LECTURE 16
Asset Price Bubbles

March 19, 2013
Announcement

• You should have a copy of the handout about the essay assignment.

• The essay is due at the beginning of lecture on Tuesday, April 23.
I. Bubbles: Basics
Galbraith’s and Shiller’s Thesis

• The stock price boom of the 1920s and the house price boom of the 2000s were speculative bubbles – the result of irrational exuberance.
Definition of a “Bubble”

- An excess of asset prices over their fundamental values.
A Refresher on Presented Discount Value

a. A one-time certain payment

Consider a payment of $X \ t \text{ years in the future, and suppose the nominal interest rate is } i. Then the present discounted value of that payment is

\[ V = \frac{X}{(1 + i)^t}. \]

The appropriate interest rate to use is the safe \( t \)-year nominal interest rate.
b. A stream of certain payments

Consider a bond that will pay $X_1$ 1 year from now, $X_2$ 2 years from now, ..., $X_T$ $T$ years from now. Suppose the nominal interest rate is constant and equal to $i$. Then the present discounted value of the payments is

\[
V = \frac{X_1}{1 + i} + \frac{X_2}{(1 + i)^2} + \ldots + \frac{X_T}{(1 + i)^T}
\]

\[
= \sum_{t=1}^{T} \frac{X_t}{(1 + i)^t}.
\]
c. The case of uncertainty

Suppose the payments are uncertain. Then the expected present discounted value of the payments is

\[ V = \sum_{t=1}^{T} \frac{E[X_t]}{(1 + i)^t} \]

where \( E[ \ ] \) denotes the “rational” expectation of \( X_t \) given the information available.
c. The case of uncertainty (continued)

\[ V = \sum_{t=1}^{T} \frac{E[X_t]}{(1 + i)^{t'}} \]

- In the case of a stock, the X’s are the dividends. In the case of a house, they are the rents or the value the homeowner attaches to the housing services.
- A complication that we will ignore is that the appropriate \( i \) to use will be different for different \( t' \)’s, and will depend on the risks of the X’\)’s.
The definition of a “bubble” revisited

• Recall: An excess of asset prices over their fundamental values.

• Let V be the expected present value of the asset’s payments.

• Then a bubble occurs when P > V.
II. ARE THERE BUBBLES?
Does Theory Tell Us that Market Forces Will Prevent Mispricings?

- Arbitrage: A riskless opportunity for immediate profit.
Mispricings of Risky Assets Do Not Create Arbitrage Opportunities

• Fundamental risk: The actual payouts could differ from the rational expectation based on the information available when I make the initial transactions.

• Noise trader risk: The mispricing could become even worse by the time I choose to unwind my position.

• Agency risk: The mispricing could become even worse, forcing me to unwind my position.

• Model risk: The way I have estimated fundamental values may be wrong.
Mispricings: A Microeconomic Example

“On March 2, 2000, 3Com sold a fraction of its stake in Palm ... via an initial public offering. ... 3Com announced that, pending an expected approval by the Internal Revenue Service (IRS), it would eventually spin off its remaining shares of Palm to 3Com’s shareholders ...

“This event put in play two ways in which an investor could buy Palm. The investor could buy ... shares of Palm directly or ... buy ... shares of 3Com, thereby acquiring a claim to ... shares of Palm plus a portion of 3Com’s other assets.”

Mispricings: A Microeconomic Example (cont.)

Implied value of non-Palm part of 3COM

“Because a closed-end fund is a company that has shares of other companies, its fundamental value ... is the market value of the securities it holds.”

But, “Investors desiring to liquidate ... must ... sell their shares [in the closed-end fund] to other investors.”

Mispricings: A Second Example (cont.)

Figure 2

POST-WORLD WAR II MEDIAN PREMIA AND DISCOUNTS ON CLOSED-END FUNDS, IN PERCENTAGE POINTS

Source: Data provided by Lee et al.
Closed-End Fund Discounts, 1928-1932

Source: DeLong and Shleifer.
House Prices and Indicators of Fundamentals, 1987-2007

Source: Shiller.
III. WHAT CAUSES BUBBLES?
The Short Answer

We don’t know.
One Factor: Momentum

• There’s some evidence that people’s expectations of future returns are higher when past returns are higher.

• So, price increases can be self-reinforcing.

• But: Prices can’t keep rising relative to fundamentals indefinitely.
Momentum (cont.)

But:

• Why do some price increases lead to bubbles while most don’t?

• What determines when – and how dramatically – the bubble bursts?

• In short: We don’t know.
IV. A LITTLE ABOUT THE EFFECTS OF Bubbles
The Effects of Asset Price Bubbles

Consider an economy in long-run equilibrium (\(Y\) is equal to \(\bar{Y}\), and inflation is steady), and suppose there is then a bubble in the prices of some type of asset (such as houses). How will this show up in the model?

- \(I\) will be higher at a given \(r\).
- \(C\) will be higher at a given \(Y - T\).
The Effects of an Asset Price Bubble in the IS-MP Diagram
The Effects of Asset Price Bubbles on the Composition of Investment

• Suppose there are two kinds of investment: \( I = I^A(r) + I^B(r) \).
• Suppose there is a bubble only in the prices of assets of type A, so only the \( I^A(r) \) function shifts.
• What will be the effect on the quantity of investment of type B?
• \( r \) is higher and the \( I^B(r) \) function has not shifted, so \( I^B \) falls.
• That is, the bubble affects the composition of investment.
Midterm Summary Statistics

• $10^{\text{th}}$ percentile: 46
• $25^{\text{th}}$ percentile: 59
• Median: 68
• $75^{\text{th}}$ percentile: 75
• $90^{\text{th}}$ percentile: 84
What If You Think There’s Been a Mistake in Grading?

• We won’t revisit judgment calls.
• The GSIs put a lot of work into grading the exams carefully, so there shouldn’t be errors.
• If you nonetheless think there’s been a mistake, you should explain the problem in writing only, and get your entire exam to your GSI by your next section meeting after today. Your GSI will pass it on to the GSI who graded that part of the exam.
• Unless it’s something as clear-cut as an adding mistake, don’t raise it if it’s only 1 or 2 points.