



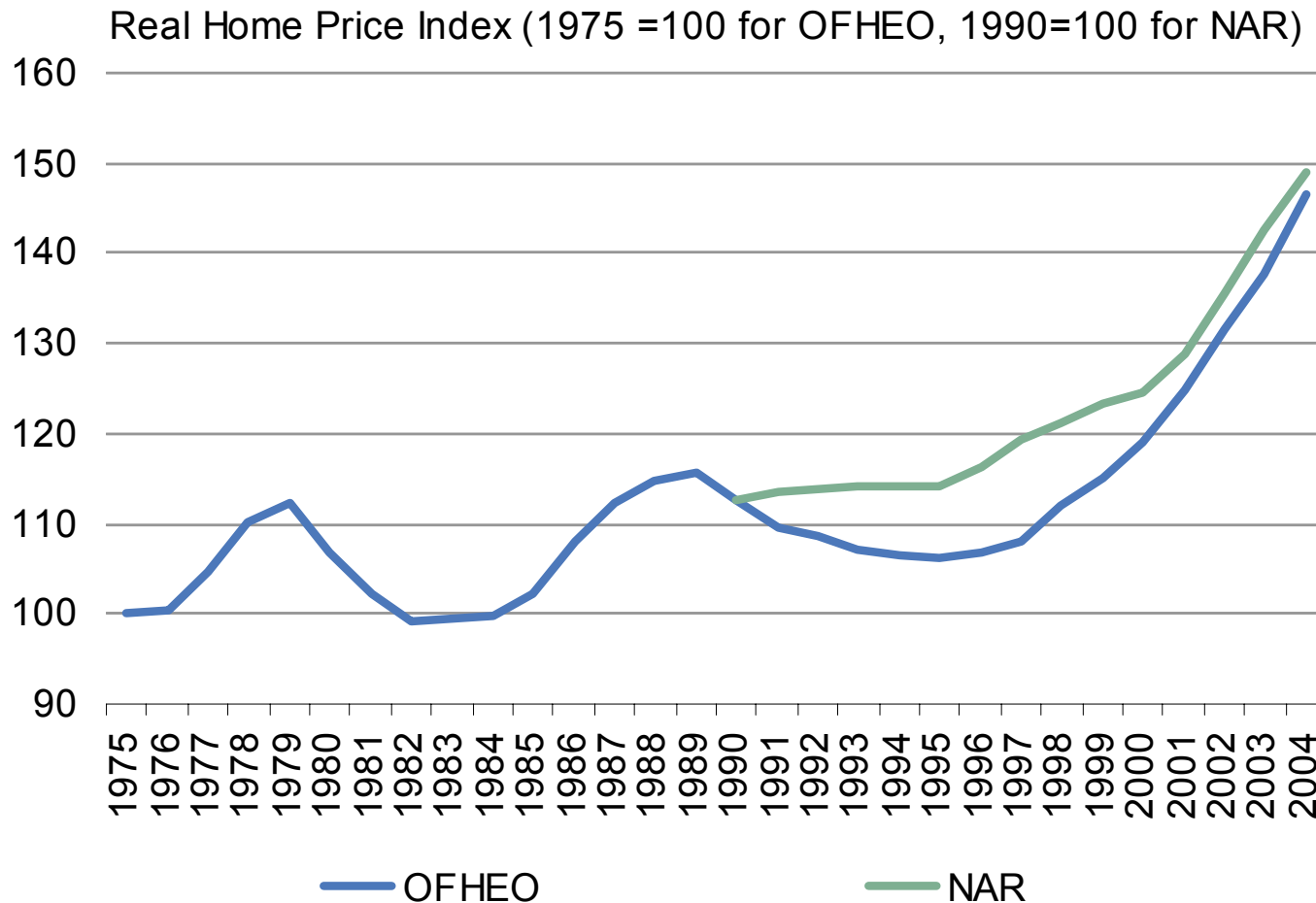
Is There a “Bubble” in US Housing Markets?

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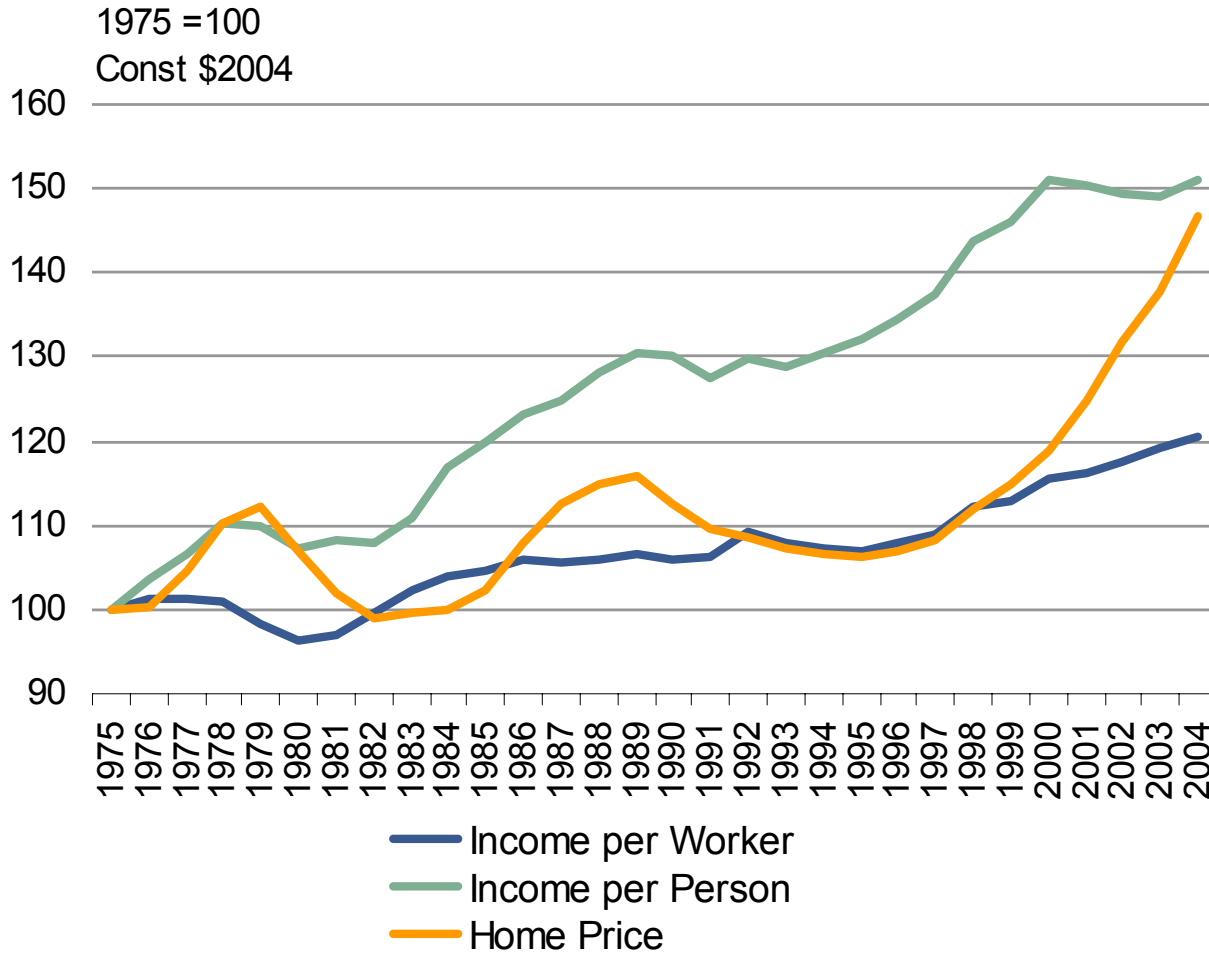
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Measuring Prices: $Exp = Price \times Q$ (consumption)
 $E = NAR$, $P = OFHEO$, $Q = \text{“housing quality+quantity”}$



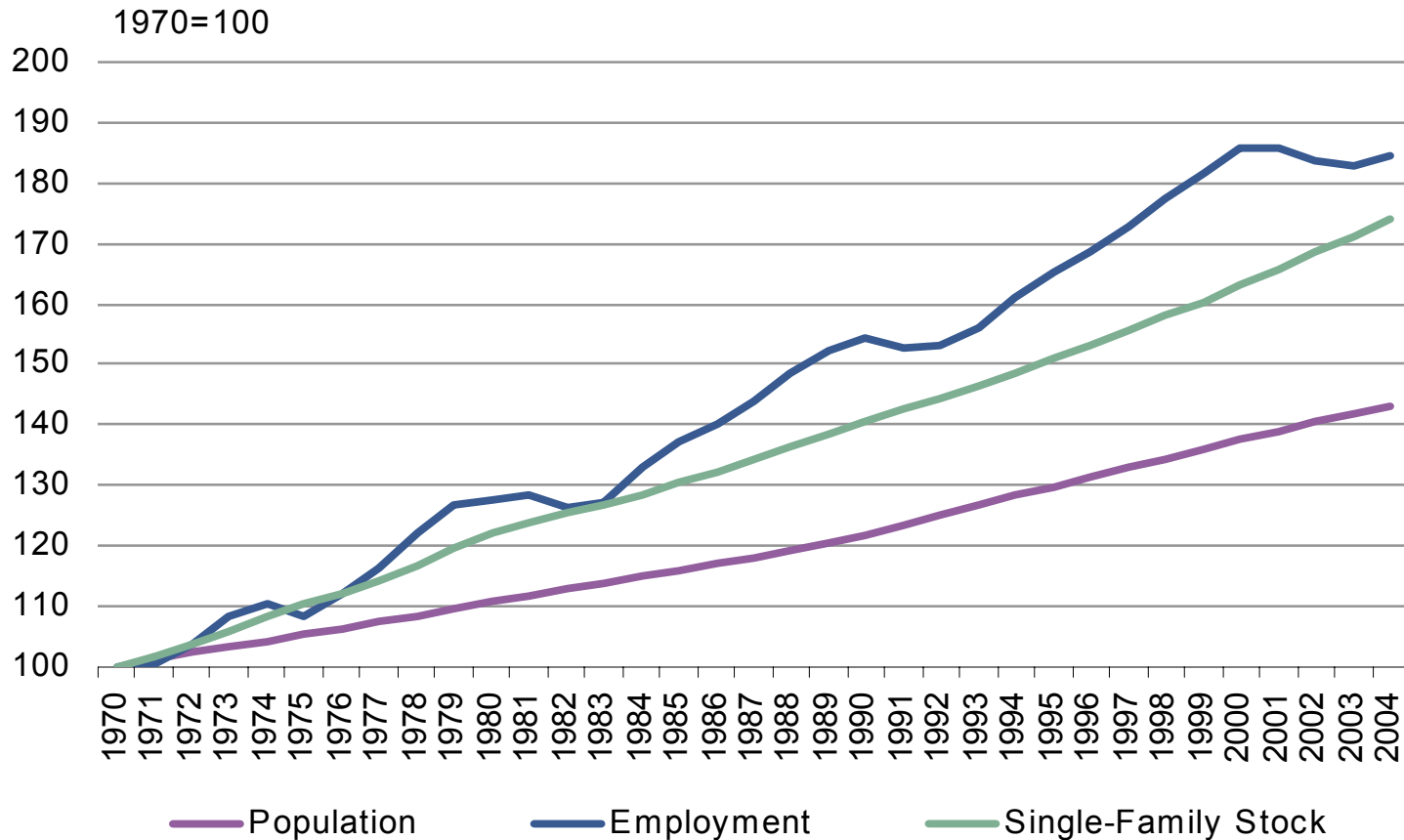


US Housing: prices versus ability to pay (what about the last 3 years?)



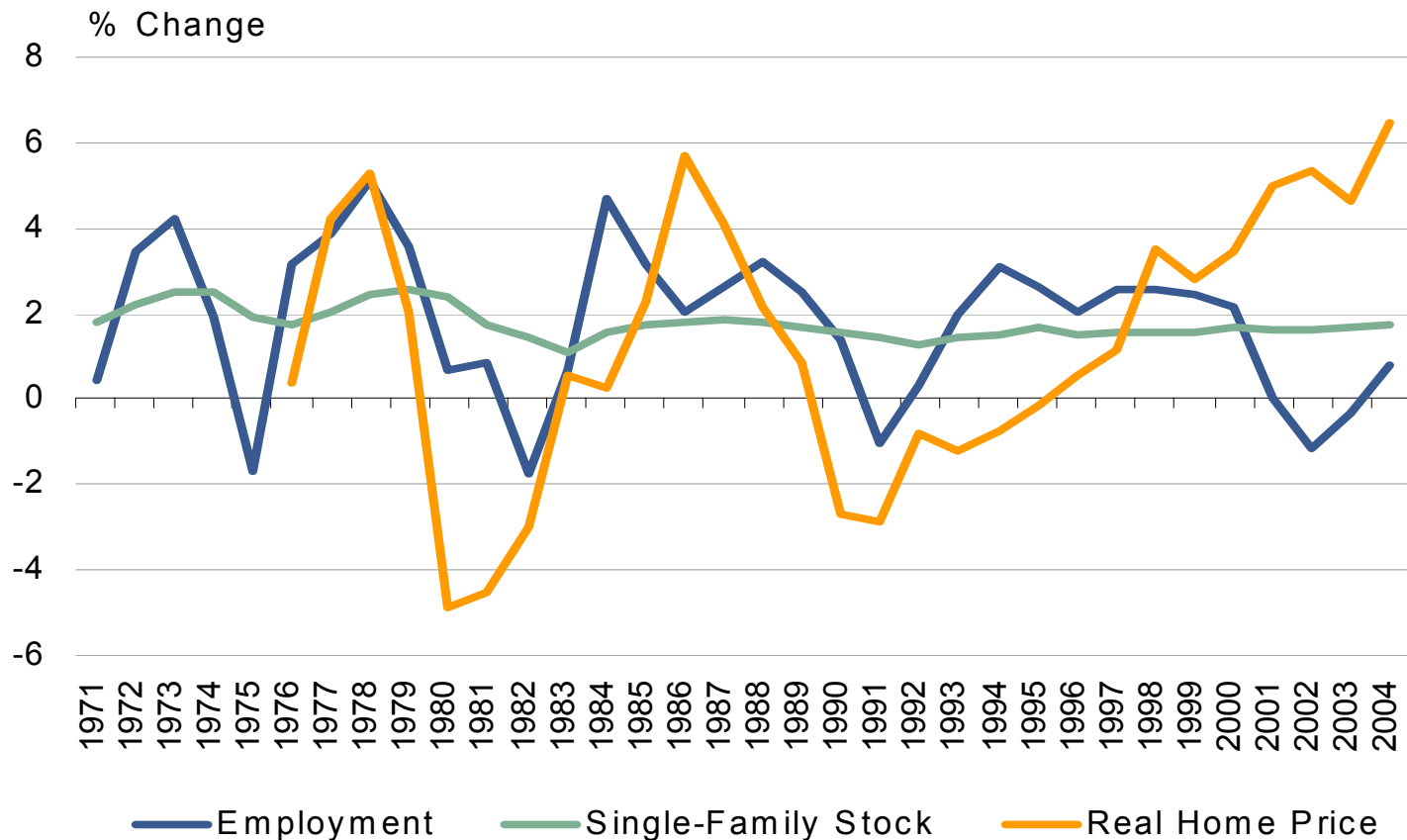


US Housing: stock versus unit demand: right in line with estimated households





Flows and Changes: highly correlated with the Economy *(except for 2001-2004)*





What is a Real Estate “Bubble”?

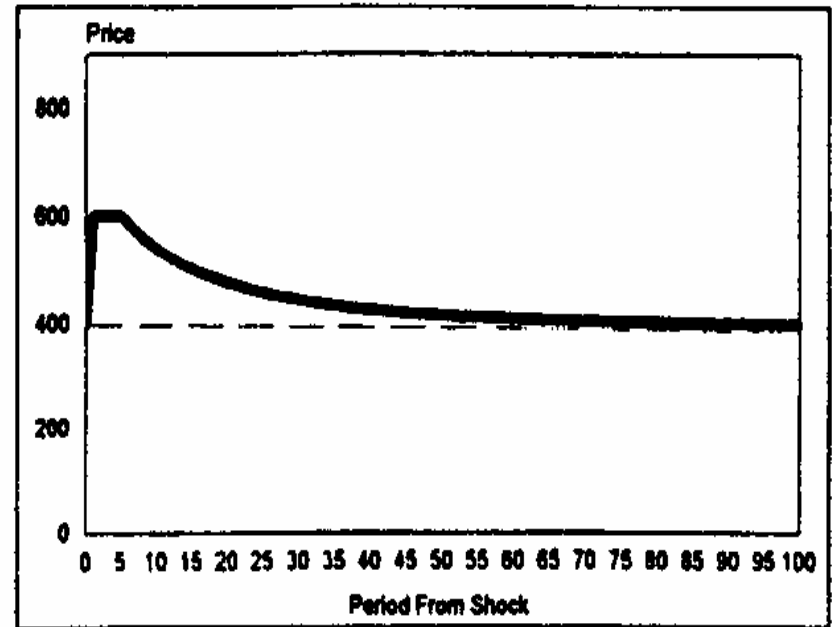
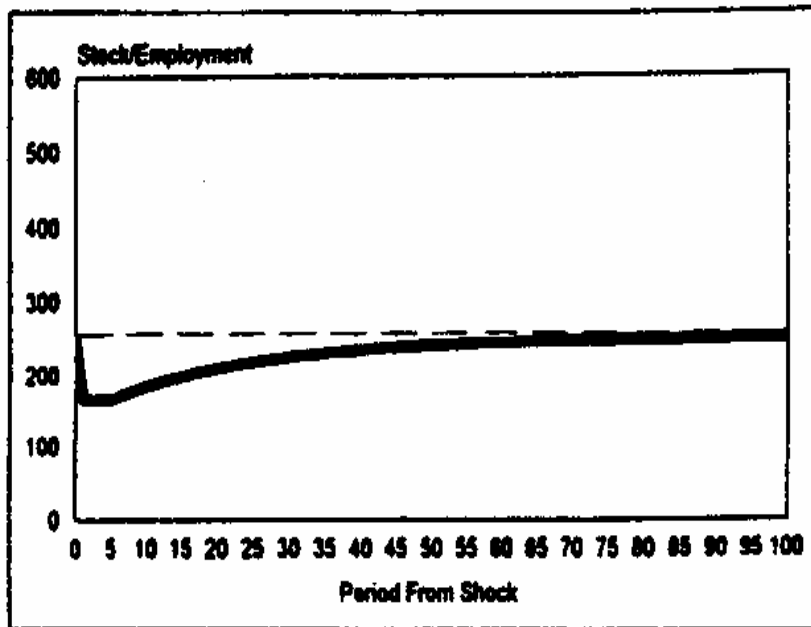
- **Definition A:** repeated ups and downs in prices with the appearance of some predictability, but with no implication as to cause.
 - Up and down economic shocks to the Housing market?
 - Inherent cyclic dynamic by the market to shocks?
- **Definition B:** a run up in prices specifically caused by *unsustainable beliefs* on the part of market participants.
 - How to assess? Certainly not with aggregate data.
 - CSW/FISERV recent buyer survey.



Market dynamics with “Bubble Definition A”

Response of Prices to demand shock (greater employment):
Intrinsic “mean reversion” as supply kicks in .

Figure 2 ■ Market reaction to a 50% demand shock (lag: $n = 5$; depreciation-growth: $\delta = 0.05$; demand elasticity = 1.0; supply elasticity = 1.0).

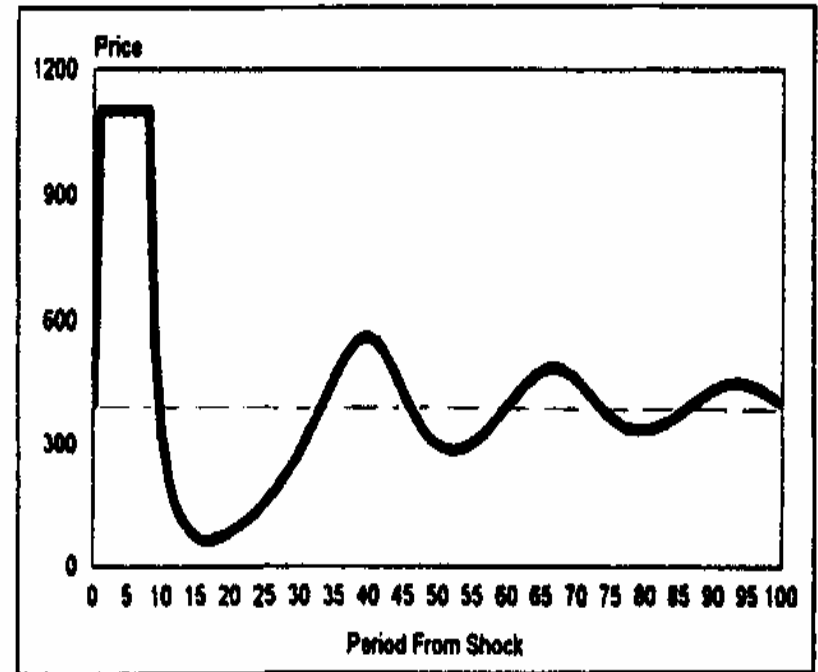
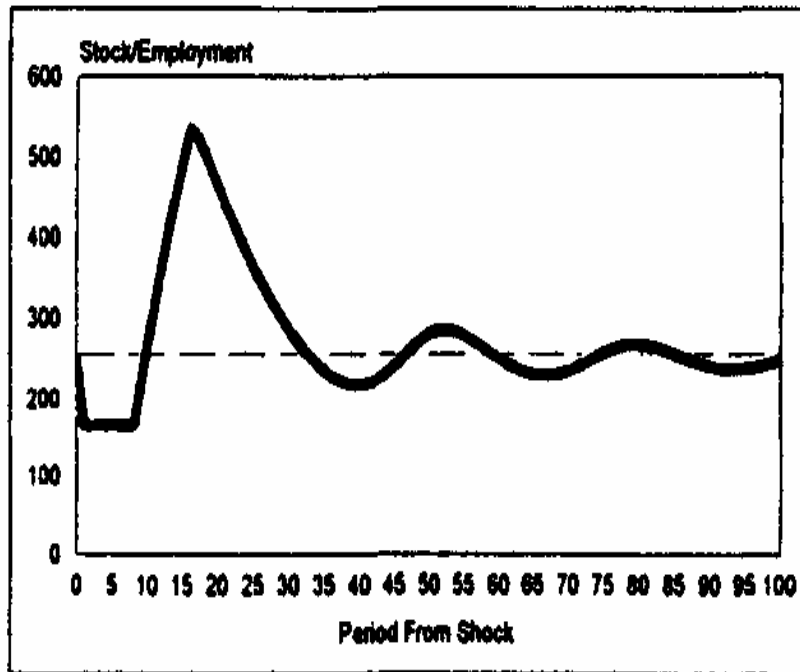




Market Dynamics with “Bubble Definition B”

In response to demand “shock” new supply “overshoots” generating repeated oscillations or “mean *over-reversion*” .

Figure 4 ■ Market reaction to a 50% demand shock (lag: $n = 8$; depreciation-growth: $\delta = 0.05$; demand elasticity = 0.4; supply elasticity = 2.0).





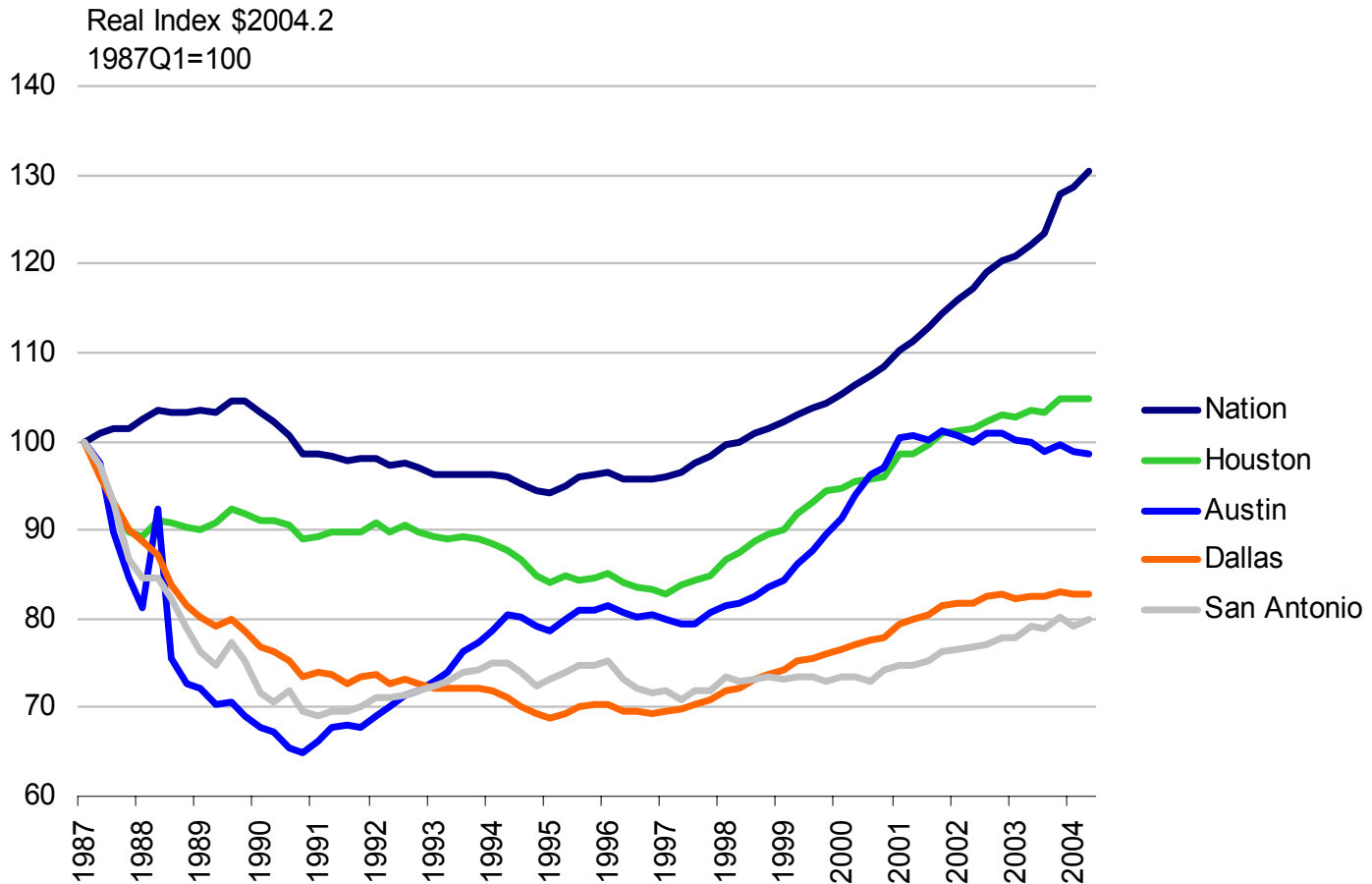
What leads to instability?

- More elastic supply, less elastic demand .
- A high rate of long term demand growth.
- Long Delivery lags for new supply(n)
- Extrapolative expectations (*definition B*) as opposed to forward, efficient expectations by buyers/builders.
- In any case, all models above have “mean reversion” (*definition A*) [Shiller, et. al].
- Empirical application: a 2-variable VAR?



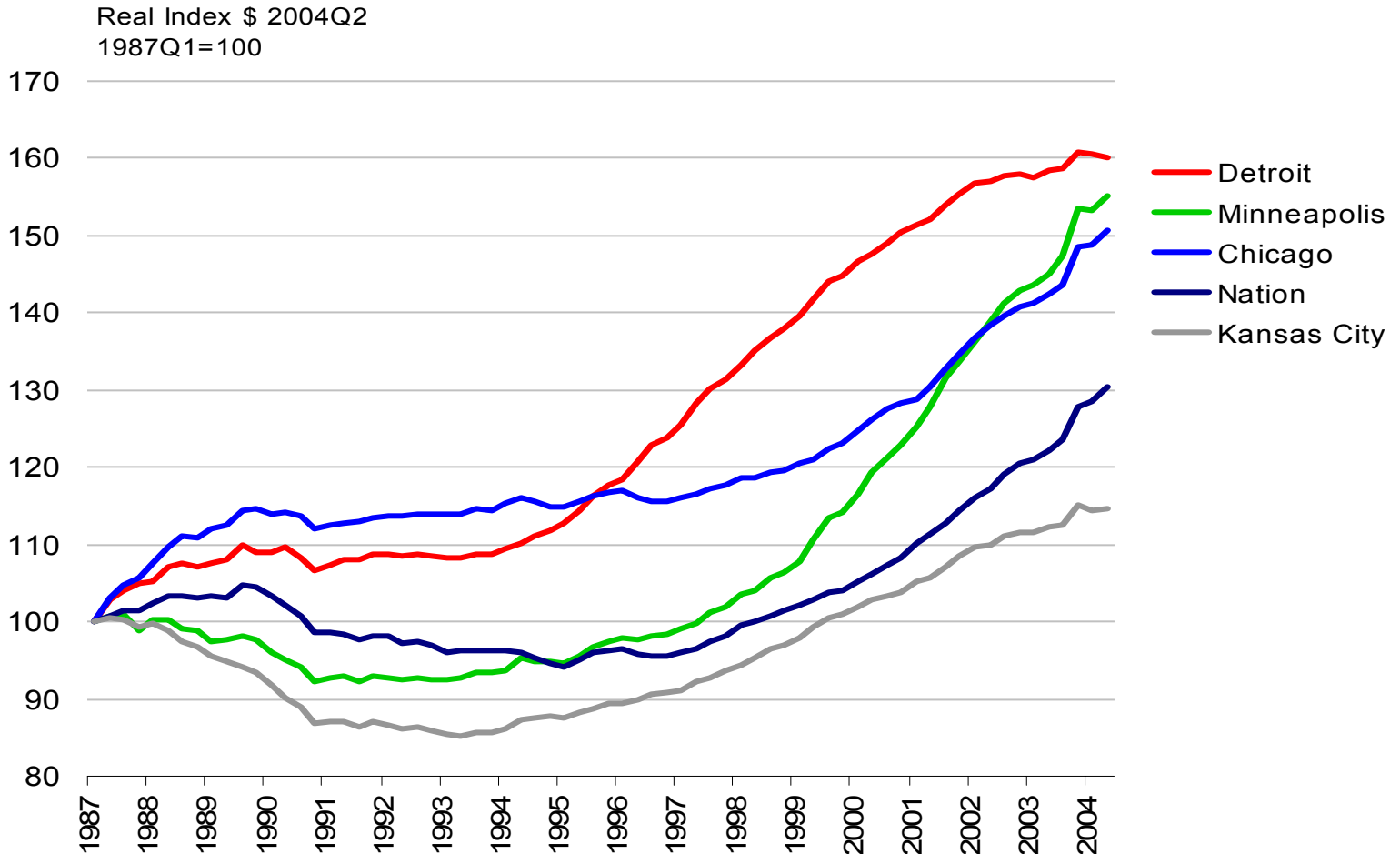
Texas Home Price Appreciation: none!

And there is risk of *nominal* price declines!





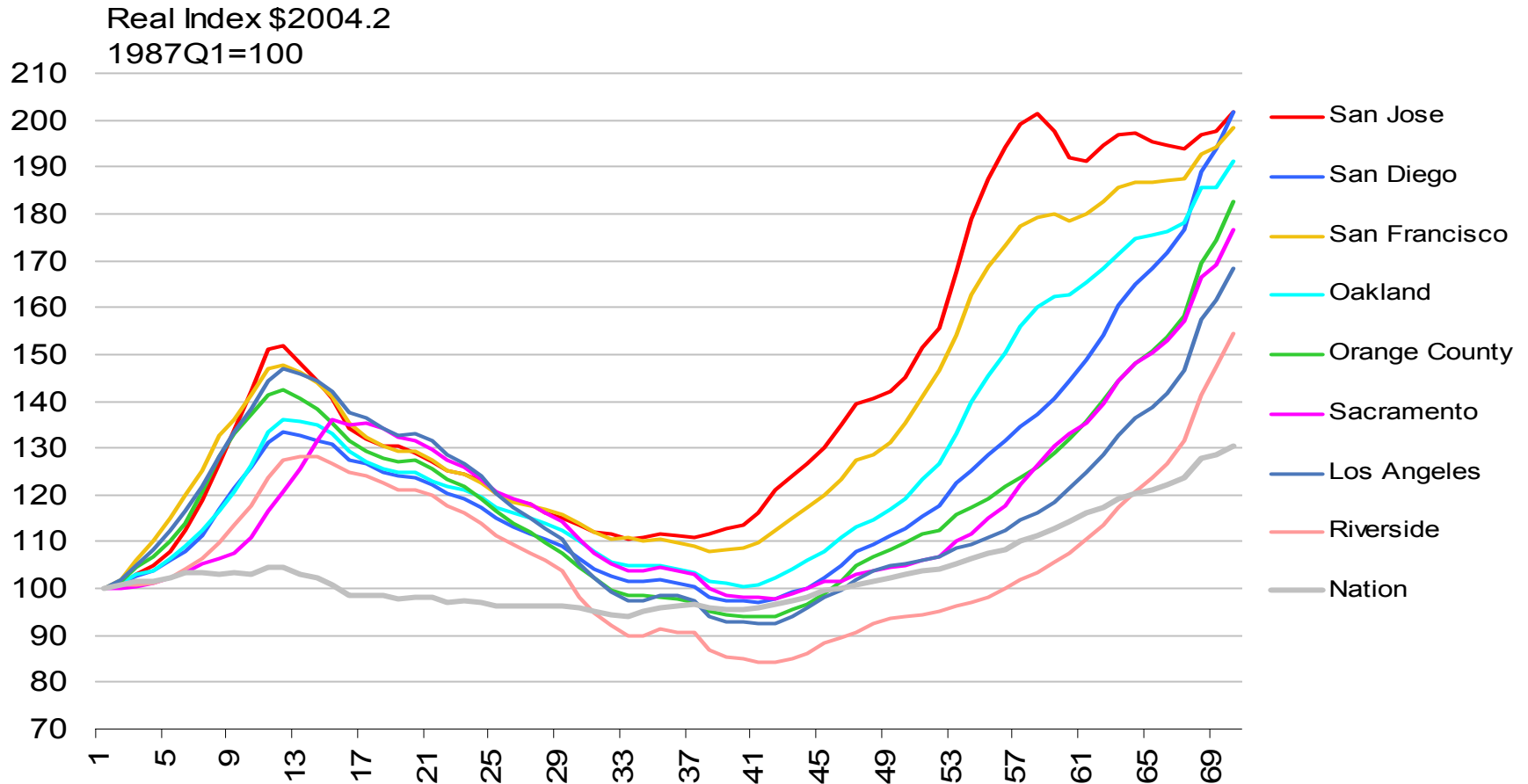
Mid West Home Price Appreciation: surprisingly strong (50% since 1987) but little risk.



Source: OFHEO



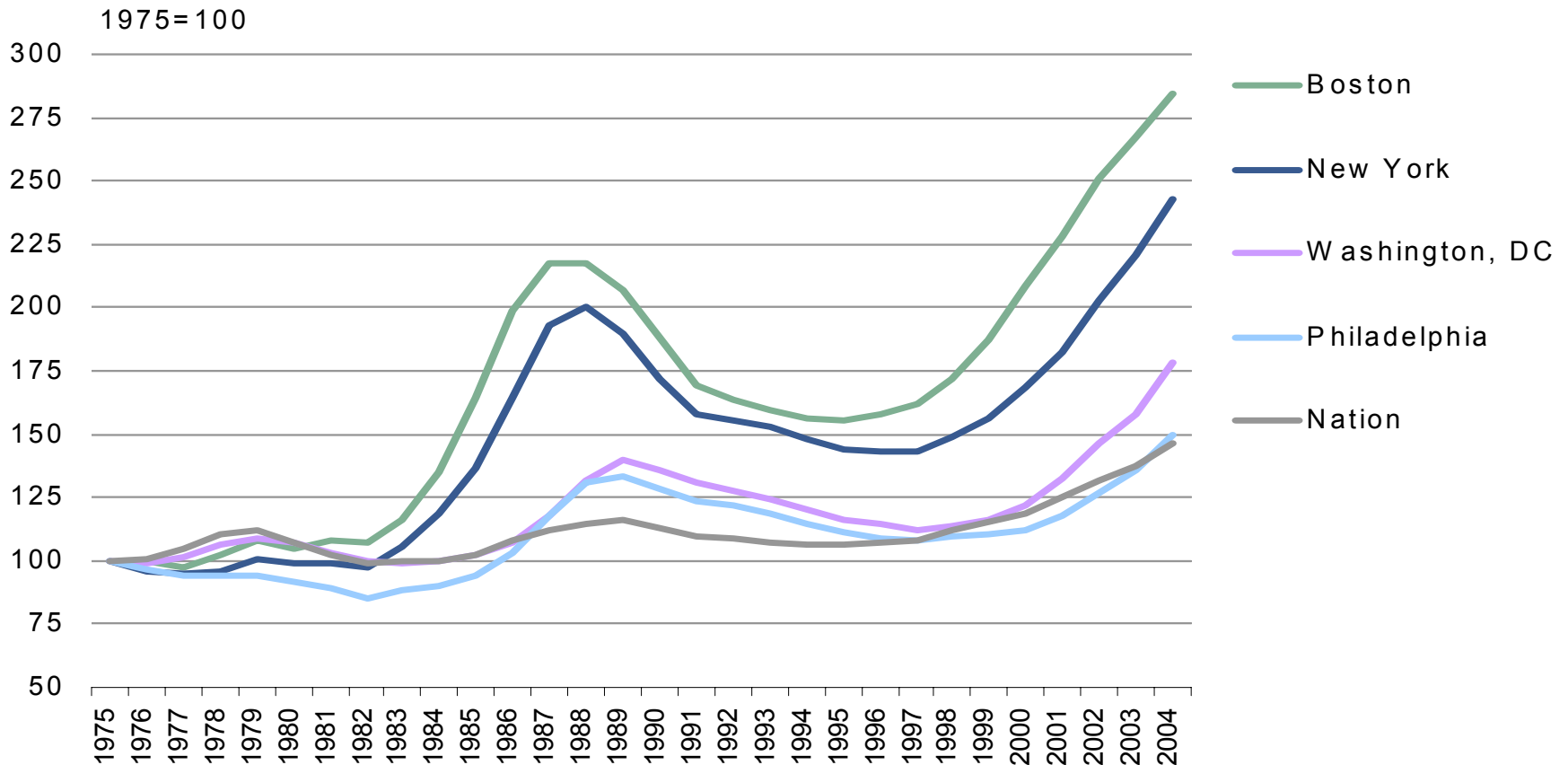
Calif. Home Price Appreciation: highest in the US (75% above 1987) but with great “risk”.



Source: OFHEO

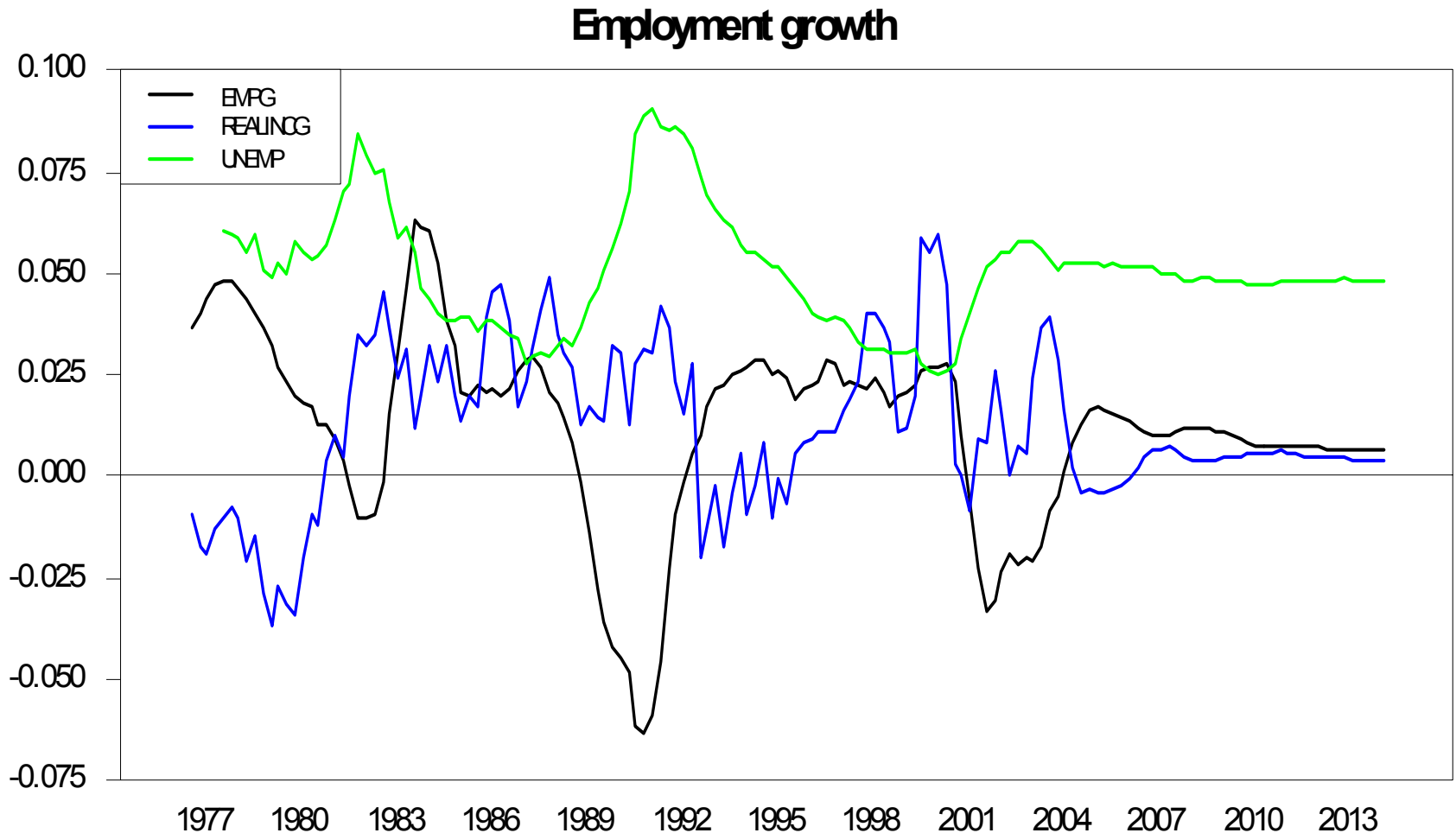


Northeast Appreciation: Lots of risk here too and only 45% ahead of 1987.





**So lets examine the Boston Market in more detail.
Can Prices be forecast? What do the forecasts say?**

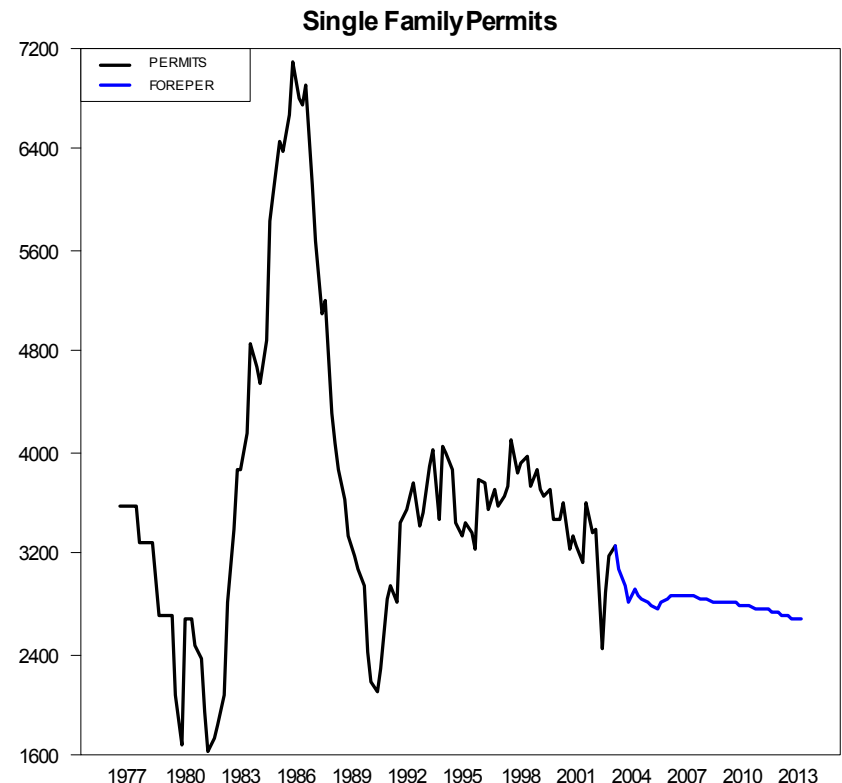
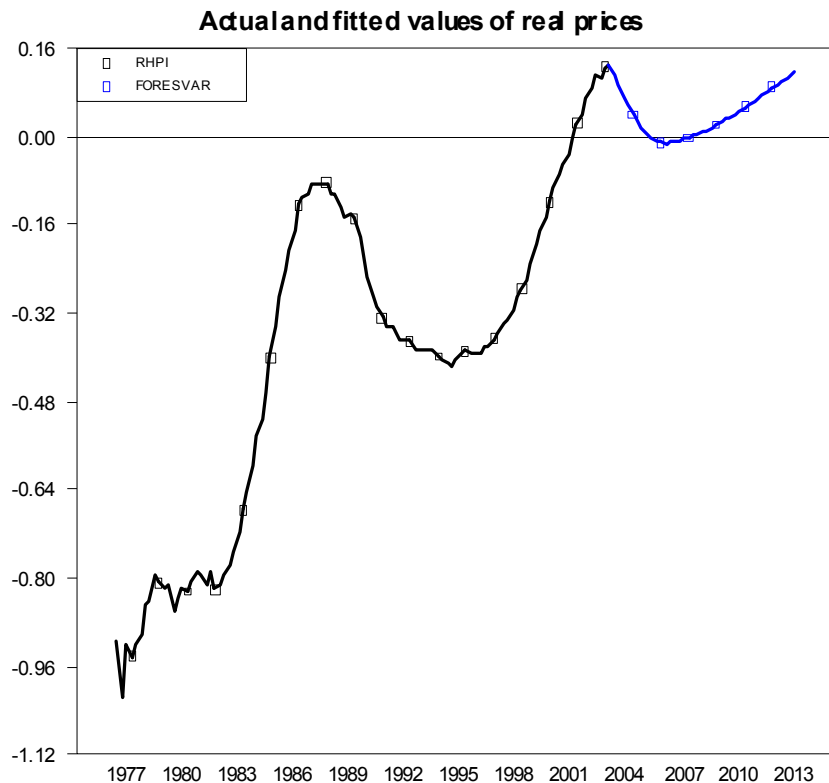




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2 equation VAR (single lag): prices, stock. Conditioning variables: Employment, Personal Income, Mortgage levels/changes. Note that permits lead prices!

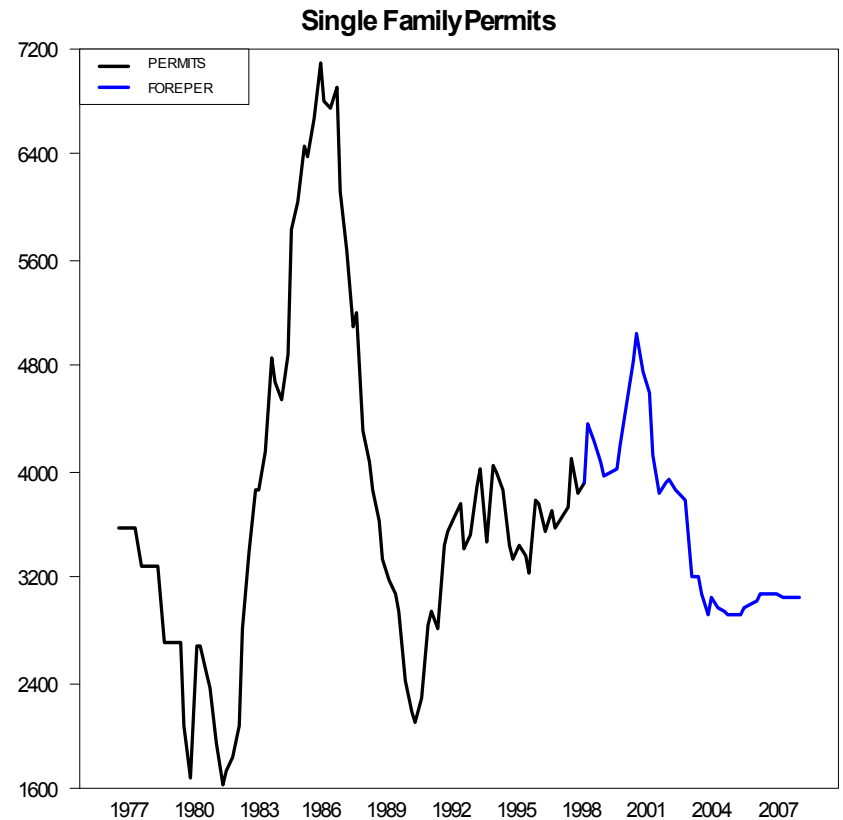
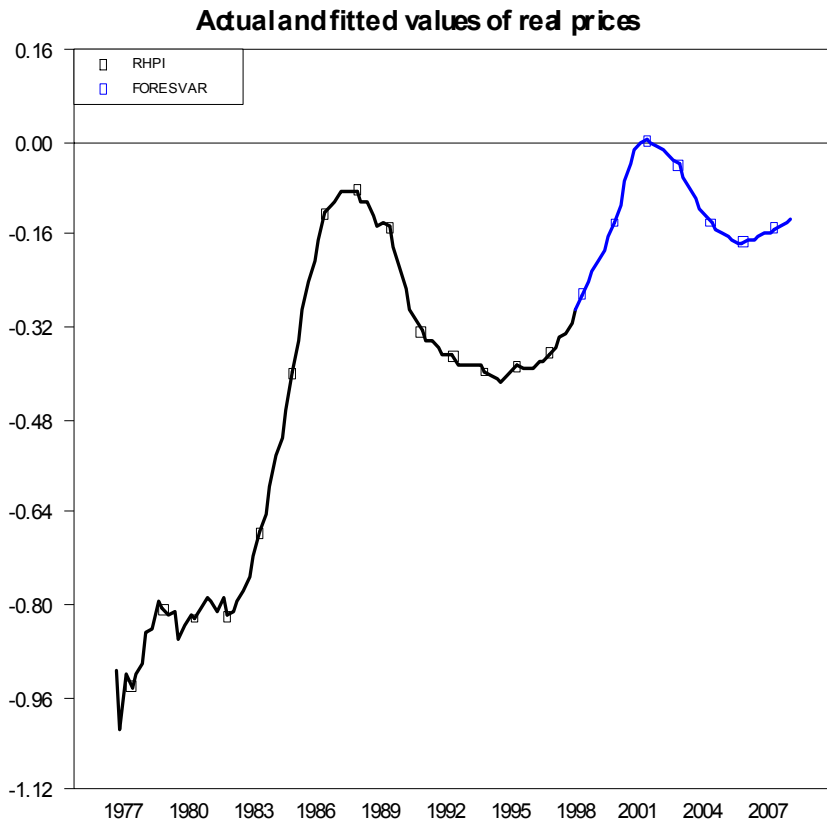
Boston



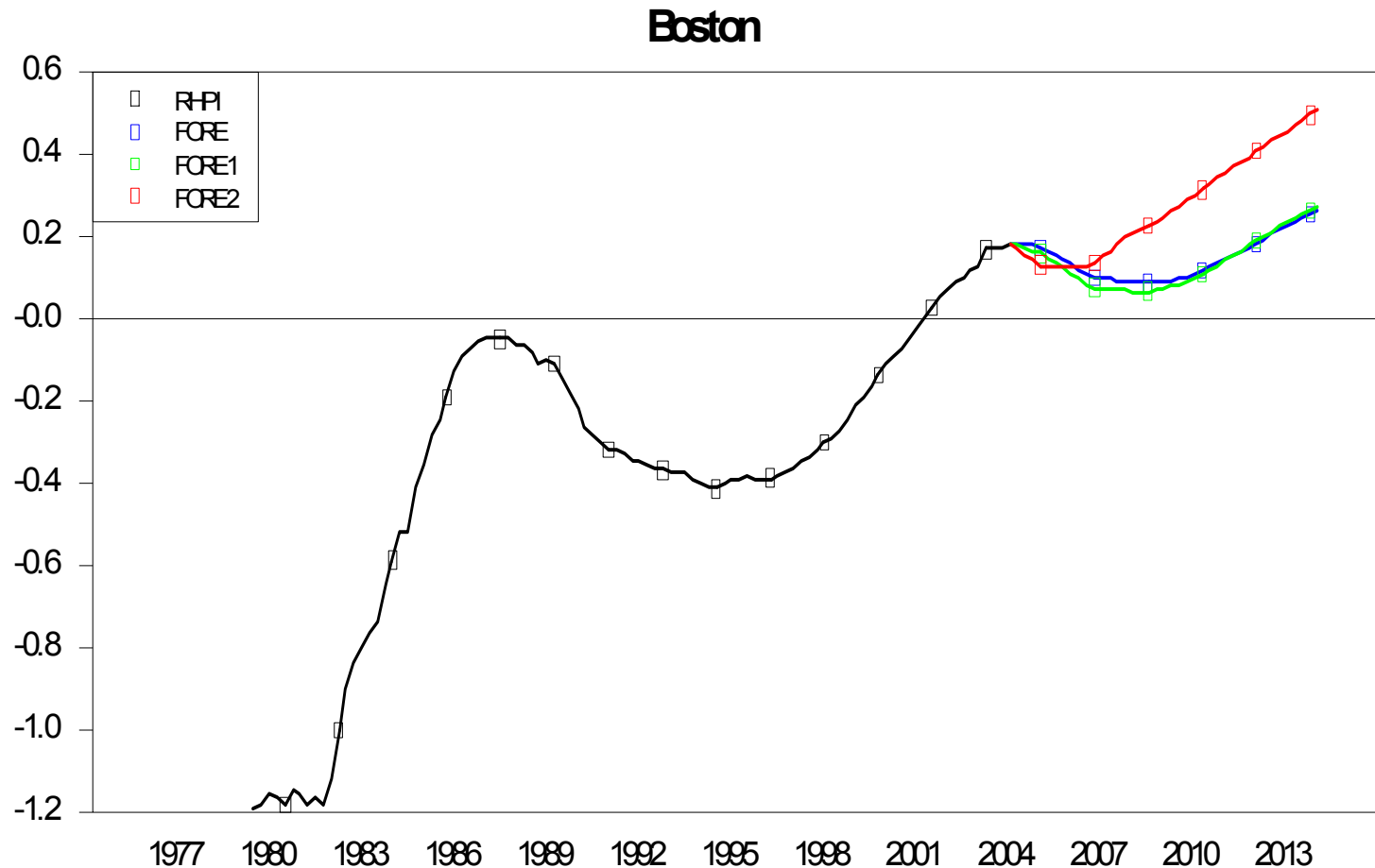


**Model Back test (data ends forecast begins in 1998):
under forecasts prices, over forecasts growth in stock
(permits). Poor performance of stock equation.**

Boston

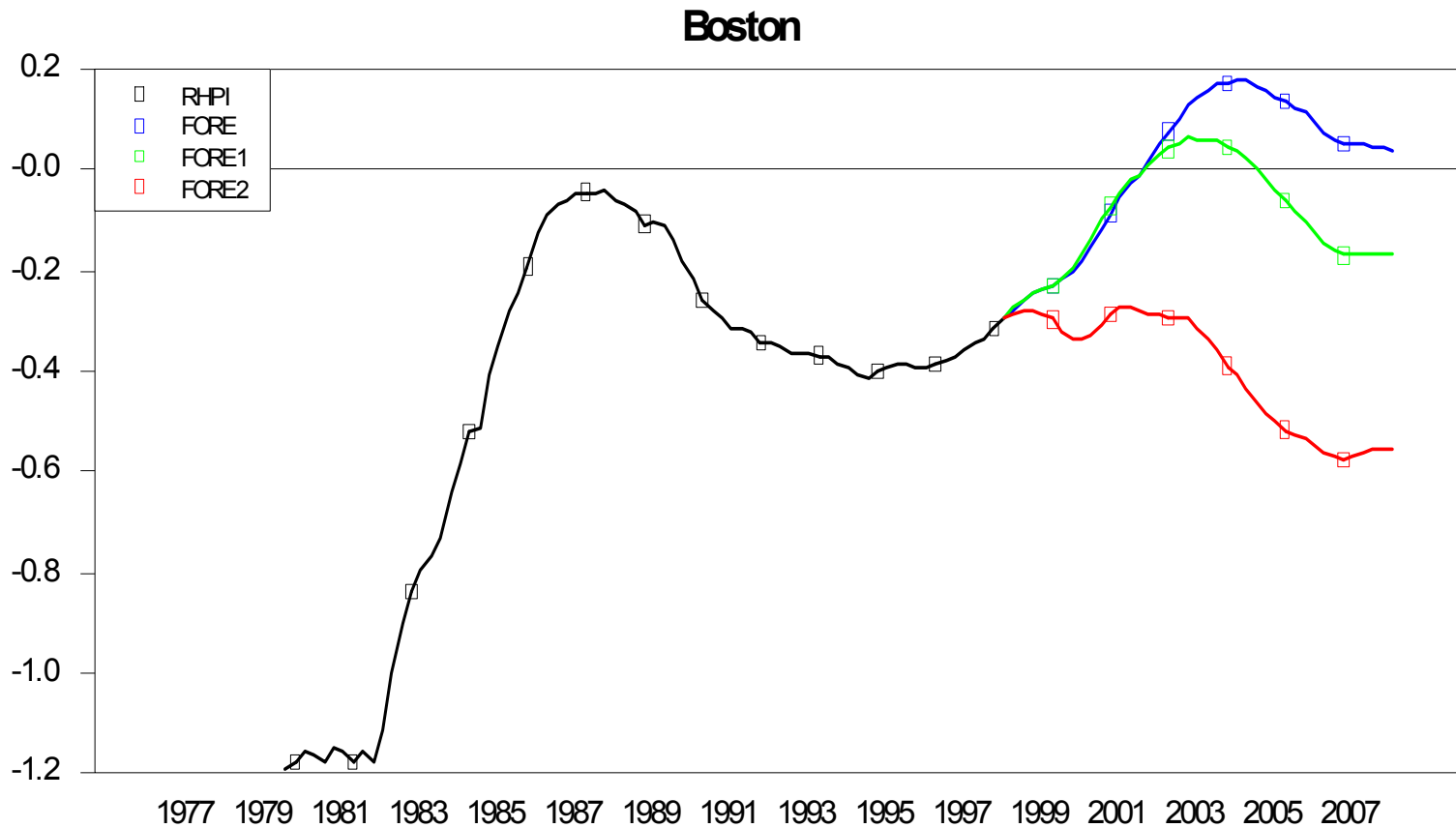


Univariate Model with multiple lags (1,4,8 quarters) versus a single lag (red). Conditioning on: employment/or population, personal income, mortgage levels/changes)





Model back test (from 1998): pretty close (except for the single lag version)



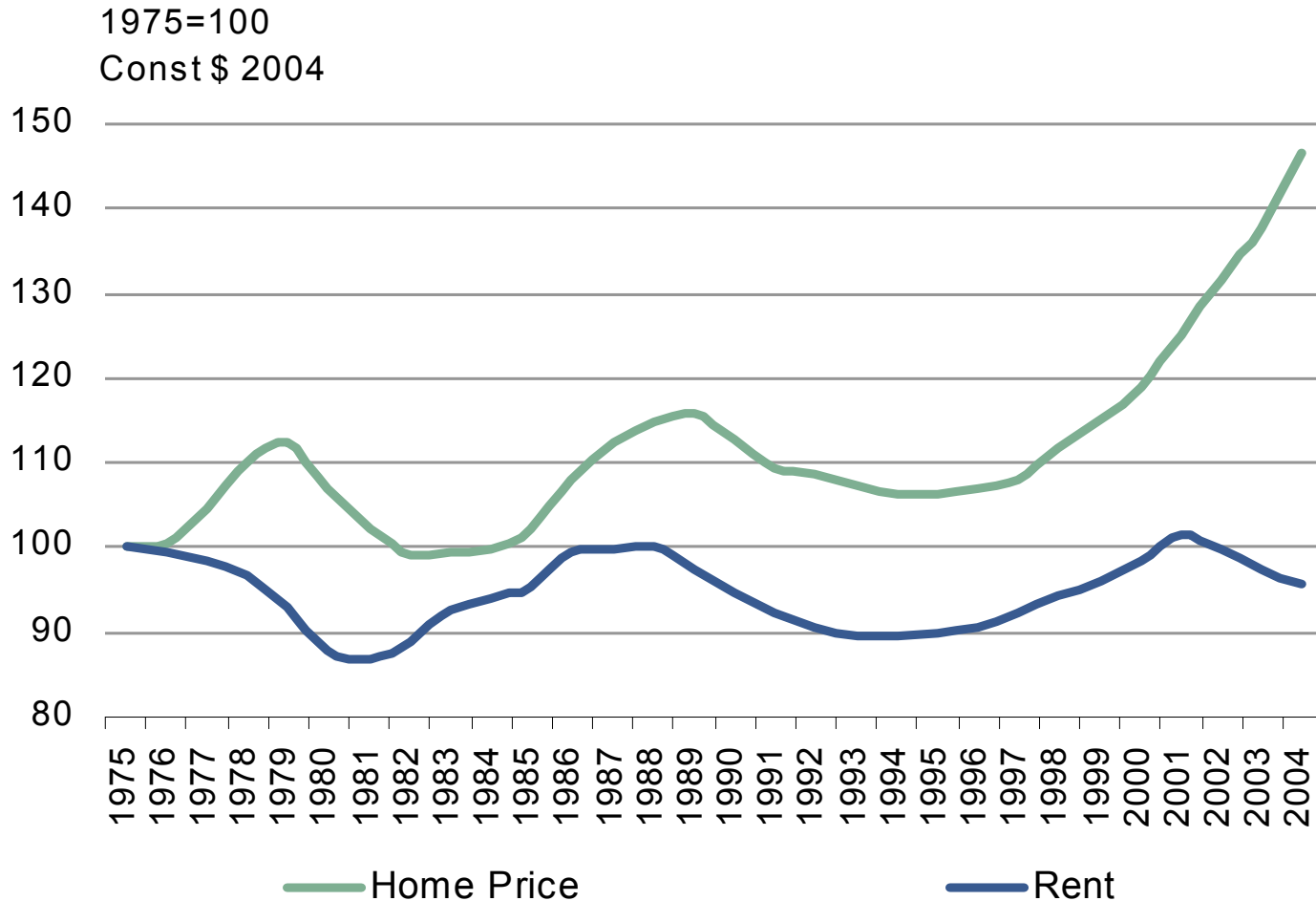


Forecasting: the bottom Line

- VAR model says “correction” should have happened in 2001.
- Univariate says “correction” should have happened this year: 2004
- Forecast going forward is for “correction” to last 3 years (until 2007) and for 10% -15% cumulative price decline in *real* dollars (easy to live with).
- Similar story with other MSAs.
- Is it happening? What’s different this time around (and hence not in the data!).

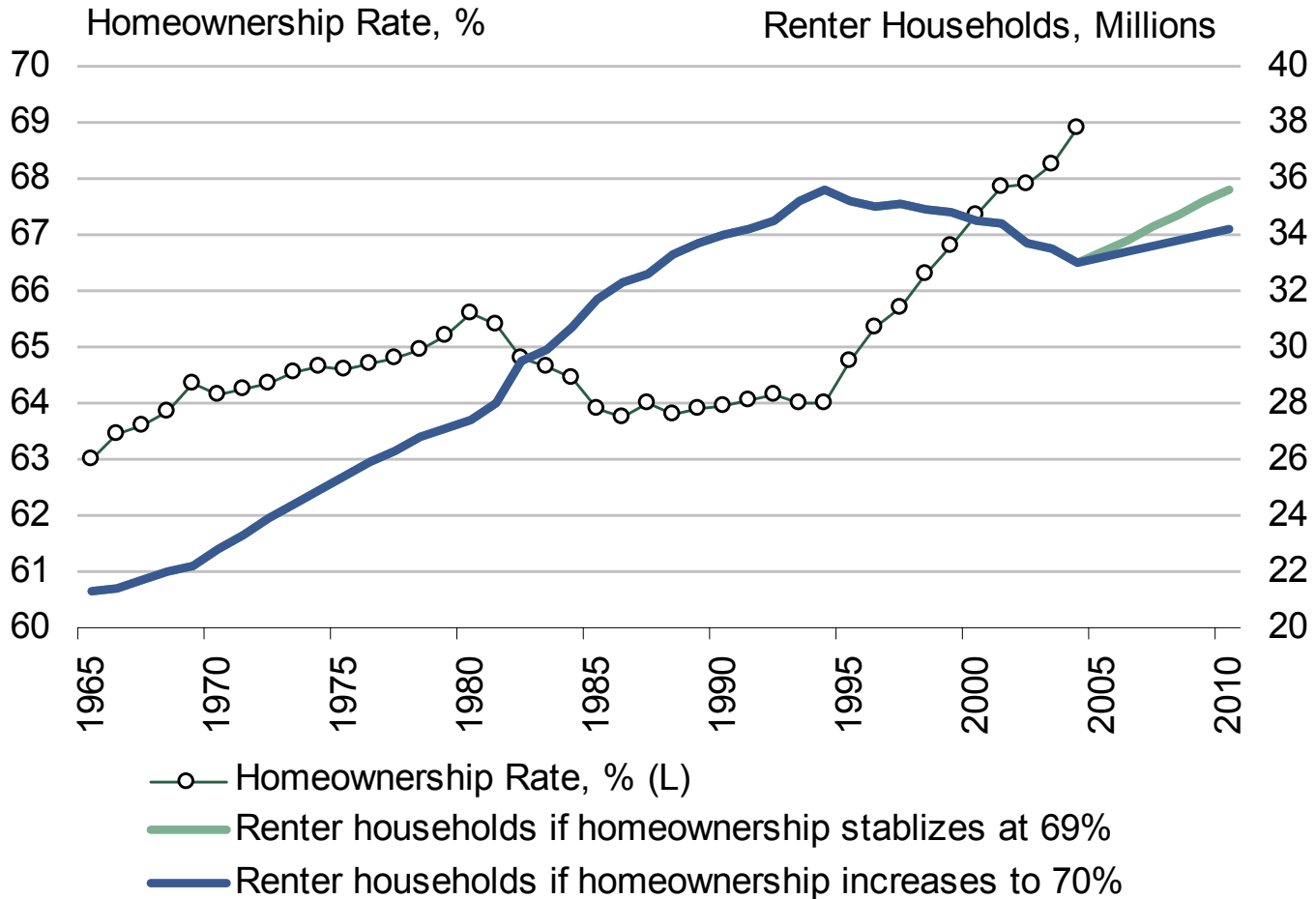


Huge Price-Rent Wedge this time around



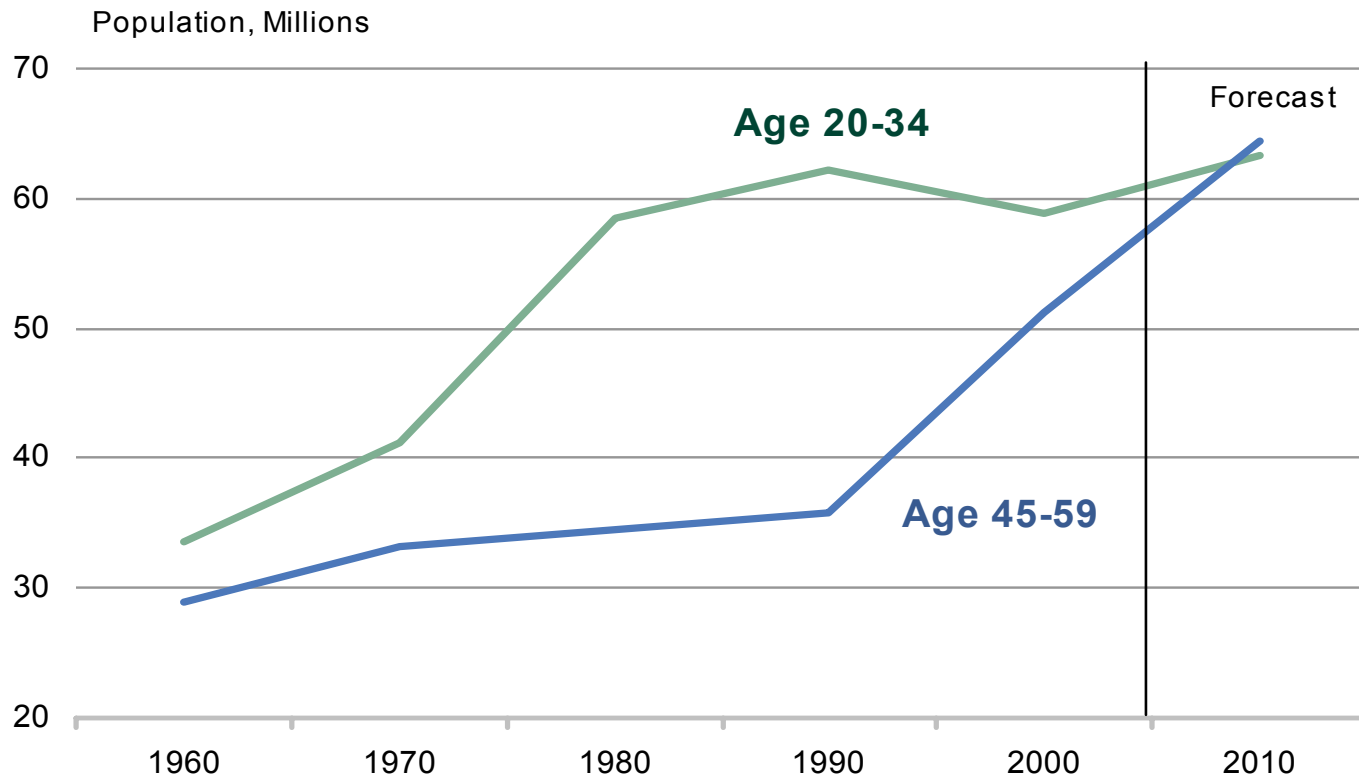


The Price-Rent “wedge” reflects a huge shift into home ownership





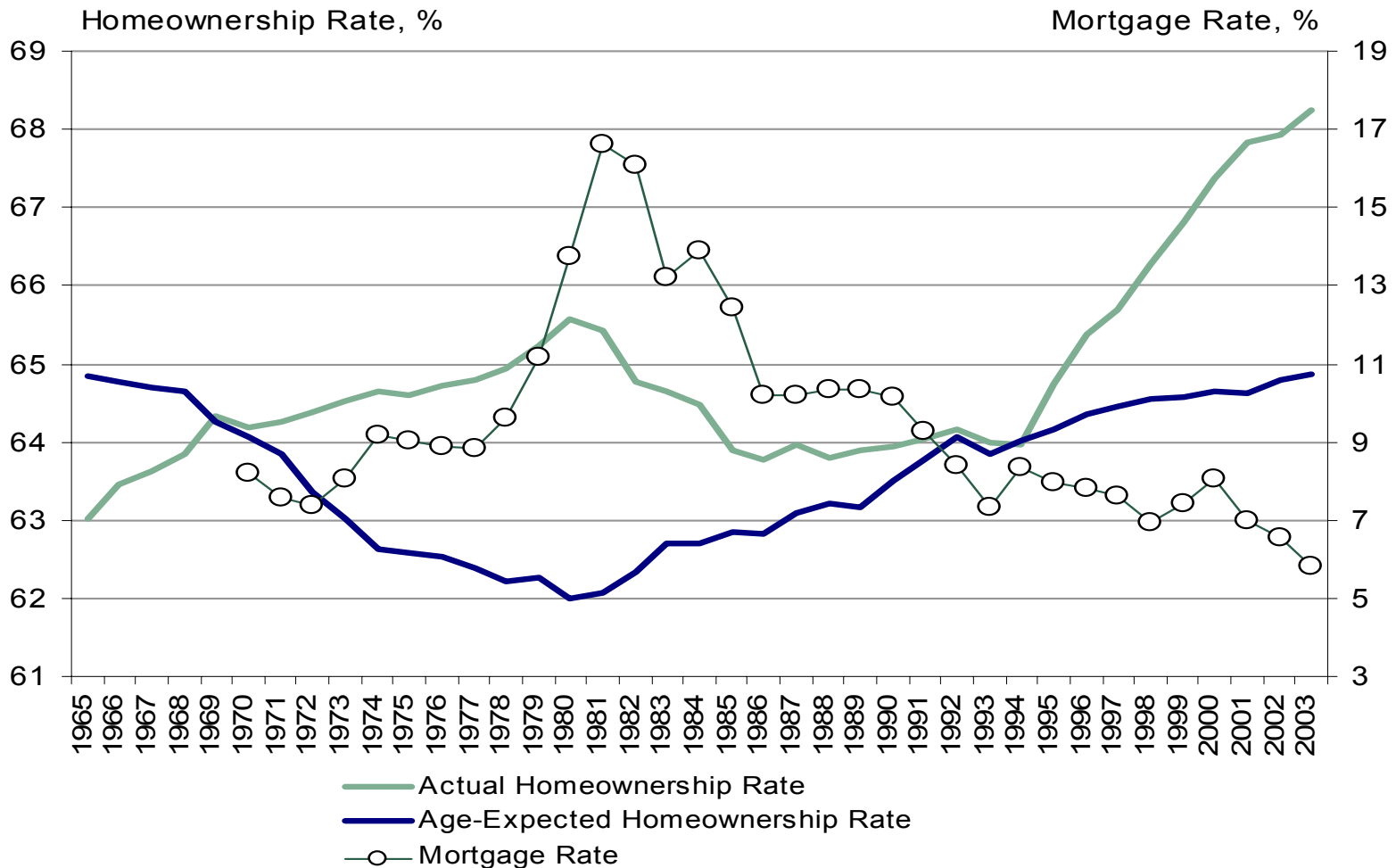
Was it demographics? The surging number of “prime home buying households”



Sources: Bureau of the Census



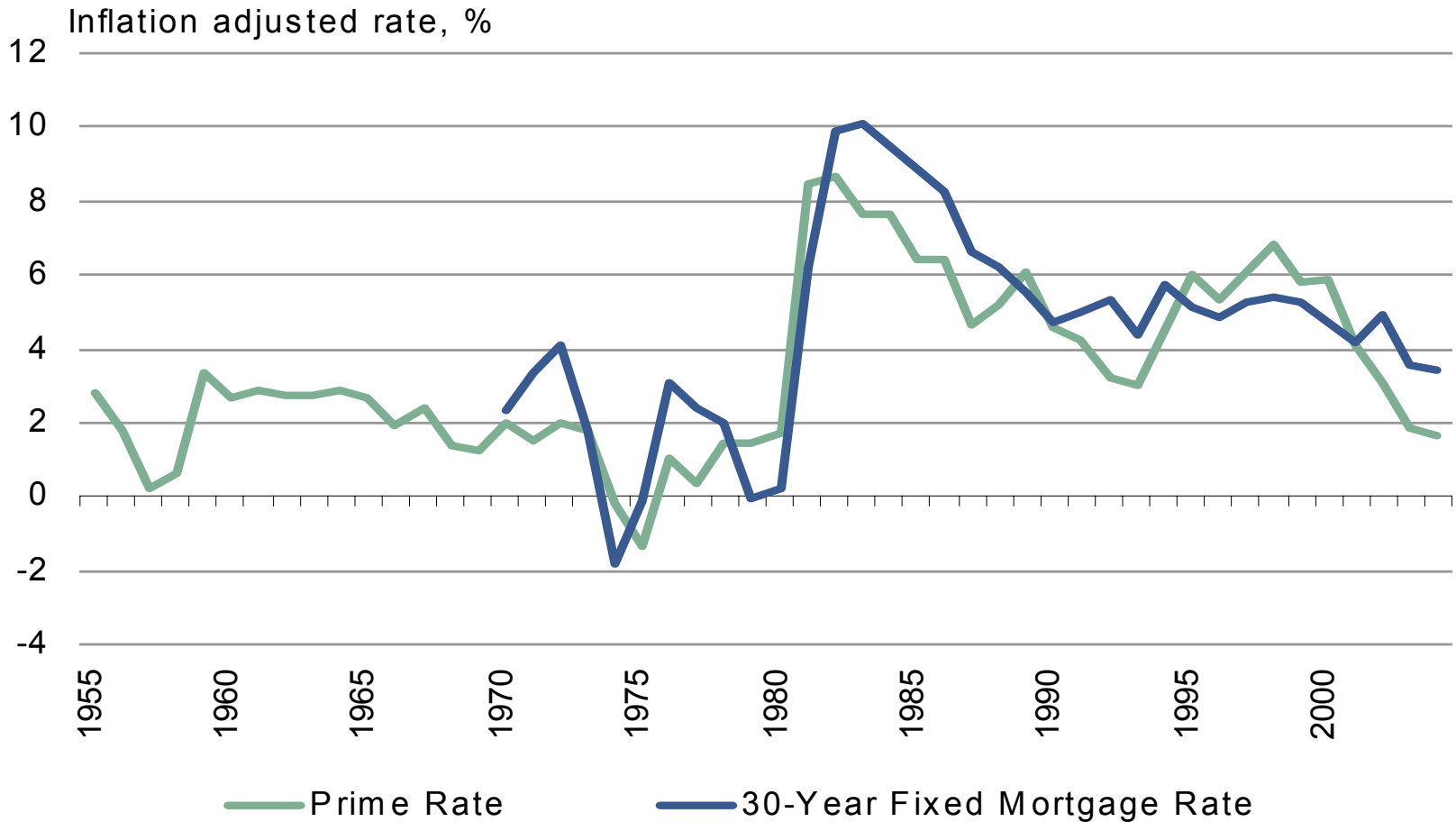
Demographics explains some increase in ownership, but is the rest just interest rates ?





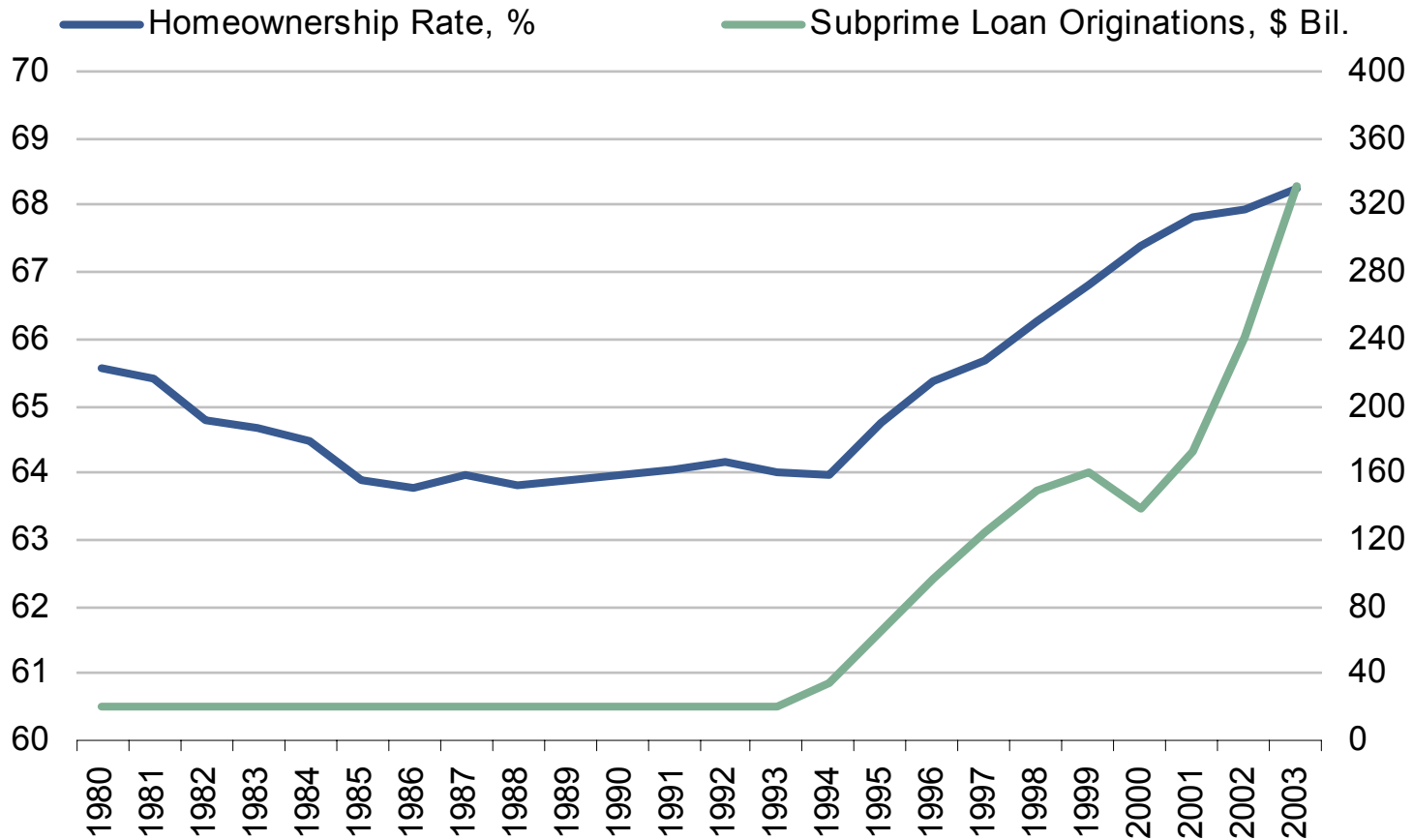
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**True: nominal rates have been at 30 year lows,
but *real rates* have not been!**





Ownership has soared from the explosive growth of the sub-Prime Lending Market!

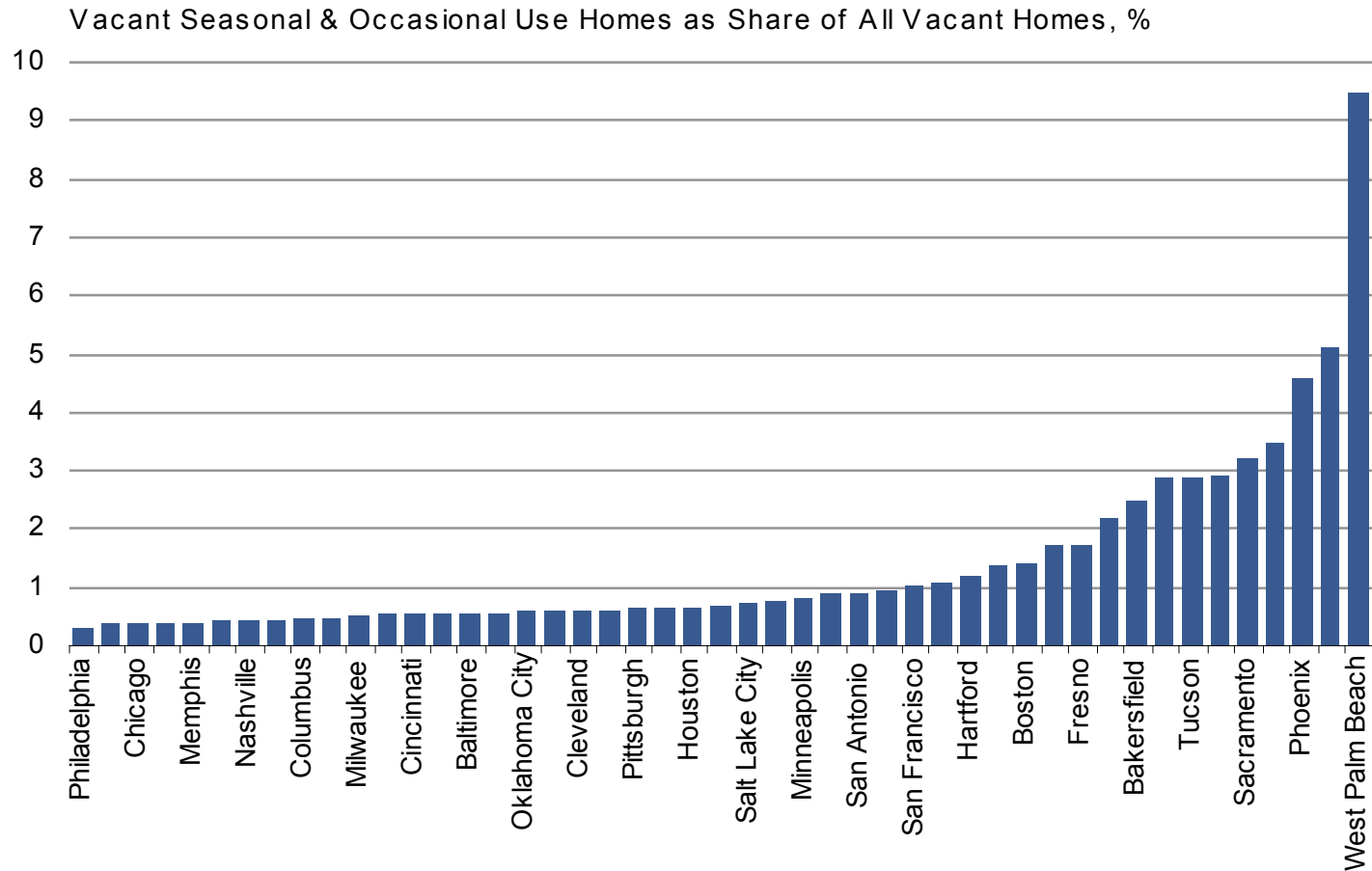


But US Housing Unit Flows (1998-2004) still don't add up.

- Household formation: 1.2m owners, 0.0m renters! (*huge rent-to-own flow*).
- MF construction for rent: 0.3m – 0.07m condos – 0.07m demolitions = .16m net (\pm).
- Rental vacancy has been rising .16m yearly since late 1990s.
- SFU construction: 1.4m (1.6m in 2004) + condos = 0.3 – 0.5m “surplus”.
- Surplus = removals? = investor/2nd homes?

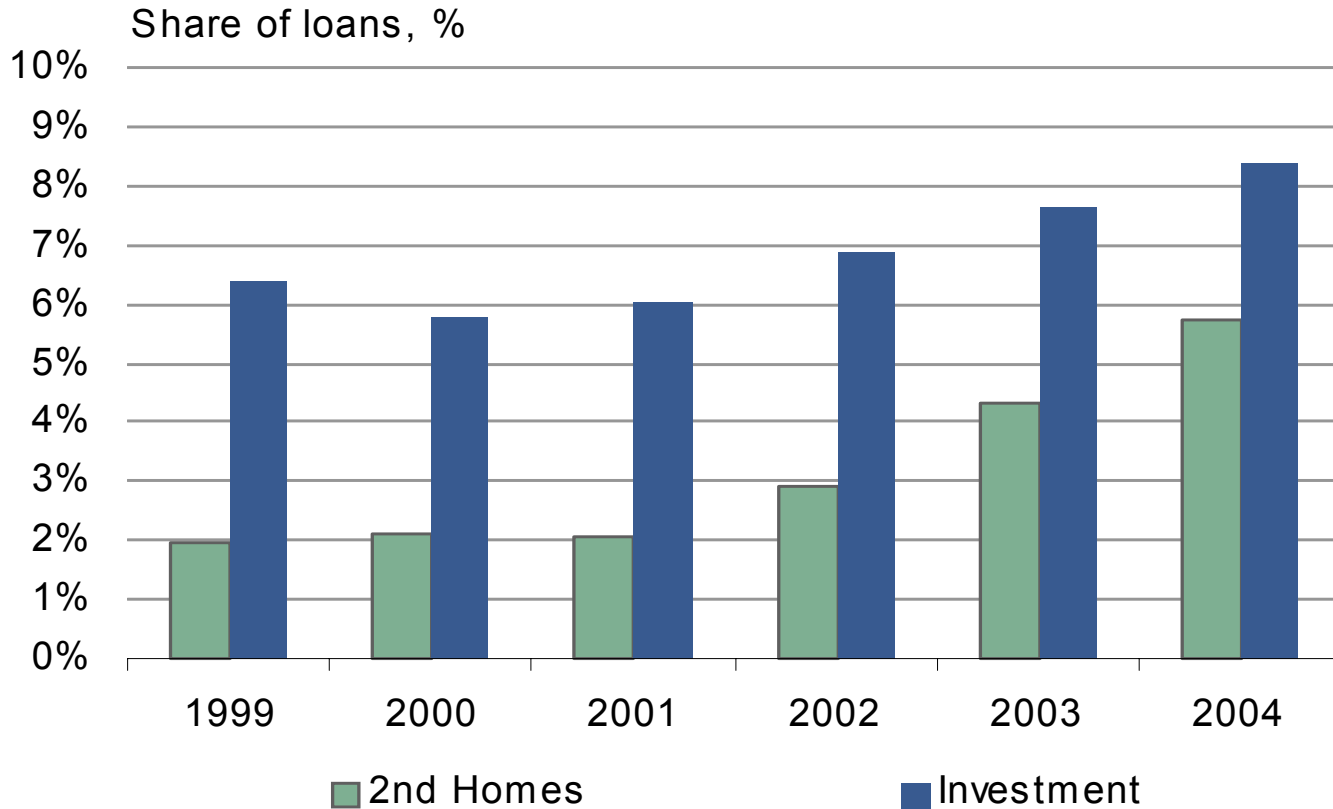


The “surplus” could be second homes, but 2000 Census says that they are (still) tiny (3% nationally).





Mortgage Originations however tell a *very* different story from the 2000 Census. (1-4 family only)



The 2nd home share of mortgage originations (1-4 family only) here looks much more like what one would expect. What's up?

msa	cnt purchased	cnt 2nd home	pct 2nd hom
Las Vegas, NV-AZ	43,454	7,548	17.37%
Phoenix-Mesa, AZ	67,277	6,108	9.08%
Riverside-San Bernardino, CA	47,944	5,055	10.54%
Orlando, FL	29,810	4,357	14.62%
Tampa-St. Petersburg-Clearwater, FL	36,753	3,930	10.69%
West Palm Beach-Boca Raton, FL	21,459	3,564	16.61%
Fort Myers-Cape Coral, FL	11,967	3,202	26.76%
Fort Lauderdale, FL	26,733	2,766	10.35%
Miami, FL	30,036	2,458	8.18%
North Carolina	15,399	2,417	15.70%
Sarasota-Bradenton, FL	11,949	2,363	19.78%
Atlantic-Cape May, NJ	6,926	2,309	33.34%
Myrtle Beach, SC	4,518	2,236	49.49%
Naples, FL	6,471	2,211	34.17%
Florida	10,091	2,061	20.42%
Colorado	9,018	2,036	22.58%
Michigan	11,552	1,919	16.61%
Daytona Beach, FL	9,168	1,885	20.56%
California	11,940	1,869	15.65%
Los Angeles-Long Beach, CA	58,316	1,706	2.93%
New York, NY	51,128	1,673	3.27%
Chicago, IL	98,765	1,652	1.67%
Atlanta, GA	57,192	1,551	2.71%
San Diego, CA	28,953	1,509	5.21%



To Wrap Up

- We have begun to exceed “fundamentals”- since 2001
- We should have (had) some correction (by) *now*. (*definition A*).
- An “omitted” variable is price pressure from the entry level market with sub-prime lending. Hence we could be in for a sharper correction if rates rise, foreclosures flood the market....
- 2nd home buying is surging because housing is now perceived as a better investment than... Hence a sharper correction could also happen should that perception change. (this is *definition B* = “speculation”).