

Using

Financial Models

as a

Value-Added
Management Tool

By Kreag Danvers, CMA, CFM, CPA, and Thomas Oliver

Effective planning, controlling, and decision making are necessary to identify and avert problems that can limit success and contribute to business failure. Within favorable economic climates, businesses can survive despite ineffective management. But higher levels of economic uncertainty exacerbate business risk, which increases the importance of executing critical managerial functions effectively and highlights the potential value that management accountants can add to organizations through financial modeling.

Building financial models for short-range planning, cost-volume-profit analysis, and decision making are highly valued skills for entry-level management accountants as well as senior-level financial management and consultancy positions. These are the types of positions held by many IMA® (Institute of Management Accountants) members and CMAs (Certified Management

Accountants). Management accountants increasingly add value within organizations by partnering with managers in strategic decision making.

Financial modeling is an important tool that lets management accountants add value and help move an organization toward achieving its goals. By relating critical inputs to performance outcomes, models support planning and controlling efforts as well as strategic decision making.

The Importance of Financial Modeling

IMA implicitly acknowledged the role financial modeling plays within management accounting when it revised the CMA® exam in May 2010 and reconfigured it from a four-part exam to a two-part exam. A number of subjects that can be affected by or improved through financial modeling are emphasized in the revised exam. Planning,

budgeting, and forecasting make up 30% of Part 1, while decision analysis and risk management constitute 25% of Part 2. It's also noteworthy that performance management constitutes 25% of Part 1. The *CMA Exam Handbook*, which provides information on the requirements for CMA certification, further emphasizes the importance of financial modeling skills: "The CMA exam aligns with the knowledge, skills, and abilities that an accountant or finance professional in business uses on the job today—financial planning, analysis, control, and decision support. These skills are critical to the success of finance teams."

IMA's *Conceptual Framework for Managerial Costing* further underlines the need to improve managerial decisions through more effective managerial costing solutions. While the Framework reflects current operating conditions for organizations, it also provides a foundation for prospectively analyzing alternative courses of action and associated risk. Indeed, the Framework states: "Internal management's forward-looking entrepreneurial activities are the most influential actions in creating and sustaining value. They can be reflected in monetary terms by adapting the managerial costing model with scenarios and assumptions." By stressing forward-looking activities, the Framework emphasizes the critical role of financial models in value creation within organizations.

In *Accounting Education: Charting the Course through a Perilous Future*, W. Steve Albrecht and Robert J. Sack stress that practicing accountants believe financial analysis and planning will be ranked first and second as the services that will be most in demand of accounting graduates. And the American Institute of Certified Public Accountants (AICPA) *Core Competency Framework*, which defines skill-based competencies students need for entering the accounting profession, highlights decision modeling as a functional competency closely aligned with providing value to business organizations. Specific elements of this competency include the ability to build models, test solutions, link data for decision making, and analyze scenarios. Such skills are integral to financial modeling.

Financial modeling clearly facilitates risk assessment pursuant to the *Enterprise Risk Management—Integrated Framework* from the Committee of Sponsoring Organizations of the Treadway Commission (COSO), a joint initiative of five private-sector organizations that includes IMA. COSO defines enterprise risk management (ERM) as "a process, effected by an entity's board of directors, management, and other personnel, applied in strategy setting and across the enterprise, designed to identify potential events that may affect the entity, and manage

risk to be within its risk appetite, to provide reasonable assurance regarding the achievement of entity objectives." COSO's ERM Framework encompasses risk assessment and monitoring. Financial models facilitate sensitivity and what-if analysis such that managers can obtain insight into possible outcomes without actually assuming risk. Modifying a model's assumptions can provide information regarding the elasticity of various input parameters (e.g., change in sales mix) with respect to performance outcomes (e.g., change in operating income). Thus, financial models support risk assessment in relation to the ERM Framework. Evaluating actual performance relative to financial model assumptions also helps organizations fulfill the monitoring function of ERM.

Financial Model Considerations

Recognizing the relationships among relevant costs, benefits, value, and risk is essential to understanding the implications of business decisions. Financial models are based on a set of assumptions and formulas that seek to simulate the real relationships among an organization's operating and financial activities. The assumptions, or parameters, often culminate in projected, forecasted, or prospective financial information. Financial models are used across manufacturing, service, not-for-profit, and governmental organizations. The basic type of financial model addresses cost-volume-profit analysis, which assesses the effects of changes in volume, revenue, costs, and profits.

Financial models must be developed within a cost-benefit framework. Constructing a financial model from scratch requires more time, expense, and expertise than purchasing an off-the-shelf template, but the increased usefulness, flexibility, and appearance of a customized financial model often make it a better choice. Moreover, templates are often too generic and of limited usefulness for highly specialized operating environments. A few days of model construction may be sufficient to evaluate decision alternatives with limited financial consequences. With more complex strategic moves, such as entering new markets, many months of ongoing financial modeling work may be needed to support decision alternatives.

Models are often constructed using Excel. In July 2011, *Strategic Finance* published the first article by Jason Porter and Teresa Stephenson in their three-part series that used an Excel-based budget to assess a company's performance. The emphasis of this series was on using the budget to facilitate planning, controlling, and decision making. An Excel-based budget such as that presented in the series essentially represents a financial model

Table 1: Financial Model Characteristics

BASIC ELEMENTS

Input Data, Parameters, or Assumptions. Assumptions are critical and must be examined carefully for validity. The *AICPA Guide for Prospective Financial Information* states: "Assumptions are the essence of developing financial forecasts and are the single most important determinant of such statements."

Relate Parameters. Assumptions must be tied together with reference links and formulas. Hardcoding (entering values or embedding assumptions within formulas) must be avoided so that parameters can be readily modified to support decision making and risk analysis.

OBJECTIVES AND DESIGN CHARACTERISTICS

Decision Usefulness. Financial models need to facilitate decision making with favorable cost-benefit characteristics.

Articulation. The financial model must flow across all schedules and statements so that a change in assumption updates all other information.

Accurate and Reliable Simulation. Models should reasonably reflect reality.

Flexible and Responsive Analysis. This necessitates the appropriate use of assumptions and formulas.

Separate Worksheets. Organize and structure the financial model for ease of use. Individual worksheets can be used for assumptions, supporting schedules, and prospective financial information for the organization. Use a separate worksheet within the Excel workbook to segregate parameters for ease of change and for different types of outcome results.

RISK ASSESSMENT CAPABILITY

Sensitivity Analysis. Tests the effects that changes in specific model parameters, such as sales price and volume, have on outcomes, such as income and cash flow.

What-if Analysis. Assesses risk by varying input assumptions.

Elasticity. Relates to the ratio of percentage change in outcome to the percentage change in parameter in order to identify actions that have the greatest impact on a performance measure. If the impact is greater than one (100%), then the parameter has a disproportionate effect on the performance measure.

Scenario Analysis. Considers best case, worst case, and most likely case (i.e., the "base" or "baseline" case).

Goal Seek. An Excel feature that can be used for benchmarking key performance indicators within the model.

that can be used for a wide range of planning, operational control, decision-support, and risk assessment purposes. Table 1 presents some basic elements, objectives, design characteristics, and related risk assessment considerations for financial models.

For financial models to function effectively, all cells must *articulate*, or be linked together across worksheets via formulas or cell references. Formulas within the model must reasonably reflect the relations of underlying assumptions so that expected outcomes are computed accurately and are updated to provide useful and reliable information.

It's important to provide an accompanying list of significant assumptions, similar to notes to historical financial statements, so that managers better understand the

foundation on which the prospective information is constructed. The financial model should also indicate sources for all significant assumptions.

It's critical for assumptions to be internally consistent across the model because the financial model represents a coherent aggregation of inputs that simulate the economic model of an organization. Since assumptions provide the basis for prospective financial information, management accountants must challenge key assumptions for reasonableness or the financial plan will provide limited benefits. For the model to generate flexible budgets and sensitivity analyses with ease, all components of the model must be integrated and automatically update upon changes to inputs.

A Planning and Operational Control Tool

Financial models facilitate basic managerial functions, including planning, controlling, decision support, and risk assessment. As a planning tool, financial models are useful in developing business strategies and establishing short-term objectives. Significant assumptions must be sufficiently detailed so that a realistic financial model can be developed for operating plans and subsequently serve as a basis for operational control. Therefore, it is especially important to model sales seasonality, receivable conversions, inventory requirements, and other key assumptions realistically.

Within a comprehensive financial model, all assumptions flow into an integrated financial plan, which can serve as an operational control tool. From a control perspective, models can be used to assess a firm's performance going forward by computing variances in input assumptions and outcome measures. A financial plan's assumptions and planned performance outcomes can be compared to actual performance so that decision makers are held accountable for decisions that are based on the model (i.e., a post-decision audit).

For instance, organizations may want to know whether or not an investment in a new segment of the business ultimately paid off. Did the project achieve the performance that was expected when the decision was made? Information regarding deviations, or variances, from planned performance helps to identify operational areas where resources may have been misused, controls were lax, or assumptions weren't sufficiently scrutinized in advance.

Although financial systems organize, summarize, and report actual accounting information, exception reporting and variance analysis may be limited within smaller organizations that don't employ standard costing systems. In such cases, management accountants can use financial models to facilitate managerial control and add further value within their organization. Thus, it's desirable to construct models with sufficient detail to provide information for control purposes.

One important outcome measure to monitor is projected vs. actual cash flow. Some common control problems that impact cash flow include uncontrolled expenditures, receivables, and inventory levels. Weak managerial control of one or two of these items can mean the difference between business failure and success.

A business that encounters cash flow problems may not clearly understand the underlying causes, particularly if sales are doing well. Managers may ask, "Where is the

cash from our higher sales volume?" Perhaps gross margins are suffering because of operational inefficiencies or higher product costs, or maybe sales growth is consuming cash in building receivables and inventories. Financial models can provide a systematic approach to investigating performance-related questions so that managers can better understand the impact of assumption variances on performance measures.

Improving operational efficiency through benchmarking relates to the control environment, and financial models can facilitate such efforts. Benchmarking is the process of comparing an organization's or subunit's performance to average, key competitor, or best-in-class levels of performance. Comparisons can be performed vis-à-vis both internal and external targets, and trends can be analyzed. For example, a firm may want to review its days in accounts receivable or inventory turnover and benchmark it to the industry average, compare it to other subunits within the organization, or compare it to prior periods. If the firm has 55 days in receivables and the industry average is 45 days, how does that translate into operating cash flow and required line-of-credit borrowings?

In addition, unfavorable trends might be identified: Perhaps there were only 50 days in receivables in the previous period. Simple or more elaborate solutions, such as credit terms or collection policies, can be modeled along with required borrowing. Through Excel's Goal Seek feature, a financial model can identify specific parameter changes to achieve benchmark levels and their impact on various outcome measures. Benchmarking, supported by financial models, thus supports operational control and continuous improvement efforts, which in turn add value to organizations.

A Decision-Support and Risk Assessment Tool

Financial models can be used as decision-support tools to guide managers in evaluating competing decision alternatives and identifying the optimal course of action. Thus, managers can better evaluate what may, in effect, be two sides of the same coin: opportunities and risks. For example, a consumer goods firm may want to determine the most effective marketing approach from among new packaging, increased advertising, or increased sales commissions. As with all decisions, there are potential downside risks as well as payoffs in sales, profitability, and cash flow.

Perhaps a hotel chain wants to evaluate the desirability of constructing an indoor pool that would provide for

increased room rates and occupancy levels. Many companies in the hospitality industry faced similar decisions after the 9/11 terrorist attacks in 2001 and again at the beginning of the economic downturn in 2008. Decisions to be made included price/rate structure and costs for things such as amenities and extras. Both situations were challenging yet quite different. In the first circumstance, reinvigorating travel demand was critical, hence adjustments were made in rates and pricing. In the latter case, costs were addressed as a way of mending the bottom line.

By changing inputs within the model, management accountants can assess the impact of assumptions on various outcome measures, such as operating income or cash flow. More complex situations can also be modeled. Perhaps the company operates globally and has receivables denominated in euros or other currencies rather than the U.S. dollar. Risk associated with changes in exchange rates can be factored into the financial model. The financial model can facilitate hedging these receivables.

A combination of changes to parameters results in a what-if analysis relative to the status quo, or baseline, scenario. By combining best-case and worst-case assumptions, managers can evaluate alternative courses through scenario analysis. Financial models facilitate risk assessment through the use of sensitivity and elasticity analyses, which identify specific parameters that cause disproportionate changes to performance measures and may adversely impact business operations. By identifying critical inputs, managers are in a better position to manage risk to achieve business objectives. Thus, financial models enable managers to obtain advance insight regarding the effects of various factors on performance measures.

Computing elasticity for various parameters provides insight regarding the relative effects of changes in input parameters on changes in performance outcomes. For example, a management accountant might be interested in knowing whether a percentage change in sales mix has a disproportionate effect on operating cash flow relative to a percentage change in sales price. Using a financial model to analyze it creates a better understanding as to which factors will most readily impact performance measures.

Such analyses relate to the operational control and improvement use of financial models. To the extent that management accountants identify parameters with the greatest elasticity, they better understand how and where to derive maximum benefit from operational improvements and benchmarking activities. If operating cash flow has

greater elasticity with respect to days in receivables than inventory turnover, the organization may want to first focus on improving the effectiveness of receivables management before considering inventory control.

As discussed earlier, financial models may be used to support a wide range of risk management decisions through sensitivity and what-if analysis, thus assisting with ERM efforts. Financial models provide insight into possible outcomes without actually assuming risk and, therefore, support a proactive risk management strategy that creates value for an organization's stakeholders. In addition, evaluating performance relative to financial model assumptions facilitates ERM's monitoring function and enables organizations to assess whether they are achieving their objectives pursuant to their risk appetite and moving in the desired direction.

A Value Proposition for Management Accountants

Financial modeling presents tremendous opportunities for management accountants, both in serving their organization and profession and in expanding career opportunities. From the perspective of business and the profession, financial models provide the means for management accountants to help managers achieve business goals and objectives, facilitate control, support decision making, and assess enterprise risk. From the individual perspective, developing the requisite financial modeling skills enables management accountants to build their own professional repertoire and intellectual capital, expand their career opportunities, and provide a wide range of value-added services to make them integral members of the finance and management team.

Financial modeling allows the management accountant to be both forward-looking and entrepreneurial. By embracing the principles of analyzing alternative courses of action and associated risk, the foundation is provided to create and sustain value for both the organization as a whole and the management accountant as a professional. **SF**

Kreag Danvers, CMA, CFM, CPA, Ph.D., is an associate professor in the Sam and Irene Black School of Business at Penn State Erie, The Behrend College, in Erie, Pa. You can contact him at (814) 898-6590 or kud14@psu.edu.

Thomas Oliver, Ph.D., is a professor in the Department of Accountancy at Clarion University in Clarion, Pa. You can contact him at (814) 393-2628 or toliver@clarion.edu.