Valuation and Its Discontents

Derivatives 2007

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What’s the Point of a Financial Model?

- In physics you predict the future.
- In finance, you interpolate, extrapolate in the present.
“Right” vs. “True”? 

- ‘Right’ is consistent. 
- ‘True’ is true.
Accuracy?

- Ross: “Options pricing is the most successful theory, not only in finance, but in all of economics.”
- Yes, but how accurate is it?
The Volatility Smile

S&P Smile  BS Smile
The Volatility Smile

S&P Smile  BS Smile

Vulgar models are probably the most practical.
The Derivatives Paradigm

This is how options theory works:

* pick a plausible stochastic process with parameters;
* calculate the value of liquid securities whose prices you know;
* calibrate the parameters to match those prices;
* use the model to calculate values of other securities.

Every few years the process has been repeated for a new asset class:
* stock options: match stock and bond prices, calibrate volatility;
* interest rates: match bond or swap prices, calibrate volatilities;
* credit: match CDS prices, calibrate future default probabilities.
Underlyer Trouble
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