

BEWARE OF TEXAS SHARPSHOOTERS

Post hoc, ergo propter hoc – “After this, therefore resulting from it.”

The rising price of forestry stocks signals the next major leg higher in U.S. housing demand, a development that sets the stage for auto behemoths like Ford to come roaring back. We estimate that over the course of the next year, many of the 12 million newly built houses with empty driveways will need to be filled with the latest model cars so the signal from timber says to get onboard with Ford. Or not. I'm sure you quickly realized that this story is complete nonsense.

Let me explain how I just committed an extreme version of the Texas Sharpshooter fallacy. Imagine that a gunman shoots at a wall from 100 yards, then walks up to that wall and draws in a target placing the bullseye right where the bullet entered. What a great sharpshooter he is, say his friends who visit the firing range 15 minutes later. Yet, we know the relationship between the hole in the wall and the target is meaningless. This is exactly what transpired in the Ford example, where I ransacked financial market data until finding a convincing correlation and then wrapped a narrative around it for you to read.

At a conference in 2010, then Google CEO Eric Schmidt said that humanity creates a quantity of data every two days, that is equivalent to the entire amount produced from the dawn of time up to 2003. Petabytes of data continuously collected and stored from digital pictures,

cell phones, GPS, purchase transactions and many other instruments, when used in conjunction with immense computing power, leaves us increasingly vulnerable to a sharpshooter or to deducing meaning in a particular relationship when there is none.

Some theories falling out from the era of big data are a little concerning to us such as the one outlined in 2008 by *Wired Magazine*. In the article, the author argued that “...with enough data, the numbers speak for themselves” and that “...correlation supersedes causation and science can advance without coherent models or unified theories.” I guess it also means that we should be very excited about space exploration when more college students choose sociology as a major field of study. With the use of Ramsey theory, a branch of mathematics, we can show that more useless or meaningless (i.e., spurious) correlations will be found as a database increases in size. Said differently and more directly, spurious correlation will form the majority of measurable correlation in extremely large data sets.

While meaningful correlations are difficult enough to determine in today's world of data access and computing power, assigning causation to correlated events is an even greater challenge. Say that every time I have a runny nose, I find that I get a sore throat. It appears logical to conclude that my runny nose causes my sore throat. But this post hoc



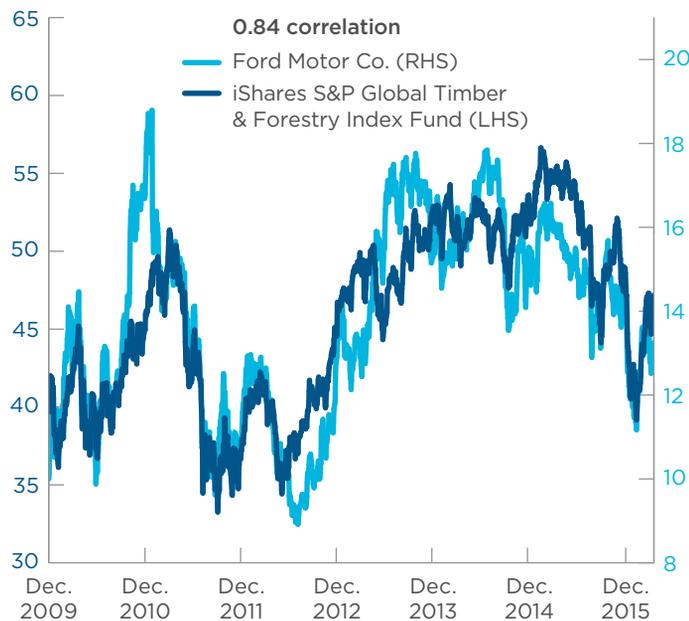
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fallacy, a common mistake, stems from the fact that both the runny nose and the sore throat are being generated by the introduction of a third, lurking variable called the common cold virus.

What if the causal links actually run in an entirely opposite direction? A 2010 study by two eminent Harvard economists, Carmen Reinhart and Kenneth Rogoff, created quite an initial stir. The authors reported a negative correlation between a country's growth rate and its debt-to-GDP ratio, concluding that economic growth was slower in countries with debt ratios above 90%. These findings alone might have greatly influenced the decisions European policy makers

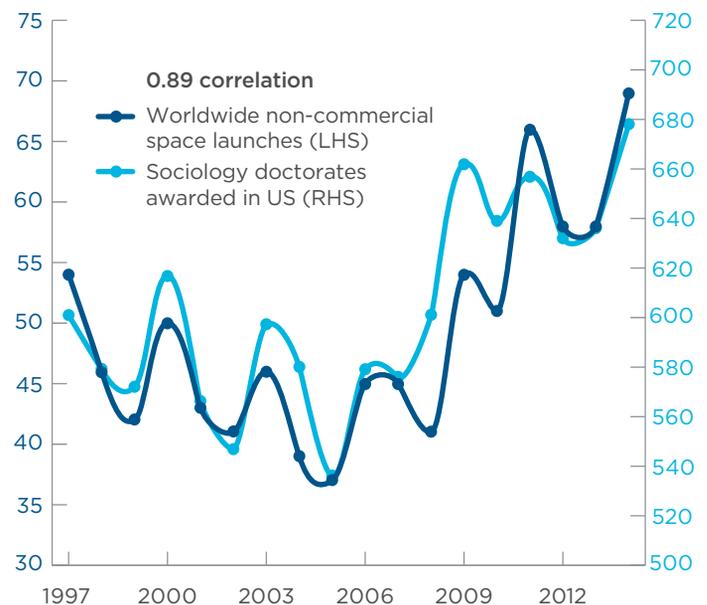
Ford & forestry “correlation”

Share price



Source: Dynamic Funds

Space & sociology “correlation”



Sources: Federal Aviation Administration and National Science Foundation

imposed on highly indebted countries such as Greece, Portugal and others in the most recent continental sovereign crisis. Yet, subsequent research reports have argued that sluggish growth actually leads to higher government debt, not the other way around. If the original study had causality running in the opposite direction to the one initially reported, a very different approach might have been used to address the European periphery's over-indebtedness.

The point of all of this is that making informed investment decisions often requires the establishment of relationships and causal links between asset prices and fundamentals. Given that most correlations do not imply meaning or causality, especially in today's era of big data, one should pause and reflect after hearing about a research study, a story in the news or the latest musings of a so-called expert. When you hear something like “The S&P 500 had a great

week after the poll results and stocks are likely to be buoyed further by a Republican president” don't just assume it to be true. Has the proposed thesis been tested with enough data to provide a comfortable degree of confidence in the conclusion and, most importantly, does it make sense? Paradoxically, as Frank Plumpton Ramsey would have argued, more information represents much less information than you currently believe.



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