



After developing the issue of long-term capital management, it is also important to analyze the short-term side of capital management, which focuses primarily on the management of working capital.

The term working capital in fact resembles the group of short-term assets under the spot when it comes to complement long-term financial management and focus on the short-term needs of the company.

Managing current assets, credits, and inventory is a crucial task for the financial managers in that it directly affects the daily operations of the company, with a significant impact on the nature and magnitude of cash flows.

Companies often play with accounting recording, so that most of the sales and purchases are not immediately followed by a corresponding inflow or outflow to repay them.

This is why credits are issued to customers and received from suppliers, and the synchronization of them is important to ensure cash management is always appropriate.

Also inventory management contributes to cost reduction and efficiency.

Depending on the nature of the business, working capital management can be the key issue for success and profitability, and it is of primary importance to have a solid background of the topic.

After studying this chapter, you will be able to answer the following questions, among others:

1. What are the current assets, and what balance sheet entries can be included in the definition?
2. How should cash management be performed, and what are the implications on the profitability of the company?
3. What are account receivables, and how are they handled by the company?
4. What are account payables, and how are they handled by the company?

5. What is an inventory? How does inventory management impact on the firm's profitability?

The first section is an introduction to cash management with definitions and methodologies. The second section focuses on receivables and payables and their management. The final section deals with the inventory management, and its impact on efficiency and profitability.

11.1 Structure of Working Capital

Learning Outcomes

- Explain what current assets are.
- Learn about the management of cash.
- Understand the significance of short-term financing.

11.1.1 Current Assets and Liabilities

Management of current assets is a crucial task in corporate finance. It involves managing the repositioning of cash flows, as well as managing current assets and liabilities.

Good working capital management (WCM) entails finding the right balance between the need of liquidity for conducting the business and the necessity to not tie too many funds in working capital (WC).

WCM involves managing the balance between a firm's short-term assets and its short-term liabilities, to ensure that the firm is able to continue its operations, with sufficient cash flow to satisfy both maturing short-term debt and upcoming operational expenses.

The topic at the center of WCM is the interaction between current assets and current liabilities. This is an important part of financial management, given the many interesting aspects it has.

The importance relies on different factors. In terms of time, WCM is a demanding task, and the financial manager allocates many hours to it. Moreover, WC represents a big portion of the company's assets.

There is also an aspect of credibility in that WCM has great significance for all firms, but it is very critical for small firms. Finally, the need for working capital is directly related to the firm's growth.

In terms of value, the main distinction is between gross WC (GWC) and net WC (NWC). With GWC, one refers to the company's investment in current assets. Those are defined as the assets that can be easily converted into cash within 12 months.

Items included in the current assets are stocks of raw materials, work in progress, finished goods, trade debtors, prepayments, and cash balances. Net working capital refers to the difference between current assets and current liabilities.

Current liabilities, on the other side of the account, are claims from suppliers and other people having credit toward the company. They include trade credits, accruals, taxation payable, bills payable, dividends payable, and short-term debt.

If WC is positive, it means the company is able to repay its short-term liabilities efficiently. On the other hand, a negative working capital means that the company currently is unable to meet its short-term liabilities.

The distinction in terms of time is between permanent and temporary WC. The permanent working capital is the minimum investment in current assets that is needed in turn around to finance basic activities of the company.

Temporary working capital is a part of the total WC that is required by a business in excess of permanent WC. It is also called variable working capital. The volume of temporary working capital fluctuates from time to time according to the business activities and is therefore financed from short-term sources.

The company runs its daily business by using both fixed assets and current assets. The raw materials are turned into products. Investment in cash and marketable securities are the least productive assets.

Such an asset is in fact not needed for manufacturing nor is it required for creating inventory or selling. It is therefore important to understand why firms hold cash and marketable securities anyway.

The truth is that daily activities of the firm also imply paying salaries, bills, and other duties. For all these expenses, a good cash balance must be maintained, so to speed up the transactions.

The tricky point is to establish how much capital must be locked in cash, therefore taken away from production. Often, firms prepare a cash budget through incorporating the estimates of inflows and outflows to know whether the cash balance would be adequate to meet the transactions. There are several specific reasons for a company to hold cash. It is crucial to analyze them.

One main issue for a company is to be protected from uncertainty about future cash required for transaction purposes. This is due to the possibility of an augment in expenditure or delay in cash collection or inability to source the materials and other supplies on credit foundation.

In order to get protection from all the contingencies, the company must hold additional cash. There is a precautionary balance to be kept in the form of short-term securities that can at least yield a small return. Securities are such that it is possible to market them promptly and collect cash rapidly.

Another motive for cash retention can be defined as speculative. It is possible in fact that sudden opportunities arise in the future. In this case the company must be ready to put cash on these opportunities to exploit them efficiently.

This is a very common issue in the commodity sector, which is characterized by the fluctuations of price for the same commodity. The success of the company heavily depends on the skill to source the material at the right time.

Surplus cash is also used for taking in the excess of other firms. Firms that intend to take advantage on the above counts stay big cash balances with them; however the same are not required either for transactions or as a precaution.

It must be also noted that some business sectors experience high seasonality in sales, and the companies involved experience an excess of cash flows in some specific periods of the accounting year.

The need of cash is therefore unevenly distributed over several points in time, so a cash flow must be addressed in order to not run out of liquidity in times of poor cash flows.

One solution is to repay bank loans in good times while taking on new loans when cash is missing. Also, when it is not clear whether a loan will be approved and available in a convenient lapse of time, the surplus cash is retained and invested in short-term securities.

The cash needs of a company are strictly related to the cash flows it generates, which depend themselves on the type of business. Many factors affect cash flows and can be broadly classified into internal and external factors.

Internal factors are those dependent on the management of working capital components and future growth plan. These factors are determined through the firm and arising out of management decisions.

There are also policies that are related to manufacturing process. The manufacture plans are determined and affect the purchase of raw materials for production, from the raw to the finished product.

Some companies manufacture on inventory, meaning that they sell the product on the market and consequently carry a high volume of material and other inventory in order to ensure smooth manufacture procedure.

There are also expenses that are not directly related to manufacturing. They show a degree of flexibility, so that they are not fixed in terms of time. R&D costs and advertisement are examples of these expenses that are called discretionary.

Requirements for discretionary expenses can be anticipated or sudden. The management policy on sanctioning discretionary expenses has a bearing on the cash flow. Flexible policies allow the expenses after seeing the current cash location, so that the pressure on cash will significantly decrease.

Cash is required in times of expansion and financing of new projects. Besides external sources of capital in the form of equity and debt, some part of the cash is expected to be raised internally.

Internal funding is expected to meet any delay in raising external sources. Companies which follow liberal dividend policy, for example, will put pressure on internal cash flows, since the dividend policy of the firm affects the cash flow.

The repayments of debt involve a cash expense that is in total higher than the nominal amount borrowed. It is therefore mandatory for the firm to have produced additional cash at the end of the operating cycle.

The main causes for the pressure of negative cash flows are due to the mismatch of inflows and outflows. Diversion of short-term funds for extensive-term requirements are another cause for this condition.

Firms that are profit creators periodically generate cash surplus even if they face pressure on cash flows at other times. The surplus cash must then be handled because an excess cash balance is the least productive asset of the firm and therefore should be minimized (Banker et al. 1993).

The common and more convenient choice is to invest in short-term funds that show to be liquid enough and give an even small return. After deciding on investment avenues and products, what is left represents the amount to be financially employed.

The securities chosen for the cash management are usually very liquid government securities. As an alternative, funds are usually also placed in certificates of deposits, commercial paper, and intercorporate deposits.

After liberalization of the economy, money and capital markets have become active, and the volume and diversity in the instruments traded have increased. The advent of money market mutual funds has broadened the scope for surplus cash investment.

Frequent use of this type of cash management through investment is anyway not recommended. The very little return can be in fact heavily offset by the transaction costs involved in frequent use of the investment strategy. Several models like the Baumol, Miller-Orr, and Stone are available to companies and help to choose the right amount to be invested.

Together with the forecast of cash flows and the planning of cash needs, good cash management also needs prompt collection efficiency, particularly speeding up the conversion of cash-in-transit to cash.

In some cases, as an example, check collection is not as fast, given the lack of a centralized electronic interbank system. In these areas of the world a payment by cash may take a long time to be collected, therefore creating a mismatch.

Summing up all the technical times at every step, it may take 2–3 weeks to complete the entire exercise. The buyer in this procedure enjoyed another 2- to 3-week credit, which is described as float.

A solution to the problem, when electronic clearing system is not available, is to force customers to pay by demand draft and send the draft through speed postage vehicles, net of courier charges.

Since customers may not agree to the proposal, not to lose the benefits of having a standing float, the solution is therefore to improve the general collection system of the company.

One way to do that is to target all the delays and assess them. An important section of the overall delay is at the banks' end, therefore making it necessary for the firm to select a bank which provides accelerated clearing facilities.

It would be beneficial to put some pressure on the banks asking them to speed up the clearing by using fast post to cut down the delay arising on explanation of postal transaction.

The sales-over-net-working-capital ratio gives an indication of the relationship between the working capital requirements and the amount of sales. Assuming the relationship exists, forecasts of sales can be used to forecast working capital needs.

One should anyway recall that the relationship between sales and working capital, even if existing, cannot be assumed to be stable. Since budgeted production is based on forecast sales, investment in inventories of raw materials, work in progress, and finished goods must be adapted to the economic cycle.

Determining needs from forecast is quite an efficient way to understand working capital needs of a firm. However, the actual level of the corporate activity may differ from the forecasted one (Bhattacharya 1997).

It is therefore important to review the capital needs regularly in the light of changing levels of activity. The cash conversion cycle also shows where managers should focus their attention if they want to decrease the amount of cash tied up in current assets.

In general, the working capital needs can be reduced by shortening the cash conversion cycle, through a decrease in the inventory days. This can be done by shortening the receivables collection period.

A more effective production planning and targeted outsourcing of some parts of the production process can lead to more efficient production times. Moreover, the amount of inventory within the production process can be reduced by increasing the responsiveness of production methods to change in sales.

A way to reduce the receivables collection period is to give incentives to customers for early payment. Good results can be reached by reducing the credit period to customers, chasing slow payers and improving the assessment of credit-worthiness of clients.

The minimum trade receivables conversion period is likely to be the credit offered by competitors. On the other side, the length of the payables period is not under the firm's control, but it is left to the judgment of the supplier.

11.1.2 Conversion Cycles

The operating cycle (OC) and cash cycle (CC) are important measures of the short-term financing management in the company. Standalone, or compared to the industry average, they give insights on possible gaps in the management of working capital.

The firm's operating cycle defines the length of time between the day inventory is purchased until the money from sales is collected, thus defining the whole timeline of the production and sales process.

By looking at Fig. 11.1, it is clear that the operating cycle is made of three main components, namely, the payables period, the inventory period, and the receivables period.

All periods are measured in days, and they normally consider 365 days in a year as normalizing factor.

One can conclude that the operating cycle is the sum of two components as:

$$OC = IP + RP$$

where

IP is the inventory period

RP is the accounts receivable period.

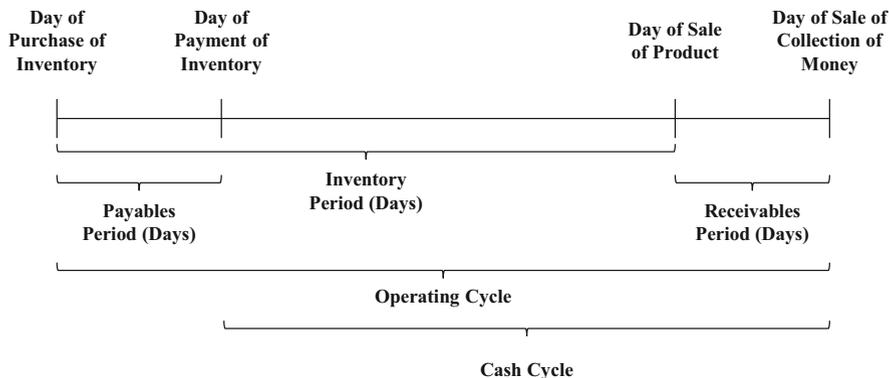


Fig. 11.1 Timeline of the cycles and periods in short-term financing management

Cash cycle instead is made of two components and can be also related to the operating cycle in that it is equal to the latter minus the payables period (days).

$$CC = OC - PP$$

where

PP is the accounts payable period.

All the three components on the timeline can be estimated by looking at the financial statements of the company. In particular it is possible to derive them as ratios of the relevant entries in the statements.

The inventory period (IP), for example, can be calculated by going through the calculation of the inventory turnover (IT) and then by dividing the 365 days by it, as

$$IT = \frac{CS}{AI}$$

where

AI is the average amount of inventory over the period considered (year)

CS is the cost of sales in the period considered.

The inventory turnover represents the number of times that on average the inventory had to be replenished in order to fulfill the overall cost of production in the period of reference (1 year in case we are using 365 as normalization factor).

$$IP = \frac{365}{IT}$$

The above two steps can be summarized as:

$$IP = \frac{AI}{\frac{CS}{365}}$$

The same logic holds for the receivables period, calculated through the receivables turnover as:

$$RP = \frac{AR}{\frac{Sales}{365}}$$

where

AR is the average amount of accounts receivable over the period (year).

Finally, one has to calculate the same for the payables period, as:

$$PP = \frac{AP}{\frac{CS}{365}}$$

where

AP is the average amount of accounts payable over the period (year).

All the information can be combined in an analysis that shows what are the problems in the management of working capital and also suggest the remedies to the gaps with the industry average.

Example 11.1 Consider a company with the following financial statements:

Balance Sheet (€ M)					
Company AAA					
	2015	2016		2015	2016
<i>Current Assets</i>			<i>Current Liabilities</i>		
Cash	1,130	1,330	Accounts Payable	86	102
S.T. Investments	200	250	Accrued Interest	4	8
Accounts Receivable	120	140	Other Current Liab.	<u>230</u>	<u>300</u>
Inventory	180	225	Tot. Current Liab.	320	410
Other Current Assets	<u>40</u>	<u>52</u>			
Tot. Current Assets	1,670	1,997	<i>Long Term Liabilities</i>		
<i>Fixed Assets</i>			Notes Payable	95	168
PPE	10,850	11,250	Mortgages	3,500	3,650
Accum. Depreciation	<u>(1,950)</u>	<u>(2,125)</u>	Other L.T. Debt	<u>1,135</u>	<u>1,264</u>
Tot. Fixed Assets	<u>8,900</u>	<u>9,125</u>	Tot. L.T. Debt	4,730	5,082
			<i>Equity</i>		
			Stocks	5,300	5,300
			Retained Earnings	<u>220</u>	<u>330</u>
			Tot. Equity	<u>5,520</u>	<u>5,580</u>
Tot. Assets	10,570	11,122	Tot. Liabilities	10,570	11,122

Income statement (€ 000s)	
Company AAA, 2016	
Sales	1,000,000
...	...
Cost of sales	(650,000)
...	

In order to calculate the operating cycle and cash cycle of the company, the components of the timeline can first be calculated as:

$$IP = \frac{AI}{CS} = \frac{AI}{CS} = \frac{180,000,000+225,000,000}{\frac{650,000,000}{365}} = 114 \text{ days}$$

$$RP = \frac{AR}{\frac{Sales}{365}} = \frac{120,000,000+140,000,000}{\frac{1,000,000,000}{365}} = 47 \text{ days}$$

$$PP = \frac{AP}{\frac{CS}{365}} = \frac{86,000,000+102,000,000}{\frac{650,000,000}{365}} = 53 \text{ days}$$

Therefore the operating cycle and cash cycle are:

$$OC = IP + RP = 114 + 47 = 161 \text{ days}$$

$$CC = OC - PP = 161 - 53 = 108 \text{ days}$$

The management of the operating cycle and cash cycle can be done by directly changing the variables that are more under control of the company. Some of the variables involved in fact are not easy to manage in a short time.

So, for example, a company with a very long inventory period can manage the situation by reducing the average amount and age of the inventory in stock. An increase in the inventory turnover in fact may reduce the inventory period and improve financial performance.

On the side of the receivables a company with problems should try to reduce the collection period so to reduce the receivables period in a fairly quick way without losing customers.

On the side of the payables, the opposite obviously holds, and the company should be able to secure contracts with suppliers that allow for a longer payables period in order to improve the situation in terms of inflows and outflows.

For all of the above, a big role is played by the implementation of technology. Modern management systems can help in obtaining the results at the lowest possible cost for the company, thus improving profitability.

This is true for all aspects of working capital management, and the efficient management of current assets can overall reduce the amount of working capital needed to run the production.

11.1.3 Significance of Short-Term Financing

Every company needs an adequate amount of working capital for its operations to run smoothly. Working capital management is very important in that it is the basis of the long-term profitability of the firm.

Efficiency in short-term financing management can help to achieve the corporate overall goal of wealth maximization for shareholders, by assuring an efficient use of the corporate resources.

Shortage or bad management of cash may result in loss of cash discount and loss of reputation due to nonpayment of obligation on due dates. Insufficient inventories may be the main cause of production held up, and it may compel the enterprises to purchase raw materials at unfavorable rates.

Lack of working capital can lead to business failure even if the company has a good balance of assets and liabilities. This is the case when there is not likewise facility of credit sale, which is essential for sales promotions. Working capital works like a buffer in times when things do not go as good as they should, by offering a precious reserve of current assets.

However, excessive working capital would also work against profitability as inadequate working capital and would harm the financial health of the firm. The danger of excessive working capital can be summarized.

Too heavy investment in fixed assets as a consequence of excessive working capital may not be justified by actual sales, thus creating a situation of overcapitalization with deteriorating effects.

Also irrational investments in inventory may result in the stock having a very low turnover and the inventory becoming obsolete. At the same time, it may increase the cost due to mishandling, waste, theft, etc.

Excessive working capital may also enhance speculative tendencies of the business and increase profits and dividend distribution. However, the image of the firm would hamper when speculative loss may start.

Also, due to liberal credit, size of accounts receivables will also increase. Bad debts would then increase as a consequence with wrong practices, regarding delay in payments starting and becoming a major issue. Finally, an excess of working capital will normally lead the management to care less about costs, with obvious adverse effects on the profitability.

There are also consequences when working capital is not enough or even scarce. In this case, for example, it will be difficult to implement operating plans, with the business not achieving its profit targets.

In case of dividend payments due, these would be not covered due to lack of funds. Another fact is that bargaining capacity is reduced in credit purchases, and cash discount could not be availed.

The failure in meeting daily commitment would also have a negative impact on the reputation of the firm, and operating inefficiencies may creep in when a concern cannot meet its financial promises.

The lack of funds for new project would indeed also have negative influence on the growth that may stop. As a consequence, the firm will have to borrow funds at an exorbitant rate of interest in case of need.

Last but not least, an emergency situation may require the firm to reduce the prices of the products so as to boost the sales in order to raise cash for working capital needs, with again negative consequences on reputation.

From the above considerations, it is clear that the objective of good working capital management is to determine the amount of current assets to be held at any point in time by the firm and the mode of financing it.

Working capital funds are the circulating blood of the business organism, in that they are even more important than profits for a firm to survive and operate on competitive markets (Deloof 2003).

If a firm is not earning profit, it may be termed as “sick,” but not having working capital may cause its bankruptcy. The alternatives are not pleasant.

The management of current asset has become more important in the recent years, and managers are nowadays called to ensure proper consideration of cash needs, especially in times of funds scarcity.

Well-managed working capital is translated in increased profitability, proper liquidity, and risk reduction. The key for a manager is to understand when to look for working capital funds, how to use them, and how to measure, plan, and control them.

Maintaining working capital is crucial for internal and external purposes. Many decisions related to sales, dividends, expansion, and new products strongly rely on the quality of the maintenance.

There are two main reasons why working capital management is so important, namely, the high proportion of average investment in current assets of companies and the fact that factors like sales can quickly push up or down the level of current assets and liabilities.

There are several differences between managing working capital and fixed assets, even if in both cases, the focus of the analysis is on the impact on profitability and risk. However, fixed assets management and working capital management differ in three important ways.

The first difference is about the use of the timeline on those assets. Fixed assets have a long life, and the discounting and compounding effect on the cash flows they produce is very important. This is not true for current assets, which are usually very limited in life, therefore not requiring particular care in terms of rules of time travel.

The second difference is that large holdings of current assets specially cash strengthen a firm’s liquidity position (and reduce risks). However, profits can be overall reduced by excessive current assets. Finally, sales affect both current and fixed assets, but only the former can be adjusted by sales fluctuation in the short term.

The whole theory on working capital is based on the interaction between current assets and current liabilities. Good working capital management is about managing both of them properly and also taking care of the relationship between the two.

The goal of working capital management is to manage a firm's current assets and current liabilities in such a way that a satisfactory level of working capital is maintained.

There is no scientific equation in the establishment of the optimal level of working capital in a firm. This is because many factors influence the need for it, and proper management is an art more than a science. The remaining of this section is meant at describing the various factors that determine the optimum level of current assets.

One important factor is the nature of the business the company is running an important discriminant in how much capital is needed. The need will vary depending on the type of products or services offered.

Consider a company working on public services, for example. Such a business does not require much working capital, as opposed to an industrial company producing high technology devices.

A company offering electric supply has low need of current assets, firstly due to cash nature of the transactions and secondly due to sale of services. On the other hand, it requires high investments in fixed assets.

Another crucial factor in determining current assets expenses is the supply of inventory. If it is adequate and well managed, the update of inventory will require less resources. Investment in working capital will fluctuate in case of seasonal nature of supply of raw materials, spare parts, and stores.

There is also a strong link between working capital and production strategies. In case production is seasonal in fact, the sales will have a cyclical pattern and so will be for the requirement of working capital.

In order to avoid that, the sales department may follow a policy of off-season discount, so that sales and production can be distributed smoothly throughout the year and sharp, variations in working capital requirement are avoided.

The available supply of credit is an important factor that determines the needs of working capital for the business. If credit is easily available at a favorable rate and good terms and conditions, less working capital will be needed.

The problem comes when credit facilities are not so easy to approach, therefore requiring the firm to set more working capital aside in order to avoid unpleasant risks of shortage in the short term.

Credit policy also has an impact on the working capital needs, with different consequences according to whether the sales are paid at cash or at credit, with payments received only after few weeks.

A constant and good inflow of cash has an obvious positive impact on the need of current assets, and less investments in the short term are needed. In order to ensure that unnecessary funds are not tied up in book debts, the enterprise must rationalize its credit policy based on the credit of the customers and other factors.

An important factor that generates need of working capital is the expansion of the business, with the growth of the company and the expanded need for funds to finance an increased amount of sales.

The critical fact in this case is that the growth in business is not antecedent but consequent to the increase of working capital. It is clear that advance planning is essential for a growing concern.

Also the change in price level has an impact, in that in order to keep the same amount of assets, more working capital is needed, if prices are making the task more expensive. The rise in prices will have different effects for different enterprises.

The need for working capital is also connected to the life cycle of the capital itself, meaning the time required to complete one cycle from cash to material, through work in progress and finished products, to cash again.

One should also note that there is a negative relationship between liquidity and profitability. The increase of working capital consequent to the increase of sales, as mentioned above, will reduce risk and profitability on one side and will increase liquidity on the other side (Filbeck and Krueger 2003).

Another interesting relationship is the one that can be established between the riskiness of business and the working capital. The sense of the relationship is that an expansion of the volume of sales will generate more risk for the company.

This is not a direct effect, but it follows from the fact that if working capital is varied relative to sales, the amount of risk that a firm assumes is also varied, and the opportunity for gain or loss is increased.

The basic financial direct relationship between risk and return holds and if the level of working capital goes up, and the amount of risk goes down, and vice-versa, the opportunity for gain is likewise adversely affected.

To conclude there are three principles that defines the recipe for the right amount of working capital to be used in the business. First of all, the principle of equity position states that the working capital investment should be justified by a correspondent amount of increase in the net worth of the company, in the form of equity.

According to the principle of cost of capital instead, it should be remembered that the cost of capital moves inversely with risk. Thus, additional risk capital results in decline in the cost of capital.

Finally, the principle of maturity of payment states that the company should eliminate the mismatch between the maturity of payments and the internally generated cash flows. Some disparity should be there, because a greater return (and risk) is generated with greater disparity. However, a margin of safety should be provided for any short-term debt payment.

11.2 Receivables and Payables

Learning Outcomes

- Learn the rationale behind accounts receivable and accounts payable.
- Define and explain accounts receivable.
- Define and explain accounts payable.

11.2.1 Accounts Receivable

The management of the credits of a company toward customers is a very important task for the profitability and the correct WCM in general. Therefore, one of the first responsibilities of the management is to determine the credit policy of the firm.

The main factor affecting the credit policy is the trade-off between the higher profits on additional sales that arise due to credit being extended on the one hand and the cost of carrying those debtors and bad debt losses on the other.

The development of a credit policy goes through the determination of factors like the credit period, as the amount of net days of credit allowed, and the cash discount, which specified the rate of discount, the cash discount period, and the net credit period.

Another part of the job for the finance manager is to determine how risky it is to allow credit to some particular customer, as well as follow up debtors and decide on a suitable credit collection policy. It is very important to develop credit policies and execute them.

The main issue of maintaining receivables is that it comes at a cost, which is composed by several expenses. First of all, locking funds in receivables implies that the company needs additional funds, with arising opportunity costs and interest expenses.

Maintenance of a good credit policy also involves administrative costs, which include record keeping, investigation of credit worthiness. Also there are costs associated with collection of credits and potential default of the counterparty.

The credit policy determines both the quantity and the quality of accounts receivables. The size of the investment in receivables is determined by several factors that can be listed as:

- Relationship between credit and sales volume.
- The terms of credit.
- Cash discount.
- Policies for credit customers' selection.
- Customer behavior in repaying credits.
- Collection policy of the company.
- Efficiency in the administrative part of credit management.

The last point in the list is very important since the degree of operating efficiency in the billing, record keeping, and adjustment function, and other tasks would also have an impact on the size of the investment in receivables.

All firms decide for different credit policies from the more flexible to the more strict. Flexible credit strategies allow very liberal terms and standards on customers. On the contrary a firm following a stringent credit policy gives credit bases on a highly selective standard, allowing only customers with proper credit worthiness.

The increase in the volume of account receivables translates into high sales but at the cost of additional resources employed to support the strategy. Also the costs of credit investigations and collection efforts and the chances of bad debts increase.

There are also several factors that are under the control of the finance manager. For example, he supervises the administration of credit and contributes to the decisions of top management.

Moreover, there must be a clear list of criteria for selecting customers to allow credit to and a strategy to speed up the conversion of receivables into cash by a possibly aggressive collection policy (Grablowsky 1999).

About the sources of financing, the main categories are pledging and factoring. Pledging refers to the use of a firm's receivable as collateral for a short-term loan. Recall that receivables are the most liquid assets for a company.

In this case the lender analyzes the quality of the receivables owned by the company, and it selects the accounts. A line of credit is then created on them, by fixing it at a percentage of financing receivables which is usually around 50–90%.

The pledging of receivables to secure funds provides high flexibility to the borrower and ensures a continuous financing. The downturn is the pretty high cost of financing due to the costs associated to the loan.

Factoring is another way to finance account receivables. In this case, the company sells its receivables to another company or agency, called factor. The factoring lays down the conditions of the sale in a factoring agreement.

The factor gains the right for credit collection and manages the accounts for a fee. Normally the factoring arrangement involves a nonrecourse clause, so that in case of default, the loss is on the factor. But it is also possible to sign the agreement on recursive basis so that, in such a situation, the accounts receivables will be turned back to the firm by the factor for resolution.

The main advantage of factoring is the speed of conversion into cash and the control on the pattern prediction of cash flows. It provides liquidity without creating net liabilities and preserving financial solidity. Moreover, factoring is a flexible financial tool providing timely funds, efficient record keepings and effective management of the collection process.

Factoring cannot be considered as a loan, in that there is no debt repayment, no balance sheet worsening, and no delays associated with standard funding methods. It is a good way to grant the firm the cash for the growth needs of business.

Recently many innovative tools have been developed to increase effectiveness in accounts receivable management. Modern practices, tools, and methodologies allow for a better handling of the topic.

Some companies have registered a significant improvement in receivables management by simply re-designing their process. Due to the nature of receivables, the decisions made elsewhere in the organization affect the level of resources employed in the management of accounts receivable.

There are several aspects defining the opportunity to improve the management of accounts receivables. Some practices lead to efficient management of receivables and payables.

Centralization of high nature transactions of receivables and payables, for example, leads to improved efficiency. The same works for alternative payment strategies that try to overcome some burdens of traditional payment methods. It is observed

that payment of accounts outstanding is likely to be quicker where a number of payment alternatives are made available to customers.

Other alternative methods for payment are convenient to the customers and therefore beneficial to the company. Several provisions are available to speed payment time, add customer service, and reduce remittance processing costs.

Direct debit is a method based on the customer authorization for the transfer of funds to the seller. Another method is the integrated voice response, with a computer-based system allowing customers to make payments over the phone.

Alternatively, the payment can be collected by an authorized external firm. The payments can be made by several means, and banks can be collecting agents of their customers and directly deposit the collections in customers' bank accounts.

Payments can also be done through the Internet platform, or lock box processing, where the latter involves an outsourced partner who captures payment data and forwards them to the client firm for processing in that firm's systems.

Every company should develop a credit management policy to support the maximization of expected profits. The policy should take into account both current and desired cash position and the ability to satisfy expected demand.

The level of optimal receivables is established by looking at the terms prevailing in the company's area of business, compared to the ability of the company to match and deliver those terms of sale.

Another important factor affecting the level of receivables is the pricing policy. There is in fact a trade-off between the price to be set for a good or service and the ease of the payment terms associated to it.

The effectiveness of trade receivables follow-up procedures used will also influence the overall level of receivables and the likelihood of bad debts arising. There are also administrative costs of debt collection to be taken into account.

The ways receivables policy can be implemented also represent a crucial factor, and the cost and effects of giving easier terms of credit should be offset by the benefits to be gained from offering credit to customers against the costs of doing so.

A higher turnover could be generated by longer credit terms. However, the longer terms increase the riskiness of the debt and should be balanced by the increased profits due to the turnover. In order to operate its trade receivables policy, a company needs to set up a credit analysis system, a credit control system, and a trade receivables collection system.

The decision about trading with another company or leaving is usually based on some necessary information. Proper screening of the creditworthiness of new customers is a good way to prevent bad debts (Kieschnick et al. 2006).

The preliminary screening is usually based on information coming from various sources. Sometimes the analysis may involve asking the new customers to produce both bank references and trade references.

Public information like financial statements and annual reports, the status of customers' accounts, as well as the experience matured with similar companies in the past help in forming a fair judgment on the creditworthiness.

For a fee, a report may be obtained from a credit reference agency, such as the US-based companies Experian, Equifax, or Callcredit. A credit report may include a

company profile, industry profile, financial ratios and margins, analysis of trading and payment history, types of borrowing, and previous financial problems (if any).

After the terms of credit are agreed, the next issue is for the company to ensure that the client will hold the obligations and keep the terms of trade. Customer accounts should be kept within the agreed credit limit, and credit granted should be reviewed periodically to ensure that it remains appropriate.

The policy toward late payers should be very strict, and no client under no circumstances should obtain additional goods or services if they have exceeded their credit limits.

The risk of debt can be insured through brokers or intermediaries, and the insurance normally covers debts up to some amount, against the risk of nonpayment. Specific account insurance will allow a company to insure key accounts against default and may be used for major customers.

Factoring companies offer a range of services for the administration of sales and the collection of the cash from receivables. A factor can take over the administration of sales invoicing and accounting for a client company.

Factors also collect the amounts due from trade receivables and put pressure on late payers. A factor can offer a cash advance for buying the trade receivables from the client company, which gain access to cash as soon as credit sales are made.

The factoring companies also offer additional services for a fee. For example, they can collect the bad debts that may arise from nonpayment. These debts are acquired with no right of recourse of the factor to the company for compensation in case payments are missed.

A factor will normally advance up to 95% of the face value of invoices and will charge an interest payment on the sum. In exchange for accelerated cash receipts, a company pays an interest, which is comparable to the cost of short-term borrowing.

Additional fees are paid in percent of the annual turnover, and the benefits for the company will be in terms of reduced administrative costs and the access to the factor's expertise in credit management.

Factoring offers a wide range of advantages like prompt payment of suppliers and easy payment discounts. Moreover, it allows the company to reduce the amount of working capital locked in receivables.

Factoring also finances growth through sales, and it allows for the drastic reduction of administrative costs. There are also benefits arising from the factor's experience in credit analysis and credit control.

11.2.2 Accounts Payable

With the term accounts payable, one indicates the amount of money owed by a firm to its suppliers. They appear in the balance sheet as liabilities and are included in the bunch of debt.

When an invoice for payment is issued, the related account payable is registered. Approval for payment therefore makes it officially a debt of the firm. Usually the payable is recorded in the General Ledger.

Most common payables are the trade payables, which are written on physical goods, which are recorded in the inventory. Expenses payables on the other hand include the purchase of goods or services that are expensed.

Generally, the firm gets various offers in terms of payment options for an invoice. The terms may include a cash discount for paying an invoice within a defined number of days.

Example 11.2 2%, Net 30 terms mean that the payer will deduct 2% from the invoice if payment is made within 30 days. If the payment is made on Day 31, then the full amount is paid.

The supplier will ship a product and after that will issue an invoice, with later collection of the payment from the customer. The cash conversion cycle is defined as the time occurring between the payment of raw materials by the firm and the payment to the same firm of the receivables by the final customers (Capon et al. 1990).

Upon reception of an invoice, the purchases match it to the purchase order and the packing slip. After a check that everything is in order, the invoice is sent to payment, in a process called the three-way match. The three-way match can slow down the payment process, so the method may be modified.

In order to prevent the accounts payable staff from engaging in unethical behaviors, there are several checks that the firm can put in place. A common control is segregation of duties, in which a junior employee processes and prints a check, and a senior employee reviews and signs the check.

In most cases the software for processing the payables will not accept operations that overcome the limitations of functions assigned to a specific employee. So there is no way any one employee—even the controller—can singlehandedly make a payment.

In some companies the two functions of entering a new customer in the system and entering vouchers in the system are separated, so that no employee can make himself a vendor and write a check for himself.

The only way to do that in this case would involve colluding with another employee having access to the so-called master vendor file, namely, the repository of all significant information about the company's suppliers. In addition, most companies require a second signature on checks whose amount exceeds a specified threshold.

If a purchase order system is not in place, then an approving manager must be put in charge of approving payments. The staff should be familiar with the common problems related to it.

In accounts payable, in fact, simple mistakes can lead to large overpayment issues. Duplicate invoices are an example of such an issue, and sometimes an invoice may be temporarily misplaced or still in the approval status when the vendor calls to inquire into its payment status.

Audits of account payables can solve many issues related to missed or duplicated payments. Auditors often focus on the existence of approved invoices, expense reports, and other supporting documentation to support checks that were cut.

In order to get a tangible proof of the existence of any account, it is a normal practice to ask for a confirmation or statement from the supplier. It is also common to lose some of the relevant documentation by the time the audit rolls around. An auditor may decide to expand the sample size in such situations.

The work of the auditors involves preparing an aging structure of accounts payable, allowing the understanding of what outstanding debts are in existence over different periods, normally counted on steps of 30 days.

One should note that an account payable for the consumer company corresponds to an account receivable for the supplier. This creates a symmetry between the payables of the customer and the payables of the supplier.

The accounts payable process or function is immensely important since it involves nearly all of a company's payments outside of payroll. The process involves the intervention of a dedicated department or small team of employees depending on the size of the firm.

The mission of the accounts payable team, regardless of the size of the firm, is to make sure only the bills are paid and that all the recorded invoices are accurate. Before a vendor's invoice is entered into the accounting records and scheduled for payment, the invoice must reflect what the company had ordered and received, the proper unit costs, calculations, and other terms.

Internal controls must be put in place in order for the accounts payable process to safeguard a company's cash and other assets. Reasons for internal controls include the prevention of payment of a fraudulent invoice, or in the case of an accurate invoice, paying it twice. Internal controls are also in place to make sure that all vendor invoices are accounted for. Periodically companies should seek professional assistance to improve their internal controls.

Efficiency and accuracy are the keys for the accounts payable process to be successful, with positive impact on the accuracy and completeness of the firm's financial statement as well.

For example, if a repair expense is not recorded in a timely manner the liability will be omitted from the balance sheet, and the repair expense will be omitted from the income statement.

Another consequence of a bad accounts payable process is that discounts for early payments of some bills could be missed. By not paying the invoices when they become due, the commercial relationship with the supplier may also deteriorate.

Just as delays in paying bills can cause problems, so could paying bills too soon. If vendor invoices are paid earlier than necessary, there may not be cash available to pay some other bills by their due dates (Cheatham 1989).

A purchase order is normally prepared to communicate what the company is ordering from a supplier in an ordered and precise manner. It consists in a multi-copy form including all the information about the purchase and distributed to several people.

The employees receiving the purchase order are the person requesting that a purchasing order is issued for the goods or services, the accounts payable department, the receiving department, the vendor, and the person preparing the purchase order.

A receiving report is a document reporting that the good has been received from the supplier. It comes either in soft or hard copy, and it contains all the features of the received good, to be then compared to the information in the purchase order.

After the receiving report and purchase order information are reconciled, they need to be compared to the vendor invoice.

The supplier invoices the firm once the good has been received and controlled. The invoice is normally on credit, thus creating accounts payable. Each vendor invoice is routed to accounts payable for verification and approval.

The amount of the invoice will be then credited to the company's accounts payable account and will also be debited to another account, as an expense, for future registration in the financial statement of the firm.

The accounts payable process is normally exploited through a three-way match technique. The three-way match involves that all documents are in agreement in order for a vendor's invoice to be entered into the accounts payable account and scheduled for payment.

Example 11.3 Assume that a company needs 1000 packs of paper for their printers. The firm issues a purchase order to the supplier at 6 € per pack, for delivery in 7 days. One copy of the purchase order is sent to the supplier, one copy goes to the person requisitioning the cartridges, one copy goes to the receiving department, one copy goes to accounts payable, and one copy is retained by the person preparing the purchase order. When the firm receives the paper, a receiving report is prepared.

The three-way match involves comparing the following information:

- The description, quantity, cost, and terms on the company's purchase order.
- The description and quantity of goods shown on the receiving report.
- The description, quantity, cost, terms, and math on the vendor invoice.

After the match has been verified, it is possible to enter the invoice into the liability account accounts payable. The information entered into the accounting software will include invoice reference information, the amount to be credited to accounts payable, the amounts and accounts to be debited, and the date that the payment is to be made.

11.3 Inventory Management

Learning Outcomes

- Define inventory management.
- Learn the definition and purpose of an inventory.
- Understand the most common inventory models.

11.3.1 Definition and Purpose

Key functions of the corporate activity, like supply chain management, logistics, and inventory, are crucial to the business delivery functions and impact on the ability of the company to produce and deliver efficiently.

Inventory management is therefore an extremely significant function, because it determines the overall quality of the supply chain process and also defines the impacts of the financial health of the balance sheet.

For every company, optimal inventory is important, in that it should meet the necessities of the production, avoiding excesses of, over, or under inventory. In fact, mismatches can have a huge impact on the financial figures.

Inventory is a dynamic bundle for the company, and its management involves constant and cautious consideration of all factors affecting it, and appropriate management through scheduling and reviewing.

Most companies have a distinct department or inventory planners who continuously monitor, manage, and review inventory and interface with manufacture, procurement, and fund departments.

Inventory can be defined as a stock of physical assets with economic value. Items in an inventory are held in custody awaiting packing, processing, transformation, exploit, or sale in a future point of time.

There are usually large amounts of capital that are invested in inventories of raw materials and goods. The production process benefits from raw materials as a buffer to ensure the smoothness of production.

By using the inventories of finished goods, on the other hand, the sales department can satisfy customer demand reasonably quickly so to avoid losses. The optimal inventory level must be determined by comparing the benefits of holding inventory against the cost of it. The costs incurred when holding an inventory go from the insurance, rent, and utility charges to the replacement costs, including the cost of obsolete inventory.

Companies in manufacturing sector, or trading, selling, and servicing products of most kinds, must hold a stock of goods in order to allow production and foster future consumption.

In general, inventory is as necessary as unwanted by companies, since it represents a locking of funds, even if it is for production purposes. Companies hold inventories for several causes, ranging from speculative purposes to functional reasons.

Inventory can be in complete state or partial state. Inventory is held to facilitate future consumption, sale, or further processing/value addition. All inventoried possessions have economic value and can be measured as assets of the institutions.

Inventories may involve raw materials and production consumables as well as semifinished goods, at several stages of production. Both raw materials and finished goods that are in transit are also included in the inventory depending upon who owns the inventory at the passage stage.

There are several stocking points in a plant or factory where raw materials are stocked until they reach the production line. Besides raw materials and finished goods, institutions also hold inventories of spare sections to service the products.

Due to the recent developments of technology and procedures for handling inventory management and supply chain management, there have been revolutionary changes, fostered by the use of computing power.

Optimum inventory management is the goal of every inventory planner. An inventory in excess or under-planned has a financial impact on the health of the business as well as business opportunities.

The need of an inventory is clear if one thinks how companies are exposed and need hedging against internal and external factors and also looks at the inventory as opportunity and a requirement and for speculative purposes.

The plan for manufacturing is not fixed for any company but changes according to factors like sales, orders, and stocking issues. Accordingly, the demand for raw material supply for manufacture varies with the product plan.

One of the reasons why inventory needs to vary in time is the cyclical nature of demand and supply, with seasonal dependency over some factors. In this case past sales data help companies to expect a vast surge of demand in the market well in advance.

Another reason for variable stocking is that sometimes it is convenient for companies to buy large stocks of raw materials every now and then, compared to buying small amounts more often. In such cases one buys in bulk and holds inventories at the plant warehouse.

Also expected changes in the price of the good sold can drive the production toward augments or diminishes, as well as the integration of sales in international markets and the impact of taxation.

When taxes and budget variations are expected to have a significant impact on the production costs, the companies tend to buy raw materials in advance and hold stocks as a hedge against increased costs.

Also there are convenience reasons for holding bigger stocks of raw materials than needed, especially when there are offers to buy in bulk to take advantage of the quantity discounts offered through the supplier. Of course this is convenient only if the discount enjoyed is higher than the inventory carrying cost.

If raw materials are imported from a foreign market, or if the distance from the vendor is substantial even if in domestic market, there are lots of savings related to buying in bulk to reduce transportation costs.

There could be a lot of factors resulting in shipping delays and transportation too, which can hamper the supply chain forcing companies to hold safety stock of raw material inventories.

Besides raw material and unfinished products, companies also hold finished goods inventory, from the time they leave the manufacturing process till the time they reach the final consumer.

During that time the inventories are either held through the company or given to intermediaries associated with the sales channels such as trading partners, selling points, distributors and dealers, etc.

The costs involved in inventory management range from the inventory procurement to the actual storage and the management of the stock. Inventory costs are simply categorized into various headings including ordering, carrying shortage, logistics, etc.

All elements of an inventory carry a value, and such a value must be recorded independently of the location of the inventory or its accessibility. To make it clear, not that even scrap has residual economic value attached to it.

Inventory holding policies differ from one company to another, with some holding inventories extremely high in value and some other holding inventories extremely high in volumes and number of units.

Inventories can occur both on site manufacturing plants or third party warehouse sites, depending on the demand for raw materials. Inventory controllers are in charge of managing inventory, by taking care of the many critical regions.

The inventory controllers must make sure that the minimum inventory is always in place, and also try to uphold the optimum quantity of raw materials, by determining the schedules for replenishment.

They also have to ensure that the balance of the inventory is granted all the time, especially in order to avoid excess inventory or lower inventory, which can result in damage to the business.

In the ABC classification of inventory, the logic is to use a Pareto principle in order to classify the stock based on the value of the elements that compose it. For example, when applying a 75/25 principle, the classification could be such that:

- Category a includes 25% of units and contributes to 75% of the cost.
- Category B includes 33% of units and contributes to 18% of the cost.
- Category C includes 42% of units and contributes to 7% of the cost.

There are several advantages in implementing this type of classification. First of all, it gives full control on the volume and allows to assign comparative priority to the right category.

Normally category A includes high value items, so the categorization allows to identify the related stocks as high value things, therefore assigned highest priority and the highest frequency of checks.

The prioritization then follows with category B which can be given second priority with lesser frequency of review and less tight controls with adequate documentation, audit controls in lay. Finally, category C can be supervised with vital and easy records.

The main disadvantage of the classification is to not reflect the actual frequency of movement of items in the inventory. This can sometimes mislead controllers, especially because lower categories might be neglected and left piling in huge stocks exposed to risks of all kind.

An inventory serves mainly five different types of use. The decoupling function is to decouple the manufacturing processes within the firm. Stored inventories may act as a buffer between two stages of production that depend on each other, so that

delays in the previous stage would not generate delays in the following stage and the production as a whole.

Another important use is storing of resources, which is particularly important for the industry sectors that produce only in determined times of the year, with a demand of products that span over the whole year.

In these cases, inventory can be used to store these resources. In a manufacturing process, raw materials can be stored by themselves, as work in process or as finished products.

Irregular supply and demand also represent an issue to be solved through holding of inventory. When there are irregularities in the demand-supply relationship on the markets, storing certain amounts in inventory can be important.

Another use of inventory is to take advantage of quantity discounts. Many suppliers offer discounts for large orders, and purchasing in larger quantities can substantially reduce the cost of products.

Large quantities come at some costs, and there are disadvantages in holding a lot of inventory stocks. There will be higher storage costs and higher costs due to spoilage, damaged stock, theft, insurance, and so on.

Inventory is also used to avoid shortages or stockouts, given that it is not good for any company to go out of stock. The customers in that case would satisfy their needs through other suppliers.

11.3.2 Inventory Models

Depletion of inventory items, with subsequent replacement by the arrival of new stocks, is one of the most common situations faced when managing inventory in a company. There are several models for managing inventories. The purpose of this section is to look at the deterministic ones.

A simple model representing the situation typically faced in the life of an inventory is the economic order quantity (EOQ) model. The model assumes that units of the product under consideration are withdrawn from inventory continuously at a known constant rate.

Another assumption is that the inventory is replenished by purchasing or producing new items, when there is a need for ordering. A fixed stock of Q units is purchased, and all Q units arrive simultaneously at the desired time.

The costs involved in the model are the setup cost K for ordering one stock, the single unit cost c , and the cost h for holding each unit in the inventory per unit of time. The objective is to determine when and by how much to replenish inventory so as to minimize the sum of these costs per unit time.

The inventory is replenished on a continuous basis, when the level gets low enough. Shortages are not allowed, and the inventory is replenished when it goes to zero, so as to minimize the holding costs.

The pattern of the inventory is such that it starts with the level Q at time zero, to progressively reduce to a level zero after one unit of time. A new stock is then

ordered, and the inventory stock goes back to Q , and then cyclically to zero again, and so on.

The process is repeated each time the inventory level drops back down to zero.

The model calculates an optimum order size by balancing the costs of holding inventory against the costs of ordering new supplies. A minimum cost procurement policy can be set based on the optimum order size.

Recall that the model assumes that, for the period under consideration, costs and demand are constant and known with certainty. The model is deterministic in that it makes these steady-state assumptions.

By assuming a constant for inventory, the holding costs are proportional to the quantity in stock, while the ordering costs decrease as order quantity increases, and the number of orders falls. The total cost is the sum of the annual holding cost and the annual ordering cost.

$$C_{\text{TOT}} = C_{\text{PCH}} + C_{\text{AH}} + C_{\text{AO}}$$

where:

C_{PCH} is the purchase cost.

C_{TOT} is the total annual cost.

C_{AH} is the annual holding cost.

C_{AO} is the annual ordering cost.

The addends in the formula can be decomposed by considering that the purchase cost is given by demand multiplied by price, as defined by

$$C_{\text{PCH}} = D_{\text{ANN}}c$$

where:

D_{ANN} is the annual demand.

Moreover it is possible to decompose the annual holding cost by considering that it is equal to the product between the average quantities in stock, multiplied by the annual holding cost, as

$$C_{\text{AH}} = \frac{Q}{2}h$$

Finally, the annual ordering cost is equal to the fixed cost of the order multiplied by how many times per year the orders are placed, as

$$C_{\text{AO}} = \frac{D_{\text{ANN}}}{Q}K$$

The annual holding cost is the average inventory level in units multiplied by the holding cost per unit per year. The annual ordering cost is the number of orders per year multiplied by the ordering cost per order.

Consider

First order condition of the total cost equation with respect to Q shows that

$$0 = -\frac{D_{\text{ANN}}}{Q^2}K + \frac{h}{2}$$

The point where the holding costs and ordering costs are the same corresponds to the minimum total costs. By putting holding costs equal to ordering costs, and rearranging, one obtains

$$\widehat{Q} = \sqrt{2K \frac{D_{\text{ANN}}}{h}}$$

which is now the economic order quantity, i.e., the order quantity which minimizes the sum of holding costs and ordering costs.

The equation is the EOQ model, one of the simplest and most commonly used inventory management models. Other models have been developed to relax some of the classical model's assumptions.

The lead time is defined as the time between ordering and delivery. When both ordering and delivery are assumed to be constant, new stock will be ordered when the inventory falls to the demand level during the lead time.

Example 11.4 Assume that the demand for some item is of 100,000 units per year and the lead time for delivery of an order is 3 weeks on average, the amount used during the lead time is

$$100,000 \left(\frac{3}{52} \right) = 5769 \text{ units}$$

When the level of the inventory in use falls to 5769 units, new stock will be ordered to replenish.

In case of stochastic demand or lead times, a firm may choose to hold buffer inventory to reduce or eliminate the possibility of running out of inventory. The EOQ model can still be used in this framework to determine the optimum order size.

By indicating with BQ the size of the order placed, considering the average annual demand, in the new framework, new orders are placed when the inventory falls to the OR level.

Recall that this is possible because lead time is known and is equal to ab . The company can meet unexpected demand during the lead time from the buffer inventory held, and the average inventory level is given by

$$I_{\text{AVG}} = I_{\text{BFF}} + \frac{Q_{\text{RO}}}{2}$$

where:

I_{BFF} is the buffer inventory.

Q_{RO} is the regular order quantity.

Another popular approach to inventory management is the just-in-time (JIT) approach. The main purpose of the model is to minimize or eliminates the time which elapses between the delivery and the use of inventory.

The main requirement for such a policy to be viable is a strong relationship between the supplier and the company. It applies to a wide range of business operations for the purchase of raw materials and components.

The margin of inventory is so thin that the company must be assured on both quality and reliability of delivery from the supplier in order to avoid disruptions to the production process.

The advantage for the supplier is the possibility to benefit from long-term purchase agreements. Companies adopting JIT inventory management policy, in fact, tend to stick to suppliers who are able to offer goods at the required quality and time.

The purchaser will benefit from a reduction in the costs of holding, ordering, and handling inventory since materials will move directly from reception to the production line.

The minimization of inventory aimed to in the JIT approach can be obtained also by changing the production process in order to reduce the queues of work in progress and the size of production batches. A JIT strategy is successful only when the production planning is efficient.

11.4 Cash and Liquidity Management

Learning Outcomes

- Understand the importance of cash management.
- Learn how companies balance inflows and outflows.
- Understand the importance of float management.

11.4.1 The Management of Cash

The goal of cash management is to optimize the quantity of cash available to the treasury of the firm. The process involves maximizing the interest earned by spare funds not required immediately and reducing losses caused by delays in the transmission of funds.

The company faces a trade-off between holding cash for liquidity purposes and employing that amount of funds for productive uses. It is therefore important to assess the right amount of cash needed by the firm for daily needs (Bragg 2017).

Too much cash set aside results in missed investment opportunities, and too small cash balances will increase the risk of being unable to meet debts as they fall due, so an optimum cash balance should be found.

Every company holds cash for basically three main reasons. First of all, there is a transaction motive, for which companies need a cash reserve in order to balance short-term cash inflows and outflows since these are not perfectly matched.

The estimation of cash reserves can be done by forecasting cash inflows and outflows and by preparing cash budgets. Cash is set aside for both daily liquidity needs and anticipated cash outflows.

There is also a precautionary motive behind the need of setting cash aside. The forecasts of future cash flows are subject to uncertainty so that unexpected demands for cash may arise.

Companies building cash reserves for speculative motive want to take advantage of investment opportunities that may suddenly arise. Such type of opportunities involves mergers and takeovers.

Cash reserves that are not seen as needed for new investment opportunities, therefore lacking a speculative motive, may be then distributed to shareholders either as dividends or share repurchases.

The several motives and reasons a company has to hold cash define how difficult it is to determine the optimum cash level to be held, which varies both over time and between companies.

Factors determining the need of cash, other than the above mentioned motives, include the cash inflows and outflows forecast, the efficiency in managing them, the liquidity of the firm's assets, the debt capacity, and the company's risk aversion.

Cash flow problems for the firm may happen for a variety of reasons. Experiencing losses on a regular basis, for example, can lead to severe cash flow problems, to the extent of liquidation or hostile acquisition.

The growth process of a firm requires investment in long-term fixed assets and working capital. When there is no prompt availability of the funds needed for this investment, the cash flows can be compromised.

Seasonal businesses are particularly exposed to cash flow imbalances, therefore requiring accurate cash flow management. The control in this case must take care of the cyclical nature of cash flow patterns.

Cash flow problems may also arise due to consistent lump-sum items of expenditure, such as redemption of debt or investment in noncurrent assets. One way to limit the impact of debt redemption is through sinking fund provision.

Recall that the sinking fund is a pool of money in which regular contributions of cash and accumulated interest combine to produce the required lump sum, although refinancing with new debt is more common.

There are several possible remedies available against shortages of cash when needed. Postponing unnecessary capital expenditures is one way to free up cash to be used for treasury purposes.

The cut in expenditures will normally accelerate the rate at which cash flows into the business. This can be also achieved by offering discounts for early payment to customers, therefore cutting the receivables period.

Another possibility is to collect cash by selling investments or projects that were financed by some excess of cash available at the time of investment. Finally, a

company may be able to identify ways to reduce or postpone cash outflows (payments).

Another way to reduce cash outflows is to delay or undo a dividend payment decision. Dividends should be paid out when the excess of cash flows in the firm is sufficient to justify that. Missed payment may in fact send a negative signal to the market.

Budgeting is the key to successful cash management. Through budgets it is possible to show expected inflows and outflows over a period, in order to highlight expected cash surpluses and deficits.

Through careful cash budgeting, managers gather information about how to plan borrowing and investment, facilitating the control of expenditure. With the help of computers, analysts can analyze scenarios and anticipate possible cash flow difficulties as well as examine possible future scenarios.

It is important to continuously update the budget in order for it to be useful. Comparison of estimated figures with the current ones allows to spot significant variations from the benchmark and plan for opportune adjustments.

Correct management of cash flows is a challenging task, involving prompt collection of credits from clients, with subsequent quick banking of the proceedings. Prompt banking will either reduce the interest charged on an outstanding overdraft or increase the interest earned on cash deposits.

On the liability side, payables should be fully exploited and all the time given by suppliers should be used, so as to delay the need of liquidity as much as possible. The benefit from such a strategy should of course be greater than the benefit of taking any early payment discounts available (Pass and Pike 1984).

Another important factor to consider is the float, which is the time period between the initiation of a payment and the record of the cash in the firm's bank account. The float can be several days and consists of some delays.

There is a transmission delay for passing the payment side to side and a lodgment delay for banking the payment. On top of that clearance also takes some time. Delay can be minimized by using electronic payment systems. Good cash management will aim to keep the float to a minimum.

Another important point is how to invest the surplus cash, not immediately needed. The cash should be invested in assets with riskless profile and short-term maturity. This is needed to support a company's continuing working capital needs.

It is therefore very important to diversify the portfolio of investment, by depositing the amounts into different banks. Several factors affect the choice of the appropriate investment method.

First of all, the size of the surplus is very important, as some investment methods have minimum amounts. Another important factor is the ease of realization of an investment, as well as its expected maturity.

Factors like risk and return are of course very important as well, as are the penalties which may be incurred for early liquidation. One should not forget in fact that the purpose of investing cash in short-term asset is for the funds to be promptly disengaged if needed.

The range of instruments available for short-term investment of cash goes from money market deposits to certificate of deposit, treasury bills, and others. It is important to get quotations about every single investment opportunity before making a choice.

Cash can be put on term deposit with a bank to earn interest, with the interest rate depending on the size of the deposit, its maturity, and the notice required for withdrawals. Money market deposits on the other hand are indicated for companies that can predict their cash flow needs with a high degree of certainty.

In most countries certificates of deposit are negotiable bearer securities issued by banks and building societies. At maturity, the holder of a certificate of deposit is entitled to receive both principal and interest.

They can be sold before maturity, which makes them a highly liquid form of investment. As opposed to term deposits, they can be useful if a company's cash flows are not predictable enough for a money market deposit to be made.

The traditional view of working capital is basically static and is defined as the difference between current assets and current liabilities. An alternative view of working capital is dynamic.

Such a view defines working capital as an equilibrium between the income-generating and resource-purchasing activities of a company (Pass and Pike 1984), in which case it is closely linked to the cash conversion cycle.

11.4.2 Float Management and Collection

The difference between the cash amount a corporate has on balance sheet and the amount it has in the bank accounts is called Float, in its more general definition, and comes in different types.

When a firm writes a check, the cash deduction is immediately recorded in the books, but not as immediately the money is deducted from the bank account. This situation is defined as disbursement float (Ross et al. 2016).

The opposite case holds when a bank receives a check which increases the amount of cash in the book, but does not immediately increase the amount of cash in the bank accounts. This is called collection float.

$$F = C_{\text{bank}} - C_{\text{book}}$$

where:

C_{bank} is the cash in the bank accounts.

C_{book} is the cash in the books.

Items affecting both disbursement and collection float include mailing time, processing delay, and availability delay. Float is then created when a company receives or writes a check that is then processed through several steps that are summarized in Fig. 11.2.

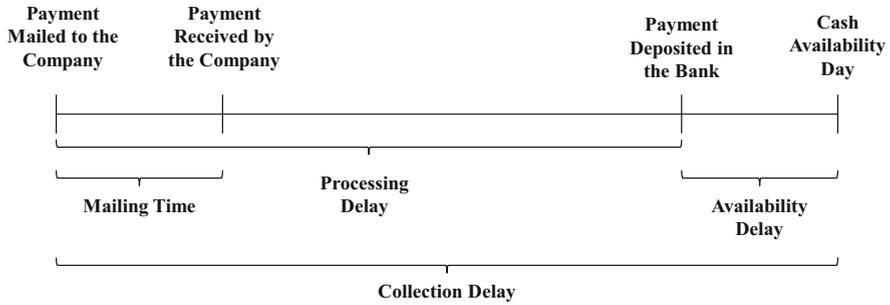


Fig. 11.2 Timeline of cash collection

Once both collection float and disbursement float are calculated for a company, the net float is simply the difference between the former and the latter and gives the measure of the net position of the company on unused cash.

$$F_{net} = F_{dis} + F_{cll}$$

where:

F_{dis} is the disbursement float.

F_{cll} is the collection float.

Example 11.5 Consider a company buying inventory and paying with a check of 50,000 €. The company book balance will be immediately reduced by the amount of 50,000 €, while the bank account will not. If the company starts with a balance of 200,000 € in both the book and the bank, the float scheme looks like:

	Bank balance (€)	Book balance (€)	Float (€)
Initial	200,000	200,000	200,000 – 200,000 = 0
After issuing the cheque	200,000	200,000 – 50,000 = 150,000	200,000 – 150,000 = 50,000

Example 11.6 Consider the same company as in Example 11.5, selling products and being paid with a check of 50,000 €. The company book balance will immediately increase by the amount of 75,000 €, while the bank account will not. If the company starts with a balance of 200,000 € in both the book and the bank, the float scheme looks like:

	Bank balance (€)	Book balance (€)	Float (€)
Initial	200,000	200,000	200,000 – 200,000 = 0
After issuing the cheque	200,000	200,000 + 75,000 = 275,000	200,000 – 275,000 = –75,000

Example 11.7 Consider the same company as in Examples 11.5 and 11.6. Given the collection float and the disbursement float calculated before, we can calculate the net float as:

$$F_{\text{net}} = F_{\text{dis}} + F_{\text{cll}} = 50,000 - 75,000 = -25,000 \text{ €}$$

The size of the float depends on the amount of cash involved in the transactions, and the days that occur between the book change and the bank account change. Float can be measured as a daily average, as:

$$F_{\text{AD}} = \frac{F_{\text{€},i}D_i + F_{\text{€},j}D_j + \dots + F_{\text{€},n}D_n}{D_i + D_j + \dots + D_n}$$

where:

$F_{\text{€},i}$ is the monetary amount of cash of float i .

D_i is the number of days between book change and bank account change of float i .

Example 11.8 A company has a collection float of 2000 € outstanding for 3 days and will have a float of 1500 € outstanding for the following 5 days. The average daily collection float is then

$$\frac{2000 \times 3 + 1500 \times 5}{3 + 5} = \frac{13,500}{8} = 1,687.50 \text{ €}$$

Example 11.9 A company has a disbursement float of 2500 € outstanding for 3 days and will have a float of 2000 € outstanding for the following 4 days. The average daily disbursement float is then

$$\frac{2500 \times 3 + 2000 \times 4}{3 + 4} = \frac{15,500}{7} = 2,214.29 \text{ €}$$

Collection float is very important to the company, as it represents the amount of cash currently not available for other investments. The delayed collection of float results in an opportunity cost for not having the chance to use the cash, due to temporary unavailability. Cash can in fact generate returns if properly invested or even be invested in new projects.

In modern times the issue of float management has been relieved by the use of electronic banking, transfers, payments, and other means that speed up the process of cash collection, compared to the past.

The collection time is normally split into several stages. The first moment is the mailing time, when the checks from customers are delivered. This time depends on the speed the postal system can deliver the checks.

The company is then responsible of the processing delay, which involves the time needed to process the payment and make it ready for collection. The bank finally is responsible of the availability delay, due to the time of processing the check in the banking system.

As mentioned above, the float represents an opportunity cost for the company. For a company having daily checks received of some amount C and average delay of n days, the average daily float will be nC .

The same amount represents the benefits that the company can get if the float is eliminated immediately. Reducing the average daily float to one day can bring a benefit of C .

The cash collection, as mentioned above, is made of three distinct components that should be handled to ensure the shortest possible collection time. Some companies even choose to outsource cash collection.

Location is one of the factors affecting collection in that the company may decide to have all checks sent to the same location or to different ones, based on criteria like business division, geographic location of subsidiaries, etc.

A very common approach to collection that is becoming more and more popular is the preauthorized payment arrangement. Dates and amounts are fixed beforehand, and the bank takes care of the transfer to be settled on the established date, at the right amount.

Back to location issues, having several different collection points for checks may entail having different banks and bank accounts taking care of the collection of cash into accounts.

Concentration of cash into one single location or few ones can normally speed the collection process by involving a single bank account or few ones. The concentration of cash into a single bank also offers the chance to negotiate better banking conditions on the amount.

Concentration banks are chosen to pool the funds from several local banks that handle a share of the company's payments. Tools allowing cash concentration include:

- Depository transfer checks (DTC), to transfer funds between accounts of the same company.
- Automated clearing house (ACH) transfers, as an electronic alternative to paper checks.

Reducing the float can be done in several ways and comes at a cost. The PV of eliminating the float is equal to the float itself, and therefore it is convenient to reduce it as long as the PV of the associated costs is lower.

Example 11.10 A company has an average daily float of 1,500,000 € and an average delay of 4 days. The total amount of float is then equal to

$$1,500,000 \times 4 = 6,000,000 \text{ €}$$

Assume the company can reduce the float by 2 days at a cost of 2,500,000 €. The total float reduction will be equal to

$$1,500,000 \times 4 = 3,000,000 \text{ €}$$

If the cost of reducing the float is lower, that means the company should reduce it and benefit from an NPV of

$$3,000,000 - 2,500,000 = 500,000 \text{ €}$$

Banks offer lock-box services to directly receive and process the checks from the company's customers, so to speed up the collection and the crediting of the money on the company's bank account.

The service comes at a cost that normally involved a variable cost per number of checks processed and a fixed fee to be paid for the wiring of the amounts to the target account.

Normally the lock boxes are a postal service maintained by local banks, and some companies may even use plenty of lock boxes. Checks are collected many times per day and process them depositing the related amounts in the company's accounts.

Thanks to lock boxes the mailing time is normally reduced due to the direct mailing of the checks to the bank. There is also an electronic version where the customers can use telephone or the Internet to authorize payments of transactions.

Example 11.11 A company has to decide whether to require a lock-box service to process the checks externally. The finance office collected the following information about cash collection:

- Collection is planned to be reduced by 2 days on average.
- Alternative means of investment are available at a daily rate of return of 0.01%.
- The lock-box will receive an average number of 5000 checks per day.
- Each check will be of an average amount of \$500.
- The bank charges a processing fee of \$0.10 per check and a total fee of \$10 to wire the funds.

Based on the information, the average amount of daily collections will be

$$5000 \times 500 = 2,500,000 \text{ €}$$

A 2-day reduction of the collection period will then correspond to a total benefit of

$$2,500,000 \times 2 = 5,000,000 \text{ €}$$

The cost associated to reducing the float is

$$5000 \times 0.10 = 510 \text{ €}$$

Assuming the deal with the bank has not termination, we can assume the cost to be perpetual, with an associated PV of opportunity cost (given the missed opportunity of investing the above sum at the daily rate of return of 0.01%) of

$$\frac{510}{0.0001} = 5,100,000 \text{ €}$$

The NPV associated with the adoption of the lock-box system is therefore

$$5,000,000 - 5,100,000 = -100,000$$

And the lock-box should not be rented.

11.5 Summary

The management of short-term capital is as important as the long-term capital in that it determines the liquidity of the firm and therefore its ability to promptly pay for its short-term obligations.

Current assets are those with maturity below 1 year and resemble all the components of the capital that relate to the production in a strict sense. Inventory is a part of such a pool, and its management is also very important.

The management of cash is also of primary importance. Keeping a good balance of cash readily available for sudden payments is the key for a business to promptly react to unwanted needs and be successful.

Receivables and payables are in this sense a good term to judge the liquidity of the company and its overall health in terms of the cash flows. It is very important in fact to correctly balance the inflows and the outflows in order to not put the liquidity at risk.

Accounts receivable represent the credit given to the customers when selling products or services not on cash but upon delayed payment. Payables on the other hand represent the same chance taken by the company toward the suppliers.

It is very important that the number of receivable days and the payable days are such that there is no shortage of cash in the firm. Appropriate approaches can be used to make the flow smooth and efficient.

Inventory is a very important part of the current assets. Working capital management strongly relies on accurate management of the inventory, which is done through several types of model.

When the inventory is correctly managed, there will be no delays in the production and no useless storage of extra items that are not needed in a reasonable term, therefore resulting in an inefficient use of resources.

Problems

1. What is the concept of working capital?
2. Define working capital.
3. List out the various kinds of working capital.
4. What is meant by gross working capital?
5. What is net working capital?
6. What is meant by core current assets?
7. What is meant by variable working capital?
8. Explain the concept of operating cycle.
9. What are the stages of operating cycle?
10. Briefly explain the various advantages of working capital.
11. Explain the various disadvantages of working capital.
12. What are the disadvantages of excessive working capital?
13. Describe the various determinants of working capital in a business concern.
14. What are the sources of short-term working capital?
15. Discuss the new trends in financing of working capital by banks.
16. Discuss the various techniques of forecasting working capital of a concern.
17. Explain the procedure for computation of working capital.

Case Study: Conversion Cycles

Shortfin Ltd

The Case

ShortFin Ltd. is a European company active in the production of intermediate goods and services to be distributed to other companies. Established in 1932, the company is florid and runs a very successful business, and even though it reached a considerable size, it is still run as a family business.

Compared to competitors in the industry, the company has been running on lower leverage in the capital structure, which makes it easier for them to face the little interest payments due and also devolve much of the profits to equity.

The company has been historically relying to a buffer of cash that has never been to large, so to avoid opportunity costs due to missed investments, and missed returns earned on the money.

Recently the management of the company has started a thorough rigorous analysis of the company financials to assess whether the company is ready to face the competition in the new millennium.

The business sector is more competitive than decades ago, and it is very important that both the long-term financing and the short-term financing management are up to date and ready to sustain the company's future challenges. Given the nature of its business, the company must take good care of the short-term financing.

The company in fact operates in an industry where profitability is strictly related to the correct management of all current assets. In particular the company shows the following financials (average over 1 year, 365 days, in €):

Net sales: 1,200,000.

Cost of goods sold: 750,000.

Inventory: 250,000.

Receivables: 230,000.

Payables: 210,000.

You are hired by the company and assigned to a team in the finance office. The team is asked to take care of the analysis of the above financials and recommend possible solutions, if any problem is identified.

As a financial manager with years of experience you know that it is very important for a company to be solid and solvent in terms of liquidity, as well as it is important to be long-term solvent.

The focus of your current task is to analyze the short-term financing situation of the firm, and to accomplish your mission you are informed that the average numbers of the competitors (industry) are:

Operating cycle: 175 days.

Cash cycle: 76 days.

Receivables period: 55 days.

Payables period: 100 days.

Inventory period: 120 days.

All the information needed is on the tables, and you want to perform the task in the most efficient way, so to use appropriate measures and ratio, to identify issues, if any, and recommend solutions, as required.

Questions

1. How can you compare the financials of the company with the average in the industry?
2. Identify the source(s) of problem(s), if any.
3. What would you recommend to do in order to fix the problem(s), if any? Justify your answer with calculations.

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