VALUING EMPLOYEE STOCK OPTIONS USING THE CRR BINOMIAL MODEL

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ABSTRACT

Employee stock options are widely used. SFAS 123(R), Share-Based Payment, issued in December 2004 requires that all entities use a fair-value-based option pricing model, adjusted for the unique characteristics of the options, to recognize expenses for employee stock options at the grant date. The Cox-Ross-Rubinstein (CRR) model - a binomial lattice model that converges to the Black-Scholes (BS) model when the number of periods to expiration approaches infinity - meets the requirements of SFAS 123(R). The CRR model factors in the often complex characteristics of employee stock options and always gives a lower option value than the BS model. This paper demonstrates the implementation of the CRR model using Microsoft Excel and shows that constant dividend yield, early exercise, and cliff vesting can be easily factored into the CRR model.

Keywords: *SFAS 123(R), Employee Stock Options, Fair-Value-Based Option Pricing Model, CRR Model*