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The Reality Of Quantitative Investing

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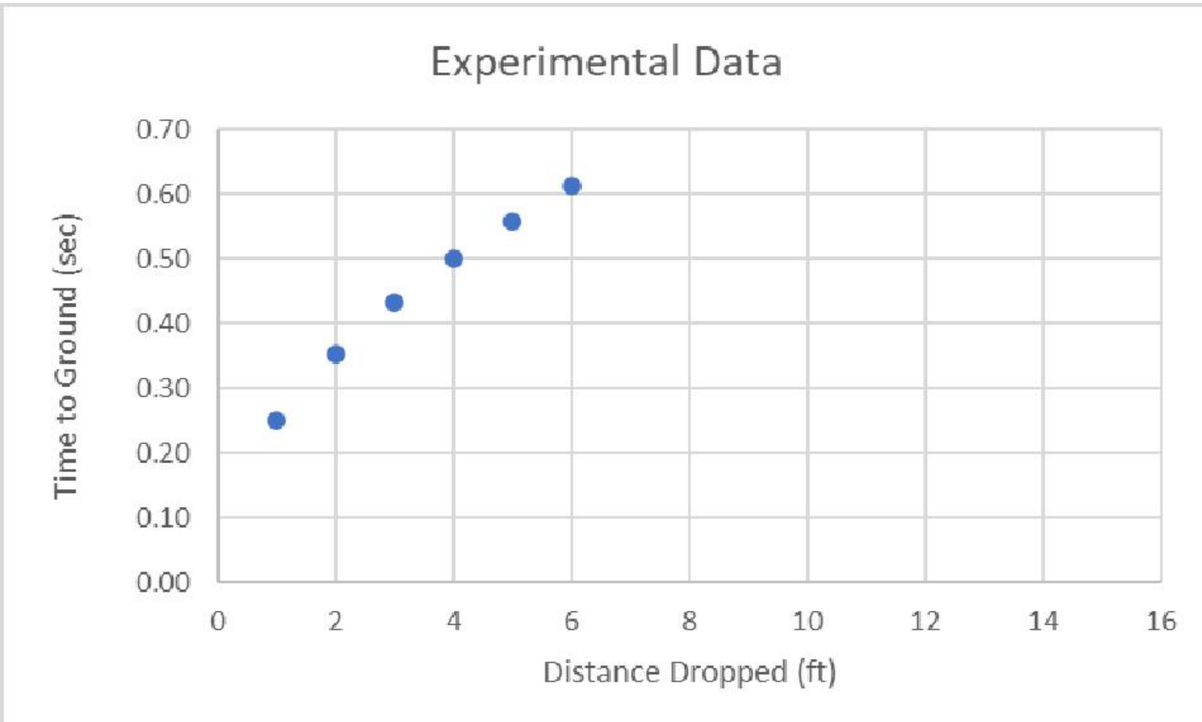
The underlying assumption of quant strategies is that stocks follow various mathematical rules like physical science. This may be intellectually engaging, but it's a farce.

As a recovering physics and math major, I still love to read about the predictive power of the physical sciences and the triumphs we have made over the years. One of the most powerful requirements of physics is that any theory must predict how nature will act, given initial conditions of a situation. For example, our early ancestors might have assumed that invisible spirits direct planetary motion in our efforts to understand our solar system, but they would not know how those spirits would direct the motion of other solar systems. In other words, there was no predictive power with that hypothesis. The famous physicist Newton pursued explanations that would indeed predict the behavior of dynamic systems. Armed with his newly discovered law of gravity and three other laws of motion, he predicted with great certainty all planetary motion. The process was what physicists call "elegant:" provide the basic facts of the situation—planet masses, distances etc., and we calculate their future trajectories. This is elegant because we don't need to perform the actual physical measurements to get the answer. Instead, we can sit at our desks and compute the answer and verify with our telescopes to observe the exact predictions. A true triumph of human thought!

"Quants" believe that the use of mathematical tools will lead to superior returns by predicting the future paths of stocks. I have reduced their position to that simple sentence, but they rarely describe it that way. Instead, there are all types of specialized terms such as factor analysis, volatility adjusted momentum measures, algorithmic trading and smart beta, just to name a few. The backgrounds of the researchers are usually hard sciences like math, physics or engineering. Typically, their doctoral theses would involve heavy computer work, but not much "pure math"—calculations that are done by hand and based on deep thought.

The trend is shifting now to pure computer programmers or "coders" as they are presently known. They pursue more complicated "algos" that non-practitioners find inscrutable. I could continue describing the esoteric processes they use—measuring many input parameters such as stock price, interest rates, earning surprises for starters. Many use thousands of inputs at the same time to predict future price movements. But let me reduce all this to a simple example that will highlight the flawed logic of this.

Say you want to know how much time it takes for a dropped stone to hit the ground from a certain initial height. You can conduct the experiment yourself by measuring the heights and times taken. Graphing your data would result in something that looks like this:



charting an experiment. PETER ANDERSEN

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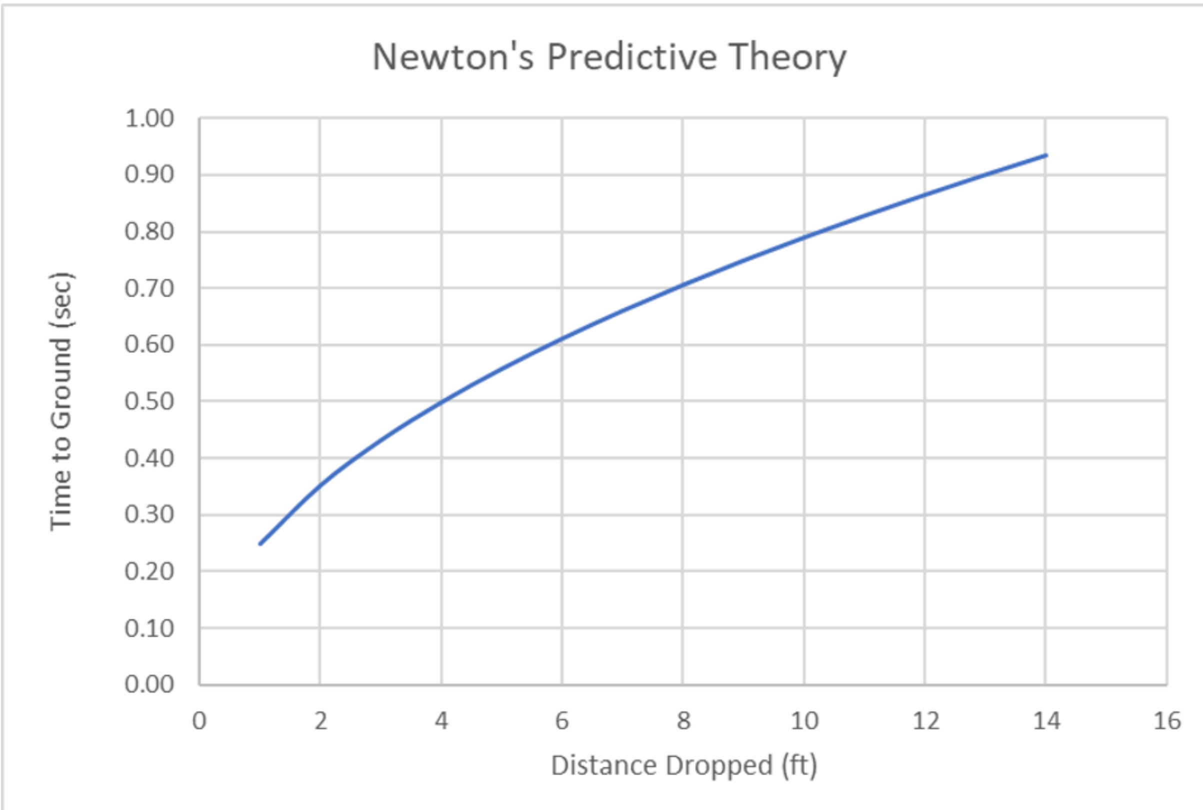
Newton solved this problem another way. He discovered an exact equation that produces the same graph without experimentation. And more important, it predicts for any given height, how long the time will be for the stone to hit the ground. The generalized graph below will tell you. You can see that you don't have to stand on a 14-foot ladder to measure the time it takes—just read this off the graph. This is a very simple example of predictive power of physics, and there are lots more complicated examples—examples that range from the atomic to the galactic levels.



Predictive Theory PETER ANDERSEN

Now here's the important part: Quants believe that stocks follow the same type of relationships. In our "dropped rock" example, gravity is a constant. But nothing is a constant in the dynamics of finance. There are no "natural laws" in investing. Many investment parameters appear to be random and don't follow simple equations. So producing simple graphs like we can do in physics is impossible.

Returning to our original example. What would physics be like if the laws followed random patterns of investing, instead of Newtonian mechanics? A more accurate picture would involve a dropped rock model where the force of gravity is fluctuating randomly. Then the graph above would not hold at all. We could not predict the times anymore, because the force of gravity would not be a constant.

Quants will continue to pursue their mathematical formulations of investing. For them, it is a very satisfying intellectual activity. Some consider it a lot of fun. For the rest of us, it is an oversimplification of the way the real world of investing works. No amount of increased computing power nor discovery of new variables will ever change that into an "elegant theory."

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