Chapter 3

Accounting and Finance

Corporations exist to compete in the marketplace and sell their products and services. However, stakeholders need to measure how corporations are doing in terms of not only their sales and profits, but also measure the size of the firm and sources and uses of funds through the balance sheet. Accurate measurement of these financial statements is crucial to measure how the firm is changing with time and what strategies work or do not work. Another important statement is the statement of cash flows. Broadly speaking cash flow statement is very important to assess the short-term health and sustenance of a corporation. A startup firm is usually small and may or may not be profitable. So balance sheet and income statements may not look very promising in the short term. However, investors may still find that the firm is promising because it is generating positive cash flows. In this chapter we will explore another phenomenon – a corporation can do business and still not make any profit but will still keep affecting its cash flow statement. We will also study common size balance sheet and common size income statement, which help us compare firms notwithstanding the scale of their operations.

Balance sheet

A balance sheet is a financial statement of a firm which deals with the size of the firm. In order to own anything, a firm must raise money. Money can be raised through two sources – debt and equity. Simply put debt is borrowing and needs to be repaid. Equity is issuance of shares that imply selling part ownership of the firm to new owners. Each method brings funds to a corporation. These funds can then be used to purchase machine and equipment or any other means that help a company expand its operations. Sometimes debt or equity is raised repay debt or if other debt is maturing. It is for this reason that professionals in finance discuss about assets as uses of funds and issuance of debt or equity as sources of funds. Before we move further, we need to define assets and liabilities. In order to determine if an item is an asset or a liability the process is simple. Just break the relationship of that item with the corporation and see if the corporation is paid or if the corporation needs to pay. If the corporation is paid, then the said item is an asst. Else it is a liability. Example: simple example is plant and machines possessed by the firm. Breaking relationship will mean selling the plant and machines implying the firm will get paid and thus implying that pant and machines are assets. A tricky example is that of bonds purchased by a firm. Effectively the firm is lending money to the issuer of the bond. Breaking the relationship will mean selling the bonds meaning our firm will get paid thereby implying it is an asset. Formal definition of an asset is anything that a firm owns. Assets can be tangible such as plant and equipment or intangible such as patents, trademarks and logos. Tangible assets are touched and felt while intangible assets are present only notionally. It is relatively harder to measure the value of intangible assets because intangible assets are not usually traded in markets and therefore do not have a market value. During the acquisition of Spirit airlines, one negotiating point for the company is the value of the “Spirit” brand and how much a customer would be willing to pay for travelling with a company that has acquired Spirit airlines. This may not be so obvious if the company here provides inferior goods[[1]](#footnote-2). However, during the purchase of premium brands, customers tend to associate brand loyalty with certain brands and therefore those brands when sold will have a brand value. To continue with previous discussion of bonds, an example of a liability would be bonds issued by a company. When we break the relation between company and its bonds, it needs to repay. Therefore, these bonds issued are a liability. Same is applicable for any loans that the company took from banks. Owners’ equity is not a liability. A company is not entitled to pay any money to its owners if it does not have it. This becomes important when we discuss liquidation of a company. If a company goes bankrupt, its assets are sold off to other entities in order to raise cash. This cash is then used to pay of all liabilities. Any remaining cash will be distributed equally among all shares to the shareholders. Therefore, owners have this “residual stake” at the liquidation value of a firm.

Following from the above discussion, a balance sheet broadly consists of two parts. One part is for assets that displays the possessions of a firm, and the other part displays liabilities or total amounts owed to various stakeholders. Therefore, the broad categories in balance sheet are assets, liabilities and owners’ equity. A balance sheet is a powerful tool to observe the evolution of the size of a corporation and the means of this evolution. For example, invariably an airline will grow if it purchases aircraft for its fleet rather than leasing for expansion of operations. This can be observed in the balance sheet. On the other hand, if it leases aircraft then there is no need to raise cash for funding aircraft purchases. However, the airline will have to pay lease, which occurs as an expense in the income statement which we will study in the next section.

We come back to our discussion on balance sheet. Assets are usually categorized as current or short-term assets and fixed or long-term assets. Usually, short term assets have a life of less than a year, while long term assets last for several years. For an airline, fuel is a short-term asset while an aircraft that it owns is a long-term asset. Short and long-term assets and liabilities are linked with money and capital markets respectively. Figure 1 below shows some short and long-term assets and liabilities of a firm.

|  |  |
| --- | --- |
| **Assets** | **Liabilities** |
|  |  |
| **Current Assets** | **Current liabilities** |
|  |  |
| Cash | Accounts Payable |
| Short term investments | Short term debt |
| Accounts receivable | Other current liabilities |
| Inventories |  |
| Other current Assets | **Long term Liabilities** |
|  |  |
| **Long Term Assets** | Long term debt |
|  | Other long-term liabilities |
| Net Plant, property |  |
| Other Long-term assets | **Total Owners' equity** |
|  |  |
|  | Common stock |
|  | Retained earnings |
|  |  |
| **Total Assets** | **Total Liabilities and OE** |

Because liabilities and owners’ equity are used to fund the purchase of assets, it must be noted that the size of total assets must equal the size of total liabilities and owners’ equity. In other words, the balance sheet must be balanced.

Assets whose life typically exceeds one year are long term assets. There are several examples such as plant and machines, value of a building, and in the case of aviation it is the value of aircraft. Assets that are long term are written off slowly over the age of their life using depreciation. This write-off process can be linear or non-linear and is a topic of an accounting class. But as an asset loses value in balance sheet, either a liability is paid off or owners’ equity decreases. This reestablishes the equilibrium between assets on one hand and liabilities and owners’ equity on the other.

Short term assets are important for maintenance of liquidity and day-to-day operations of a firm. These are usually a part of money markets. Examples are cash, accounts receivable, inventory such as raw materials, intermediate goods and finished product not sold. In the case of airlines, short term assets could include aircraft fuel which is unused, maintenance parts and equipment which is regularly used, and food & other items procured to serve the passengers.

Short term liabilities include payables to others for materials purchased, short term commercial paper borrowings and bank loans or lines of credit borrowed. Long term liabilities include funds owed in bank loans and debentures which typically exceed a period of one year.

There are several ways to represent a balance sheet. The most common way is to represent assets first and then liabilities and owners’ equity to represent that Total Assets = Total Liabilities + Owners’ Equity

Other ways are to represent market value balance sheet in which asset and liability values are dynamically changed as their value in real life changes. But this is not the common way of representing a balance sheet. Most long-term assets and liabilities are shown at their acquisition cost (minus any depreciation written off), which can be misleading to investors. Sometimes balance sheets of large and small companies are compared using common size balance sheet, in which all assets and liabilities are divided by size of total assets and represented as a percentage. Size of balance sheet is an attractive way to assess the size of a corporation indiscriminately across sectors – whether it is a bank, an airline or an information technology (IT) company. In particular, for shareholders, it is important to know the size of total assets, the amount of cash (and short-term securities) held, as well as owners’ equity. A balance sheet is a quick source of reference to access this information. One limitation of balance sheet is that it presents snapshot of a company at any given point in time. However, a company’s business is not static and therefore its balance sheet by definition should not be static. In a simple example below, we will observe how the balance sheet changes with every single business operation of the firm even when the firm is actually not recording sales or making profits. Then we will complicate this by bringing in sales and profits. But first we will discuss the income statement.

Income statement

Income statement is a record that shows revenues a corporation earns and costs that it spends in manufacturing or producing the goods or services that produced that revenue. The difference of revenues and production costs yields operating revenues. When we remove non-operating expenses, such as selling expenses then we arrive at earnings before interest and taxes (EBIT). When we subtracted interest expenses from EBIT, we obtain earnings before taxes (EBT). Finally, we subtract tax expenses to obtain net income or net profit or earnings after taxes. Net income is very important because investors and shareholders care about how much money is available for their appropriation from business operations of that year (recall that shareholders and owners of a company receive residual profits). However, there are some problems in interpreting income statement. We will see that in statement of cash flows.

|  |
| --- |
|  |
| **Revenue** |
| Minus |
| Cost of goods sold |
| Depreciation |
| Selling, general, admn exp |
| Other exp |
| Equals |
| **Operating income** |
| (+) Other income  (-) other expense |
| Equals |
| **EBIT** |
| (-) Interest expense |
| Equals |
| **Taxable income** |
| (-) Taxes |
| Equals |
| **Net Income** |

Cash flows

One major problem with measurement of net income is it does not necessarily mean that the corporation is generating cash. Remember accounts receivable? What if a company makes credit sales (and hence generates no cash) and on the other hand pays off all costs with cash? This is a potentially problematic situation for the company because then it will not have cash left for its day-to-day operations. Therefore, cash flows are an important component that a company and investors must look at during all times. It is said that in 2008 one reason why Lehmann Brothers, the great investment bank collapsed is because it did not have the liquidity to tide over its day-to-day operations even though it had potential buyers of its assets: Barclays Plc., which ultimately acquired all the Lehmann North America operations. Hence the statement of cash flows is an extremely important statement for investors. Every quarter when a company reports its results, not only are its profits per share important, but also cash flow per share. One is important in noticing how the company would do in a longer run but two is also important in checking how the company would do in the short run.

Next, we will see a simple example of a starting a coffee shop and how it effects a company’s balance sheet, income statement and cash flows.

Suppose Ms. Cici wants to start a coffee shop with her $ 700. However, she is very ambitious and thinks long term she would like to convert it into a large multinational corporation called Barstucks Inc. But right now, she wants to start small. So she gives $ 700 to Barstucks to create owners’ equity worth $ 700. Barstucks at its end now has cash worth $ 700 as in table 3.1 below.

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| **Assets** | |  | **Liabilities** | |
|  |  |  |  |  |
| **Current Assets** | **$ 700** |  | **Current liabilities** | **$ -** |
|  |  |  |  |  |
| Cash | $ 700 |  |  |  |
|  |  |  | **Total Owners' equity** | **$ 700** |
|  |  |  |  |  |
|  |  |  | Common stock | $ 700 |
|  |  |  |  |  |
| **Total Assets** | **$ 700** |  | **Total Liabilities and OE** | **$ 700** |

Table 3.1

CEO Ms. Cici now decides to buy a machine for $ 500. As a result, its cash decreases to $ 200 as in table 3.2 below.

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| **Assets** | |  | **Liabilities** | |
|  |  |  |  |  |
| **Current Assets** | **$200** |  | **Current liabilities** | **$0** |
|  |  |  |  |  |
| Cash | $200 |  |  |  |
|  |  |  |  |  |
| **Long Term Assets** | **$500** |  | **Long term Liabilities** | **$0** |
|  |  |  |  |  |
| Net Plant, property | $500 |  |  |  |
|  |  |  | **Total Owners' equity** | **$700** |
|  |  |  |  |  |
|  |  |  | Common stock | $700 |
|  |  |  |  |  |
| **Total Assets** | **$700** |  | **Total Liabilities and OE** | **$700** |

Table 3.2

Next, she buys raw materials such as coffee, cream, sugar etc. to start business operations. Therefore, its raw material inventory increases. However, she buys it on credit. Therefore, her liabilities increase by $ 100 (accounts payable). This leads to expansion of its balance sheet from $ 700 to $ 800 as in table 3.3 below.

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| **Assets** | |  | **Liabilities** | |
|  |  |  |  |  |
| **Current Assets** | **$300** |  | **Current liabilities** | **$100** |
|  |  |  |  |  |
| Cash | $200 |  | Accounts Payable | $100 |
| Short term investments |  |  | Short term debt |  |
| Accounts receivable |  |  | Other current liabilities |  |
| Inventories (raw materials) | $100 |  |  |  |
| Inventories (finished goods) |  |  |  |  |
|  |  |  |  |  |
| **Long Term Assets** | **$500** |  | **Long term Liabilities** | **$0** |
|  |  |  |  |  |
| Net Plant, property | $500 |  | Long term debt |  |
| Other long-term assets |  |  | Other long-term liabilities |  |
|  |  |  |  |  |
|  |  |  | **Total Owners' equity** | **$700** |
|  |  |  |  |  |
|  |  |  | Common stock | $700 |
|  |  |  | Retained earnings |  |
|  |  |  |  |  |
| **Total Assets** | **$800** |  | **Total Liabilities and OE** | **$800** |

Table 3.3

Next, she converts 10% of her raw material into 10 coffees. This is depicted in Barstucks’ balance sheet in table 3.4 as follows:

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| **Assets** | |  | **Liabilities** | |
|  |  |  |  |  |
| **Current Assets** | **$300** |  | **Current liabilities** | **$100** |
|  |  |  |  |  |
| Cash | $200 |  | Accounts Payable | $100 |
| Short term investments |  |  | Short term debt |  |
| Accounts receivable |  |  | Other current liabilities |  |
| Inventories (raw materials) | $90 |  |  |  |
| Inventories (finished goods) | $10 |  |  |  |
|  |  |  |  |  |
| **Long Term Assets** | **$500** |  | **Long term Liabilities** | **$0** |
|  |  |  |  |  |
| Net Plant, property | $500 |  | Long term debt |  |
| Other long-term assets |  |  | Other long-term liabilities |  |
|  |  |  |  |  |
|  |  |  | **Total Owners' equity** | **$700** |
|  |  |  |  |  |
|  |  |  | Common stock | $700 |
|  |  |  | Retained earnings |  |
|  |  |  |  |  |
| **Total Assets** | **$800** |  | **Total Liabilities and OE** | **$800** |

Table 3.4

Note that income statement has not been affected yet because no sales have been made.

However, that changes in step 5. Mc. Cici finally makes a sale. She sells those ten coffees for $ 25 on credit. This now decreases her inventory of finished goods and increases her accounts receivable. This is now depicted in table 3.5 below.

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| **Assets** | |  | **Liabilities** | |
|  |  |  |  |  |
| **Current Assets** | **$315** |  | **Current liabilities** | **$100** |
|  |  |  |  |  |
| Cash | $200 |  | Accounts Payable | $100 |
| Short term investments |  |  | Short term debt |  |
| Accounts receivable | $25 |  | Other current liabilities |  |
| Inventories (raw materials) | $90 |  |  |  |
| Inventories (finished goods) | $0 |  |  |  |
|  |  |  |  |  |
| **Long Term Assets** | **$500** |  | **Long term Liabilities** | **$0** |
|  |  |  |  |  |
| Net Plant, property | $500 |  | Long term debt |  |
| Other long-term assets |  |  | Other long-term liabilities |  |
|  |  |  |  |  |
|  |  |  | **Total Owners' equity** | **$700** |
|  |  |  |  |  |
|  |  |  | Common stock | $700 |
|  |  |  | Retained earnings |  |
|  |  |  |  |  |
| **Total Assets** | **$815** |  | **Total Liabilities and OE** | **$800** |

Table 3.5

From table 3.5 above, we can notice that Assets now exceed liabilities. However, there is a problem – and that problem is that balance sheet is now unbalanced…

But this is not correctly depicted in the balance sheet, because Ms. Cici actually made a sale (even though not in cash). This is now recorded in the income statement, which we will discuss later. The most important part is that the revenue minus cost is $ 15, which is the difference between the assets and liabilities and OE. The $ 15 of profits is recorded as retained earnings. Another thing to note is that the company made sales and profits but no cash! Let us correct the balance sheet in table 3.6 below.

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| **Assets** | |  | **Liabilities** | |
|  |  |  |  |  |
| **Current Assets** | **$315** |  | **Current liabilities** | **$100** |
|  |  |  |  |  |
| Cash | $200 |  | Accounts Payable | $100 |
| Short term investments |  |  | Short term debt |  |
| Accounts receivable | $25 |  | Other current liabilities |  |
| Inventories (raw materials) | $90 |  |  |  |
| Inventories (finished goods) | $0 |  |  |  |
|  |  |  |  |  |
| **Long Term Assets** | **$500** |  | **Long term Liabilities** | **$0** |
|  |  |  |  |  |
| Net Plant, property | $500 |  | Long term debt |  |
| Other long-term assets |  |  | Other long-term liabilities |  |
|  |  |  |  |  |
|  |  |  | **Total Owners' equity** | **$715** |
|  |  |  |  |  |
|  |  |  | Common stock | $700 |
|  |  |  | Retained earnings | $15 |
|  |  |  |  |  |
| **Total Assets** | **$815** |  | **Total Liabilities and OE** | **$815** |

Table 3.6

Next Ms. Cici wants to pay suppliers $ 50 cash. Her cash decreases to $ 150 and payables decreases to $ 50 as seen in table 3.7 below. As can be seen the balance sheet has shrunk.

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| **Assets** | |  | **Liabilities** | |
|  |  |  |  |  |
| **Current Assets** | **$265** |  | **Current liabilities** | **$50** |
|  |  |  |  |  |
| Cash | $150 |  | Accounts Payable | $50 |
| Short term investments |  |  | Short term debt |  |
| Accounts receivable | $25 |  | Other current liabilities |  |
| Inventories (raw materials) | $90 |  |  |  |
| Inventories (finished goods) | $0 |  |  |  |
|  |  |  |  |  |
| **Long Term Assets** | **$500** |  | **Long term Liabilities** | **$0** |
|  |  |  |  |  |
| Net Plant, property | $500 |  | Long term debt |  |
| Other long-term assets |  |  | Other long-term liabilities |  |
|  |  |  |  |  |
|  |  |  | **Total Owners' equity** | **$715** |
|  |  |  |  |  |
|  |  |  | Common stock | $700 |
|  |  |  | Retained earnings | $15 |
|  |  |  |  |  |
| **Total Assets** | **$765** |  | **Total Liabilities and OE** | **$765** |

Table 3.7

Next, she receives $ 25 from her customers. So, the cash of Barstucks increases and receivables decrease by $ 25 as seen in table 3.8 below.

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| **Assets** | |  | **Liabilities** | |
|  |  |  |  |  |
| **Current Assets** | **$265** |  | **Current liabilities** | **$50** |
|  |  |  |  |  |
| Cash | $175 |  | Accounts Payable | $50 |
| Short term investments |  |  | Short term debt |  |
| Accounts receivable | $0 |  | Other current liabilities |  |
| Inventories (raw materials) | $90 |  |  |  |
| Inventories (finished goods) | $0 |  |  |  |
|  |  |  |  |  |
| **Long Term Assets** | **$500** |  | **Long term Liabilities** | **$0** |
|  |  |  |  |  |
| Net Plant, property | $500 |  | Long term debt |  |
| Other long-term assets |  |  | Other long-term liabilities |  |
|  |  |  |  |  |
|  |  |  | **Total Owners' equity** | **$715** |
|  |  |  |  |  |
|  |  |  | Common stock | $700 |
|  |  |  | Retained earnings | $15 |
|  |  |  |  |  |
| **Total Assets** | **$765** |  | **Total Liabilities and OE** | **$765** |

Table 3.8

Suppose instead of receiving $ 25 from customers, Ms. Cici decides to borrow another $ 700 to start another shop. This is seen in table 3.9 below.

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| **Assets** | |  | **Liabilities** | |
|  |  |  |  |  |
| **Current Assets** | **$965** |  | **Current liabilities** | **$50** |
|  |  |  |  |  |
| Cash | $850 |  | Accounts Payable | $50 |
| Short term investments |  |  | Short term debt |  |
| Accounts receivable | $25 |  | Other current liabilities |  |
| Inventories (raw materials) | $90 |  |  |  |
| Inventories (finished goods) | $0 |  |  |  |
|  |  |  |  |  |
| **Long Term Assets** | **$500** |  | **Long term Liabilities** | **$700** |
|  |  |  |  |  |
| Net Plant, property | $500 |  | Long term debt | $700 |
| Other long-term assets |  |  | Other long-term liabilities |  |
|  |  |  |  |  |
|  |  |  | **Total Owners' equity** | **$715** |
|  |  |  |  |  |
|  |  |  | Common stock | $700 |
|  |  |  | Retained earnings | $15 |
|  |  |  |  |  |
| **Total Assets** | **$1,465** |  | **Total Liabilities and OE** | **$1,465** |

Table 3.9

Common size balance sheet

Let us translate table 3.1 into a common size balance sheet.

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| **Assets** | |  | **Liabilities** | |
|  |  |  |  |  |
| **Current Assets** | **100%** |  | **Current liabilities** | **$ -** |
|  |  |  |  |  |
| Cash | 100% |  | Accounts Payable |  |
| Short term investments |  |  | Short term debt |  |
| Accounts receivable |  |  | Other current liabilities |  |
| Inventories |  |  |  |  |
| Other current Assets |  |  |  |  |
|  |  |  |  |  |
| **Long Term Assets** | **$ -** |  | **Long term Liabilities** | **$ -** |
|  |  |  |  |  |
| Net Plant, property |  |  | Long term debt |  |
| Other long-term assets |  |  | Other long-term liabilities |  |
|  |  |  |  |  |
|  |  |  | **Total Owners' equity** | **100%** |
|  |  |  |  |  |
|  |  |  | Common stock | 100% |
|  |  |  | Retained earnings |  |
|  |  |  |  |  |
| **Total Assets** | **100%** |  | **Total Liabilities and OE** | **100%** |

Table 3.9

Let us now translate table 3.2 into common size balance sheet.

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| **Assets** | |  | **Liabilities** | |
|  |  |  |  |  |
| **Current Assets** | **29%** |  | **Current liabilities** | **0%** |
|  |  |  |  |  |
| Cash | 29% |  | Accounts Payable |  |
| Short term investments |  |  | Short term debt |  |
| Accounts receivable |  |  | Other current liabilities |  |
| Inventories |  |  |  |  |
| Other current Assets |  |  |  |  |
|  |  |  |  |  |
| **Long Term Assets** | **71%** |  | **Long term Liabilities** | **0%** |
|  |  |  |  |  |
| Net Plant, property | 71% |  | Long term debt |  |
| Other long-term assets |  |  | Other long-term liabilities |  |
|  |  |  |  |  |
|  |  |  | **Total Owners' equity** | **100%** |
|  |  |  |  |  |
|  |  |  | Common stock | 100% |
|  |  |  | Retained earnings |  |
|  |  |  |  |  |
| **Total Assets** | **100%** |  | **Total Liabilities and OE** | **100%** |

Table 3.10

Moving on, we need to see the effect of all these on the income statement. Recall that it was only in step 5 that we made coffee sales. That is when we create an income statement and a common size income statement in table 3.11 below. As is seen in table 3.1 below, we only apply $ 10 of cost to the revenue of $ 25, even though we spent $ 100 in raw materials. This is called accrual in accounting. We only “accrue” that part of cost to the revenue that was spent to produce that amount of goods. The rest of “cost” will sit in the balance sheet as “assets”. This is the first connection between balance sheet and income statement. The second connection is obviously the addition of $ 15 (profit) as retained earnings in owners’ equity.

|  |  |  |
| --- | --- | --- |
|  | **Income statement** | **Common size** |
| **Revenue** | **25** | **100%** |
| Cost of goods sold | 10 | 40% |
| Depreciation |  | 0% |
| Selling, general, admn exp |  | 0% |
| Other exp |  | 0% |
|  |  |  |
| **Operating income** | **15** | **60%** |
| Other income |  | 0% |
|  |  |  |
| **EBIT** | **15** | **60%** |
| Interest expense | 0 | 0% |
|  |  |  |
| **Taxable income** | **15** | **60%** |
| Taxes | 0 | 0% |
|  |  |  |
| **Net Income** | **15** | **60%** |

Table 3.11

Lastly, we see the cash flow statement. As may be recalled, our cash position keeps changing constantly as long as the transaction is in cash. Some elements of the cash flow statement are revenue, cost of goods sold, change in inventories, change in accounts receivable and change in accounts payable. Let us discuss each one individually. When we sell goods (i.e. make a revenue), it is expected that our cash position goes up. However, if we spent money on purchasing raw materials or other items, then the corresponding cash spent (for the sales) is considered next (with a minus sign, because it decreases our cash position). Next if accounts payable increase, then all else constant we must have bought some goods, produced them and sold them for cash, our cash goes up – this gives change in accounts payable a positive sign or a direct proportionality with cash flows. If accounts payable go up, so does cash, all else constant and vice versa. On the other hand, accounts receivable has an opposite effect. If accounts receivable increase, then all else constant, we must have made a sale on credit for which we procured raw materials and undertook other expenses in cash. Thus accounts receivable going up leads to decrease in cash, all else constant and vice versa, thereby giving an inverse proportionality to accounts receivable as compared to cash and vice versa.

All the above discussion is reflected in the cash flow statement, which reads as revenue minus cost of goods sold minus change in inventories minus change in accounts receivable plus change in accounts payable.

* ­ sales = ­ cash flow (direct proportionality)
* ­ cost of goods sold = ¯ cash flow (inverse proportionality)
* ­ inventories = ¯ cash flow (inverse proportionality)
* ¯ accounts receivable = ­ cash flow (inverse proportionality)
* ¯ accounts payable = ¯ cash flow (direct proportionality)
* So, Cash flow = + sales – COGS – DInv – DAR + DAP

Table 3.12 below describes in detail the cash flows surrounding each activity we performed in the coffee shop:

|  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- |
| Period: | 0 | 1 | 2 | 3 | 4 | 5 |
| Sales ($) |  | 0 | 0 | 25 | 0 | 0 |
| - D Accounts Receivable |  | 0 | 0 | 25 | 0 | -25 |
| + D Accounts payable |  | 100 | 0 | 0 | -50 | 0 |
| - Cost of Goods Sold |  | 0 | 0 | 10 | 0 | 0 |
| - D in Inventories |  | -100 | 0 | -10 | 0 | 0 |
| Net Cash Flow |  | 0 | 0 | 0 | -50 | 25 |
| Calculation |  | +100-100 |  | 25-25-10-(-10) | +(-50) | -(-25) |
| Cash position | 200 | 200 | 200 | 200 | 150 | 175 |

Table 3.12

In period 1, we procured inventories using credit. Hence both inventories and accounts payable increase and cancel each other as seen in the row “calculation”.

In period 2, we just create 10 coffees. So, there is no change in cash position.

In period 3, we sell those coffees for $ 25 on credit, which creates sales and cost of goods sold, but also decreases inventory of finished goods and increases accounts receivable. Thus no change in cash position.

In period 4, we pay down payables, which decreases cash.

In period 5, we receive cash against accounts receivable. So, accounts receivable decreases and cash increases.

As can be seen from above, cash flow is not necessarily dependent on income statement. Further cash flow is an important consideration for investors because only available cash and not profits determine how much money would be distributed as dividends to shareholders/ owners of the company, which in turn determines the stock price. Cash flow position also governs how much money is available for a company to make new investments. In the above case Barstucks could not generate enough cash to start a second shop from its profits from regular operations. Therefore Ms. Cici had to make a hard decision – that of taking a bank loan (borrowing) to create a second shop. We see that the first shop was created using owners’ equity. However, the second shop was created using debt. Debt and equity are two ways a company can expand. However, a company’s obligations to its lenders are different from its owners. As seen in the income statement interest expense is paid first. Then dividend distributions are done after paying taxes. Dividends are typically paid if net profits are positive. Sometimes, firms may borrow money to pay dividends.

Broadly speaking cash flows are affected by operating activities, investing activities and financing activities. In the above example, sale of coffees produced positive cash flow net of raw material costs (operating activities). In the above example, when new machine was purchased, new investment was made and therefore cash decreased. Lastly, when Barstucks raised money from owners or lenders (Ms. Cici’s $ 700 and then bank loan of $ 700), its cash position went up and these are called financing activities.

Change in Cash flow = Cash flow from operations + cash flows from investing activities + cash flows from financing activities.

Taxation and tax rates

In the US, prior to 2017 corporate tax rates worked in a similar way as personal tax rates. There were brackets for net income and for every bracket, there is a tax rate. One way to explain this is as follows:

Suppose the tax rates are as follows:

|  |  |
| --- | --- |
| Income bucket or range | tax rate |
| 0 – 100 | 5% |
| 101 – 200 | 10% |

Table 3.1

If a corporation A earns $ 100 in income, then it will pay $ 5 in tax.

If a corporation B earns $ 165 in income, then it will pay $ 5 in tax on the first $ 100 and 10% on the remaining income (165 – 100 = $ 65). This will be 10% of 65 or $ 6.5. Total tax liability will be $ 5 + $ 6.5 = $ 11.5.

The rates of 5% on first $ 100 and 10% on the next $ 65 are respectively called marginal tax rates for each bucket. The average tax rate for the corporation is $ 11.5/ $ 165 = 6.96%.

In the US after tax year beginning January 1, 2018, the tax rate has become a flat 21%. So, whether a corporation earns $ 100 or $ 1000, their marginal and average tax rate will be 21w% (i.e. $ 21 or $ 210 respectively).

1. An inferior good in economics is a good that people consume more when their income decreases. Spirit Airlines is an ultra-low-cost-carrier (ULCC) and more people tend to fly with cheaper air tickets during a recession when overall income levels decrease [↑](#footnote-ref-2)