TEACHING THE CONCEPT OF FREE CASH FLOW TO NON-BUSINESS STUDENTS

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ABSTRACT

The evaluation of financial performance has been extended to include an analysis of free cash flow in finance courses. Understanding this concept is important since it is less subject to accounting manipulations than the more familiar concept of "profits." Students in disciplines other than business are often encouraged to take one or two business courses as electives. The course often selected is Introduction to Business, a course where profits are discussed, but free cash flow is not. In this paper, we discuss why teaching free cash flow is important, and present an example of the calculation of free cash flow.

INTRODUCTION

Business is widely regarded as a desirable area of study in universities today. The School of Business is one of the largest units in many universities. Students in other disciplines are often encouraged to gain some familiarity with business by taking one or two business courses as electives. It is felt that these courses will improve their overall educational background and increase their opportunities for finding employment following graduation. The courses generally selected are Introduction to Business, accounting, and economics. The Introduction to Business course is required in some programs.

Introduction to Business courses generally include a section on finance and accounting, and there is some discussion of a company's income statement and the bottom line figure, profits after taxes. The concept of profits is also discussed in micro-economics, and the calculation of corporate profits is thoroughly covered in accounting. Introduction to Business and introductory accounting courses also discuss the statement of cash flows, which public companies are required to prepare and publish. This statement presents information about a firm's cash receipts and cash payments, where the sum of cash flows from operating activities, investing activities, and financing activities is equal to the change in cash and cash equivalents during the accounting period. The measurement of free cash flow, however, is not generally discussed in these courses. The income statement, along with its profit figure, and the statement of cash flows are important to creditors, but a firm's free cash flow may be more useful to security analysts and investors because it indicates the cash flow that is actually available for distribution to the firm's investors. Since many nonbusiness students taking these courses will not take any other business courses during their undergraduate years, they will have no other opportunity to be exposed to the free cash flow

concept in a classroom setting. Because of the many ways that reported profits can be manipulated, it is important that students become familiar with another method of evaluating company performance.

We begin by discussing reported profits and the difficulties that may arise when a reliance on profits is the sole measure of company performance. Second, the free cash flow concept is discussed, along with an example of the calculation of free cash flow. Finally, some problems in applying the free cash flow concept are discussed.

THE UNCERTAINTY OF REPORTED PROFITS

Accounting scandals, inflated earnings reports, earnings restatements, and analysts who consistently give bullish investment advice have led many investors to question the integrity of reported earnings figures.

When presented to students in the Introduction to Business course, net income is a fairly simple concept. Expenses of the business are subtracted from sales to determine taxable income; taxes are calculated and subtracted, and the resulting figure is net income. However, there are a variety of rules that govern the recognition and timing of sales and expenses, and some of these rules are open to interpretation by corporate management. As a result, some "profitable" firms may be in a very poor financial condition. For example, in 2000, WR Grace & Company continued to report quarterly profits as it headed towards bankruptcy (Chang 2002).

Rather than simply reporting earnings, firms can use a variety of assumptions and accounting irregularities that enable them to "manage earnings" and obfuscate financial results (Rappaport 2002). Some firms recognize sales prematurely by recording sales in the current period of customers who have shipping dates of later periods. In other cases, fictitious sales are recorded, or credit sales are made to companies with meager prospects of paying. A change in cash flow that lags significantly behind a change in sales, or a rise in receivables that is significantly greater than a rise in sales, might be indicative of these practices (Magrath 2002).

Gains from pension fund investments can be counted as earnings, although they are not related to the profitability of the firm's operations and provide no inherent benefit to the firm's investors. And pension income is calculated based on an expected long-term rate of return, not on actual earnings. Verizon Communications, for example, was profitable in 2001 only because of $2.7 billion in pension gains (Gibbs 2002).

Reported earnings can also be boosted by accounting rules that allow a firm tremendous flexibility in estimating the fair market value of securities, certain contracts, and other assets that it holds at the end of each quarter. Any resulting increases in value can be recorded as earnings. It has been estimated that more than half of Enron's originally reported pretax profits in 2000 resulted from this type of subjective valuation estimates (Gibbs 2002).

Subjectivity may also arise in the recording of some costs. A firm that had been expensing research and development expenditures may capitalize them, resulting in lower reported expenses and thus higher reported profits, but less actual available cash, because of the tax effect. Other costs, such as commissions, may be capitalized and then charged to future time periods, resulting in higher reported profits for the current period. Similarly, current reported profits may be increased when contributions to underfunded pension plans are decreased or discontinued for a period of time. On the other hand, firms that are experiencing sizable losses may prepay some costs and write them off to boost later earnings.

Congressional hearings that preceded the passage of the Sarbanes-Oxley Act of 2002 highlighted some of the ways corporate accountants have engaged in manipulations to report favorable profits growth, to meet projected numbers, or to meet analysts' expectations. To correct these erroneous earnings reports, there were 156 restatements of income in 2000 according to the Securities and Exchange Commission, costing investors an estimated $31.2 billion in market value (Henry 2001).

FREE CASH FLOW: MEASUREMENT AND EVALUATION

A performance measure that may be a more accurate indicator of firm success than traditional earnings based measures is free cash flow. For some analysts, free cash flow has replaced earnings as the preferred method of analyzing financial performance.

In recent years corporate finance textbooks have included free cash flow analysis as a component of the evaluation of financial performance. Each year as more business school graduates with an understanding of free cash flow enter the workforce, free cash flow will grow in importance and application. Calculation of free cash flow is an attempt to avoid the subjectivity and potential manipulation in reported earnings.

For this paper, free cash flow is defined as the cash flow that is available for distribution to investors after the firm has made all of the investments in fixed assets and working capital necessary to sustain its ongoing operations. Since all cash flow generated by a firm must go somewhere, free cash flow can be calculated from two equivalent perspectives: an operating perspective and a financing perspective. To calculate free cash flow, one needs an income statement, a balance sheet for the beginning of the income period, and a balance sheet for the end of the period. Following the general approach suggested by Keown et al (2008) and Brigham and Daves (2007), free cash flow is calculated as follows:

Free Cash Flow from an Operating Perspective: FCF = CFO – OWC – FA

FCF = free cash flow

CFO = after-tax cash flows from operations

OWC = investment in operating working capital

FA = investment in fixed assets and other long-term assets

CFO = operating income + depreciation – (tax expense – change in income tax payable)

OWC = operating working capital at the end of the period – operating working capital at the beginning of the period

Operating working capital = operating current assets – operating current liabilities
= current assets that do not pay interest – current liabilities that do not earn interest
= (cash + accounts receivable + inventory + prepaid expenses) – (accounts payable + accruals other than accrued taxes and accrued interest)

FA = gross fixed assets and other long-term assets at the end of the period – gross fixed assets and other long-term assets at the beginning of the period

Free Cash Flow from a Financing Perspective:

FCF = Interest + Debt + Dividends + Equity + Other

FCF = free cash flow

Interest = interest due creditors and investors – change in interest payable (a negative cash flow)

Debt = repayment of short-term debt – acquisition of new short-term debt + repayment of long-term debt – issuance of new long-term debt (negative for repayment of debt and positive for acquisition of new debt)

Dividends = dividends paid to stockholders (a negative cash flow)

Equity = repurchase of common and/or preferred stock – issuance of common and/or preferred stock (negative for repurchases and positive for new issuance)

Other = purchase of marketable securities – sale of marketable securities

Free cash flow from an operating perspective must equal the absolute value of free cash flow from a financing perspective; they will be the same amount but different signs. The equivalence of these measures can best be demonstrated by an actual example. The financial statements of practically any publicly-held company can be used to demonstrate the free cash flow calculations. Consider the financial statements of the McDonald's Corporation, as presented in Keown (2003); the income statement for calendar year 2000 is shown in Table 1 and balance sheets for December 31, 1999 and

Table 1. The McDonald's Corporation Income Statement for the Year Ended December 31, 2000 ($ millions)

Sales		$14,244
Cost of goods sold		8,622
Gross profits		5,622
Marketing, general, and Administrative expenses	$1,898	
Depreciation expense	395	
Total operating expenses		2,293
Operating profits		3,329
Interest expenses		446
Earnings before taxes		2,883
Income taxes		905
Profit after taxes		1,978
Common stock dividends		664
Change in retained earnings		1,314

2000 are shown in Table 2. The figures shown in these statements have been simplified to enhance the explanation of the free cash flow concept; the complexity found in the actual statements is not necessary for an understanding of the concept.

Table 2. The McDonald's Corporation Balance Sheet for December 31, 1999 and 2000 ($ millions)

	1999	2000	Net changes
Assets			
Cash	$ 420	$ 422	$ 2
Accounts receivable	708	797	89
Inventory	83	99	16
Prepaid expenses	362	345	(17)
Total current assets	$ 1,573	$ 1,623	$ 90
Gross fixed assets	22,451	23,569	1,118
Accumulated depreciation	(6,126)	(6,521)	(395)
Net fixed assets	16,325	17,048	723
Other assets	3,086	2,973	(113)
Total assets	$20,948	$21,684	$ 700
Liabilities and Equity			
Short-term notes payable	$ 1,620	$ 630	$ (990)
Accounts payable	586	685	99
Accrued expenses	1,069	1,046	(23)
Total current liabilities	3,275	2,361	(914)
Long-term debt	7,344	9,418	2,074
Total liabilities	$10,619	$11,779	$ 1,160
Equity:			
Par value and paid in capital	2,031	2,159	128
Treasury stock	(6,209)	(8,111)	(1,902)
Retained earnings	14,543	15,857	1,314
Total common equity	10,365	9,905	(460)
Total liabilities and equity	$20,948	$21,684	$ 700

From these statements, we can calculate free cash flow.

Free Cash Flow from an Operating Perspective = CFO – OWC – FA

CFO = operating income + depreciation – (tax expense – change in income tax payable) = 3,329 + 395 – 905 = 2,819

Operating working capital (2000) = (422 + 797 + 99 + 345) – (685 + 1,046)
= 1,663 – 1731 = (68)

Operating working capital (1999) = (420 + 708 + 83 + 362) – (586 + 1,069)
= 1,573 – 1655 = (82)

OWC = (68) – (82) = 15

Gross fixed assets and other assets (2000) = 23,569 + 2,972 = 26,541

Gross fixed assets and other assets (1999) = 22,451 + 3,086 = 25,537

FA = 26,541 – 25,537 = 1,004

Thus, FCF (operating perspective) = CFO – OWC – FA = 2,819 – 15 – 1,004 = 1,800

From a financing perspective, FCF = Interest + Debt + Dividends + Equity + Other

Interest = - 446
Debt = (-990 + 2,074) = 1,084
Dividends = - 664
Equity = 128 - 1902 = - 1774
Other = 0

Thus, FCF (financing perspective) = Interest + Debt + Dividends + Equity + Other
= - 446 +1,084 - 664 - 1774 + 0 = - 1,800

In 2000, McDonald's had after-tax cash flows of $2,819 million. After investing in operating working capital and fixed assets, $1,800 million was available for distribution to investors. The investment in assets is obviously necessary if McDonald's is to remain viable in the extremely competitive fast foods business. The $1,800 million free cash flow was distributed to stockholders in the form of dividends and stock repurchases, and to creditors in the form of interest payment and the repayment of short-term debt. Since the total amount distributed was greater than the $1,800, the firm issued some additional long-term debt and common stock.

Healthy free cash flow permits a firm to increase dividends, pay interest on time, and reduce debt. Negative free cash flow over long periods of time may lead to declining dividend payments, unsustainable debt levels, and attempts to manufacture profits and hide debt. Understanding free cash flow is important because it is a measure that cannot be as easily manipulated as can reported profits to meet a predetermined management goal.

The measurement of free cash flow is also crucial to firm valuation. In spite of the attention given to reported earnings, earnings per share, and EBITDA by analysts and investors, it is free cash flow that is the basis for valuing a company, where the value of a company is equal to the present value of the free cash flow expected to be generated over the life of the business, discounted at the firm's weighted average cost of capital. Valuation based on economic value added gives equivalent results, but the massive body of academic research demonstrates that accounting profits are only coincidentally related to firm value (Stewart 1991; Copeland, Koller, and Murrin 1992; and Damodaran 1996).

CAUTIONS IN THE USE OF FREE CASH FLOW

A firm with high profits is generally preferred by investors to a firm with low profits. Can the same conclusion be drawn with regard to free cash flow? Jensen (1986) suggested that firms with substantial free cash flow may have low growth prospects and little or no potential projects with positive net present values. Firms with low growth prospects and large free cash flow may become targets of hostile takeover attempts. An agency conflict arises in that managers may be tempted to invest these funds at below the cost of capital or misuse it on organizational inefficiencies. Jensen advanced the hypothesis that a major source of stockholder gain when publicly held companies go private is the mitigation of agency problems associated with free cash flow. Thus, having high free cash flow in not necessarily a desirable condition.

Research results on Jensen's free cash flow hypotheses have been mixed. Lehn and Poulsen (1989) supported the hypothesis: they found a significant relationship between undistributed cash flow and a firm's decision to go private, and that premiums paid to stockholders in going private transactions were significantly related to undistributed cash flow. In contrast, Kieschnick (1998) did not find that the prior level of a firm's free cash flow was a significant determinant of the odds of it going private. Nor was there a significant relationship between free cash flow and premiums paid when firms go private.
If free cash flow is high because of inadequate investment opportunities, there may be a need to consider an acquisition or an expansion into another line of business.

A company may also be able to attain high levels of free cash flow by stretching accounts payables, collecting receivables more diligently, depleting inventory, or deferring taxes. Gains in free cash flow from these means, however, are only temporary. Accounts payable and deferred taxes must eventually be paid, inventory must be restocked, and collection policies must be brought in line with the competition.

On the other hand, low or negative free cash flow is not necessarily a reason for concern. Free cash flow may be depressed for several years because of a high level of investment demands. And a low level of free cash flow in any one year may reflect significant investment requirements in that year. Those investments may help the firm sustain a higher rate of sales growth in the future. Of course, negative free cash flow that arises because of negative operating earnings is not desirable and creates a need for prompt corrective action by the company.

Finally, there is the problem of consistency and comparability among companies reporting free cash flow in their financial statements. There are many ways to define free cash flow, and companies provide their own definitions and calculations in their annual reports. When a firm changes its free cash flow definition, the change in reported free cash flow can be astonishing. Coca-Cola, for example, changed its definition of free cash flow in 1999 with the result that its reported free cash flow increased in 1998 by over $500 million and by almost $2 billion in 1999 (Mills, Bible, and Mason 2002). Twelve different definitions of free cash flow from corporations, financial reporting services, and finance textbooks are reviewed by Mills, Bible, and Mason (2002). They point out although free cash flow is an important measure of a firm's financial strength, there is a need for a consensus of what it actually represents. Thus if one wishes to compare the free cash flow of various companies, it is necessary to select a definition and then compute each firm's free cash flow according to that definition. One cannot simply use the free cash flow figures reported in the annual reports of the individual firms because of the variety of definitions used.

CONCLUSION

Reported profits can be manipulated by a variety of accounting gimmicks, but it is far more difficult to manipulate free cash flow and the working capital accounts. Thus, it is possible for a company to report positive profits as it heads to bankruptcy. Free cash flow, however, would generally begin to decline much earlier, and investors who focus on this variable may become aware of an approaching problem. Free cash flow indicates the amount of cash flow actually available for distribution to all investors; it is a more reliable variable than reported profits - either you have the cash or you don't - and thus it may be a better measure of a firm's performance. Positive free cash flow is generally preferred by investors, but there are cases where negative free cash flow is acceptable.

In recent years corporate finance textbooks have included free cash flow analysis as a component of the evaluation of financial performance, and business students, most of whom are required to take at least one finance course, have the opportunity to learn about this concept. It is important that a wider number of individuals become familiar with this concept because many of them will become investors and it is important that they understand performance measures beyond reported profits. Inclusion of a discussion of free cash flow in the Introduction to Business course would be a step in the right direction

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