PART

I

Introduction to Construction Financial Management

In this section we introduce you to construction financial management, how it is different from financial management in other industries, and why construction companies need to use good financial management. This section includes:

- Chapter 1: Construction Financial Management

CHAPTER

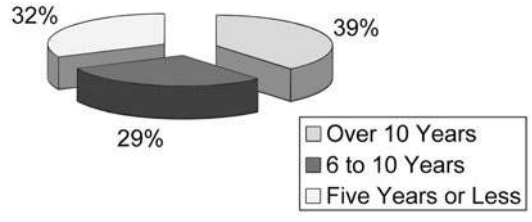
1

Construction Financial Management

In this chapter you will learn what financial management is and why the financial management of construction companies is different from financial management of most other companies.

In 1997, 10,867[1] construction companies in the United States failed, bringing the total for the eight-year period beginning in 1990 to more than 80,000[2] construction companies. These failures include only those business failures that resulted in a loss to their creditors and do not include contractors who closed their doors without leaving their creditors with a loss. The 1997 failure rate translates to 118 failures per 10,000[3] construction companies or 1.18% of the construction companies. These failures are divided among companies of all ages. Figure 1-1 shows the breakdown of these failures by age of the business. During 1997 the greatest number of business failures was for construction companies that had been operating for longer than 10 years.[4]

FIGURE 1-1 Business Failure by Age[5]



[1]Dun & Bradstreet, *Business Failure Record,* 1986–97, annually as quoted by The Center to Protect Worker's Rights, *The Construction Chart Book,* 3rd Edition, September 2002. Note: Dun & Bradstreet stopped publishing business failure data after 1997.

[2]Dun & Bradstreet, *Business Failure Record,* 1986–97, annually as quoted by Surety Information Office, *Why Do Contractors Fail?,* downloaded from http://www.sio.org/html/whyfail.html downloaded on April 3, 2003.

[3]Dun & Bradstreet, *Business Failure Record,* 1986–97, annually as quoted by The Center to Protect Worker's Rights, *The Construction Chart Book,* 3rd Edition, September 2002.

[4]Dun & Bradstreet, *Business Failure Record,* 1986–97, annually as quoted by The Center to Protect Worker's Rights, *The Construction Chart Book,* 3rd Edition, September 2002.

[5]Dun & Bradstreet, *Business Failure Record,* 1986–97, annually as quoted by The Center to Protect Worker's Rights, *The Construction Chart Book,* 3rd Edition, September 2002.

Since 1988 the construction industry has experienced a higher-than-average business failure rate when compared to the failure rate of all businesses.[6]

The number of construction companies doing business in the United States declined from 709,590 in 2000 to 698,898 in 2001,[7] resulting in a net decline of 10,692 companies or 1.5% for the year. This statistic does not represent the true number of companies that went out of business during the year because the actual number of construction companies that went out of business is offset by the number of new construction companies that were started during the year.

In 2002, two of Japan's largest construction companies—Sato Kogy Company and Nissan Construction—filed for bankruptcy in the same month.[8] Also in the same month, Germany's second-largest construction company, Philipp Holzmann AG, which had been in business for longer than 150 years, filed for bankruptcy.[9]

By 2006, nearly one in four contractors (23.6%) of the 850,029 construction contractors that were in business at the beginning of 2004 had gone out of business. These numbers include all sectors of the construction industry except single-family residential contractors (SIC 1521).[10]

Large and small, old and new, domestic and foreign construction companies are among the statistics of failed construction companies. What are the sources of failure for construction companies? The Surety Information Office—an office that collects data on surety bonds—has identified six broad warning signs that a construction company is in trouble. They are "ineffective financial management systems . . . bank lines of credit constantly borrowed to the limits . . . poor estimating and/or job cost reporting . . . poor project management . . . no comprehensive business plan . . . [and] communication problems."[11] Four of these six sources of failure are directly related to the financial management of the company. Without sound financial management, construction companies are setting themselves up for failure.

---

[6]Dun & Bradstreet, *Business Failure Record,* 1986–97, annually as quoted by The Center to Protect Worker's Rights, *The Construction Chart Book,* 3rd Edition, September 2002.

[7]U.S. Census Bureau, *CBP United States Economic Profiles,* 2000 and 2001 downloaded from http://www.census.gov/epcd/cbp/view/cbpus.html.

[8]The Associated Press, *Nissan Construction to File for Bankruptcy,* The New York Times on the Web, April 1, 2002, and Ken Belson, *Contractor in Japan Is Seeking Bankruptcy,* The New York Times on the Web, March 5, 2002.

[9]Edmund L. Andrews, *Kirch in Danger of Bankruptcy After Rescue Talks Break Down,* The New York Times on the Web, April 3, 2002, and Skyscrapers.com.

[10]BizMiner, as reported by the Surety Information Office, *Why Do Contactors Fail? Surety Bonds Provide Prevention & Protection*, 2007, downloaded from http://www.sio.org/html.whyfail.htm.

[11]Surety Information Office, *Why Do Contractors Fail?,* downloaded from http://www.sio.org/html/whyfail.html downloaded on April 3, 2003.

What Is Financial Management?

Financial management is the use of a company's financial resources. This includes the use of cash and other assets—such as equipment. Many everyday decisions affect a company's financial future. For example, the decision to bid on a large project can have great impact on the finances of a company. When deciding whether to bid on a project, a manager may need to address the following questions: Does the company have enough cash resources to perform this work or will the company need outside financing? Can the company get bonded for this work? If not, what changes need to be made in the company's financial structure so the company can get a bond for the project? Should the company hire employees to perform the work or should the company subcontract out this labor? Should the company lease or purchase the additional equipment needed for this project? If the company purchases the equipment, how should it be financed? Will this project require the company to increase its main office overhead? And, finally, what profit and overhead markup should be added to the bid? The answers to all of these questions will affect the company's finances. The answer to one of the questions may change the available options to other questions. For example, if the manager decides to hire employees to perform the work on the project, the project will require more financial resources than if the company had hired subcontractors to perform the labor and may leave the company with insufficient resources to purchase the additional equipment, leaving leasing the equipment as the only option.

Why Is Construction Financial Management Different?

Construction companies are different from most other companies and are faced with many unique challenges and problems not faced by other companies in other industries. Although the construction industry is producing a product—as do manufacturing plants—the construction of buildings, roads, and other structures is different from manufacturing of most other products. Because of these unique characteristics the financial management principles applied to other product-producing industries often need to be modified before they are applied to the construction industry, otherwise they are useless.

To understand the unique characteristics and challenges faced by the managers of construction industries, let's compare the management of a construction company to the management of a manufacturing plant. For this example we look at the manufacturing of fiberglass insulation. The manufacturing of fiberglass batt insulation can be summarized in the following steps:

1. Sand and other ingredients necessary to make glass are delivered to the plant and stored in silos.
2. The glass-making ingredients, delivered to the mixing bin by conveyor belts or other means, are mixed in the specified proportions.

3. After mixing, the ingredients are fed into a furnace, where they are heated to make molten glass.
4. The molten glass is passed through a machine that spins the glass into fibers, cools the fibers, and adds liquid binders which causes the glass fibers to stick together.
5. The spun glass is placed on a conveyor belt, where the speed of the conveyor belt controls the thickness of the insulation.
6. As the insulation proceeds along the conveyor belt, it is cut to width, and paper backing is added if required.
7. Finally, the insulation is cut to length, packaged, and stored for shipment.

Now that you have a basic understanding of the process used to manufacture fiberglass insulation, let's compare the management of this process to the management of a construction company.

Project Oriented

The insulation manufacturer is process oriented, whereas the construction company is project oriented. Although the insulation manufacturer produces different types of insulation, the range of products that they produce is limited. In the above example the insulation produced may be of different thickness or R values, different widths, and with or without paper backing and packaged in rolls or bundles of 8-foot batts. All of these products are similar with slight variations. For many construction companies, each product is unique but often the products are very different. It is not uncommon for a construction company to be working on a tenant finish in a high-rise tower, a fire station, and an apartment complex at the same time. Even when a construction company is working on similar products—such as a homebuilder or a company building a number of convenience stores—the projects are often different due to site conditions and locations, which affects the availability of labor and materials.

Because insulation manufacturers have a limited number of products they produce repeatedly, it is easier for them to determine their production costs. When a manager has produced a million square feet of R-11 insulation with paper backing packaged in a 15-inch-wide by 40-foot-long roll it is easier to project the cost to produce the next 10,000 square feet than it is if the product has never been produced before. Construction companies often give clients fixed prices for a product that the company has never built or for a product that the company has never built using the local group of suppliers and subcontractors available at the project location.

The insulation manufacturer sells the same product to a wide variety of buyers at locations other than the place the insulation is manufactured. In the construction industry, projects are often custom built for a specific owner on a specific location. The insulation manufacturer can deal with fluctuation in demand by producing and storing extra products when demand is slower for use when the demand is higher. It is relatively easy to store 5,000 square feet of insulation for immediate shipment to meet some future demand. With most of a

construction company's work occurring at the individual project's location, the construction company cannot store unused production during slow times for use on future projects. How can you store 500 cubic yards of excavation for immediate use on some future project? To deal with this, the construction company must constantly bid new work to keep the company's employees workforce fully utilized or build speculative projects—projects without owners or buyers. Speculative building is a risky venture for the company because the product cannot be moved and often must be modified before it can be sold to another buyer.

No other industry is as project based as is the construction industry. Almost everything a construction company does is a project. Because of this, a construction company must keep accurate construction costs for each and every project that it constructs. Not only must the cost be kept for each project, but also the cost must be kept for each group of components on a project. This data is necessary to control the costs of the current project and also so the cost of the components may be used in the bidding of future projects. With each project requiring a different mix of labor, materials, and equipment, knowing the cost of the components of a project is necessary to bid future projects.

Decentralized Production

The insulation manufacturers perform all of their work at a centralized location, whereas the construction company performs its work at a number of decentralized locations. Insulation manufacturing plants are set up at a fixed location with the equipment being dedicated to a specific manufacturing process for years. Employees come to the same plant year after year. In the construction industry the equipment and employees are seldom dedicated to a single project year after year. Equipment and employees may move from job to job on a regular basis. As a result, the location of each employee and piece of equipment must be tracked to ensure that their costs are charged to the correct job. Additionally, each crew and piece of equipment must be managed as a project center.

Payment Terms

The insulation manufacturer bills the buyer at the time the insulation is shipped or when it is ordered with the expectation that the buyer will pay the full bill within a specified number of days. For many construction companies, their work consists of long-term contracts for individual projects with monthly progress payments being made by the owner as the project is being built. Additionally, the owners often withhold retention—funds used to ensure the contractor completes the construction project—thus deferring payment of a portion of the progress payment. As a result, construction companies have unusual cash flows and require modification to accounting and other financial procedures to handle retention.

Heavy Use of Subcontractors

The insulation manufacturer would never subcontract out a step in its manufacturing process, yet many construction companies rely heavily on subcontractors'

work. The use of subcontractors allows a construction company to tap into a subcontractor's financial assets during the construction process. The use of subcontractors has a great impact on the finances of a construction company.

Because of these unique characteristics it is important for the manager of a construction company to have a sound understanding not only of financial management but also of how financial management principles are applied to the construction industry. The tools that financial managers are taught in business schools must be modified to take into account the unique characteristics of the construction industry if they are to be useful to construction managers.

Who Is Responsible for Construction Management?

The person ultimately responsible for the financial management of a construction company is often the owner or general manager. Often (especially in smaller companies) many of these tasks are delegated to estimators, superintendents, or project managers—particularly those tasks that are project specific. For this reason, and because many project managers, superintendents, and estimators aspire to move up within the company or start their own construction business, it is important for all construction management students to understand the principles of financial success for a construction company. Nothing will put an employee on the fast track to success within a company faster than increasing the company's profitability through sound construction financial management. In this book the term *financial manager* is used to designate superintendents, project managers, estimators, general managers, or owners who are responsible for all or part of the financial management of a construction company.

What Does a Financial Manager Do?

The financial manager is responsible for seeing that the company uses its financial resources wisely. A financial manager's responsibilities may be broken down into four broad areas that include accounting for financial resources, managing costs and profits, managing cash flows, and making financial decisions.

Accounting for Financial Resources

Financial managers are responsible for accounting or tracking how the company's financial resources are used, including the following:

- ❑ Making sure that project and general overhead costs are accurately tracked through the accounting system.
- ❑ Ensuring that a proper construction accounting system has been set up and is functioning properly.
- ❑ Projecting the costs at completion for the individual projects and ensuring that unbilled committed costs—costs that the company has

committed to pay but have not received a bill for—are included in these projections.

- ❑ Determining whether the individual projects are over- or underbilled.
- ❑ Making sure that the needed financial statements have been prepared.
- ❑ Reviewing the financial statements to ensure that the company's financial structure is in line with the rest of the industry and trying to identify potential financial problems before they become a crisis.

Chapters 2 through 6 will help prepare you to fulfill these functions.

In Chapter 2 you will be introduced to the structure of construction financial statements, including the different ledgers used by construction accounting systems. You will also learn the difference between accounting systems that are used for cost reporting and systems that are used for controlling costs, as well as the different accounting methods available to construction companies. Because of the unique characteristics of construction companies, there are some key differences between accounting systems and financial statements for the construction industry and other industries. Before you can understand how to read construction company financial statements or understand how construction costs are tracked and managed, you must understand how construction accounting systems operate.

In Chapter 3 you will gain a better understanding how different accounting transactions are processed in the accounting system. There are a number of unique transactions that take place in construction accounting that do not occur in other industries. Most of these transactions are a result of the construction industry's focus on job costing, equipment tracking, and accounting for long-term contracts. Understanding these transactions is important for three reasons: First, some project costs—such as labor burden and equipment costs—are often generated by the accounting system rather than an invoice or time card. Understanding how these costs are obtained will help you gain a better understanding how to estimate these costs and incorporate them in the financial analysis of the project. Second, financial managers must review the accounting reports for errors—improperly billed costs and omitted costs—and ensure that the necessary corrections are made. Understanding how the costs are generated will help you better understand how to interpret the accounting reports. Finally, for the general manager and owner, understanding construction accounting is necessary to ensure that the accounting system is set up to meet the needs of the company. Many construction companies are using substandard accounting systems because the management does not understand how accounting systems should be structured to meet the needs of the construction industry.

In Chapter 4 you will increase your understanding of construction accounting systems. You will learn to track committed costs outside the accounting system if your company's accounting system does not track committed costs, which will also help you understand how accounting systems track committed costs. You will learn to use committed costs to project the estimated cost and profit at completion for projects. You will also learn to calculate over- and underbillings.

Finally, you will learn about the internal controls needed to protect your financial resources and what to look for in computerized construction accounting systems.

In Chapter 5 you will learn the differences among the methods available for depreciating construction assets, including the methods used for tax purposes. Understanding the difference in depreciation methods is necessary for a manager to interpret the financial statement and financial ratios, which is covered in the next chapter. Simply put, changing the method of depreciation can have significant impact on the company's financial statements. An understanding of depreciation is also necessary when preparing income tax projections, which is discussed in Chapter 13.

In Chapter 6 you will learn to use financial ratios to analyze the company's financial statements, including comparing the company's ratios to industrial averages. This will include adapting commonly used ratios to the unique characteristics of the construction industry. Analysis of the financial statements will help the financial manager identify problems before they become a crisis. These problems may be life threatening to the company (such as realizing that the company will not be able to pay its bills in the upcoming months) or simple planning issues (such as identifying that the company's equipment is aging and that funds need to be set aside to replace this equipment in the next few years).

Managing Costs and Profits

Financial managers are responsible for managing the company's costs and earning a profit for the company's owners. Financial managers rely heavily on the reports from the accounting system in their management of costs. Managing the company's costs and profits includes the following duties:

- ❑ Controlling project costs.
- ❑ Monitoring project and company profitability.
- ❑ Setting labor burden markups.
- ❑ Developing and tracking general overhead budgets.
- ❑ Setting the minimum profit margin for use in bidding.
- ❑ Analyzing the profitability of different parts of the company and making the necessary changes to improve profitability.
- ❑ Monitoring the profitability of different customers and making the necessary marketing changes to improve profitability.

Chapters 7 through 11 will help to prepare you to fulfill these functions.

In Chapter 7 you will learn to monitor and control construction costs for materials, labor, subcontractors, equipment, other costs, and general overhead. You will also learn to measure the success of the project by monitoring profitability, using the schedule performance index, the cost performance index, and project closeouts. These skills help financial managers determine the success of projects and identify problem areas on projects, regardless of whether you are a project manager or superintendent who wants to know how your project is doing

or a general manager or owner who wants to know how well your project managers and superintendents are running their projects.

In Chapter 8 you will learn to determine the labor burden markup. This helps you better understand how to project these costs, whether they are to be used to bid a new job, price a change order, or project the cost to complete the project. This helps the general manager and owner determine the labor costs needed to prepare a general overhead budget.

In Chapter 9 you will learn how to prepare a general overhead budget that may be used to track overhead costs. It is easy for a company to squander its profits by failing to control general overhead costs. Construction managers often spend enormous amounts of time and effort budgeting, tracking, and controlling construction costs while ignoring general overhead costs. Just as a project manager or superintendent tracks and manages construction costs on a project, the general manager or owner needs to track and manage the general overhead costs. The key to doing this is to set and follow a general overhead budget. A general overhead budget is also needed to prepare the company's annual cash flow projection, which is discussed in Chapter 14.

In Chapter 10 you will learn to set profit margins for use in bidding and how the profit changes as the volume of work changes. You will also learn to determine the volume of construction work and profit and overhead markup necessary to cover the costs associated with the general overhead. Profits are used to pay for general overhead costs and provide the owners with a profit. If the profits are insufficient to cover the general overhead costs the company will consume its available cash and fail. If the profits fail to provide the owner with a reasonable profit, the owner may decide there are better places to invest his or her money and the company will lose financing.

In Chapter 11 you will learn to analyze the profitability of different parts of the company and identify where the company needs to make changes to improve profitability. You will learn to choose between hiring a subcontractor and self-performing work. You will also learn to monitor the profitability of different customers and identify which customers should be developed and which customers your company would be better off without.

Managing Cash Flows

Financial managers are responsible for managing the cash flows for the company. Many profitable companies fail because they simply run out of cash and are unable to pay their bills. The duties of a financial manager include the following:

- ❑ Matching the use of in-house labor and subcontractors to the cash available for use on a project.
- ❑ Ensuring that the company has sufficient cash to take on an additional project.
- ❑ Preparing an income tax projection for the company.

- ❑ Preparing and updating annual cash flow projections for the company.
- ❑ Arranging for financing to cover the needs of the construction company.

Chapters 12 through 16 will help prepare you to perform these functions.

In Chapter 12 you will learn to develop a cash-flow projection for a construction project from both the perspective of a construction company that is receiving progress payments or draws from the project's owner and from the perspective of a construction company that receives a single payment when the project is sold—such as is the case with many homebuilders. For companies in either of these situations, the company must pay for some or all of the construction costs—especially labor—from the company's funds before being reimbursed for these costs. To cover these costs the company needs cash. Because inadequate funding of the construction company can spell doom to a construction project as well as to all of the companies involved, it is important that managers accurately project both the amount and timing of the cash required by a construction project. Understanding the cash flow for a construction project is a prerequisite to preparing a cash flow for an entire construction company, which is discussed in Chapter 14.

In Chapter 13 you will learn the fundamentals of income taxes and how to prepare an income tax projection. Income taxes are a significant expense to the company and need to be included in the company's annual cash flow projection. Having an unexpected income tax bill can reduce the funds available for use on construction projects to a dangerously low level.

In Chapter 14 you will learn how to prepare an annual cash flow projection for a construction company. This is necessary to ensure that the company has sufficient cash for the upcoming year. Should a financial manager find that there are insufficient funds, he or she will have time to arrange for the necessary financing to provide the necessary funds. Annual cash flow projections for a company are prepared by projecting the annual revenues and construction costs for the construction company by combining the cash flows from the individual jobs or are based on historical data. The financial manager must then combine the projected revenues, construction costs, the general overhead budget, and the projected income taxes with the company's available cash to determine the cash needs of the company.

In Chapter 15 you will learn to convert cash flows occurring in one time period to an equivalent cash flow occurring at another time period or into a uniform series of cash flows occurring over successive periods. Understanding the time value of money is a prerequisite to understanding debt financing and how to compare two or more financial options, which are the topics of Chapters 16, 17, and 18. Additionally, you will learn how to adjust interest rates for inflation.

In Chapter 16 you will learn about financial instruments that can be used to provide the necessary cash for a construction company's operation. You will also learn to compare debt instruments with different conditions and learn how loan provisions and closing costs can increase the effective interest rate on a loan or line of credit. An understanding of these principles helps you reduce borrowing costs and determine the best way to provide the cash needed to operate a

construction company. Success in obtaining financing for a company can allow the company to take on additional projects, whereas failure to obtain financing can spell the doom of a company.

Choosing among Financial Alternatives

Financial managers are responsible for selecting among financial alternatives. These decisions include the following:

- ❑ Selecting which equipment to purchase.
- ❑ Deciding to invest the company's limited resources in which area of the business.

There are many financial tools that are available to quantitatively analyze the alternatives. In Chapters 17 and 18 you will learn to use these tools.

In Chapter 17 you will learn ten quantitative methods that may be used to analyze financial alternatives and choose the alternative that is best for the company. Without some quantitative method it is hard for managers to determine which option is best. Understanding these skills is necessary for any manager who must decide where to invest limited capital.

In Chapter 18 you will learn how income taxes can influence the choice of financial decisions and how to incorporate income taxes into the decision-making tools from Chapter 17. If income taxes affected all alternatives in the same way, income taxes would not be an issue; however, income taxes can make some financial alternatives preferable. With income tax rates of up to 38.6% financial managers must take income taxes into account by weighing financial alternatives.

Conclusion

A construction company is a risky venture. Each year, many construction companies go out of business. Operating a successful construction company requires a specialized set of financial management skills, because of the unique nature of the construction industry. Unlike other industries, the construction industry faces a number of challenges: (1) constantly building unique, one-of-a-kind projects, (2) building a project at a different location each time, (3) dealing with retention and progress payments, and (4) relying heavily on the use of subcontractors to complete the projects. This book is designed to help the reader develop the financial management skills required to become a successful construction manager.

Problems

1. According to the Surety Information Office, what are the six warning signs that a construction company is in financial trouble?

2. Who is responsible for financial management in a construction company?
3. Why is construction financial management different from the financial management of other companies?
4. What activities are involved in accounting for the company's financial resources?
5. What activities are involved in managing the company's costs and profits?
6. What activities are involved in managing the company's cash flows?
7. List some examples of financial decisions that construction managers must make.