

General Equilibrium Options Pricing Under Recursive Preferences

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Abstract:

A general equilibrium model of options pricing is considered.

We use a full GE model with time-varying growth rate of capital to explain the mystery behind OTM put options. The model is able to explain the smile associated with OTM put options as a function of the underlying growth rate of capital, thus providing a formal economic insight into the popular VIX volatility index.

Our dynamic time series model has the mean growth rate of capital as the underlying state. It allows us to jointly study the time-series of capital growth as well as a panel of option prices that are consistent with the information structure in the presence of recursive utility.

Computationally intensive Markov Chain Monte Carlo is used to obtain inference for the underlying state and model parameters given the non-linear state-space model. Given that the model itself can generate the features of the data, the empirical findings solidify our intuition regarding the VIX index.