Financial Statement Analysis

Introduction

- **Financial statements** are important tools through which investors, financial analysts, and other interested outside parties (such as creditors) obtain information about a corporation.
- They are also useful for managers within the firm as a source of information for corporate financial decisions. Financial managers assess the success of their own firm and compare it to the performance of competitors
- Financial statements are accounting reports with past performance information that a firm issues periodically (usually quarterly and annually).
- Private companies often prepare financial statements as well, but they usually do not have to disclose these reports to the public.

Financial Reporting

- The reporting standards ensure that the transactions are reported by the firms similarly. However, standards must remain flexible and allow discretion to management to properly describe the economies of scale.
- The standard-setting body IASB i.e. International Accounting Standards Boards has established International Financial Reporting Standards (IFRS). IFRS Standards are required in more than 140 jurisdictions and permitted in many parts of the world. In the United States, Financial Accounting Standards Board (FASB) set forth Generally Accepted Accounting Principles (GAAP) which is generally referred to as US GAAP.
- India has adopted the Indian accounting standards (Ind AS) that are based on and substantially converged with IFRS. India used to follow Indian GAAP prior to Ind AS.

Types of Financial Statements

- Every public company is required to produce four financial statements: the **balance sheet, the income statement, the statement of cash flows, and the statement of stockholders' equity.**
- The **balance sheet**, or **statement of financial position**, lists the firm's *assets* and *liabilities*, providing a snapshot of the firm's financial position at a given point in time.
- The balance sheet is divided into two parts, with the assets on the left side and the liabilities on the right. The **assets** list the cash, inventory, property, plant, and equipment, and other investments the company has made; the **liabilities** show the firm's obligations to creditors.

GLOBAL CONGLOMERATE CORPORATION

Consolidated Balance Sheet
Year Ended December 31 (in $ million)

Assets	2015	2014	Liabilities and Stockholders' Equity	2015	2014
Current Assets			**Current Liabilities**		
Cash	21.2	19.5	Accounts payable	29.2	24.5
Accounts receivable	18.5	13.2	Notes payable/short-term debt	3.5	3.2
Inventories	15.3	14.3	Current maturities of long-term debt	13.3	12.3
Other current assets	2.0	1.0	Other current liabilities	2.0	4.0
Total current assets	57.0	48.0	Total current liabilities	48.0	44.0
Long-Term Assets			**Long-Term Liabilities**		
Land	22.2	20.7	Long-term debt	99.9	76.3
Buildings	36.5	30.5	Capital lease obligations	—	—
Equipment	39.7	33.2	Total debt	99.9	76.3
Less accumulated depreciation	(18.7)	(17.5)	Deferred taxes	7.6	7.4
Net property, plant, and equipment	79.7	66.9	Other long-term liabilities	—	—
Goodwill and intangible assets	20.0	20.0	Total long-term liabilities	107.5	83.7
Other long-term assets	21.0	14.0	Total Liabilities	155.5	127.7
Total long-term assets	120.7	100.9	Stockholders' Equity	22.2	21.2
Total Assets	177.7	148.9	Total Liabilities and Stockholders' Equity	177.7	148.9

- Also shown with liabilities on the right side of the balance sheet is the stockholders' equity. **Stockholders' equity**, the difference between the firm's assets and liabilities, is an accounting measure of the firm's net worth.
- The assets on the left side show how the firm uses its capital (its investments), and the right side summarizes the sources of capital, or how a firm raises the money it needs.
- Because of the way stockholders' equity is calculated, the left and right sides must balance: The Balance Sheet Identity

Assets = Liabilities + Stockholders' Equity

Assets- Current and Long term

- Assets are divided into **current and long-term assets**.
- **Current assets** are either cash or assets that could be converted into cash within one year. This category includes the following:

➢Cash and other **marketable securities**, which are short-term, low-risk investments that can be easily sold and converted to cash (such as money market investments like government debt that matures within a year);

➢**Accounts receivable**, which are amounts owed to the firm by customers who have purchased goods or services on credit;

➢**Inventories**, which are composed of raw materials as well as work-in-progress and finished goods;

➢Other current assets, which is a catch-all category that includes items such as prepaid expenses (such as rent or insurance paid in advance).

- The first category of **long-term assets** is net property, plant, and equipment. These include assets such as real estate or machinery that produce tangible benefits for more than one year.
- The firm reduces the value of fixed assets (other than land) over time according to a depreciation schedule that depends on the asset's life span. This is because equipment tends to wear out or become obsolete over time. The company will reduce the value recorded for this equipment each year by deducting a **depreciation expense.**
- Depreciation is not an actual cash expense that the firm pays; it is a way of recognizing that buildings and equipment wear out and thus become less valuable the older they get. **The book value of an asset, which is the value shown in the firm's financial statements, is equal to its acquisition cost less accumulated depreciation**.

- When a firm acquires another company, it will acquire a set of tangible assets (such as inventory or property, plant, and equipment) that will then be included on its balance sheet. In many cases, however, the firm may pay more for the company than the total book value of the assets it acquires. In this case, the difference between the price paid for the company and the book value assigned to its tangible assets is recorded separately as **goodwill** and **intangible assets**.
- The value of other intangibles that the firm acquired through the acquisition include brand names and trademarks, patents, customer relationships, and employees). If the firm assesses that the value of these intangible assets declined over time, it will reduce the amount listed on the balance sheet by an **amortization** or **impairment charge** that captures the change in value of the acquired assets. Like depreciation, amortization is not an actual cash expense.
- Other long-term assets can include such items as property not used in business operations, start-up costs in connection with a new business, investments in long-term securities, and property held for sale.

Calculating depreciation

- Depreciation is a way for businesses to allocate the cost of fixed assets, including buildings, equipment, machinery, and furniture, to the years the business will use the assets. For book purposes, most businesses depreciate assets using the straight-line method.
- To calculate depreciation **using the straight-line method**, subtract the asset's salvage value (what you expect it to be worth at the end of its useful life) from its cost(includes all costs for acquiring the asset, including sales tax, transportation, set-up, and training). The result is the depreciable basis or the amount that can be depreciated. Divide this amount by the number of years in the asset's useful lifespan.
- The cumulative depreciation of a long term asset up to a single point in its life is called **accumulated depreciation**. The carrying value, or book value, of an asset on a balance sheet is the difference between its purchase price and the accumulated depreciation.

- The **double declining balance method of calculating depreciation** is used to recognize the majority of an asset's depreciation early in its lifespan.
- Double-declining-balance depreciation results in a larger amount expensed in the earlier years as opposed to the later years of an asset's useful life. The method reflects the fact that assets are typically more productive in their early years than in their later years – also, the practical fact that any asset (think of buying a car) loses more of its value in the first few years of its use. With the double-declining-balance method, **the depreciation factor is 2x that of the straight-line expense method.**
- Depreciation formula for the double-declining balance method:

Periodic Depreciation Expense = Beginning book value x Rate of depreciation

Double declining balance method example

Year #		1	2	3	4	5	6	7	8
DDB									
Opening Book Value		25,000	18,750	14,063	10,547	7,910	5,933	4,449	3,337
Depreciation	25%	6,250	4,688	3,516	2,637	1,978	1,483	1,112	834
Ending Book Value	25,000	18,750	14,063	10,547	7,910	5,933	4,449	3,337	2,503

- Consider a piece of property, plant, and equipment (PP&E) that costs Rs 25,000, with an estimated useful life of 8 years and a Rs 2,500 salvage value. To calculate the double-declining balance depreciation, set up a schedule (previous slide).
- The beginning book value of the asset is filled in at the beginning of year 1 and the salvage value is filled in at the end of year 8.
- The rate of depreciation (Rate) is calculated as follows:

Expense = (100% / Useful life of asset) x 2

Expense = (100% / 8) x 2 = 25%

- Since this is a double-declining method**,** we multiply the rate of depreciation by 2.
- Multiply the rate of depreciation by the beginning book value to determine the expense for that year. For example, Rs 25,000 x 25% = Rs 6,250 depreciation expense.
- Subtract the expense from the beginning book value to arrive at the ending book value. For example, Rs 25,000 – Rs 6,250 = Rs 18,750 ending book value at the end of the first year.
- The ending book value for that year is the beginning book value for the following year. For example, the year 1 ending book value of Rs 18,750 would be the year 2 beginning book value. Repeat this until the last year of useful life.

Liabilities

- Liabilities are divided into current and long-term liabilities. **Liabilities that will be satisfied within one year are known as current liabilities**. They include the following:

➢ **Accounts payable**, the amounts owed to suppliers for products or services purchased with credit;

➢ **Short-term debt** or notes payable, and current maturities of *long-term debt*, which are all repayments of debt that will occur within the next year;

➢ **Items such as salary** that are owed but have not yet been paid, and deferred or unearned revenue, which is revenue that has been received for products that have not yet been delivered.

- The difference between current assets and current liabilities is the firm's **net working capital**, the capital available in the short term to run the business. Firms with low (or negative) net working capital may face a shortage of funds unless they generate sufficient cash from their ongoing activities.

- **Long-term liabilities** are liabilities that extend beyond one year. The main types are as follows:

➢ **Long-term debt** is any loan or debt obligation with a maturity of more than a year. When a firm needs to raise funds to purchase an asset or make an investment, it may borrow those funds through a long-term loan.

➢ **Capital leases** are long-term lease contracts that obligate the firm to make regular lease payments in exchange for use of an asset. They allow a firm to gain use of an asset by leasing it from the asset's owner. For example, a firm may lease a building to serve as its corporate headquarters.

➢ **Deferred taxes** are taxes that are owed but have not yet been paid.

- Firms generally keep two sets of financial statements: one for financial reporting and one for tax purposes. Occasionally, the rules for the two types of statements differ. Deferred tax liabilities generally arise when the firm's financial income in the financial statement exceeds its income for tax purposes in the tax statement. Because deferred taxes will eventually be paid, they appear as a liability on the balance sheet.

How is a deferred tax liability created?

- **One of the most common deferred tax liability examples is when a company depreciates its assets differently**. When a company depreciates its assets at a lower rate, its gross profit inflates in its books compared to what is derived in its tax reports in a particular year.
- Consider the following example. Company A depreciates its assets in the **straight line method in its income statement** but adopts the **diminishing balance method in its tax reports**. It has assets worth Rs 2 lakh which depreciates at a 10 per cent rate in its books and 15 per cent rate in its tax statements in FY 2019-20. It also has generated revenues worth Rs 8 lakh in that year and incurred expenses of Rs 5 lakh excluding depreciation on assets.

DTL due to variance in depreciation rates

Particulars	For books (in Rs)	For tax purpose(in Rs)	Difference(in Rs)
Revenues	8,00,000	8,00,000	Nil
Expenses	5,00,000	5,00,000	Nil
Depreciation	20,000	30,000	10,000
Gross Profit	2,80,000	2,70,000	10,000
Tax @25%	70,000	67,500	**2500**
Net Profit	2,10,000	2,02,500	7500

- **Deferred tax liability can also arise when there is a difference in the way certain revenues and expenses are treated in financial reports.** For instance, tax is only levied on revenues that has company has realized in a particular year, whereas per accounting principles, future receivables such as credit sales are recorded in the income statement in the year such transaction has taken place and not when they are realized. Hence, it creates a disparity in the revenue shown in an income statement and tax reports. As tax shall be paid in a subsequent year when such revenue is realized, it is considered as a deferred tax liability.
- Consider a company that sells its good on credit. In FY 2019-20, it sold Rs 10 lakh worth of goods at credit, out of which it received Rs 4 lakh in a particular year and the rest will be paid by debtors in the following fiscal year. It also incurred expenses worth Rs 5 lakh in that year and earned Rs 3 lakh on investments.

DTL due to difference in treatment of revenues and expenses

Particulars	Income Statement(in Rs)	Tax Report((in Rs)	Difference(in Rs)
Sales	10,00,000	4,00,000	6,00,000
Interest from investments	3,00,000	3,00,000	Nil
Expenses	5,00,000	5,00,000	Nil
Gross Profit	8,00,000	2,00,000	6,00,000
Tax@25%	2,00,000	50,000	**1,50,000**

Stockholder's equity

- The sum of the current liabilities and long-term liabilities is total liabilities. The difference between the firm's assets and liabilities is the stockholders' equity; it is also called the **book value of equity**. It is an accounting measure of the **net worth of the firm**.
- Ideally, the balance sheet would provide us with an accurate assessment of the true value of the firm's equity. Unfortunately, this is unlikely to be the case. **First, many of the assets listed on the balance sheet are valued based on their historical cost rather than their true value today.** For example, an office building is listed on the balance sheet according to its historical cost net of depreciation. But the actual value of the office building today may be very different (and possibly much *more*) than the amount the firm paid for it years ago. The same is true for other property, plant, and equipment, as well as goodwill.
- A second, and probably more important, problem is that **many of the firm's valuable assets are not captured on the balance sheet**. Consider, for example, the expertise of the firm's employees, the firm's reputation in the marketplace, the relationships with customers and suppliers, the value of future research and development innovations, and the quality of the management team. These are all assets that add to the value of the firm that do not appear on the balance sheet.

Market value versus Book value

- The book value of equity, while accurate from an accounting perspective, is an inaccurate assessment of the true value of the firm's equity. Successful firms are often able to borrow in excess of the book value of their assets because creditors recognize that the market value of the assets is far higher than the book value. Thus, it is not surprising that the book value of equity will often differ substantially from the amount investors are willing to pay for the equity.
- The total **market value of a firm's equity** equals the number of shares outstanding times the firm's market price per share:

Market Value of Equity = Shares outstanding * Market price per share

- The market value of equity is often referred to as the company's **market capitalization** (or market cap). The market value of a stock does not depend on the historical cost of the firm's assets; instead, it depends on what investors expect those assets to produce in the future.

Market to Book Ratio (also called price to book ratio) =

$$\frac{\text{Market Value of Equity}}{\text{Book Value of Equity}}$$

- The market-to-book ratio for most successful firms substantially exceeds 1, indicating that the value of the firm's assets when put to use exceeds their historical cost. Variations in this ratio reflect differences in fundamental firm characteristics as well as the value added by management.
- If Global has 3.6 million shares outstanding, and these shares are trading for a price of $14 per share, Global's market capitalization is (3.6 million shares)*($14/share) = $50.4 million. This market capitalization is significantly higher than Global's book value of equity of $22.2 million.
- Thus, investors are willing to pay 50.4/22.2 = 2.27 times the amount Global's shares are worth according to their book value.

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Year Ended December 31 (in $ million)

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Other current assets	2.0	1.0	Other current liabilities	2.0	4.0
Total current assets	57.0	48.0	Total current liabilities	48.0	44.0
Long-Term Assets			**Long-Term Liabilities**		
Land	22.2	20.7	Long-term debt	99.9	76.3
Buildings	36.5	30.5	Capital lease obligations	—	—
Equipment	39.7	33.2	Total debt	99.9	76.3
Less accumulated depreciation	(18.7)	(17.5)	Deferred taxes	7.6	7.4
Net property, plant, and equipment	79.7	66.9	Other long-term liabilities	—	—
Goodwill and intangible assets	20.0	20.0	Total long-term liabilities	107.5	83.7
Other long-term assets	21.0	14.0	Total Liabilities	155.5	127.7
Total long-term assets	120.7	100.9	Stockholders' Equity	22.2	21.2
Total Assets	177.7	148.9	Total Liabilities and Stockholders' Equity	177.7	148.9

Enterprise value

- The enterprise value of a firm (also called the total enterprise value or TEV) assesses the value of the underlying business assets unencumbered by debt and separate from any cash and marketable securities. We compute it as follows:

Enterprise Value = Market Value of Equity + Debt – Cash

- **The enterprise value can be interpreted as the cost to take over the business**. That is, it would cost $50.4 million which is the market value of equity + $116.7 million in debt($3.5 million of notes payable, $13.3 million of current maturities of long-term debt, and remaining long-term debt of $99.9 million) = **$167.1 million to buy all of Global's equity and pay off its debts**, but because we would acquire Global's $21.2 million in cash, the net cost of the business is only 167.1 - 21.2 = $145.9 million.

Income Statement

- The **income statement** or statement of financial performance lists the firm's revenues and expenses over a period of time. The last or "bottom" line of the income statement shows the firm's **net income**, which is a **measure of its profitability** during the period. The income statement is sometimes called a **profit and loss,** or P&L statement, and the net income is also referred to as the firm's **earnings**.
- Whereas the balance sheet shows the firm's assets and liabilities at a given point in time, the income statement shows **the flow of revenues and expenses generated by those assets and liabilities** between two dates.

GLOBAL CONGLOMERATE CORPORATION

Income Statement
Year Ended December 31 (in $ million)

	2015	2014
Total sales	186.7	176.1
Cost of sales	(153.4)	(147.3)
Gross Profit	33.3	28.8
Selling, general, and administrative expenses	(13.5)	(13.0)
Research and development	(8.2)	(7.6)
Depreciation and amortization	(1.2)	(1.1)
Operating Income	10.4	7.1
Other income	—	—
Earnings Before Interest and Taxes (EBIT)	10.4	7.1
Interest income (expense)	(7.7)	(4.6)
Pretax Income	2.7	2.5
Taxes	(0.7)	(0.6)
Net Income	2.0	1.9
Earnings per share:	$0.556	$0.528
Diluted earnings per share:	$0.526	$0.500

Earnings calculations

- **Gross profit**

➢ The first two lines of the income statement list the revenues from sales of products and the costs incurred to make and sell the products. Cost of sales shows costs directly related to producing the goods or services being sold, such as manufacturing costs. Other costs such as administrative expenses, research and development, and interest expenses are not included in the cost of sales. The third line is **gross profit**, which is the difference between sales revenues and the costs.

- **Operating expenses**

➢ The next group of items is operating expenses. These are expenses from the ordinary course of running the business that are not directly related to producing the goods or services being sold. They include administrative expenses and overhead, salaries, marketing costs, and research and development expenses. The third type of operating expense, depreciation and amortization, is not an actual cash expense but represents an estimate of the costs that arise from wear and tear or obsolescence of the firm's assets. The firm's gross profit net of operating expenses is called **operating income.**

- **Earnings before Interest and Taxes-** We next include other sources of income or expenses that arise from activities that are not the central part of a company's business. Income from the firm's financial investments is one example of other income that would be listed here. After we have adjusted for other sources of income or expenses, we have the firm's earnings before interest and taxes, or **EBIT**.
- **Pretax and Net Income-** From EBIT, we deduct the interest expense related to outstanding debt to compute Global's pretax income, and then we deduct corporate taxes to determine the firm's net income.
- Net income represents the total earnings of the firm's equity holders. It is often reported on a per-share basis as the firm's **earnings per share (EPS)**, which we compute by dividing net income by the total number of shares outstanding **EPS= Net income/ Number of shares outstanding**
- The number of shares outstanding may grow if Global compensates its employees or executives with **stock options** that give the holder the right to buy a certain number of shares by a specific date at a specific price. If the options are "exercised," the company issues new stock and the number of shares outstanding will grow. The number of shares may also grow if the firm issues **convertible bonds**, a form of debt that can be converted to shares. Because there will be more total shares to divide the same earnings, this growth in the number of shares is referred to as **dilution**.
- Firms disclose the potential for dilution by reporting **diluted EPS**, which represents earnings per share for the company calculated as though, for example, in-the-money stock options or other stock-based compensation had been exercised or dilutive convertible debt had been converted.

Statement of cash flows

- The income statement provides a measure of the firm's profit over a given time period. However, it does not indicate the amount of *cash* the firm has generated. T**here are two reasons that net income does not correspond to cash earned.** First, there are non-cash entries on the income statement, such as depreciation and amortization. Second, certain uses of cash, such as the purchase of a building or expenditures on inventory, are not reported on the income statement.
- **The firm's statement of cash flows utilizes the information from the income statement and balance sheet to determine how much cash the firm has generated, and how that cash has been allocated**, during a set period. From the perspective of an investor attempting to value the firm, the statement of cash flows provides what may be the most important information of the four financial statements.
- **The statement of cash flows is divided into three sections: operating activities, investment activities, and financing activities**. The first section, operating activity, starts with net income from the income statement. It then adjusts this number by adding back all non-cash entries related to the firm's operating activities. The next section, investment activity, lists the cash used for investment. The third section, financing activity, shows the flow of cash between the firm and its investors.

GLOBAL CONGLOMERATE CORPORATION

Statement of Cash Flows
Year Ended December 31 (in $ million)

	2015	2014
Operating activities		
Net income	2.0	1.9
Depreciation and amortization	1.2	1.1
Other non-cash items	(2.8)	(1.0)
Cash effect of changes in		
Accounts receivable	(5.3)	(0.3)
Accounts payable	4.7	(0.5)
Inventory	(1.0)	(1.0)
Cash from operating activities	(1.2)	0.2
Investment activities		
Capital expenditures	(14.0)	(4.0)
Acquisitions and other investing activity	(7.0)	(2.0)
Cash from investing activities	(21.0)	(6.0)
Financing activities		
Dividends paid	(1.0)	(1.0)
Sale (or purchase) of stock	—	—
Increase in borrowing	24.9	5.5
Cash from financing activities	23.9	4.5
Change in cash and cash equivalents	1.7	(1.3)

Operating activity

- The first section of Global's statement of cash flows adjusts net income by all non-cash items related to operating activity. For instance, depreciation is deducted when computing net income, but it is not an actual cash outflow. **Thus, we add it back to net income when determining the amount of cash the firm has generated**. Similarly, we add back any other non-cash expenses (for example, deferred taxes or expenses related to stock-based compensation).
- Next, we adjust for changes to net working capital that arise from changes to accounts receivable, accounts payable, or inventory. When a firm sells a product, it records the revenue as income even though it may not receive the cash from that sale immediately. Instead, it may grant the customer credit and let the customer pay in the future. The customer's obligation adds to the firm's accounts receivable.

- We use the following guidelines to adjust for changes in working capital:

➢ **Accounts Receivable:** When a sale is recorded as part of net income, but the cash has not yet been received from the customer, we must adjust the cash flows by *deducting* the increases in accounts receivable. This increase represents additional lending by the firm to its customers, and it reduces the cash available to the firm.

➢ **Accounts Payable:** Conversely, we *add* increases in accounts payable. Accounts payable represents borrowing by the firm from its suppliers. This borrowing increases the cash available to the firm.

➢ **Inventory:** Finally, we *deduct* increases to inventory. Increases to inventory are not recorded as an expense and do not contribute to net income (the cost of the goods are only included in net income when the goods are actually sold). However, the cost of increasing inventory is a cash expense for the firm and must be deducted.

- We can identify the changes in these working capital items from the balance sheet. For example, Global's accounts receivable increased from $13.2 million in 2014 to $18.5 million in 2015. We deduct the increase of 18.5 - 13.2 = $5.3 million on the statement of cash flows. **Note that although Global showed positive net income on the income statement, it actually had a negative $1.2 million cash flow from operating activity, in large part because of the increase in accounts receivable.**

Investment Activity

- The next section of the statement of cash flows shows the cash required for investment activities. Purchases of new property, plant, and equipment are referred to as **capital expenditures**. Recall that capital expenditures do not appear immediately as expenses on the income statement. Instead, firms recognize these expenditures over time as depreciation expenses.
- To determine the firm's cash flow, we already added back depreciation because it is not an actual cash outflow. Now, we subtract the actual capital expenditure that the firm made. Similarly, we also deduct other assets purchased or long-term investments made by the firm, such as acquisitions or purchases of marketable securities. We see that in 2015, Global spent $21 million in cash on investing activities.

Financing Activity

- The last section of the statement of cash flows shows the cash flows from financing activities. Dividends paid to shareholders are a cash outflow. Global paid $1 million to its shareholders as dividends in 2015.
- The difference between a firm's net income and the amount it spends on dividends is referred to as the firm's **retained earnings** for that year:

Retained Earnings = Net Income - Dividends

- Global retained $2 million - $1 million = $1 million, or 50% of its earnings in 2015.
- Also listed under financing activity is any cash the company received from the sale of its own stock, or cash spent buying (repurchasing) its own stock. Global did not issue or repurchase stock during this period.
- The last items to include in this section result from changes to Global's short-term and long-term borrowing. Global raised money by issuing debt, so the increases in borrowing represent cash inflows.

- The final line of the statement of cash flows combines the cash flows from these three activities to calculate the overall change in the firm's cash balance over the period of the statement.
- In this case, Global had cash inflows of $1.7 million, which matches the change in cash from 2014 to 2015 shown earlier in the balance sheet. By looking at the statement as a whole, we can determine that Global chose to borrow to cover the cost of its investment and operating activities.
- **Although the firm's cash balance has increased, Global's negative operating cash flows and relatively high expenditures on investment activities might give investors some reasons for concern**. If that pattern continues, Global will need to raise capital, by continuing to borrow or issuing equity, to remain in business.

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Goodwill and intangible assets	20.0	20.0	Total long-term liabilities	107.5	83.7
Other long-term assets	21.0	14.0	Total Liabilities	155.5	127.7
Total long-term assets	120.7	100.9	Stockholders' Equity	22.2	21.2
Total Assets	177.7	148.9	Total Liabilities and Stockholders' Equity	177.7	148.9

Management Discussion & Analysis

- The **management discussion and analysis (MD&A)** is a preface to the financial statements in which the company's management discusses the recent year (or quarter), providing a background on the company and any significant events that may have occurred. Management may also discuss the coming year, and outline goals, new projects, and future plans.
- Management should also discuss any important risks that the firm faces or issues that may affect the firm's liquidity or resources. Management is also required to disclose any **off-balance sheet transactions**, which are transactions or arrangements that can have a material impact on the firm's future performance yet do not appear on the balance sheet. For example, if a firm has made guarantees that it will compensate a buyer for losses related to an asset purchased from the firm, these guarantees represent a potential future liability for the firm that must be disclosed as part of the MD&A.

Notes to Financial Statements

- In addition to the four financial statements, companies provide extensive notes with further details on the information provided in the statements. For example, the notes document important accounting assumptions that were used in preparing the statements. They often provide information specific to a firm's subsidiaries or its separate product lines.
- They show the details of the firm's stock-based compensation plans for employees and the different types of debt the firm has outstanding. Details of acquisitions, spin-offs, leases, taxes, debt repayment schedules, and risk management activities are also given. The information provided in the notes is often very important to interpret fully the firm's financial statements.

Financial Statement Analysis

- Investors often use accounting statements to evaluate a firm in one of two ways:

➢Compare the firm with itself by analyzing how the firm has changed over time.

➢Compare the firm to other similar firms using a common set of financial ratios. The most commonly used ratios are related to profitability, liquidity, working capital, interest coverage, leverage, valuation, and operating returns.

GLOBAL CONGLOMERATE CORPORATION

Income Statement
Year Ended December 31 (in $ million)

	2015	2014
Total sales	186.7	176.1
Cost of sales	(153.4)	(147.3)
Gross Profit	33.3	28.8
Selling, general, and administrative expenses	(13.5)	(13.0)
Research and development	(8.2)	(7.6)
Depreciation and amortization	(1.2)	(1.1)
Operating Income	10.4	7.1
Other income	—	—
Earnings Before Interest and Taxes (EBIT)	10.4	7.1
Interest income (expense)	(7.7)	(4.6)
Pretax Income	2.7	2.5
Taxes	(0.7)	(0.6)
Net Income	2.0	1.9
Earnings per share:	$0.556	$0.528
Diluted earnings per share:	$0.526	$0.500

Profitability ratios

- The income statement provides very useful information regarding the profitability of a firm's business and how it relates to the value of the firm's shares. **The gross margin of a firm is the ratio of gross profit to revenues(sales)**. A firm's gross margin reflects its ability to sell a product for more than the cost of producing it.
- For example, in 2015, Global had gross margin of 33.3/186.7 = 17.8%. Because there are additional expenses of operating a business beyond the direct costs of goods sold, another important profitability ratio is the **operating margin**, the ratio of operating income to revenues:

Operating Margin = Operating Income/Sales

- The operating margin reveals how much a company earns before interest and taxes from each dollar of sales. In 2015, Global's operating margin was 10.4/186.7 = 5.57%, an increase from its 2014 operating margin of 7.1/176.1 = 4.03%. We can similarly compute a firm's **EBIT margin** = (EBIT/Sales).
- **By comparing operating or EBIT margins across firms within an industry, we can assess the relative efficiency of the firms' operations.**

- In addition to the efficiency of operations, **differences in operating margins can result from corporate strategy**. For example, in 2014, high-end retailer Nordstrom had an operating margin of 9.8%; Wal-Mart Stores (WMT, brand name Walmart) had an operating margin of only 5.6%. In this case, Walmart's lower operating margin was not a result of its inefficiency. Rather, the low operating margin is part of Walmart's strategy of offering low prices to sell common products in high volume. Indeed, Walmart's sales were nearly 36 times higher than those of Nordstrom.
- Finally, a firm's **net profit margin** is the ratio of net income to revenues:

Net Profit Margin = Net Income/Sales

The net profit margin shows the fraction of each dollar in revenues that is available to equity holders after the firm pays interest and taxes.

- In 2015, Global's net profit margin was 2.0/186.7 = 1.07%. One must be cautious when comparing net profit margins: While differences in net profit margins can be due to differences in efficiency, they can also result from differences in leverage, which determines the amount of interest expense, as well as differences in accounting assumptions.

Liquidity ratios

- Financial analysts often use the information in the firm's balance sheet to assess its financial solvency or liquidity. Specifically, creditors often compare a firm's current assets and current liabilities to assess whether the firm has sufficient working capital to meet its short-term needs. This comparison can be summarized in the firm's **current ratio, the ratio of current assets to current liabilities**. Notice that Global's current ratio increased from 48/44 = 1.09 in 2014 to 57/48 = 1.19 in 2015.
- A more stringent test of the firm's liquidity is the **quick ratio, which compares only cash and "near cash" assets, such as short-term investments and accounts receivable, to current liabilities**. In 2015, Global's quick ratio was (21.2 + 18.5)/48 = 0.83. A higher current or quick ratio implies less risk of the firm experiencing a cash shortfall in the near future. A reason to exclude inventory is that it may not be that liquid; indeed an increase in the current ratio that results from an unusual increase in inventory could be an indicator that the firm is having difficulty selling its products.

GLOBAL CONGLOMERATE CORPORATION

Consolidated Balance Sheet
Year Ended December 31 (in $ million)

Assets	2015	2014	Liabilities and Stockholders' Equity	2015	2014
Current Assets			**Current Liabilities**		
Cash	21.2	19.5	Accounts payable	29.2	24.5
Accounts receivable	18.5	13.2	Notes payable/short-term debt	3.5	3.2
Inventories	15.3	14.3	Current maturities of long-term debt	13.3	12.3
Other current assets	2.0	1.0	Other current liabilities	2.0	4.0
Total current assets	57.0	48.0	Total current liabilities	48.0	44.0
Long-Term Assets			**Long-Term Liabilities**		
Land	22.2	20.7	Long-term debt	99.9	76.3
Buildings	36.5	30.5	Capital lease obligations	—	—
Equipment	39.7	33.2	Total debt	99.9	76.3
Less accumulated depreciation	(18.7)	(17.5)	Deferred taxes	7.6	7.4
Net property, plant, and equipment	79.7	66.9	Other long-term liabilities	—	—
Goodwill and intangible assets	20.0	20.0	Total long-term liabilities	107.5	83.7
Other long-term assets	21.0	14.0	Total Liabilities	155.5	127.7
Total long-term assets	120.7	100.9	Stockholders' Equity	22.2	21.2
Total Assets	177.7	148.9	Total Liabilities and Stockholders' Equity	177.7	148.9

- Ultimately, firms need cash to pay employees and meet other obligations. Running out of cash can be very costly for a firm, so firms often gauge their cash position by calculating the **cash ratio**, which is the most stringent liquidity ratio.

Cash ratio= Cash/ Current Liabilities

- Of course, all of these liquidity ratios are limited in that they only consider the firm's current assets. If the firm is able to generate significant cash quickly from its ongoing activities, it might be highly liquid even if these ratios are poor.

Working Capital Ratios

- We can use the combined information in the firm's income statement and balance sheet to gauge how efficiently the firm is utilizing its net working capital. To evaluate the speed at which a company turns sales into cash, firms often compute the number of **accounts receivable days**—that is, the number of days' worth of sales accounts receivable represents.

Accounts Receivable Days =Accounts Receivable/Average Daily Sales

- Given average daily sales of $186.7 million/365 = $0.51 million in 2015, Global's receivables of $18.5 million represent 18.5/0.51 = 36 days' worth of sales. In other words, on average, Global takes a little over one month to collect payment from its customers. In 2014, **Global's accounts receivable represented only 27 days' worth of sales. Although the number of receivable days can fluctuate seasonally, a significant unexplained increase could be a cause for concern** (perhaps indicating the firm is doing a poor job of collecting from its customers or is trying to boost sales by offering generous credit terms).

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- There are similar ratios for accounts payable and inventory. For these items, it is natural to compare them to the firm's cost of sales, which should reflect the total amount paid to suppliers and inventory sold. Therefore, **accounts payable days** is defined as:

  Accounts Payable Days = Accounts Payable/Average Daily Cost of Sales

  Similarly, **inventory days** = (inventory/average daily cost of sales).

- **Turnover ratios** are an alternative way to measure working capital. We compute turnover ratios by expressing annual revenues or costs as a multiple of the corresponding working capital account. For example,

  Inventory Turnover =Annual Cost of Sales/Inventory

- Global's **inventory turnover** in 2015 is 153.4/15.3 = 10.0, indicating that Global sold roughly 10 times its current stock of inventory during the year. Similarly, **accounts receivable turnover** = (annual sales/accounts receivable) and **accounts payable turn over** = (annual cost of sales/accounts payable). Note that higher turnover corresponds to shorter days, and thus a more efficient use of working capital.

- **While working capital ratios can be meaningfully compared over time or within an industry, there are wide differences across industries**. Airlines tend to have minimal accounts receivable or inventory, as their customers pay in advance and they sell a transportation service as opposed to a physical commodity. On the other hand, distillers and wine producers tend to have very large inventory (over 300 days on average), as their products are often aged prior to sale.

Interest Coverage ratios

- Lenders often assess a firm's ability to meet its interest obligations by comparing its earnings with its interest expenses using an **interest coverage ratio**. One common ratio to consider is the firm's EBIT as a multiple of its interest expenses. A high ratio indicates that the firm is earning much more than is necessary to meet its required interest payments.
- As a benchmark, creditors often look for an EBIT/Interest coverage ratio in excess of 5x for high-quality borrowers. When EBIT/Interest falls below 1.5, lenders may begin to question a company's ability to repay its debts.
- Depreciation and amortization expenses are deducted when computing EBIT, but they are not actually cash expenses for the firm. Consequently, financial analysts often compute a firm's earnings before interest, taxes, depreciation, and amortization, or **EBITDA**, as a measure of the cash a firm generates from its operations and has available to make interest payments.

EBITDA = EBIT + Depreciation and Amortization

- We can similarly compute the firm's EBITDA/Interest coverage ratio

Leverage ratios

- An important piece of information that we can learn from a firm's balance sheet is the firm's **leverage**, or the extent to which it relies on debt as a source of financing. The **debt-equity ratio** is a common ratio used to assess a firm's leverage. We calculate this ratio by dividing the total amount of short- and long-term debt (including current maturities) by the total stockholders' equity.

Debt to Equity Ratio =Total Debt/Total Equity

- We can calculate the debt-equity ratio using either book or market values for equity and debt. Global's debt in 2015 includes notes payable ($3.5 million), current maturities of long-term debt ($13.3 million), and long-term debt ($99.9 million), for a total of $116.7 million. Therefore, its book debt-equity ratio is 116.7/22.2 = 5.3, using the book value of equity.
- Because of the difficulty interpreting the book value of equity, the book debt-equity ratio is not especially useful. Indeed, the book value of equity might even be negative, making the ratio meaningless. It is therefore most informative to compare the firm's debt to the market value of its equity.

- We can also calculate the fraction of the firm financed by debt in terms of its **debt-to capital ratio**. Again, this ratio can be computed using book or market values.

Debt to Capital Ratio = Total Debt/(Total Equity + Total Debt)

- While leverage increases the risk to the firm's equity holders, firms may also hold cash reserves in order to reduce risk. Thus, another useful measure to consider is the firm's **net debt**, or debt in excess of its cash reserves:

Net Debt = Total Debt - Excess Cash & Short term Investments

- To understand why net debt may be a more relevant measure of leverage, consider a firm with more cash than debt outstanding: Because such a firm could pay off its debts immediately using its available cash, it has not increased its risk and has no effective leverage.
- Analogous to the debt-to-capital ratio, we can use the concept of net debt to compute the firm's **debt-to-enterprise value ratio**:

Debt to Enterprise Value Ratio = Net Debt/(Market Value of Equity + Net Debt)

= **Net Debt/ Enterprise Value**

- Given Global's 2015 cash balance of $21.2 million, and total long- and short-term debt of $116.7 million, its net debt is 116.7 - 21.2 = $95.5 million. Given its market value of equity of $50.4 million, Global's enterprise value in 2015 is 50.4 + 95.5 = $145.9 million, and thus its debt-to-enterprise value ratio is 95.5/145.9 = 65.5%. That is, 65.5% of Global's underlying business activity is financed via debt.
- The **market value equity multiplier**, which is generally measured as Enterprise Value/Market Value of Equity, indicates the amplification of shareholders' financial risk that results from leverage.

Valuation Ratios

- Analysts use a number of ratios to gauge the market value of the firm. The most common is the firm's **price-earnings ratio (P/E)**:

P/E Ratio = Market Capitalization/Net Income

= Share Price/ Earnings per Share

- That is, the P/E ratio is the ratio of the value of equity to the firm's earnings, either on a total basis or on a per-share basis. For example, Global's P/E ratio in 2015 was 50.4/2.0 = 14/0.556 = 25.2. In other words, investors are willing to pay over 25 times Global's earnings to purchase a share.
- **The P/E ratio is a simple measure that is used to assess whether a stock is over- or undervalued based on the idea that the value of a stock should be proportional to the level of earnings** it can generate for its shareholders. P/E ratios can vary widely across industries and tend to be highest for industries with high expected growth rates. The risk of the firm will also affect this ratio—all else equal, riskier firms have lower P/E ratios.

- Because the P/E ratio considers the value of the firm's equity, it is sensitive to the firm's choice of leverage. **The P/E ratio is therefore of limited usefulness when comparing firms with markedly different leverage.** We can avoid this limitation by instead assessing the market value of the underlying business using valuation ratios based on the firm's enterprise value.
- **Common ratios include the ratio of enterprise value to revenue, or enterprise value to operating income, EBIT, or EBITDA**. These ratios compare the value of the business to its sales, operating profits, or cash flow. Like the P/E ratio, these ratios are used to make intra-industry comparisons of how firms are priced in the market.

Operating returns

- Analysts often evaluate the firm's return on investment by comparing its income to its investment using ratios such as the firm's **return on equity (ROE)**

Return on Equity = Net Income/Book Value of Equity

- Global's ROE in 2015 was 2.0/22.2 = 9.0%. The ROE provides a measure of the return that the firm has earned on its past investments. A high ROE may indicate the firm is able to find investment opportunities that are very profitable.
- Another common measure is **return on assets (ROA)**, which we calculate as

Return on Assets = (Net Income + Interest Expense)/Book Value of Assets

- The ROA calculation includes interest expense in the numerator because the assets in the denominator have been funded by both debt and equity investors.

- As a performance measure, ROA has the benefit that it is less sensitive to leverage than ROE. However, it is sensitive to working capital—for example, an equal increase in the firm's receivables and payables will increase total assets and thus lower ROA. To avoid this problem, we can consider the firm's **return on invested capital (ROIC)**:

Return on Invested Capital = EBIT (1 - tax rate)/(Book Value of Equity + Net Debt)

- The return on invested capital measures the after-tax profit generated by the business itself, excluding any interest expenses (or interest income), and compares it to the capital raised from equity and debt holders that has already been deployed (i.e., is not held as cash). **Of the three measures of operating returns, ROIC is the most useful in assessing the performance of the underlying business.**

The DuPont Identity

- We can gain further insight into a firm's ROE using a tool called the **DuPont Identity** (named for the company that popularized its use), which expresses the ROE in terms of the firm's profitability, asset efficiency, and leverage.

$$\text{ROE} = \underbrace{\left(\frac{\text{Net Income}}{\text{Sales}}\right)}_{\text{Net Profit Margin}} \times \underbrace{\left(\frac{\text{Sales}}{\text{Total Assets}}\right)}_{\text{Asset Turnover}} \times \underbrace{\left(\frac{\text{Total Assets}}{\text{Book Value of Equity}}\right)}_{\text{Equity Multiplier}}$$

- The first term in the DuPont Identity is the firm's **net profit margin, which measures its overall profitability.** The **second term is the firm's asset turnover,** which measures how efficiently the firm is utilizing its assets to generate sales. Together, these terms determine the firm's return on assets.
- We compute ROE by multiplying by a measure of leverage called the equity multiplier, which indicates the value of assets held per dollar of shareholder equity. The greater the firm's reliance on debt financing, the higher the equity multiplier will be. Applying this identity to Global, we see that in 2015 its asset turnover is 186.7/177.7 = 1.05, with an equity multiplier of 177.7/22.2 = 8.
- Given its net profit margin of 1.07%, we can compute its ROE as

ROE = 1.07% * 1.05 * 8 = 9.0%