

## The Last Bear Market Did Not Follow A Random Walk

**Portfolios heavy  
with  
under-  
performing  
stocks almost  
never  
outperform the  
market.**

### **Ignat's Law**

**The random walk hypothesis is a cornerstone of modern portfolio theory and the random walk model does not fit the behavior pattern of the majority of stocks. Because the underlying process is random, these trends are unpredictable and the process can change at any time.**

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The last major bear market in the stock market ended in March of 2009 and it was one of the worst declines in the stock market in many years. For the year that ended on April 6, 2009 the S&P 500 suffered a loss of almost 40%. It is revealing to examine how that bear market developed.

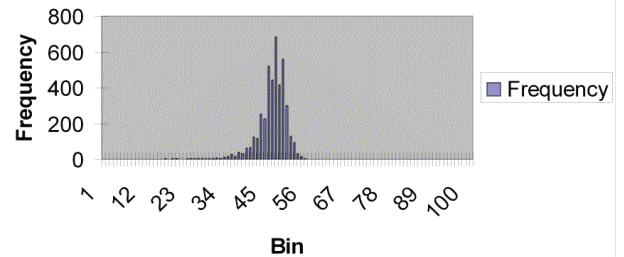
At that time there were 4225 stocks in the Market Dynamics database and I calculated the percentage of up days for each stock in that universe. A histogram of these statistics is shown at right and it definitely appears to be a bell shaped curve and that implies randomness.

The average number of up days turned out to be 46.4%. This implies that the percentage of down days was 53.6%. These proportions are very close to that of a flip of a fair coin which would be 50/50. A random walk is based on the proposition that the proportion of up days and down days should be close to 50/50. On this basis alone the bear market of 2008-2009 appears to fit the requirements of a random walk.

How did the stock market decline almost 40% and yet the number of up days was almost equal to the number of down days? To generate such a decline, the absolute magnitude of the average of the price change on the down days had to be much greater than the absolute magnitude of the average price change on the days up. The difference between the days up and the down days had to be close to  $-0.154\%$  per day.

The large difference between

**Histogram -4225 stocks  
% up days past year  
Average = 46.4%**



the average price change on the down days versus the up days indicates that this bear market did not follow a random walk. The second part of the random walk requirement is that the up days and the down days should be of equal magnitudes. These statistics clearly demonstrate that this bear market did not follow a random walk.

The process that generated all these price changes was random in nature but the process produced average price changes on the down days that were substantially greater than the price changes on the up days. This implies that the process produced an outcome that followed a steep down trend. Many investors believe that a random process such as this cannot follow a trend and that was clearly not borne out by the facts during this bear market.

This experience demonstrates that a random process can produce an output that follows a trend. The trend in the data is proof that this example did not follow a random walk. It can be shown that the majority of stocks move in persistent trends most of the time and do not fit the requirements of a random walk. The investor has to be concerned with the direction and strength of the trend for each of the stocks in his portfolio. He should record and measure the trend shown by each stock in order to be aware of any change in the direction or strength of the trend.  
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