

abstract

[Video of this lecture](#) COMPUTER SCIENCE/DISCRETE MATH II

Topic:

Speaker:

Affiliation:

Date:

Time/Room:

Collateralized Default Obligations (CDOs) and related financial derivatives have been at the center of the last financial crisis and subject of ongoing regulatory overhaul.

Despite their demonstrable benefits in economic theory, derivatives suffer from the drawback that pricing them accurately is often difficult even for sophisticated trading banks using powerful computers. We propose a new explanation: the pricing problem is computationally intractable. Specifically, it is at least as hard as a well-studied intractable problem (densest subgraph) in computer science, and this is true for some common types of CDOs.

We quantify the economic costs of this computational intractability using an Akerloff-like notion of lemon costs. This measure can differentiate between different types of derivatives, say CDOs and CDO-squared, supporting the traditional belief that the latter are more "complex." We can also exhibit instances where the derivative can *amplify* the lemon costs, which goes against the traditional belief that derivatives ameliorate the effects of asymmetric information.

Joint work with Sanjeev Arora, Markus Brunnermeier, and Rong Ge.