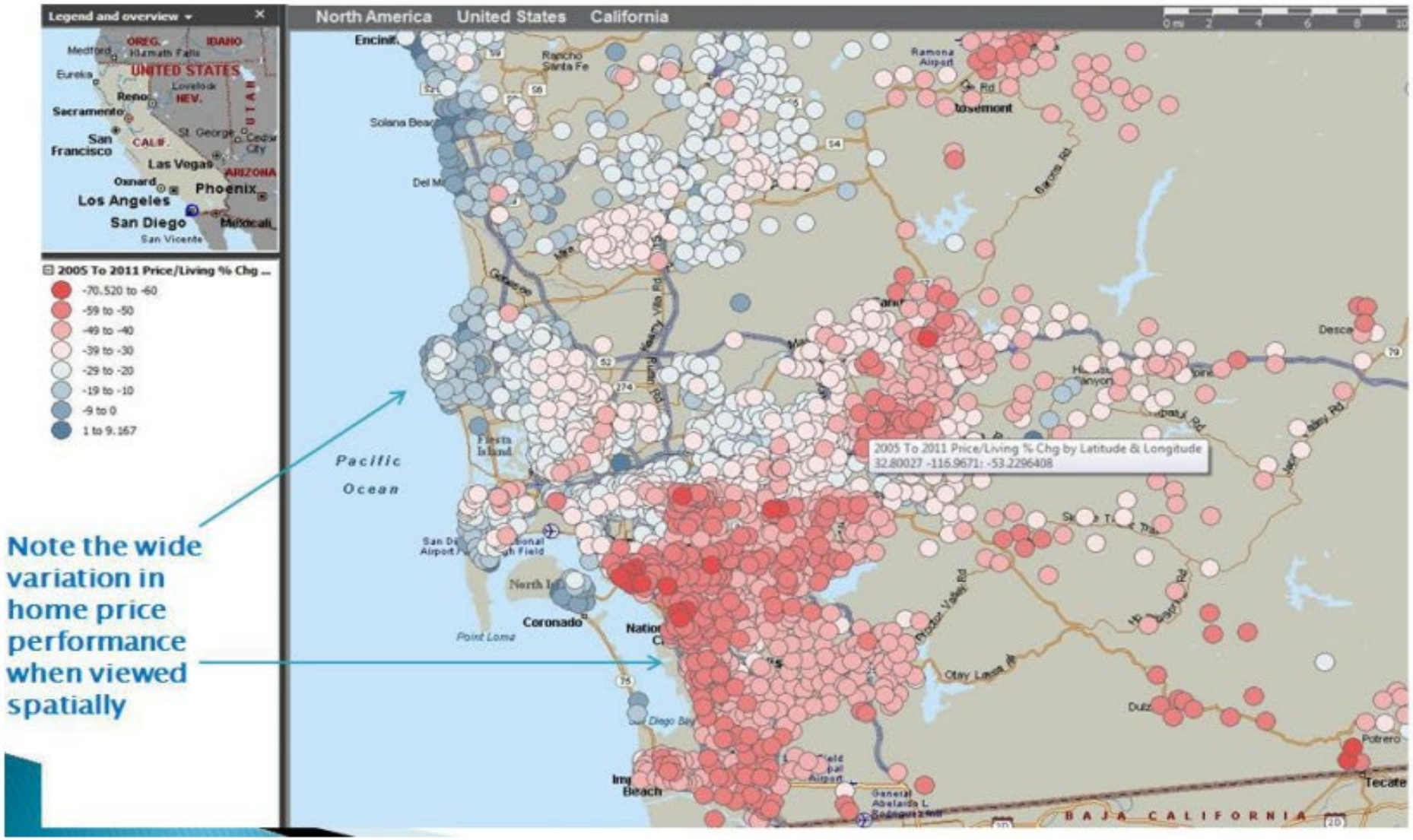
Cap gains taxes

Do Housing Indices like Core-Logic Case-Shiller Tell Us Anything Useful? (2 months lag in reporting)



Geographical Price Dispersion - There is significant variation in home price performance among neighborhoods – so don't use metro indices to update values!

San Diego County 2005 to 2011
Median Single Family Price/Living % Change By Neighborhood



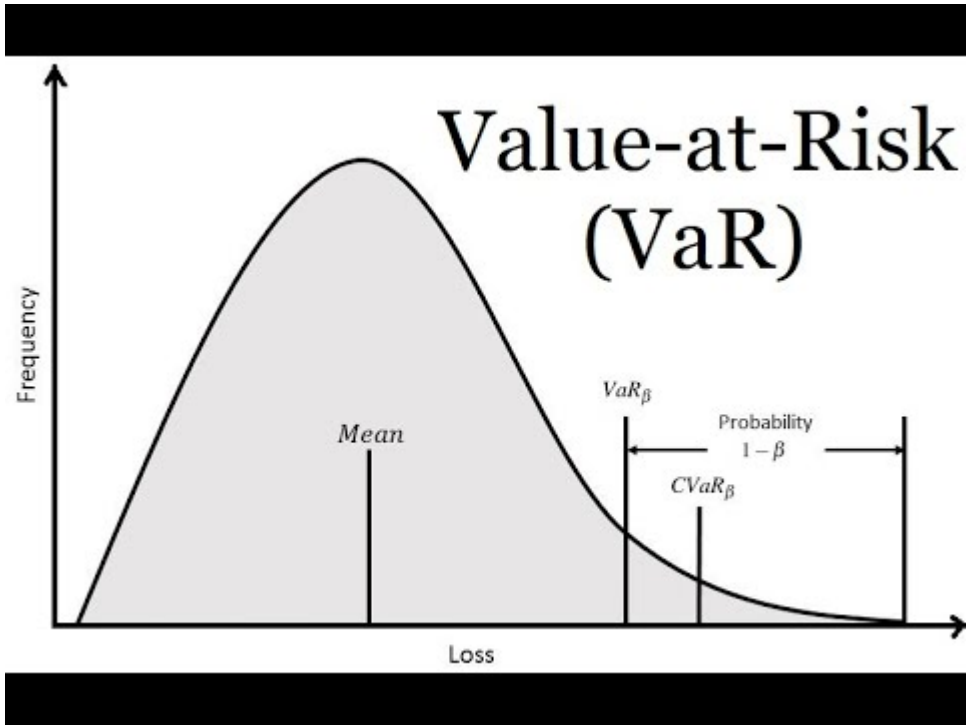
Case-Shiller for San Diego was **down 35%** for the metro during this time period.

Background for the state of the art on valuation uncertainty and why it is important

- Risk Based Pricing and Capital Reserve Proposals like Basel II or III

- Price and Value Theory

Back in 2004-2005 the we almost passed Basel 2, that may have curtailed subprime mortgage lending…



It required banks to measure risk by bringing in uncertainty around things like value and then the hold reserves as a function of that risk.

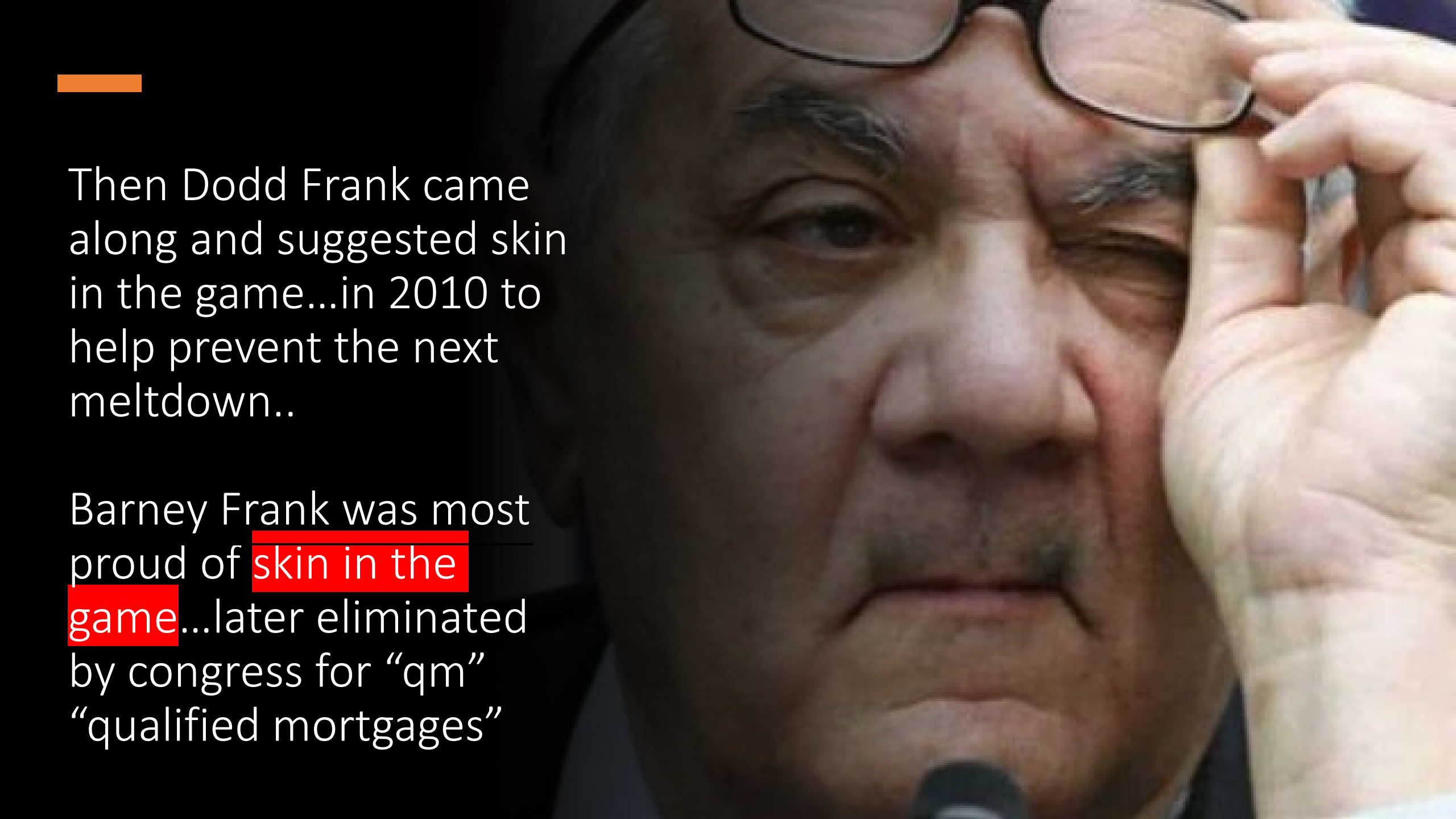
The results of Basel 2 would have been something like this

- We develop different risk weights for different mortgage loans.
- A risk weight of 100% requires 8% capital reserves.
- The average mortgage risk weight is 50% so it requires 4% reserve capital, but lower or higher risk weights are a result of credit score and LTV.

- Simple Examples:
- FICO 740, LTV 70% = risk weight of 3% therefor .03*.08 = .0024 capital reserve
- FICO 620, LTV 95% = risk weight of 62% therefore .62*.08= .0496 capital reserve

Then Dodd Frank came along and suggested skin in the game…in 2010 to help prevent the next meltdown..

Barney Frank was most proud of skin in the game…later eliminated by congress for “qm” “qualified mortgages”



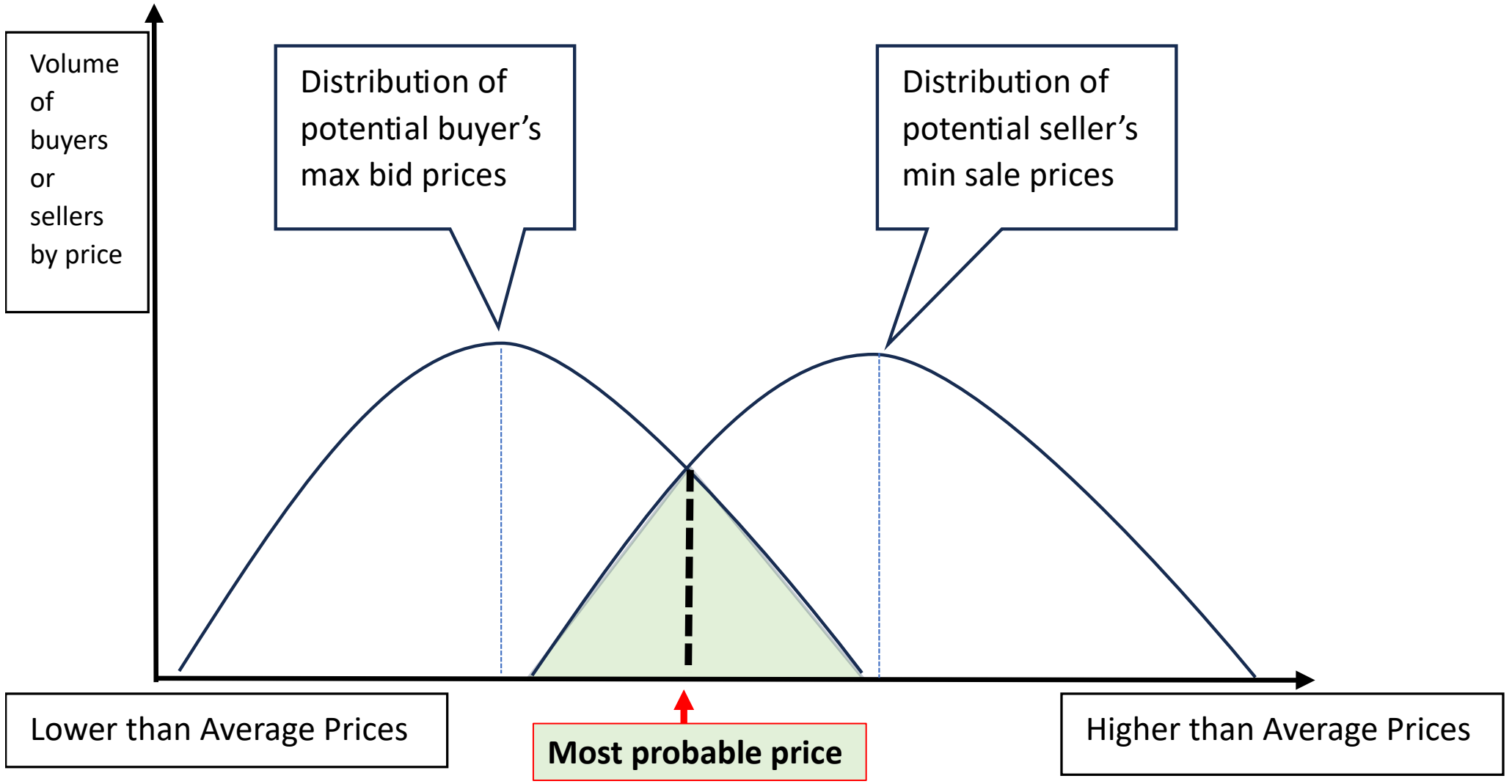
Now we have a simpler Basel III proposal

What a concept?

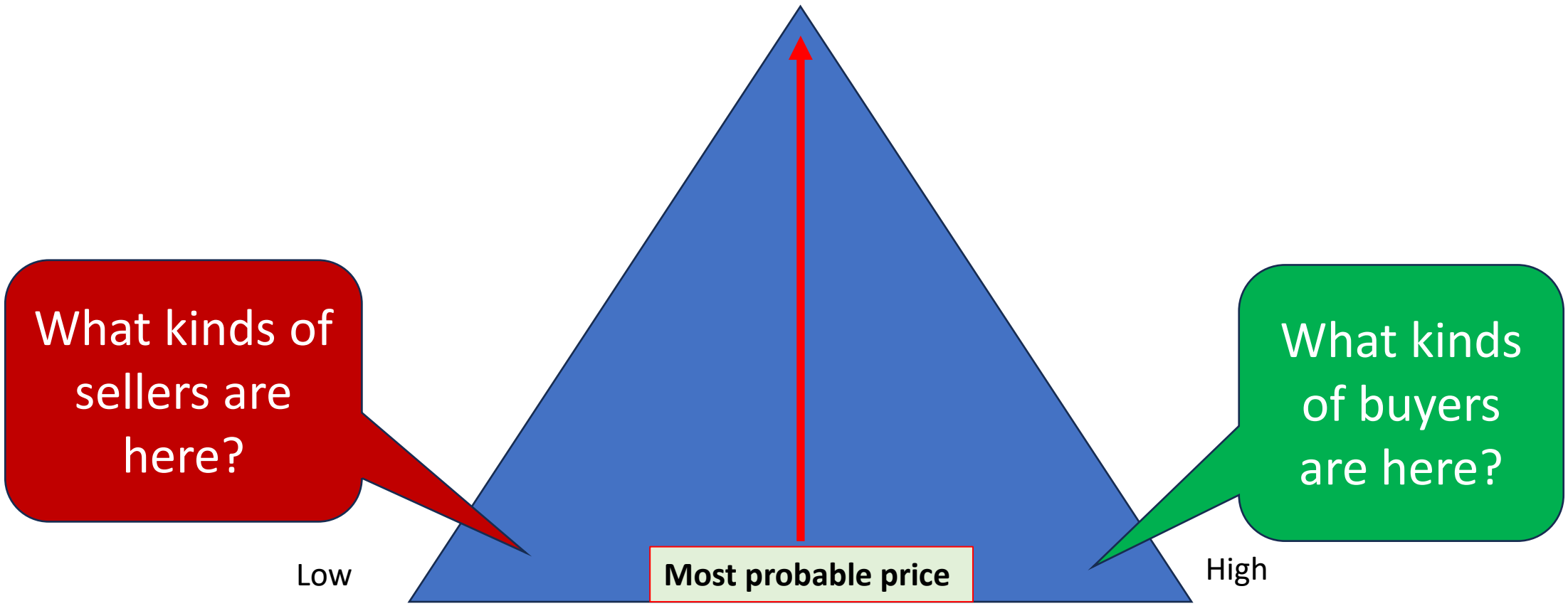
Risk based pricing!

Price dispersion as an equilibrium condition =‘s uncertainty

Exhibit 1-1: Theoretical Distribution of Buyers and Sellers Reservation Prices for a Similar Home



Distribution of actual transaction prices for a similar property



Research in 1977: Out of town buyer premium = 8%
Research in 2005: Out of town buyer premium = 5.72%
Research in 2015: Out of town buyer premium = 4.54%

Does this decline suggest improved informational market efficiency?

And who gets excited about efficiency?

See Leveling the playing field: out-of-town buyer premiums in US housing markets over time
Katrin Kandlbinder, Norman G. Miller, Michael Sklarz, International Journal of Housing Markets and Analysis
ISSN: 1753-8270, Publication date: 3 June 2019 Note: We also found anchoring bias based on how expensive the home sold in a prior market. Other factors: Credits, Points.

How good are AVMs (Automated Valuation Models) and what is the state of the art?

- **Statistically what explains prices?**
  - 80% of the variation in **most** home prices, within a **pre-defined neighborhood**, can be explained with 3 variables:
    - Location (must first define submarkets or neighborhoods)
    - Size (Space matters)

    - Age or a property condition indicator

Heterogeneity matters

Older property with high maintenance and repair variance as well as high-end custom homes are harder to value for both AVMs and appraisers.

Escondido 92025

Beverly Hills 90210

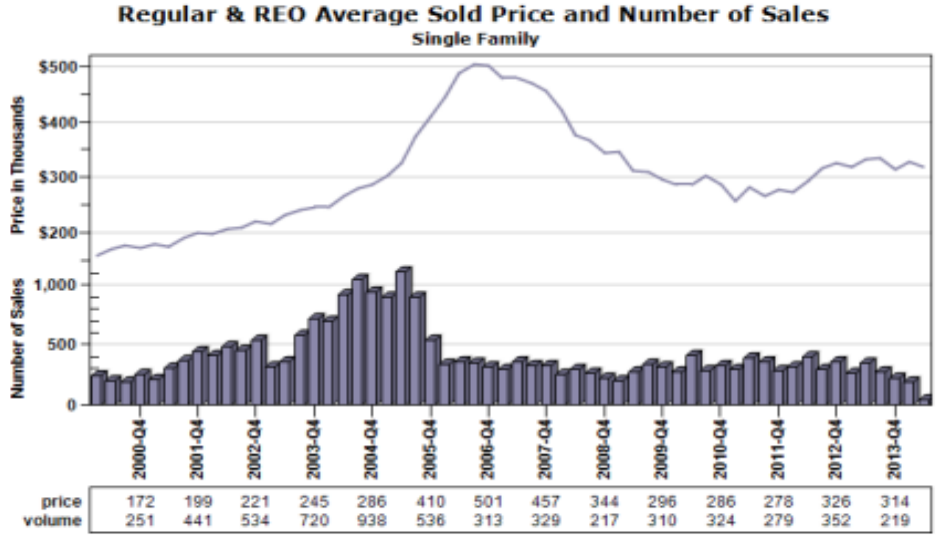
Going beyond size, age and location

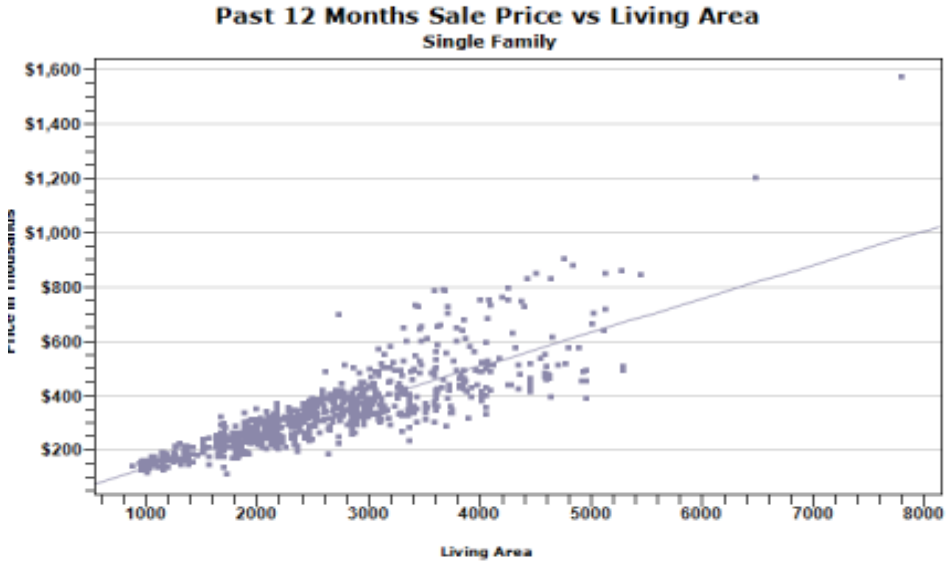
- We can add in lots of other variables bedrooms, bathrooms, landscaping, roof quality, construction type, fireplaces, AC, various features, finishes via photo data mining, and text mining. This might get us to **88% or so R^2.**

- We can also test for non-linearity and we will find it with age, bedrooms, lot size and more. This might get us to being able to explain **91%+ of the sale price** on average in a typical neighborhood.

A typical hedonic model using 2 years of past sales back in 2013

All Sales Data Hedonic Model for Chandler AZ Zip Code 85249





Ln(Sold Price) is Dependent Variable

Factor	Regression Coefficient	Std Error	t-statistic
Constant	11.27068	0.1254655	89.83
Assessed Value	0.0000187	6.08E-07	30.8
Living Area	0.0004592	0.0000186	24.69
Living Area^2	-4.65E-08	2.61E-09	-17.81
Lot Area	6.65E-06	6.54E-07	10.18
Lot Area^2	-3.05E-11	4.69E-12	-6.5
Pool	0.0700503	0.0065955	10.62
2 Bedrooms	0.0141835	0.0871413	0.16
3 Bedrooms	-0.0017741	0.0876567	-0.02
4 Bedrooms	-0.0334167	0.0881073	-0.38
5 or More Bedrooms	-0.0711992	0.0885991	-0.8
2 Baths	0.0573448	0.1497364	0.38
3 Baths	0.0657875	0.1499658	0.44
4 or More Baths	0.0965066	0.1504293	0.64
Age	-0.0214794	0.0018243	-11.77
Age^2	0.0003193	0.0000591	5.4
REO Sale	-0.0537626	0.0085602	-6.28
Short Sale	-0.1402335	0.0077633	-18.06
2012Q1	0.0168901	0.0117124	1.44
2012Q2	0.0532142	0.0111481	4.77
2012Q3	0.0965626	0.012128	7.96
2012Q4	0.1313803	0.0119636	10.98
2013Q1	0.1641535	0.0124023	13.24
2013Q2	0.2090585	0.0115942	18.03
2013Q3	0.2255357	0.0122501	18.41

Note that sometimes the best fit models require non-linearity

Regression Statistics	
Num of Observations	1913
Model Degree of Freedom	24
Residual Degrees of Freedom	1888
F-Statistics	834.450601
R-Square	0.9138

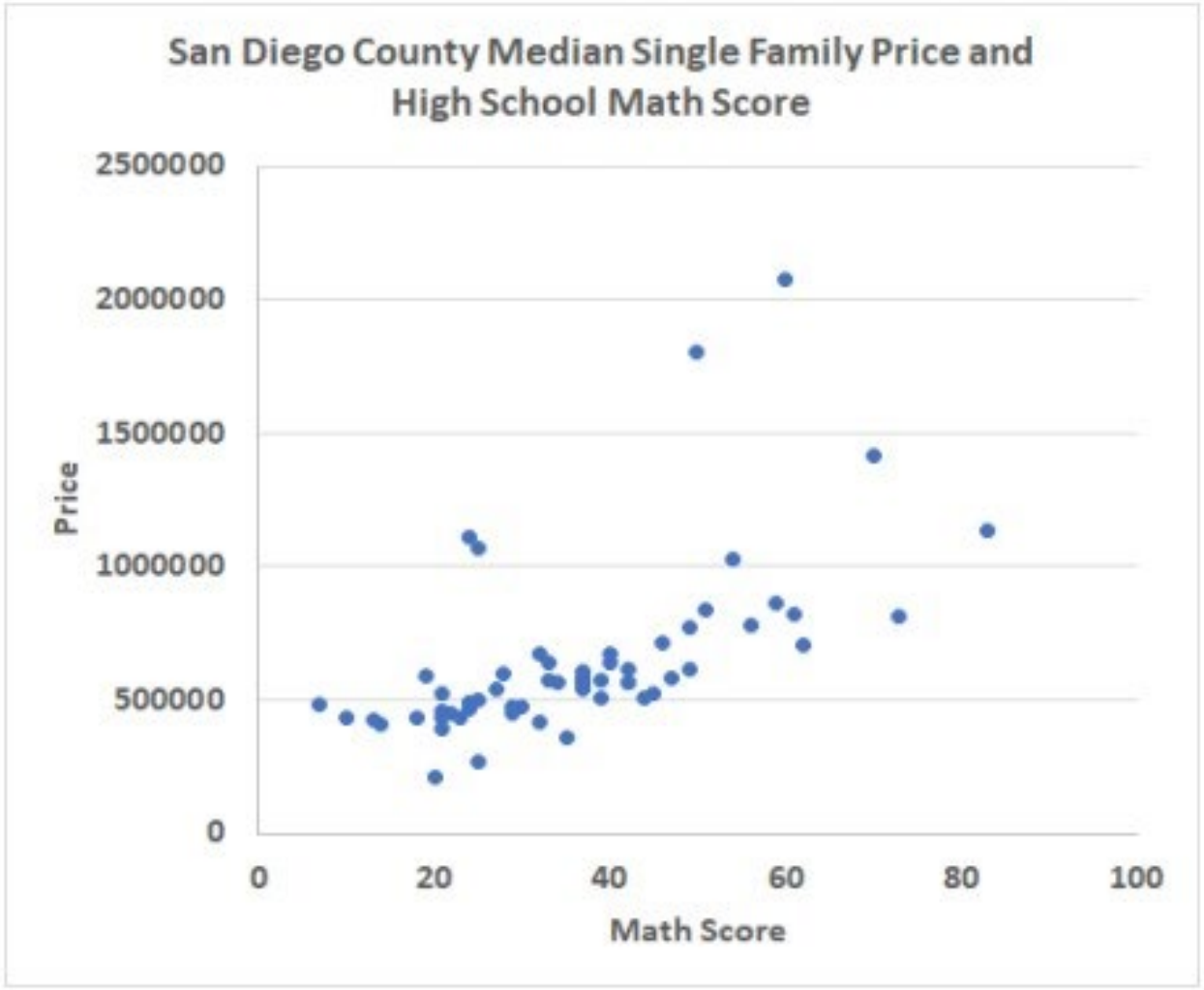
% of variation explained

What else should be added to explain price?
What fundamental locational data is harder to get but matters?

- School quality by school level
- Noise: Highway, flight paths
- Views: Water, mountains, parks, industrial, slope and heights of adjacent buildings
- Flood risks? Insurance rates?
- Note: The models matter as well. We ran 11 different models. Neural network models might work, but are risky especially if disparate impact (Racial bias) is a concern.

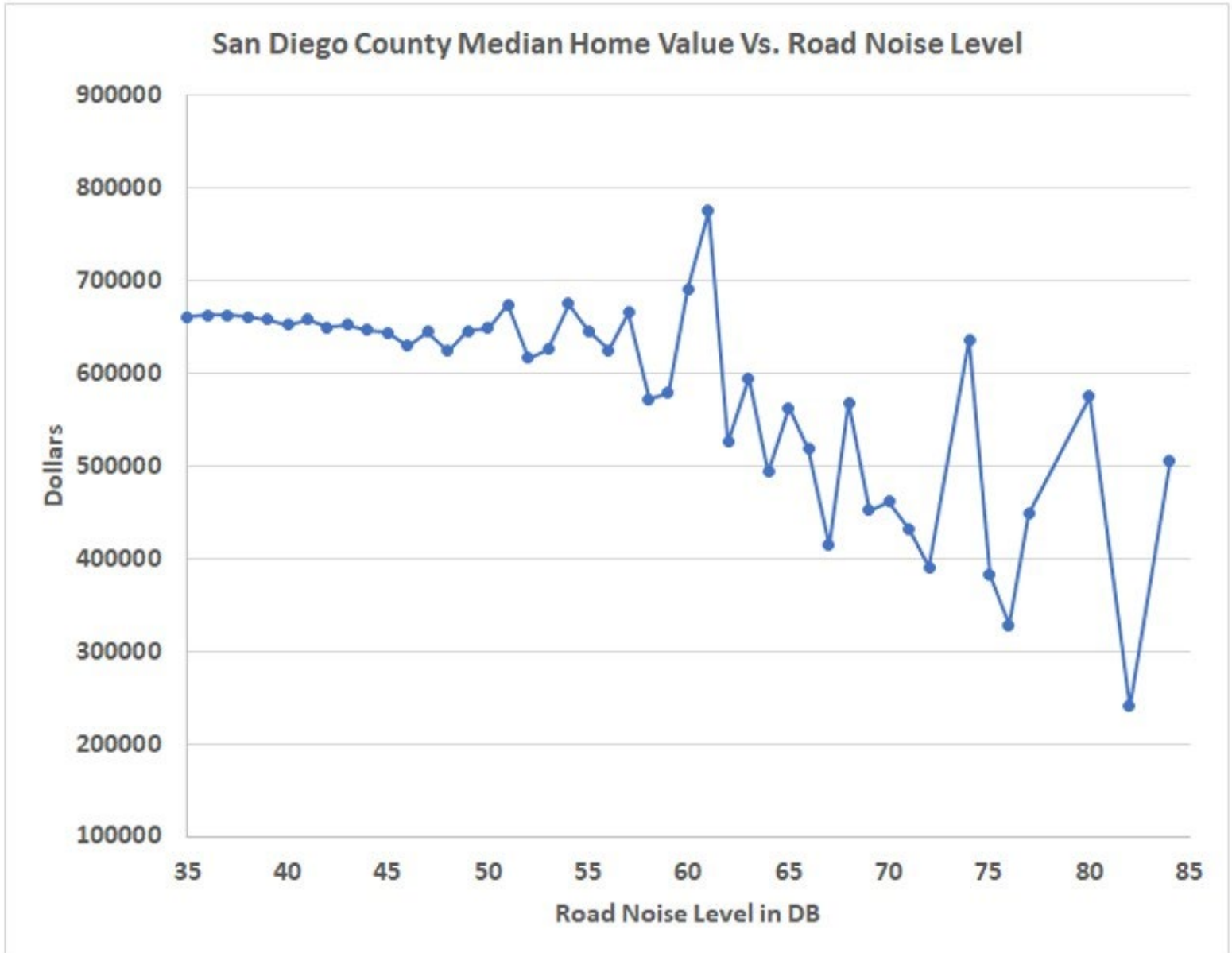
How nuanced can you get? One example

Exhibit 6: San Diego County High School Math Scores and House Prices

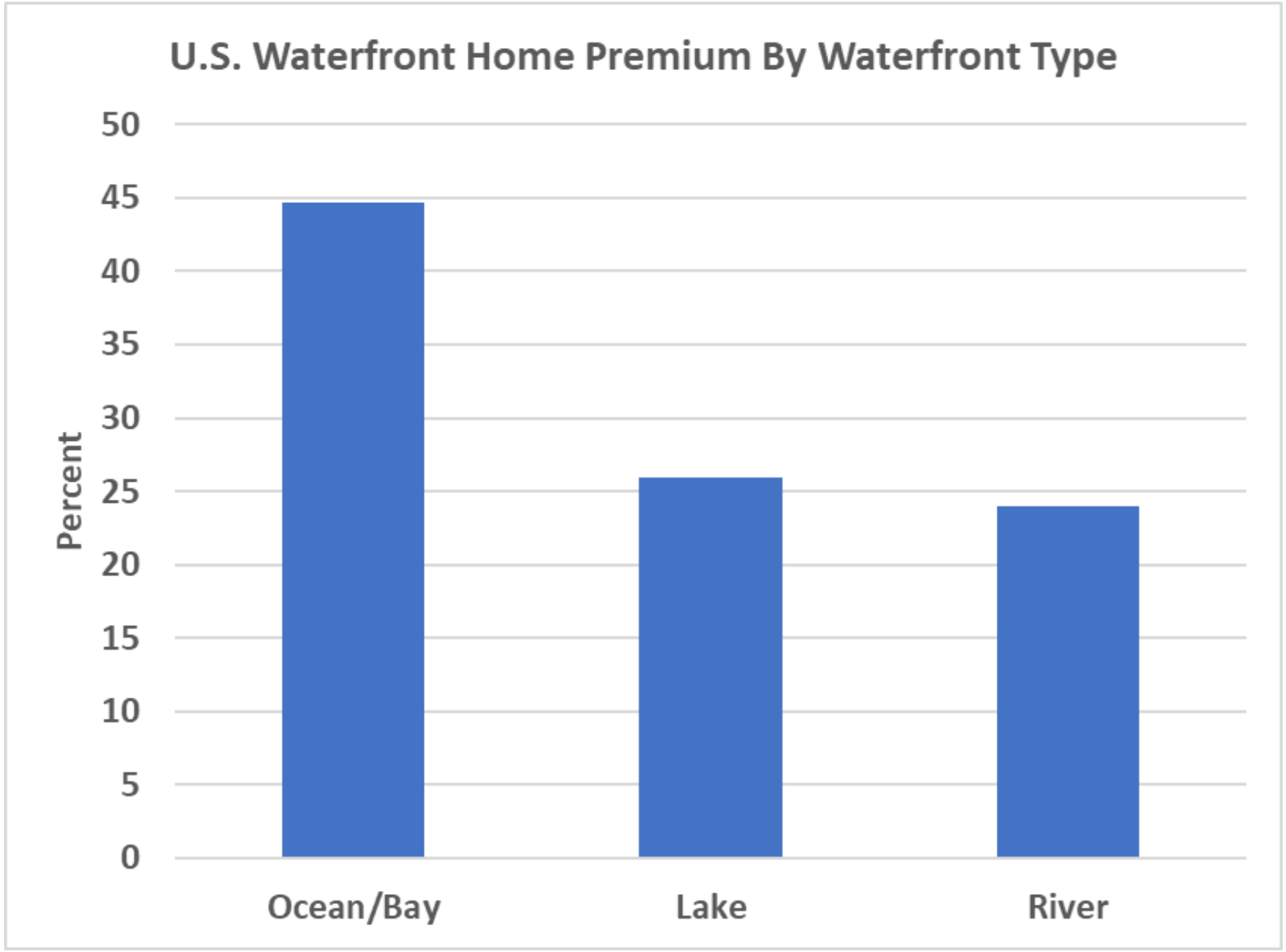


Another nuance: Noise

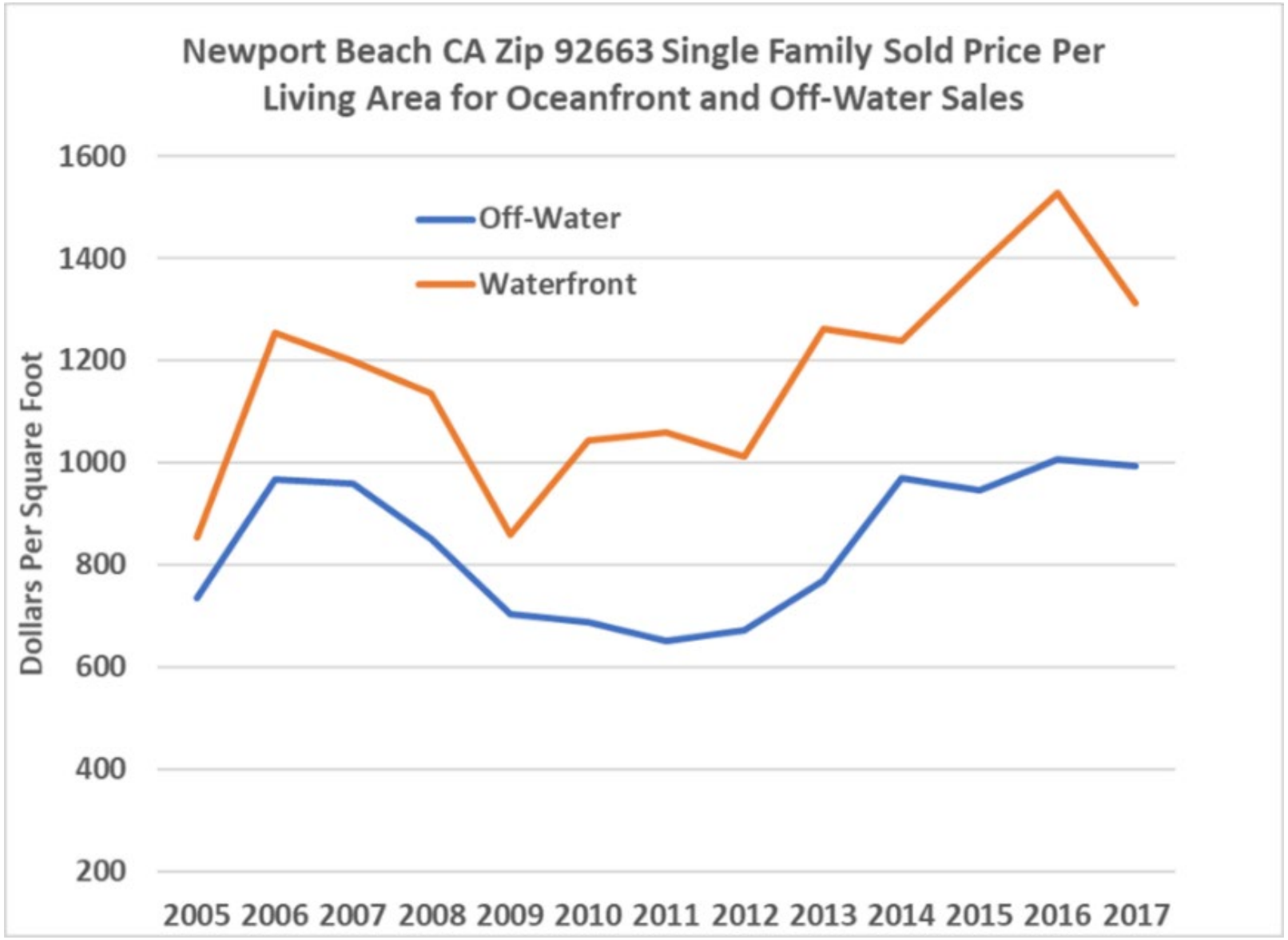
Exhibit 1: Noise and Home Prices



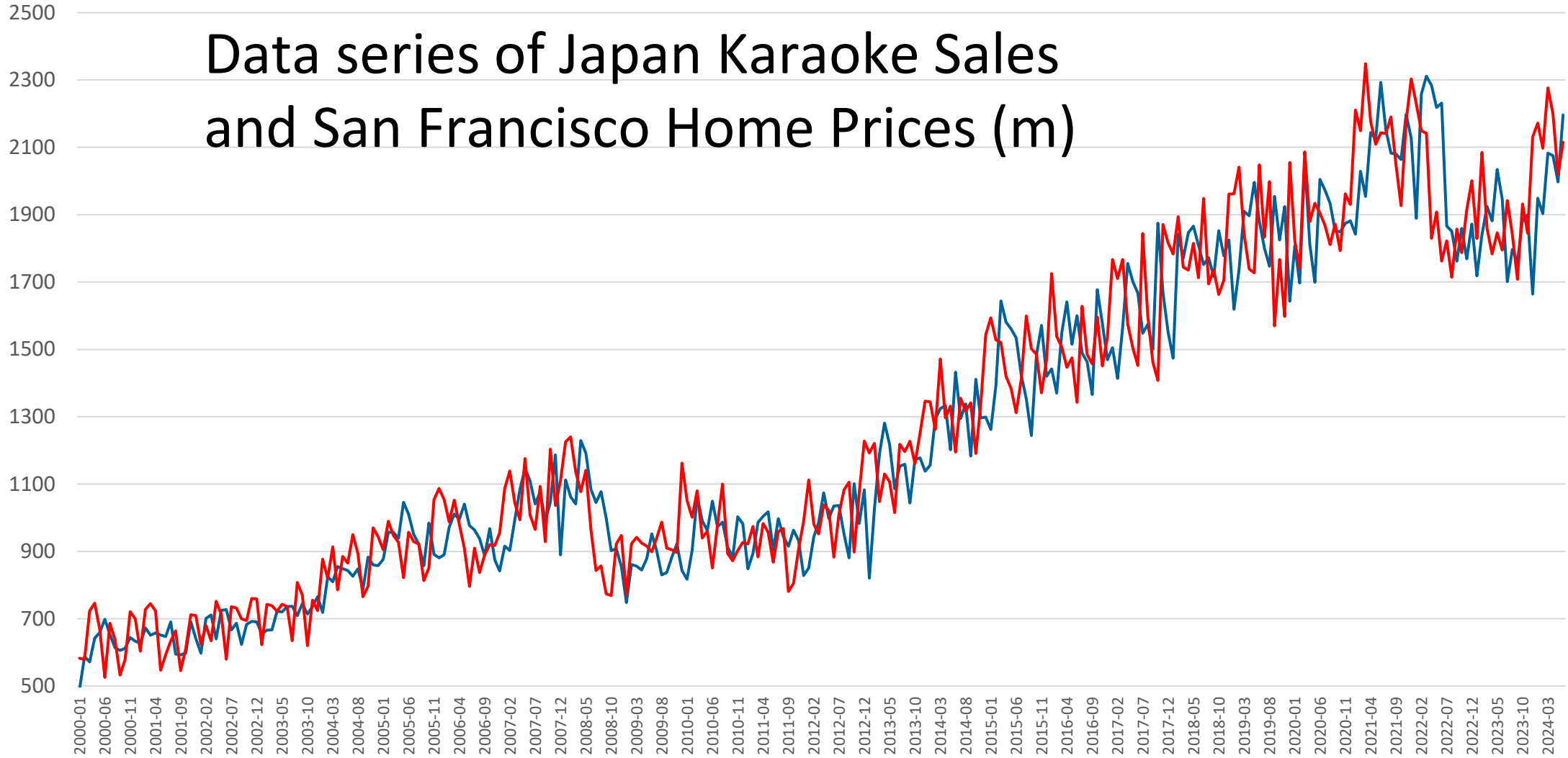
Water views matter: Ocean, lake, rivers?



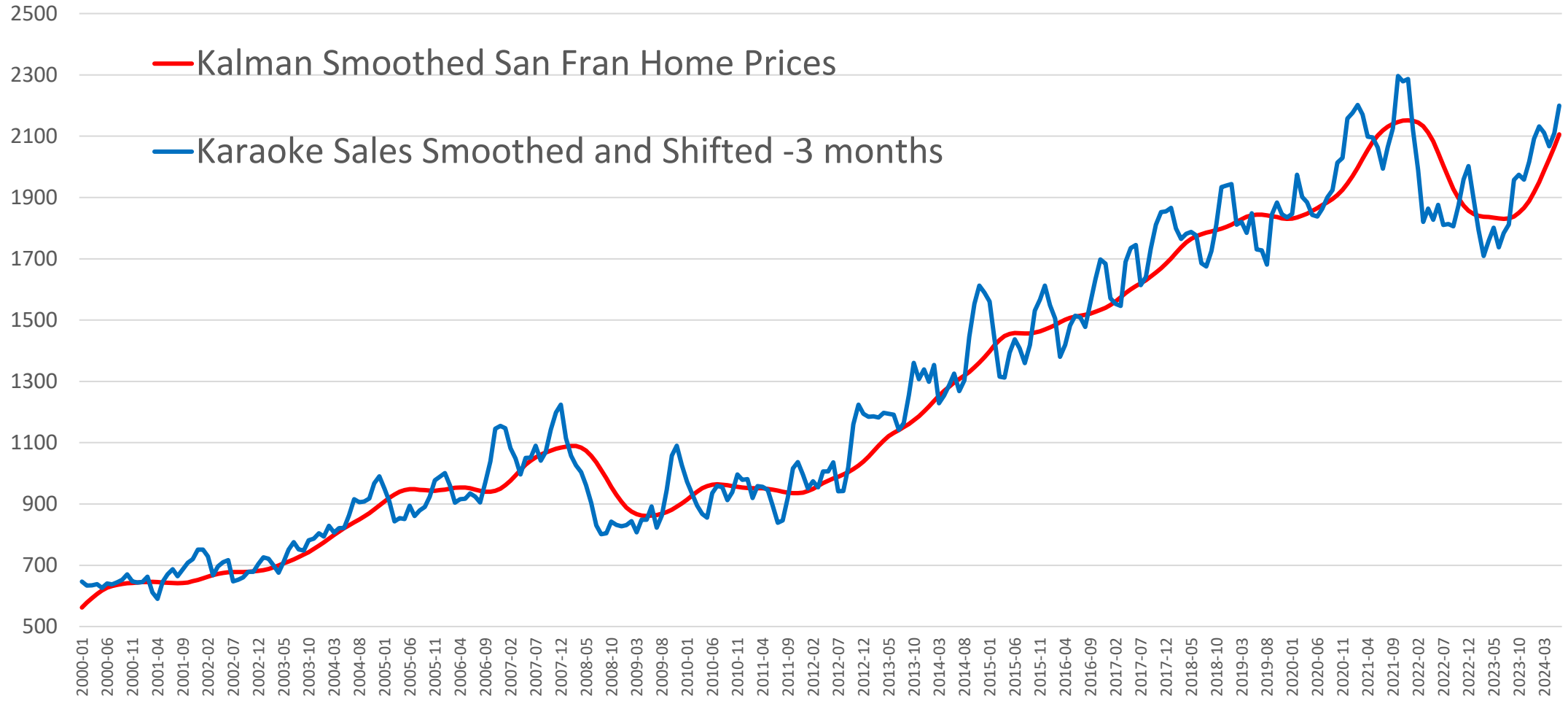
Premiums need to be localized: water view vs waterfront



In today's world why not throw every possible variable into unstructured models and see what happens?

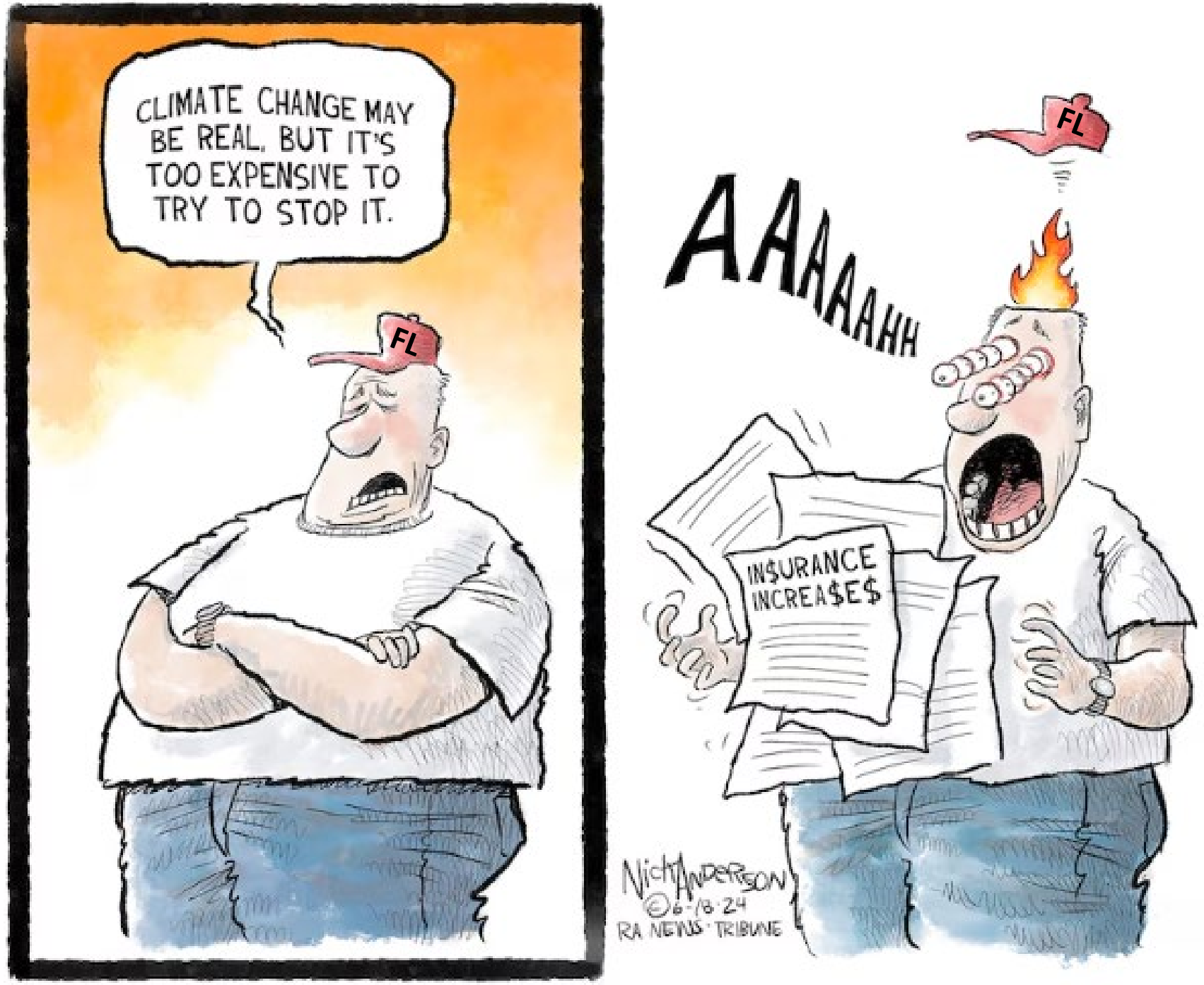


Obviously, Karaoke Sales from the prior 3 months in Japan provide a leading indicator of home prices in San Francisco

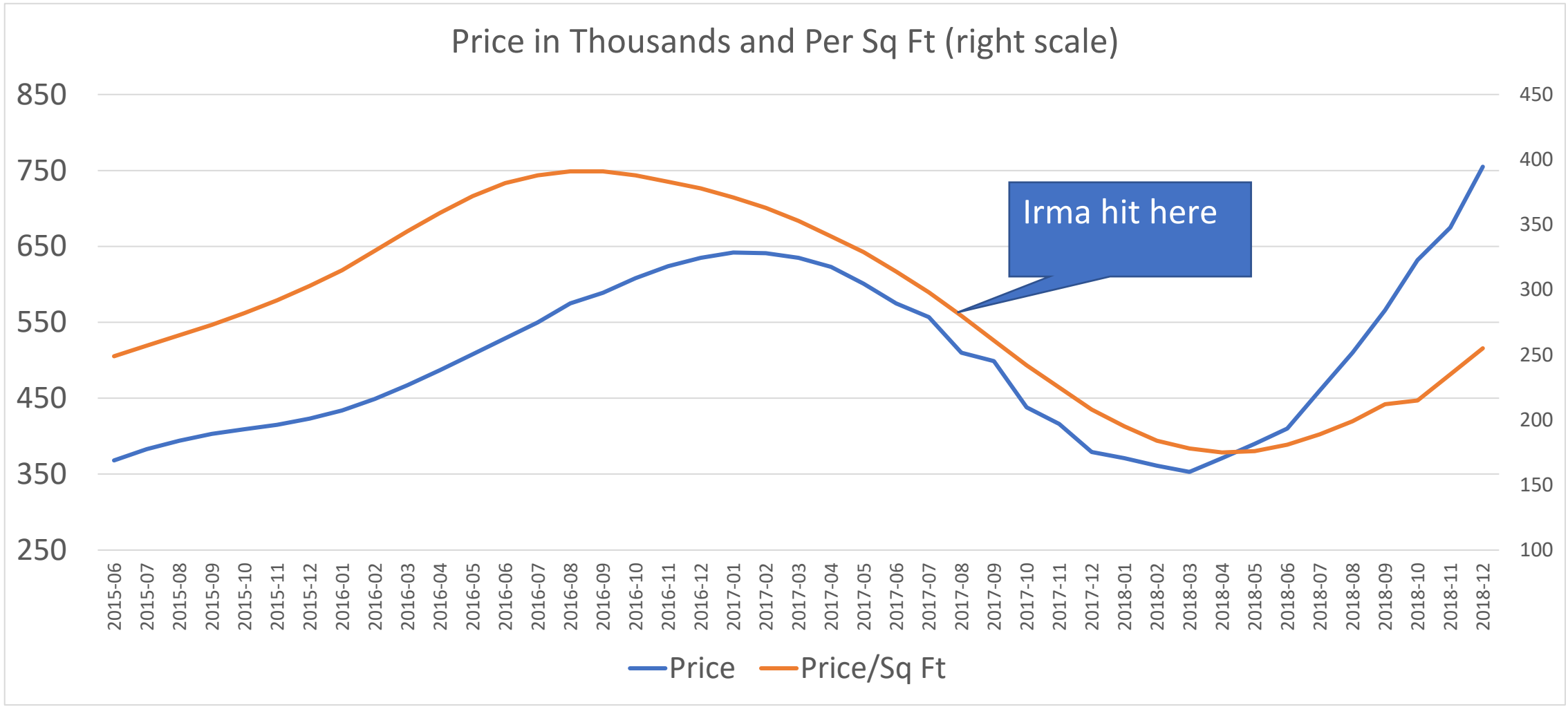


What about flood risks?


CLIMATE CHANGE MAY BE REAL, BUT IT'S TOO EXPENSIVE TO TRY TO STOP IT.
FL

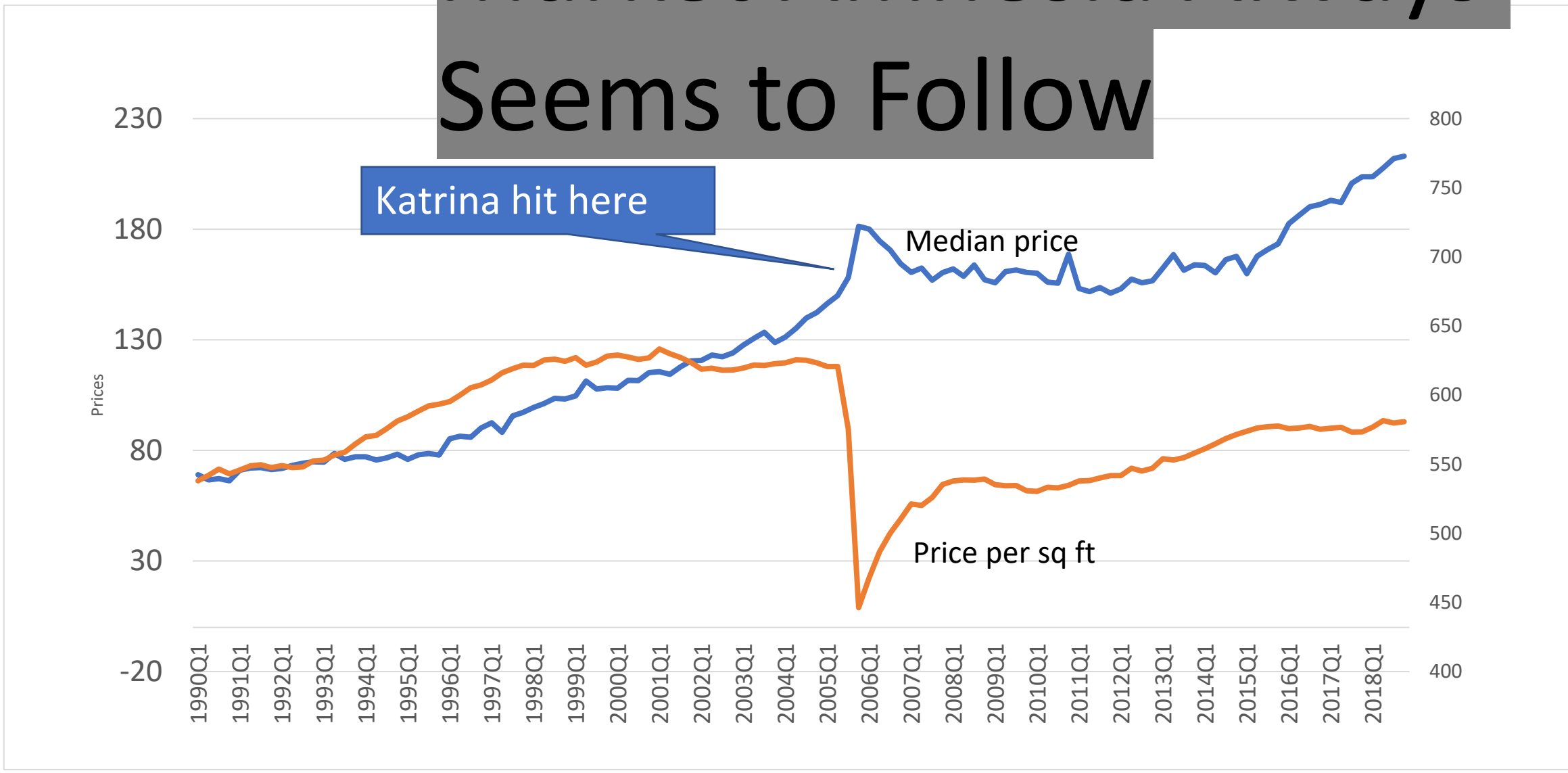

CLIMATE CHANGE MAY BE REAL, BUT IT'S TOO EXPENSIVE TO TRY TO STOP IT.
FL
FL
AAAAAHH
IN$URANCE INCREA$E$
NICK ANDERSON ©6·18·24 RA NEWS·TRIBUNE

Key West: Memories are short



New Orleans

Market Amnesia Always Seems to Follow



New disclosures on climate risks may start to affect market prices… but when

$34,900,000

6 Beds • 7 Baths • 3,950 Sq Ft

3006 Sandy Ln, Del Mar, CA 92014

Ensconced in private gated community on the sand in Del Mar, this oceanfront compound is completely turn-key & comes fully furnished! At almost 4,000 square feet, this spacious home features 5 en-suite bedrooms upstairs including the primary suite retreat with private…

Eric Iantorno • Pacific Sotheby's International Realty

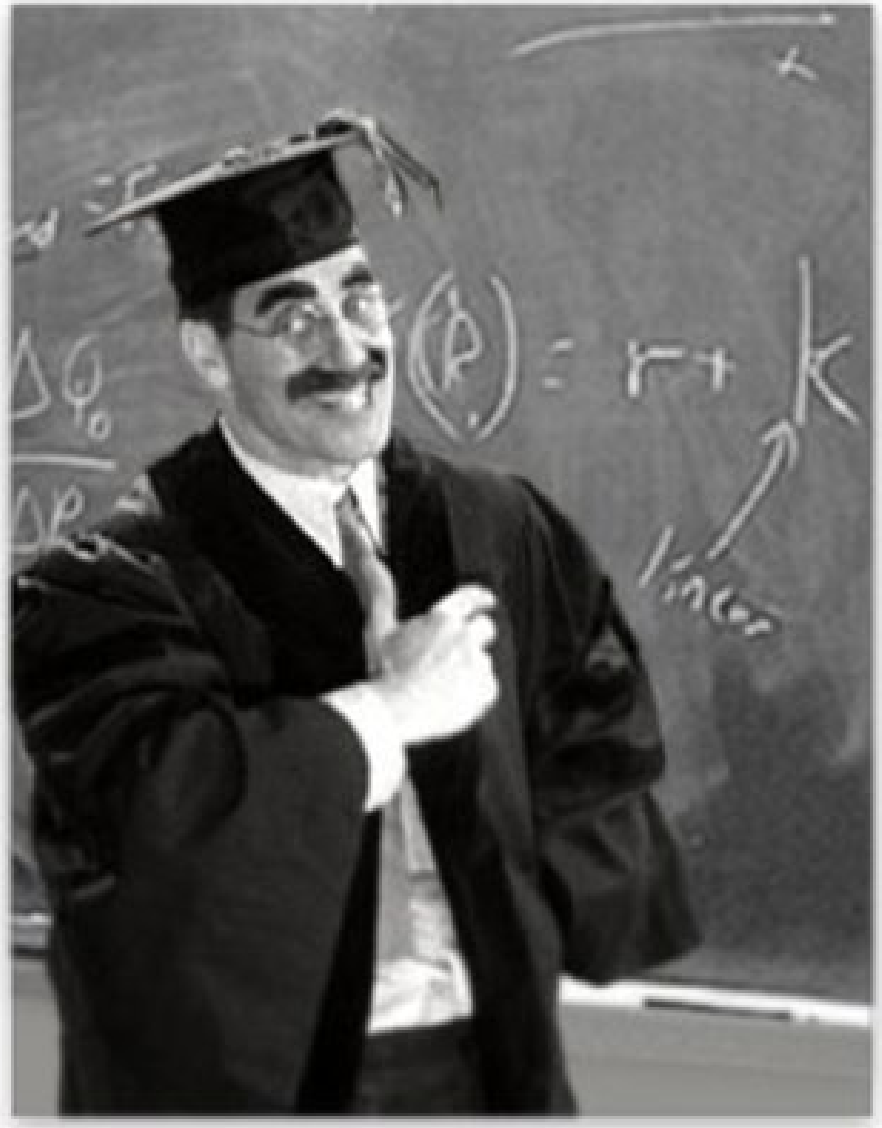
Guess what the flood risk is according to Risk factor data?

Minimal

Flood Factor ®

1 / 10

"Yes, the planet got destroyed. But for a beautiful moment in time we created a lot of value for shareholders."

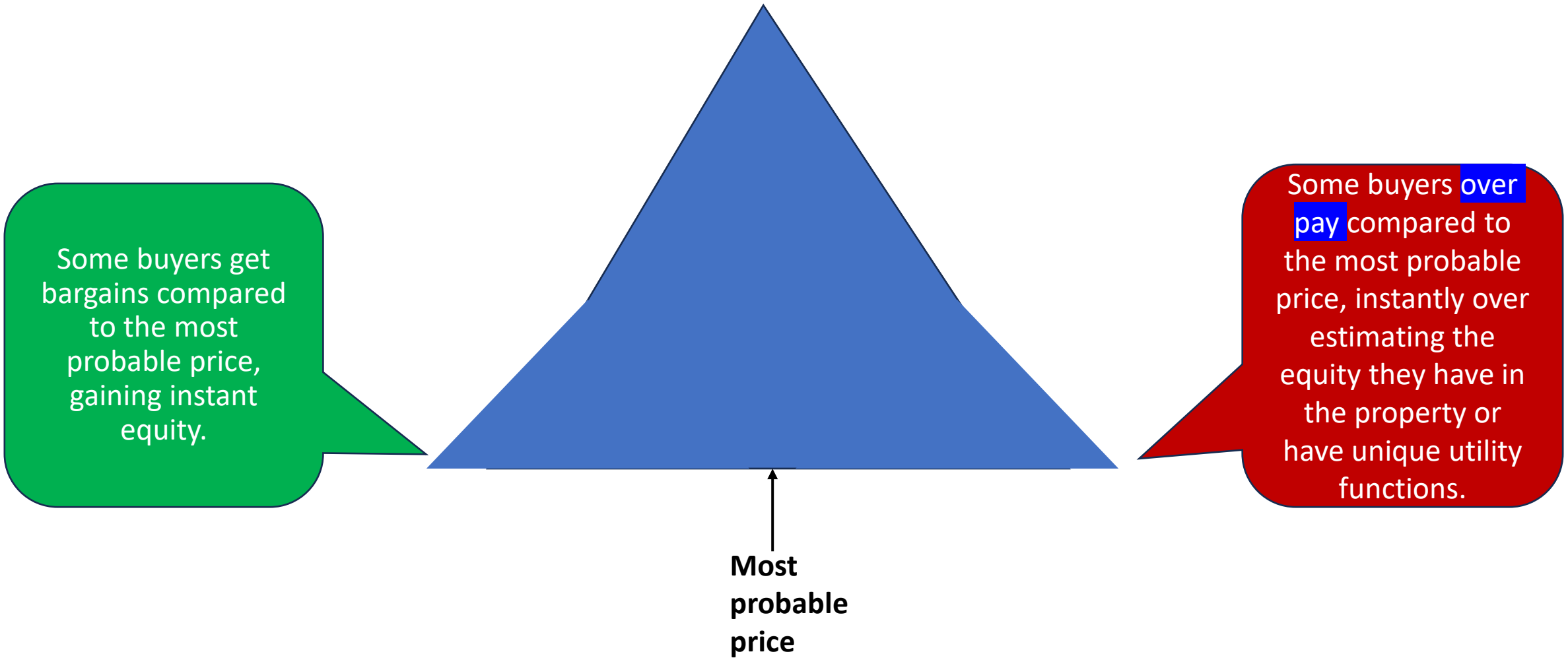


- Why should I care about future generations? What have they ever done for me? -- Groucho Marx

Running AVMs: What explains price variation beyond the fundamentals?

- ✓Seasonality (holidays and weather)
- ✓Distress sales: REOs, short sales
- ✓Out-of-town vs. in-town buyer and the typical price in their prior market?
- ✓How many credits or concessions were paid by the seller at closing?
- ✓Who paid the points for financing?
- ✓Tastes and preferences that are unobservable (for now).
- ✓Market conditions beyond seasonality like changing credit access
- ✓Death and estate sales with multiple heirs on the seller side.
- ✓Note that people do “overpay” or “get bargains”, but economists have this urge to explain all prices as rational!

The possibility of over payment or bargains, or unique preferences is not well accounted for in lender risk of default and loss models.



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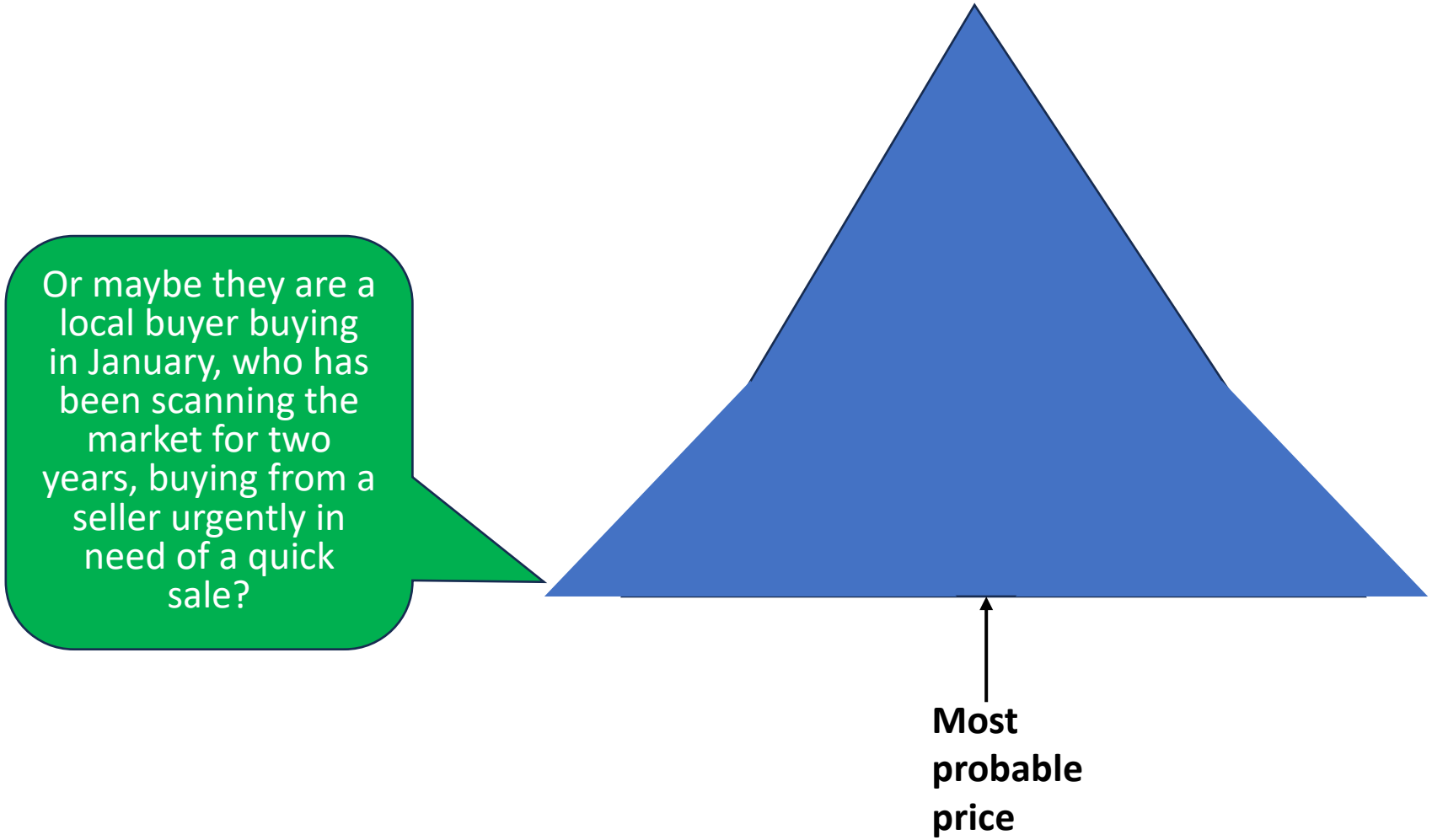

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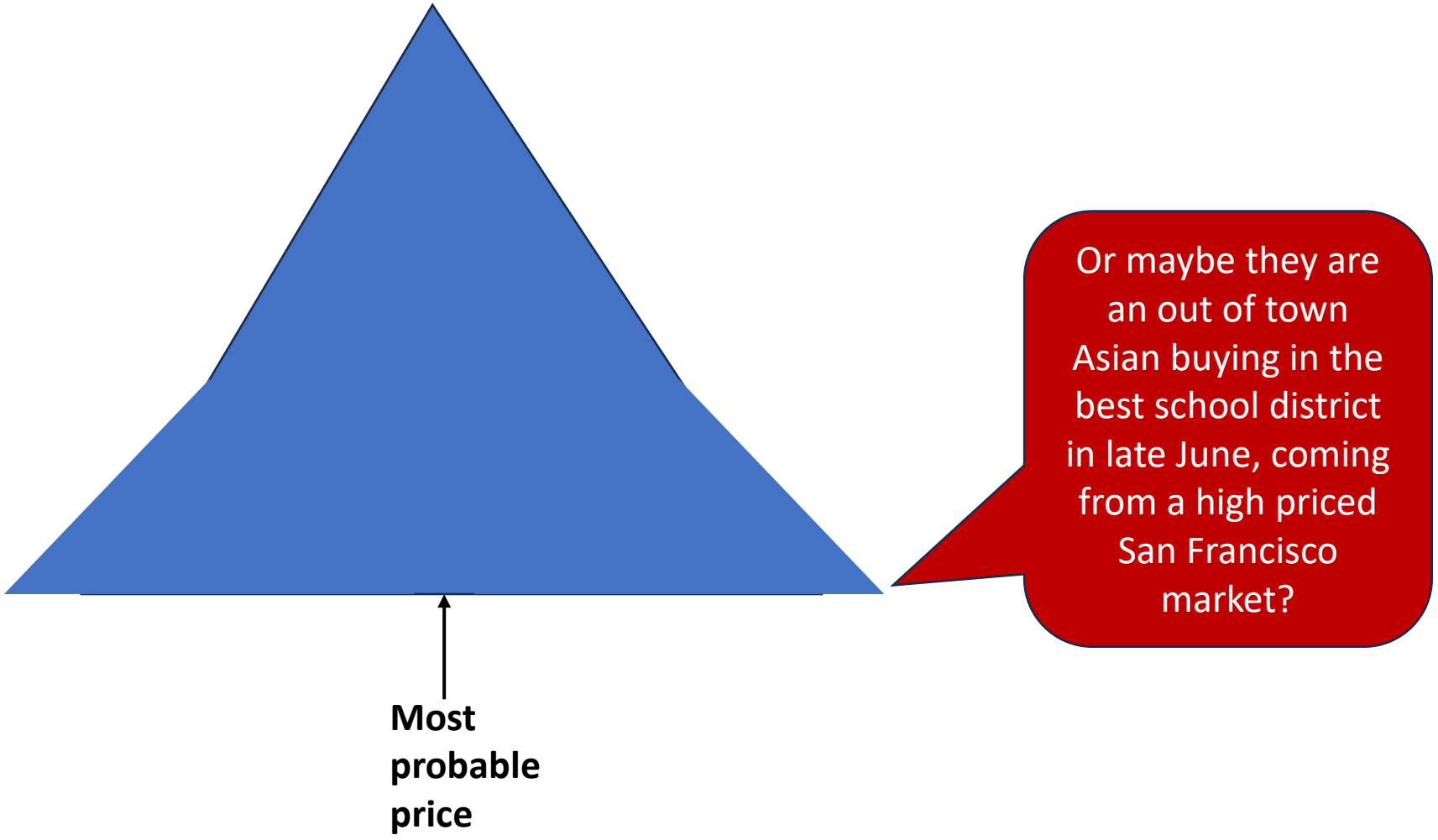


But the price paid now relative to most probable price is very significant in forecasting default.

- When someone overpays, they are throwing equity away, i.e. 10% over payment equals almost 50% equity gone with a 20% down purchase. This affects loan risk of default.
- **How do we mitigate this risk?** **Appraisal?**

Are appraisals useful in predicting over payment?

Information Losses in Home Purchase Appraisals

FRB of Philadelphia Working Paper No. 15-11

37 Pages • Posted: 18 Aug 2015

Paul S. Calem
Federal Reserve Banks - Federal Reserve Bank of Philadelphia

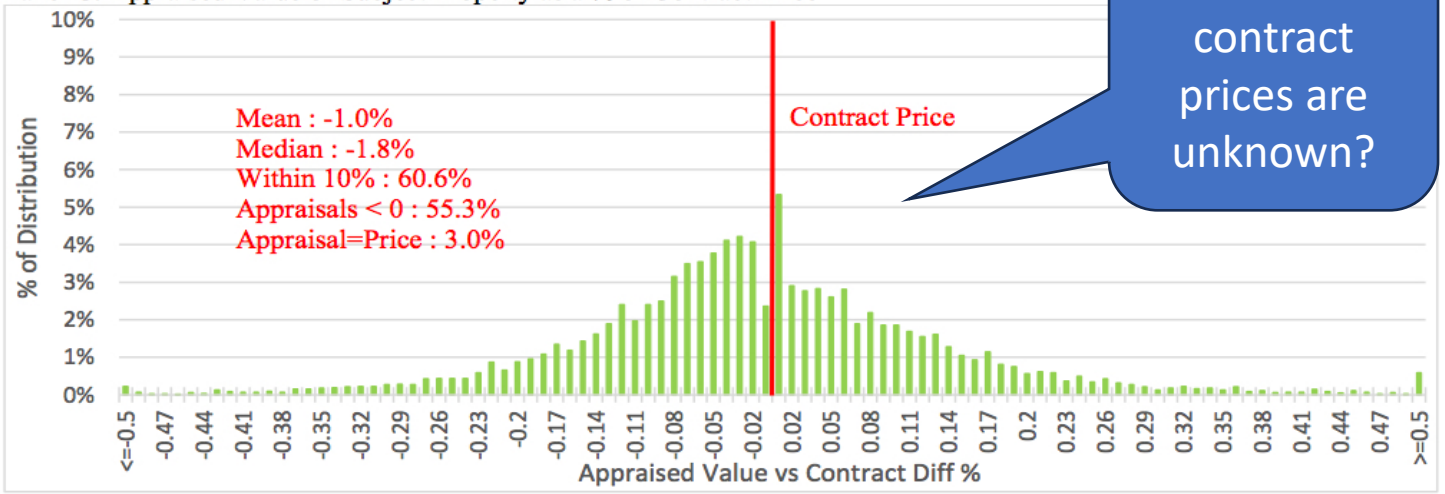
Lauren Lambie-Hanson
Federal Reserve Banks - Federal Reserve Bank of Philadelphia

Leonard I. Nakamura
Federal Reserve Banks - Federal Reserve Bank of Philadelphia

Date Written: 2015-03-06

FIGURE 2. PRE-CONTRACT APPRAISALS (N = 8,533)

Panel C. Appraised Value of Subject Property as a % of Contract Price



When contract prices are unknown?

Are appraisals useful in predicting over payment?

Information Losses in Home Purchase Appraisals

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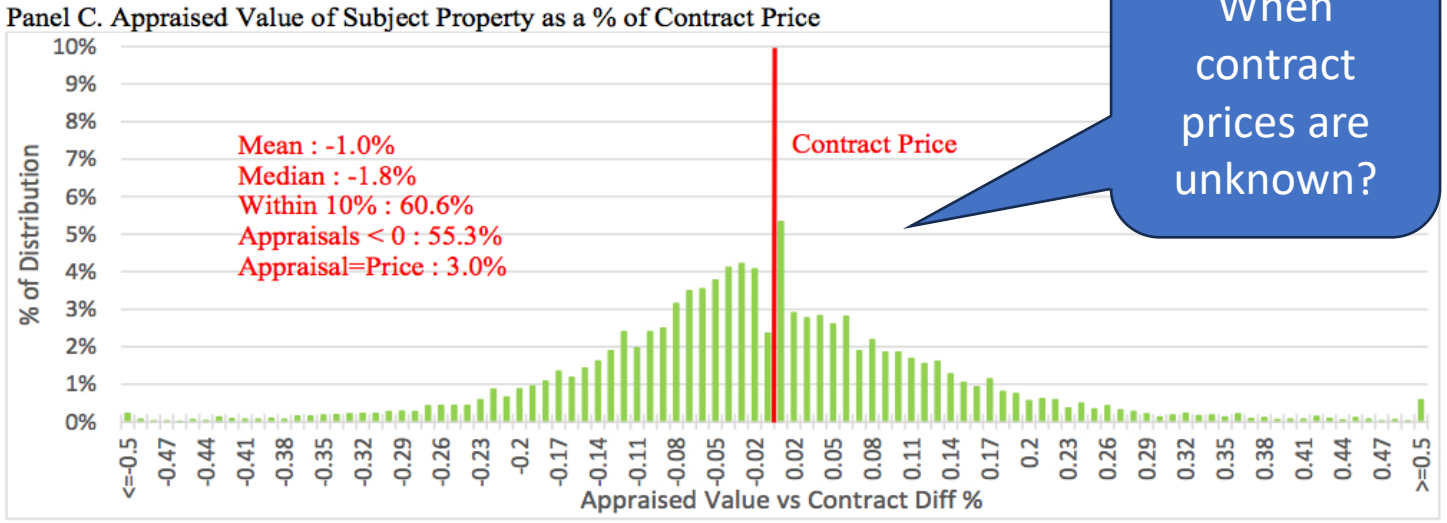
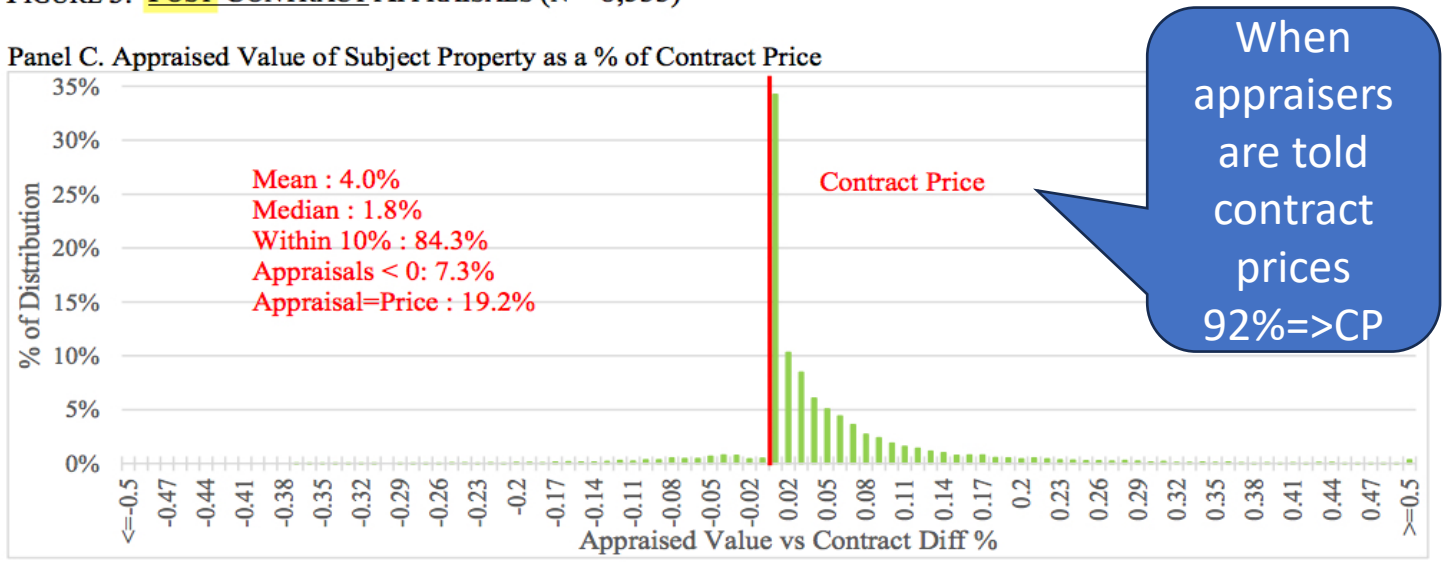


FIGURE 3. POST-CONTRACT APPRAISALS (N = 8,533)

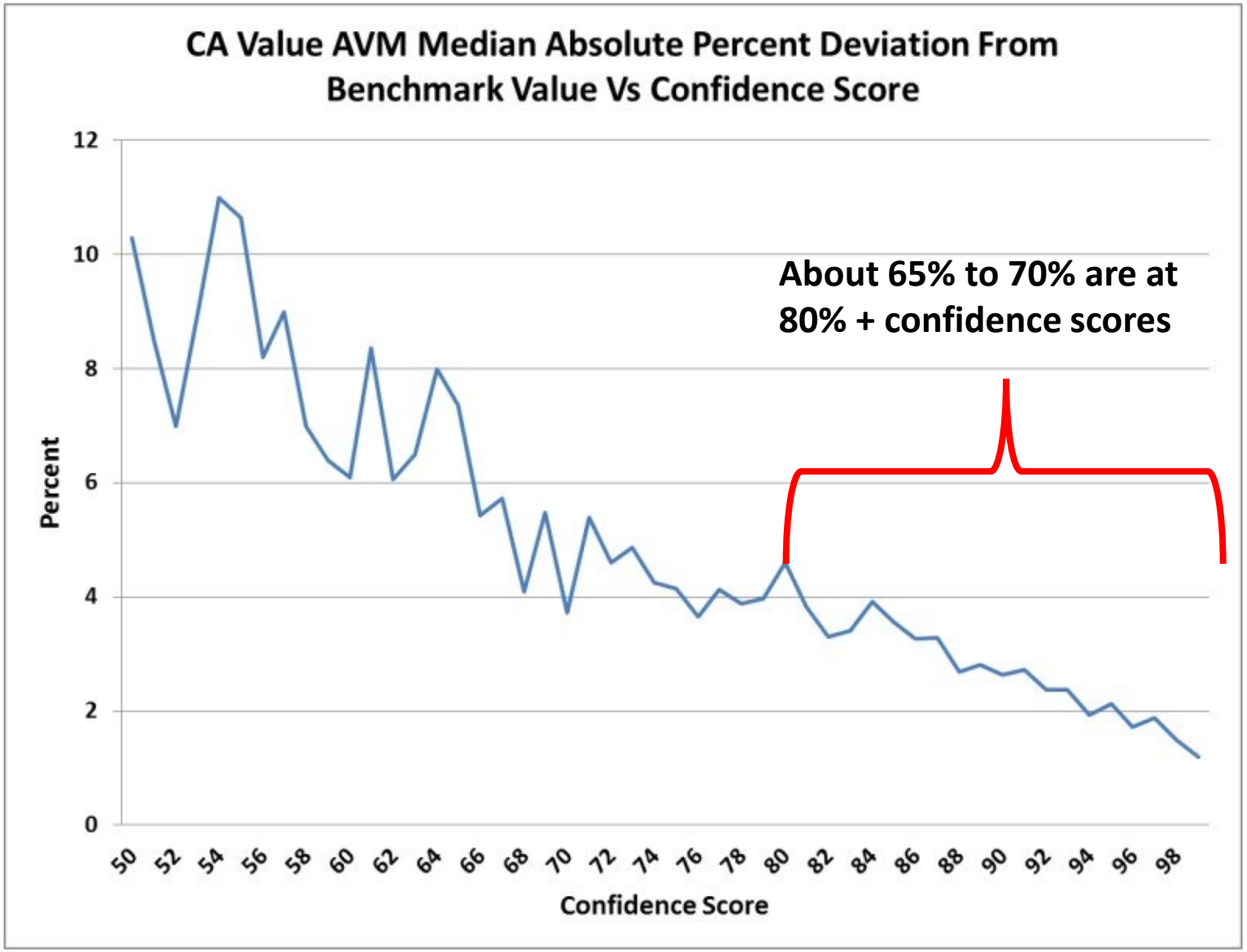


Selected graphics from, "Contract Price Confirmation Bias: Evidence from Repeat Appraisals," Eriksen, Fout, Palim, Rosenblatt. 2016.

In 2011 the accuracy of AVMs vs Appraisals was fairly close, with a slightly fatter tail on the low side for AVMs.

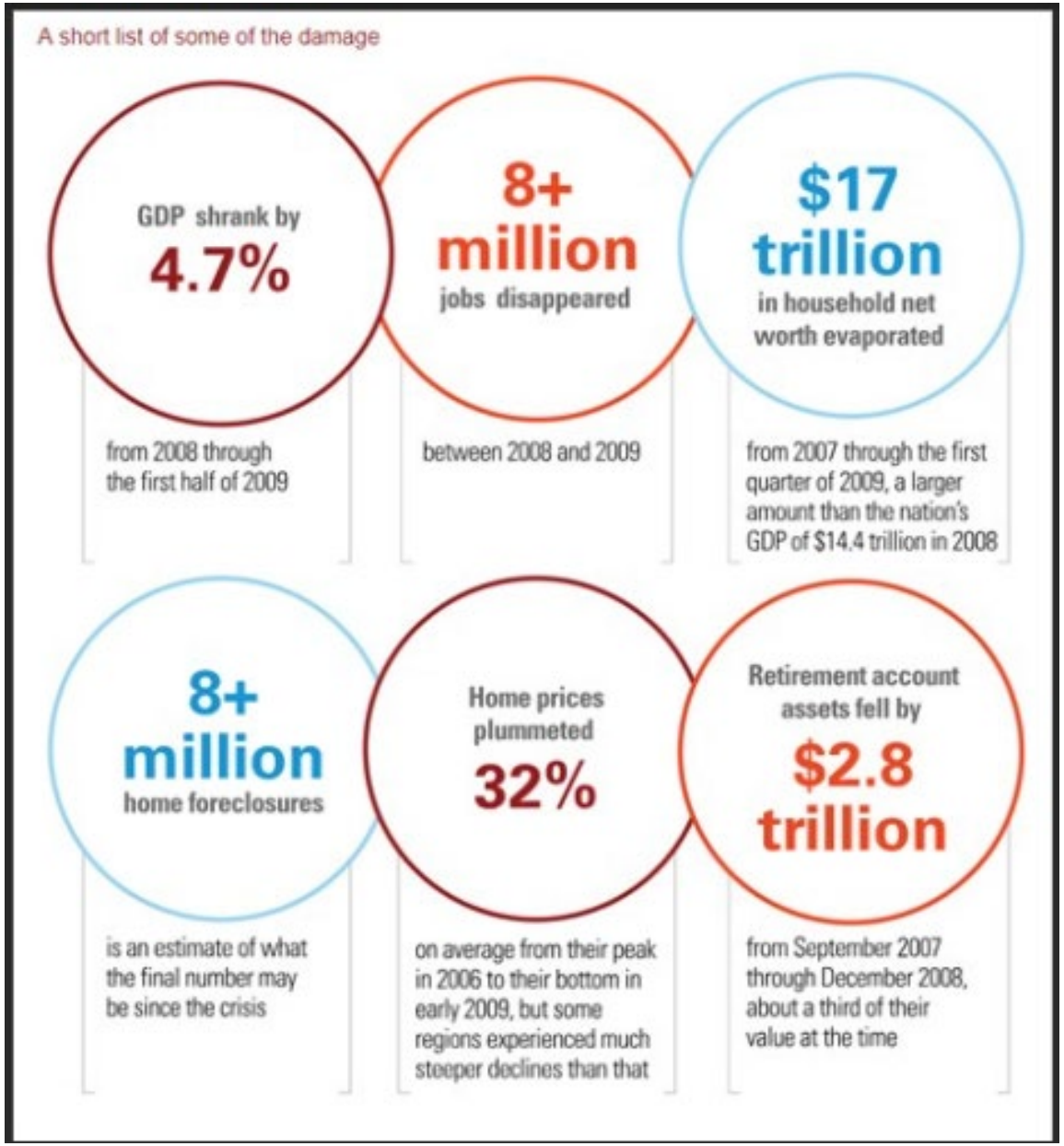
Today AVMs are more accurate than appraisals in the majority of cases because they use more comps and more information in the valuation process, but their advantage is that they are **agnostic** about value unlike appraisers, and **they provide information about uncertainty**.

AVMs provide confidence metrics as well as a value and value range

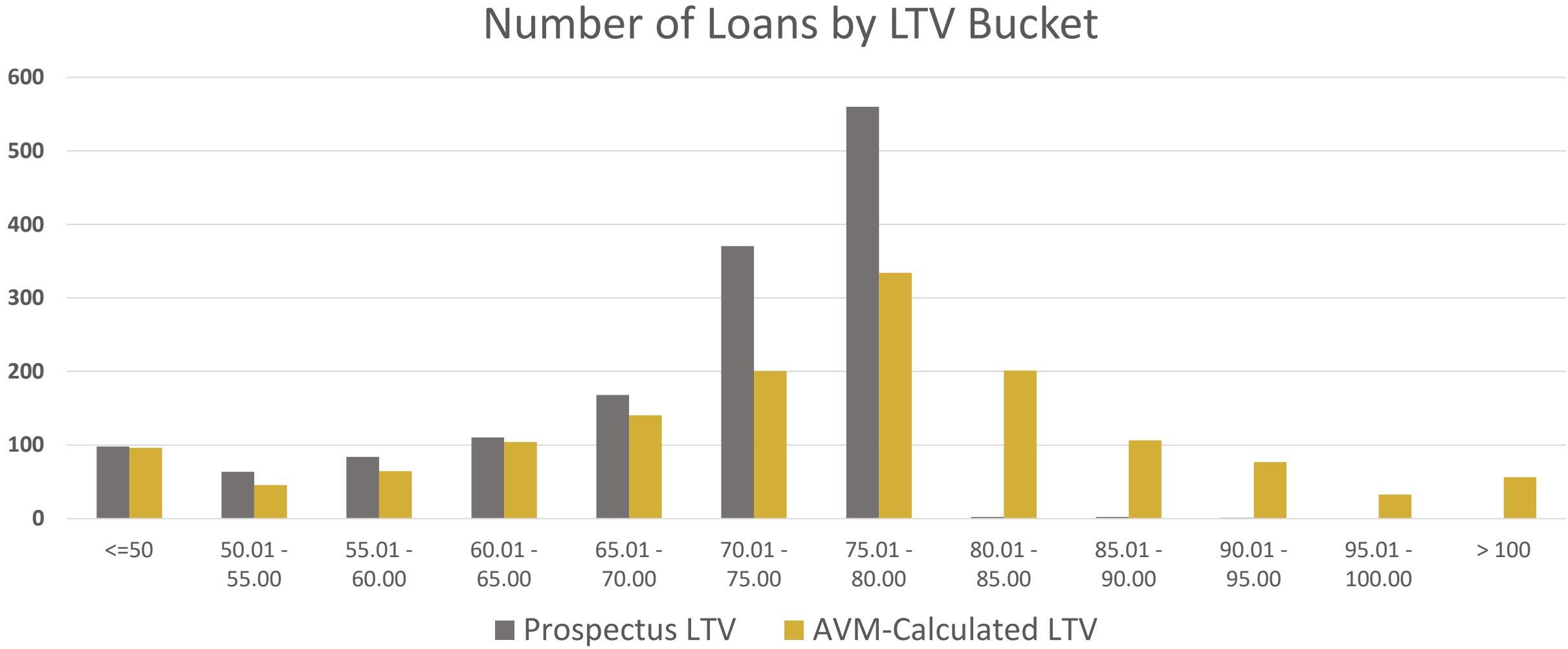


Note: This should feed into Basel 3 risk metrics, reserve calcs and risk-based pricing for banks

A look back at GFC Subprime days….



Bank XYZ Certificates: Loan Distribution by LTV Based on Appraisals vs AVMs Using a Basket of Subprime Loans



People can overpay and this increases the chances of default

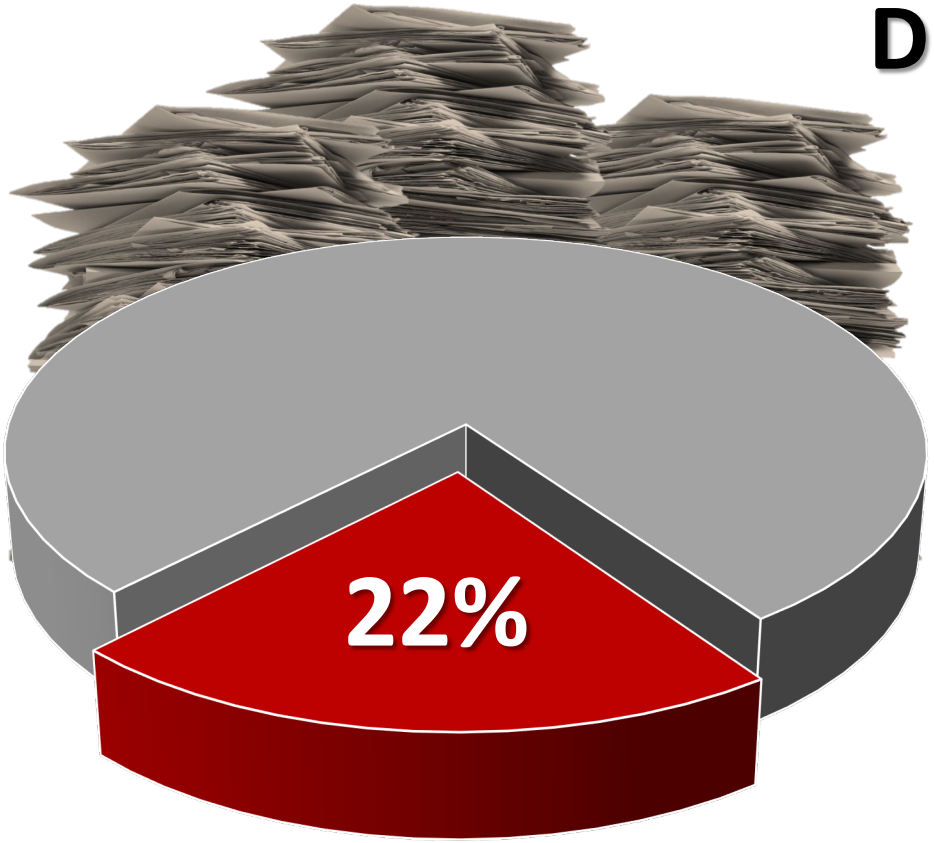
Logistic Regression Coefficients (8,169 Observations)

	B	p-value	Exp(B)	95% C.I. for Exp(B)	
				Lower	Upper
AVM LTV > 80*	0.5406	0.0000	1.7171	1.4565	2.0242
FICO*	-0.0118	0.0000	0.9883	0.9863	0.9902
LTV*	0.1040	0.0000	1.1096	1.0932	1.1264
%chg. in HPI*	-0.0687	0.0000	0.9336	0.9260	0.9412
%chg. in Unemployment*	0.0291	0.0000	1.0296	1.0265	1.0326
Interest Rate	-0.0111	0.5310	0.9890	0.9552	1.0239
ln(Original Balance)*	0.2124	0.0210	1.2366	1.0324	1.4813
Non-Owner Occupied*	0.5714	0.0000	1.7707	1.4013	2.2374
Full Documentation*	-0.5594	0.0000	0.5716	0.4594	0.7110
Refinance*	0.2406	0.0130	1.2720	1.0525	1.5373
Single Family Property	0.0394	0.6650	1.0402	0.8704	1.2430
HVMLT 2005-16	0.2165	0.4420	1.2418	0.7148	2.1573
HVMLT 2005-8*	0.4726	0.0260	1.6042	1.0572	2.4341
INDX 2005-AR16IP	0.4104	0.0480	1.5074	1.0031	2.2650
RALI 2005-QO1*	0.6586	0.0020	1.9320	1.2811	2.9137
RALI 2005-QO5*	0.7543	0.0000	2.1260	1.4227	3.1771
Constant*	-5.7157	0.0000	0.0033	0.0002	0.0659

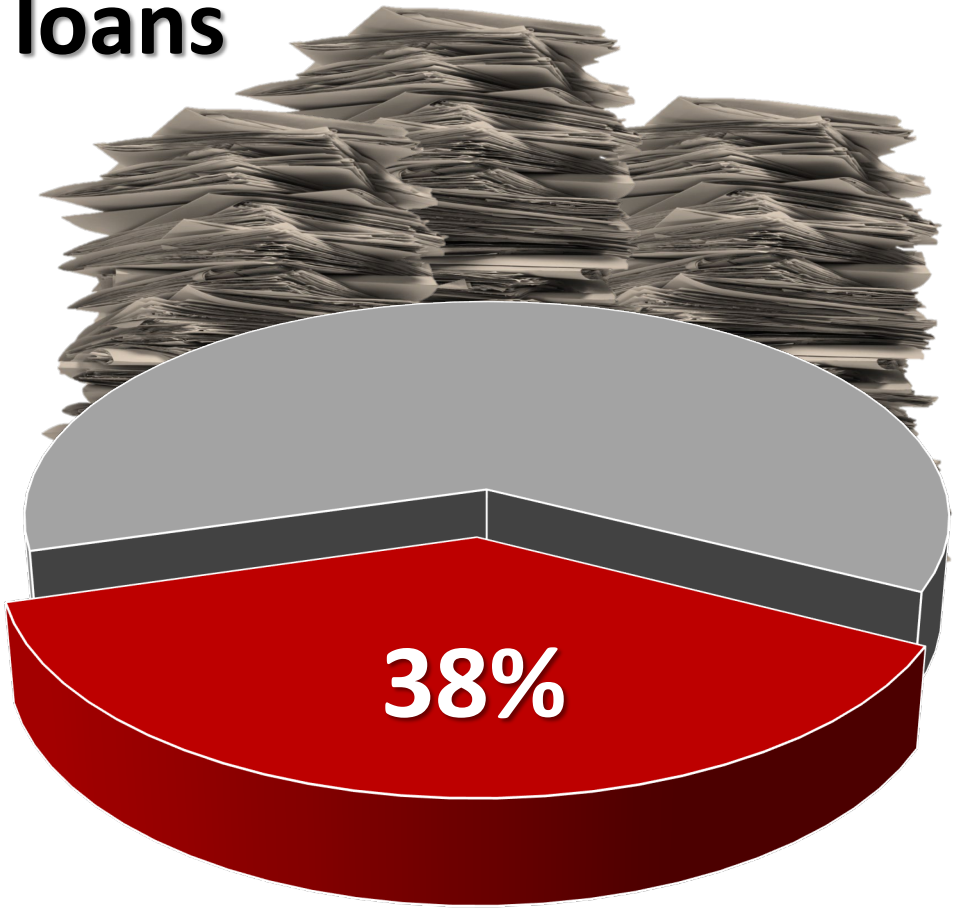
*denotes statistically significant variables at 95% confidence level (p-value <5%)

For loans stated as 80% LTV we found that when the AVM calculated LTV was above 80% these were 72% more likely to default than when the 80% LTV was confirmed.

Using only those claimed as 80% LTV or less which loans DEFAULTED?



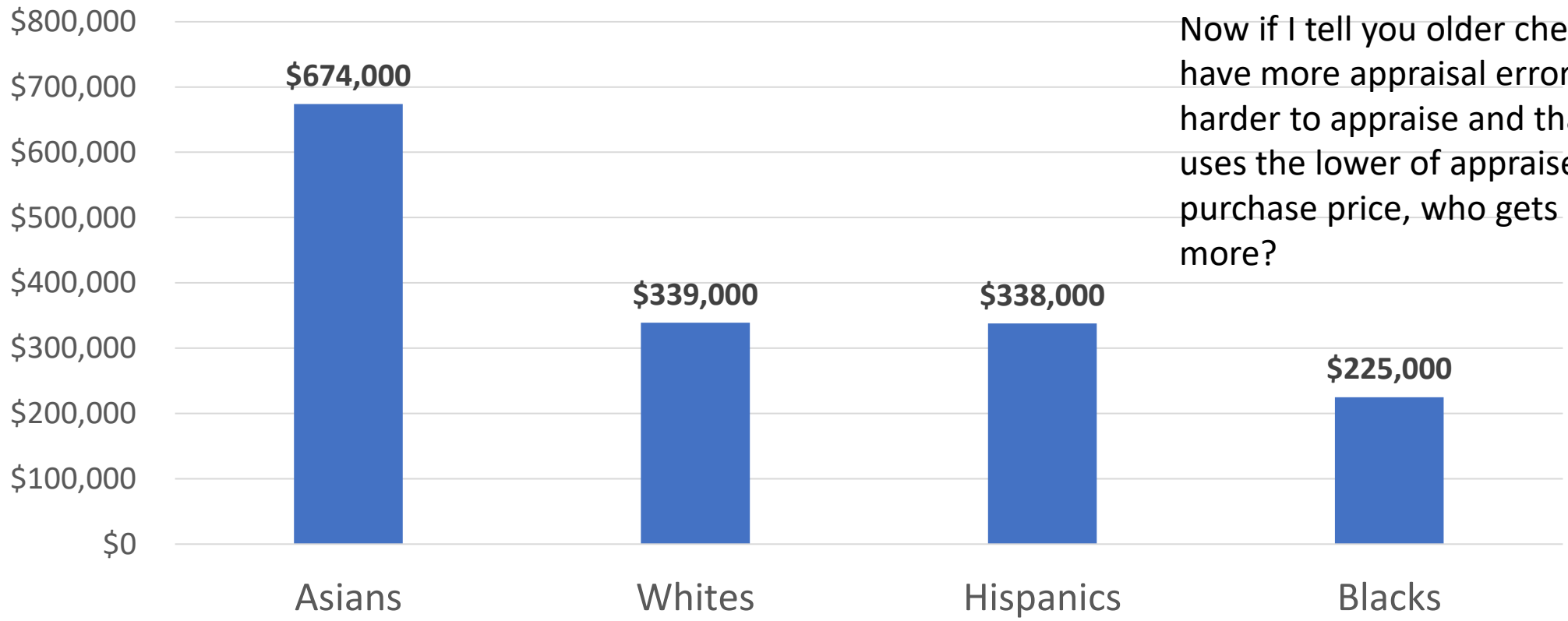
When AVM confirmed LTV was 80% or less



When AVM showed LTV was actually above 80%

A note on race and housing valuation bias

Median Home Prices Paid by Race for USA Buyers of One Large National Bank
2020-2022 (sample of a few million observations)

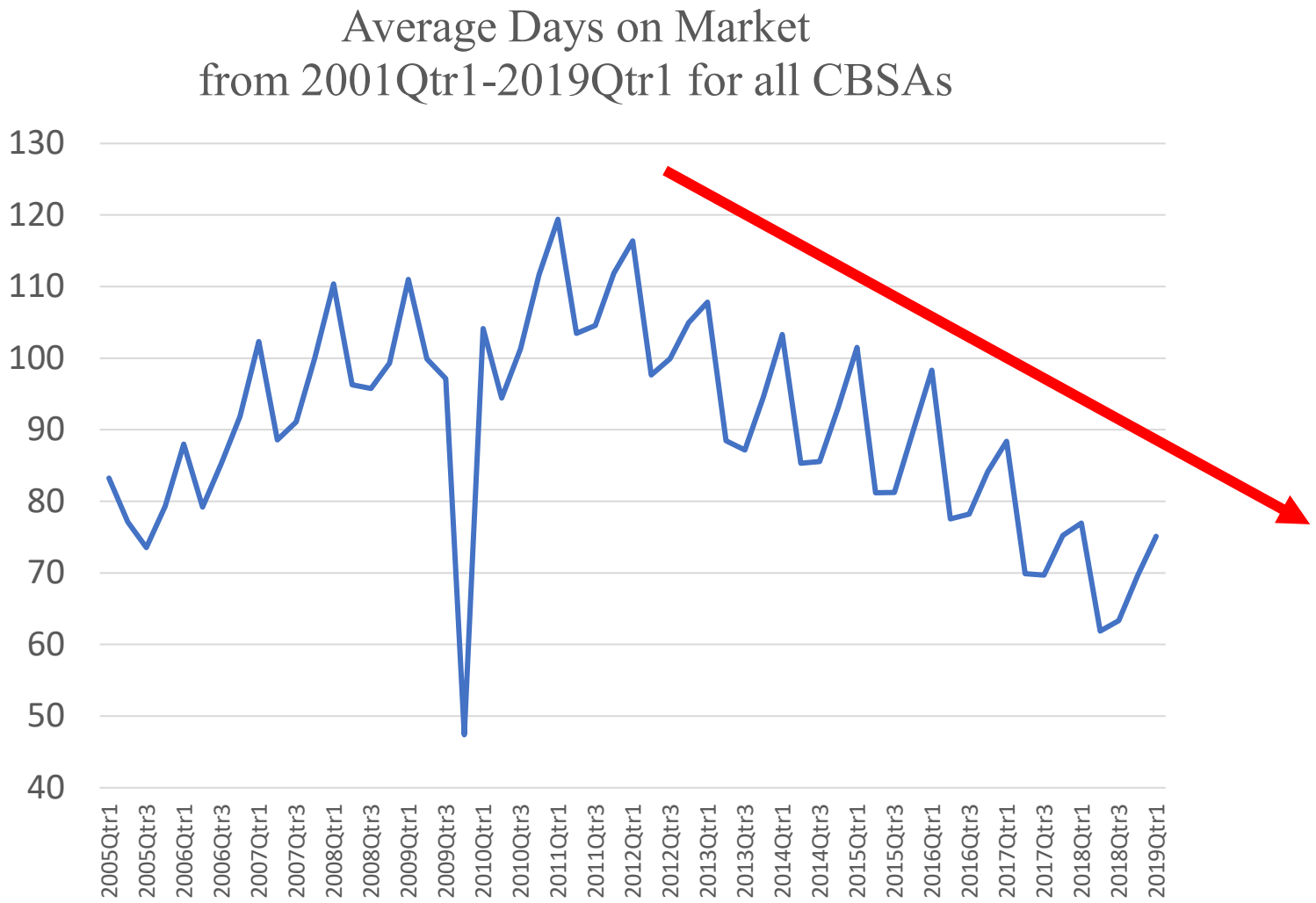


Now if I tell you older cheaper homes have more appraisal error and are harder to appraise and that the lender uses the lower of appraised value or purchase price, who gets penalized more?

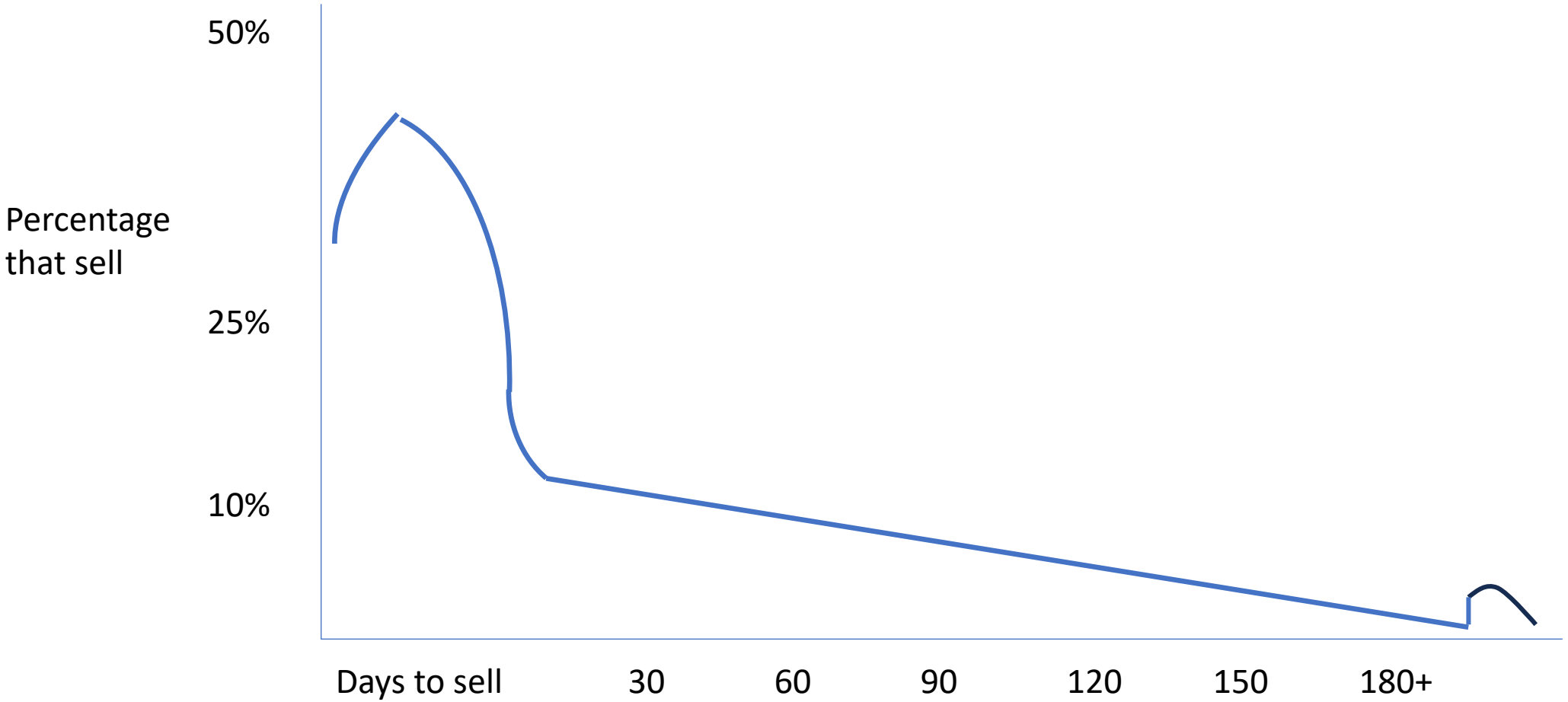
Next: Is the housing market finally getting more efficient?

Is the housing market getting more efficient?

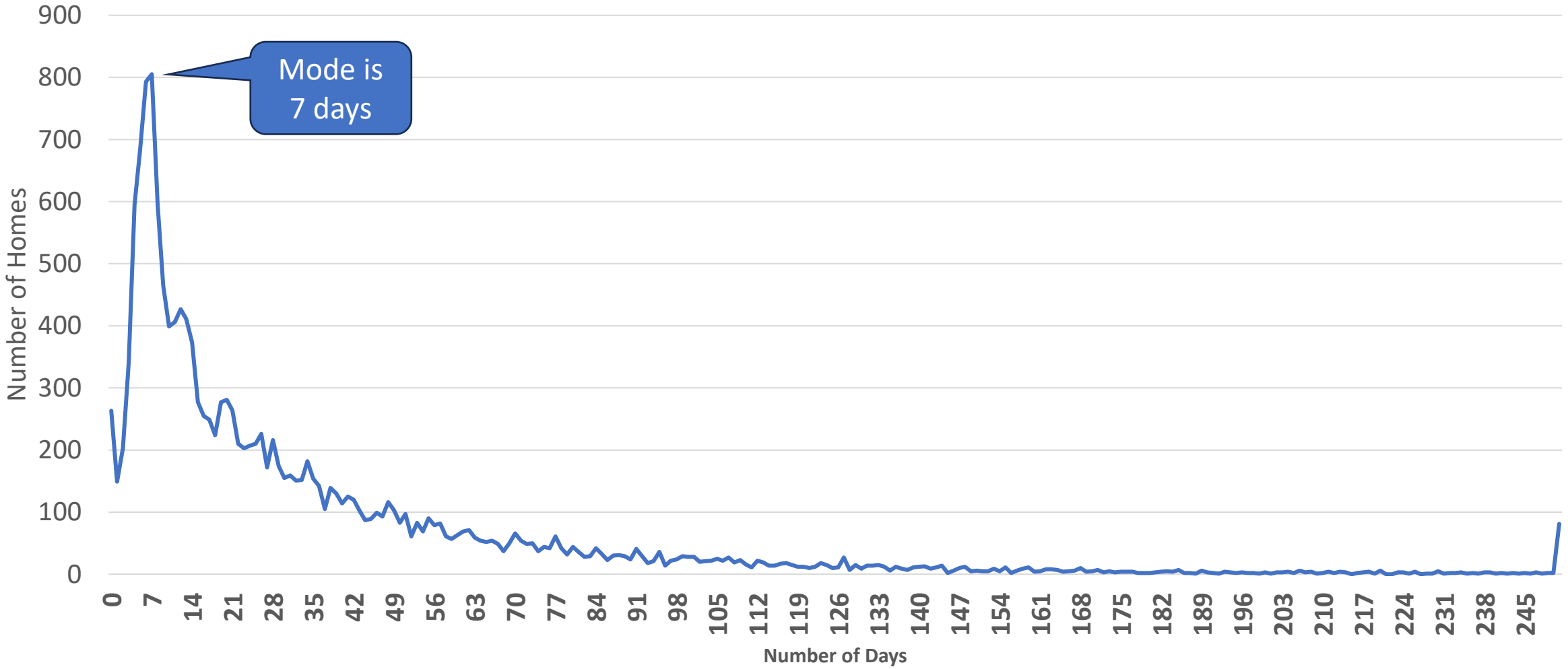
- Since 2011 days on market has declined until recently: All CBAs



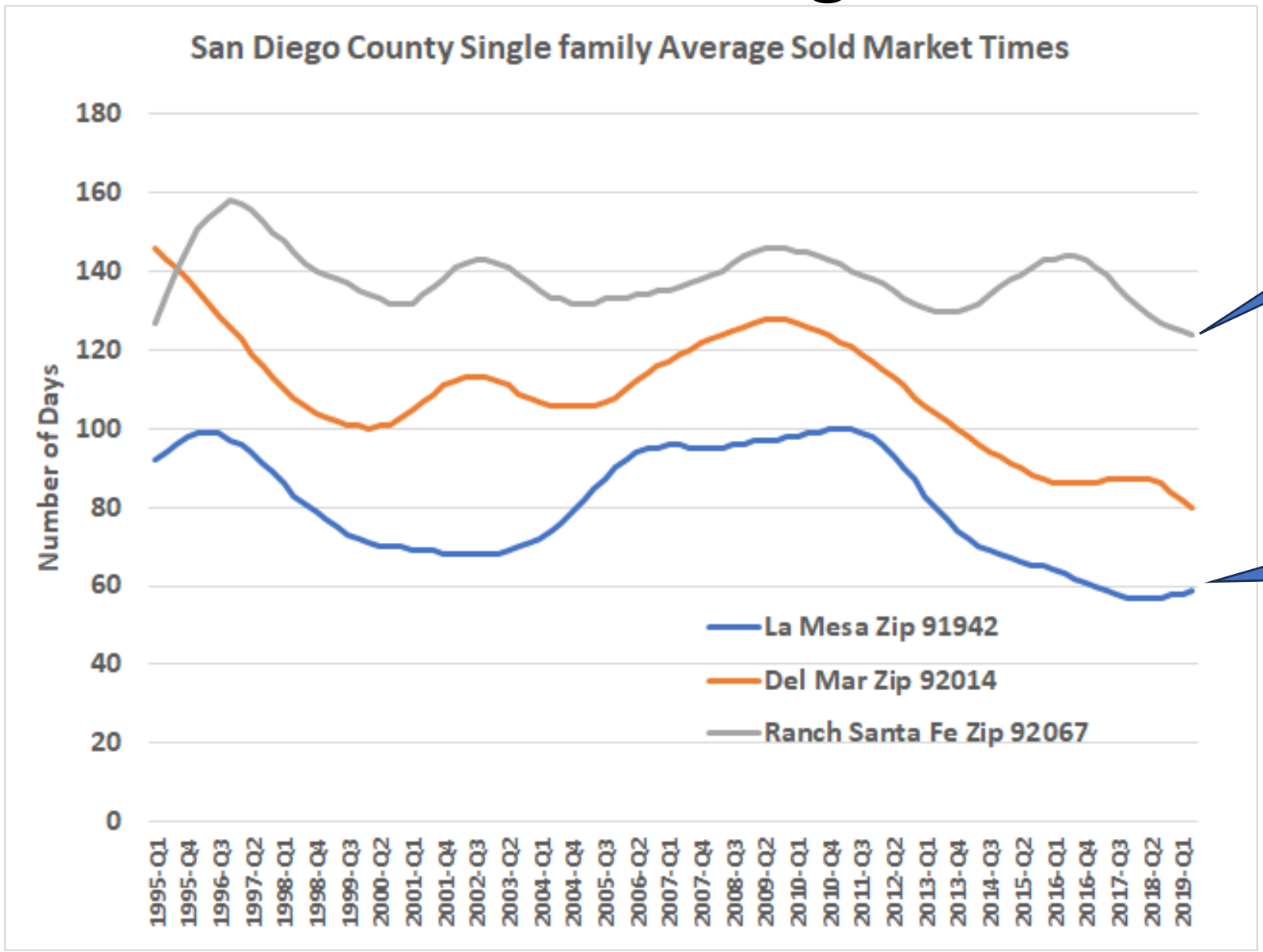
Typical patterns of home selling over time from listing to final sale or expiration. Note many still expire without selling.



San Diego County Single Family Sold Market Time Distribution (Jan 2022 to June 2023)



Higher priced homes take longer to sell

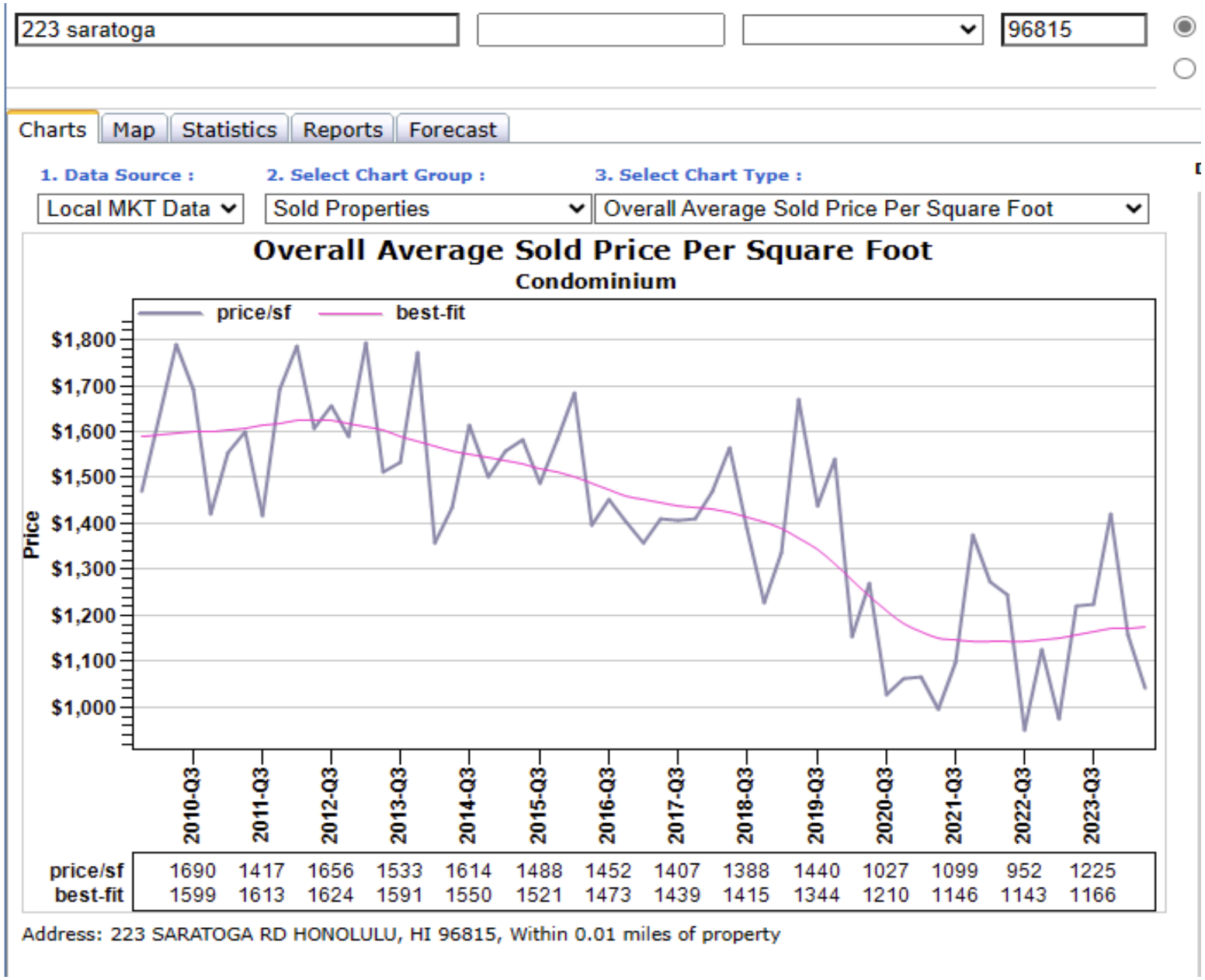


Rancho Santa Fe

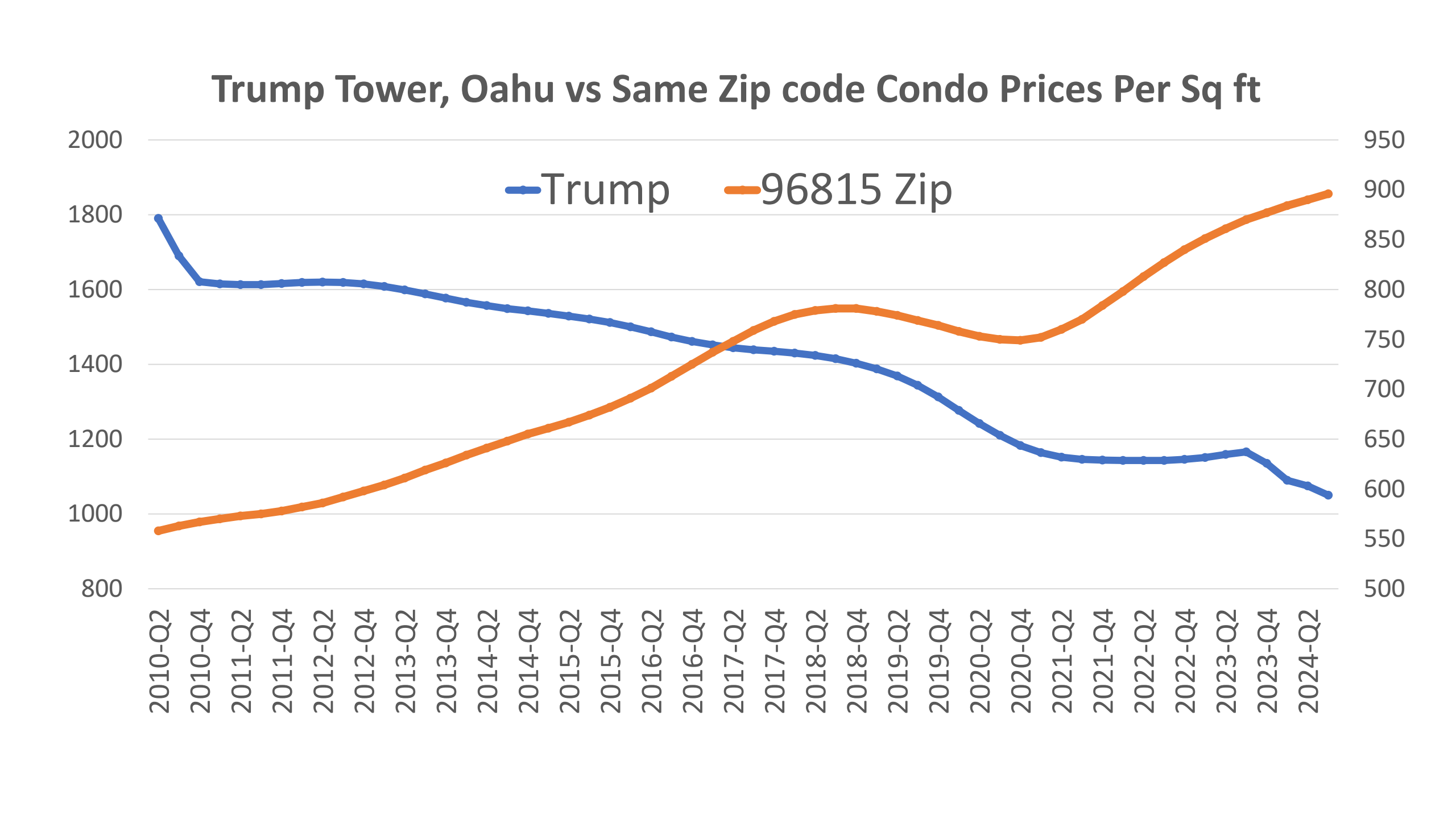
La Mesa

Just for fun: Has Trump’s Brand had an impact on sale prices?

Trump Tower: 223 Saratoga, Honolulu, HI



Not enough Trump supporters with money in Hawaii?


Trump Tower, Oahu vs Same Zip code Condo Prices Per Sq ft
Trump
96815 Zip
2000
1800
1600
1400
1200
1000
800
950
900
850
800
750
700
650
600
550
500
2010-Q2
2010-Q4
2011-Q2
2011-Q4
2012-Q2
2012-Q4
2013-Q2
2013-Q4
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2017-Q2
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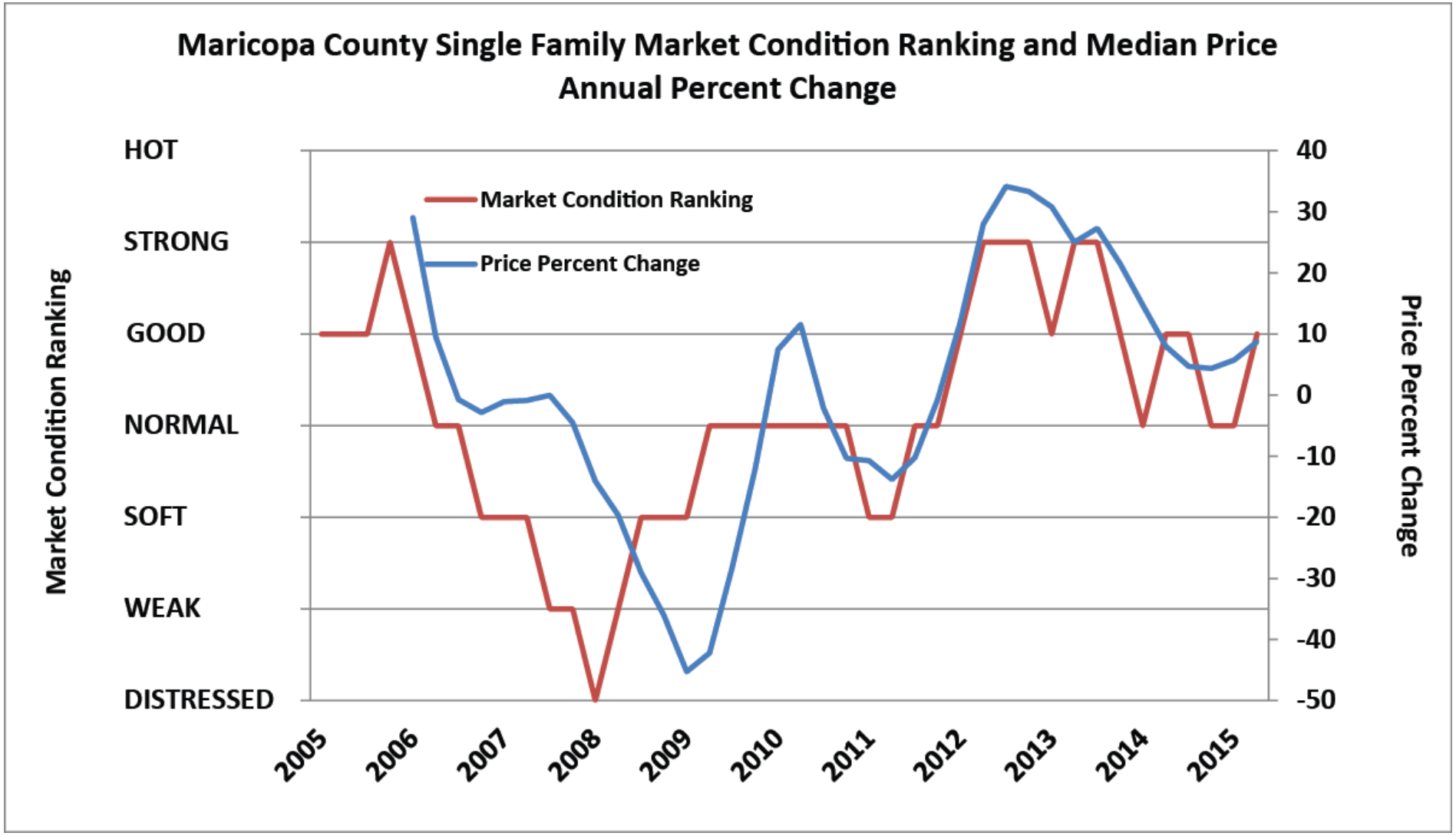
2018-Q2
2018-Q4
2019-Q2
2019-Q4
2020-Q2
2020-Q4
2021-Q2
2021-Q4
2022-Q2
2022-Q4
2023-Q2
2023-Q4
2024-Q2

Can we forecast housing prices? 1988 ASSA presentation

Short Term Technical Market Condition Indicators of Price Trends

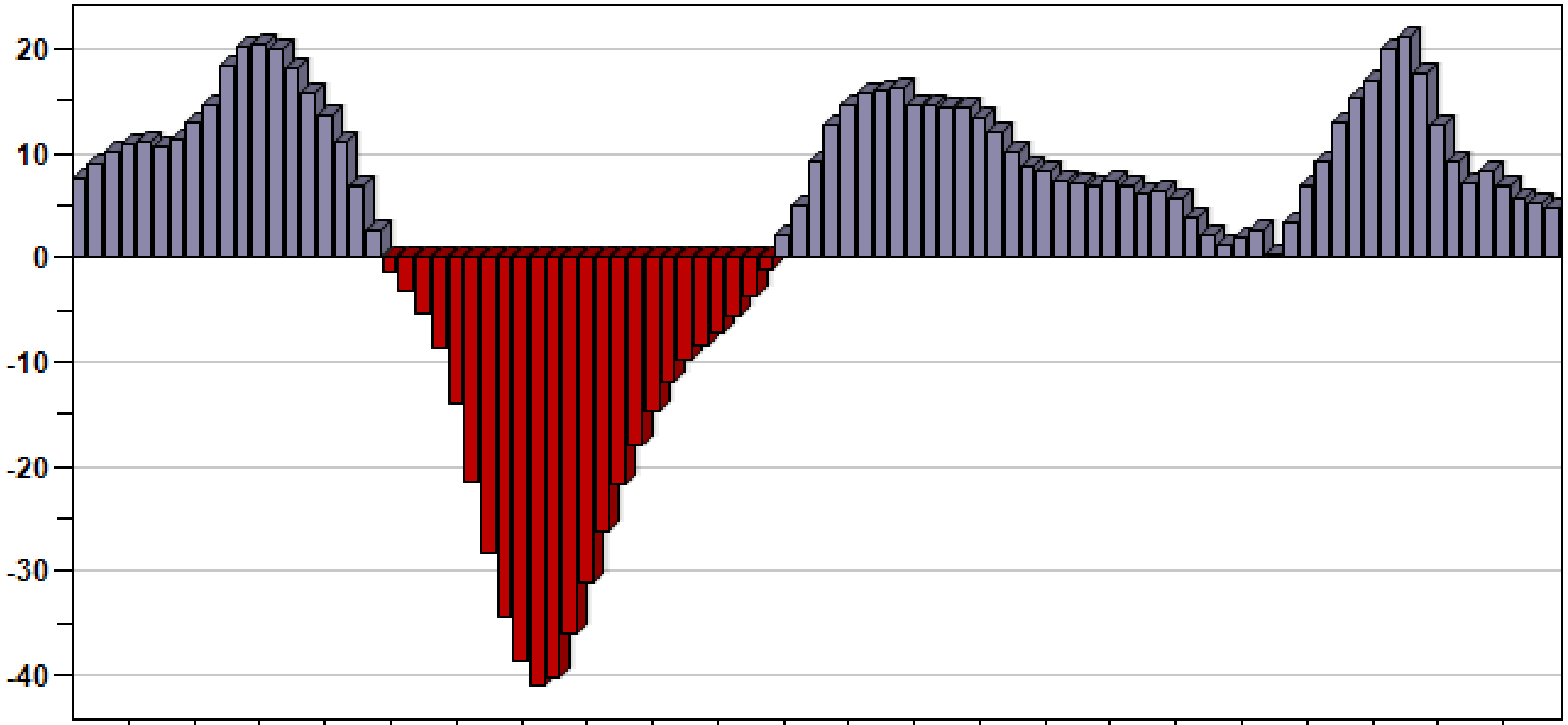
- Months remaining inventory
- Selling Price/Listing Price Ratios
- Days on Market
- Percentage of listings that expire without selling
- Percentage of listings that drop asking prices
- Percentage of sales that are REOs, Foreclosures or Short Sales
- Inventory for sale as percentage of total stock in local market

Market conditions and MRI drives appreciation rates: Example: Phoenix



Single Family Buy / Sell

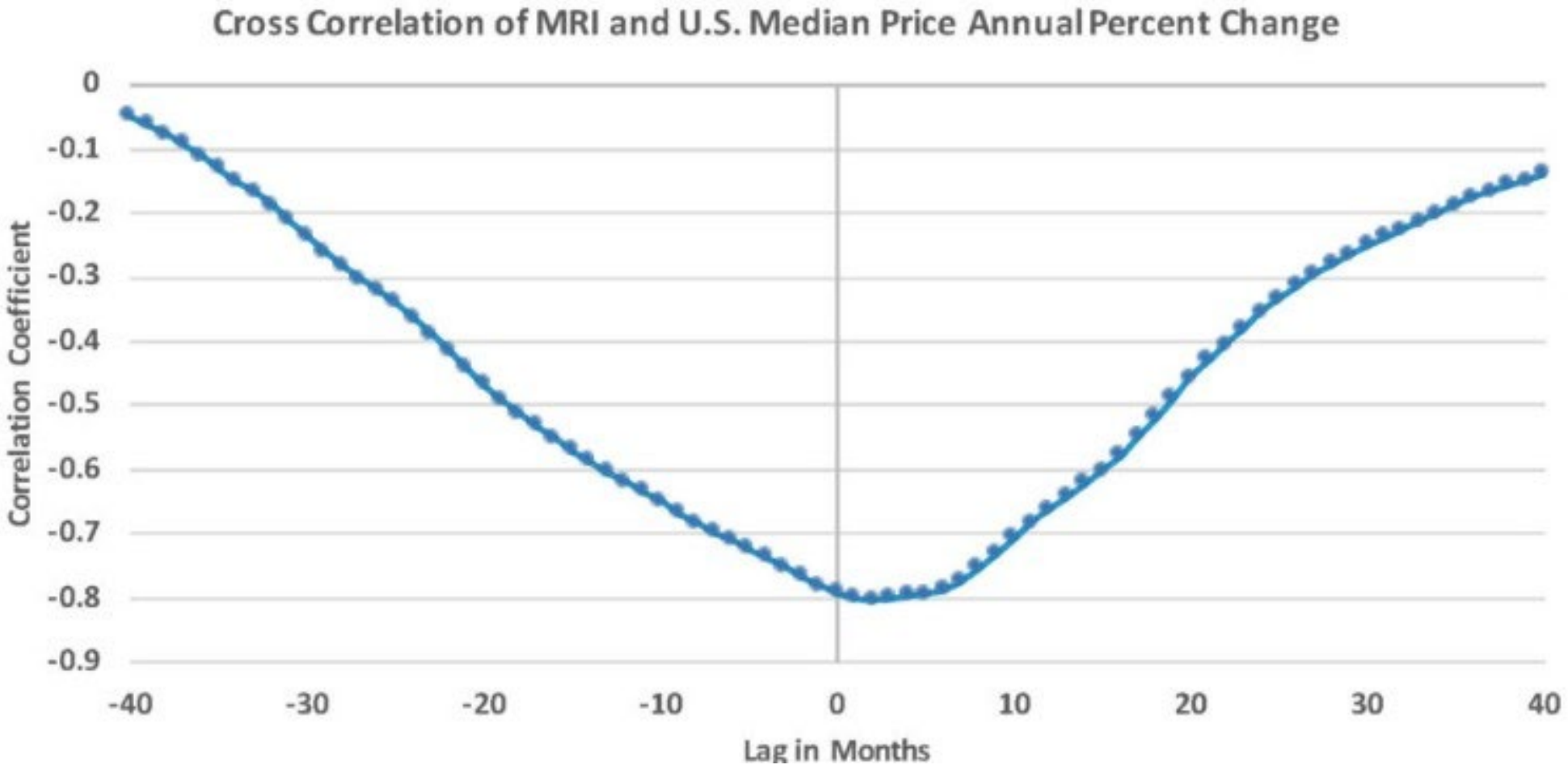
San Diego Single Family



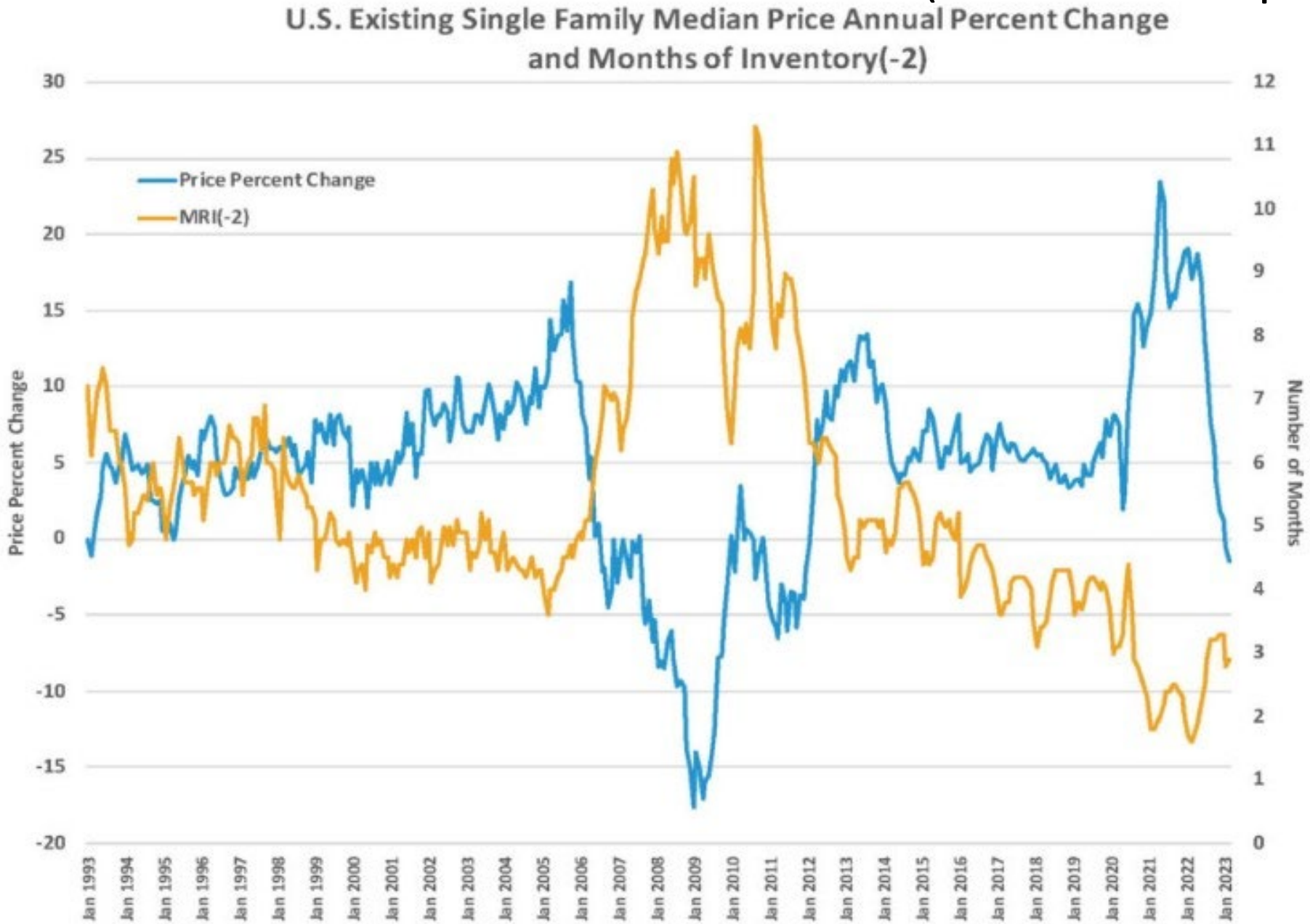
	2002-Q4	2003-Q4	2004-Q4	2005-Q4	2006-Q4	2007-Q4	2008-Q4	2009-Q4	2010-Q4	2011-Q4	2012-Q4	2013-Q4	2014-Q4	2015-Q4	2016-Q4	2017-Q4	2018-Q4	2019-Q4	2020-Q4	2021-Q4	2022-Q4	2023-Q4
buy/sell	11	13	21	14	-1	-14	-39	-31	-15	-7	2	15	15	13	8	7	6	2	7	17	13	7

Modest positive outlook

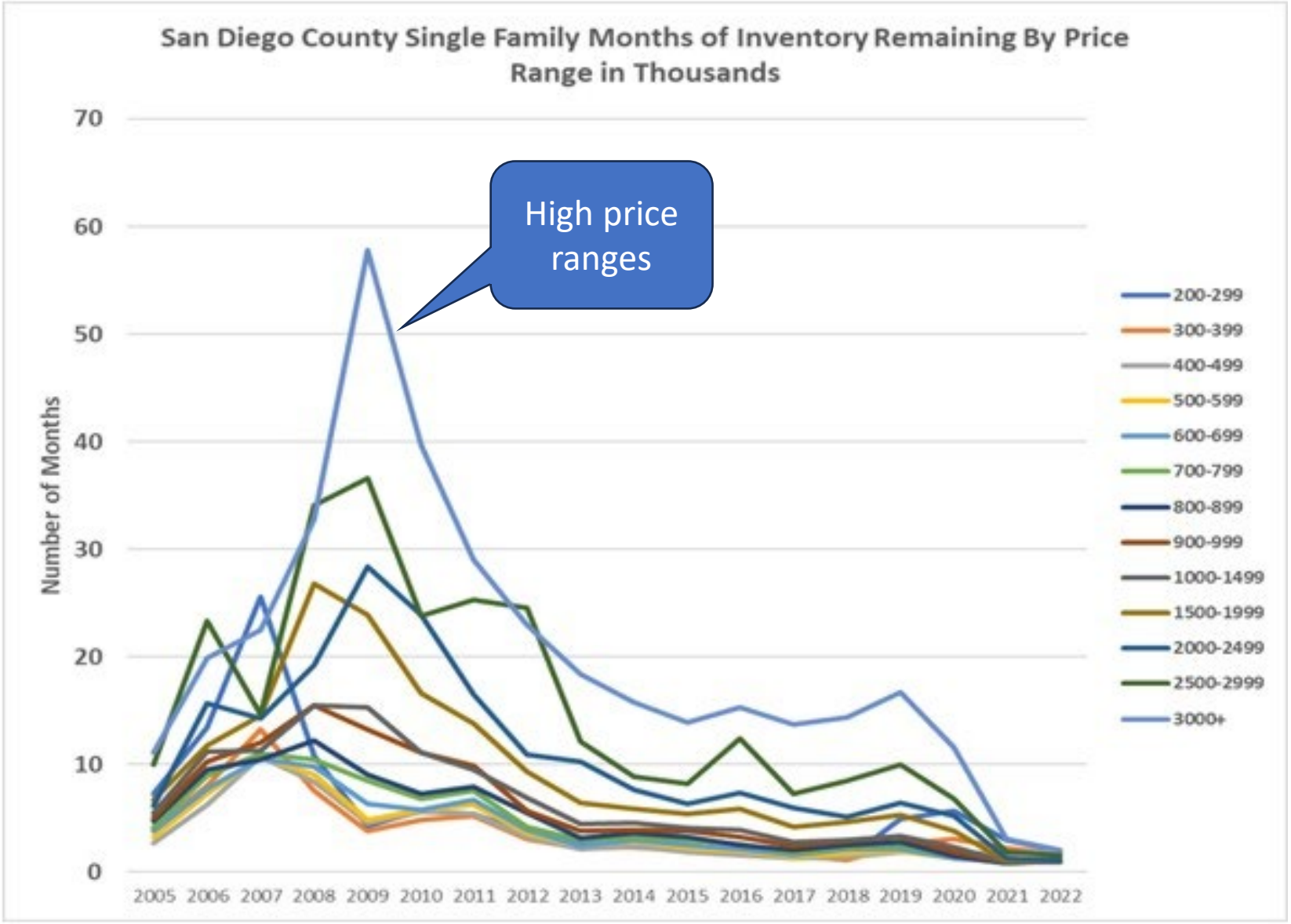
We note that for the US Months Remaining Inventory (MRI) leads Price Changes by 2 to 6 months but even a year ahead we see a strong correlation



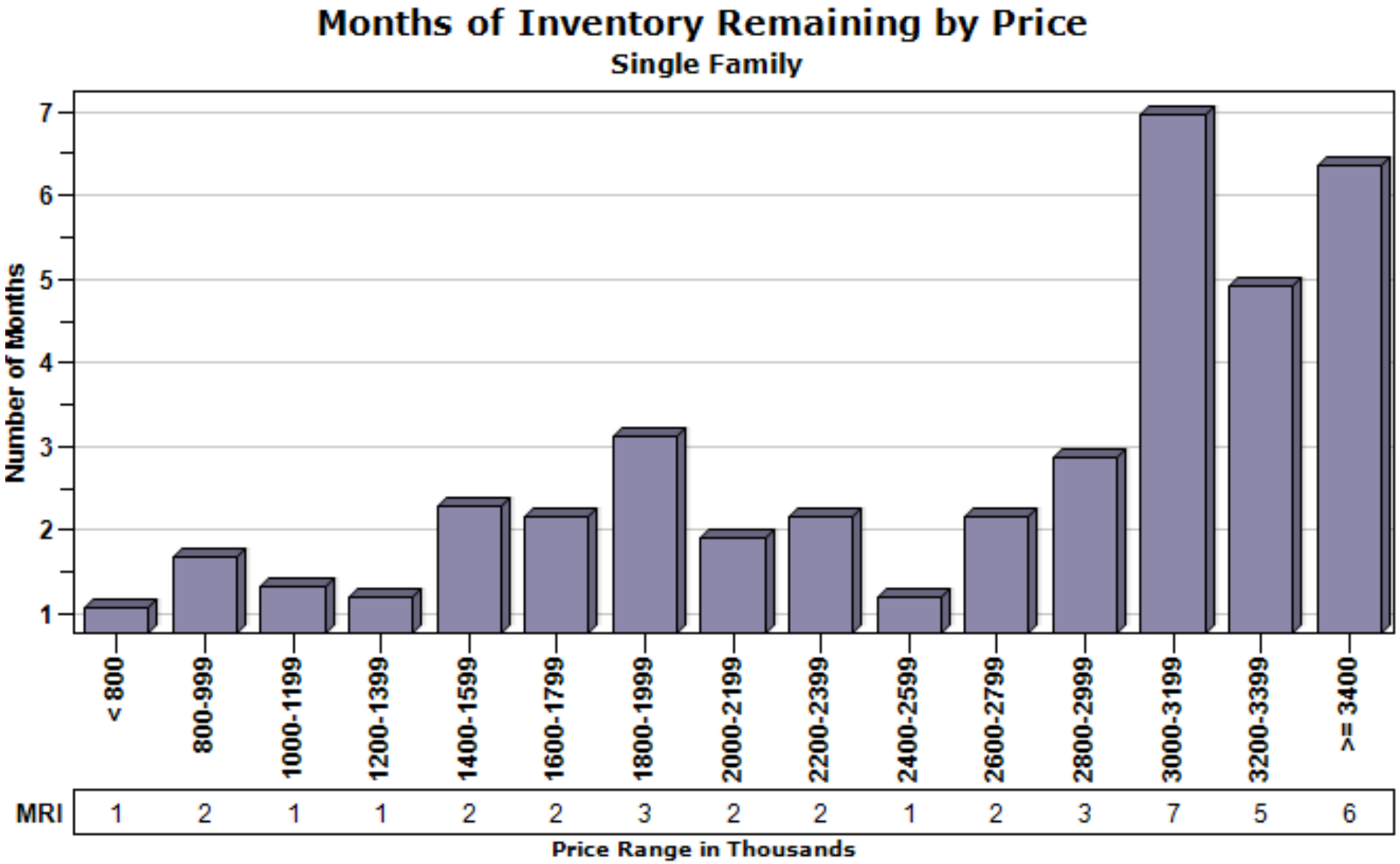
This is US Data 1993 to Jan 2023 (Shifted 2 qtrs.)



For all metros the MRI has been declining until recently. Here is San Diego through 2022



Months of Inventory Remaining for Single Family in San Diego in June of 2024

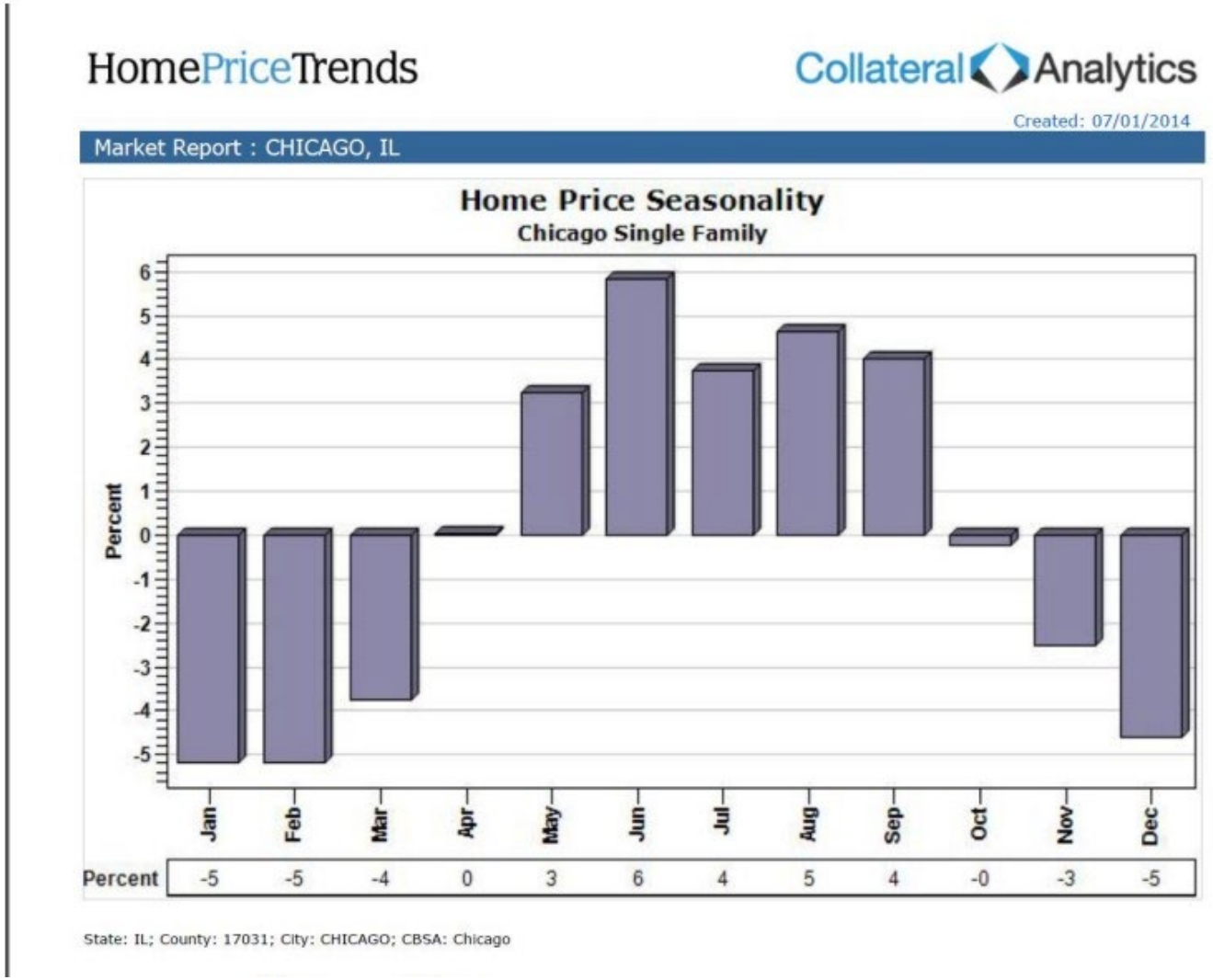


Anything under 3 months is considered low. These figures are up significantly from a few years ago, but still low.

When to buy or sell aside from MRI? Price seasonality is significant!

When you value properties matters.

Markets exhibit consistent seasonal patterns, i.e.



When you value properties matters.
Markets exhibit consistent seasonal patterns, i.e.

HomePriceTrends

Collateral Analytics

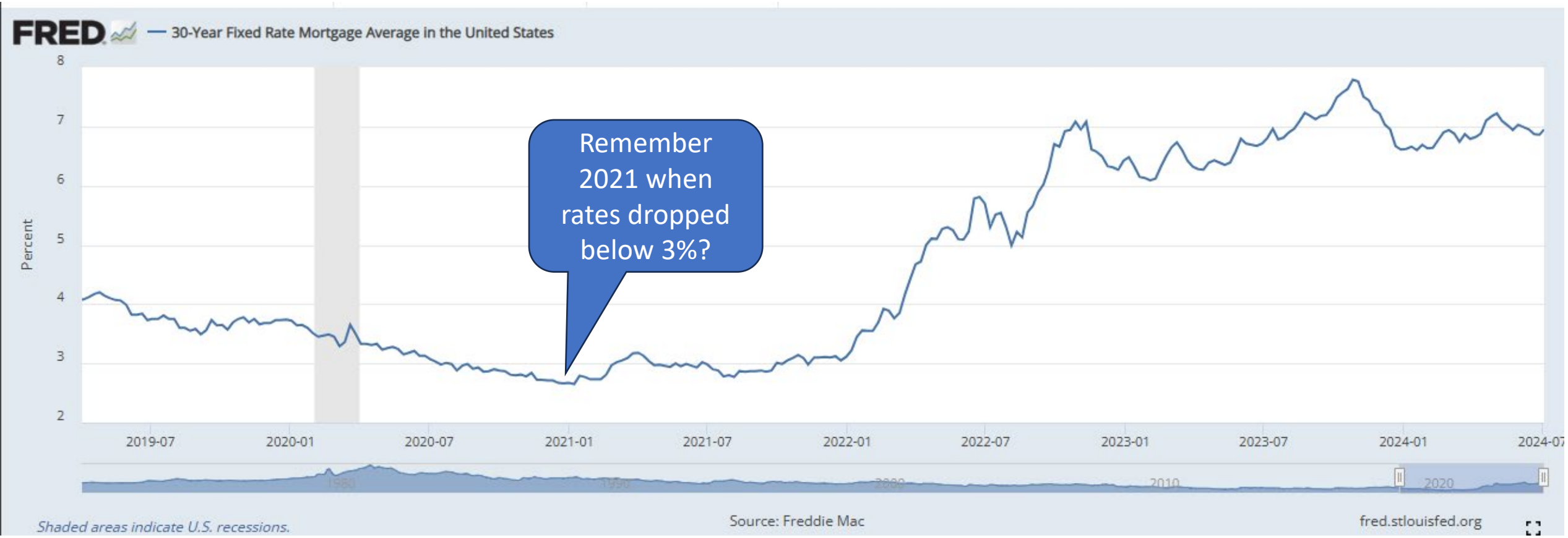
Created: 07/01/2014

Market Report : CHICAGO, IL

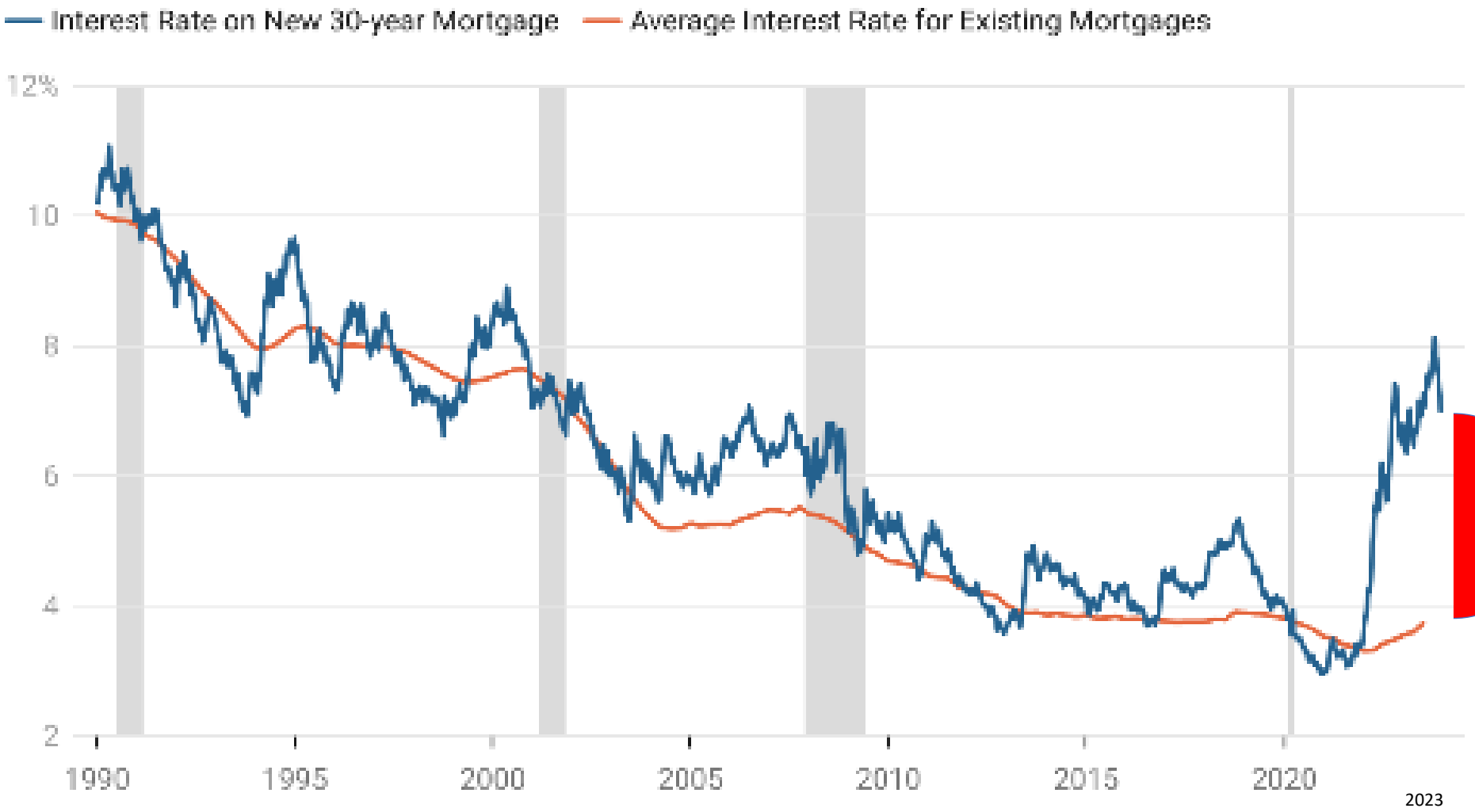
If property is appraised in Jan. versus June there is a 10% difference in price per sq ft.

State: IL; County: 17031; City: CHICAGO; CBSA: Chicago

How have the higher mortgage rates affected the market? Or how have the artificially low rates affected the market?



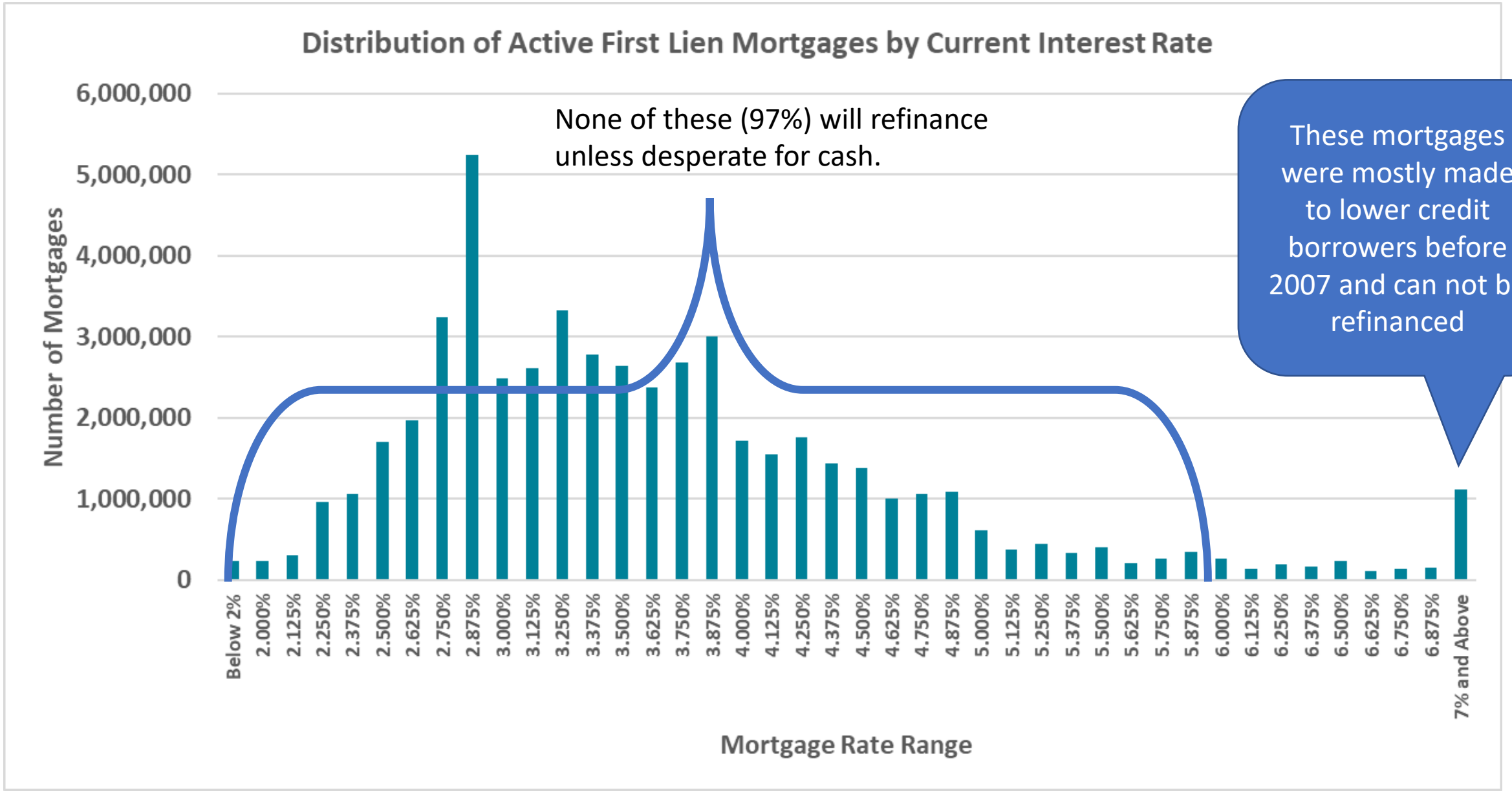
Interest Rates Weigh On and Lock In Housing



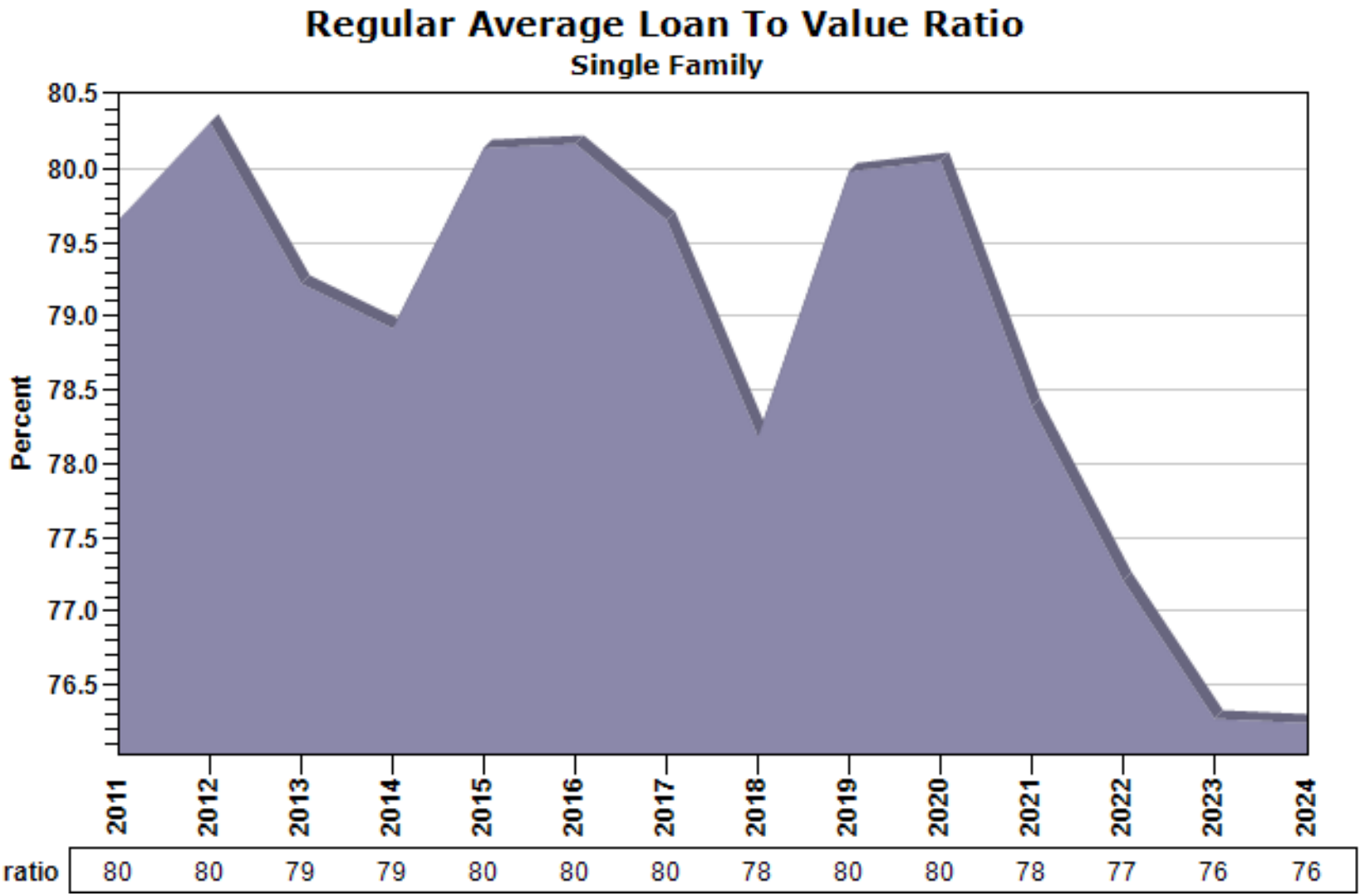
Largest gap ever between existing rates and current rates

Source: Mortgage Bankers Association, Bureau of Economic Analysis

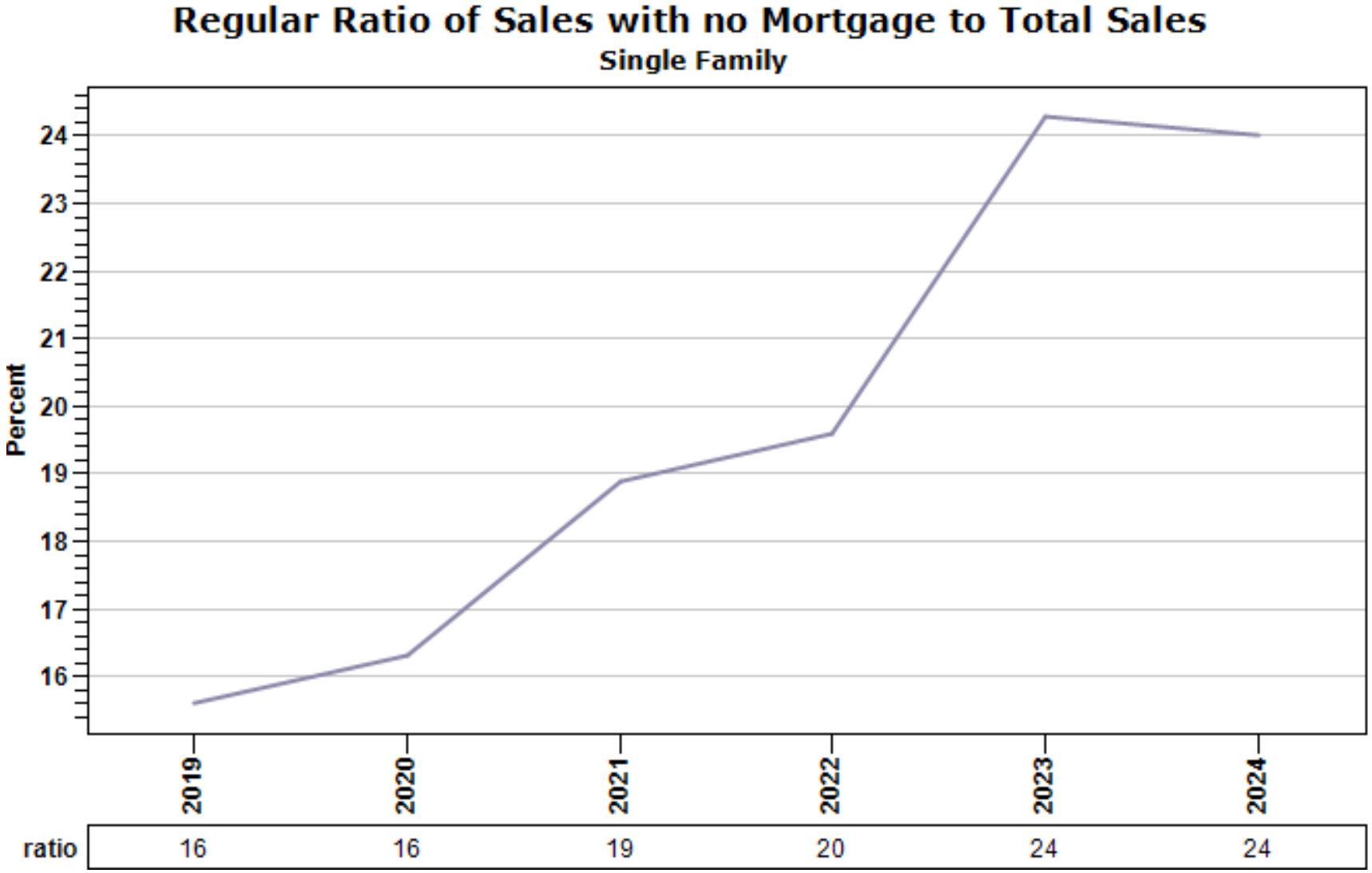
Rooted sellers 2024



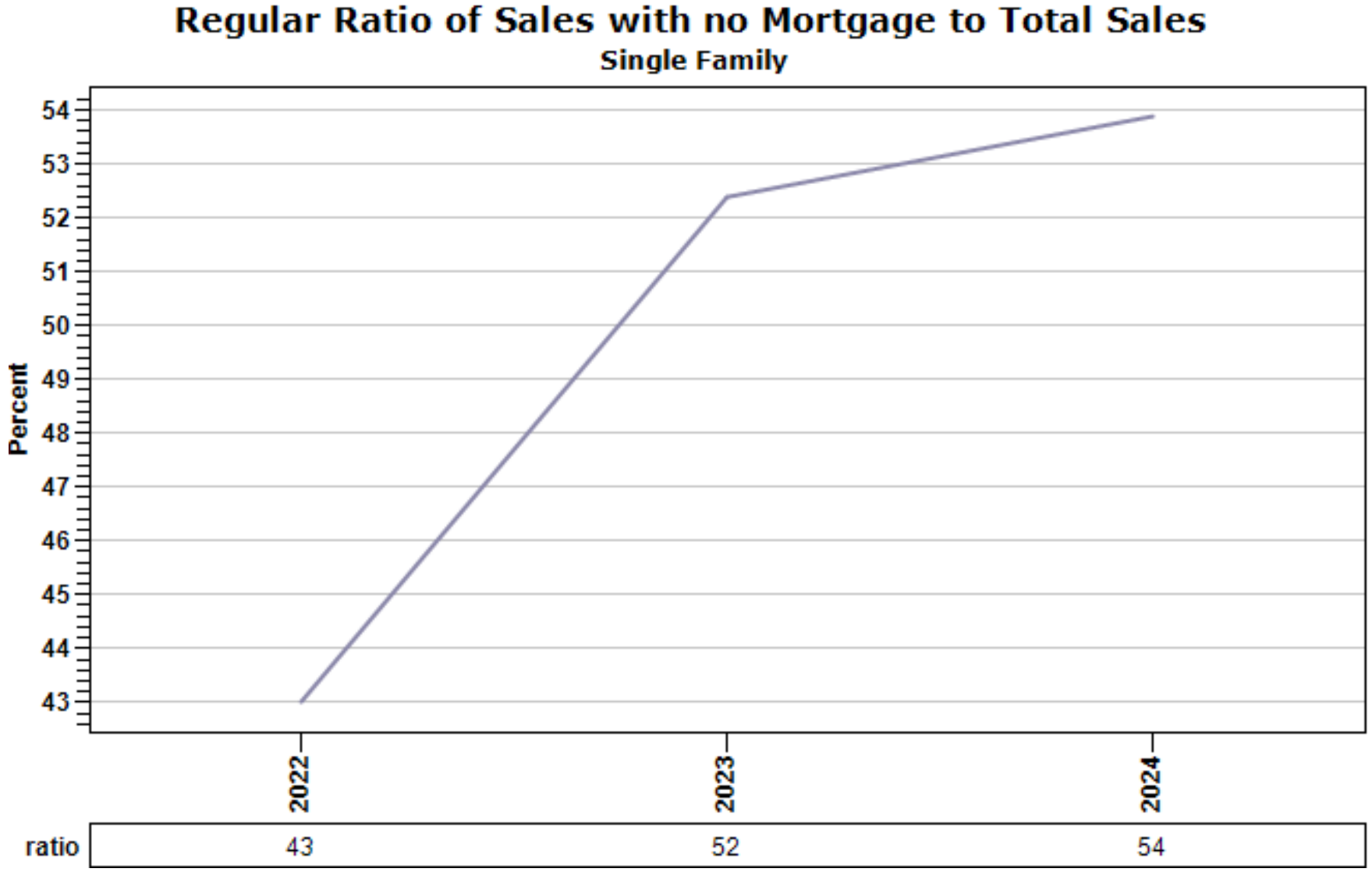
People are borrowing a slightly lower percentage of the home price.



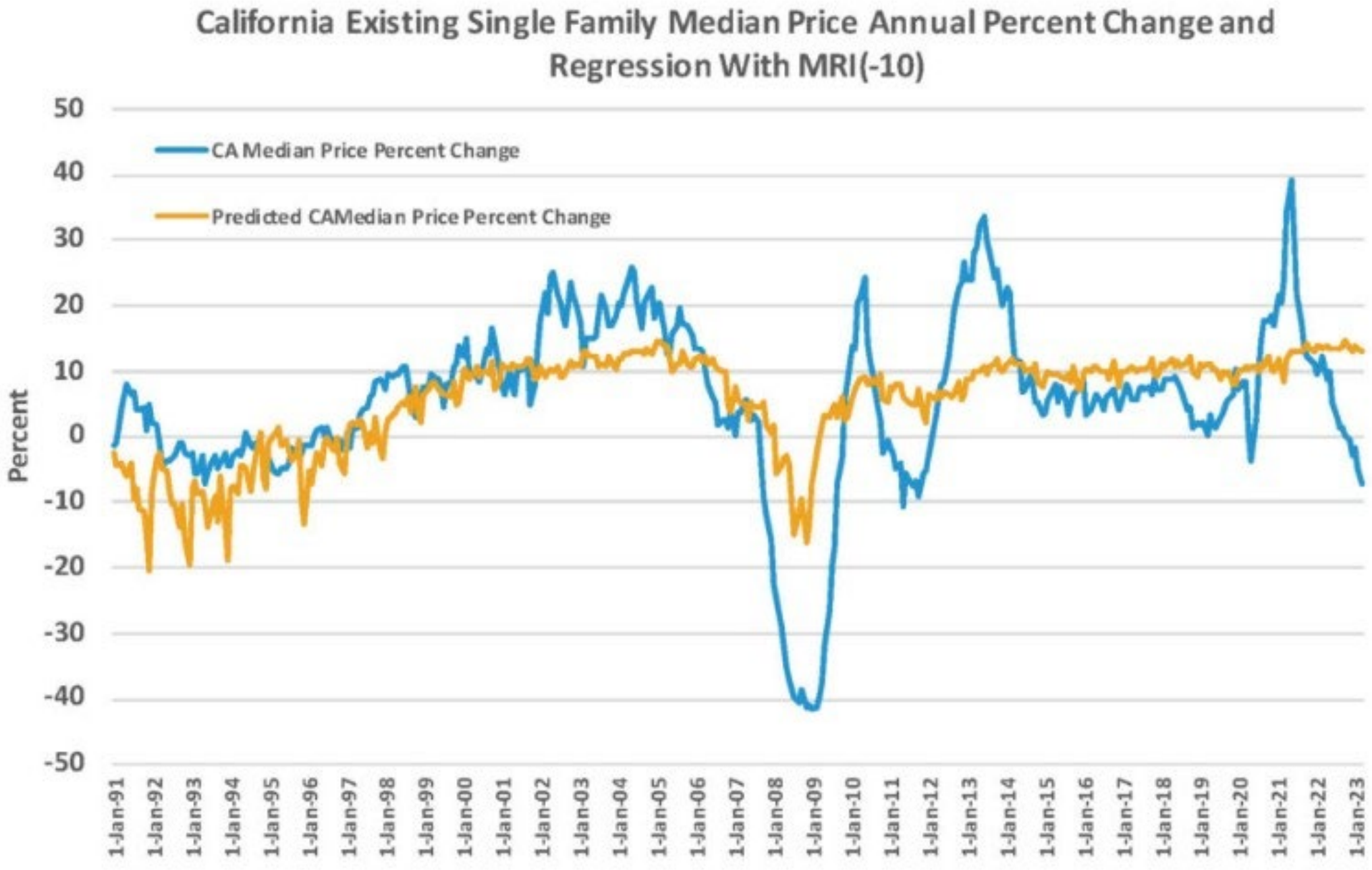
The percentage of homes being sold **all cash** is now 24% of all sales, but first-time home buyers are in trouble with rates at 7.0% and insufficient equity to borrow less.



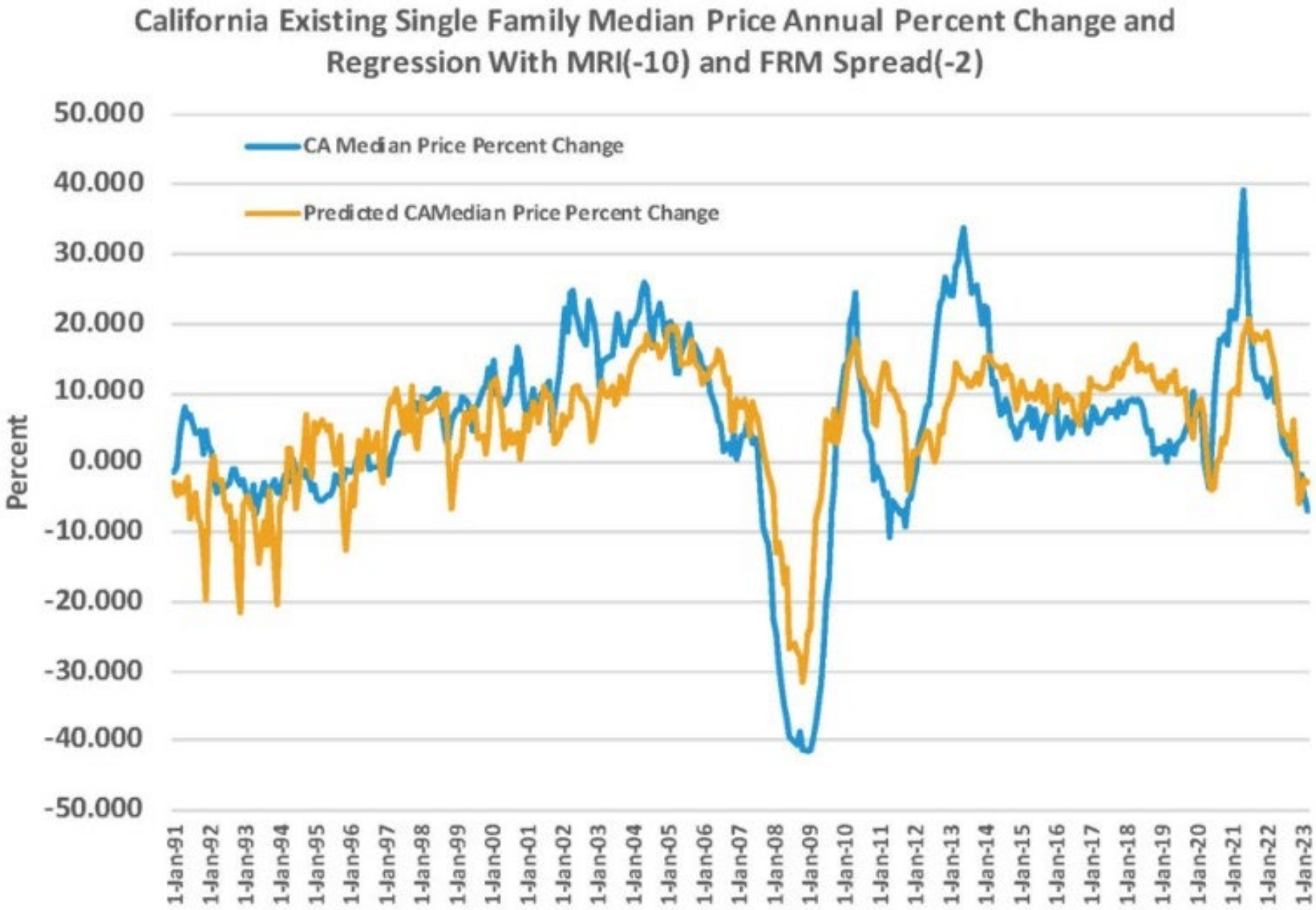
For homes over $3 million, **more than half** are now **all cash** purchases. This segment of the market is driven by the stock market as much as by interest rates.



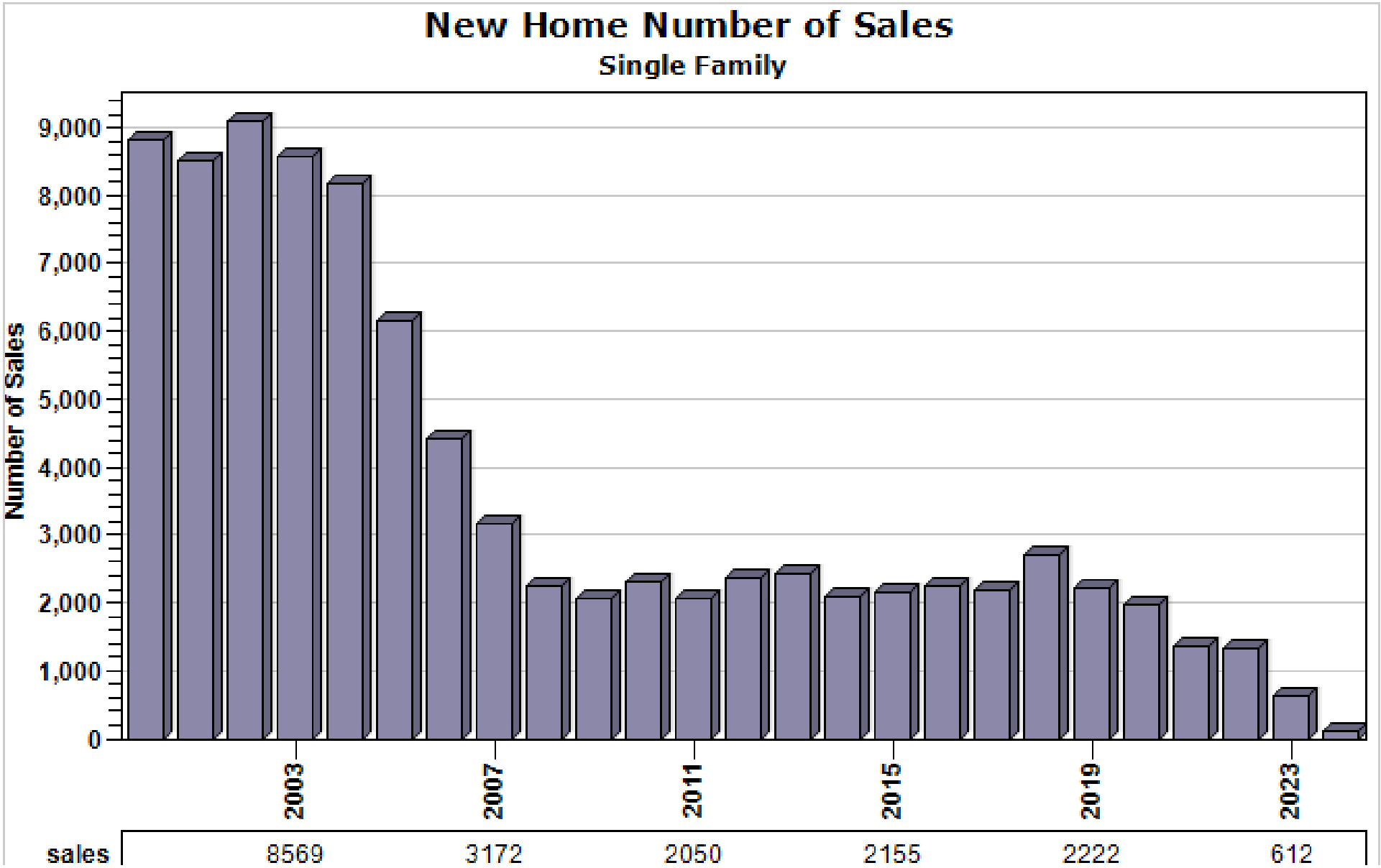
If we try and predict prices with only MRI it does not work that well



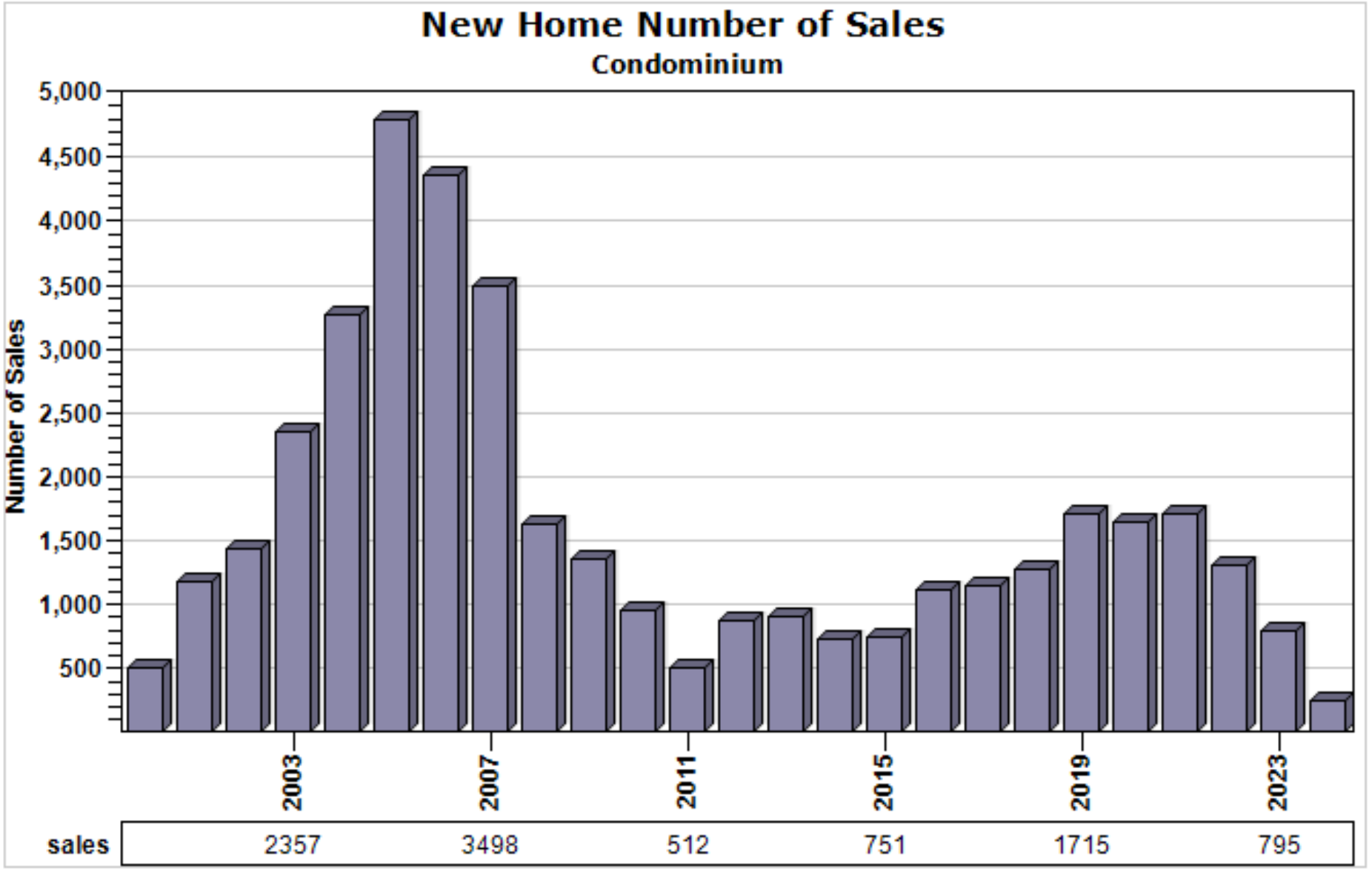
Now add interest rates and it works much better



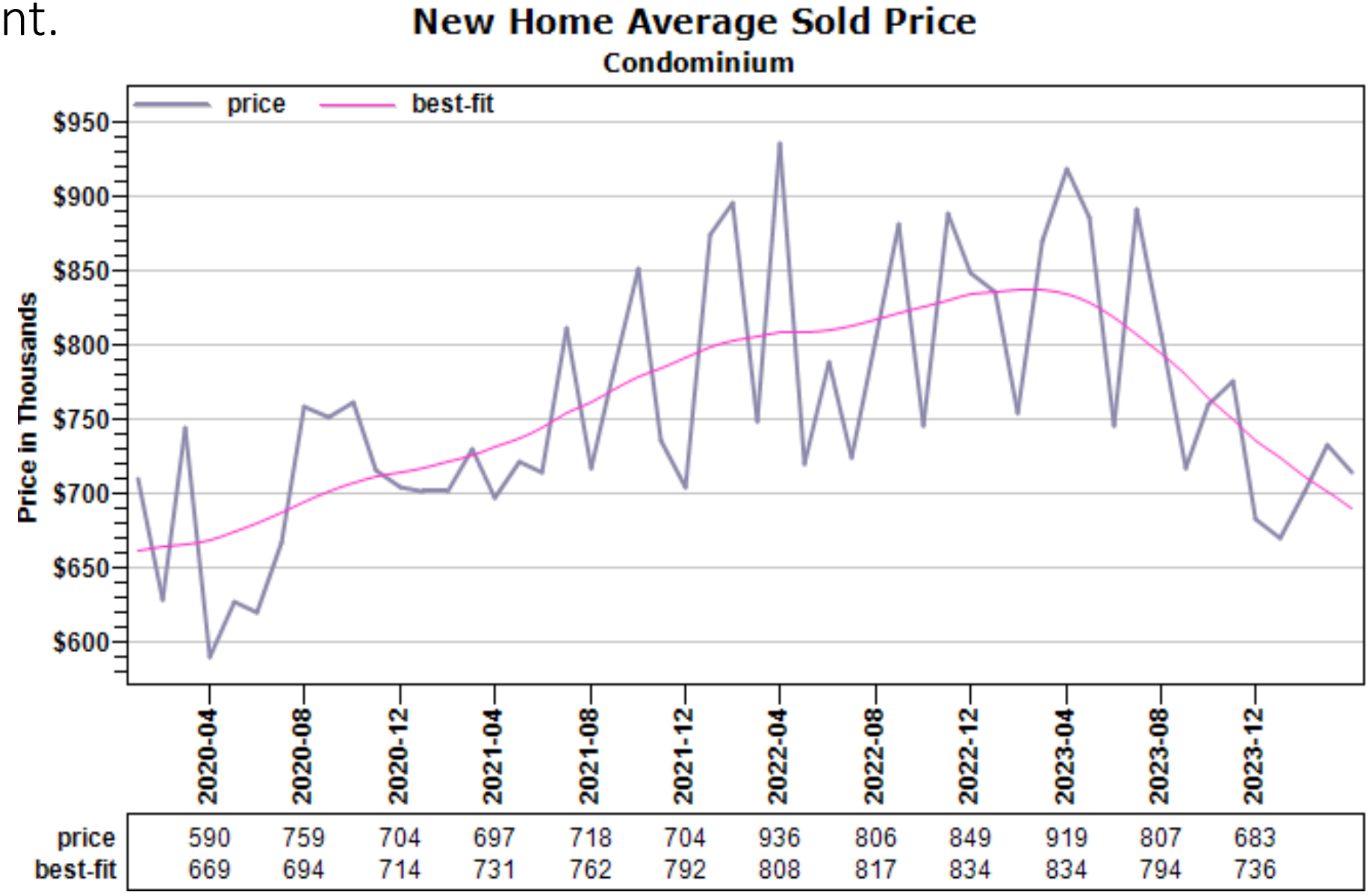
San Diego County Number of New Home Sale: SF by Year



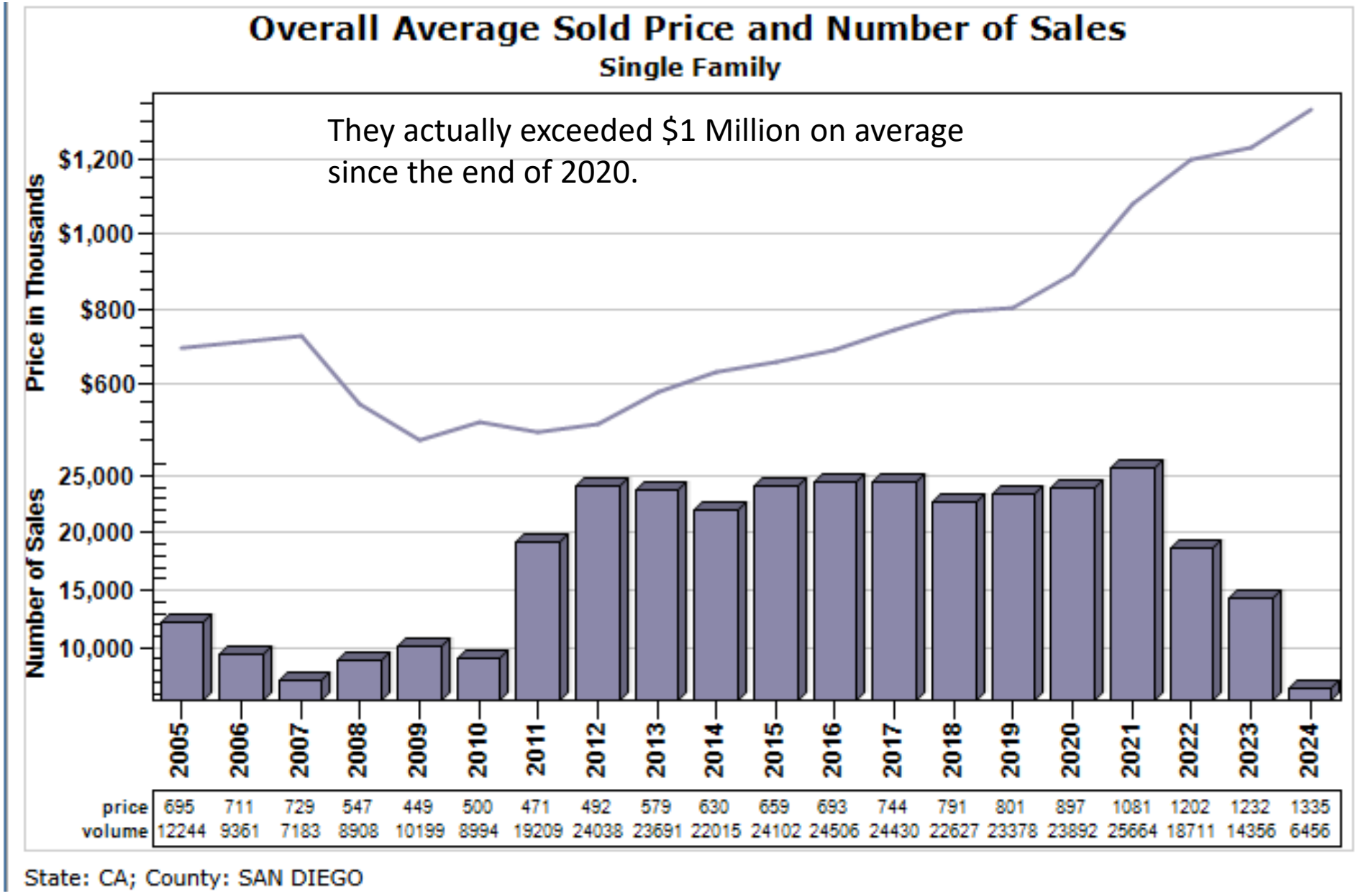
San Diego County Number of New Home Sale: Condo by Year



Note that **new** condo sales prices have softened while existing SF unit prices have started to flatten. The condo segment of the market is more interest rate dependent.



San Diego SF Home Prices Now Exceed $1.33 million on average



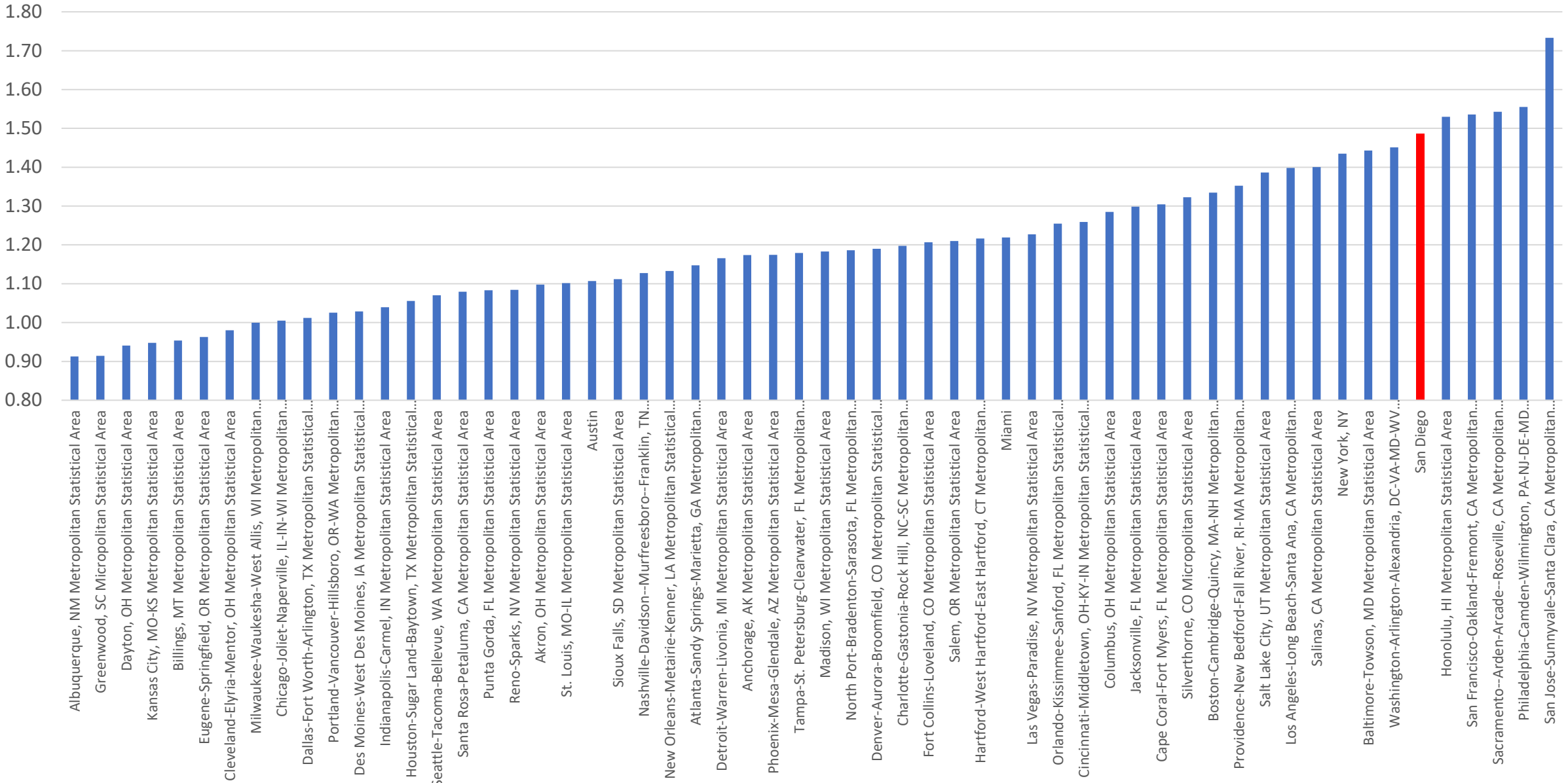
Are NIMBYs to blame for our housing prices?

The Hoyt Index is based on these measures

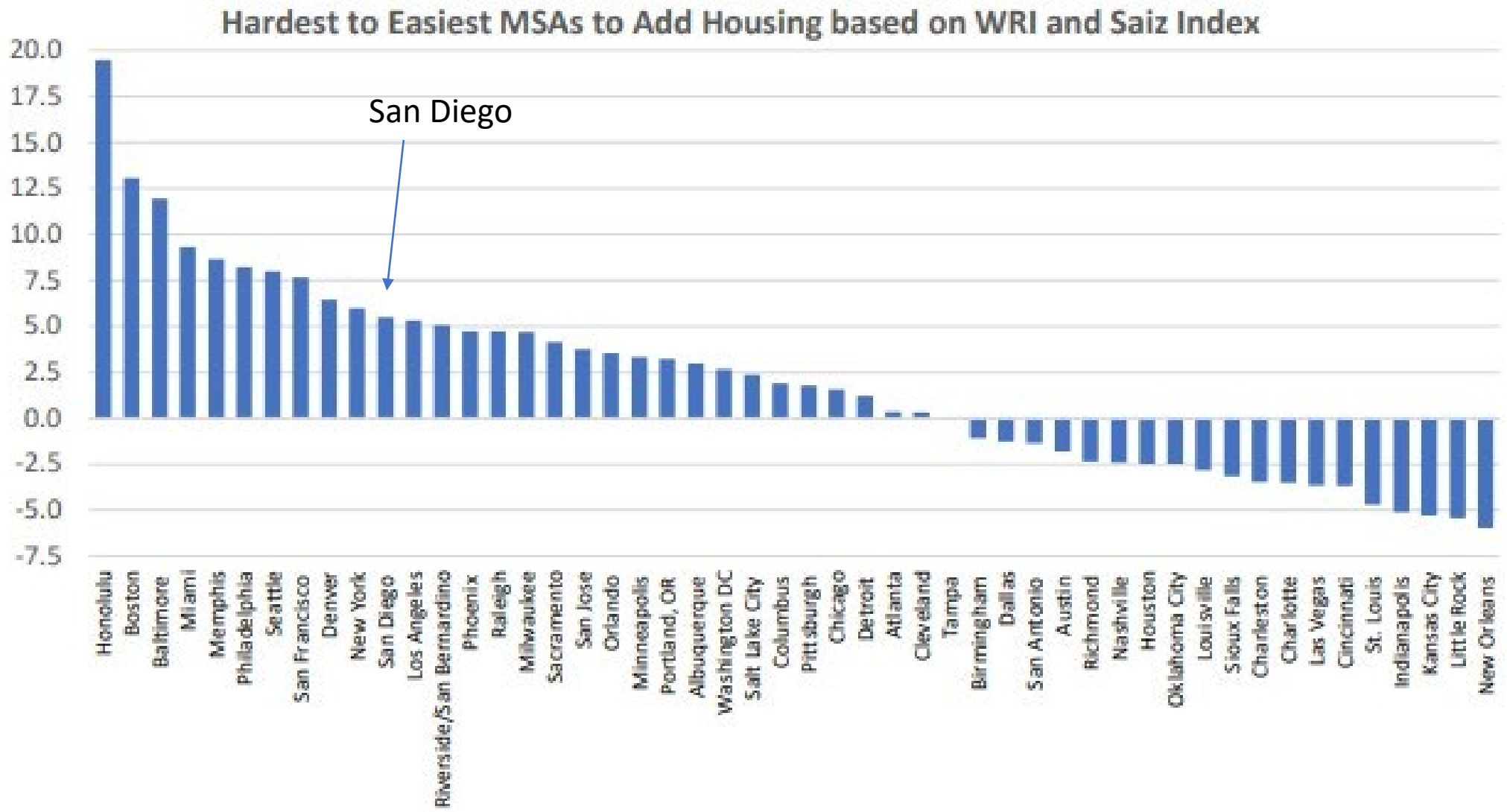
- ✓Community Involvement in Entitlement Process: **NIMBYs**
- ✓Construction Costs
- ✓Land Availability based on natural and political constraints
- ✓Infrastructure requirements
- ✓Environmental restrictions and regulations, i.e. CEQA, CA Coastal Commission
- ✓Process complexity (modification or starting from scratch with each change)
- ✓Time required to get approvals (One Paseo took 11 years)

Easiest to Hardest to Add Housing Supply Based on Time and Regulation

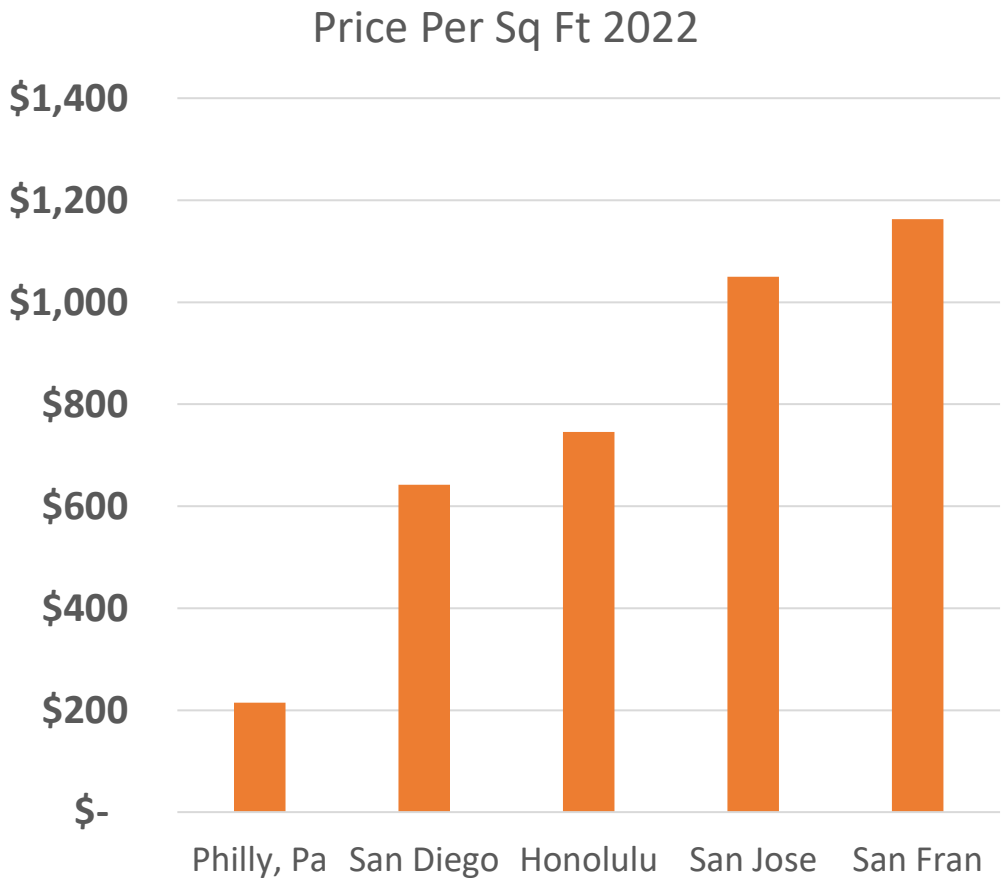
Source: Hoyt Advisory



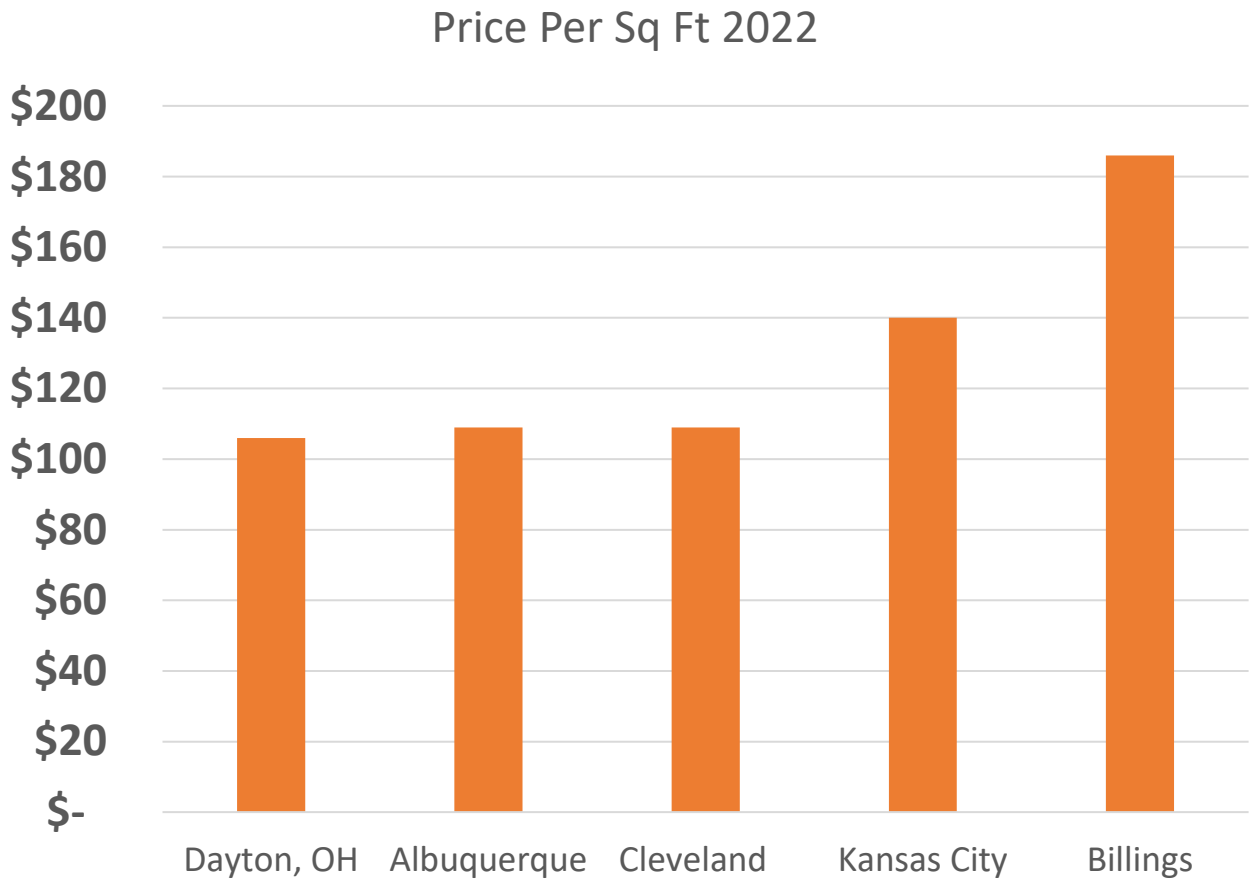
Source: Wharton Regulatory Index



Prices Reflect Difficulty of Development and Economic Growth



Supply Inelastic



Supply Elastic

Thank you for your attention!