CHAPTER 1

What Is Financial Modelling?

There are all sorts of complicated definitions of financial modelling, and in my experience there is quite a bit of confusion around what a financial model is exactly. A few years ago, we put together a Plum Solutions survey about the attitudes, trends, and uses of financial modelling, asking respondents, "What do you think a financial model is?" Participants were asked to put down the first thing that came to mind, without any research or too much thinking about it. I found the responses interesting, amusing, and sometimes rather disturbing.

Some answers were overly complicated and highly technical:

- "Representation of behaviour/real world observations through mathematical approach designed to anticipate range of outcomes."
- "A set of structured calculations, written in a spreadsheet, used to analyse the operational and financial characteristics of a business and/or its activities."
- "Tool(s) used to set and manage a suite of variable assumptions in order to predict the financial outcomes of an opportunity."
- "A construct that encodes business rules, assumptions, and calculations enabling information, analysis, and insight to be drawn out and supported by quantitative facts."
- "A system of spreadsheets and formulas to achieve the level of record keeping and reporting required to be informed, up-to-date, and able to track finances accurately and plan for the future."

Some philosophical:

- "A numerical story."

Some incorrect:

- "Forecasting wealth by putting money away now/investing."
- "It is all about putting data into a nice format."
- "It is just a mega-huge spreadsheet with fancy formulas that are streamlined to make your life easier."

Some ridiculous:

- "Something to do with money and fashion?"

Some honest:

- "I really have no idea."

And some downright profound:

- "A complex spreadsheet."

There are many (often very complicated and long-winded) definitions available from different sources, but I actually prefer the last, very broad, but accurate description: "a complex spreadsheet." Whilst it does need some definition, a financial model can pretty much be *whatever you need it to be*.

As long as a spreadsheet has inputs and outputs, and is dynamic and flexible—I'm happy to call it a financial model! Pretty much the whole *point* of financial modelling is that you change the inputs and the outputs. This is the major premise behind scenario and sensitivity analysis—this is what Excel, with its algebraic logic, was *made* for! Most of the time, a model will contain financial information and serve the purpose of making a financial decision, but not always. Quite often it will contain a full set of financial statements: profit and loss, cash flow, and balance sheet; but not always.

According to the more staid or traditional definitions of financial modelling, the following items would all most certainly be classified as financial models:

- A business case that determines whether or not to go ahead with a project.
- A five-year forecast showing profit and loss, cash flow, and balance sheet.
- Pricing calculations to determine how much to bid for a new tender.
- Investment analysis for a joint venture.

But what about other pieces of analysis that we perform as part of our roles? Can these also be called financial models? What if something does not contain financial information at all? Consider if you were to produce a spreadsheet for the following purposes:

- **An actual-versus-budget monthly variance analysis** that does not contain scenarios and for which there are no real assumptions listed.

- **A risk assessment**, where you enter the risk, assign a likelihood to that risk, and calculate the overall risk of the project using probability calculations. This does not contain any financial outputs at all.
- **A dashboard report** showing a balance scorecard type of metrics reporting like headcount, quality, customer numbers, call volume, and so on. Again, there are few or no financial outputs.

See the section, "Types and Purposes of Financial Models," later in this chapter for greater detail on financial models that don't actually contain financial information.

Don't get hung up on whether you're actually building something that meets the definition of a financial model or not. As long as you've got inputs and outputs that change flexibly and dynamically, you can call it a financial model. If you're using Excel to any extent whereby you are linking cells together, chances are you're already building a financial model—whether you realise it or not. The most important thing is that you are building the model (or whatever it's called!) in a robust way, following the principles of best practice, which this book will teach you.

Generally, a model consists of one or more input variables along with data and formulas that are used to perform calculations, make predictions, or perform any number of solutions to business (or nonbusiness) requirements. By changing the values of the input variables, you can do sensitivity testing and build scenarios to see what happens when the inputs change.

Sometimes managers treat models as though they are able to produce the answer to all business decisions and solve all business problems. Whilst a good model can aid significantly, it's important to remember that models are only as good as the data they contain, and the answers they produce should not necessarily be taken at face value.

"The reliability of a spreadsheet is essentially the accuracy of the data that it produces, and is compromised by the errors found in approximately 94 percent of spreadsheets."[1] When presented with a model, the savvy manager will query all the assumptions, and the way it has been built. Someone who has had some experience in building models will realise that they must be treated with caution. Models should be used as one tool in the decision-making process, rather than the definitive solution.

[1] Ruth McKeever, Kevin McDaid, and Brian Bishop, "An Exploratory Analysis of the Impact of Named Ranges on the Debugging Performance of Novice Users" (presented at the annual conference of the European Spreadsheet Risks Interest Group, Paris, France, July 2–3, 2009). Available at arxiv.org/abs/0908.0935.

WHAT'S THE DIFFERENCE BETWEEN A SPREADSHEET AND A FINANCIAL MODEL?

Let me make one thing very clear: I am not partial to the use of the word *spreadsheet*; in fact, you'll hardly find it used at all in this book.

I've often been asked the difference between the two, and there is a fine line of definition between them. In a nutshell, an Excel spreadsheet is simply the medium that we can use to create a financial model.

At the most basic level, a financial model that has been built in Excel is simply a complex spreadsheet. By definition, a financial model is a structure that contains input data and supplies outputs. By changing the input data, we can test the results of these changes on the output results, and this sort of sensitivity analysis is most easily done in an Excel spreadsheet.

One could argue then, that they are in fact the same thing; there is really no difference between a spreadsheet and a financial model. Others question if it really matters what we call them as long as they do the job. After all, both involve putting data into Excel, organising it, formatting, adding some formulas, and creating some usable output. There are, however, some subtle differences to note:

1. **"Spreadsheet" is a catch-all term for any type of information stored in Excel, including a financial model.** Therefore, a spreadsheet could really be anything—a checklist, a raw data output from an accounting system, a beautifully laid out management report, or a financial model used to evaluate a new investment.
2. **A financial model is more structured.** A model contains a set of variable assumptions, inputs, outputs, calculations, scenarios, and often includes a set of standard financial forecasts such as a profit and loss, balance sheet, and cash flow, which are based on those assumptions.
3. **A financial model is dynamic**. A model contains variable inputs, which, when changed, impact the output results. A spreadsheet might be simply a report that aggregates information from other sources and assembles it into a useful presentation. It may contain a few formulas, such as a total at the bottom of a list of expenses or average cash spent over 12 months, but the results will depend on direct inputs into those columns and rows. A financial model will always have built-in flexibility to explore different outcomes in all financial reports based on changing a few key inputs.
4. **A spreadsheet is usually static.** Once a spreadsheet is complete, it often becomes a stand-alone report, and no further changes are made. A financial model, on the other hand, will always allow a user to change input variables and see the impact of these assumptions on the output.

5. **A financial model will use relationships between several variables to create the financial report, and changing any or all of them will affect the output.** For example, Revenue in Month 4 could be a result of Sales Price × Quantity Sold Prior Month × Monthly Growth in Quantities Sold. In this example, three factors come into play, and the end user can explore different mixes of all three to see the results and decide which reflects his or her business model best.
6. **A spreadsheet shows actual historical data, whereas a financial model contains hypothetical outcomes.** A by-product of a well-built financial model is that we can easily use it to perform scenario and sensitivity analysis. This is an important outcome of a financial model. What would happen if interest rates increase by half a basis point? How much can we discount before we start making a loss?

In conclusion, a financial model is a complex type of spreadsheet, whilst a spreadsheet is a tool that can fulfill a variety of purposes—financial models being one. The list of attributes above can identify the spreadsheet as a financial model, but in some cases, we really are talking about the same thing. Take a look at the Excel files you are using. Are they dynamic, structured, and flexible, or have you simply created a static, direct-input spreadsheet?

TYPES AND PURPOSES OF FINANCIAL MODELS

Models in Excel can be built for virtually any purpose—financial and non-financial, business-related or non-business-related—although the majority of models will be financial and business-related. The following are some examples of models that do not capture financial information:

- **Risk management:** A model that captures, tracks, and reports on project risks, status, likelihood, impact, and mitigation. Conditional formatting is often integrated to make a colorful, interactive report.
- **Project planning:** Models may be built to monitor progress on projects, including critical path schedules and even Gantt charts. (See the next section in this chapter, "Tool Selection," for an analysis of whether Microsoft Project or Excel should be used for building this type of project plan.)
- **Key performance indicators (KPIs) and benchmarking:** Excel is the best tool for pulling together KPI and metrics reporting. These sorts of statistics are often pulled from many different systems and sources, and Excel is often the common denominator between different systems.

- **Dashboards:** Popularity in dashboards has increased in recent years. The dashboard is a conglomeration of different measures (sometimes financial but often not), which are also often conveniently collated and displayed as charts and tables using Excel.
- **Balanced scorecards:** These help provide a more comprehensive view of a business by focusing on the operational, marketing, and developmental performance of the organisation as well as financial measures. A scorecard will display measures such as process performance, market share or penetration, and learning and skills development, all of which are easily collated and displayed in Excel.

As with many Excel models, most of these could be more accurately created and maintained in a purpose-built piece of software, but quite often the data for these kinds of reports is stored in different systems, and the most practical tool for pulling the data together and displaying it in a dynamic monthly report is Excel.

Although purists would not classify these as financial models, the way that they have been built should still follow the fundamentals of financial modelling best practices, such as linking and assumptions documentation. How we classify these models is therefore simply a matter of semantics, and quite frankly I don't think what we call them is particularly important! Going back to our original definition of financial modelling, it is a structure (usually in Excel) that contains inputs and outputs, and is flexible and dynamic.

TOOL SELECTION

In this book we will use Excel exclusively, as that is most appropriate for the kind of financial analysis we are performing when creating financial models. We often hear it said that Excel is the "second-best solution" to a problem. There is usually a better, more efficient piece of software that will also provide a solution, but we often default to the "Swiss army knife" of software, Excel, to get the job done. Why do many financial modelling analysts use Excel almost exclusively, when they know that better solutions exist? At Plum Solutions, our philosophy is also one of using only "plain-vanilla" Excel, without relying on any other third-party software, for several reasons:

- No extra licences, costly implementation, or software download is required.
- The software can be installed on almost any computer.
- Little training is needed, as most users have some familiarity with the product—which means other people will be able to drive and understand your model.

- It is a very flexible tool. If you can imagine it, you can probably do it in Excel (within reason, of course).
- Excel can report, model, and contrast virtually any data, from any source, all in one report.
- But most important, Excel is commonly used across all industries, countries, and organisations, meaning that the Excel skills you have are highly transferable.

What this last point means to you is that if you have good financial modelling skills in Excel, these skills are going to make you more in demand—especially if you are considering changing industries or roles or getting a job in another country. In fact, **one of the best things you can do for your career is to improve your Excel skills.** Becoming an expert developer on a proprietary piece of software is useful, but becoming a highly skilled Excel expert will stand you in good stead throughout your career.

Excel has its limitations, of course, and Excel's main downfall is the ease with which users can make errors in their models. Therefore, a large part of financial modelling best practice relates to reducing the possibility for errors. See Chapter 3, "Best Practice Principles of Modelling," and "Error Avoidance Strategies" in Chapter 4 for details on errors and how to avoid them.

The other issue with using Excel is capacity; we simply run out of rows, especially in this "Age of Big Data." Microsoft is trying to keep Excel relevant by introducing Power Pivot, which is a free add-in that is part of your Excel licence if you are using Excel 2010 or above. Power Pivot can handle much bigger data than plain Excel, which gets around Excel's capacity limitations.

Is Excel Really the Best Option?

Before jumping straight in and creating your solution in Excel, it is worth considering that some solutions may be better built in other software, so take a moment to contemplate your choice of software before designing a solution. There are many other forms of modelling software on the market, and it might be worth considering other options besides Excel. There are also a number of Excel add-ins provided by third parties that can be used to create financial models and perform financial analysis. The best choice depends on the solution you require.

The overall objective of a financial model determines the output as well as the calculations or processing of input required by the model. Financial models are built for the purpose of providing timely, accurate, and meaningful information to assist in the financial decision-making process. As a result, the overall objective of the model depends on the specific decisions that are to be made based on the model's output.

As different modelling tools lend themselves to different solutions or output, before selecting a modelling tool it is important to determine precisely what solution is required based on the identified model objective.

Evaluating Modelling Tools

Once the overall objective of the model has been established, a financial modelling tool that will best suit the business requirements can be chosen.

To determine which financial modelling tool would best meet the identified objective, the following must be considered:

- The output required from the model, based on who will use it and the particular decisions to be made.
- The volume, complexity, type, and source of input data—particularly relating to the number of interdependent variables and the relationships between them.
- The complexity of calculations or processing of input to be performed by the model.
- The level of computer literacy of the users, as they should ideally be able to manipulate the model without the assistance of a specialist.
- The cost versus benefit set off for each modelling tool.

As with all software, financial modelling programs can either be purchased as a package or developed in-house. Whilst purchasing software as a package is a cheaper option, in a very complex industry, in-house development of specific modelling software may be necessary in order to provide adequate solutions. In this instance, one would need to engage a reputable specialist to plan and develop appropriate modelling software.

Which package you choose depends on the solution you require. A database or customer relationship management (CRM) data lends itself very well to a database, whereas something that requires complex calculations, such as those in many financial models, is more appropriately dealt with in Excel.

Excel is often described as a band-aid solution, because it is such a flexible tool that we can use to perform almost any process—albeit not as fast or as well as fully customised software, but it will get the job done until a long-term solution is found: "Spreadsheets will always fill the void between what a business needs today and the formal installed systems."[2]

[2] Mel Glass, David Ford, and Sebastian Dewhurst, "Reducing the Risk of Spreadsheet Usage—A Case Study" (presented at the annual conference of the European Spreadsheet Risks Interest Group, Paris, France, July 2–3, 2009). Available at arxiv.org/abs/0908.1584.

Budgeting and Forecasting

Many budgets and forecasts are built using Excel, but most major general ledger systems have additional modules available that are built specifically for budgeting and forecasting. These tools provide a much easier, quicker method of creating budgets and forecasts that is less error-prone than using templates. However, there are surprisingly few companies that have a properly integrated, fully functioning budgeting and forecasting system, and the fallback solution is almost always Excel.

There are several reasons many companies use Excel templates over a full budgeting and forecasting solution, whether they are integrated with their general ledger system or not.

- A full solution can be expensive and time consuming to implement properly.
- Integration with the general ledger system means a large investment in a particular modelling system, which is difficult to change later.
- Even if a system is not in place, invariably some analysis will need to be undertaken in Excel, necessitating that at least part of the process be built using Excel templates.

Microsoft Office Tools: Power Pivot, Access, and Project

Plain-vanilla Excel (and by this I mean no add-ins) is the most commonly used tool. See the next section for a review of some extra add-ins you might like to consider. However, there are other Microsoft (MS) tools that could also serve to create the solution.

MS Power Pivot First introduced as a free add-in in Excel 2010, and slightly more diffcult to find in Excel 2013, Power Pivot replaces and improves the SQL Server Analysis Services for Microsoft's Business Intelligence (BI) suite. Put simply, Power Pivot is PivotTables on steroids. It extends the capabilities of the PivotTable data summarisation and cross-tabulation feature by introducing the ability to import data from multiple sources. It will allow you to do things you couldn't do before in plain Excel, like matching data from multiple sources and pulling them together into a single report. Because it is a relational database, Power Pivot makes it easy to link together data from various sources employing a simple-to-use "drag-and-drop" graphical user interface.

Wonderful as it is, we know that plain-vanilla Excel stops being quite so wonderful when your data is more than 1,048,576 records long or if the data needs to be consolidated from multiple sources. When faced with

this problem, Excel users find themselves migrating to a data warehouse or other, more powerful software. Microsoft has tried to retain these users by introducing Power Pivot, which addresses these problems with added capacity and speed yet retains the familiar Excel interface that we all know and love.

As a self-service BI product, Power Pivot is intended to allow users with no specialised BI or analytics training to develop data models and calculations, sharing them either directly or through SharePoint document libraries. For more sophisticated users, Power Pivot can:

- Create your own BI solutions without purchasing expensive software.
- Manipulate large data sets quickly, even if they consist of millions of rows (Excel can't do that!).
- Construct complex what-if reporting systems with data modelling and data analysis expressions (DAX).
- Link data from various sources quickly and easily.

Power Pivot is one of the most exciting things to happen to Excel in a long time, and certainly worth some consideration when you are building an Excel solution. Although more appropriate for data analysis than pure dynamic financial models, Power Pivot is worth bearing in mind as a possible tool. If you find that your model has the following attributes, then you should consider using Power Pivot:

- Your data contains many thousands of rows and your model is starting to slow down.
- PivotTables or Tables are used extensively.
- Data needs to be sourced from multiple locations.

One of the great things about Power Pivot is that it is a free download that comes with the licence you have already if you're using Excel 2010. Be careful, however, about which version you buy if you're using Excel 2013, as Power Pivot is not included with every version (for some inexplicable reason). There are also a number of differences between the Excel 2010 and 2013 versions, and as this is an area of rapid change, I have no doubt that the availability of versions and features may have changed by the time this book goes to print, so be sure to research carefully before you purchase your license if you are specifically upgrading with the intention of using Power Pivot.

The disadvantage of using Power Pivot is that although you don't need to be a BI specialist to use it, learning how to use Power Pivot is not particularly straightforward even for advanced users. We offer a number of Power

Pivot training courses at Plum Solutions through our partners, and there are many videos and online resources that can help you to get started if you decide that Power Pivot is the solution that you need.

If you are trying to decide whether your Excel skills are advanced enough to consider tackling Power Pivot, here are some questions that will help you to determine whether you are ready to take on Power Pivot. You should:

- Understand and have used Excel's SUMIF function.
- Have a working knowledge of filtering data in Excel (e.g., Auto or Advanced Filters).
- Know how to deal with multiple criteria (e.g., SUMIFS, SUMPRODUCT, or DBASE functions).
- Be able to import data from third-party databases and/or files (e.g., Access, SQL, MIS systems).
- Regularly use, adapt, and modify PivotTables (see Chapter 8 for more on PivotTables).
- Have created calculated fields in PivotTables.
- Have created and/or modified an Excel Table (a structured reference table, not a data table) (see Chapter 8 for more on Excel Tables).
- Have access to either Excel 2010 or Excel 2013 Professional Plus.

Although still quite new, Microsoft seems to be devoting a lot of resources to developing the Power Pivot product, so it is likely to gain even more popularity in the near future. It's worth investing some time in learning it: Being skillful in Power Pivot may become similar to having advanced Excel skills and will be a valuable addition to your CV, and benefit your career as an analyst.

MS Access Access is probably the closest alternative to Excel, and is worth a mention. There is often some resistance to using Access, and it is certainly less popular than it was a decade or so ago. Prior to the release of Excel 2007, Excel users were restricted to only 65,000 rows, and many analysts and finance staff used Access as a way to get around this limit. With now over 1.1 million rows (and purportedly up to a billion rows if you install Power Pivot), Excel is able to handle a lot more data, so there is less need for the additional row capacity of Access. If you've been using Access over the years, you might have noticed that not very much has changed in Access between versions. It seems that Microsoft is investing more of its efforts into the new Power Pivot rather than Access, and therefore we can expect more models in the future to be built using Power Pivot.

Advantages of Excel

- Excel is included in most basic Microsoft packages (unlike Access, which often needs to be purchased separately) and therefore comes as standard on most PCs. Excel is much more flexible than Access and calculations are much easier to perform.
- It is generally faster to build a solution in Excel than in Access.
- Excel has a wider knowledge base among users, and many people find it to be more intuitive. This means it is quicker and easier to train staff in Excel.
- It is very easy to create flexible reports and charts in Excel.
- Excel can report, model, and contrast virtually any data, from any source, all in one file.
- Excel easily performs calculations on more than one row of data at a time, which Access has difficulty with.

Advantages of Access

- Access can handle much larger amounts of data. Excel 2003 was limited to 65,536 rows and 256 columns, and later versions of Excel are limited to around 1.1 million rows (1,048,576 rows, to be precise) and 16,384 columns. Access's capability is much larger, and it also has a greater memory storage capacity.
- Data is stored only once in Access, making it work more efficiently.
- Data can be entered into Access by more than one user at a time.
- Access is a good at crunching and manipulating large volumes of data.
- Due to Access's lack of flexibility, it is more difficult for users to make errors.
- Access has user forms, which provide guidance to users and are an easy way for users to enter data.

In summary, Access is probably most commonly used for legacy software; databases that have been around for a long time. If it's a brand-spanking-new solution that you need, consider Power Pivot instead.

MS Project MS Project is specifically for creating project plans and associated component tasks, assigning resources to those tasks, tracking progress, managing budgets, and monitoring workloads. The user can also create critical path schedules and Gantt charts.

Because the program handles costs, budgets, and baselines quite well, Project could be considered a viable alternative to a financial model, if the purpose of the model were simply to create an actual-versus-budget tracking report. In fact, as with most purpose-built software, if your aim is to track and monitor a project, Project is a superior option to Excel. Of course, creating a project plan and even a Gantt chart is certainly possible in Excel, although it will take longer and be far more prone to error than Project. There are many reasons, however, why users will opt to use Excel rather than Project for a project plan:

- Project is not included in any of the Office suites and therefore needs to be purchased separately.
- The plan may need to be accessed, updated, and monitored by different users, who may not be able to use Project due to lack of skills.
- For a reasonably small project, it's probably not worth the trouble; it's simpler to just handle it in Excel.

In summary, the choice between Excel and Project really depends on the size, scope, and complexity of the project plan model you are building. Bear in mind of course that there are many other pieces of project planning software besides Project on the market!

Excel Add-Ins Add-ins are programs that add optional commands and features to Excel. Although Power Pivot is also an add-in to Excel, it has been discussed in a previous section. There are many add-ins on the market that have been developed specifically for the purpose of financial modelling. For more complex calculations or processing of input, it may be useful to activate or install one or more add-ins, especially tools such as Solver, which are included in your MS Excel licence. Bear in mind that other users will probably not have add-ins enabled, so they will not be able to see how your model has been created or calculated.

Excel add-ins can be categorised according to source:

- Add-ins such as Solver and the Analysis ToolPak that only need to be activated once Excel has been installed.
- Add-ins that must be downloaded from Office.com and installed before they can be used (such as Power Pivot).
- Custom add-ins created by third parties that must be installed before they can be used: Component Object Model (COM) add-ins, Visual Basic for Applications (VBA) add-ins, Automation add-ins, or DLL add-ins.

Excel add-ins from all sources can be used to perform a variety of tasks that assist in the financial modelling process. These add-ins can be broadly defined as:

- Standard Excel add-ins such as the Analysis ToolPak and Solver.
- Audit tools.
- Integration links between Excel and the general ledger system.

The most commonly used add-ins are the Analysis ToolPak and Solver, which are standard add-in programs that are available when you install Microsoft Office or Excel. They are included in the program but are disabled by default, so if you want to use them, you need to enable them.

Prior to the release of Excel 2007, the only way to access certain functions (e.g., =EOMONTH and =SUMIFS) in Excel 2003 was to download the Analysis ToolPak. However, these functions are now standard in Excel 2007 and later, so the Analysis ToolPak is now less commonly used. Other features in the Analysis ToolPak are tools like the Data Analysis ToolPak, which has some powerful statistical and engineering functions not commonly used in financial modelling. Solver, however, is an extremely useful but quite advanced tool for calculating optimal values in financial modelling.

Audit add-ins for Excel are used to ensure the accuracy of data and calculations within a spreadsheet or workbook. They can very quickly identify formula errors by looking at inconsistent formulas, comparing versions, and getting to the bottom of complex named ranges. There are several custom add-ins available both from Microsoft and other parties that will facilitate accuracy by performing formula investigations, precedent/dependent analysis, worksheet analysis, and sensitivity reporting.

Whilst they can assist with checking for formula errors, there are many other types of errors that can be easily overlooked, and using these add-ins can provide a false sense of security. See the section "Error Avoidance Strategies" in Chapter 4 for greater detail.

Integration add-ins allow information from the financial reporting system to be transferred into Excel for further analysis, or data stored in Excel to be transferred into the financial reporting system. These are often used for the purpose of:

- Transferring information from the general ledger system into Excel for the purposes of reporting and analysis. Many management reports are built in Excel, and extract up-to-date data directly from the general ledger system into the reports.
- Loading information in the form of journal entries back into the general ledger system. Data is often manipulated in Excel, and then loaded into the general ledger as a journal. For example, if an invoice needs to be split among different departments based on headcount allocation, this calculation might be done in Excel, split to departments in the journal, and loaded into the general ledger system.

The Final Decision

The more sophisticated a financial model is, the more expensive it is to maintain. It is therefore best to use a model with the lowest possible level of sophistication needed to provide a specific solution. For this reason, purchasing a software package, provided it can deliver the desired solution, might be advisable.

Once the decision has been made to purchase a software package, it must be determined which package will provide the best solution as certain solutions may be better provided by particular software packages.

There are many forms of software and Excel add-ins on the market that can be used to create financial models. However, provided that it can deliver an adequate solution, we recommend using plain Excel, as it is easy to use and no extra licenses, training, or software downloads are required. If additional functionality is needed, Excel add-ins may be considered.

32-Bit versus 64-Bit Excel

Since the introduction of Excel 2010 several versions ago, Excel is now available in 64-bit; this has become a topic of discussion and interest for many Excel users. With all the buzz around the 64-bit version, many of us are wondering: Is 64-bit Excel better than 32-bit Excel? Should I make the switch? Is 64-bit MS Excel the solution to poor Excel performance?

First, let's explore exactly what 32-bit and 64-bit really means. A 32-bit system can process the data in 32-bit pieces, whereas 64-bit can process double that. Because more data is being processed at once, the system will operate more quickly and will use the physical memory more efficiently. Installing the 64-bit version of Excel will certainly make your Excel models run faster and more efficiently, but consider whether it's really necessary before you take the plunge.

You need to consider three components: the software, the operating system, and the hardware. Just because you have 64-bit-capable hardware does not mean you have a 64-bit operating system, or software, but if you want to run the 64-bit, your machine and operating system need to be 64-bit. See below to check which hardware, operating system, or software you are running.

Increasing to the 64-bit version of Excel will increase the speed, capacity, and efficiency of working in Excel significantly. For those working in Office, what this means is that you are no longer limited to 2GB file sizes. This is quite revolutionary for Excel users as, at the moment, Excel file sizes are nowhere near 2GB, simply because anything over around 50MB does not work very efficiently on 32-bit. Most Excel files rarely exceed 20MB, unless you are working in Power Pivot. So if you're a heavy-duty file-size Excel user, you'll notice a big difference, but otherwise consider whether you are really going to gain much advantage with the upgrade. If you're having trouble with your memory, see the section on "Improving Model Performance" in Chapter 10.

The file size supported by 64-bit Excel is limited only by the system capacity (hard drive) and memory (RAM) available for storage and computation,

respectively. Also, the 64-bit solutions also offer much better security features than the 32-bit versions.

What Are You Using at the Moment? To figure out what is on your machine, there are three different things that you need to consider here: first, is your machine 64-bit capable, is the operating system 64-bit, and is the version of Office you've installed 32-bit or 64-bit? Whilst you can't install 64-bit Office on a 32-bit machine, it is entirely possible (and very common) to have 32-bit Office installed on a 64-bit-capable machine. In fact, this is the default option when you install Office 2010, even if you are running the 64-bit edition of Windows. It is also important to note that 64-bit computers can still use 32-bit-based software programs, even when the Windows operating system is a 64-bit version.

1. To check whether your computer is 32-bit or 64-bit capable, go to the Start button, and right-hand click on Computer or My Computer, select Properties, and look for system type. If you're using Windows 8 and you don't have a Start button, go to the Control Panel and search for System. On the system tab you'll be able to see either "x32-based processor" or "x64-based processor."
2. If you're running Windows XP, you're probably on a 32-bit operating system, but on other versions, it's anyone's guess. Go to the Control Panel, and choose "System." In the section where it explains basic information about your computer, it should say "System Type" and you'll be able to see whether it is 32-bit or 64-bit. By the way, it's important to know which version you're running when you install device drivers for your hardware.
3. Last, to check if your version of Excel is 32-bit or 64-bit, if you're using the latest, Excel 2013, click on the File button, go to Account, and then About Excel. A dialog box will appear with either 32-bit or 64-bit at the top of the screen.

   If you're using Excel 2010, click on the File button, and then Help. About Excel will appear on the right-hand side and underneath it will state the version and whether it is 32-bit or 64-bit.

What to Beware of before Installing the 64-Bit Version You have established that you have a 64-bit-capable computer. This doesn't mean you necessarily should instantly install the 64-bit operating system and Office software! Bigger is better, right? Hold on a minute. While 64-bit does improve the capacity of the file size, there are some limitations with the 64-bit, mainly due to its nascence. Despite the fact that it has been around for at least two versions (Office 2010 and 2013), it's still a relatively new introduction, and

as such many add-ins and other pieces of software don't work well with the 64-bit version of Office.

The 64-bit Excel is a little more stable, but if you are sticking to fairly standard Excel functionality, the switch from 32-bit to 64-bit will probably not impact you; in fact, you probably won't even notice the increased capacity. For Power Pivot users, though, the additional amount of RAM that 64-bit can access might well come in handy, especially if you are regularly working with data models that contain over a million rows.

However, if you need to use advanced features with add-ons like ActiveX, VBA codes from an older Excel version or other third-party add-ons, you could encounter all sorts of problems. This is because many Excel add-ons are 32-bit versions that are not fully compatible with the 64-bit Excel. Of course, if you upgrade to 64-bit Excel, then you'll need to upgrade for the rest of Office, and you may encounter similar problems with add-ins for these products as well. Users have particularly complained about add-ins for Outlook, such as not syncing with mobile phones or other devices.

Microsoft has a newer version of VBA called VBA 7, which comes in 32-bit and 64-bit formats that are compatible with both Excel versions. For ActiveX controls and other third-party add-ons, you need to either edit the source code (if you can access it) for 64-bit compatibility or look for an alternative or upgrade.

Last, if you are planning to build a solution or a tool using 64-bit Excel, you need to ensure that your solution will work on both 32-bit and 64-bit Excel. Given that 64-bit Excel is still not as prevalent as 32-bit, building a 64-bit compatible solution could be detrimental to its popular adoption or usage.

In summary, if you are looking at moving to 64-bit Excel, you need to evaluate how you use Excel. Unless you are a data-hungry Power Pivot user with the need to generate Excel files bigger than 2GB, there is no real value in making the switch. The 32-bit Excel versions can and will continue to meet your needs until the 64-bit solution becomes the norm.

WHAT SKILLS DO YOU NEED TO BE A GOOD FINANCIAL MODELLER?

When you decide your financial models are not as good as they should be, should you immediately take an advanced Excel course? Whilst this is helpful, there's a great deal more to financial modelling than being good at Excel!

When considering the skills that make up a good financial modeller, we need to differentiate between conceptual modelling, which is to have

an understanding of the transaction, business, or product being modelled, and spreadsheet engineering, which is the representation of that conceptual model in a spreadsheet. Spreadsheet skills are reasonably easy to find, but a modeller who can understand the concept of the purpose of the model and translate it into a clear, concise, and well-structured model is much rarer.

People who need to build a financial model sometimes think they need to become either an Excel super-user or an accounting pro who knows every in and out of accounting rules. I'd argue you need a blend of both, as well as a number of other skills, including some business common sense!

Spreadsheet and Technical Excel Skills

It's very easy for financial modellers to get bogged down in the technical Excel aspects of their model, get carried away with complex formulas, and not focus on key high-level, best-practice procedures, such as error-checking strategies and model stress-testing.

Excel is an incredibly powerful tool, and almost no single Excel user will have the need or desire to utilise most of the functionality this program offers. As with most software, the 80/20 rule applies: 80 percent of users use only 20 percent of the features—although some would argue that 95 percent of Excel users use only 5 percent of the features! Still, there are those select few who understand every in and out of Excel, every single function, and work out how to do practically anything in Excel. Do you need to have this level of Excel skill to become a good financial modeller? Unfortunately, having great software skills doesn't always help when it comes to applying them to a specific area of business. Realise that Excel is used in several capacities, so being an Excel super-user doesn't automatically mean you'll be a super financial modeller. The best financial models are clear, well structured, flexible, and dynamic; they are not always the biggest and most complicated models that use the most advanced tools and functions! Many of the best financial models use only Excel's core functionality.

Having said that, to be a good financial modeller, you do need to know Excel exceptionally well. Those people who maintain that you don't need good Excel skills to be a financial modeller are usually those with weak Excel skills. You should be building a superb model using simple and straightforward tools because you've chosen to make your model clear and easy to follow, not because that's all you know how to do! You don't have to be a super-user—the 99th percentile in Excel knowledge—but you must certainly be above average. A complex financial model might use features in Excel that the everyday user doesn't know. The best financial model will always use the solution that is the simplest tool to complete the task (as simple as possible and as complex as necessary, right?), so the more familiar you are

with the tools available in Excel, the easier it will be. An array formula or a macro might be the only way to achieve what you need to achieve, but a simpler solution may well be—and often is—superior. You might also need to take apart someone else's model, which uses complex tools, and it's very difficult to manipulate an array formula or a macro if you've never seen one before! So, if you are considering a career as a financial modeller (as I assume you are), improving your Excel knowledge is an excellent place to start.

EXAMPLES OF TECHNICAL EXCEL SKILLS QUESTIONS

- How do I use the appropriate formula? For example, should I use a VLOOKUP or a SUMIF?
- How do I hide a sheet and then protect it so that the user can't access it?
- How do I construct a complex but concise formula?

Industry Knowledge

One of the fantastic things about financial modelling is that it is applicable across so many different industries. Good financial modelling skills will always stand you in good stead, no matter which industry or country you are working in! Financial modelling consultants or generalists will probably work in many different industries during their careers and be able to build models for different products and services. They will probably not be experts in the intricacies of each industry, however, and that's why it's important for a financial modelling generalist to consult carefully with the subject matter expert for the inputs, assumptions, and logic of the financial model. Don't be afraid to ask lots and lots of questions if the details are not absolutely clear. It's quite likely that the person who has commissioned the model hasn't actually thought through the steps, inputs, assumptions, and even what the outputs should look like, until you ask the right question.

Financial modelling consultants are very careful to transfer responsibility for the assumptions to the end user, which is a very sensible course of action. The person building the model is often not the one who has commissioned it or the person who is actually using it. Model builders are often not overly familiar with the product or even the organisation, and they cannot (and should not) take responsibility for the inputs. (See the section "Document Your Assumptions" in Chapter 3 for greater detail on the importance of documentation of assumptions.)

For example, when building a pricing model, the modeller needs to understand the product and how the costs and revenue work. Experience with regulatory constraints will help the modeller to understand the basis of regulation and its components (e.g., cost building blocks, cost index, revenue cap, weighted average price cap, maximum prices, etc.). Understanding of economic concepts, such as efficient cost calculation, return on and of a regulatory asset base, operating costs and working capital, long-run versus short-run marginal costs, and average costs, are other examples of industry knowledge that is useful for the financial modeller.

EXAMPLES OF INDUSTRY KNOWLEDGE

- Regulatory constraints.
- Industry standards.
- Maximum price that can be charged for a certain item.

Accounting Knowledge

Elements such as financial statements, cash flow, and tax calculations can be an important aspect of many financial models. Professional accountants know every single accounting rule and law there is, but this does not necessarily make them good financial modellers. If a highly skilled accountant built a financial model, you would guess that the layout and structure of the financial statements will be 100 percent correct, but will they be linked properly? If you change some of the inputs, does the balance sheet still balance? Sometimes not. A good accountant, or even someone qualified who has a master's degree in applied finance, for example, might not be familiar with all of the modelling technical tools, even if he or she is a competent Excel user. As with the other modelling skills, you don't need a top level of accounting knowledge to build a financial model. In fact, financial models are often relatively straightforward from an accounting standpoint. You certainly do not need to be a qualified accountant to become a financial modeller, although a good understanding of accounting and knowledge of finance certainly helps.

There are some situations where industry knowledge and accounting are required for financial modelling. For example, in manufacturing or, particularly, in the oil and gas industry, the modeller needs to know whether FIFO (first in, first out) or LIFO (last in, first out) accounting is being used, as this has a big impact on the way that inventory is being modelled. A financial modeller who has never worked in these industries may not have ever heard of FIFO and LIFO, and would probably have no idea how to model them.

EXAMPLES OF ACCOUNTING KNOWLEDGE

- How is a profit-and-loss statement structured?
- How do I construct a cash-flow forecast from my model?
- How do I turn capital expenditure into a depreciation expense?

Business Knowledge

A modeller with wide-ranging business experience is well equipped to probe for the facts and assumptions that are critical for building a financial model. This is probably the most difficult skill to teach, as it's most easily picked up by working in a management role.

Business acumen is particularly important when commissioning, designing, and interpreting a financial model. When creating the model, the modeller needs to consider the purpose of the model. What does the model need to tell us? Knowing the desired outcome will assist with the model's build, design, and inputs. If, for example, we are building a pricing model, we need to consider the desired outcome—normally, the price we need to charge in order to achieve a certain profit margin. What is an acceptable margin? What costs should we include? What cost will the market bear? Modellers should also have an understanding of economic concepts, such as efficient costs and how these are calculated, an expected return on an asset base, operating costs and working capital, or long-run versus short-run marginal costs.

Of course the answers to these questions can be obtained from other people, but a modeller with good business sense will have an innate sense of how a model should be built, and what is the most logical design and layout to achieve the necessary results.

EXAMPLES OF BUSINESS KNOWLEDGE

- What is cost of capital and how does that affect a business case?
- Which numbers are important?
- What does the internal rate of return mean, and what is an acceptable rate?

Aesthetic Design Skills

This is an area that many modellers and analysts struggle with, as aesthetics simply do not come naturally to left-brain thinkers like us. We are mostly

so concerned with accuracy and functionality that we fail to realise that the model looks—and I'm not going to mince words here—ugly! Although it's just a simple matter of taking our time when formatting, most of us could not be bothered with such trivial details as making models pretty, and consequently most models I see use the standard gridlines, font, and black-and-white colouring that are Excel defaults. I'm certainly not suggesting that you embellish your models with garish colours, but you should take some pride in your model. See the section "Bulletproofing Your Model" in Chapter 7 for some ideas on how to remove gridlines and change some of the standard settings so that your model looks less like a clunky spreadsheet and more like a reliable, well-crafted model you've taken your time over. Research shows that users place greater faith on models with aesthetic formatting than those without, so one of the fastest and easiest ways to give your model credibility is to simply spend a few minutes on the colours, font, layout, and design.

Some aesthetic formatting is critical for the functionality and to avoid error (see section "Error Avoidance Strategies" in Chapter 4), but mostly it adds credibility and makes your model easier to work with.

Models can become complex very quickly and without a well-planned design they can be unintelligible. Some basic components of a model should be a cover sheet, instructions, and clearly labelled inputs, outputs, workings, and results. For extremely long and complex models with many sheets, a hyperlinked table of contents is also a valuable addition to help the user navigate the model.

Communication and Language Skills

This is also an area that we left-brain thinkers are not always good at. Some analysts like to lock themselves away, working on spreadsheets without communicating with other people. If this is your tendency, then you might need to consider whether financial modelling is a good career choice for you, because there is a surprising amount of human interaction required for most financial modellers.

- **Assumptions validation:** In order to gain buy-in from stakeholders, the key assumptions and inputs often need to be communicated verbally or in writing. People in various parts of the business should be involved in order to check the accuracy and appropriateness of inputs for inclusion in a model. Stakeholders will often query the assumptions or the way they have been used and provide extremely valuable insight for modellers (particularly for a consultant or modeller with little industry or product knowledge). Performing this task well is a critical step in the modelling process.
- **Data gathering:** There are some modelling projects where more time is spent gathering and collating data than actually building the model.

Holders of information can be guarded about giving access to data, sometimes irrationally, but often it's because they've had bad experiences in the past. This can occur when someone provides estimates off the record, and later discovers that those numbers have been used in budgets or other documents to which they are held accountable. So, people can be understandably reticent about providing data when requested for an ad hoc project such as a financial model. A modeller with good communication skills will be able to dig, delve, and coax the information out of them!

- **Presentation skills:** Senior management, when approving a project, often wants to hear about the financial implications of the project from the person who actually built the model, and so modellers are sometimes required to present the key outcomes to a board or executive committee. Being able to distill a 30-megabyte, extremely complex financial model that contains 20 tabs and took you six weeks to build, into three PowerPoint slides and a six-minute summary presentation can be quite a challenge!
- **Client skills:** Whether you are a consultant or an in-house employee, working well with clients is a useful skill. Even in-house modellers have clients; every person you work with or for should be considered a client and treated with the same respect and consideration as though they were paying your bill.

In all of these interactions with other people, financial modellers must show confidence in their model. Build the model to the best of your ability. Use best practices, check for errors, and follow a good and logical thought process, so that when you present or discuss your model, you can do so in a way that exudes absolute confidence. Doing so reduces questions about the accuracy, usefulness, and validity of your model. Be honest about the fallibility of your model and its known shortcomings (let's face it, no model is perfect), but be confident that you have built it to best-practice standards within the limitations of time, data, or scope. This will serve to increase your model's credibility, building your reputation within your company and, of course, enhancing your career!

Numeracy Skills

Financial models, of course, have a significant mathematical component, and people with good numeracy skills are best suited to it. Solid math skills can be particularly useful in error-checking and sense-checking. The ability to make rough estimates quickly means they will be able to spot errors more easily. If we sell 450 units at $800 each, will our sales revenue be $3.6 million, or $360,000? If we've made a calculation error, the numerate modeller will pick up the mistake much more quickly.

The numerate modeller will also have a gut feel for differentiating between critical assumptions that need further verification, and input that is insignificant or immaterial to the model. The less-numerate modeller will have to test it manually, and will probably end up with the same result, but it will simply take longer.

General numeracy is a skill that is difficult to teach, and one that can be easily tested for in the recruitment process. Experience working with models over time can drastically improve these skills as the modeller who is less numerate will learn ways to compensate through error-testing, and these techniques will become acquired, innate habits.

Ability to Think Logically

Modelling is often like programming, and complex logic needs to be interpreted into the language of Excel so that the program can understand and create the modeller's expected results. For example, if we want to show a value, but only if the cell being tested is in the future, we would vocalise it by saying: "Show me the value, but only if the test cell is greater than or equal to today's date." The way that we need to translate this into Excel's language is to use the formula:

=IF(test_cell>=today,value,0)

Logic is also critical for model layout, design, and the use of assumptions in calculations. The issue of timing in annual models is one that I use often when demonstrating logic in my training workshops. If we are estimating the revenue for a new insurance product, and the assumption is that we acquire 30,000 customers every year, we can't assume revenue for the full 30,000 customers, as not all of them will begin on the very first day of Year 1. Customers will be acquired gradually throughout the year, so we need to take an average in order to calculate revenue. This is an example of how it is very easy to get logic wrong and overestimate revenue by a substantial amount.

Logic is one of those analytical skills that is very difficult to teach, but modellers who have made a logic error (like the one illustrated above) learn quickly from their mistakes and are quite careful to use clear, well-documented logic for others to follow and check.

THE IDEAL FINANCIAL MODELLER

In general, most modellers have at least some of the aforementioned skills, and at times it is necessary to consult specialists in order to create a successful financial model. Having read the section on the skills that you need to be

a good financial modeller, you should have a fairly good idea about which areas you are lacking in. Once you have identified these areas, you can work to improve them and liaise with other specialists to ensure that your model is not lacking as a result of your weaknesses.

What financial modellers bring to the table is a combination of skills. First, they know Excel well enough to be able to choose the simplest and most functional tool to build a model. They can create a PivotTable, array formula, or macro (but only when necessary, of course); use a simple or complex nested formula; and choose the best technical tool to perform a scenario analysis. They also understand all the relevant business and accounting principles. At the end of the day, the balance sheet has to balance, and the ending cash on your cash flow statement needs to tie to the balance sheet, for example.

The ideal financial modeller brings a unique combination of skills that neither an Excel guru nor an accounting whiz possesses. He or she understands sensitivity and relationships between variables, how fluctuations in inputs will impact the outcomes, and how this needs to be modelled in Excel. A financial modeller can also take a step back and realise what the ultimate goal of the model should be. Are we building a model for in-house use, or to present to investors? Do we need a valuation, a variance analysis, a nice summary, or a detailed, month-by-month profit-and-loss report? The financial modeller can take information, build an Excel model that is technically correct from an accounting standpoint, set up the model, and ultimately reflect what the business is looking to achieve.

What's the Typical Background for a Financial Modeller?

A key problem in the financial modelling industry is that modelling is often incorrectly considered a junior task and is often given to inexperienced graduate analysts who undoubtedly have good Excel skills but simply do not have the depth of business experience to create good financial models. If a modeller is able to check off all of the above boxes (i.e., good financial skills, good communicator, able to resolve ambiguity), he or she is likely to quickly move into a more senior position to execute more management responsibilities and spend less time building financial models.

Most financial modellers come from a finance background and have gradually been exposed to industry knowledge. They often become specialists in a field, picking up business acumen, communication skills, and logic along the way. Quite often engineers, project managers, construction specialists, or even scientists who are required to build their own financial models end up pursuing a career in financial modelling. They have the industry and product knowledge and are able to learn the Excel skills but may

struggle with the finance side of things. Some would argue that it is easier to teach an engineer or scientist financial skills than it is to teach a financial accountant about the industry, but I think both have a tough job. Every modeller will have strengths and weaknesses, but a good financial modeller will span different skill sets and will have a little bit of everything.

Training Courses

As a specialist financial modelling consultant and trainer, I spend a lot of my time running training courses and, consequently, many people expect me to be a firm advocate of the face-to-face training workshop, right? Not necessarily. I've come under fire from my training partners in the past for publicising this opinion, but I'm not entirely convinced that going on a training course is always the best option for someone keen to improve his or her financial modelling skills.

Excel is the backbone to any custom-built financial model, and as discussed in the previous section, one of the core attributes of a financial modeller is to have good technical Excel skills. When struggling with financial models, some managers' first reaction is to send their staff on an advanced Excel course to improve their modelling skills. However, with training budgets under constant scrutiny, you really need to make sure that you get the best value out of your training options. Is a training course really what you need?

When considering an advanced Excel course, there are a few points you should consider.

- As financial modellers, our use of Excel is quite narrow. I know it's hard for us to conceive, but there is a whole world of Excel outside the finance industry! Statisticians, database programmers, and engineers, to name a few, are able to use Excel's advanced functions to create nonfinancial spreadsheets. Most advanced Excel courses are very broad and will cover functions and capabilities that do not apply to your needs as a financial modeller. You may learn a few tricks, but the time and money spent could be invested elsewhere.
- Research shows that a large percentage of the skills learned in training courses are not retained. Will you really remember everything that you learn? A program of continuous, applied learning is often more effective than an intensive training course.
- Are your Excel skills really the problem? Following best practices and mastering the logic behind a financial model are more important than building in complex formulas and, for the most part, you will want to keep formulas as simple as possible.

Alternatives to Attending a Training Course Other options to improve your financial modelling skills without going on an advanced Excel course include:

- Read a book. Buying this book is a great start. You'll still have it to refer to when the excitement and enthusiasm you felt after completing a training course are long gone, and you're back to struggling with building your financial models.
- Take an interest in what work your colleagues have done and how they did it—you can always learn from the techniques of others.
- Read, use, and dissect other people's models. Sometimes the best way to learn is to see what someone else has done. Try taking someone else's model apart and see how he or she built it. It's probably best to use your company's models, but if you don't have access to those, take a look at some of the sample models provided on this book's companion website, which can be found at www.wiley.com/go/steinfairhurstrevised.
- Read specialist financial modelling publications or subscribe to e-mail newsletters about using Excel. They often contain useful articles about specific techniques and tips that can enhance your skills. Getting a short e-mail tip every day is much more effective than reading many all at once. You'll retain the information better in bite-size pieces.
- Search online. If you're struggling with a formula or layout problem and are convinced that there must be an easier way to do something, there usually is! Chances are that others have had the same problem in the past and, if you're lucky, they've documented it as a blog post. There are some fantastic, publicly available online resources including tutorials, articles, blogs, forums, and videos specialising in Excel and financial modelling that can be used at your convenience rather than taking an entire day or two to attend a course. You will find links to some of my favorite websites and online resources listed on the companion website at www.wiley.com/go/steinfairhurstrevised.

Select the Right Training Option for You The strategies outlined here are great for continually improving your Excel and financial modelling skill set, and they certainly won't break the budget, but what if you really need to give your skills a quick boost to get you ready for an upcoming project? There are a number of options available:

- Try to find a course specifically aimed at Excel for financial modellers, and—even better—find one dedicated to your industry. Although good financial modelling skills are relevant across many different industries, there is nothing like specialised training dedicated to the modelling

issues inherent in your own industry. In recent years, many more specialist financial modelling courses have become available, especially in major cities.
- If your company is able to arrange a group in-house training course, this will be even better, as you may be able to learn with the templates and models actually used within your organisation. You also have the added advantage of choosing a time and location that suit you.
- If you can afford a private session, this is the most convenient and time-efficient method, as you can ask questions and cover only topics that are useful to you. Many specialist training companies provide one-on-one mentoring sessions with Excel.

Do You Really Need an Advanced Excel Course?

It's true that "you don't know what you don't know," and so some people go on training courses because they want to make sure there isn't something about the subject that they are missing. Having heard or seen something in a training course gives you exposure to something that you might never have heard about, but if it's simply inspiration you're after, a good newsletter might well suffice (and be a lot cheaper).

You might learn a few tricks in a course, but most people have got to think really hard before spending the money and taking a day or two out of their schedules to commit to training workshops. There is no question that face-to-face workshops are very effective; for many people, they are the best way to learn. However, I would recommend that potential attendees exhaust the available blogs, forums, and newsletters first. Please visit this book's companion website at www.wiley.com/go/steinfairhurstrevised for a list of my favourite blogs and other online resources.

In summary, an advanced Excel course would certainly benefit those who plan on extensively using Excel in their role for multiple purposes. However, if your main objective is to become an expert financial modeller, focus instead on mastering the few tools you need—such as logic and methodology—either in a course or via another medium, rather than expending time and money to learn things you may not use.

SUMMARY

In this chapter, we have discussed the definition of a financial model, and determined that, at a basic level, a financial model is really just a complex spreadsheet that contains inputs and outputs in a dynamic way. However, not

every spreadsheet could be called a financial model. Models in Excel can be built for virtually any purpose, both financial and nonfinancial, business or nonbusiness, although the majority of models will be financial- and business-related—and these are the kinds of examples we will mainly focus on.

Although this book is about how to use Excel in the context of business analysis and financial modelling, consider that there are many other available modelling tools besides Excel, including Microsoft products, add-ins, and third-party software. Excel is the most commonly used software for this type of analysis, and in terms of building your skill set, improving your Excel skills will always stand you in good stead for a career in finance.

Having good technical Excel skills is not the only attribute of a good financial modeller: industry knowledge, accounting, business acumen, design skills, communication, logic, and numeracy are also important. Modellers will have all of these skills in varying degrees, so think about which skills you need to work on the most. Going to a training course, using and taking apart others' models, reading specialist publications and blogs, and using other online resources are all great ways to improve your financial modelling skills.