Re: Dynamical Systems and Expansion−Contraction

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- *From*: "OsherD" <mdoctorow@xxxxxxxxxxx>
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>>From Osher Doctorow

A curious thing happened in probability−statistics on the way to "game theory" and economics. It imitated physics and algebra rather than philosophy or logic in seeking to explore by using more complicated mathematics rather than by first looking internally at meanings and then deciding what to do.

Does this relate to dynamical systems and Probable Correlation? Yes. Here's how.

Take a look at The History of Economic Thought Website, accessible by those keywords or at http://cepa.newschool.edu/het/home.htm, by Goncalo L. Fonseca (Graduate Student in Economics, Johns Hopkins U.) and Leanne Ussher (Graduate Student in Economics, NYU), in particular the section "Uncertainty, Information and Games" and the subsection I − Choice under Risk and Uncertainty, and subsection (6) of that "Riskiness".

There you will discover fascinating definitions of First and Second Order Stochastic Dominance, and how they relate to characterization of increasing risk and portfolio allocation and alternative measures of increasing risk.

First Order Stochastic Dominance is the one that corresponds to my last posting, where a person prefers prospect F to prospect G, and we say that F dominates G, F >−1 G or F >−s G or whatever. Let's use the cdfs with the same letters but with arguments, F(x), G(x), so that this turns out to be equivalent under certain assumptions to:

1) F(x) < = F(x) for all x

Intuitively, people prefer prospects with much probability mass skewed toward higher returns rather than toward low returns. This turns out to be consistent with von Neumann−Morgenstern theory.

However, for risk−averse people, one might consider that how spread out the returns are in addition to the above will remove more ambiguity, and this leads to Second Order Stochastic Dominance which turns out to

follow from the First Order Stochastic Dominance but not vice versa.
It involves the integral I(x) = I[G(t) − F(t)]dt > = 0 for all x in [a, b] where I is the integral from a to x.

Had researchers stopped at First Order Stochastic Dominance, they might have noticed Probable Correlation. They were in a rush to be fancy and more complicated, and they didn't notice. It might seem understandable to go ahead to spread of data, but it also is understandable to first understand first things first so to speak.

Osher Doctorow

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