

Portable Code: FFT Option Pricing

Dr Mike Staunton

CQF, London

26 January 2011

Code and Interface Journey

- VBA using Excel UDFs
- VB.NET using ExcelDna XLLs
- VB.NET using VB Compiler EXEs
- C++/CLI using Visual Studio EXEs
- C# (possible)
- Java (tentative)

Code Syntax Restrictions

- Use $\exp(a \cdot \ln(b))$ not b^a
- Change VBA Math to .NET Math
- Change VBA Types to .NET Types
- Change Variants to Vector & Matrix Doubles
- Function names (va, vb, cp, Vector, Matrix)
- No Excel functions
- Implicit or Explicit Type Conversion

ExcelDna - Background

- Govert van Drimmelen
- South African software developer
- Free
- Open-source
- Easy to distribute files
- Active Google Groups forum
- <http://groups.google.com/group/exceldna>

ExcelDna - Features

- Requires .NET framework ≥ 2.0
- Ribbon, RTD support
- .NET 4 support
- Task Parallel Library with .NET 3.5
- Excel 64-bit support in months
- <http://exceldna.typepad.com/>

ExcelDna - Programming

- Only 2 files
- .dna file with program code
- Rename container .xll file
- Load named xll as Excel add-in

- Can also use to check VBA syntax

VBA to VB.NET

- Function vaFn10(AMat As Variant, nr&, nc&) As Double
-
- Dim sumij#
- Dim i&, iBase&, j&
-
- iBase = 1
- sumij = 0
- For i = 0 To nr
- For j = 0 To nc
- sumij = sumij + AMat(i + iBase, j + iBase)
- Next j
- Next i
- vaFn10 = sumij
- End Function
- Function vbFn10(AMat(,) As Double, nr As Int32, nc As Int32) As Double
- Dim sumij As Double
- Dim i As Int32, iBase As Int32, j As Int32
- iBase = 0
- sumij = 0
- For i = 1 To nr
- For j = 1 To nc
- sumij = sumij + AMat(i + iBase, j + iBase)
- Next j
- Next i
- vbFn10 = sumij
- End Function

Visual Basic Compiler

- Start with text file containing VB.NET code
- Search for vbc.exe file
- Command prompt
- Create .exe file

- Can also add command prompt to Visual Studio menu

Visual Studio Express

- Free downloads
- VS IDE plus .NET Framework
- .NET Framework 2.0, 3.5, 4.0
- VS 2008 VB, C#, C++
- VS 2010 VB, C#, C++, F#
- www.microsoft.com/express/

Tangible Software Solutions

- Automatic translation of program code between major .NET languages
- Instant C++, Instant C#
- Standard and Demo editions
- Correct handling of array bounds
- Continually updated
- <http://tangiblesoftware.com/>

VS 2008 Console Application

- FFT Bermudan Put Pricing
- CONV paper
- http://papers.ssrn.com/sol3/papers.cfm?abstract_id=966046
- mikeCONVBP.h header file
- mikeCONVBP.cpp project file
- Remember to Maximize Speed (/O2)
- Compiled file mikeCONVBP.exe

Alternative Thoughts

- C# seems to be language of choice for non-VBA users
- Proper C++ starts with Scott Myers' Effective C++ or Herb Sutter's Exceptional C++
- C++ Design Patterns (Mark Joshi) or Derivatives Algorithms (Tom Hyer)
- C/C++ Excel add-ins (Steve Dalton)
- CUDA GPU programming