

Identifying and Responding to Asset Price Bubbles

Eric Doviak

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What are the Causes and Symptoms?
A General Equilibrium Model of House Price Appreciation
Conclusion

Rapid Growth of Home Prices

- ▶ Between 2000 Q1 and 2006 Q1:
 - ▶ home prices rose 48 percent nationwide
 - ▶ home prices rose 72 percent in the NYC CMSA
- ▶ For comparison, over the same period:
 - ▶ average household income rose 15 percent nationwide
 - ▶ consumer prices rose 16 percent nationwide
 - ▶ housing rents rose 20 percent nationwide
 - ▶ housing rents rose 26 percent in the NYC CMSA

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Outline

What are the Causes and Symptoms?

- Funny T-shirts
- Rapid Growth of Real Prices
- Increasing Price-Income Ratios
- Increasing Price-Rent Ratios

A General Equilibrium Model of House Price Appreciation

- Economics 101: Marginal Product of Labor
- Specific Factors Model

Conclusion

- Economic Implication
- How to Pop the Bubble?
- Guidance for Banks and Regulators?

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Funny T-Shirts

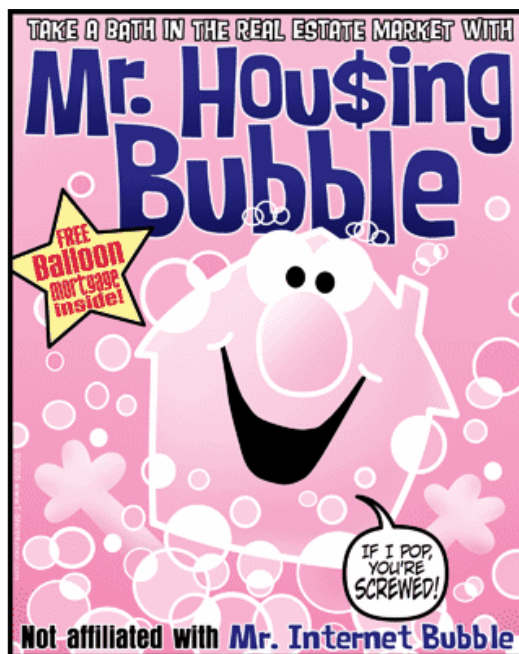


Image on a T-shirt that T-shirtHumor.com began selling in August 2005.



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Magazine Covers

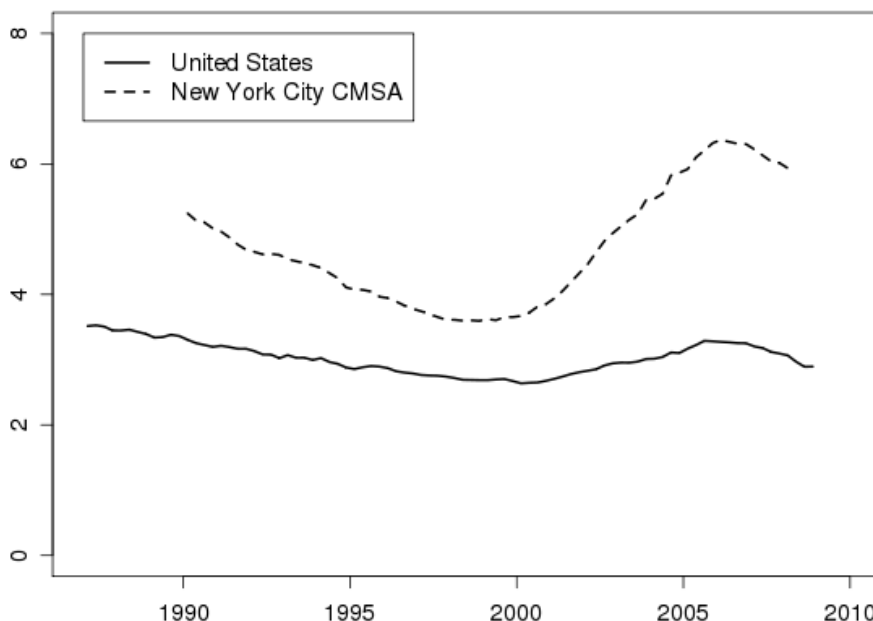


Cover of the March 30, 2002 edition of the *Economist* magazine.



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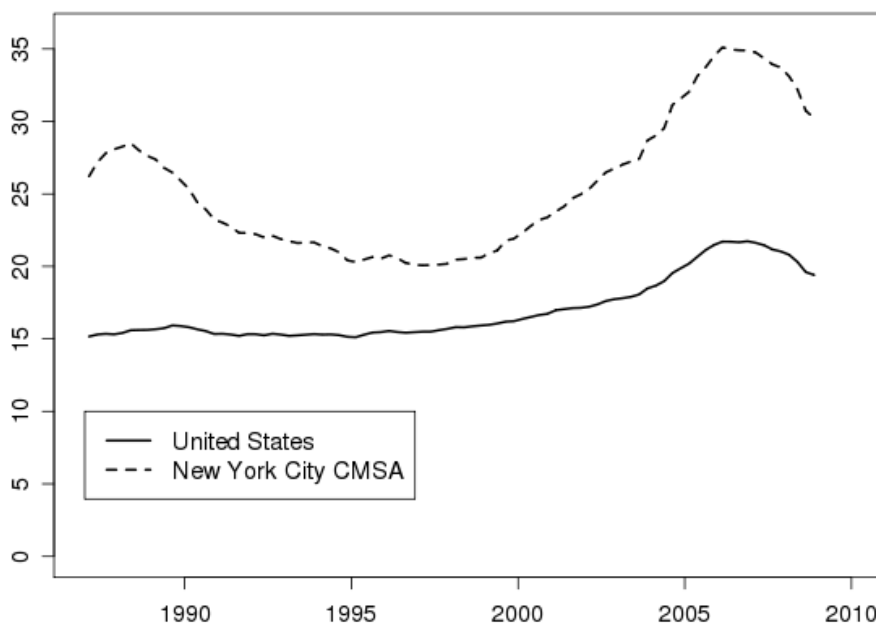
Increasing Price-Income Ratios



OFHEO Home Price Index divided by an income index. The median home value and median household income from Census 2000 were used to impute dollar values to the indices.



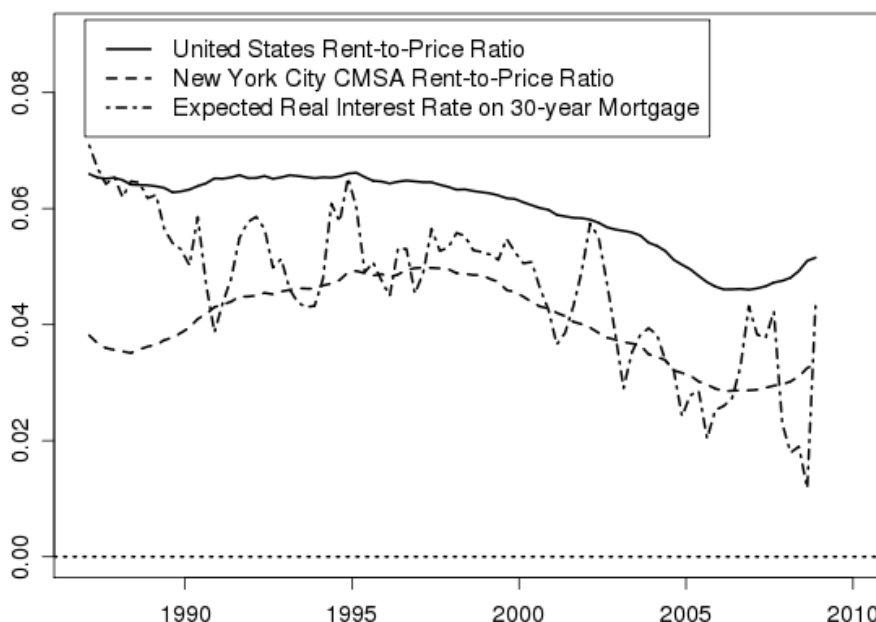
Increasing Price-Rent Ratios



OFHEO Home Price Index divided by CPI Rent Index. The median home value and median gross rent from Census 2000 were used to impute dollar values to the indices.



Falling Rent-Price Ratios and Real Mortgage Interest Rates



CPI Rent Index divided by OFHEO Home Price Index. Expected real interest rate on a 30-year fixed-rate conventional home mortgage is assumed to equal the nominal interest rate minus the previous year's inflation rate.



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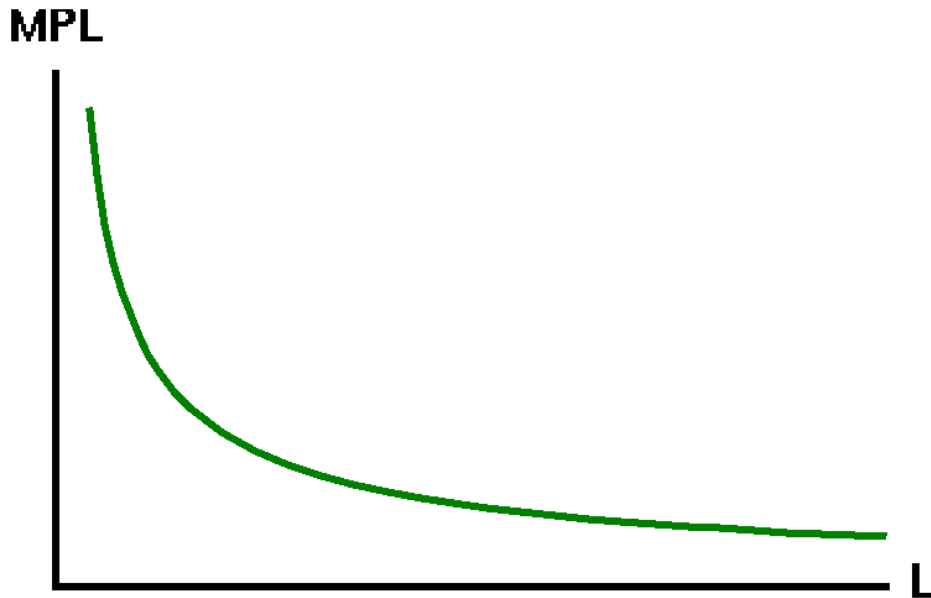
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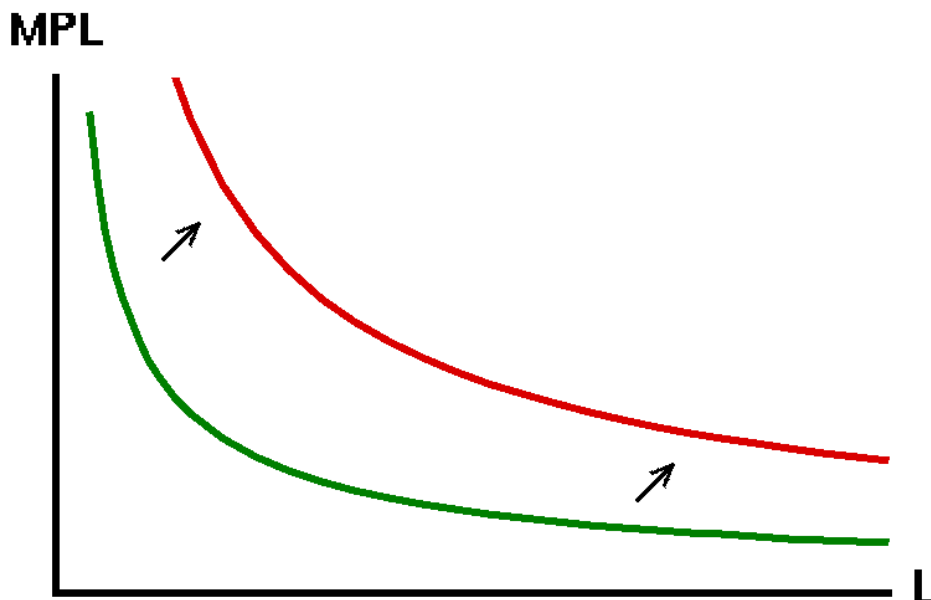
Marginal Product of Labor (1)



As you add more cooks to a kitchen, the additional food produced by each additional cook falls ...



Marginal Product of Labor (2)



... but if you increase the size of the kitchen, the additional food produced rises at every value of the number of cooks.

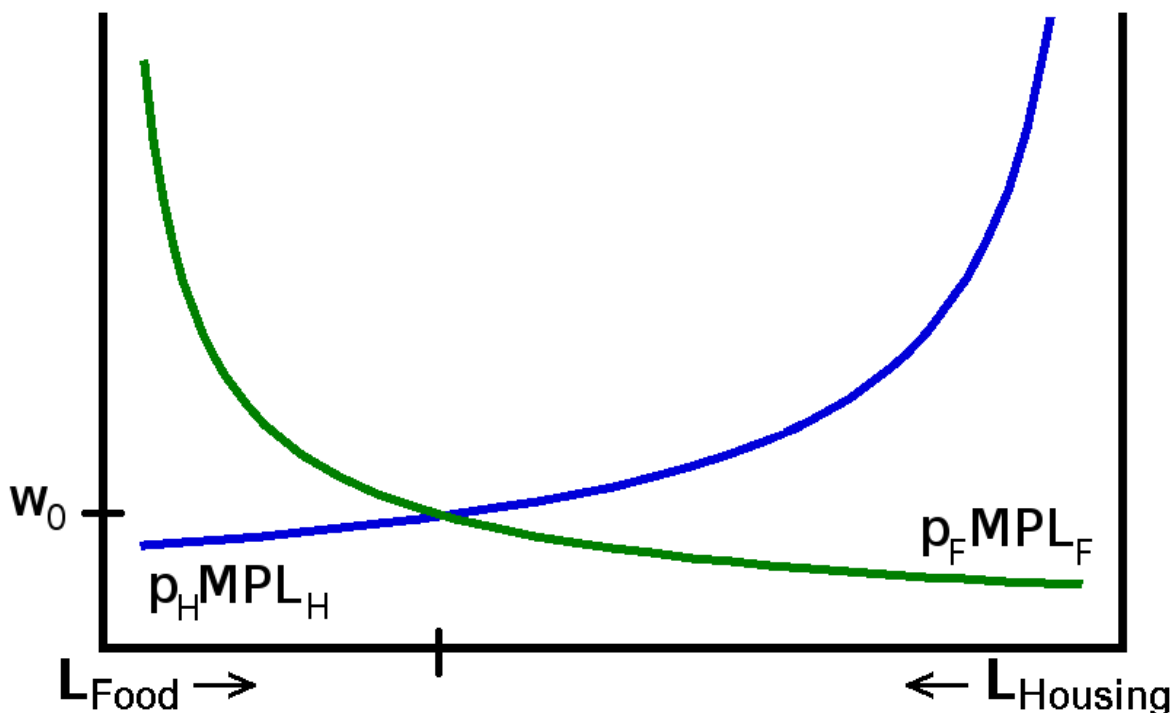


Inputs and Outputs

- ▶ Assume that:
 - ▶ capital and labor are combined to produce houses
 - ▶ arable land and labor are combined to produce food
 - ▶ two periods of time
- ▶ **“Food”** represents the **aggregate of all other sectors in the economy**.
- ▶ Labor migrates between the “food” and housing sectors until the wage is equal in both sectors.

$$\begin{aligned}
 W_1 &= P_{H,1} \cdot MPL_{H,1} = P_{F,1} \cdot MPL_{F,1} \\
 W_2 &= P_{H,2} \cdot MPL_{H,2} = P_{F,2} \cdot MPL_{F,2}
 \end{aligned}
 \tag{1}$$

Wage Equal in Food and Housing Sectors



Can We Make a Housing Bubble?

- ▶ Now suppose that technological progress raises the marginal productivity of labor in the food sector.

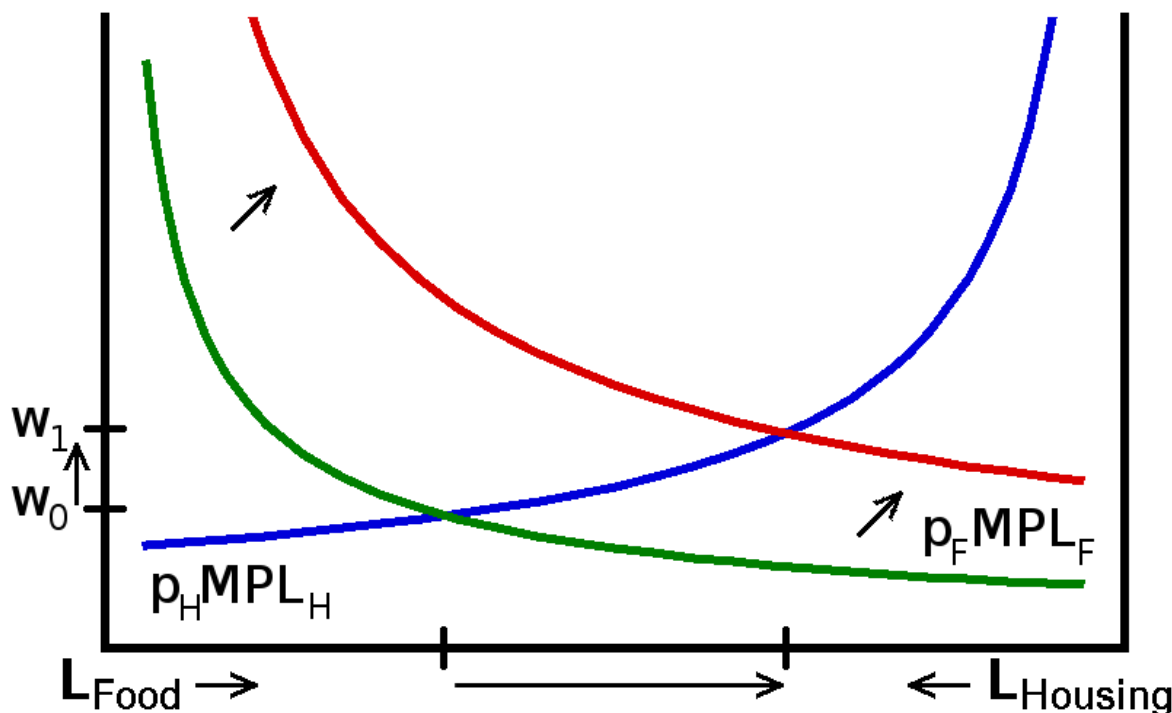
$$MPL_{F,1}(L_F) < MPL_{F,2}(L_F) \quad \forall L_F > 0 \quad (2)$$

- ▶ The increase in food sector productivity increases the demand for labor in the food sector.
- ▶ Workers migrate from the housing sector to the food sector until the wage is once again equal in both sectors.
- ▶ More food produced. Fewer homes produced.
- ▶ Relative price of homes rises:

$$\frac{MPL_{F,1}}{MPL_{H,1}} = \frac{P_{H,1}}{P_{F,1}} < \frac{P_{H,2}}{P_{F,2}} = \frac{MPL_{F,2}}{MPL_{H,2}} \quad (3)$$

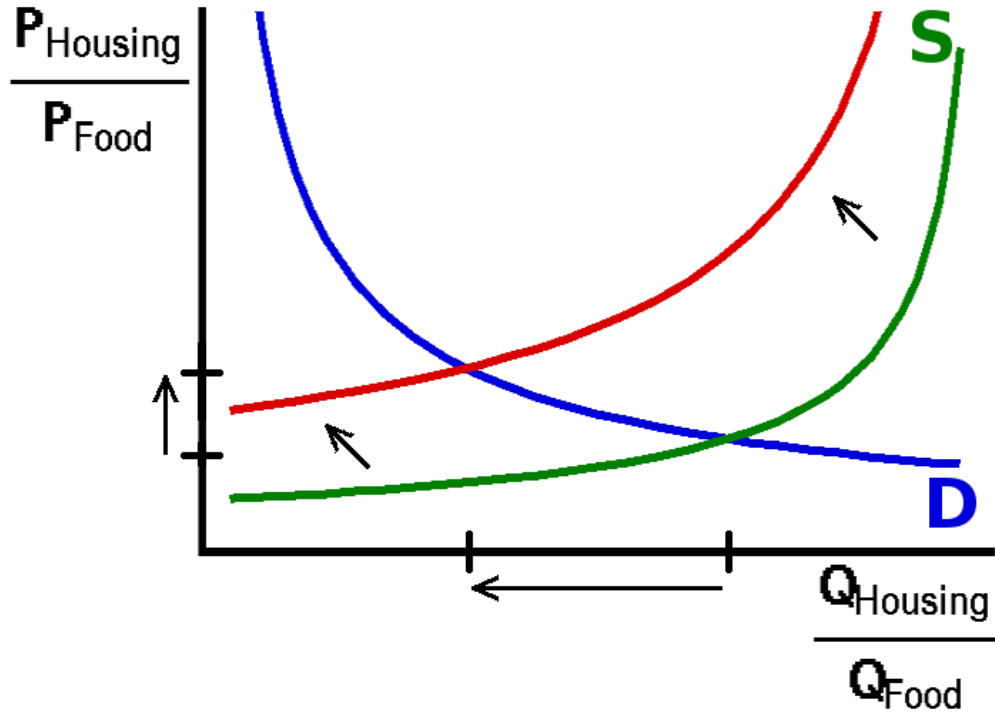
Navigation icons: back, forward, search, etc.

Technological Progress in the Food Sector (1)



Navigation icons: back, forward, search, etc.

Technological Progress in the Food Sector (2)

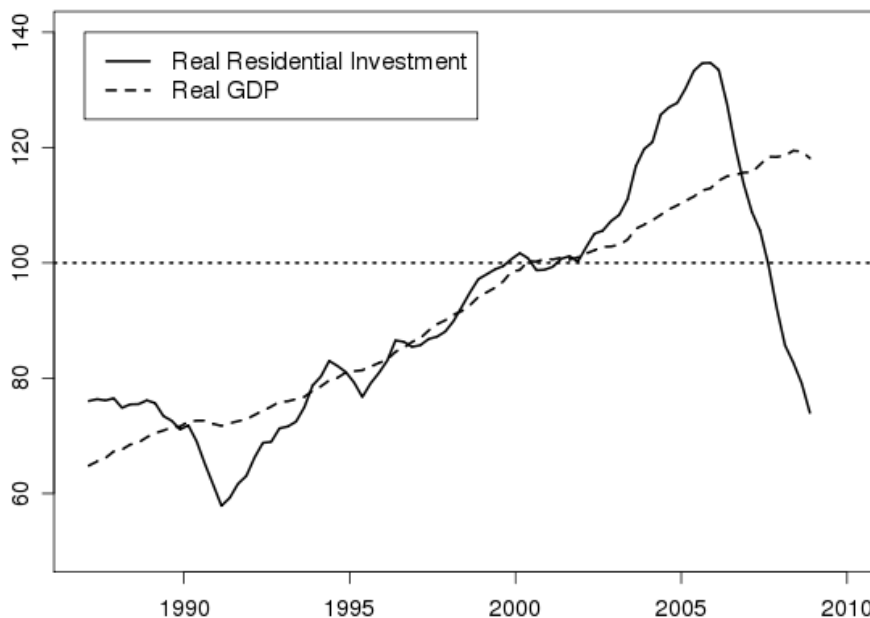


Navigation icons: back, forward, search, etc.

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But WAIT!!! Home Construction Boomed!



Source: Bureau of Economic Analysis, Table 1.1.3 Real Gross Domestic Product, Quantity Indexes. The values for the year 2000 are normalized to 100.

Navigation icons: back, forward, search, etc.

Signs of a Bubble

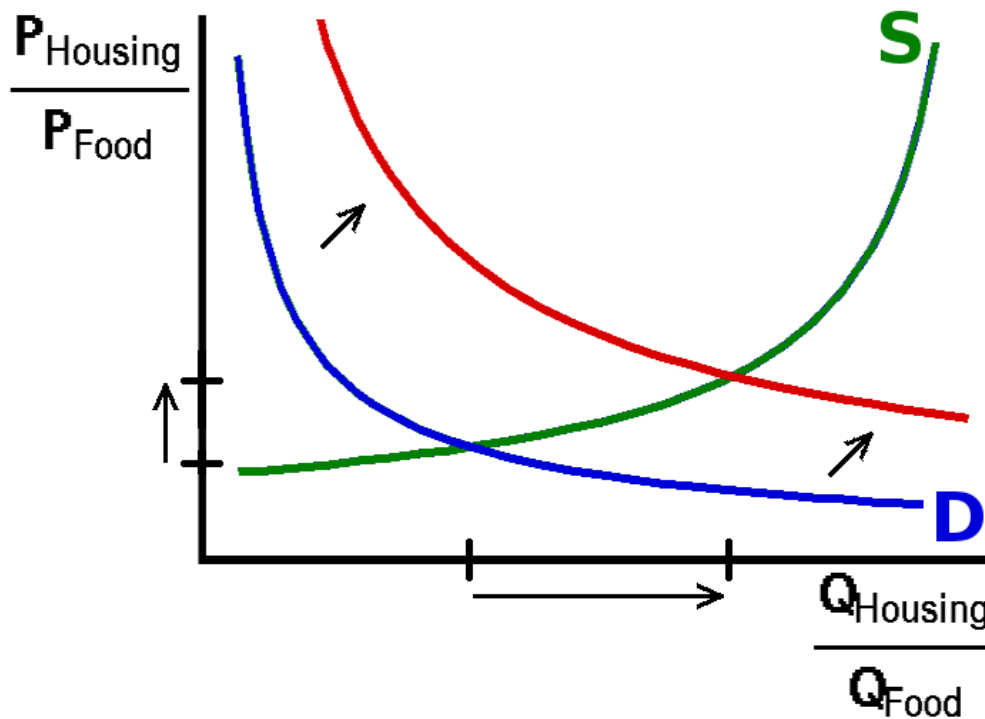
A bubble is occurring if all of the following conditions are met:

- ▶ asset price grows faster than overall price level
- ▶ asset price grows faster than income
- ▶ quantity of the asset grows faster than real GDP

Possible Criticism of My Model

- ▶ One might argue that an increase in relative demand for homes would:
 - ▶ increase the relative price of homes and
 - ▶ increase the relative quantity of homes demanded
 - ▶ (in my general equilibrium model)
- ▶ This is true, but what would cause the increase in relative demand for homes?
- ▶ Only possibility is a change in preferences, but why would preferences change?
- ▶ Unless you can explain the change in preferences, the previous slide's "signs of a bubble" are still valid.

Increase in the Relative Demand for Homes



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Criticism of the “Relative Demand Argument”

- ▶ A major problem with the “relative demand argument” is that the “numbers don’t add up.”
- ▶ To generate the 20 percent increase in the relative quantity of housing demanded with Carliner’s (1973) estimate that owners’ income elasticity of housing was between 0.6 and 0.7:
 - ▶ households would have to spend over 80 percent of their income on housing and
 - ▶ households would have to experience a 10 percent decrease in real income.
- ▶ The former is wildly unrealistic and the latter greatly overstates the extent of households’ decrease in purchasing power.

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Increasing Income Inequality

- ▶ An important, but often overlooked, element of the subprime mortgage crisis is that the real income of the people to whom these subprime loans were made fell throughout the decade.
- ▶ Between 2000 and 2006, the real income of households in the:
 - ▶ lowest income quintile fell 4.6 percent
 - ▶ second income quintile fell 3.1 percent
 - ▶ third income quintile fell 2.5 percent
 - ▶ fourth income quintile fell 0.7 percent
 - ▶ top income quintile **rose** 1.0 percent
- ▶ In other words, the purchasing power of 80 percent of households fell, thus making it more difficult for those households to meet their mortgage payments.



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Signs of a Bubble

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Economic Implication (1)

- ▶ Bubbles are relatively easy to identify and the recent housing bubble was identified several years before it popped.
- ▶ A long period of low real mortgage interest rates allowed the bubble to occur.
- ▶ The Federal Reserve should have used monetary policy to raise interest rates sooner and faster.
 - ▶ They left the Federal Funds Rate at 1.00% until July 2004.
 - ▶ Then they slowly raised the Federal Funds Rate. It peaked at 5.25% in July 2006.
 - ▶ The Fed then began cutting the Federal Funds Rate again in August 2007.

Economic Implication (2)

- ▶ Given the Fed's inaction, bank regulators should have sought legal authority to restrict bank lending for home purchases and refinancing. By contracting the supply of bank lending:
 - ▶ mortgage interest rates would have risen
 - ▶ the quantity of homes demanded would have fallen
 - ▶ the equilibrium home price would have fallen
- ▶ Had policymakers undertaken actions to deflate the housing bubble in 2005:
 - ▶ far fewer home loans would be in delinquency today
 - ▶ any recession caused by "popping the bubble" would not be as severe as the recession that we are currently experiencing.

How to Pop the Bubble?

- ▶ Can a bank regulator restrict bank lending for the purchase or refinancing of assets experiencing a price bubble?
- ▶ What policy measures are available to a bank regulator?
- ▶ What key indicators of "bubble exposure" should be identified on a bank's balance sheet?
- ▶ Should there be regulation of the extent to which banks may securitize their assets?