



Calling C++ Developed DLL and XLL by Excel

2007/05/28 資財97 羅紹玫

Using Excel to solve some financial problems

functions、VBA

Dynamic Linked Library (DLL)

蒙地卡羅的模擬次數	10000	30000	50000	100000
VBA (ms)	62.5	183.5	308.5	605.5
DLL (ms)	15	30	62	109

Extensible Linked Library (XLL)



Windows Library Basic

- Static Linked Library (SLL)
 - part of the resulting executable file
 - the more libraries being used, the bigger the executable file is.
 - wasting of memory when using the same library in different executable files



Windows Library Basic (cont.)

- Dynamic Linked Library (DLL)
 - need it, load it
(usually when the application starts up)
 - smaller executable file
 - applications that use DLL only need to have one copy of it
 - easy to update

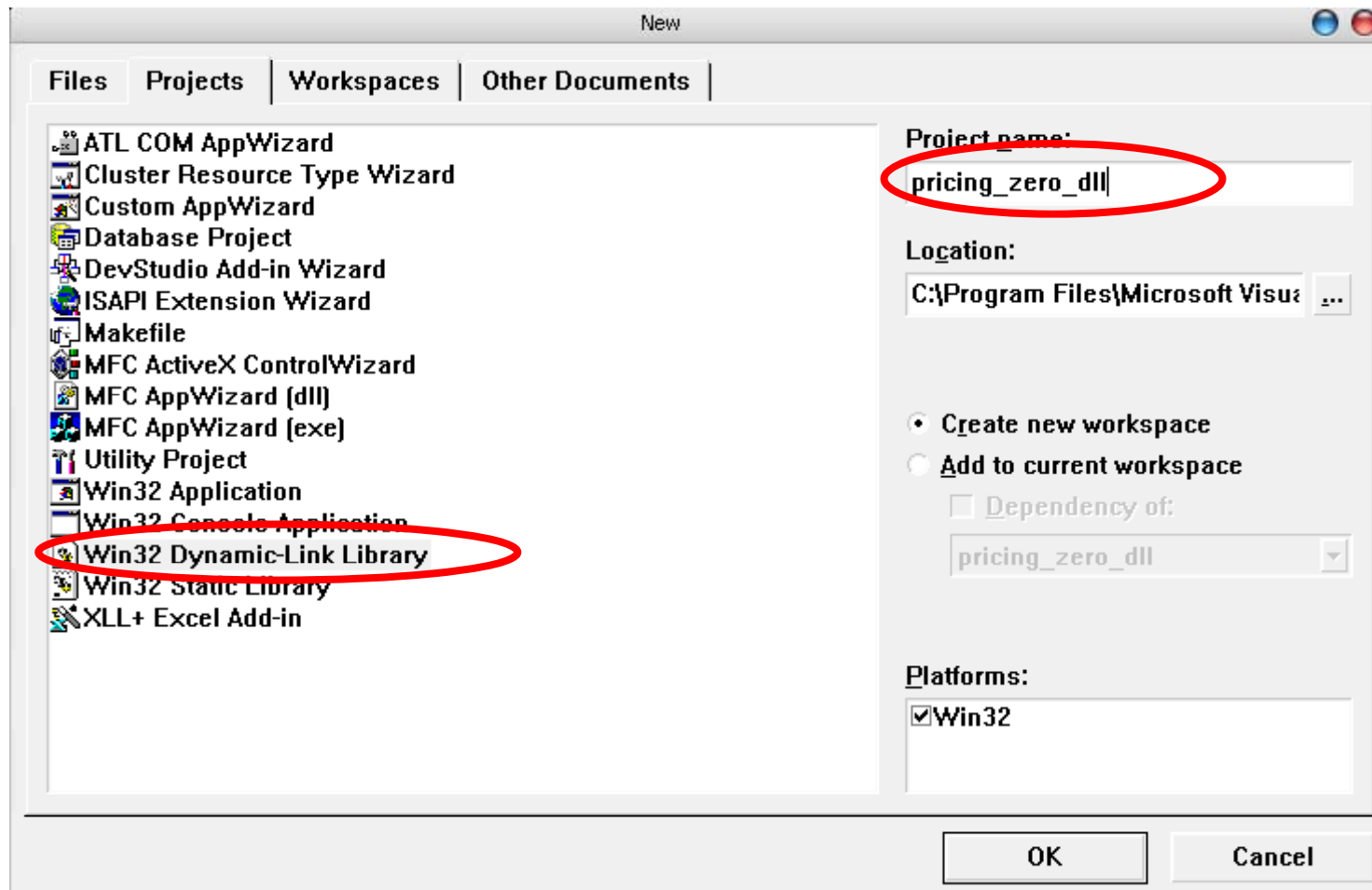


Using DLL via Excel

- Creating DLL using Visual C++ 6.0
- Accessing DLL Functions From VB

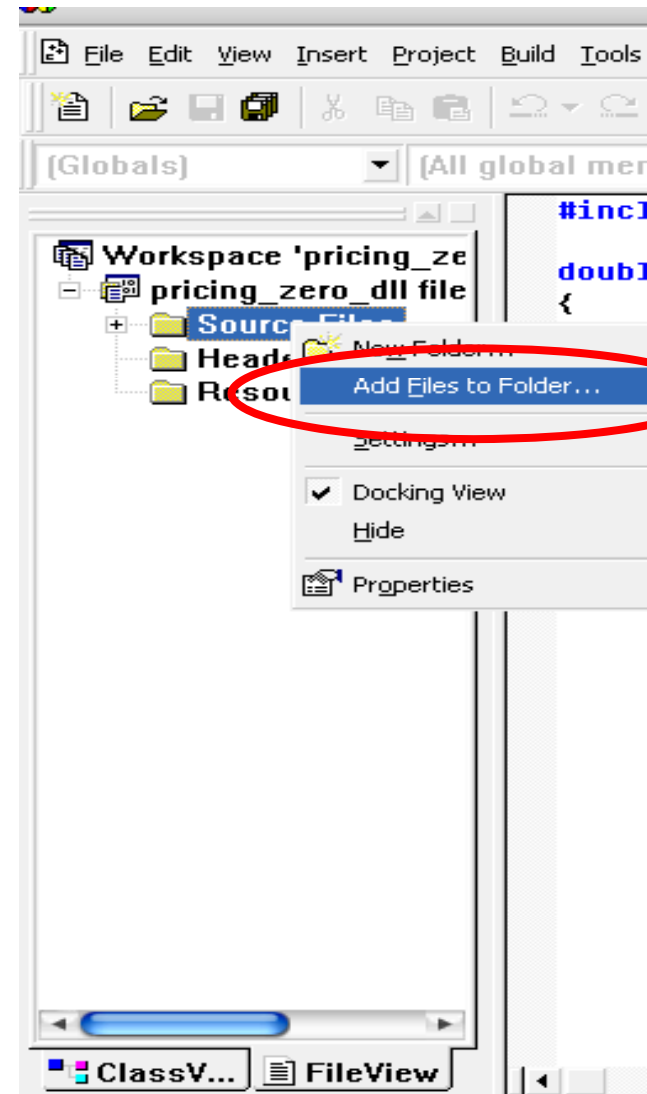
Creating DLL using Visual C++ 6.0

■ New project



Creating DLL using VC6 (cont.)

- Add two files
 - pricing_zero_dll.cpp
 - pricing_zero_dll.def





Creating DLL using VC6 (cont.)

■ Add Code

– pricing_zero_dll.cpp

```
#include <math.h>

double discount_factor(double yield,long period)
{
    double discount=pow(1+yield,-period);
    return discount;
}

double _stdcall pricing_zero(double FU, double yield, long period)
{
    double price=FU*discount_factor(yield, period);
    return price;
}
```



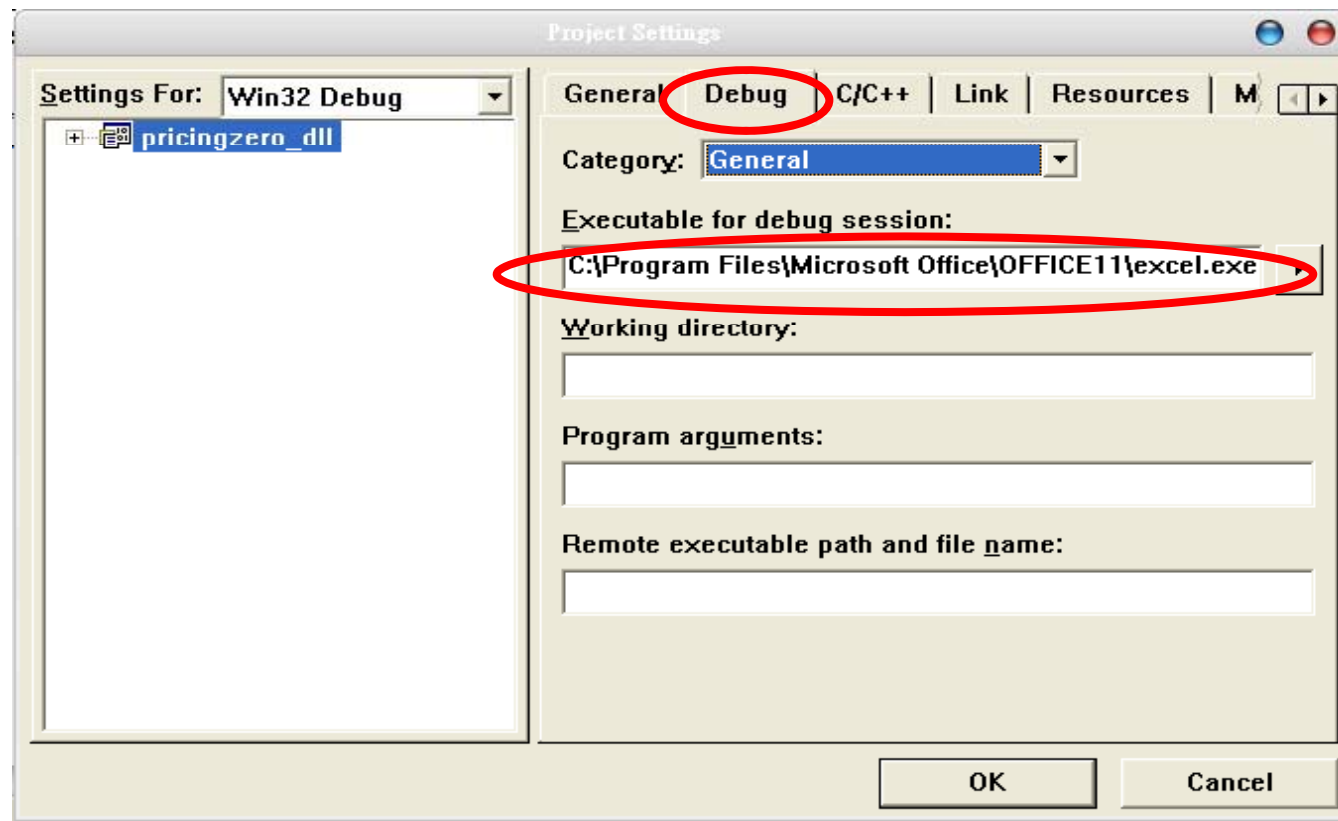

Creating DLL using VC6 (cont.)

- Add Code
 - pricing_zero_dll.def

```
EXPORTS
    pricing_zero
```

Creating DLL using VC6 (cont.)

- Compiling and Debugging the DLL
 - Project / Settings (Alt+F7)





Accessing DLL from VB

- Calling DLL in VBA to price a zero-coupon bond

```
Declare Function pricing_zero Lib _  
"C:\Program Files\Microsoft Visual Studio\MyProjects\pricingzero_dll\Debug\pricingzero_dll.dll" _  
(ByVal FV As Double, ByVal yield As Double, ByVal period As Long) As Double
```

- Adding code to price two zero-coupon bonds

```
Function pricing_twozero(FV As Double, yield As Double, period As Long) As Double  
    pricing_twozero = 2 * pricing_zero(FV, yield, period)  
End Function
```

Using DLL via Excel

	A	B	C
1	FV	100	
2	yield	0.05	
3	period	5	
4			
5	Excel cell calculation	78.3526	$B1/(1+B2)^{B3}$
6	Excel PV function	\$78.3526	PV(0.05,5,0,100,0)
7	pricing_zero	78.3526	pricing_zero(100,0.05,5)
8	pricing_twozero	156.7052	pricing_twozero(100,0.05,5)



Using Excel to solve some financing problems

functions · VBA

Dynamic Linked Library (DLL)

Extensible Linking Language (XLL)

- An XLL is a type of DLL
(developed by Microsoft)
 - Tools/ Add-in



Turning DLLs into XLLs

- Creating XLL using Visual C++ 6.0
 - Using XLL PLUS Toolkit
 - Using Microsoft Excel 97 Developer's Kit
- Accessing XLL by Excel Add-in

XLL PLUS Toolkit

■ Download

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<http://www.as-ltd.co.uk/xllplus/>

XLL Plus - Microsoft Internet Explorer

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XLL Plus

XLL+ is a toolkit to aid C/C++ programmers in the construction of Excel add-in libraries.

New - XLL+ 5.0 is now available. Owners of XLL+ 4.2 or 4.3 are entitled to a free upgrade to the equivalent version of XLL+ 5.0. See [What's New](#) for a list of new features.

What is it?

If you write add-ins for Excel in C++, then you should be using **XLL+**. The toolkit helps you with all aspects of creating and maintaining an Excel add-in. Here are just some of the features:

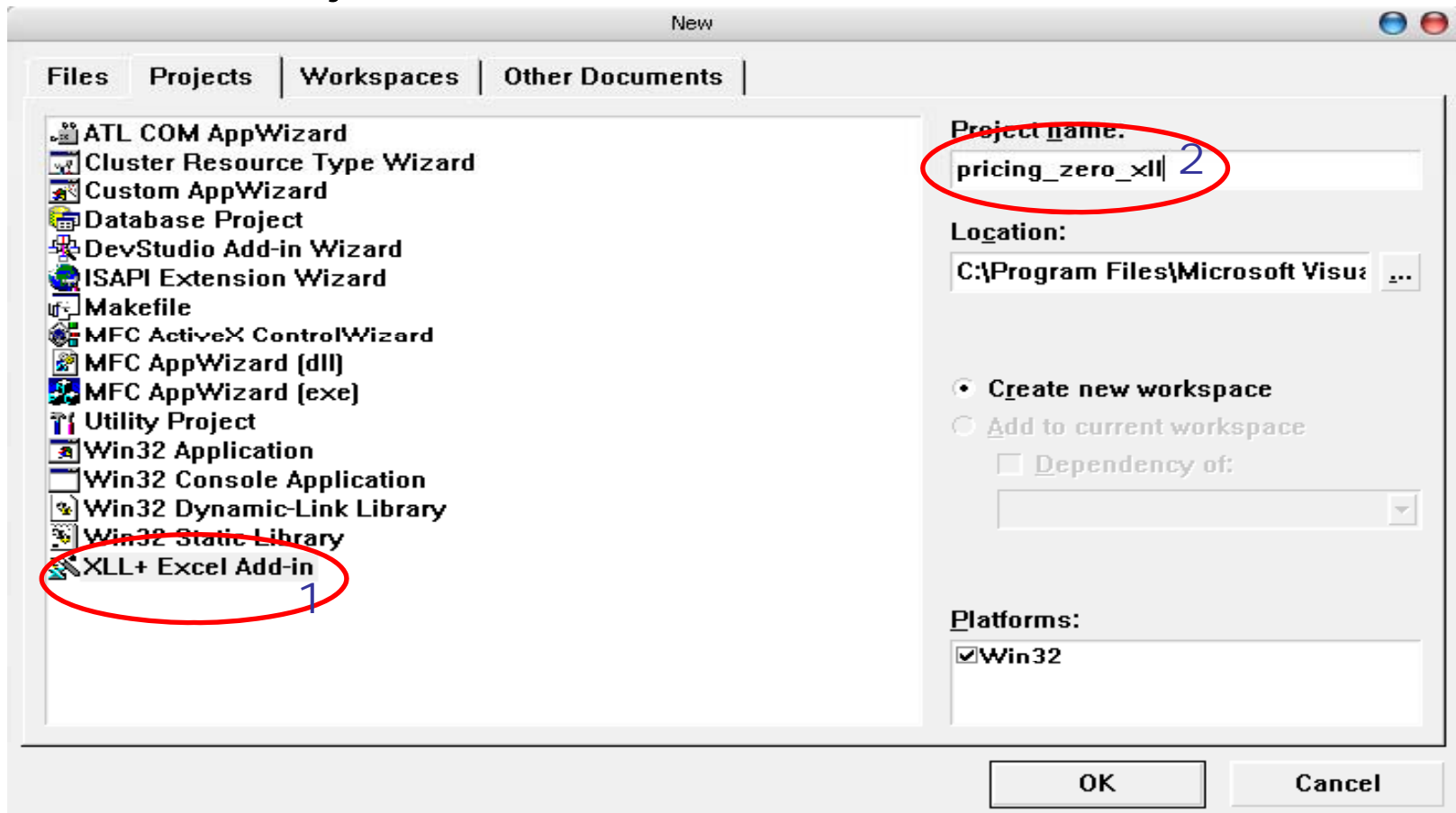
- AppWizard creates complete Visual Studio projects, ready to compile and run
- XLL+ Function Wizard helps you write and maintain Excel add-in functions, and generates most of the code for
- Powerful and extensive C++ class library opens up the power of Excel's add-in API, with no learning curve
- Complete on-line help with tutorials, walkthroughs and dozens of working examples



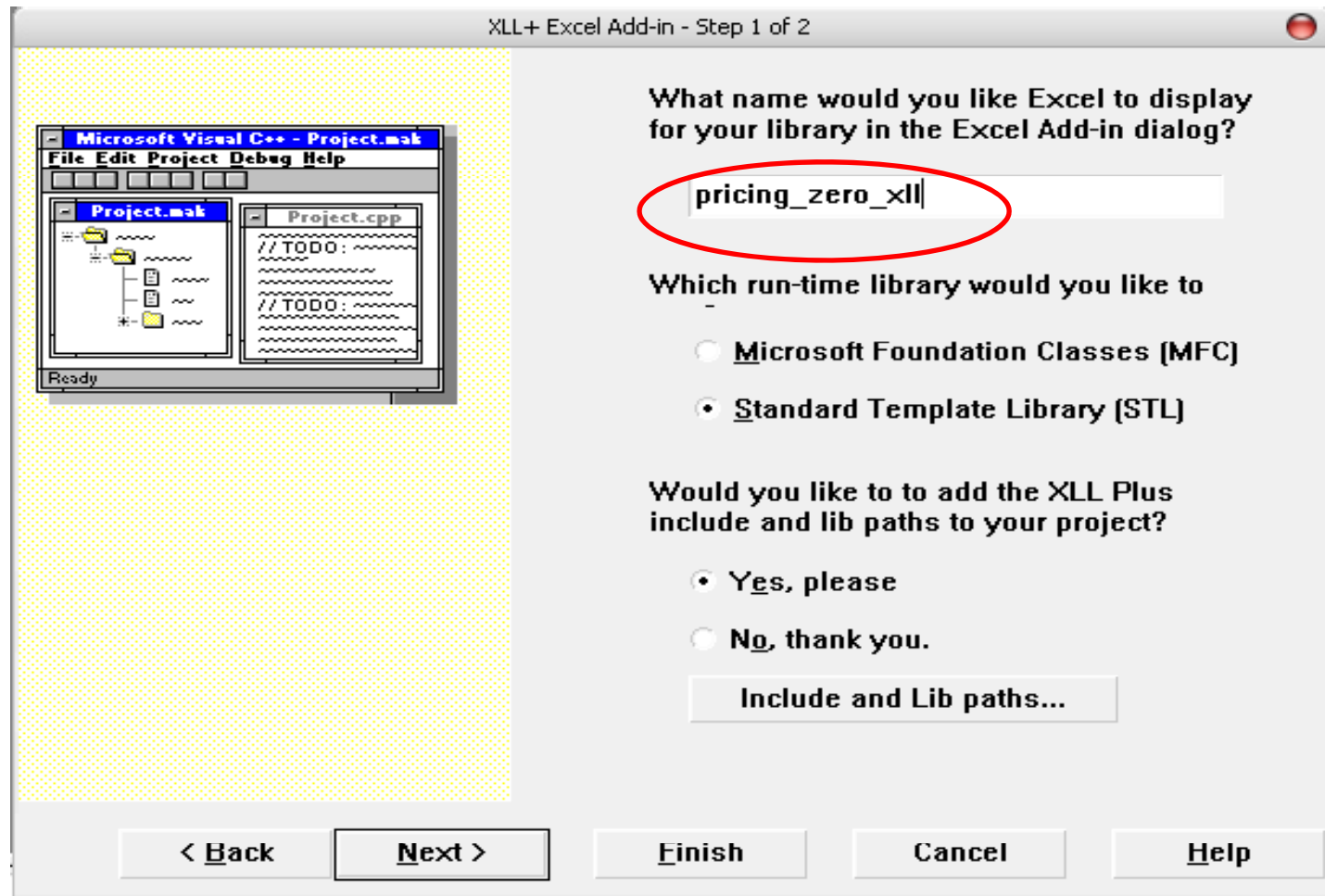
XLL PLUS Toolkit (cont.)

■ VC6

New / Project

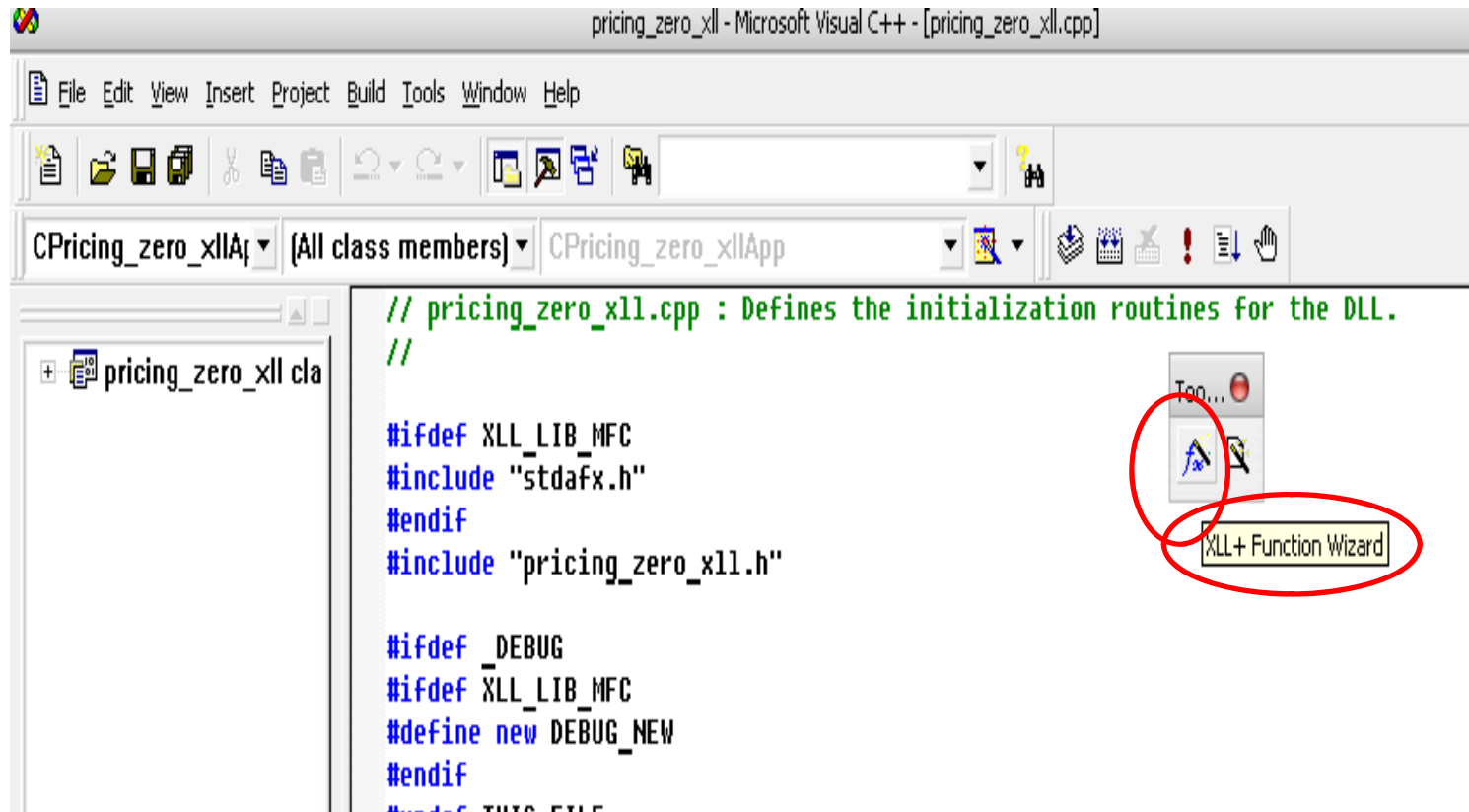


XLL PLUS Toolkit (cont.)



XLL PLUS Toolkit (cont.)

■ XLL+ Function Wizard



XLL PLUS Toolkit (cont.)

■ Add New Function

Copy signature from...
[None]

Name: pricing_zero_xll
Category: User Defined

Description: No description provided

OK Cancel

XLL+ Function Wizard - pricing_zero_xll *

File Edit View Function Argument Tools Help

'C' Name: pricing_zero_xll Worksheet function
Excel Name: pricing_zero_xll Macro function
Category: User Defined Volatile
Returns: CXIOper Defer recalculation

Description: No description provided

Name	Type	Dimensions	Description
FV	±1.0 Double	Scalar	No description provided
yield	±1.0 Double	Scalar	No description provided
period	±12 Short	Scalar	No description provided

OK Cancel New Function



XLL PLUS Toolkit (cont.)

■ Adding Code (pricing_zero_xll.cpp)

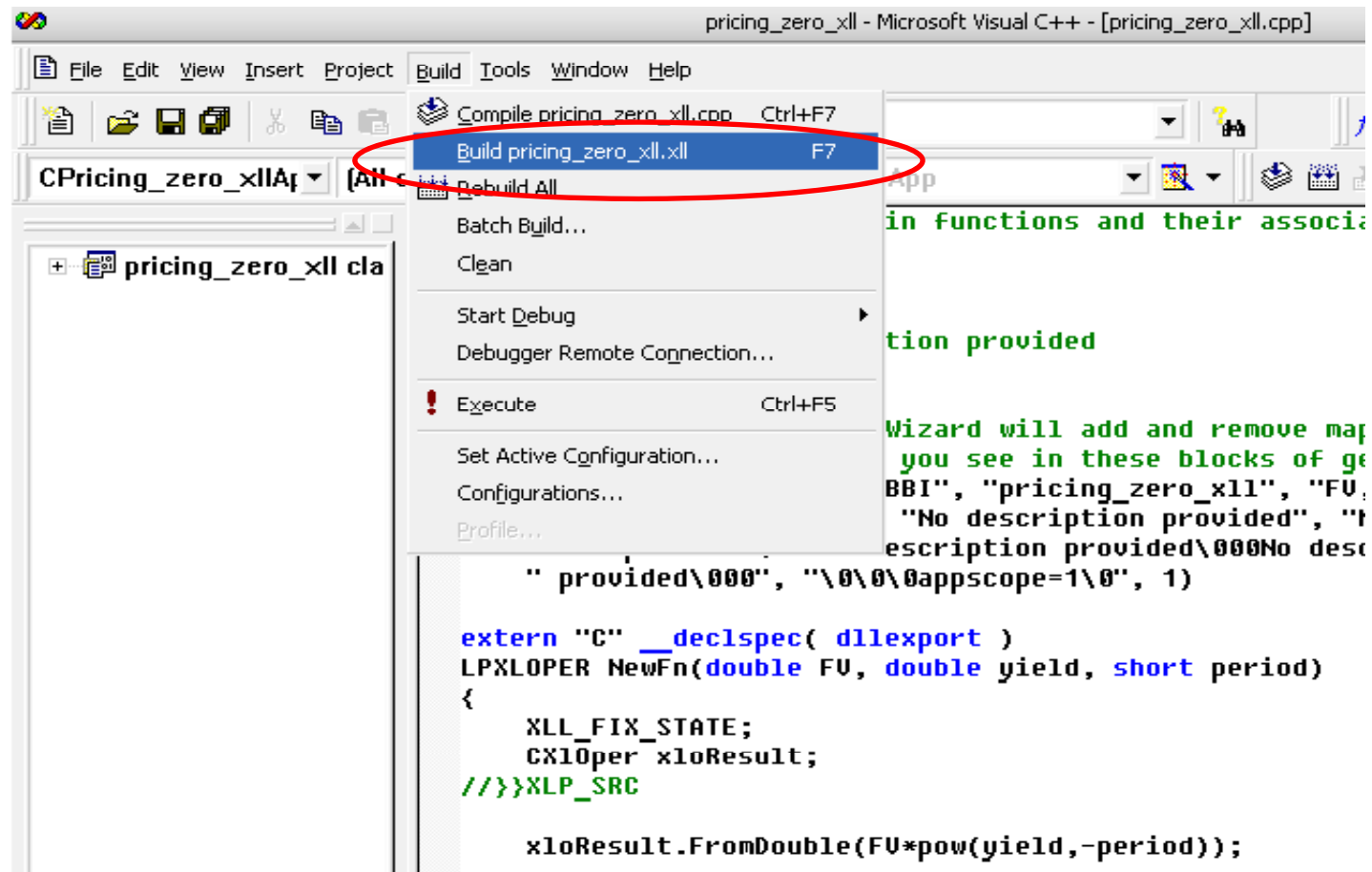
```
extern "C" __declspec( dllexport )
LPXLOPER pricing_zero_xll(double FU, double yield, short period)
{
    XLL_FIX_STATE;
    CXLOper xloResult;
    //}}XLP_SRC

    // TODO - Set the value of xloResult
    xloResult.FromDouble(FU*pow(1+yield,-period));

    return xloResult.Ret();
}
```

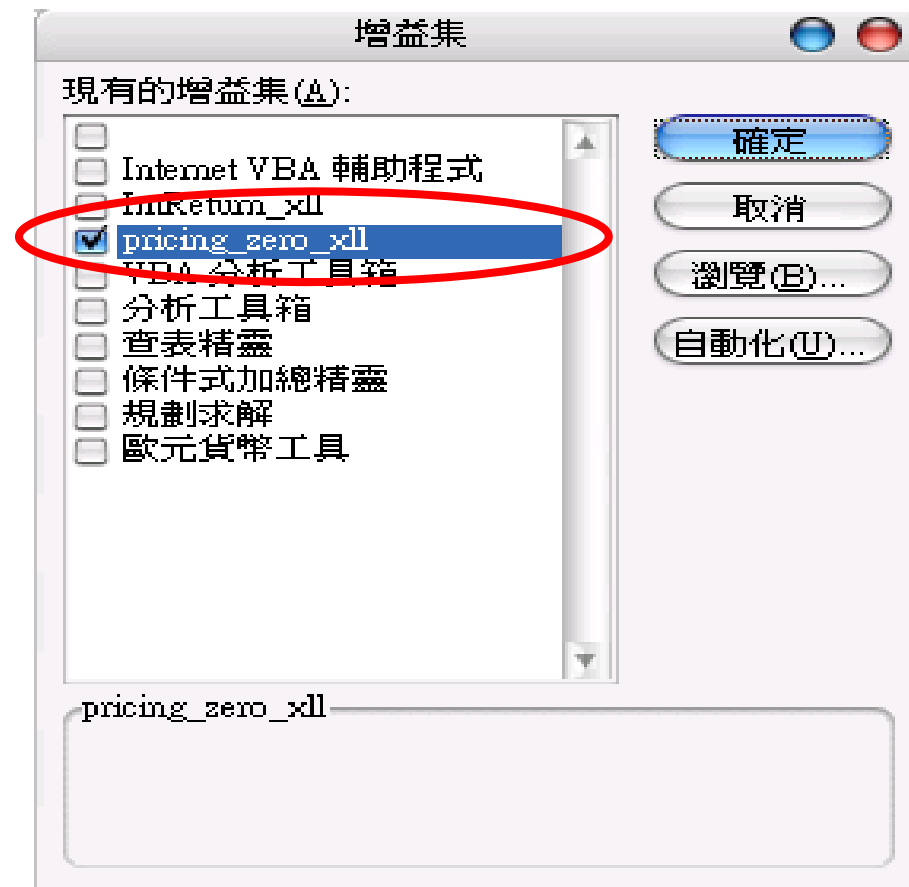
XLL PLUS Toolkit (cont.)

■ Build XLL



Accessing XLL by Excel Add-in

■ Excel Add-in



Accessing XLL by Excel Add-in

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D1 =pricing_zero_xll(100,0.05,5)

	A	B	C	D	E	F	G
1				78.35262			
2							
3							
4							
5							