

# Lecture Notes for Math 210 – Wednesday, 28 Nov. 2007

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## **Burton Malkiel: A Random Walk Down Wall Street**

Page numbers will be written as  $xxx / yyy$  where  $xxx$  is the page number in 8th edition and  $yyy$  is the page number in 9th edition.

### Page 82/78: How Bubbles Arise

“Robert Shiller, in *Irrational Exuberance*, describes bubbles in terms of “positive feedback loops.” A bubble starts when any group of stocks, in this case those associated with the excitement of the Internet, begin to rise. The updraft encourages more people to buy the stocks, which causes more TV and print coverage, which causes even more people to buy, which creates big profits for early Internet stockholders. The successful investors tell you at cocktail parties how easy it is to get rich, which causes the stocks to rise further, which pulls in larger and larger groups of investors. But the whole mechanism is a kind of Ponzi scheme where more and more credulous investors must be found to buy the stock from the earlier investors. Eventually, one runs out of greater fools.”

This description reminds me of a pyramid scheme.

You pay \$1 dollar to the person who sends you a letter, then send the letter on to 2 more people, who are each supposed to send you \$1.

Thus your total profit is \$1 and it looks like even the people you duped out of \$1 will get \$1 profits themselves, when they send the letters on.

The problem is that a pyramid scheme must end somewhere.

If you are in the first generation of people from a pyramid scheme, then there should be 1 other person sending money back to the “root”.

So there are 2 people in the first generation, 4 people in the second generation and so on.

In the last generation, there are  $2^n$  people.

But by the geometric sum, that is equal to all the people who ever made any profit, plus 1.

Presumably all the people in the last generation are going to get duped.

So, in the grand scheme of things, it is not a fair system.

Also, it is hard to be one of the lucky ones in a pyramid scheme.

More than half the people are in the last generation.

So, in some sense, if you participate in a pyramid scheme, then you have a greater than 50% chance of being duped, even in this most fair and conservative version.

(Of course that must be true in order for the game to be “fair”.

This also reminds me of the unstable gambling scheme called “betting the martingale”: On each loss of a bet you double your wager. If you ever win, you are guaranteed to make a prescribed profit. The problem is that in order to play  $n$  turns, costs an exponential amount of money, and eventually you go bankrupt.)

In this Chapter, Malkiel presents some of the most entertaining examples of the irrationality of the market during the tech-boom:

“At the bubble’s height, scoffers were as hard to find as the Maytag repairman. Surveys of investors in early 2000 revealed that expectations of future stock returns ranged from 15 percent per year to 25 percent or higher. After all, since 1982, the stock market had produced greater than 18 percent returns. And for companies such as Cisco and JDS Uniphase, widely known as producing ‘the backbone of the Internet,’ 15 percent returns per year were considered a slam dunk. But Cisco was selling at a triple-digit multiple of earnings and had a market capitalization of almost \$600 billion. If Cisco grew its earnings at 15 percent per year, it would still be selling well above average multiple ten years later. And if Cisco returned 15 percent per year for the next twenty-five years and the national economy continued to grow at 6 percent over the same period, Cisco would have been bigger than the entire economy.”

Malkiel then goes on to list the table of the high versus low for various tech stocks. In 2000 the high for Cisco was \$82.00. In 2001-2002, the low was \$8.12. Its percentage decline was 90.1%.

“An example of the complete insanity that gripped the market – an insanity that went well beyond irrational exuberance – is the case of PalmPilot, the maker of Personal Digital Assistants (PDAs). Palm was owned by a company called 3Com, which decided to spin it off to its shareholders. Since PDAs were touted as a sine qua non of the digital revolution, it was assumed that PalmPilot would be a particularly exciting stock. Little did 3Com know how strongly the market would react.”

“In early 2000, 3Com sold 5 percent of its shares in Palm in an initial public offering and announced its intentions to spin off all the remaining shares to the 3Com shareholders. Palm took off so fast that its market capitalization became twice as large as that of 3Com. But remember that 3Com still owned 95 percent of Palm. It turned out that the value of 95 percent of Palm was almost \$25 billion greater than the total market capitalization of 3Com. It was as if all of 3Com’s other assets were worth a negative \$25 billion. If you wanted to buy PalmPilot you could have bought 3Com and owned the rest of 3Com’s businesses for minus \$61 per share.”

“ Speculative manias, such as the Internet bubble, bring out the worst aspects of our system. The South Sea Bubble of the eighteenth century led to a vast number of fraudulent new issues designed to meet the public’s insatiable appetite for speculative vehicles. The speculative frenzy of the 1920s led to a degree of manipulation of the stock exchanges that set new records for unscrupulousness. Let there be no mistake: it was the extraordinary New Economy mania that encouraged a string of business scandals that shook the capitalist system to its roots.

Many businesses were managed not for the creation of long-run value but for the immediate gratification of speculators. When Wall Street’s conflicted sell-side analysts looked for high short-term forecasted earnings to justify outlandishly high stock prices, many corporate managers willingly obliged. And if aggressive earnings targets proved hard to meet, ‘creative accounting’ could be used so that not only the published street estimates but even the ‘whisper numbers’ could be surpassed. One spectacular example was the rise and subsequent bankruptcy of Enron – at one time the seventh largest corporation in America. The collapse of Enron, where over \$65 billion of market value was wiped out, can only be understood in the context of the enormous bubble in the New Economy part of the stock market. Enron was seen as the perfect New Economy stock that could dominate the market not only for energy but also for broadband communications, widespread electronic trading, and commerce.”

“One of the scams perpetrated by Enron management was the establishment of a myriad of complex partnerships that obfuscated the true financial position of the firm and led to an overstatement of Enron’s earnings. Here is how one of the simpler ones worked. Enron formed a joint venture with Blockbuster to rent out movies online. The deal failed several months later. But after the venture was formed, Enron secretly set up a partnership with a Canadian bank which essentially lent Enron \$115 million in exchange for future profits from the Blockbuster venture. Of course, the Blockbuster deal never made a nickel but Enron counted the \$115 million loan as a ‘profit.’ Wall Street analysts applauded and called Ken Lay, Enron’s chairman, the ‘mastermind of the year.’ ”

“Deception appeared to be a way of life at Enron. The *Wall Street Journal* reported that Ken Lay and Jeff Skilling, Enron’s top executives, were personally involved in establishing a fake trading room to impress Wall Street security analysts, in an episode employees referred to as ‘The Sting.’ The best equipment was purchased, employees were given parts to play arranging fictitious deals, and even the phone lines were painted black to make the operation look particularly slick. Rehearsals were held and Jeff Skilling, by personal choice, was given the role of Paul Newman’s character in *The Sting*. The whole thing was an elaborate charade. In 2006, Lay and Skilling were convicted of conspiracy and fraud.”

“Probably more so than any other chapter in the book, this review of the Internet bubble seems inconsistent with the view that the stock market is rational and efficient. The lesson from this chapter, it seems to me, is not that markets occasionally can be irrational and, therefore, that we should abandon the firm foundation theory. Rather, the clear conclusion is that, in every case, the market did correct itself. The market eventually corrects any irrationality – albeit in its own slow, inexorable fashion. Anomalies can crop up, markets can get irrationally optimistic, and often they attract unwary investors. But eventually, true value is recognized by the market, and this is the main lesson investors must heed.”

“I am also persuaded by the wisdom of Benjamin Graham, author of *Security Analysis*, who wrote that in the final analysis the stock market is not a voting mechanism but a weighing mechanism. Valuation metrics have not changed. Eventually, every stock can only be worth the value of the cash flow it is able to earn for the benefit of investors. In the final analysis, true value will win out.”