

Supply Chain Financial Management

Best Practices, Tools, and Applications for
Improved Performance



Robert J. Trent

UNDERSTANDING SUPPLY CHAIN FINANCIAL MANAGEMENT

Imagine the following scenario, which is based on a true story. After years of trying to convince your colleagues about the value of supply chain management, the day finally arrives when you are invited to make a presentation to your company's executive committee, including the CEO. And, if all goes well, an invitation to present to the Board of Directors could be on the horizon. This will be your shining moment as you demonstrate, at the highest levels, the accomplishments and importance of supply chain management. Life is going to be good.

While your presentation went well, it was not received with the enthusiasm that you had expected. In fact, despite your best efforts to excite the group about the value of your company's supply chain efforts, you felt your session came across *flat*. How could this group not appreciate the significance of improved inventory turns, reduced purchase costs, new longer-term supply contracts, improved forecast accuracy, and a streamlined material releasing system? What is wrong with these people?

Just as men are from Mars and women are from Venus (or so the saying goes), corporate executives and supply chain professionals are also from different planets. The make-up of executive committees and boards of directors includes people who are largely not from the supply chain world. Talking about faster inventory turns probably invokes some mental image of material spinning around in some god-forsaken facility that few in this group have ever visited. To put it bluntly, you entered the lair of a group whose obsession is strategy, corporate-level indicators, and financial results. You, on the other hand, brought to them a world that is

more about tactical operations, nonfinancial indicators, and activities instead of accomplishments. Can anyone spell *disconnect*? Would it not have been better to speak their language?

This chapter begins our journey through the world of supply chain financial management. We first define the terms *finance* and *supply chain management*, then present a set of reasons supporting the integration of supply chain management and finance, and identify what finance has to offer supply chain professionals. A discussion of financial statements and financial indicators will help build the knowledge base that underlies this book. The chapter concludes with a case that illustrates the benefits of taking a financial perspective when pursuing supply chain improvements.

WHAT IS FINANCE? WHAT IS SUPPLY CHAIN MANAGEMENT?

Let's define two major concepts that populate this book—*finance* and *supply chain management*. So, what is finance? We can think of finance in terms of a noun and a verb. When we think of finance as a noun, we are referring to a formal entity within the organizational structure—just as marketing, purchasing, and engineering are formal entities. As a functional entity, the finance group or department has the right to perform activities that are central to running any organization. A corporate finance group (a noun) is concerned with activities such as pursuing sound investments, obtaining low-cost credit, allocating funds to pay for liabilities, managing tax obligations, and banking (the verbs).

As a body of knowledge, finance deals with the allocation of assets and liabilities over time—under conditions of certainty and uncertainty. Some refer to finance as the science of money management. Finance also applies various economic theories.¹ One thing that we know for certain is that the body of knowledge that populates finance is well-developed and has evolved over many years.

Supply chain management (SCM) is much less mature, compared with finance. SCM is concerned with the two-way management of some important flows—funds, information, materials, and services. One way to view SCM is in terms of a broad domain with many activities under that domain's *umbrella*. These domain activities include purchasing and materials management; demand and supply planning, including forecasting; transportation; distribution; material handling; receiving; some parts of operations and new product development; and inventory management. Without question SCM is still maturing, particularly in terms of financial management and risk management.

Much of what finance concerns itself with is not directly relevant to what we cover in this book. Conversely, finance has developed a host of tools, techniques,

and concepts that supply chain professionals can draw upon to enhance their personal expertise, support more effective decision making, and present results in a way that corporate executives understand. Along the way you might even gain the respect and admiration of some important people in your company, which should bode well for your future advancement.

WHY INTEGRATE SUPPLY CHAIN AND FINANCE?

We are going to start this section by making a bold statement—the language of business is finance. If this is the case, and many would argue this to be true, it makes sense to have a working knowledge of that language. One of the main reasons for integrating SCM and finance is to become comfortable with speaking a language that is spoken at the upper echelons of governments, nonprofit organizations, and corporations.

Think about when news services report business results. We typically do not hear that a company increased its inventory turns last quarter. And, if we do hear that inventory turns increased, it is usually as a footnote or a corollary to explain something that was financially related. What we hear about are changes to gross margins, cash flow, and net income; stock buy-backs or sales; and the return on invested capital or assets. Occasionally we hear about market share, which usually excites the marketing people (except when it drops).

Rarely does the focus of these news reports have anything to do with supply chain indicators, even though, as we will see, the supply chain group affects more financial levers than any other group. The time has come to start thinking like a financial manager, not just a cost, supply, and risk manager. Frankly, executive leaders are not going to learn to speak the language of SCM. As you think about your professional development, learn to speak a foreign language called finance.

Supply chain financial management represents a maturing of the supply chain discipline. Compared with other business disciplines, SCM is relatively young. And, that means it is still evolving. Three areas appear to define the next level of maturation for SCM—the use of big data and data analytics, global risk management, and supply chain financial management. This book is about financial management for the supply chain professional, although finance professionals may appreciate a better understanding of supply chain practices.

Why else should we integrate SCM and finance? Without question, finance is characterized by a sophisticated body of knowledge populated by a diverse set of tools, techniques, and concepts. Some of what resides within that body can be employed directly by supply chain professionals to support better analyses,

decision making, and risk management. Throughout this book we are going to borrow selectively from finance (and then use ruthlessly) those tools and techniques.

WHAT FINANCE BRINGS TO THE SUPPLY CHAIN TABLE

Finance is a mature discipline that offers a robust and accepted set of concepts, tools, and techniques. The word *robust* means that financial concepts, tools, and techniques are applicable across a range of settings. While some of the financial topics presented in this book were not intended to be applied to supply chains, later chapters will demonstrate how to use these techniques in ways Mother Nature never intended.

Besides a robust body of knowledge, what else does finance offer? Finance is perhaps the only corporate entity with the validity to bless the cost savings that supply chain professionals claim they are achieving. This has been an ongoing struggle for most supply chain groups. It is not uncommon for a chief procurement officer (CPO) to claim that her procurement group saved \$100 gazillion last year. Upon hearing this, the CEO suspiciously asks how that money mysteriously *disappeared*? After all, gazillions of dollars did not make it to the bottom line. The CPO then responds that different operating units siphoned off the money before it reached the bottom line, like a river being diverted before it reaches its final destination. The savings never stood a chance! When this scenario occurs, and it occurs more often than we realize, it becomes evident why the CPO not only appreciates what finance has to offer—but, that the CPO *needs* what finance has to offer.

Finance can also help determine how supply chain initiatives affect corporate performance indicators, although by the end of this book, the reader will also be able to make these determinations. If we better manage inventory and increase inventory turns, how does that affect return on assets (ROA)? If procurement negotiates a major contract that lowers costs of goods sold, how does this affect various financial indicators, including net income? Linking changes (i.e., causes) to specific outcomes (i.e., effects) is something that finance professionals understand well. It is also something we are going to understand.

As we progress through the book, the reader will be exposed to many financial approaches, making reliance on finance personnel less of an issue. Examples include using supplier financial data to predict supplier bankruptcy, using financial investment techniques to evaluate the viability of supply chain projects, gauging the impact of inventory management approaches on working capital, and interpreting the impact of supply chain initiatives on key corporate performance

indicators. It is time to transfer some of that finance magic over to the supply chain group.

The bottom line is that the finance community is skillful at managing financial and corporate risk activities. Never doubt that finance people are some of the smarter people in the corporate world (which at times has gotten us into some serious trouble). Unfortunately, finance support is not always available or the finance group may show minimal interest in supporting supply chain activities. The Hackett Group reported that since 2004, the median number of full-time finance department employees has declined by 40% to 71 people for every \$1 billion of revenue—down from 119.² There are just some things we are going to have to learn to do for ourselves.

As we progress through this book, keep in mind that certain topics will remain the responsibility of finance. In particular, four areas should remain firmly entrenched in the finance camp. This includes currency and commodity hedging, the calculation of reported corporate performance indicators, the calculation of the inventory carrying cost rate, and the calculation of the corporate hurdle rate. Each of these important topics requires finance support and input.

Some Finance Shortfalls

While, over the years, finance has developed a comprehensive set of tools and techniques, without question there are areas where finance does not offer as much to the supply chain professional. In other words, there are shortcomings regarding the availability or applicability of financial tools and techniques.

Supply chain professionals will have to take the lead when developing certain techniques because these techniques have not been the historical focus of finance or accounting groups. In particular, total cost of ownership (TCO) models, except for capital expenditure models, have never been stressed by the financial community, even though these models rely extensively on financial information. Many of the cost categories embedded in total cost systems have no corresponding financial or accounting category that allows easy data retrieval. TCO modeling is an area where finance and accounting professionals could learn a thing or two from supply chain professionals. Chapter 12 covers TCO systems in depth.

Another shortfall involves calculating the true cost of switching from one supplier to another—or what we call supplier switching costs. Supplier switching costs are not something the finance and accounting community usually think about, even though these costs are often significant. Ideally, an account would exist where all related costs associated with supplier switching is easily accessible. With the emergence of information technology (IT) systems that allow users to

sift through huge amounts of data, the ability to identify supplier switching costs may become routine. At this time supplier switching costs remain elusive.

Finance and managerial accounting will also not be much help when trying to quantify transaction costs. This is due partly to the fact that transactions occur just about everywhere and across all parts of the supply chain. We see an extensive amount of transactions in the commercial exchanges of goods, services, and funds—transactions involving the exchange of electronic data and information; transactions where material moves internally from one part of a process to another during production; financial transactions of all kinds; and transactions associated with just about any kind of change.

It is not that finance and accounting systems do not address transactions. The problem is they often do not address the kinds of transactions that are of interest to supply chain professionals. Finance and managerial accounting systems came of age well before SCM evolved as a business discipline. As a result, supply chain transactions are often buried in overhead accounts. What is the transaction cost, for example, of issuing purchase orders, paying invoices with electronic funds transfers, changing forecasts or material due dates, or issuing material releases to suppliers? Transaction costs are like the elusive quarks that populate the universe. They are everywhere, yet they are nowhere to be found.

A divergence also exists regarding how the supply chain and finance community view expenses and investments. Let's use supplier development as an example. Finance and accounting systems almost always look at the resources put toward developing a supplier's capabilities as an expense item. Not surprisingly, we know that expenses are not viewed internally as favorably as investments. Most financial managers strive to cut expenses while maximizing the returns from investments. Shifting our perception from an expense to an investment opens up a new world of possibilities. Chapter 6 will show how to use investment techniques to support that shift.

Another area where finance falls short from a supply chain perspective relates to managing working capital. Finance and supply chain professionals view working capital and its management quite differently. And, as we progress through the book, these differences will be meaningful. Technically speaking, finance defines working capital as the difference between current assets and current liabilities, which relies on information taken from the balance sheet. Furthermore, finance professionals stress the management of receivables and payables when managing working capital.

Supply chain managers have (or should have) a different perspective of working capital and its management. Besides defining working capital from an operational perspective, supply chain professionals generally focus on managing the inventory portion of the working capital equation. These differences will become clearer when we reach the chapters on managing inventory as an investment.

The fields of finance and managerial accounting have much to offer supply chain professionals. But, let's not lose sight of the fact that finance and managerial accounting are mature disciplines that have grown up over the last 125 years—well before SCM was even a glimmer in someone's eye. To think that every supply chain requirement will have a corresponding financial technique or approach to support it is naïve. At times, we will have to adapt financial approaches to fit our needs—at other times, we will have to invent our own approaches to fill any voids. It is perfectly acceptable for supply chain managers to be creative regarding how they approach their analytical needs.

UNDERSTANDING FINANCIAL STATEMENTS

Everything we do within a supply chain ends up somewhere on a financial statement. Since that is the case, we have to make sure we have a working knowledge of three important financial documents—the balance sheet, the income statement, and the cash flow statement. So much of what we talk about in this book relates to items that appear on these statements. The purpose of this section is not to make the reader an expert at reading and interpreting all the nuances of financial statements. The intent is to develop a working knowledge of these statements that is just enough to make you dangerous.

Balance Sheet

The balance sheet is a financial statement that summarizes a company's assets, liabilities, and shareholders' equity (also called stockholders' equity or net worth). The balance sheet is also called a *statement of financial position* or a *statement of financial condition*.³ It represents a company's financial position for a specific date. From a financial perspective, companies have been known to manipulate their asset base, particularly inventories, when the balance sheet *snapshot* is taken. This allows a company to look better on some important financial indicators, particularly ROA.

Table 1.1 presents an actual balance sheet. You might notice that a balance sheet is divided into two major parts: assets and liabilities plus shareholders' equity. This statement is called a balance sheet because the two major parts of the statement balance out, which means they are equal. Why are they equal? A company has to pay for all of its assets either by borrowing money and/or raising money from shareholders. In equation form, a balance sheet is:

$$\text{Total Assets} = \text{Total Liabilities} + \text{Shareholders' Equity}$$

Table 1.1 Balance sheet statement—TRW

Figures are in thousands.

	Dec 31, Current Year	Dec 31, Previous Year	Dec 31, Two Years Ago
Assets			
Current Assets			
Cash and Cash Equivalents	1,729,000	1,223,000	1,241,000
Short-term Investments	—	—	—
Net Receivables	2,702,000	2,365,000	2,415,000
Inventory	1,019,000	975,000	845,000
Other Current Assets	178,000	165,000	126,000
Total Current Assets	5,628,000	4,728,000	4,627,000
Long-term Investments	—	—	—
Property, Plant, and Equipment	2,718,000	2,385,000	2,137,000
Goodwill	1,760,000	1,756,000	1,753,000
Intangible Assets	292,000	293,000	298,000
Accumulated Amortization	—	—	—
Other Assets	1,538,000	1,315,000	1,360,000
Deferred Long-term Asset Charges	316,000	380,000	87,000
Total Assets	12,252,000	10,857,000	10,262,000
Liabilities			
Current Liabilities			
Accounts Payable	2,909,000	2,713,000	2,658,000
Short/Current Long-term Debt	641,000	93,000	104,000
Other Current Liabilities	1,205,000	1,075,000	1,078,000
Total Current Liabilities	4,755,000	3,881,000	3,840,000
Long-term Debt	1,473,000	1,369,000	1,428,000
Other Liabilities	1,483,000	1,715,000	1,682,000
Deferred Long-term Liability Charges	145,000	123,000	173,000
Minority Interest	202,000	191,000	199,000
Negative Goodwill	—	—	—
Total Liabilities	8,058,000	7,279,000	7,322,000
Stockholders' Equity			
Common Stock	1,000	1,000	1,000
Retained Earnings	2,858,000	2,408,000	1,668,000
Treasury Stock	—	—	—
Capital Surplus	1,715,000	1,635,000	1,602,000
Other Stockholder Equity	(380,000)	(466,000)	(331,000)
Total Stockholder Equity	4,194,000	3,578,000	2,940,000
Total Liabilities and Stockholder Equity	12,252,000	1,529,000	889,000

Adapted from public domain information retrieved at finance.yahoo.com.

Total Assets

The asset portion of the balance sheet is divided into two distinct parts—current assets and noncurrent assets. A current asset is one that can or will be converted into cash within a year. The primary categories of current assets include cash and cash equivalents (such as marketable securities), receivables, and inventories. For a manufacturing firm, inventories include a company's raw materials, work-in-process, and finished goods. For a retailer, inventory typically consists of goods purchased for resale from manufacturers or distributors. The issue of treating inventories as current assets from a supply chain perspective is addressed at various points in this book.

Noncurrent assets have three defining features—they cannot be turned readily into cash, they are not expected to be converted into cash within the next year, or they have a lifespan of more than a year. Plant and equipment often represents a large portion of noncurrent assets, particularly for capital intensive companies. Most of the assets in this category are subject to depreciation, which means the asset is subject to lost value due to age, wear and tear, and obsolescence. Depreciation is treated by accountants as a noncash expense. It is the economic cost of an asset over its life. Noncurrent assets also include intangible assets such as goodwill, patents, or copyrights.

Total Liabilities

Liabilities represent financial obligations owed by a company. Similar to assets, liabilities are also presented in terms of current and long-term. Current liabilities are those liabilities that must be paid within a year. This includes primarily accounts payables, short-term notes, and the current portion of any long-term debt. Long-term liabilities include debt and other non-debt financial obligations that are not due within one year from the date of the balance sheet.

Shareholders' Equity

Mathematically, the total value of shareholders' equity is the equivalent of total assets minus total liabilities. Breaking down shareholders' equity further: shareholders' equity comes from two main sources—the first source is the original investment in the company as well as any subsequent investments; the second source includes the retained earnings that a company has accumulated over time through its operations. Oftentimes, the retained earnings portion comprises a major portion of shareholders' equity, particularly for older firms. Technically, retained earnings are the net earnings that are not paid as dividends.⁴ Instead, these are earnings retained by the company for reinvestment or to pay debt, hence the designation *retained earnings*. In formula form, a current period's retained earnings equals $([\text{Beginning Retained Earnings} + \text{Net Income}] - \text{Dividends})$.

What parts of the balance sheet are of interest to supply chain professionals? Supply chain professionals affect, more than any other group, the inventory portion of current assets. Supply professionals also affect the value of longer-term assets through the negotiated contracts for capital expenditures. The supply group also plays an important role with outsourcing, which is essentially a transfer of a company's asset requirements (and associated liabilities) to a third party. This affects the longer-term assets portion of the balance sheet.

Income Statement

Unlike the balance sheet, an income statement measures a company's financial performance over a specific time period, such as a quarter or year. At its most basic level, the income statement considers a company's revenues (often called sales or net sales) and subtracts expenses to arrive at a net income (or loss) figure. The top line of the statement represents revenue, while everything following that line is presented in a logical sequence of expenses. Table 1.2 presents a sample income statement.

Two basic formats characterize an income statement.⁵ The *single-step* format includes only two measures of profitability: pretax income and net income. A multi-step format includes four measures of profitability: gross income or profit, operating income, pretax income, and net income. For our purposes we favor the multi-step format. The following describes the four profitability measures included in the multi-step format.

Gross income (also called gross profit) equals revenues minus cost of goods sold. As a side note, gross income/revenue equals the often reported gross margin percentage. This is an especially important part of the income statement for supply chain managers. In manufacturing, cost of goods sold is equal to the combined total of direct material, direct labor, and factory overhead costs that are incurred when producing a product. While it sometimes appears separately, depreciation expense is also part of cost of goods sold.

We know that materials comprise a large portion of the costs of goods sold at most manufacturers, particularly as firms rely on greater amounts of value-add from suppliers through outsourcing contracts. In retail the cost of goods sold represents the cost of merchandise. For service providers, cost of goods sold equals the cost of providing the service. And, when the figure is called *cost of revenue*, it also includes the cost of delivering a product or service.

Operating income represents a firm's income from its operations. It is also called *earnings before interest and taxes* (EBIT). This is an important figure when calculating certain financial ratios and the Z-Score bankruptcy predictor, something that Chapter 3 addresses. Operating income equals gross profit less selling, general, and administrative expenses (SG&A). Moving down to the next level,

Table 1.2 Income statement—Apple

Figures are in thousands.

Period Ending	Sep 27, Current Year	Sep 28, Previous Year	Sep 29, Two Years Ago
Total Revenue	182,795,000	170,910,000	156,508,000
Cost of Revenue	112,258,000	106,606,000	87,846,000
Gross Profit	70,537,000	64,304,000	68,662,000
Operating Expenses			
Research Development	6,041,000	4,475,000	3,381,000
Selling, General, and Administrative Expenses	11,993,000	10,830,000	10,040,000
Operating Income or Loss	52,503,000	48,999,000	55,241,000
Income from Continuing Operations			
Total Other Income/Expenses Net	980,000	1,156,000	522,000
Earnings before Interest and Taxes	53,483,000	50,155,000	55,763,000
Interest Expense	—	—	—
Income before Tax	53,483,000	50,155,000	55,763,000
Income Tax Expense	13,973,000	13,118,000	14,030,000
Net Income from Continuing Ops	39,510,000	37,037,000	41,733,000
Net Income	39,510,000	37,037,000	41,733,000

Adapted from public domain information retrieved at finance.yahoo.com.

pretax income adds in any interest income earned by a company and then subtracts out interest expenses. As a formula, pretax income = (operating income + interest revenue) – interest expense. Finally, net income is what we call *the bottom line* on the income statement. It represents all sources of revenue minus all expenses. As we move down the income statement, it equals pretax income minus any taxes paid during the income statement period.

Cash Flow Statement

A cash flow statement identifies the cash that flows in and out of a company for a particular period. It identifies where a company makes its money and where it spends its money. Cash flow statements consider the amount, timing, and predictability of cash inflows and outflows. These statements are especially useful for budgeting and business planning.⁶ If the cash flow statement were a movie, it would be known by the famous line, “Show me the money!”

Interestingly, many finance professionals believe the cash flow statement is more useful than the income statement as an indicator of a company’s true financial well-being. The reason for this is most companies use what is called an

accrual method of accounting. With this method a quarterly income statement, for example, may not reflect actual changes in a company's cash position. A company may book revenue from a new customer contract even though the total revenue from that contract is not realized until a later date. Boeing, for example, books as revenue the sale of an aircraft at the time of the order even though it will be a considerable period before payment is received from an airline or leasing company.

Table 1.3 presents a sample cash flow statement. As the statement shows, the accounting data are organized into three main areas—operating activities, investing activities, and financing activities. The bottom of the statement includes any miscellaneous adjustments that do not fall cleanly into one of the main sections. In this case, there is an adjustment due to exchange rate changes. Nonparenthetical items represent net cash inflows while items with a parenthesis represent net cash outflows.

In this example Xerox realized an improvement of \$518 million in available cash from the previous year. This compares with a cash flow decrease of \$309 million two years earlier. How was the \$518 million figure computed?

	Total cash flow from operating activities:	\$2,375
+	Total cash flow from investing activities:	(\$452)
+	Total cash flow from financing activities:	(\$1,402)
+	Exchange rate changes	(\$3)
=	Change in cash and cash equivalent	\$518

UNDERSTANDING CORPORATE PERFORMANCE INDICATORS

A desired goal of supply chain professionals should be to routinely articulate the affect that supply chain initiatives have on corporate level indicators. Rest assured that a performance indicator that starts with the word *return* is almost always a key corporate indicator. We will examine three such indicators—ROA, return on investment (ROI), and return on invested capital (ROIC).

Return on Assets

ROA, which is a ratio we usually present as a percentage, shows earnings that are generated from invested capital (assets). ROA provides an idea of how efficient assets are utilized to generate earnings. In a later chapter we will calculate ROA in the context of something called the DuPont model.

The basic formula for ROA is net income/total assets. If, for example, a company earns \$1 million and has assets of \$10 million, its ROA is 10%. The ROA

Table 1.3 Cash flow statement—Xerox

Figures are in thousands.

Period Ending	Dec 31, Current Year	Dec 31, Previous Year	Dec 31, Two Years Ago
Operating Activities, Cash Flows Provided by or Used in			
Net Income	1,159,000	1,195,000	1,295,000
Depreciation	1,358,000	1,301,000	1,251,000
Adjustments to Net Income	(17,000)	(64,000)	(188,000)
Changes in Accounts Receivables	573,000	641,000	174,000
Changes in Liabilities	(76,000)	91,000	149,000
Changes in Inventories	(38,000)	—	(124,000)
Changes in Other Operating Activities	(604,000)	(612,000)	(629,000)
Total Cash Flow from Operating Activities	2,375,000	2,580,000	1,961,000
Investing Activities, Cash Flows Provided by or Used in			
Capital Expenditures	(346,000)	(388,000)	(338,000)
Investments	—	—	—
Other Cash Flows from Investing Activities	(106,000)	(373,000)	(337,000)
Total Cash Flows from Investing Activities	(452,000)	(761,000)	(675,000)
Financing Activities, Cash Flows Provided by or Used in			
Dividends Paid	(352,000)	(324,000)	(287,000)
Sale Purchase of Stock	(629,000)	(1,050,000)	(684,000)
Net Borrowings	(434,000)	(108,000)	49,000
Other Cash Flows from Financing Activities	(3,000)	—	(670,000)
Total Cash Flows from Financing Activities	(1,402,000)	(1,472,000)	(1,586,000)
Effect of Exchange Rate Changes	(3,000)	(3,000)	(9,000)
Change in Cash and Cash Equivalents	518,000	344,000	(309,000)

Adapted from public domain information retrieved at finance.yahoo.com.

formula appears in a variety of formats, which is true for a number of financial indicators. Some companies may use average assets over a time period for the denominator while others use the asset figure derived from the balance sheet. Others rely on a return on net asset (RONA) formulation, which uses fixed assets plus net working capital rather than total assets in the denominator. Still others replace net income in the numerator with EBIT. Regardless of the specific formula used, ROA is a high-level indicator that considers income over assets.

Supply chain professionals affect ROA most directly through their inventory management activities. Recall from Table 1.1, that inventory is treated as an asset (i.e., the denominator of the ROA formula) on the balance sheet. Effective inventory management by supply chain professionals also affects the numerator of the ROA equation. More effective inventory management will lead to lower inventory carrying costs. And, when the net result of better inventory management is cost reductions, then income should increase. Chapter 15 will show how to model the impact of inventory changes on the ROA formula.

Return on Investment

ROI attempts to measure the profitability of an investment and, as such, there is no one *right* calculation.⁷ ROI is often used to calculate the return from specific investments, and the term investment might be used loosely. A marketing executive might be interested in the financial return from a marketing campaign (i.e., the investment) while an investor wants to know the return from a particular stock. When it is used in these contexts, the ROI is a relatively straightforward calculation: $ROI = (\text{gain from investment} - \text{cost of investment}) / (\text{cost of investment})$.

Many sources interchange the definition of ROI and the basic definition just provided for ROA, particularly when looking at returns at the corporate level. This can be confusing. Keep in mind that the calculation for ROI and its definition can be modified to suit a particular situation. This flexibility has a downside since ROI calculations can be easily manipulated to suit a particular purpose.⁸

Even though ROI is widely used, and most people would say ROI as their first choice if asked to name a measure that starts with the word *return*, we will not use this indicator directly in our analysis. When examining returns at the corporate level, we will use ROA (which, as mentioned, also can refer to ROI when looking at the company as a whole). When considering a particular investment, we will use simple payback, net present value, or internal rate of return (IRR).

Why won't we use ROI when considering the merits of a particular investment? One problem with ROI is it is historical—it looks back at what happened. When considering the return potential of capital projects, we often need to look forward at what we expect will happen. Chapter 6 will review a set of forward-looking techniques in detail. You will not want to skip that chapter.

Return on Invested Capital

ROIC is one of the most important financial indicators in use today. ROIC is also referred to as *return on capital* or *return on total capital*. It is a calculation that assesses a company's efficiency (i.e., its return percentage) at allocating the capital

under its control to profitable investments. The ROIC measure gives a sense of how well a company is using its money to generate returns.⁹ Like ROA, a search of respected financial sources reveals different perspectives regarding how to calculate ROIC. Several examples of ROIC formulas include:¹⁰

$$\text{ROIC} = (\text{net income} - \text{dividends}) / (\text{debt} + \text{equity}), \text{ or}$$

$$\text{ROIC} = (\text{net income} - \text{dividends}) / \text{total capital}, \text{ or}$$

$$\text{ROIC} = (\text{net income after taxes}) / (\text{total assets} - \text{excess cash} - \text{non-interest-bearing liabilities})$$

We will not employ ROIC directly in any of our financial calculations or *what if* scenario exercises in this book. This does not mean that ROIC is not worth understanding or that we should not appreciate how supply chain activities affect the ROIC calculation. In fact, the opposite is true. ROIC is considered by many to be the granddaddy of corporate financial performance. Understanding how the return rate is derived, and appreciating how to affect the components of ROIC is important. Rest assured, if you can articulate how SCM affects these corporate indicators, you might just be ready to run with the big dogs.

Several other important corporate indicators not addressed here include return on capital employed (ROCE) and return on equity (ROE). Both are indirectly related to what we are trying to do (i.e., show a direct link between supply chain performance and the indicator).

TAKING A FINANCIAL VIEW OF THE SUPPLY CHAIN AT STEEL CORP

A number of years ago, executive managers at Steel Corp directed its operating units to concentrate on RONA as their key financial performance indicator. As a corporation, all units were expected to achieve at least a 20% RONA. The challenge was issued—the game was on.

This directive also applied to the subsidiaries of Steel Corp, which includes six railroads, a trucking company, and an intermodal carrier. Each subsidiary operates as a separate business entity, and the parent company measures the financial performance of each unit. This case focuses on actions taken by the six railroads to achieve the mandated RONA target. It shows the benefits of applying a financial perspective when pursuing functional improvements. It also demonstrates the value of rallying around a superordinate measure, which is defined as a measure of a higher (i.e., corporate) condition. Perhaps the most important characteristic of a superordinate measure is that no single group can achieve the measure on its own. The most relevant financial metrics tend to also be superordinate measures.

The Background

The emphasis on net asset return began when executive management challenged the company's operating units to develop ways to meet or exceed the established RONA target. The corporate decision to improve RONA forced different groups to search for ways to increase earnings while simultaneously reducing assets and other current liabilities. The centralized purchasing group that represented the railroads made a decision to focus extensively on the denominator of the RONA equation. This group concluded it had to develop creative ways to manage purchased inventory. Locomotives, railroad cars, and the material required to maintain railroad tracks comprise the main components of inventory.

Other functional groups were each responsible for specific parts of the RONA equation. Managers from the various departments met monthly to discuss progress against their financial return targets. Managers took this process seriously because the parent corporation frequently evaluated whether it should even own railroads. Each group developed, in coordination with other groups, ways to improve the RONA metric.

Systems Contracting with Consignment Inventory

The purchasing group's approach to increasing RONA involved the development of systems contracts featuring consignment inventory. Inventory consignment involves deferring payment for an item until a user physically takes an item from a railroad yard or warehouse and receives or *posts* the material into the railroad's inventory. The primary purpose of consignment inventory was to reduce the average amount of inventory that each railroad maintained financially.

The purchasing group initially developed 30 or so corporate-wide systems contracts with six suppliers. Each contract covers approximately 25 items, with renewal or renegotiation occurring every three years. The contracts are subject to review earlier than three years if suppliers fail to meet performance expectations. While contract items primarily involve higher value items, the railroads also apply systems contracting to lower unit value items (less than \$500) that have higher volume requirements.

Although each railroad operates as a separate entity, a centralized purchasing department is responsible for working directly with users at each railroad to develop and negotiate these contracts. Specifically, purchasing identifies potential items for systems contracts; aggregates the requirements at each railroad for these items; identifies and analyzes potential systems contract suppliers; coordinates the calculation of annual demand estimates; and represents each railroad during negotiations. Each year, purchasing works with field managers to identify new items to add to existing systems contracts, identify items for new contracts, and develop estimates of annual demand at each railroad.

Users at each railroad participate during the development of annual purchase requirements. Since local managers have the best idea concerning planned maintenance projects and expected usage, they are responsible for developing local demand forecasts. Before each negotiation, the different railroads receive an e-mail with a sample *boiler plate* systems contract attached. Each railroad has an opportunity to identify the contractual options they prefer, and users can expand the contract by listing any items they would like to see addressed in the final agreement. A supplier will have a contract addendum for each railroad it services.

Determining when inventory is used and issuing payment are vital parts of systems contracting, and this timing has major financial implications. As a railroad employee removes an item, the local railroad posts the item as a receipt into a computerized inventory control system. The railroads forward usage reports to purchasing, which consolidates the usage into a single report. The report is then forwarded to suppliers for billing purposes. Each supplier sends a single invoice for the total usage, not separate invoices to each unit. This streamlines the accounts payable and receivable process.

Show Me the Money

Ironically, while the parent company has not achieved its own RONA target, the railroads eventually achieved net asset returns of over 50%! The railroads view their asset return achievements as evidence of their contribution to the parent company. Greatly exceeding the RONA target quieted the rumblings about why the parent company owned railroads.

Systems contracting featuring consignment inventory has resulted in other direct benefits. Perhaps foremost, purchasing is achieving its primary goal of reducing inventory investment as average inventory on a financial basis decreased by almost 40% over a three-year period. And, the railroads expect further reductions as they expand their use of systems contracts. The railroads also avoided or deferred price increases due to fixed pricing in the three-year agreements. Systems contracts have also allowed for some staff downsizing since suppliers assumed responsibilities for delivering and placing physical inventory in storage. Finally, acquisition costs are lower because users submit annual orders for the items covered by the systems contracts.

Lessons Learned

The most important part of any case involves the lessons it provides. At first glance, RONA appears to be just another corporate indicator. What's the lesson here? In reality, a superordinate measure like RONA cannot be achieved unless functional groups coordinate their efforts. The presence of superordinate measures demands

that different groups work together or risk failing individually. A second lesson is that our finance friends have provided us with a fair number of superordinate measures. Do not underestimate the value of knowing how to map your group's contribution to these measures. (Chapter 16 will provide a tool for identifying how improvements affect specific parts of the ROA formula.) When someone asks, "What have you done lately?" you will be able to show, in no uncertain terms, the linkage between activity and accomplishment. The ability to show that linkage never gets old.

CONCLUDING THOUGHTS

Combining the worlds of supply chain and finance is going to take many of us out of our comfort zone. That is to be expected as we apply new concepts, tools, and techniques in some exciting ways. But, as we expand our base of knowledge, a confidence should emerge—perhaps even a swagger that tells the world you are bringing your *A* game to the table.

Let's not lose sight of what we are trying to accomplish as we apply financial thinking to SCM. For SCM to mature as a discipline, we must appreciate the language of finance, including its terms, concepts, tools, and techniques. We must also understand how to apply financial tools and techniques to support better decision making and risk management. And, we must demonstrate the value that supply chain managers create by showing how supply chain initiatives affect a company's most important financial indicators. Finally, we must continue to develop as professionals through the application of new knowledge.

REFERENCES

1. <http://en.wikipedia.org/wiki/Finance>.
2. Vipal Monga, "The New Bookkeeper is a Robot," *The Wall Street Journal*, May 5, 2015, p. B1.
3. <http://www.investopedia.com/terms/b/balancesheet.asp>.
4. <http://www.investopedia.com/terms/r/retainedearnings.asp>.
5. Loth, Richard, "Understanding the Income Statement," www.investopedia.com/articles/04/022504.asp.
6. www.businessdictionary.com/definition/cash-flow-statement.html.
7. www.investopedia.com/terms/r/returnoninvestment.asp.
8. www.investopedia.com/terms/r/returnoninvestment.asp.
9. www.investopedia.com/terms/r/returnoninvestmentcapital.asp.

10. www.investorwords.com/4317/ROIC.html and <http://www.investinganswers.com/financial-dictionary/ratio-analysis/return-invested-capital-roic-1188>.

Sample Chapter



This book has free material available for download from the Web Added Value™ resource center at www.jrosspub.com