Asset Price Bubbles: Economics, Mathematics and Statistics

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Starting with the economic literature, we will review the most common models explaining the appearance of rational bubbles in asset prices. These are market equilibrium models where some kind of restriction (say short selling constraints) limit the ability of arbitrageurs to profit from and eliminate bubbles. We then move to the characterization of bubbles in the mathematical finance literature, using the concept of strict local martingales and Merton's stochastic dominance. Here we briefly discuss the recent controversy on whether transaction costs would eliminate this type of bubbles. We conclude by describing some of the statistical methods that have been proposed to detect the existence of a bubble for an asset and its corresponding derivatives.