

# The Phase Method of Analyzing Economic Cycles

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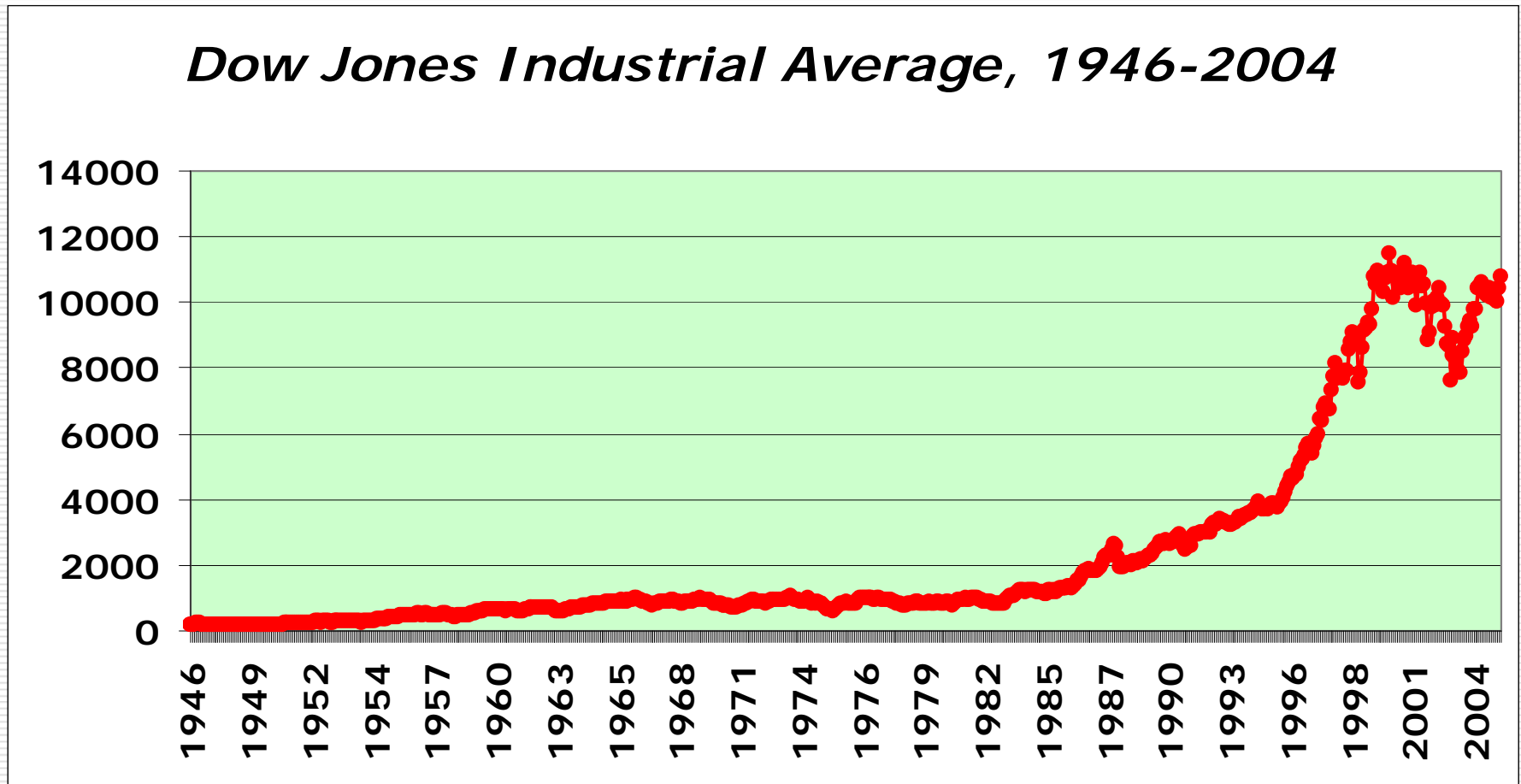
This material was originally presented in late 2007;  
see for yourself if it was right!

# What does the Phase Method do?

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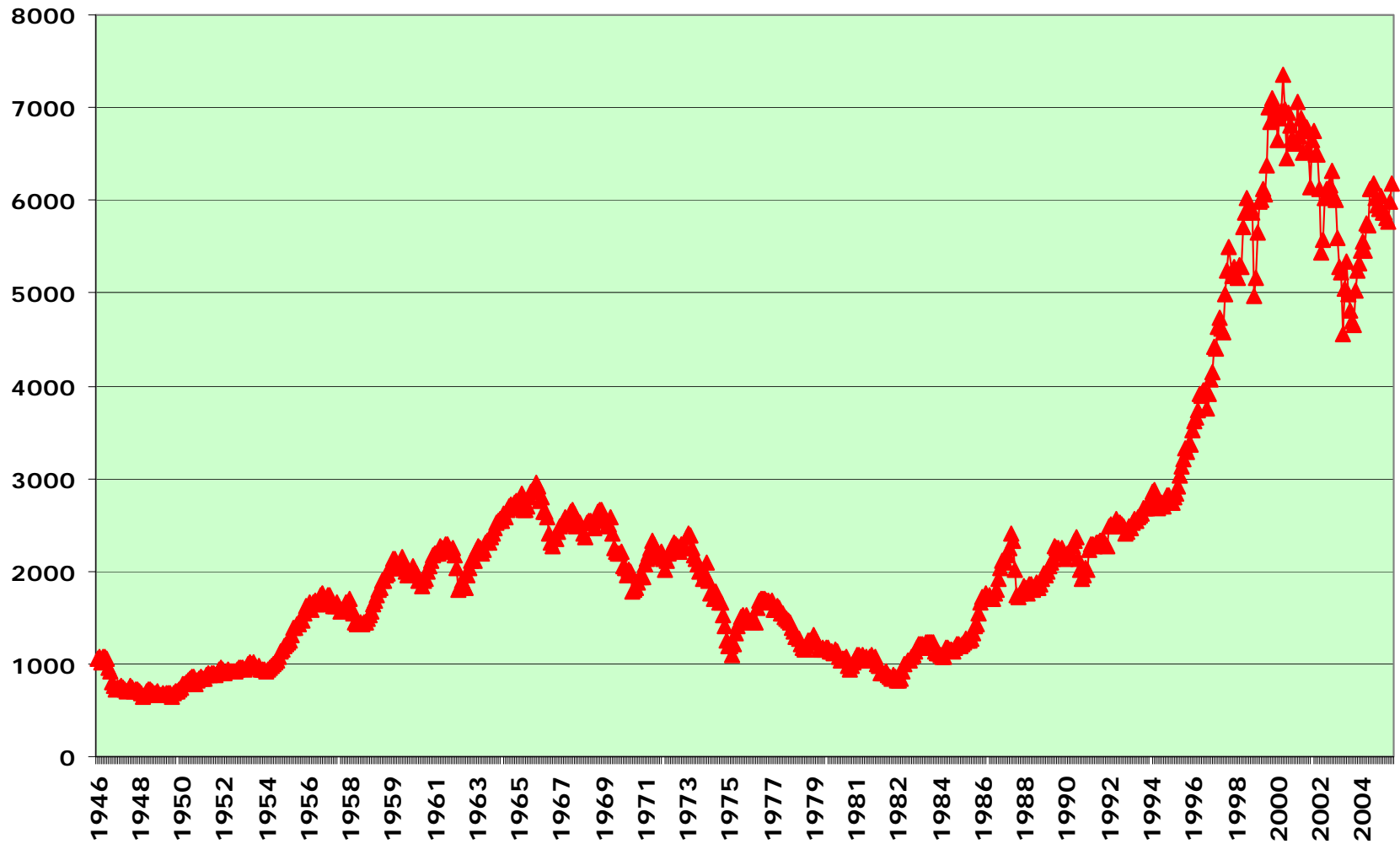
- Converts cyclic data into a new conceptual model
- Is robust; can handle time-lagged and imperfect data.
- Is navigational rather than determinist; tells you about where you've been sailing in the cycle and what is likely to follow, rather than providing exact point predictions
- Is useful in handling economic cycles that are irregular and non-repetitive in size, length, shape, features, and underlying dynamics, but that are cyclical nonetheless
- The business cycle is as fundamental as the law of supply and demand
- A cycle-friendly model will be useful in understanding and judgment, since it follows the natural lines of the situation
- Does better than linear extrapolation, which goes wrong when a market cycle turns

This is a well-known data series, but how can we navigate it?



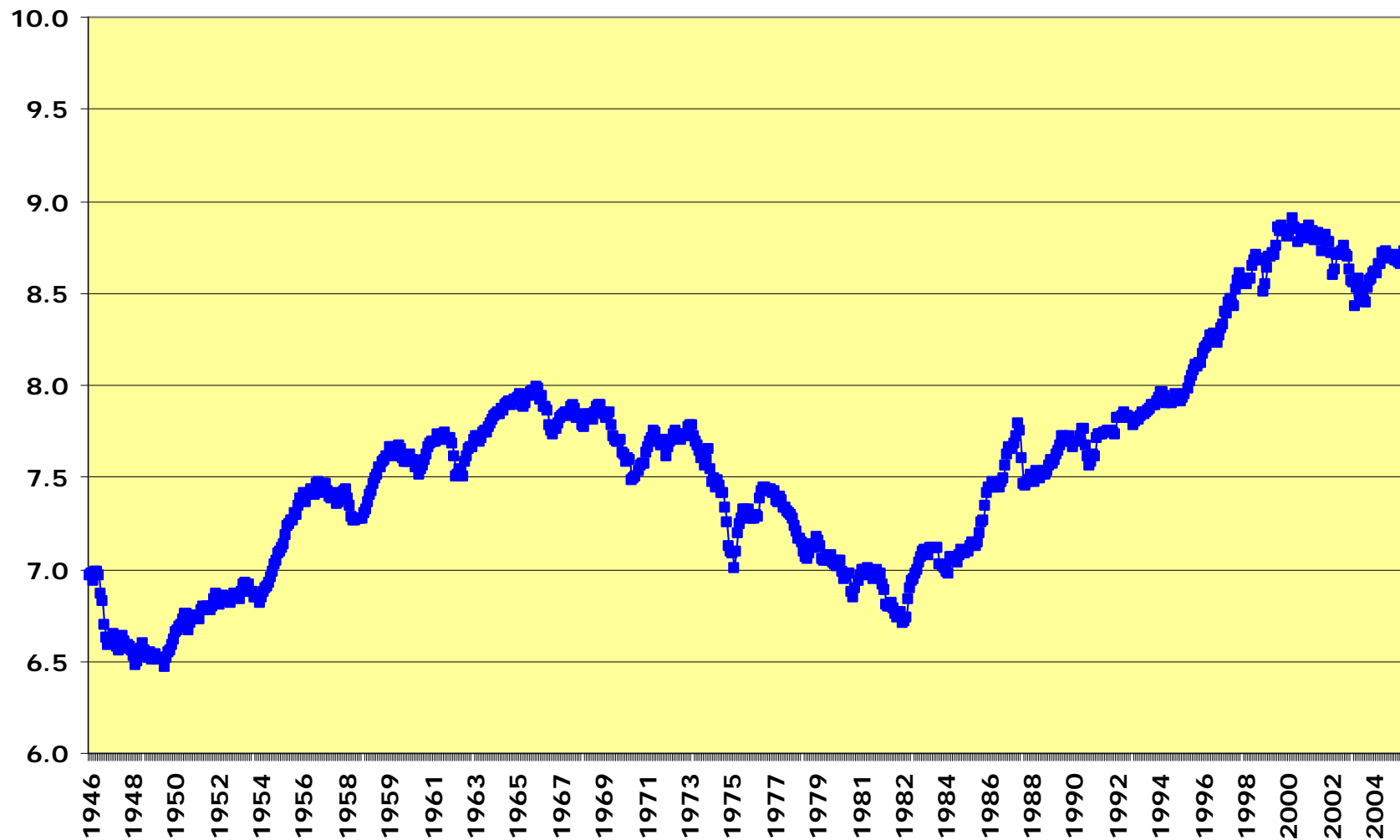
# Remove the effects of inflation to work in constant dollars

*Dow Jones After Inflation, 1982-1984 = 1.00*



Take logarithms: from 1000 to 2000 same as 2000 to 4000

### *Natural Logarithm of Dow in Constant Dollars*

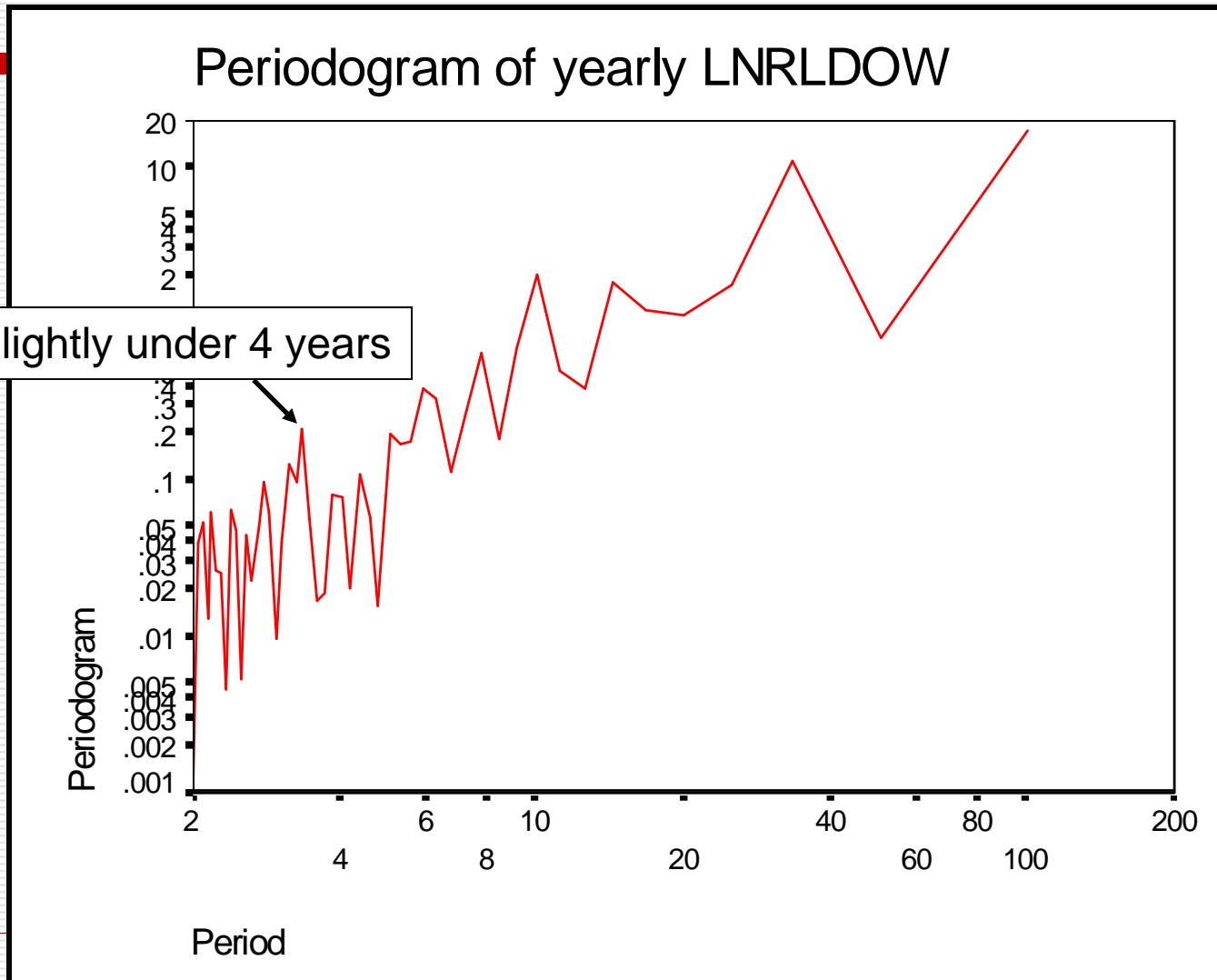


# The motion is a homeostatic cycle

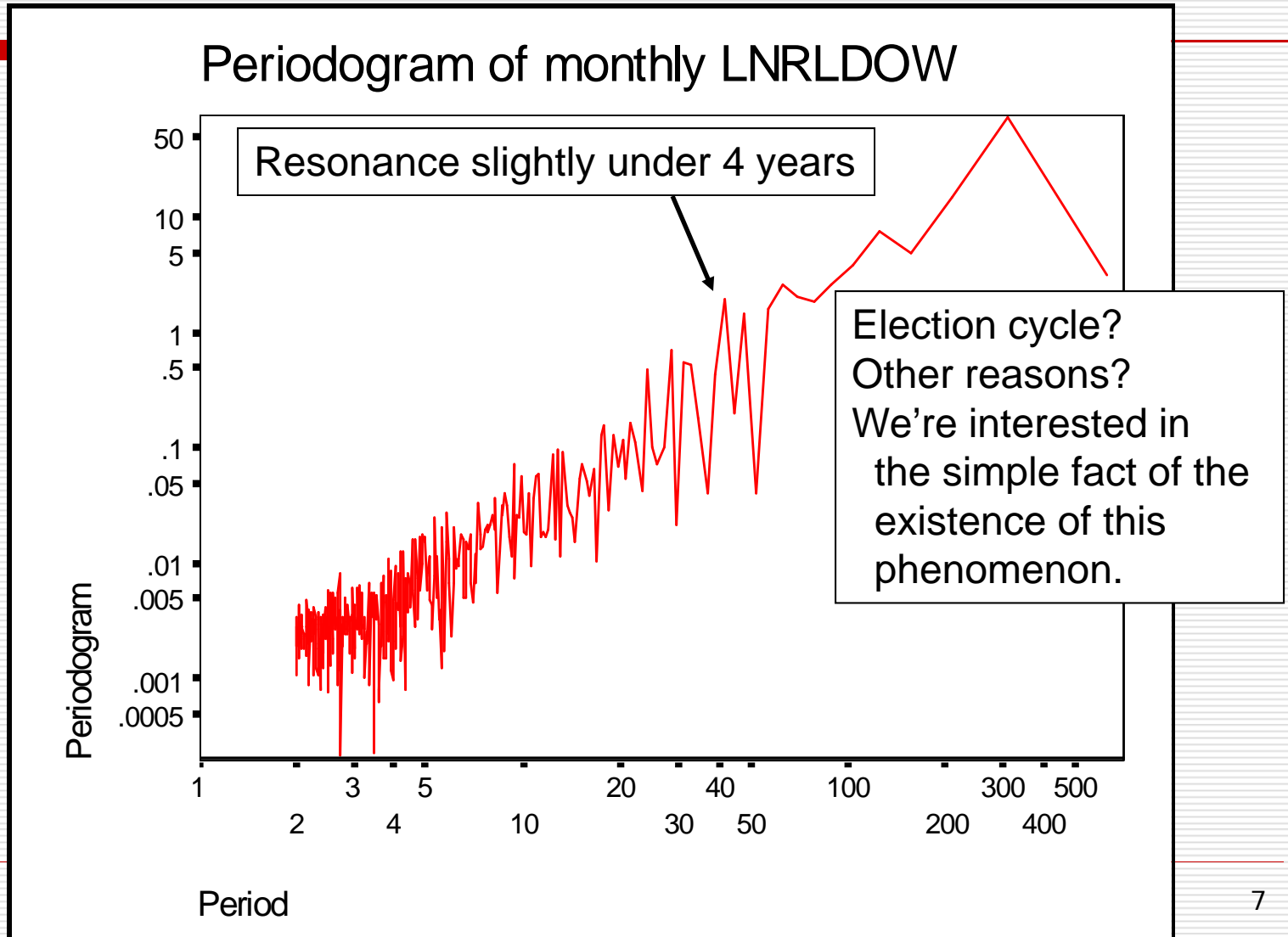
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- ❑ Clearly cyclical
- ❑ But the cycles are irregular in size, length, shape, form, and driving factors
- ❑ There is a tendency to revert to trend (homeostasis in biology)
- ❑ People and animals can vary and postpone eating, activity, and sleep, but sooner or later go back to their ways

To see how to smooth the data, do a spectral analysis and look for approximate periodicity; find the “natural lines”

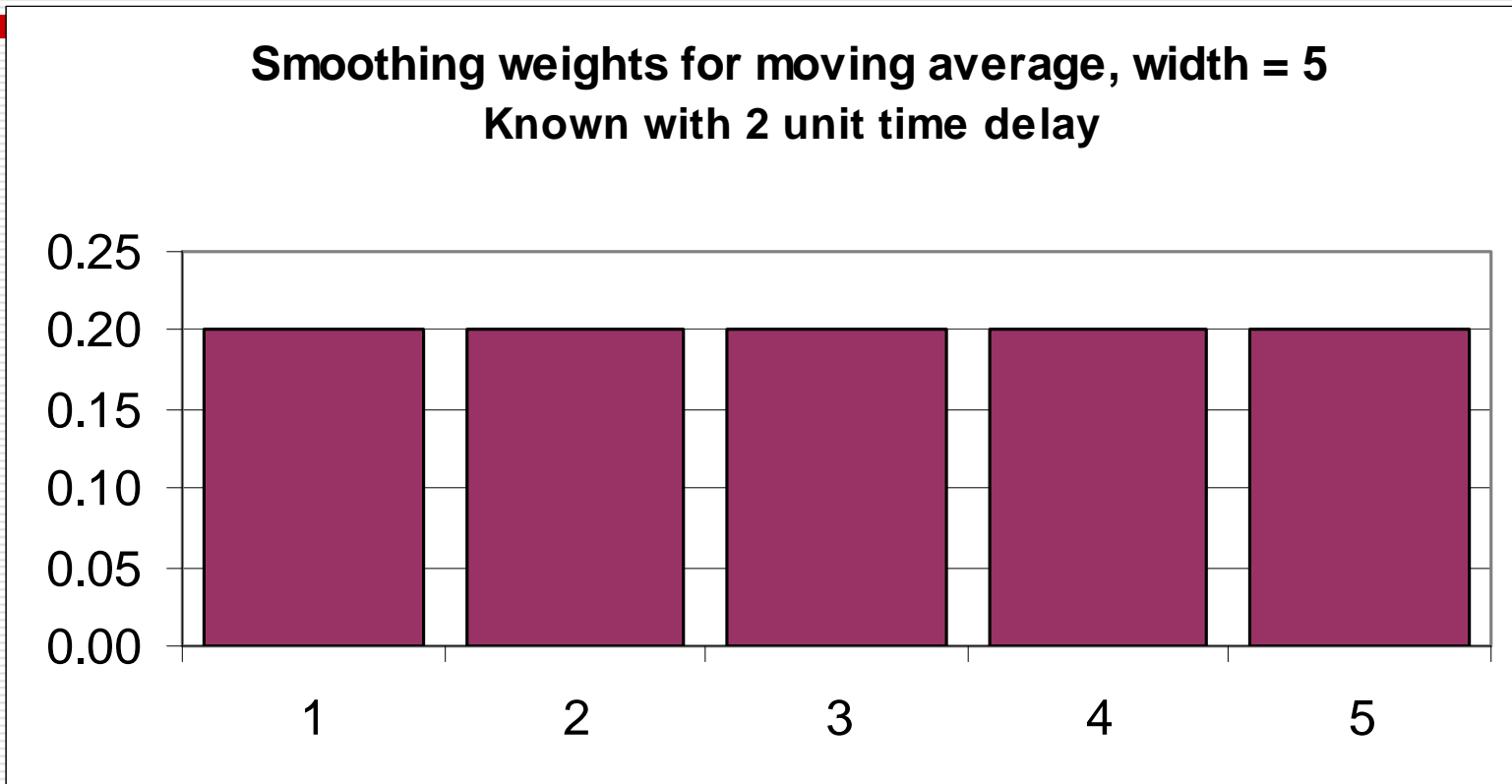


To see how to smooth the data, do a spectral analysis and look for approximate periodicity; find the “natural lines”



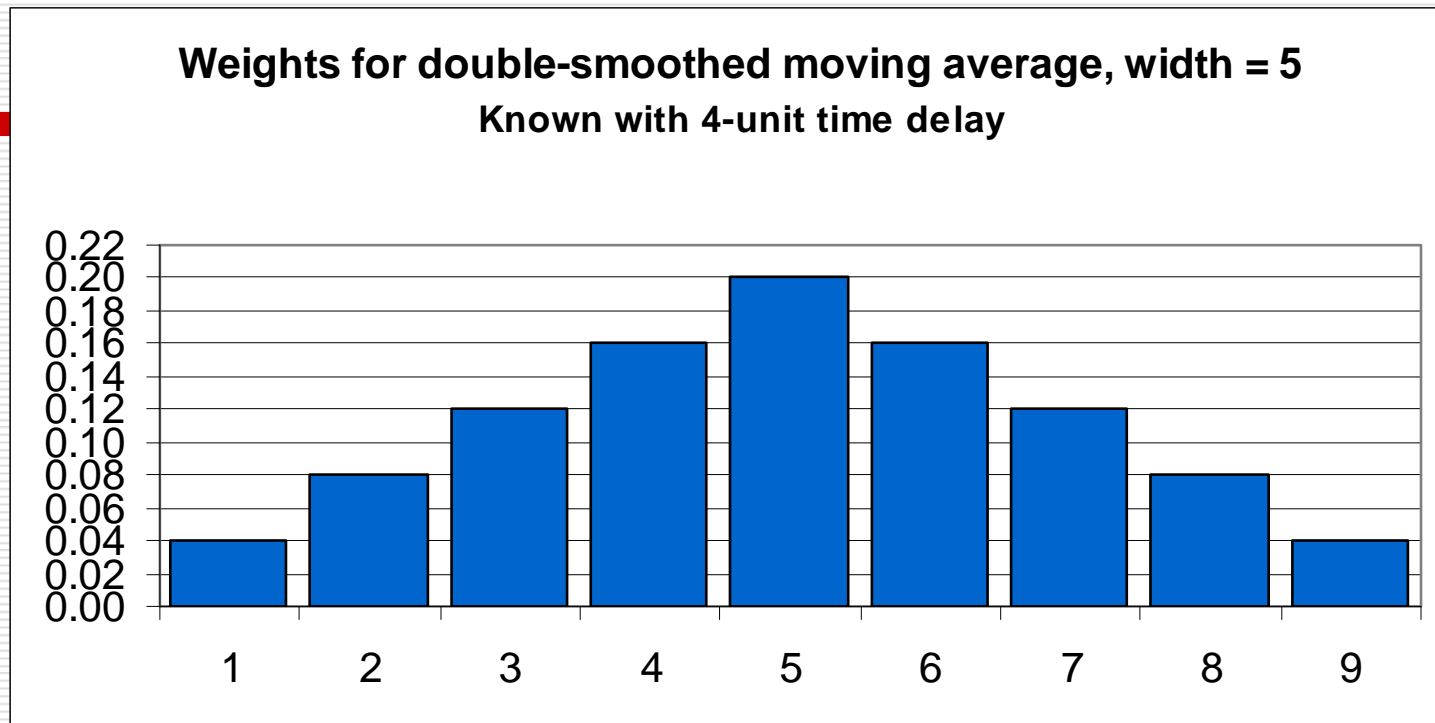


We can smooth the series with a simple moving average  
This is an example, but we should use the “right” width



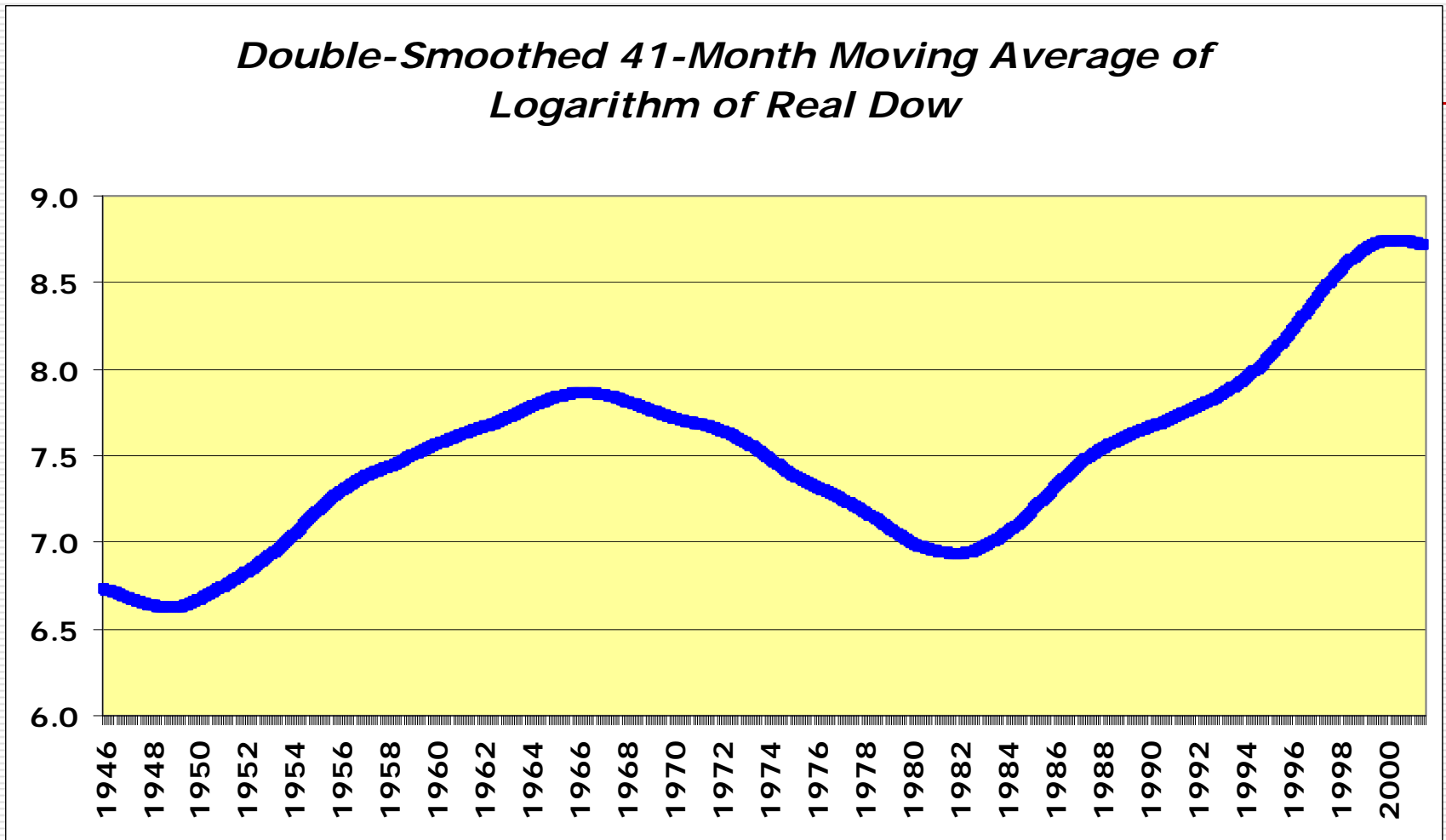
Not known in current time, but there is a gain in smoothness

We can smooth the series out using a double moving average; the moving average of the moving average; has a triangular weighting



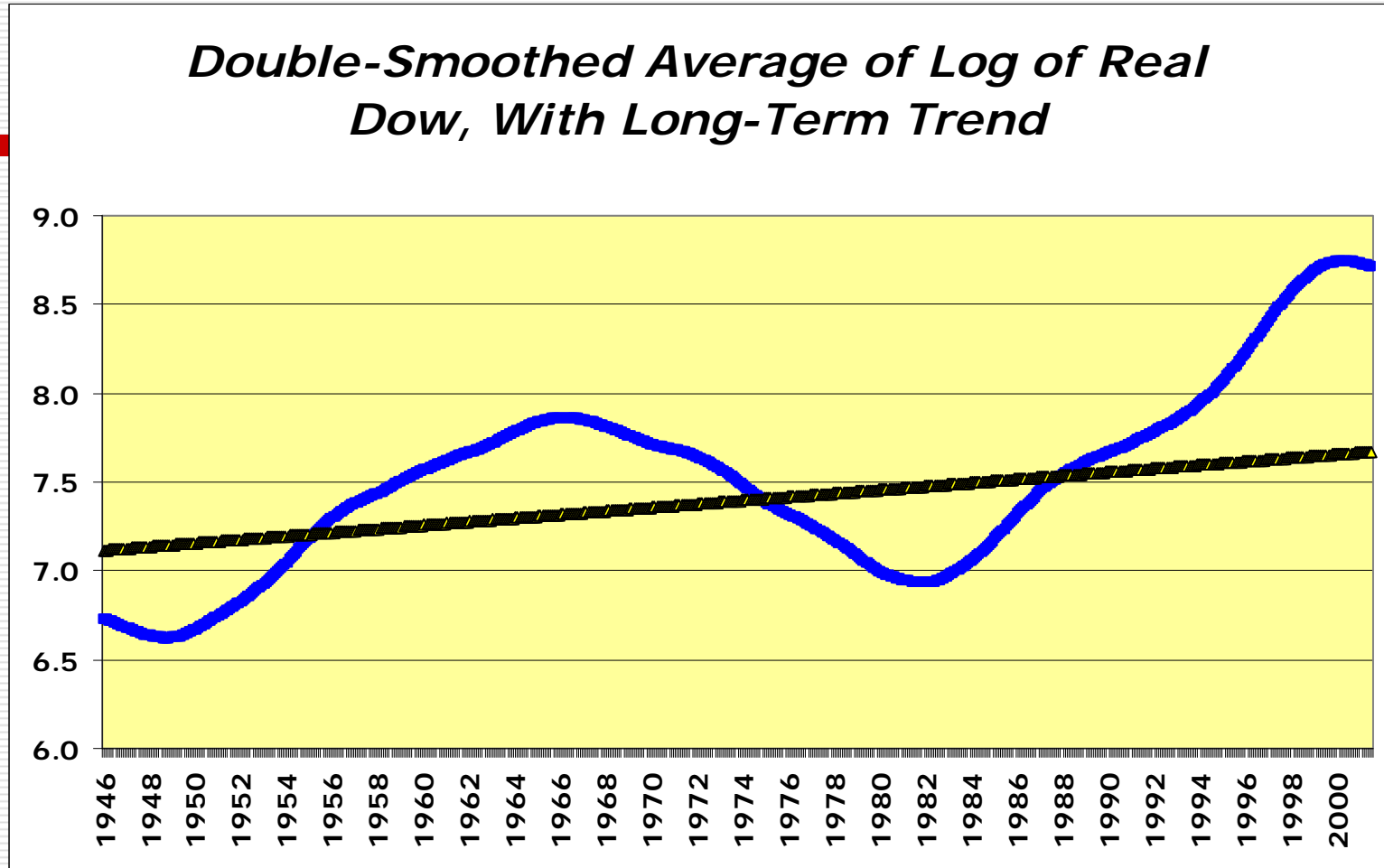
- Needs more time lag to be fully known
- Can be “almost known” quicker by ignoring the tails
- Triangular (quadratic, not flat) weight turns out to be cycle-friendly
- Gain in regularity will more than offset the time lag
- Variations: half-triangles, truncated triangles, rounded weights

Double-smoothing *at the resonance* of 41 months shows the cyclic motion



Gain in regularity and understanding offsets the time lag

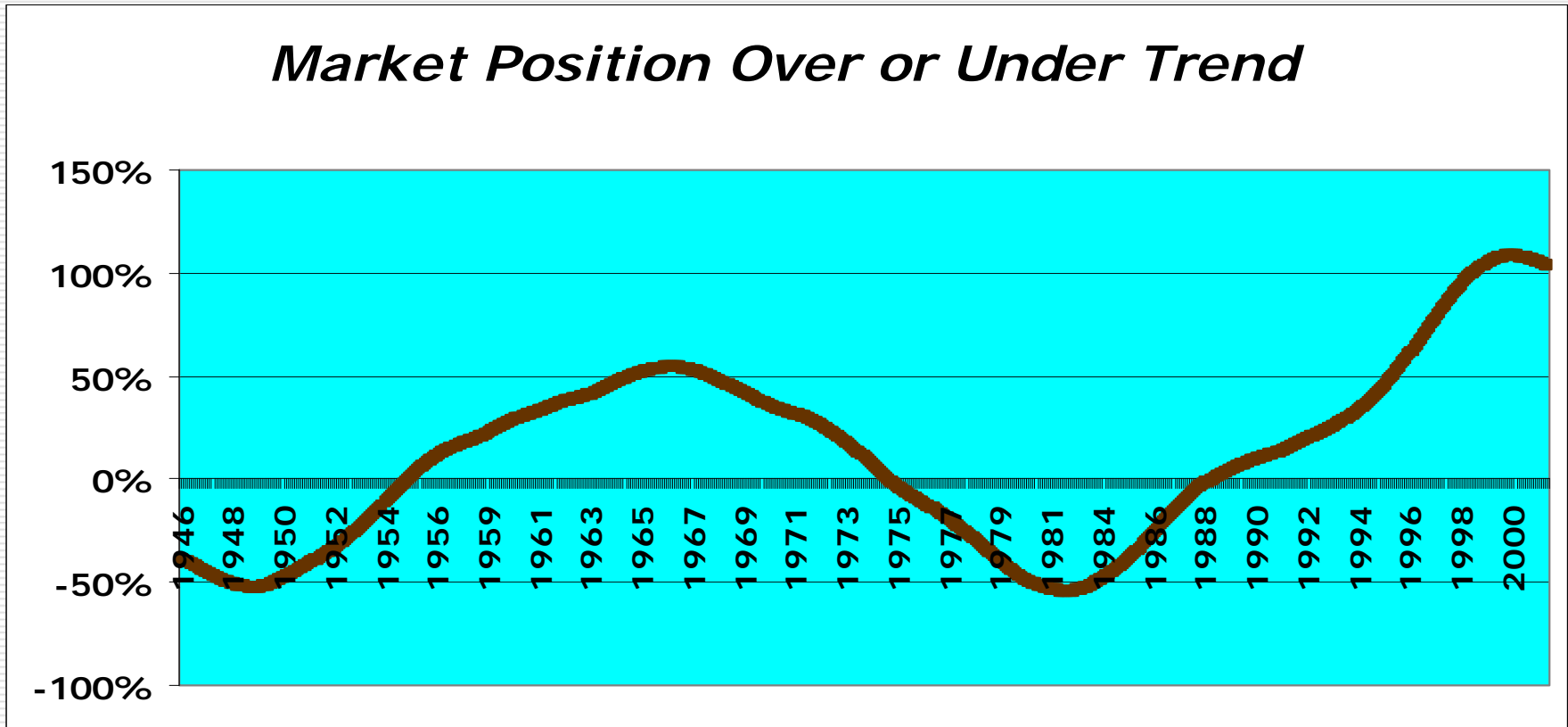
Now put in a long-term trend line. **Exact accuracy is not required.**



Can do linear regression (complete cycles, balance bull/bear)  
But I like a simple **middle-to-middle** trend line.

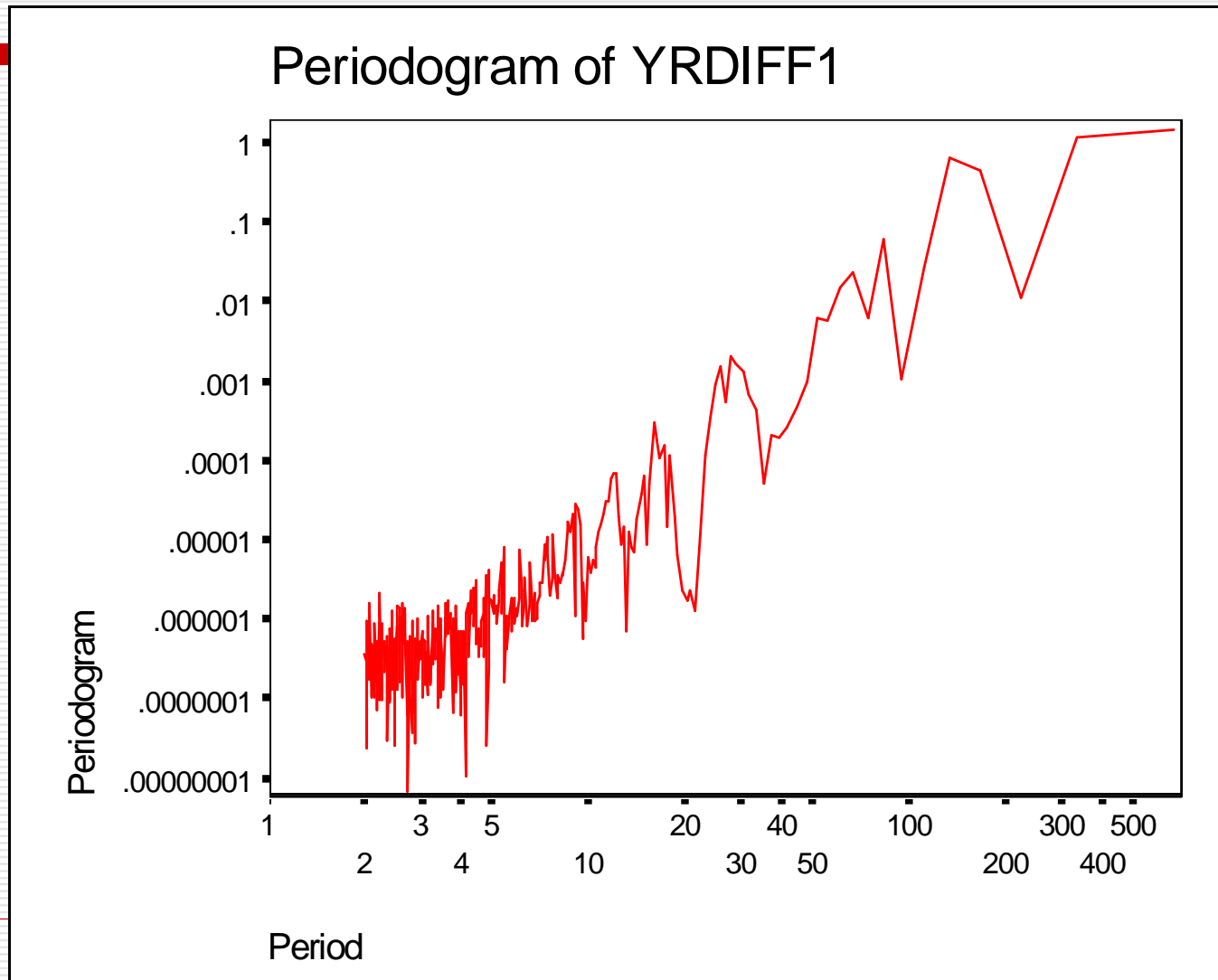
# Subtract the series from the trend to get the residuals

If the trend line was wrong, this new series will be too high or too low, or tilted up or down. Even in these cases the phase diagram will still help us.

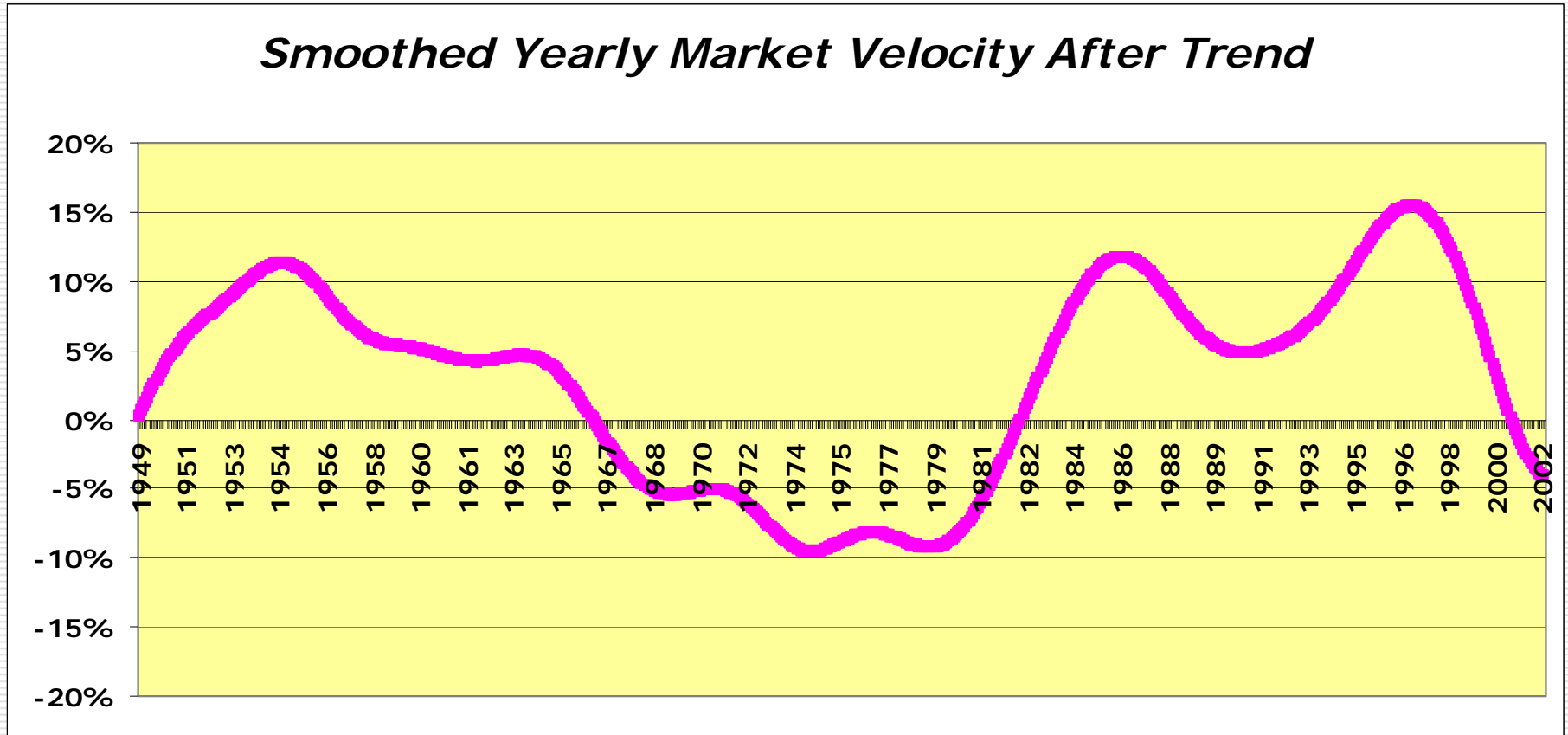


These cycle displacements over and under trend will be the *horizontal* (x) axis of the Phase Clock.

For the velocity (vertical axis), take the annualized monthly differences of those residuals. That series is irregular but has an approximate resonance about 29 months. What's important is to make it smooth.

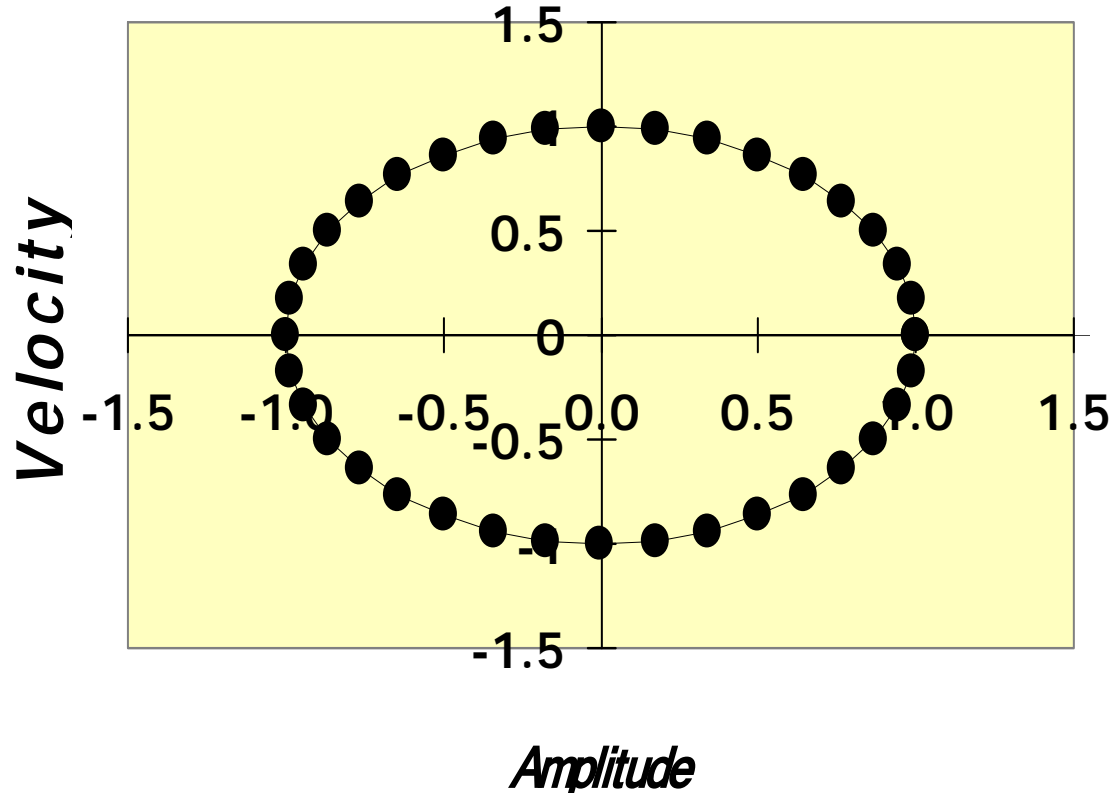


# Double-smoothed 29 month moving average of annualized velocity



**The smoothed velocity of the residuals will be the *vertical (y)* axis of the Phase Clock.**

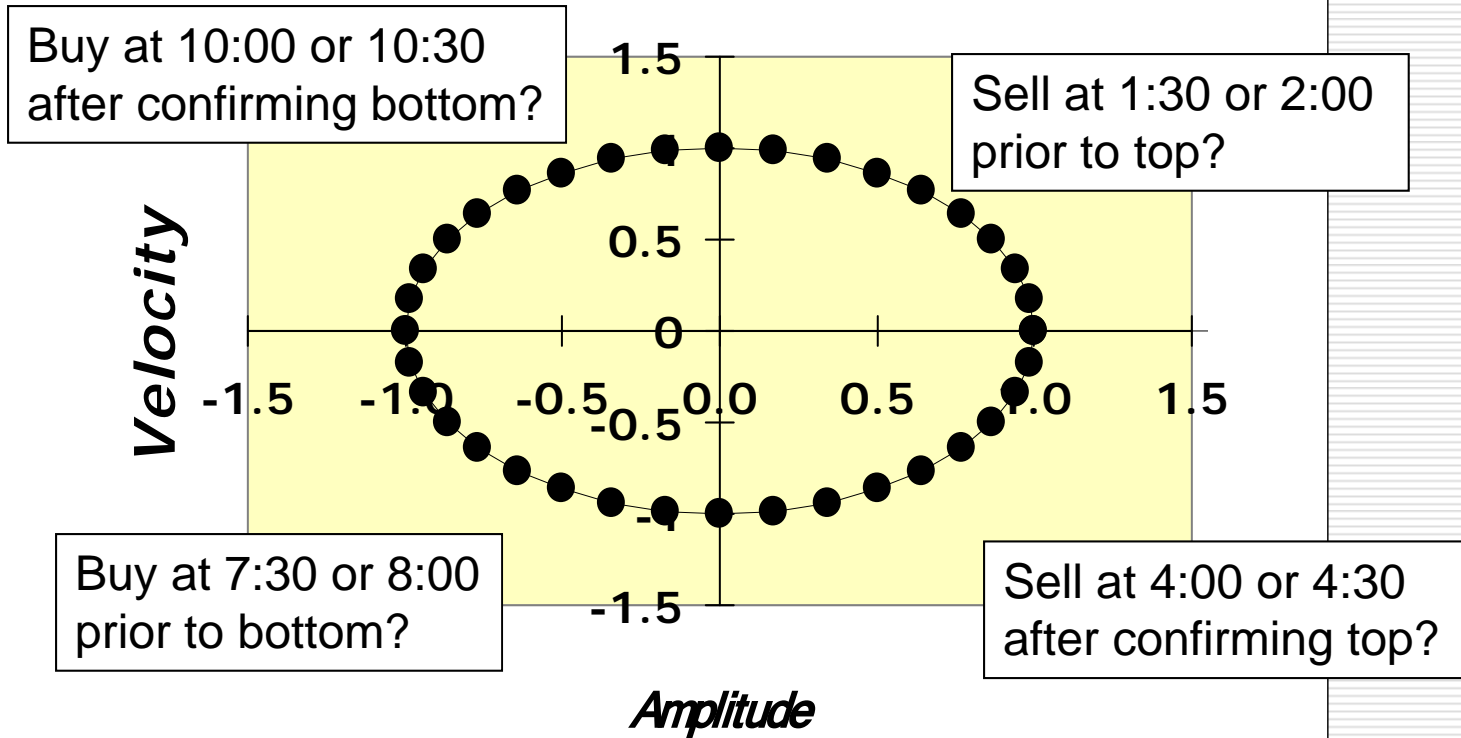
# *Idealized Phase Clock*



This is an idealized phase diagram. Each point represents the state of the system (position and velocity) at a particular time. The motion goes clockwise around the circle. In a perfect sinusoidal cycle, this would be a perfect circle.



# *Idealized Phase Clock*



**Many people think they can time the absolute bottom and top, but this is impossible to do in practice.**

# **This method is friendly to real-world business cycles**

Big up and down motion = bigger circle

Small cycle = small circle

Long cycle = go around slowly

Short cycle = go around fast

Irregular motions = go around in a bumpy way, but the bumps don't show much

Tend to get smoothed

Even if irregularity remains, it is still an approximate circle/cycle  
that is useful in understanding

Time lag not insuperable

Can use regularity to extrapolate in a curved way to estimate  
current position

Can do testing: estimate current position or hypothetical position/velocity

Does that make sense on the phase diagram?

Is this position and trend likely to be sustainable?

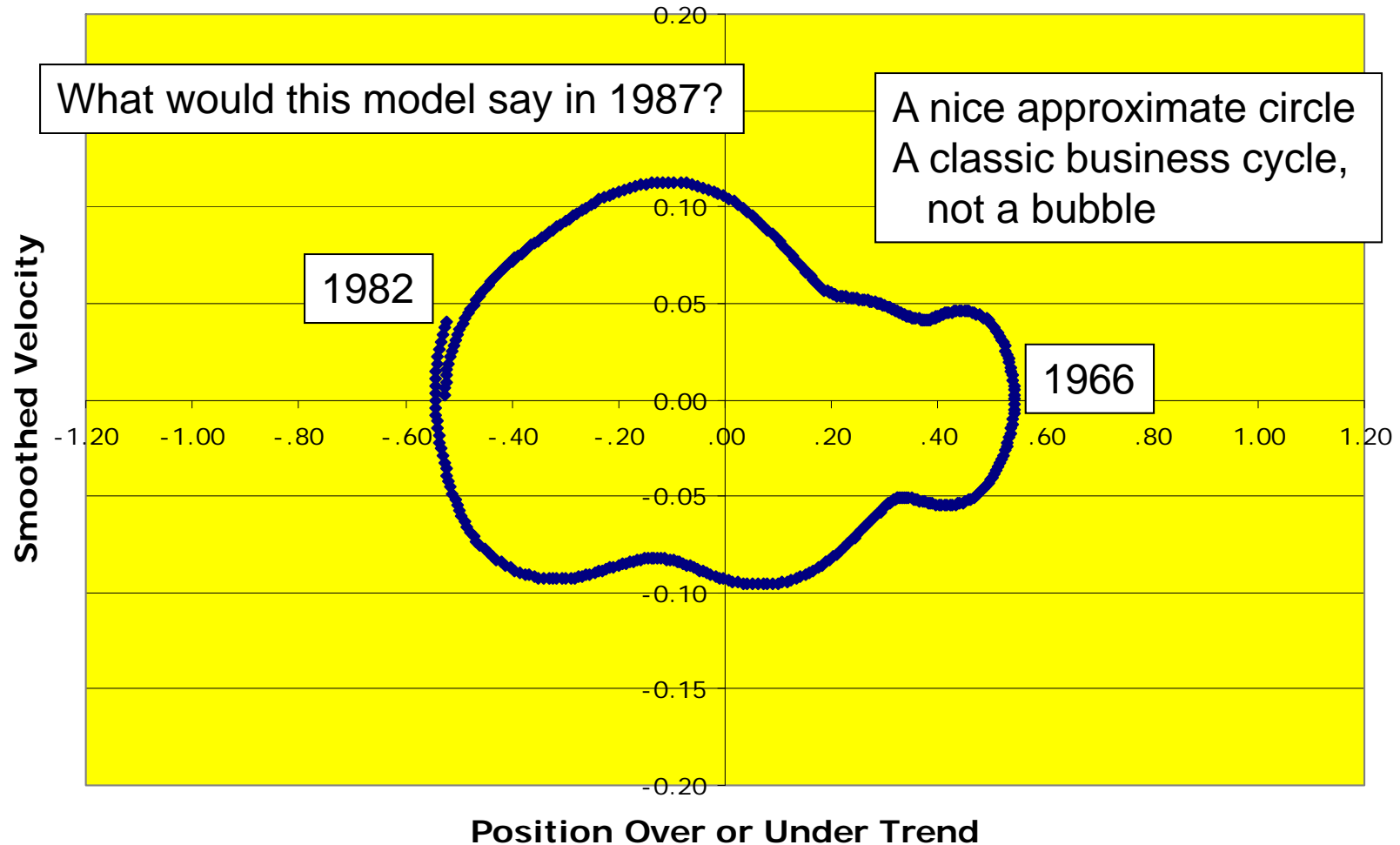
What is likely to follow?

In some ways is a technical indicator

In some ways is a fundamental indicator (long-term growth trend, reality of cycle)

I can call it a techno-fundamental indicator

## Phase Diagram, Dow Jones Index, 1949-1982



This is known in retrospect, but could give reasonable navigation even in real time allowing for a time lag; can capture most of gains on a logarithmic basis

***On a phase diagram, a bubble actually looks like a bubble!***

***Phase Diagram, Dow Jones Index,  
January 1974 to May 2000***

Exuberance, flying out  
rather than curving back  
as standard economics  
would say

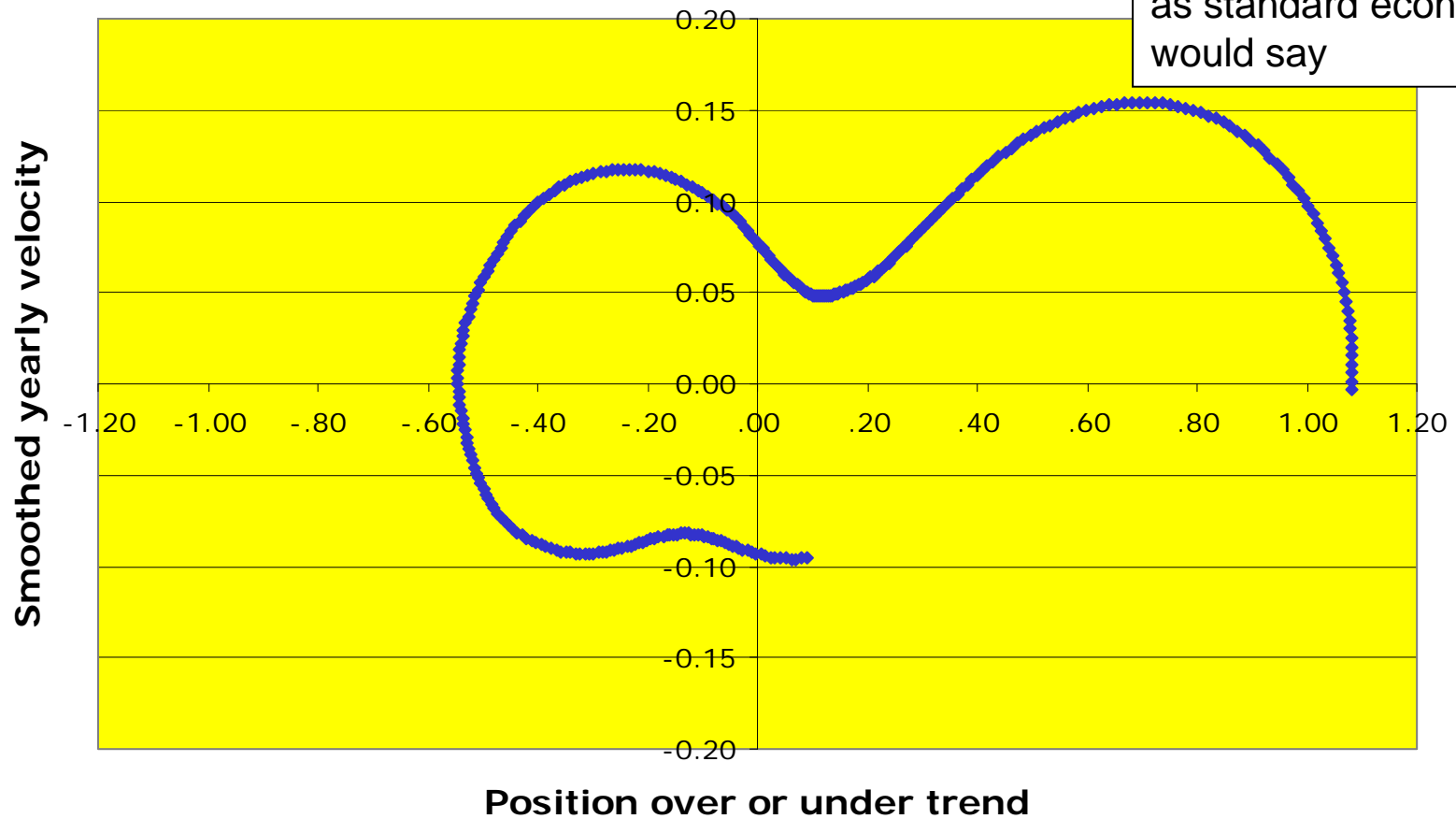
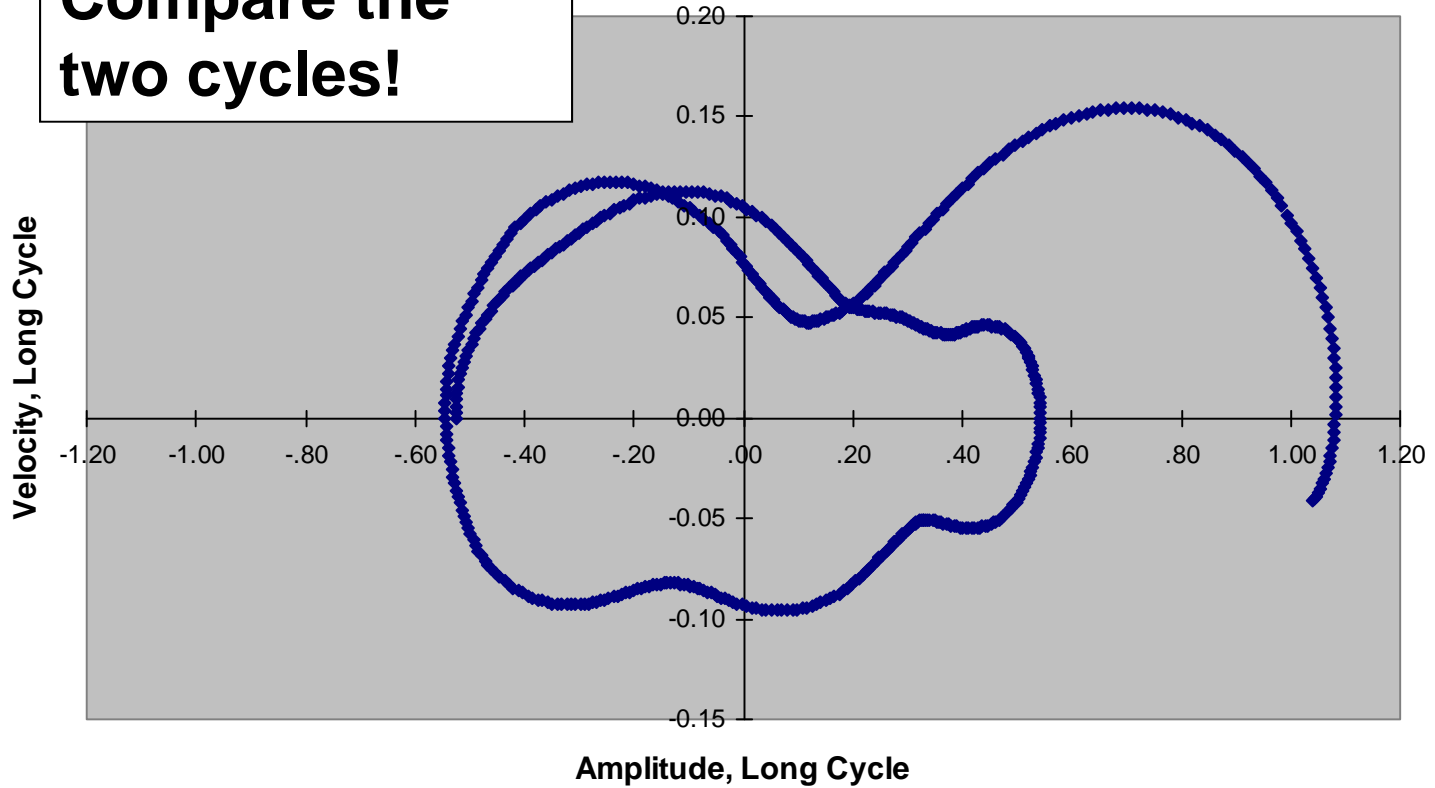


Chart 2 - Phase Diagram of Long Cycle, Known with Certainty 1946-1992

**Compare the two cycles!**

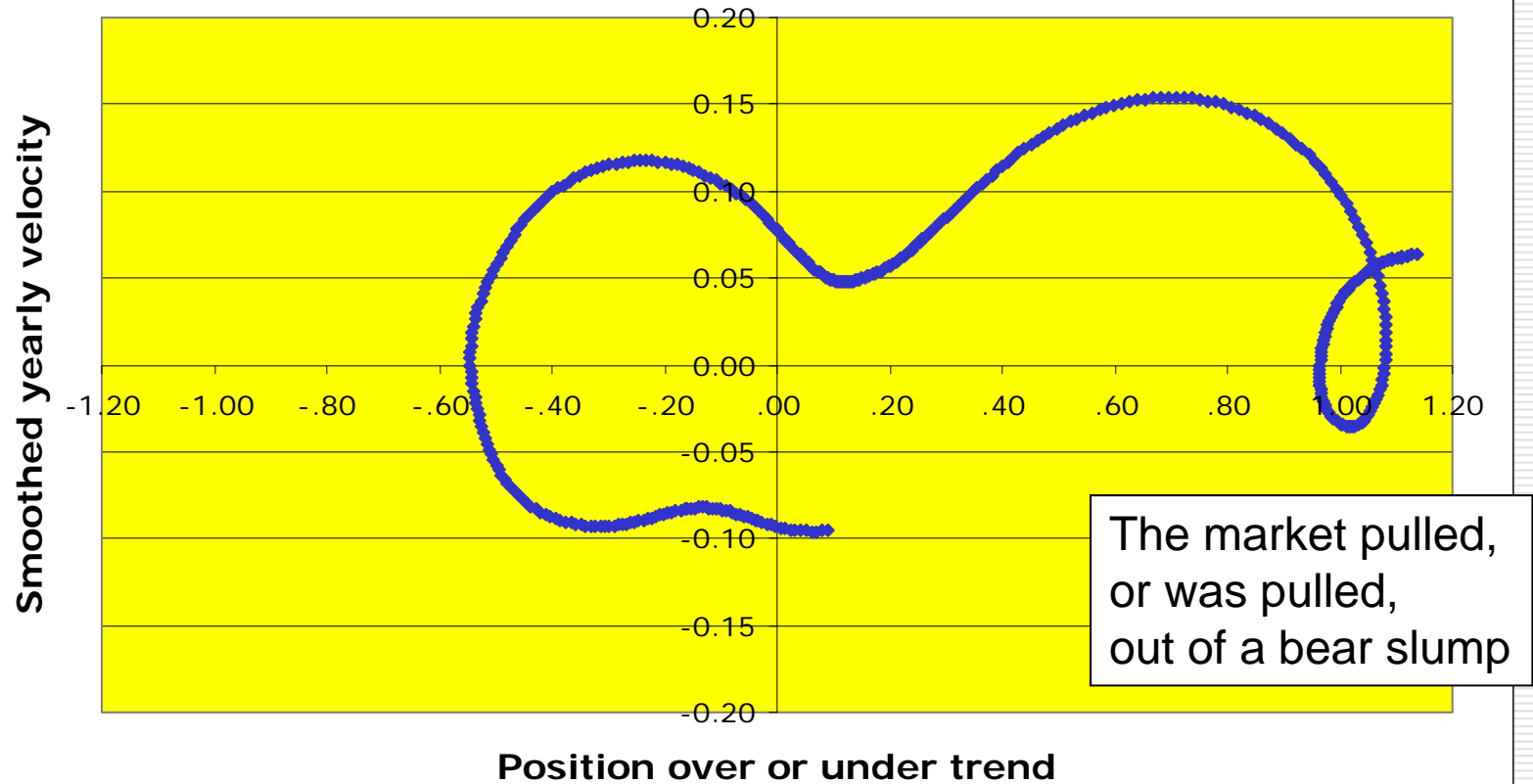


**Remember there is a lot of short-term and medium-term tradable motion that is smoothed over, and not shown here**



**Extend graph taking recent behavior as sustainable, not to be revoked by future motion – doesn't look right!**

*Phase Diagram, Dow Jones Index,  
known January 1974 to March 2002  
estimated through fall 2007*



What happened? Why didn't the motion follow the circle?

Is the Phase Method imperfect (though still useful)?

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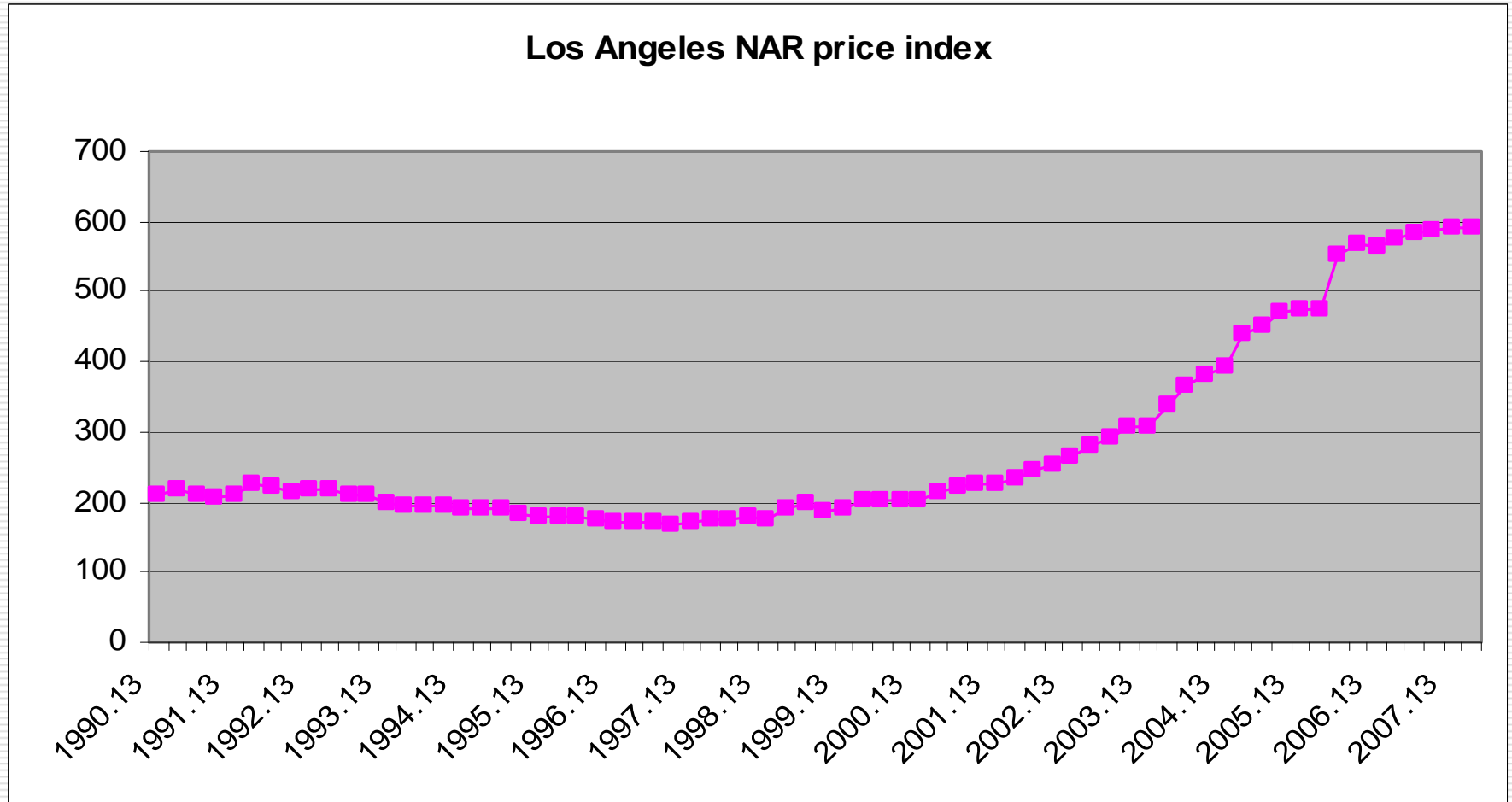
**I've got my theory. Don't confuse me with the facts!**

But - are there other underlying reasons for the pull-up?

1. Very low interest rates after 9/11 and a global savings glut keeps prices high; can the model be adjusted to allow for interest rates?
2. Is inflation in fact underestimated?  
A higher rate of inflation would pull the curve to the left.  
Dollar depreciation – what about measuring the Dow in euros?
3. Is the market receiving some support to keep it from curving down?

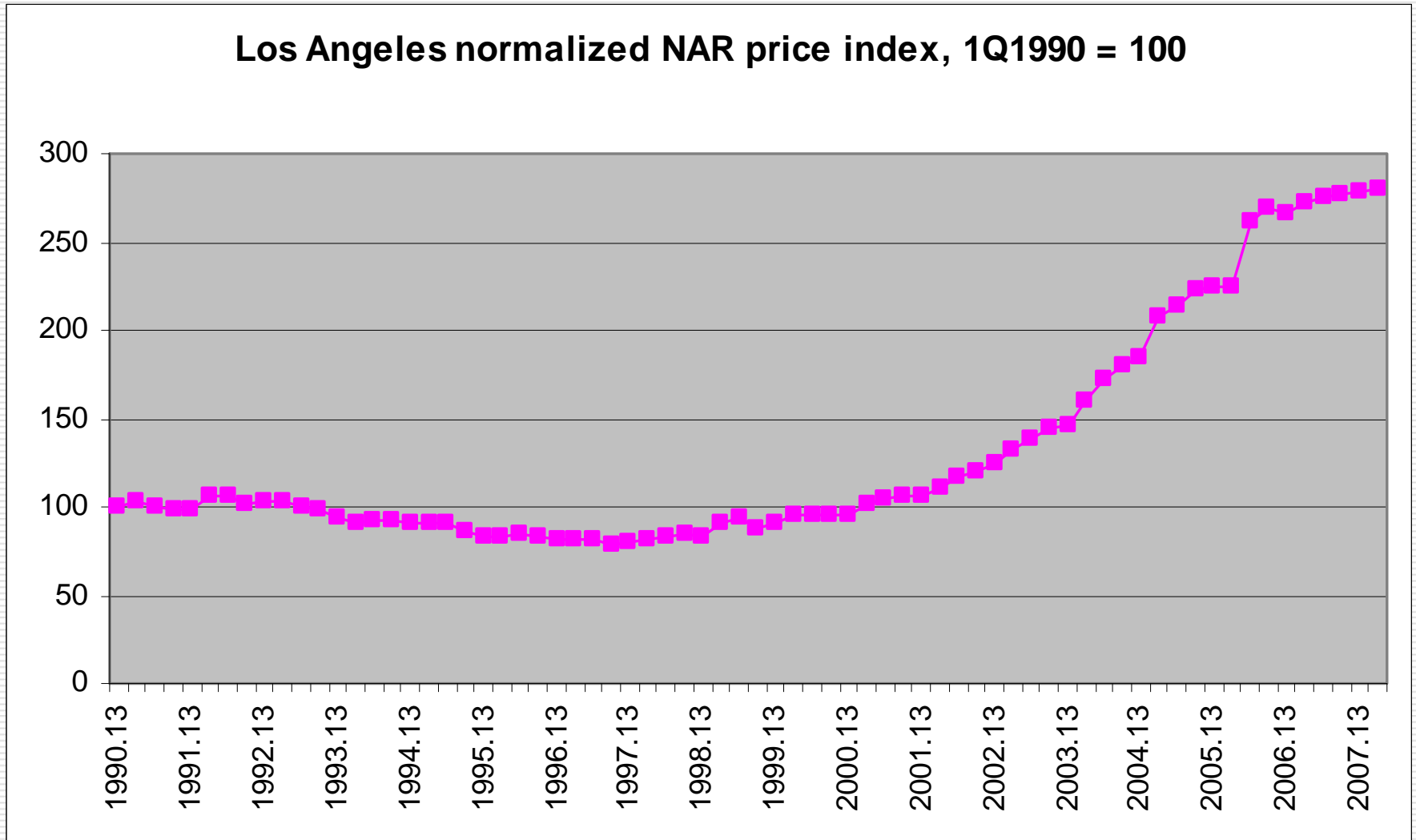


# Now let's apply the Phase Method to median residential real estate prices in Los Angeles County

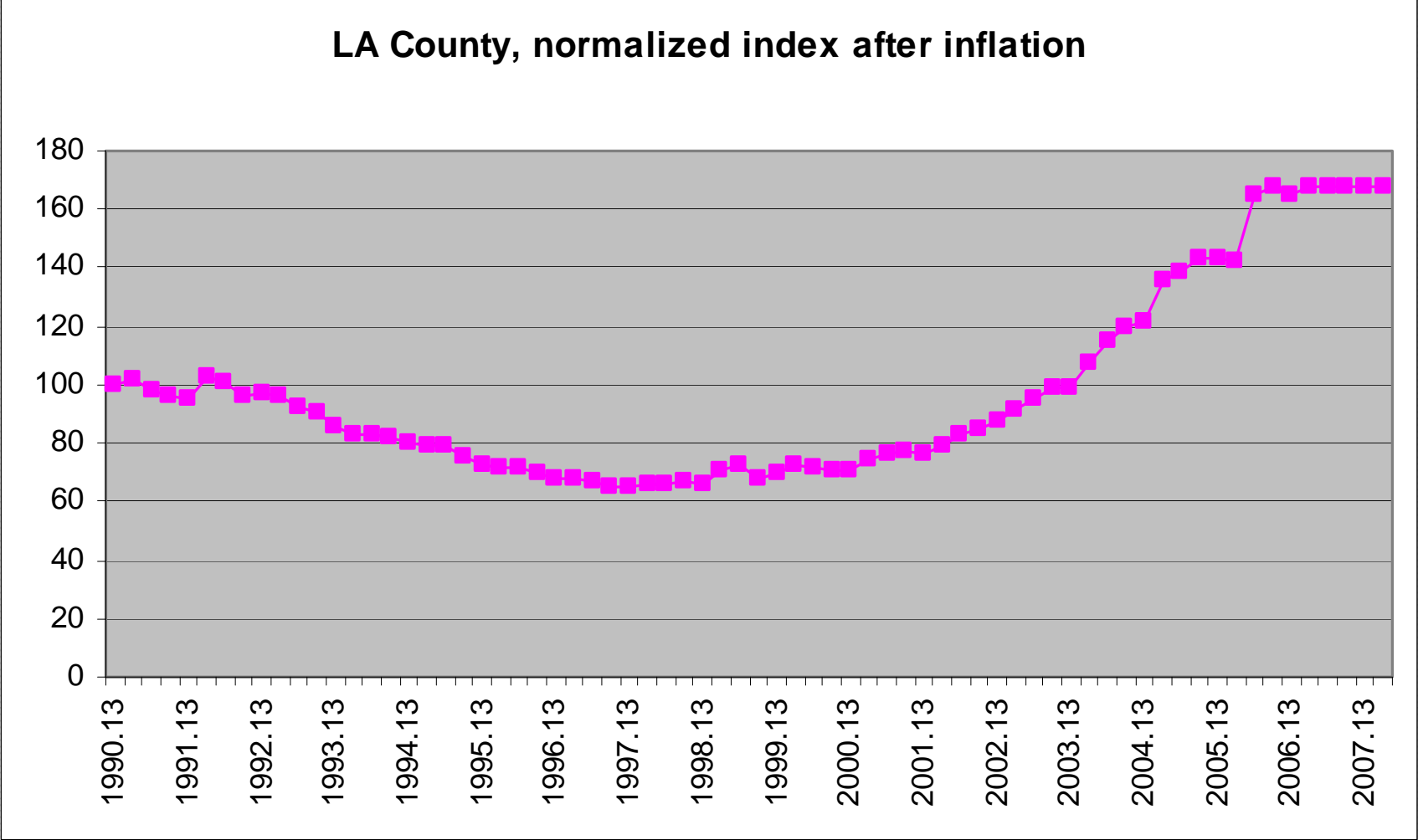


Source: National Association of Realtors®  
Median Price Index of Existing-Single Family Homes

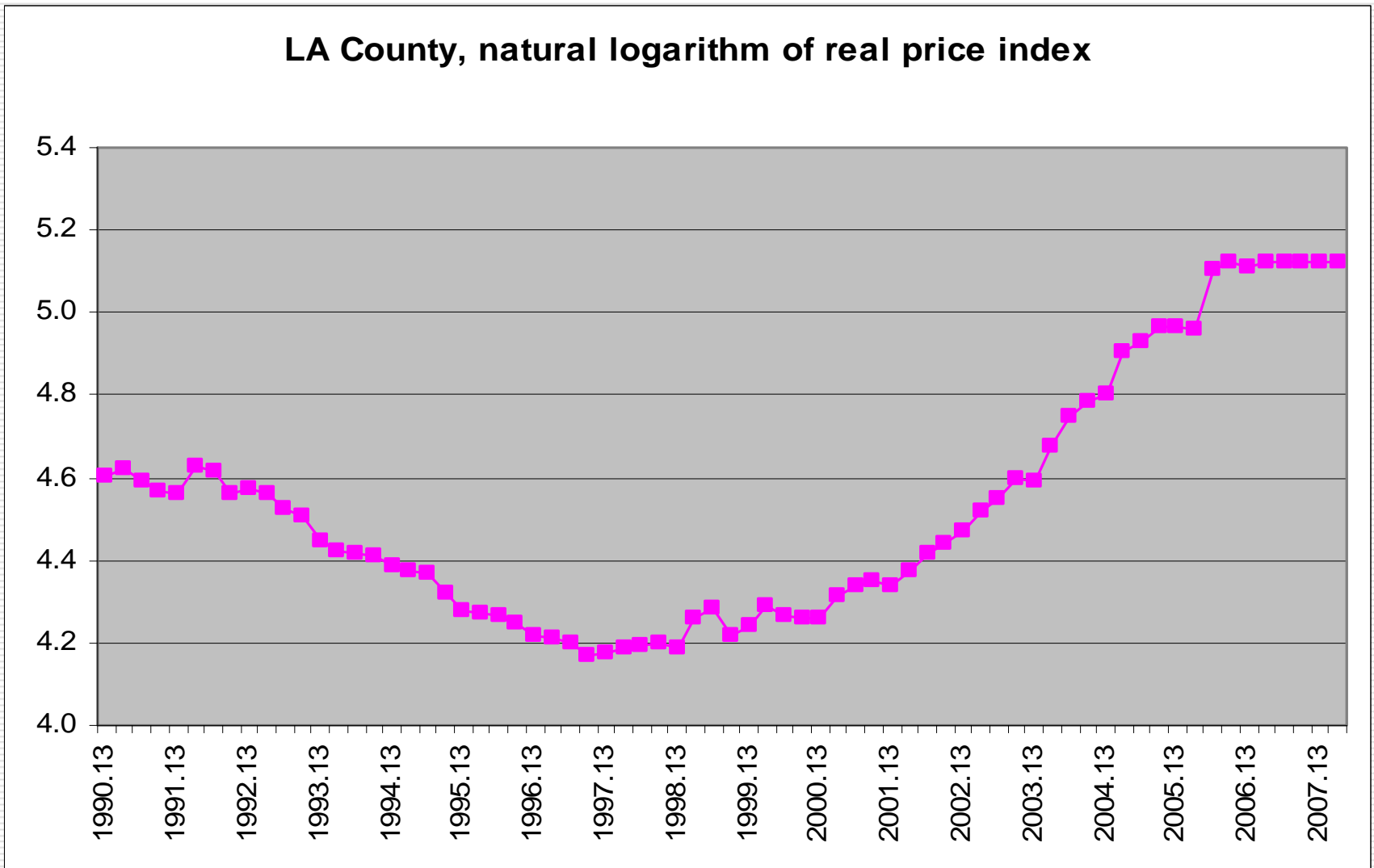
## Normalize the index to 1Q1990 = 100 to enable ratio comparisons with other counties



# Take off inflation to work in constant dollars

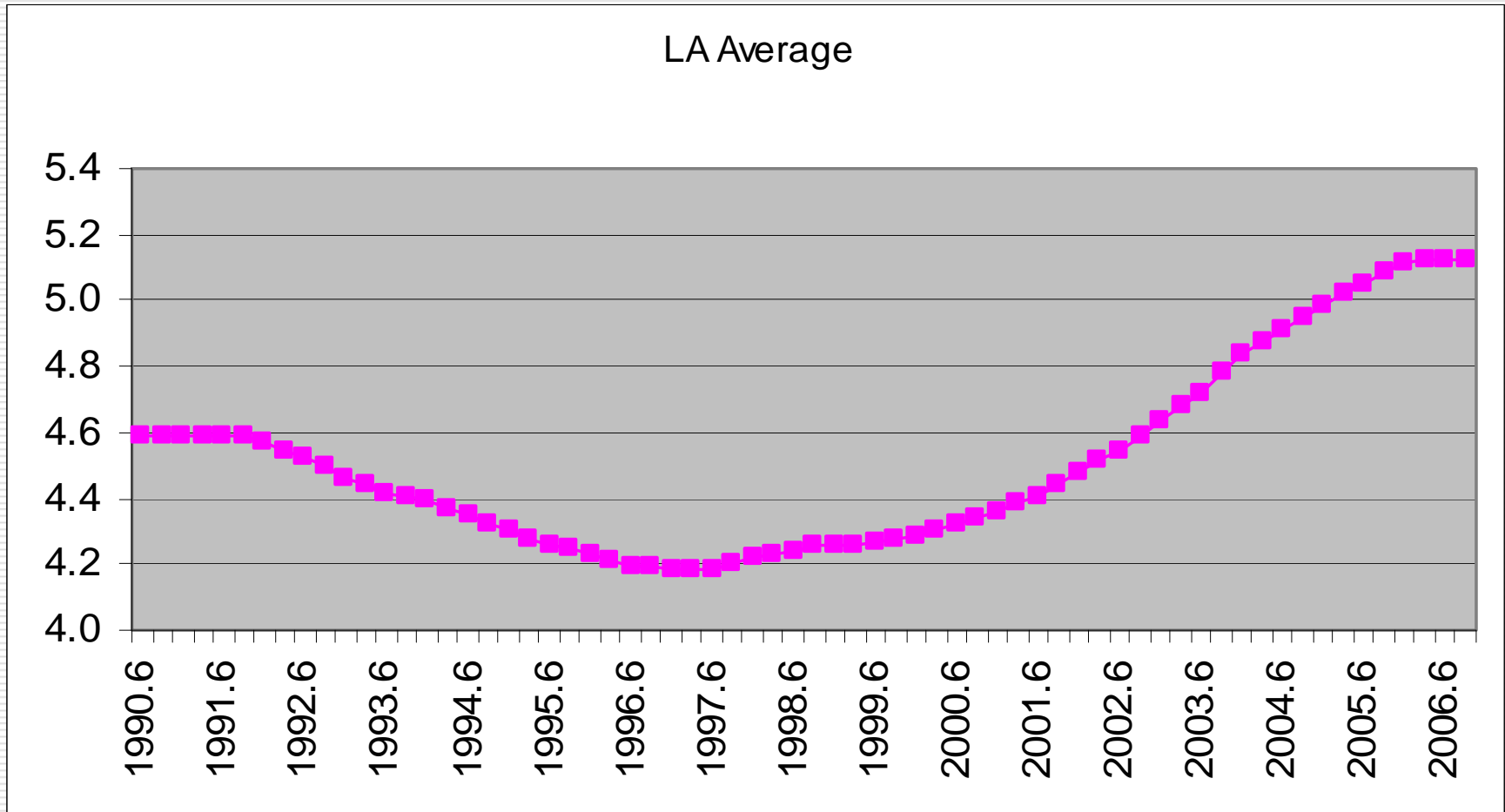


# Take natural logarithms



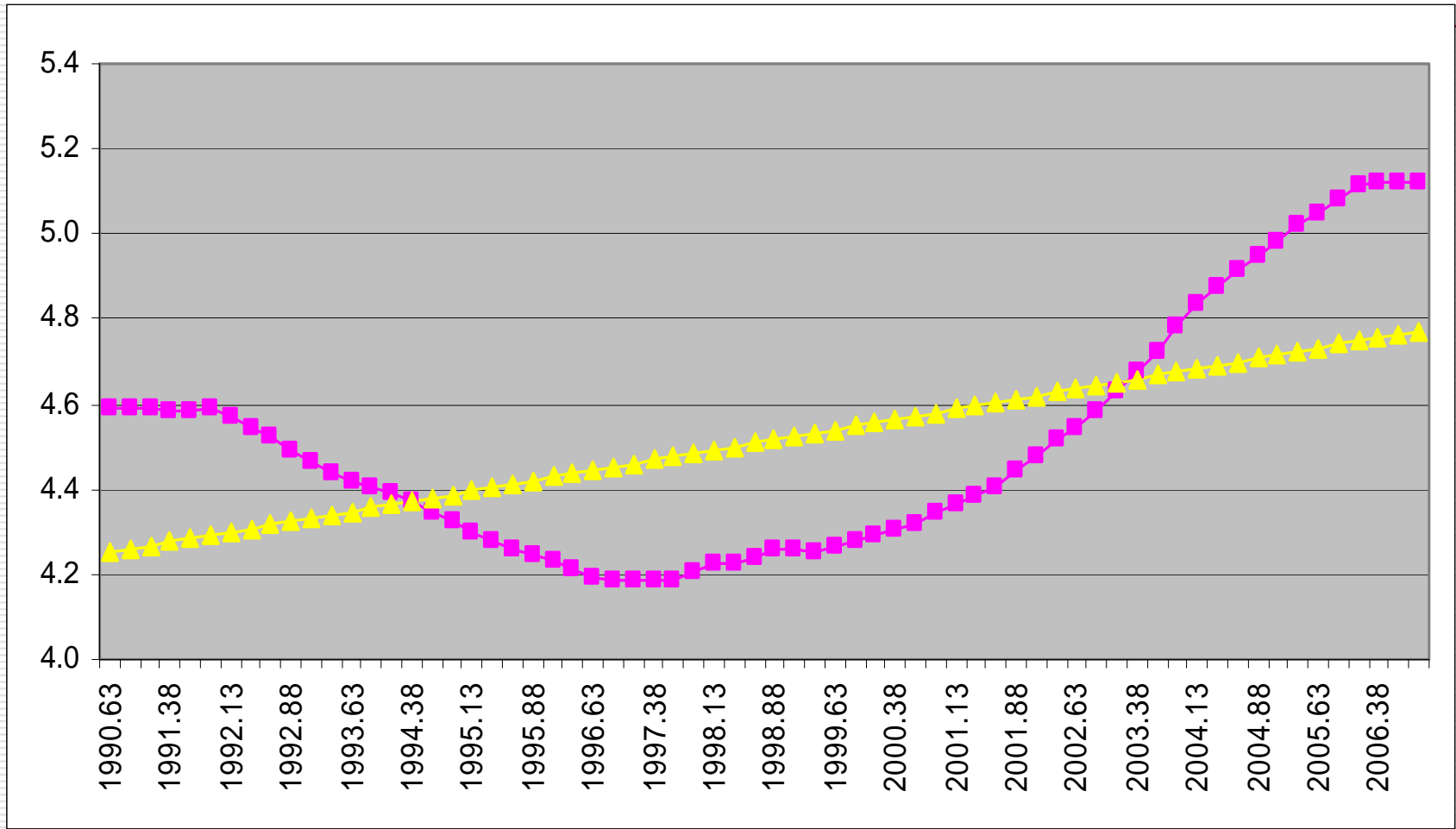
# Single-moving average, width = 5

Use single average to minimize time lag – smooth enough



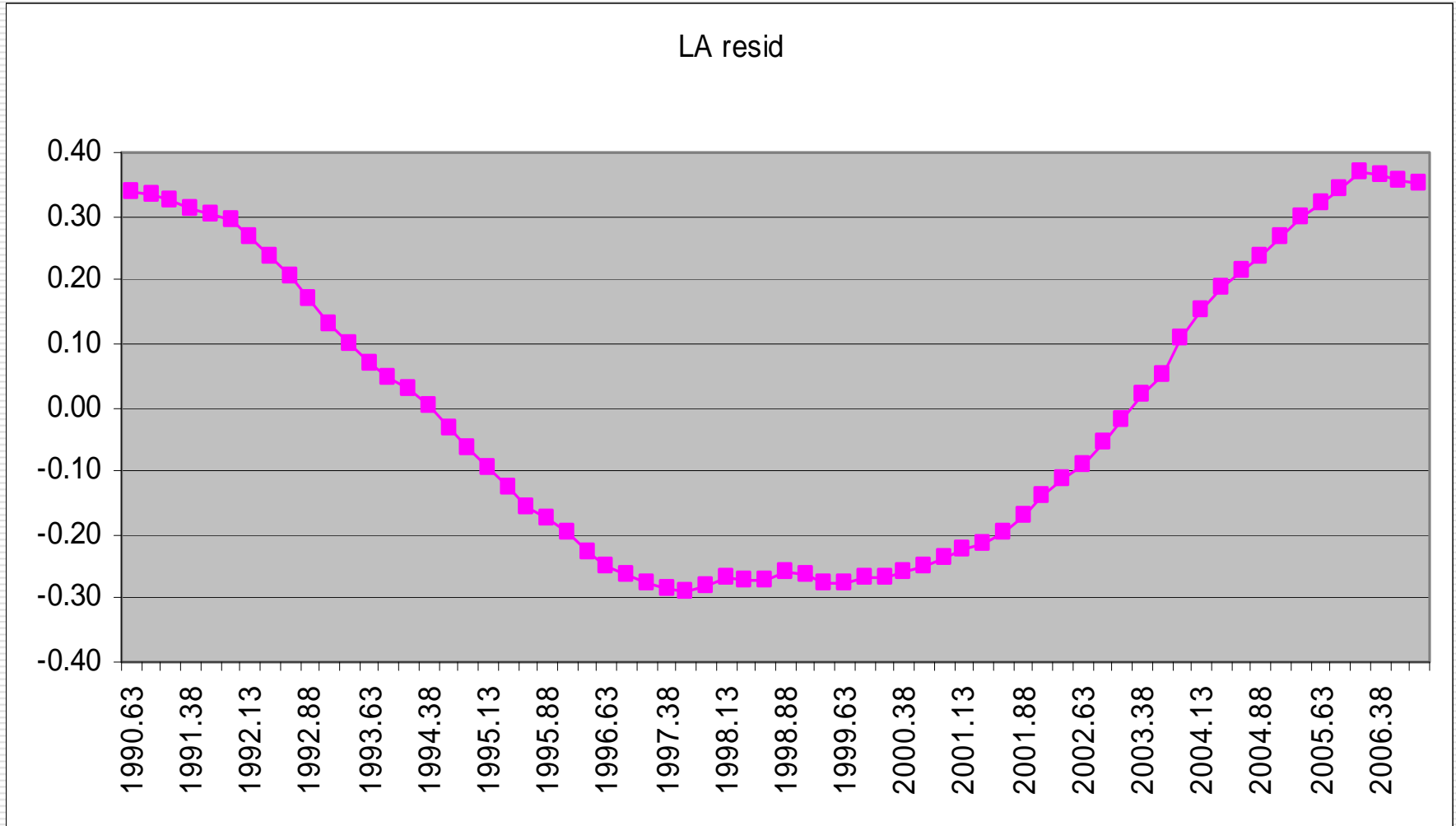
# Put in a middle-to-middle trend line

However you draw the line, it's clearly over trend now and has been that way for years

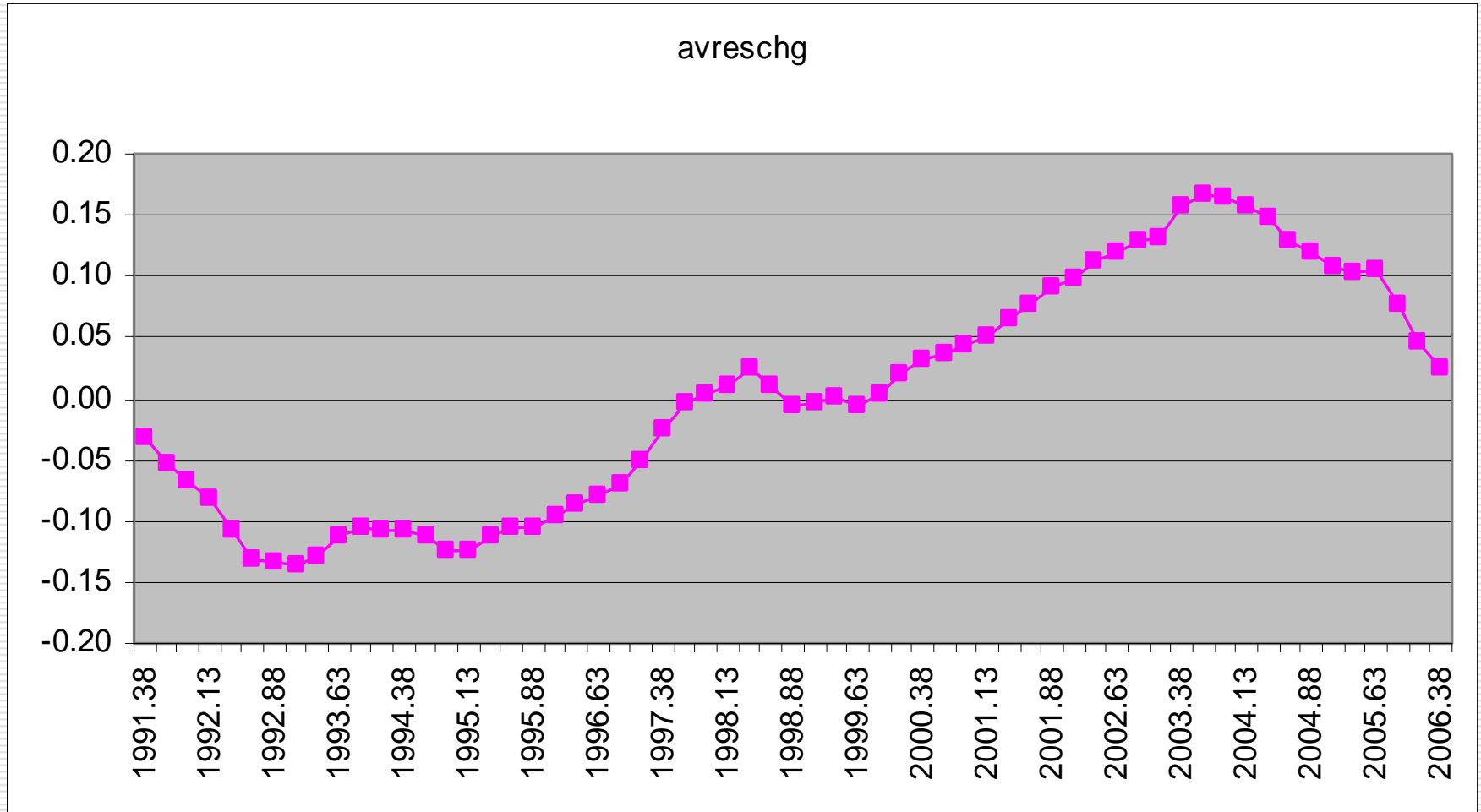


# Subtract to get the residuals

However you drew the line, we're clearly over trend



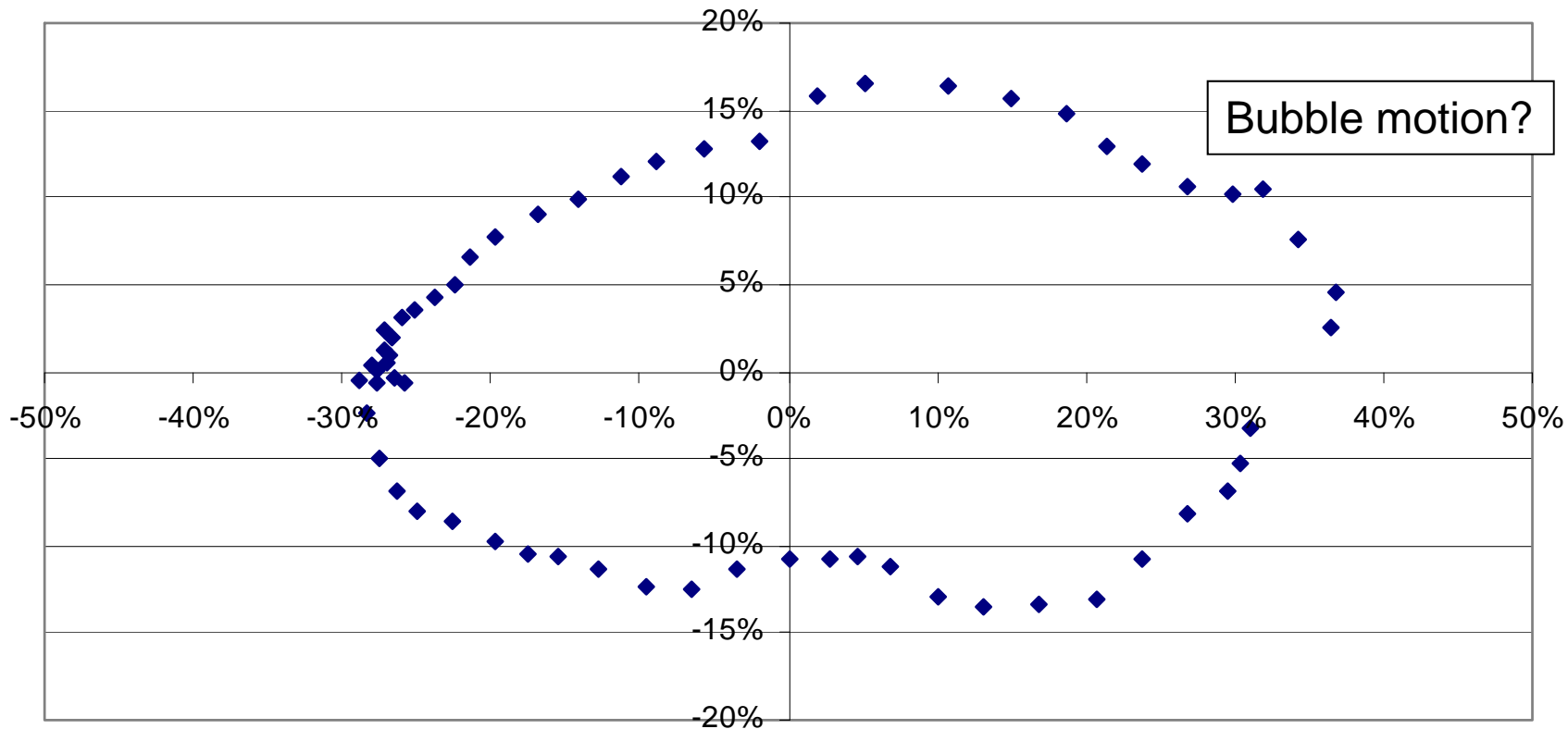
Take year-over-year quarterly changes  
Then take a single moving average, width = 5





# Phase Diagram, known through 2Q2006

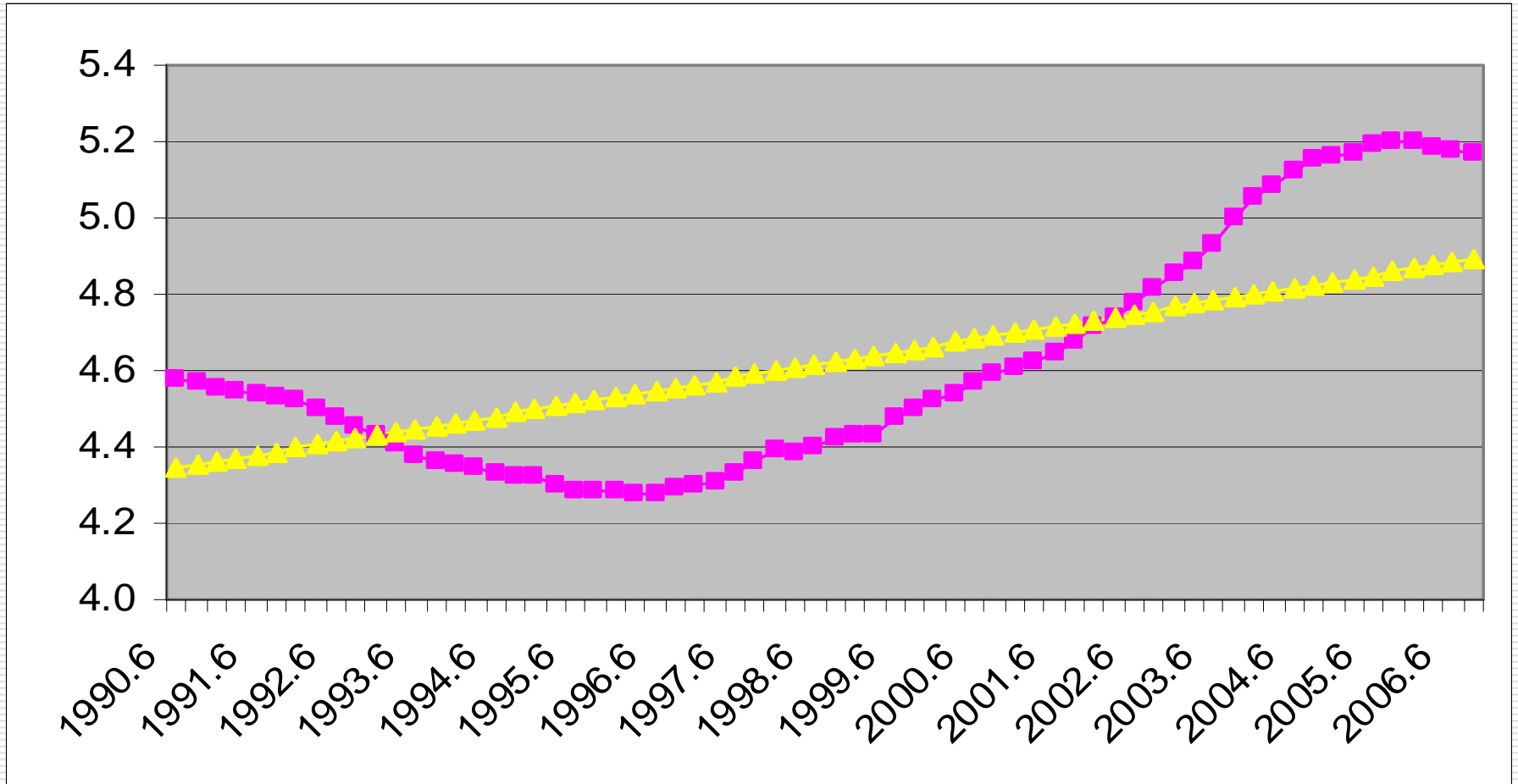
Los Angeles County phase diagram



Cyclic motion clear. Even if the trend or position is wrong the basic idea is right. That's robustness!

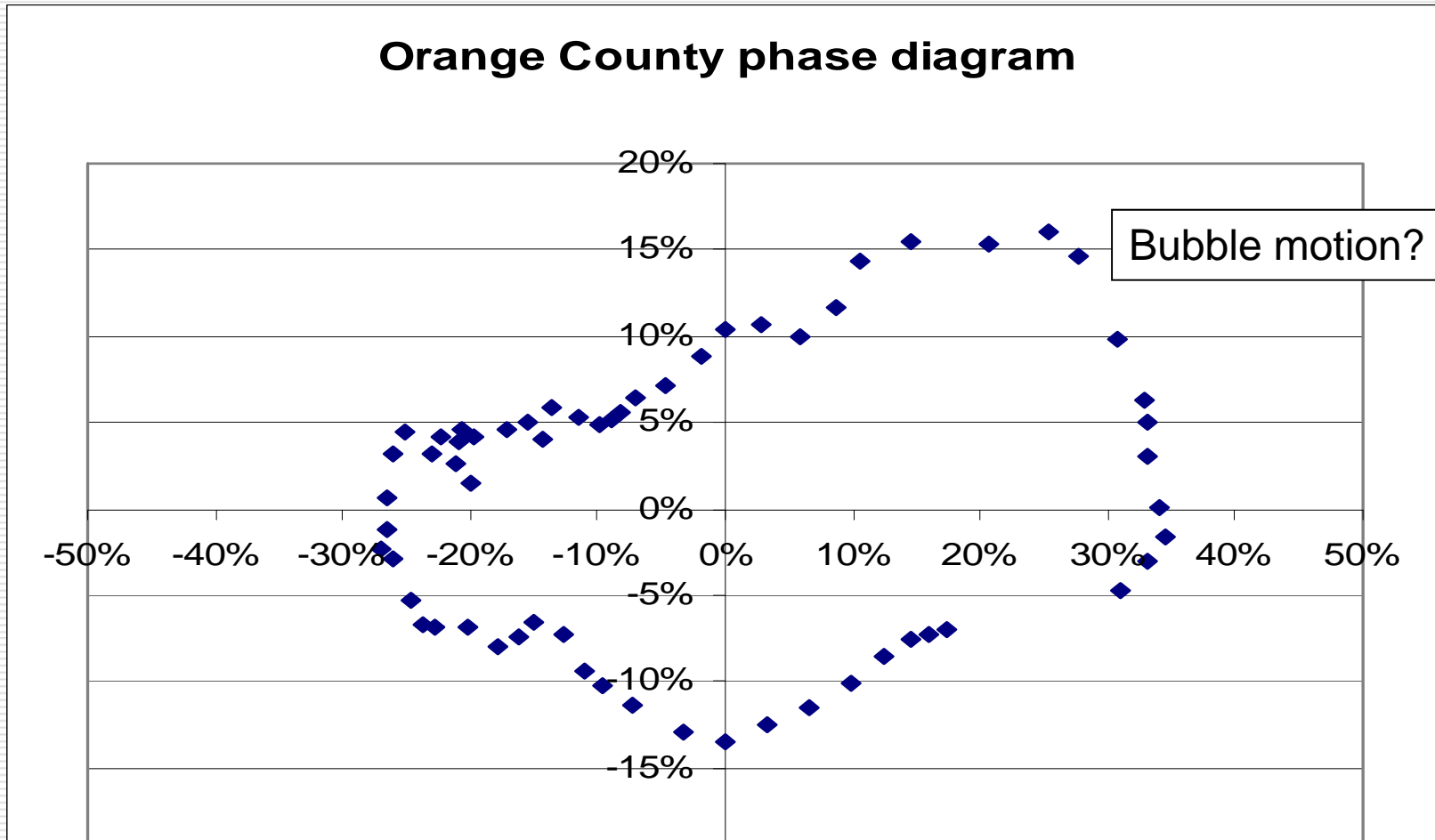
We can use the cycle regularity to estimate and test current position and direction.

# Orange County, same methodology



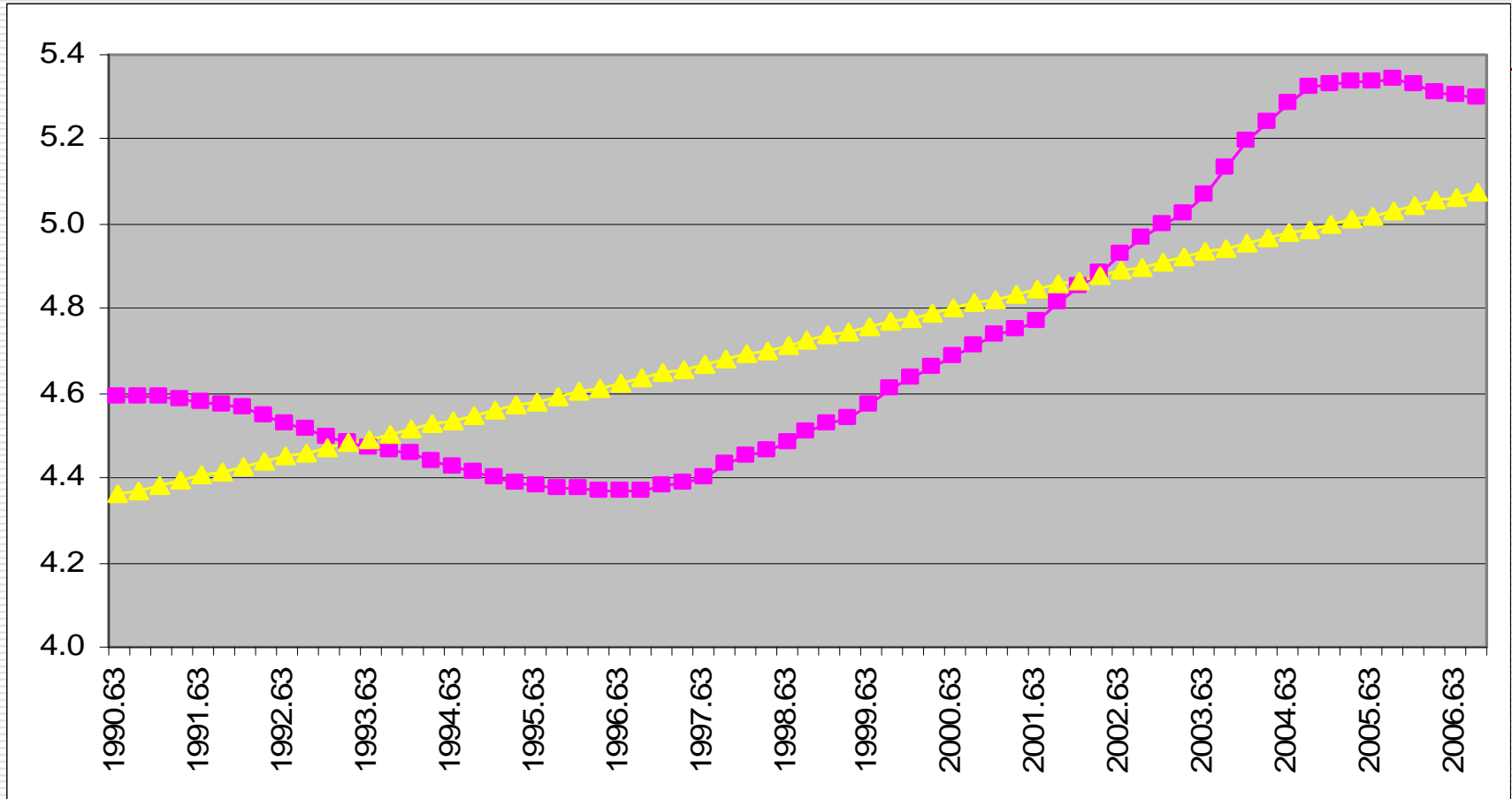
Data source: National Association of Realtors®

# Orange County Phase Diagram known through 2Q2006



By 2Q2006 the cycle had clearly passed its peak, as far as averages were concerned. Further drops are likely; also consider the fundamentals. Orange County **leads** Los Angeles County in the cycle! Its graph is further advanced along the circle.

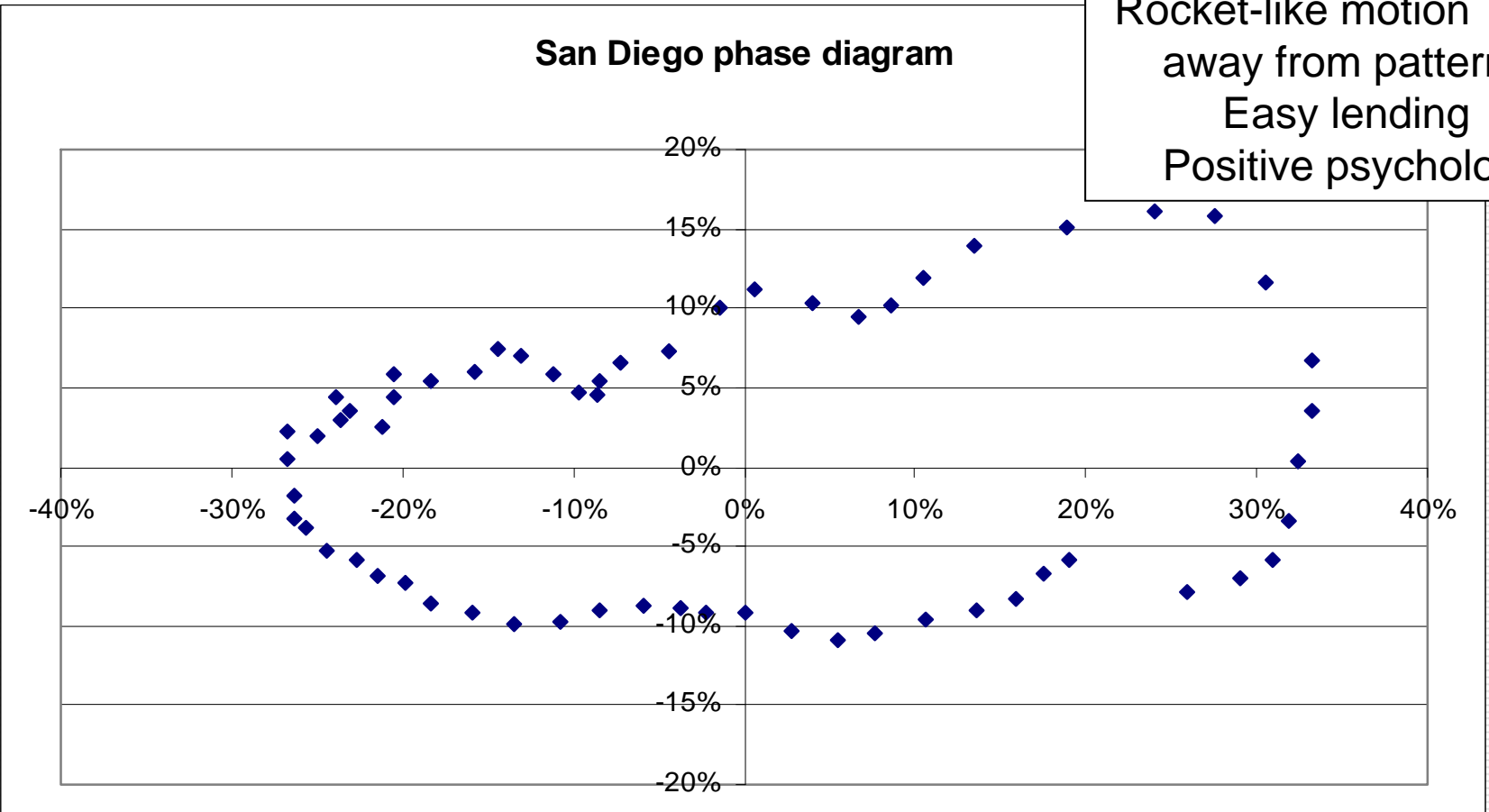
# San Diego County, same methodology



Data source: National Association of Realtors®

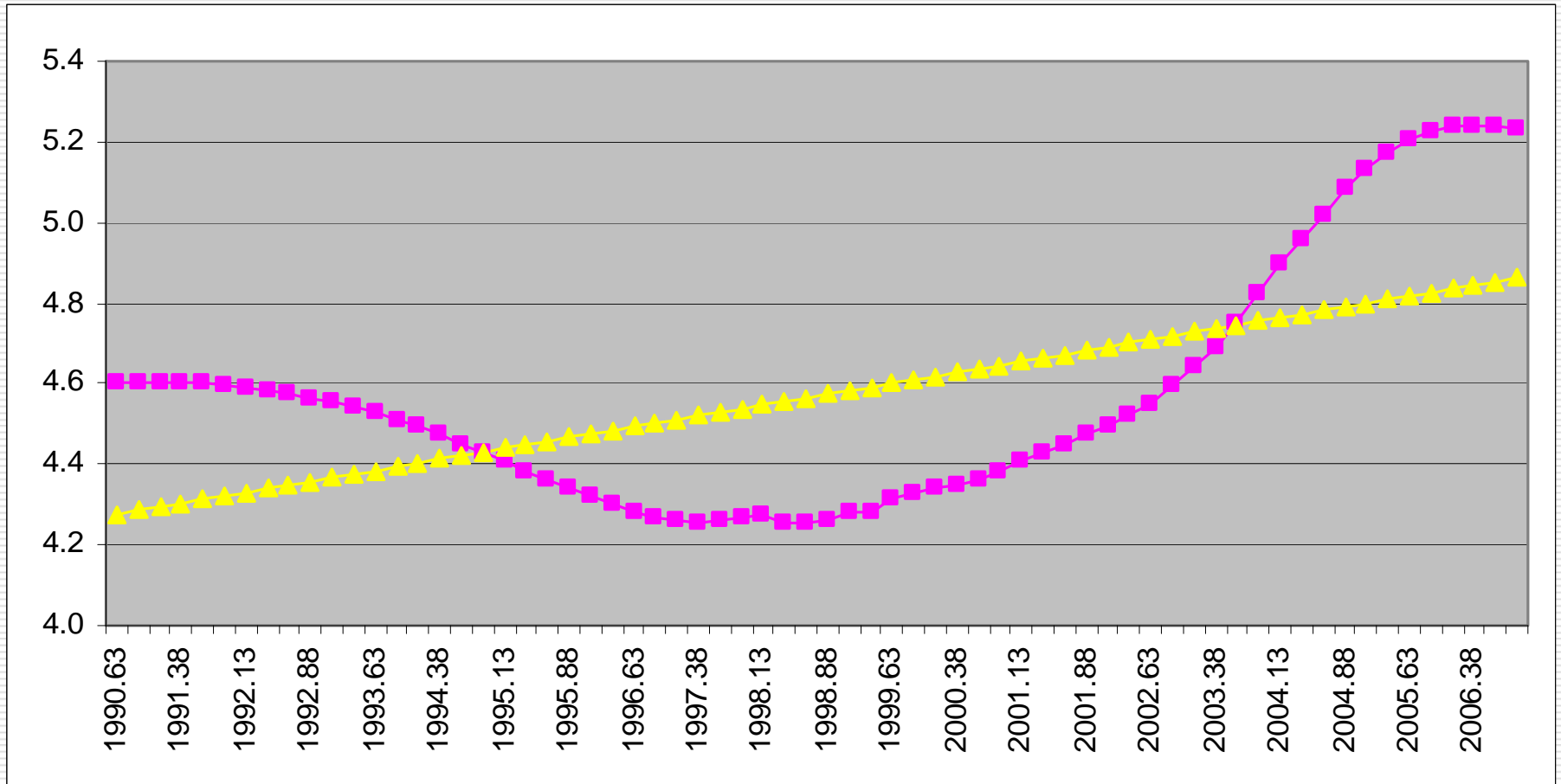
# San Diego County Phase Diagram known through 2Q2006

Bubble motion?  
Rocket-like motion  
away from pattern  
Easy lending  
Positive psychology



San Diego County is the farthest along in the phase circle. Peaked earliest. This county is considered a market leader in Southern California and has been studied as a "canary in the coal mine." Behavior observed through 3Q2007 is consistent with this diagram.

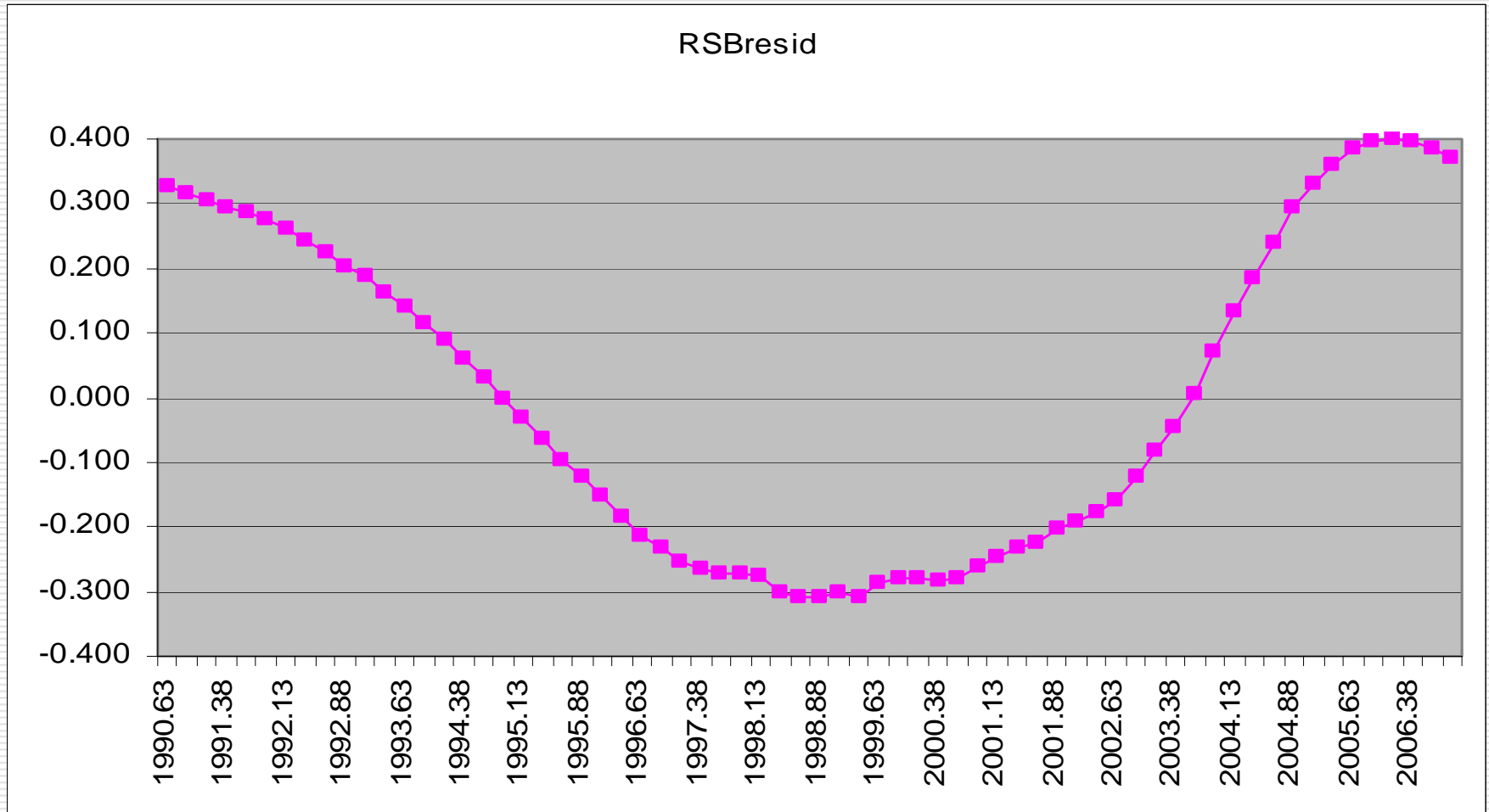
# Inland Empire, same methodology Riverside/San Bernardino Counties



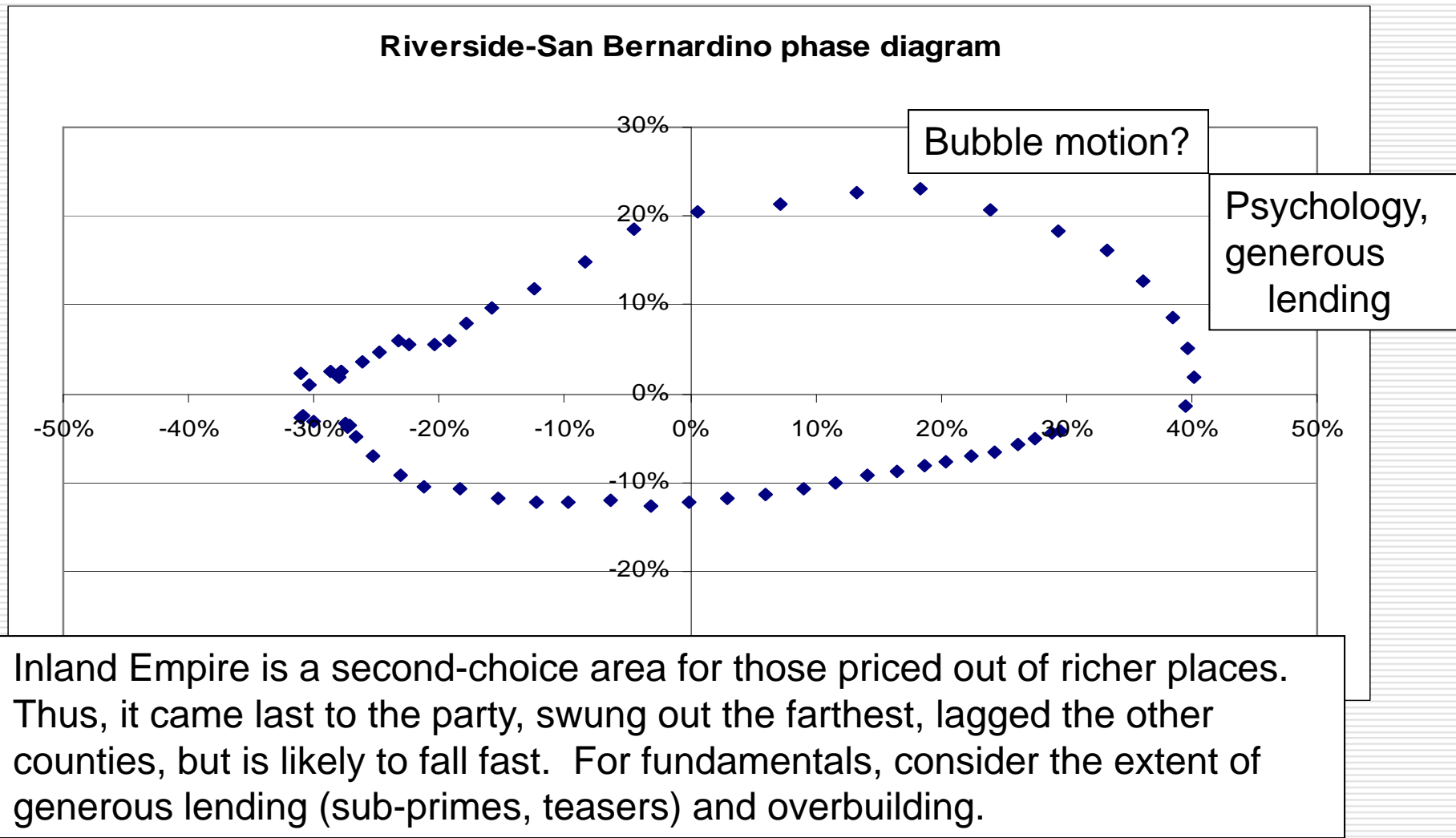
Data source: National Association of Realtors®

# Inland Empire, residuals Riverside/San Bernardino Counties

RSBresid



# Inland Empire Phase Diagram known through 2Q2006





# Comments and observations

## The Phase Method is often contrarian

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Buy in bear markets, sell in bull markets

You must not only be called a fool and feel like a fool,  
you must actually **be** a fool for some time.

But you will capture the great majority of price rises/falls  
on a logarithmic basis

No one can expect to time the absolute top or bottom.

Caveat: geopolitical events or major government intervention can  
break into the system and change the rules.

**In general, the Phase Method fits and is friendly to business cycles;**  
It works well as a tool, not perfect, but useful, in understanding cycles.

I believe **business cycles are more alike than not.**

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**Different names** and phenomena characterize them; consider the names and theme songs of different bull market phases.

Stocks on margin, IPOs, land on binder/escrow, options  
Dotcoms, speculation in condos and tract houses  
Leveraged buyouts, no-down and negative amortization loans  
New Era, New Paradigm, Never Goes Down psychology

But in my judgment there is essentially **one** basic business cycle with bull and bear phases, positive and negative, risk-taking and risk-averse.

It is more important to know **whether** a cycle is extended or depressed than the exact details of how it turns, or what events happen in what order.

## **Simply put, the business cycle is basic to economics.**

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It is as fundamental as the law of supply and demand.

The Phase Method is cycle-friendly, and thus is a useful tool in analyzing cycles.

It can be part of one's tool box, used in conjunction with other techniques.

For further inquiries, please contact

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