

## Pricing an Option on Movie Revenue: Theory and Application

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We develop a model for valuing revenue streams from innovations. The stochastic properties of revenue from innovations create a more difficult environment in which to value options than when the underlying is a security. There is no initial revenue and cumulative revenue cannot decrease. Revenues from innovations are characterized by different lives and different rates of the resolution of uncertainty. A common deterministic model for predicting revenue from an innovation is due to Bass (1969). We imbed the Bass model in a gamma process, resulting in a stochastic process with moments proportional to the mean of the Bass model. To illustrate this model we choose the valuation of options on movie box office revenue. These options enable film distributors to manage the risk of a movie, and they offer diversification opportunities for investors. We develop the econometric methodology for ex-ante parameter estimation and a Bayesian updating scheme using Markov Chain Monte Carlo simulation as data after release become available. Call prices obtained using MLE parameter estimates from the full data set closely approximate the average discounted value of ex-post call payouts that would have occurred at option maturity.

### Bio:

I received a diploma degree in economics, a diploma degree in mathematics, and a PhD in Economics from the University of Bremen, Germany. I went to Stanford University, Dept of Mathematics, as a Visiting Researcher in 2001-2003. Since 2003 I'm at LSU Economics. My main research focus is volatility models of asset prices, in particular realized volatility, continuous time volatility models, and GARCH models. Recently, I have been working on volatility models for movie revenue data, which is the topic of the talk.