

*Detecting a housing bubble with the P/E (Price to rent) ratio*  
By Erick Eschker

The most common way to look for a housing bubble is to look at changes in the P/E (or Price to rent) ratio. (see Leamer 2002, Feldman 2003, Kainer and Wei 2004, and Max 2005) The P/E or Price-Earnings ratio is a common term from financial literature and is the price of an asset divided by the annual earnings of the asset. In the case of housing, the price is simply the actual price at which the house sells and the earnings is the current yearly rent that the house could earn if it were rented. Often maintenance costs are subtracted from rent.

The P/E ratio comes from the basic idea of asset pricing: The most that you will be willing to pay for an asset is the amount of income that it will generate for you. For example, suppose someone wanted to borrow \$100 from you for one year and the interest rate was five percent. How much would they have to repay you next year? If instead of loaning the money you put \$100 in the bank, then next year you would have \$105, which is \$100 times one plus five percent. Therefore, you would want to be repaid \$105 next year for extending a loan of \$100 today. In other words, you would pay at most \$100 for the \$105 asset (the promise of receiving \$105 next year). For housing, the most that you would pay for a house is the sum of all rent that you could charge today and forever into the future. If we adjust the future rents for foregone interest, then we say that the most that you would pay for a house is the present discounted value of all rent today and into the future. We can write this asset pricing rule as an equation

$$Price_t = Rent_t + \frac{Rent_{t+1}}{(1+i)} + \frac{Rent_{t+2}}{(1+i)^2} + \dots$$

where *Price* is the house selling price, *Rent* is the house rental price, *i* is the real interest rate, and *t* is the current year, *t+1* is the next year, etc.

Asset pricing tells us that the price of a house should be related to current and future rents and the interest rate. If we assume that current rents are related to future rents, and that the interest rate does not change, then price should change when the current rent changes. In other words, the P/E ratio should be constant. If the P/E ratio rises very high, then people may be paying too much for their house based on existing fundamentals. Therefore, a housing bubble may exist if the P/E ratio rises too high.

In reality, the P/E ratio is related to future rents and the interest rate. What determines future rents? This will be factors such as household income, population, taxes, job growth, government regulation, and special events in the rental housing market. Specifically, the P/E ratio may rise if household income rises, population increases, taxes decrease, job growth is high, or government regulation is low (since it reduces costs of owning housing). Or, the P/E ratio may rise on account of anything else that may raise future rents. Landsburg (2005) and Krugman (2005) report that restrictive zoning may also keep prices artificially high.