

Compare and Contrast of Option Decay Functions

Author: Nick Rettig

Major: Agricultural Business and Applied Economics

Project Advisor: Carl Zulauf

Options are commonly used to manage risk and earn profit. Buying an option requires the payment of an option premium to the seller of the option. Assuming everything else constant, the value of an option premium declines over time as expiration of said option nears. This decay in value is a cost to the option buyer because the value of their investment is declining. Therefore, understanding the attributes of decay in option value is important to effectively manage the cost of using options. A review of the literature finds only limited analysis and therefore information on the attributes of the option decay function. The objective of this study is to provide an initial examination of the observed decay paths for option premiums for a diverse array of option products: corn, soybeans, crude oil, gold, and the S&P 500. Corn and soybeans are agricultural commodities with a defined harvest, crude oil is an energy source and industrial input with continuous production, gold is a precious metal with continuous production, and the S&P 500 is an equity index of stock values. The time period analyzed is 2007-2013, a period of volatile commodity and equity prices and increased use of options. As expected from the theoretical models of option prices, the option decay function is nonlinear, with the decay becoming more rapid as expiration of the option contract approaches. Relatively little difference has been found in the decay function across different contract maturities for the same product, but differences in decay functions have been found across products. The different rates of decay and the differences across products suggest that management of cost resulting from option decay may be an important consideration in using options to manage risk and earn profit.