An Introduction to VBA in Excel *

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First draft: November, 1995

November 3, 2000

Abstract

This is a tutorial showing how to use the macro facility in Microsoft Office—Visual Basic for Applications—to simplify analytical tasks in Excel.

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 Thanks to Jim Dana for asking stimulating questions about VBA.

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1 Introduction

Visual Basic for Applications, Excel's powerful built-in programming language, permits you to easily incorporate user-written functions into a spreadsheet.[1] You can easily calculate Black-Scholes and binomial option prices, for example. Lest you think VBA is something esoteric which you will never otherwise need to know, VBA is now the core macro language for all Microsoft's office products, including Word. It has also been incorporated into software from other vendors. You need not write complicated programs using VBA in order for it to be useful to you. At the very least, knowing VBA will make it easier for you to analyze relatively complex problems for yourself.

This document presumes that you have a basic knowledge of Excel, including the use of built-in functions and named ranges. I do not presume that you know anything about writing macros or programming. The examples here are mostly related to option pricing, but the principles apply generally to any situation where you use Excel as a tool for numerical analysis.

All of the examples here are contained in the Excel workbook VBA.XLS.

2 Calculations without VBA

Suppose you wish to compute the Black-Scholes formula in a spreadsheet. Suppose also that you have named cells[2] for the stock price (s), strike price (k), interest rate (r_), time to expiration (t), volatility (v), and dividend yield (d). You could enter the following into a cell:

```
s*exp(-d*t)*normsdist((ln(s/k)+(r-d+v ^ 2/2)* t)/(v*t ^0.5))
  −k * exp(-r_ * t)* normsdist((ln(s/k)+(r_-d-v^2/2)*t)/(v*t^0.5))
```

Typing this formula is cumbersome, though of course you can copy the formula wherever you would like it to appear. It is possible to use Excel's data table feature to create a table of Black-Scholes prices, but this is cumbersome and inflexible. If you want to calculate option Greeks (e.g. delta, gamma, etc...) you must again enter or copy the formulas into each cell

[1] This document uses keystrokes which are correct for Office 97. VBA changed dramatically (for the better, in my opinion) between Office 95 and Office 97. The general idea remained the same, but specific keystrokes changed. So far I have not found changes required for Office 2000.

[2] If you do not know what a named cell is, consult Excel's on-line help.