About Option pricing

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Author	Message
stabiloboss New poster Post Number: 5	Posted on Monday, 30 April, 2007 - 02:14 pm: Can anyone kindly give me a guidance or help me solve in relation to the derivation of the delta(first derivate) and gamma second derivate) of digital (binary) call option? Pre-condition: Strike K, Maturity T, pays $1 if S(T) greater and equal to K, and worthless if S(T)<K, where, Digital call(t)= e^-r(T-t)N(d2).....(equation 1) d2=d1-STD*Squrt(T-t)......(equation 2) Prove: Delta= e^-r(T-t)N'(d2)/STD*S(t)*Sqrt(T-t) Gamma- e-r(T-t)d1*N'(d2)/STD^2*S(t) many thanks
stabiloboss Poster Post Number: 6	Posted on Monday, 30 April, 2007 - 04:29 pm: For the above question, i forgot to add one more condition: Given: d1= 1/STD*Sqrt(T-t)*[ln(S(t)/k)+(r+1/2*STD^2)(T-t)] Also, the Gamma should be : Gamma= -e^-r(T-t)d1*N'(d2)/STD^2*S(t)^2(T-t) Below is my attempt answer for Delta: STEP 1 Take Derivative of d(2) with respect to S(t) d/dS(t)(d2)=d/dS(t)1n S(t)/STD*Sqrt(T-t)=1/S(t)*STD*Sqrt(T-t) STEP 2: Apply chain rule to equation (1) e^-r(T-t)N'(d2) d/dS(t)(d2)= e^-r(T-t)N'(d2)/STD*S(t)*Sqrt(T-t) I have already give it a try for Gamma using quotient rule, however, i was not able to reach the answer as requested, could please someone help me? thanks a lot
Andre Rzym Veteran poster Post Number: 1540	Posted on Monday, 30 April, 2007 - 08:31 pm: I haven't checked whether the result to be proved is actually correct, but I would start by thinking about N'(d2). Recall that N(x) is an integral with an upper limit of x. What, therefore, is N'(x)? Writing this out explicitly in the expression for delta, then differentiating the lot with respect to S should get you there.

If not, post your workings (and have a look at the formatting page in the instructions link below).

Andre

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