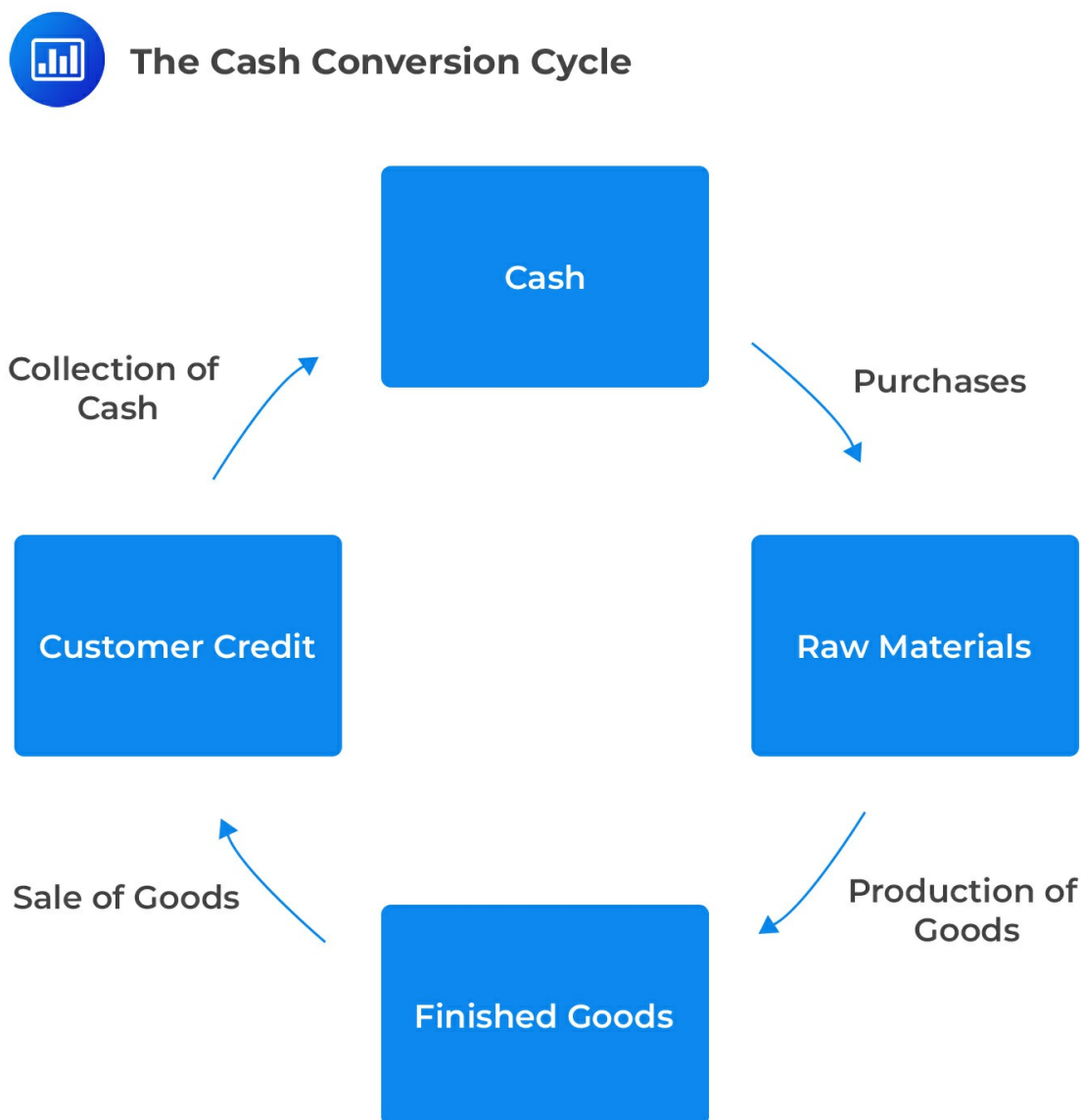


Learning Module 4: Working Capital & Liquidity

LOS 4a: explain the cash conversion cycle and compare issuer's cash conversion cycles

The business operations of a company typically consist of a series of consecutive stages. For example, consider a manufacturing company whose operating cycle includes the purchase of raw materials, inventory production, sale to customers, and debt collection, as shown below:



The operating cycle activities of a company results in cash inflows, and outflows will occur at a different times. On the issuer's balance sheet, future cash outflows within the operating cycle are recorded as short-term liabilities (current liabilities), while future cash inflows are recorded as short-term assets (current assets).

Table 1 and 2 contains the definition, recognition, and derecognition of different cash outflows and inflows.

Table 1: Short-Term Assets Information			
Short-term Assets	Definition	Recognition	Derecognition
Account receivable	Payment to be collected from customers for services or goods sold.	When goods are sold to customers on credit.	When payment is received from the customer.
Inventory	Cost of goods purchased or produced for sale.	When the issuer takes ownership of the materials, goods, suppliers, and other inventories.	Derecognized when ownership rights are transferred to the customer (sold to the customer)

Exhibit 2: Short-Term Liabilities Information			
Short-term Liabilities	Definition	Recognition	Derecognition
Accounts Payable	Payment owed to suppliers for services or goods received.	Recognized when the issuer receives the goods and service, and payment is deferred to the supplier.	When the supplier is paid.

The average duration of each of these short-term accounts can be used to create a timeline for a corporate issuer's operating cycle. Days of inventory on hand (DOH), days payable outstanding (DPO), and days sales outstanding (DSO) are used by analysts to construct the cash conversion cycle.

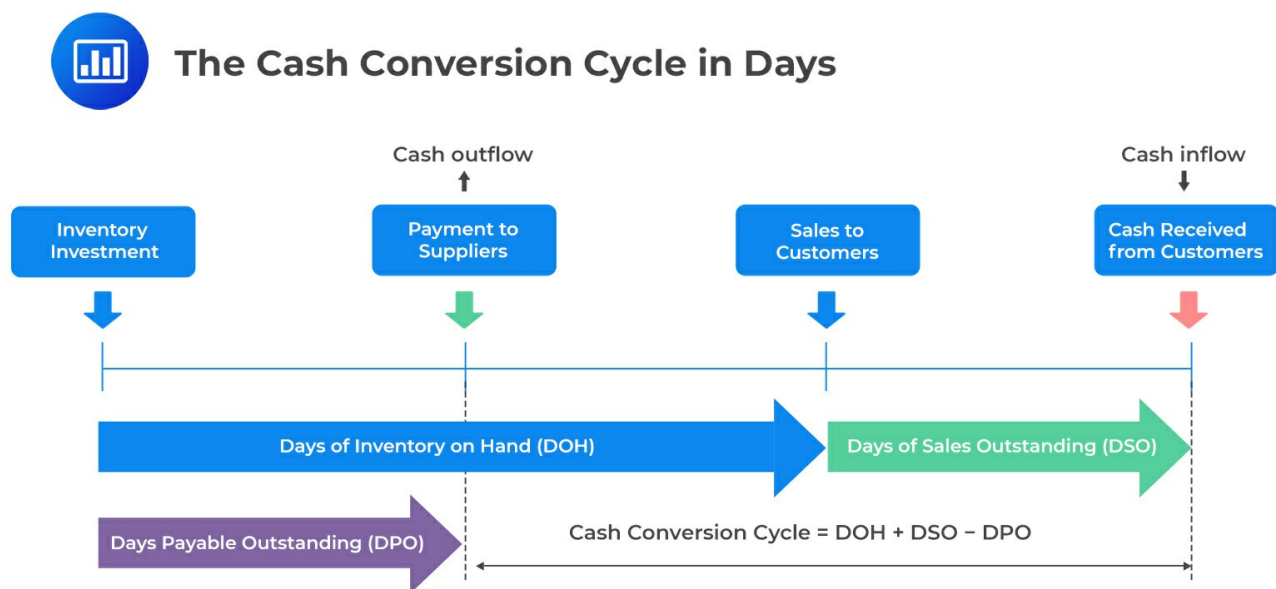
Cash Conversion Cycle

The cash conversion cycle is the amount of time between an issuer's payment to its suppliers and receiving cash from customers. In other words, the cash conversion cycle is the time between the derecognition of accounts payable and the derecognition of accounts receivables.

The cash conversion cycle is mathematically expressed as follows:

$$\begin{aligned}\text{Cash conversion cycle} &= \text{Days of inventory on hand} + \text{Days sales outstanding} \\ &\quad - \text{Days payable outstanding} \\ &= \text{DOH} + \text{DSO} - \text{DPO}\end{aligned}$$

From the equation above, the cash conversion cycle can be seen as the number of days it takes for a company to convert inventory investment into cash receipts from customers. Consider the following diagram:



When the cash conversion cycle is longer, the company will need more time to finance the payment of its bills because it has not received cash receipts from customers. For instance, airlines tend to have shorter cash conversion cycles than pharmaceuticals since the latter keeps more inventory.

A short or even negative cash conversion cycle is preferred since the cash can be used to finance other activities reducing the dependence on alternative financing options to fund operations. A

negative cash conversion cycle results from a company receiving cash from customers before the suppliers are paid.

Ways of Shortening Cash Conversion Cycle.

Intuitively from the conversion cycle formula, the following are ways a corporate issuer can shorten its cash conversion cycle:

1. Reducing inventory days on hand (DOH) by:

- discontinuing low-demand product lines,
- negotiating with suppliers to increase the frequency of their deliveries to establish “just in time” inventory levels, and
- using data analytics to rationalize the stocking levels and improve customer demand forecasts.

2. Reducing days sales outstanding (DSO) by

- tightening credit standards,
- imposing late fees,
- offering discounts to early-paying clients,
- accelerating installment payments, and
- working with third-party collection agencies.

3. Increase days payable outstanding (DPO) by negotiating longer terms for supplier contracts. This method will work by dealing with a preferred supplier offering longer terms if, for example, a company purchases supplies in large volumes.

Comparing Trade Credit and Borrowing from a Bank

Lengthening the days payable outstanding can enhance the cash conversion cycle. However, some suppliers may offer discounts for prompt or early payment. If a company forgoes this

discount to extend days payable outstanding, the company is implicitly borrowing from the supplier for the extra days at the cost of the forgone discount.

For example, assume that a company is given the following terms of trade credit: “3/10, net 30”. This implies that a supplier will give the company a 3% discount if the account is paid within 10 days; otherwise, the full amount is due by the 30th day.

Suppose a company decides to forego this discount for a payment in the 30th day. In that case, the company is implicitly borrowing from the supplier for 20 (=30-10) days at a cost equivalent to the foregone discount.

A remedy to this problem is for a corporate issuer to borrow from a bank at a low-interest rate to pay the supplier early to qualify for the discount and repay the bank later. However, we need to calculate the effective annual rate (EAR) of supplier financing and compare it with the bank's EAR on the loan.

The effective annual rate (EAR) of supplier Financing is given by:

$$\text{EAR of Supplier Financing} = \left[\left(1 + \frac{\text{Discount \%}}{100\% - \text{Discount \%}} \right)^{\frac{\text{Days in Year}}{\text{Payment Period} - \text{Discount Period}}} \right] - 1$$

If the effective annual rate of the supplier financing is higher than the interest rate on the bank loan, then the company should borrow from its bank and pay the supplier early, and vice versa.

Example: Comparing Trade Credit and Borrowing from a Bank

Assume that a manufacturing company is given the following terms of trade credit: “2/10, net 30” by one of its suppliers of raw materials. Further, the company lacks enough cash to pay its suppliers to take advantage of the discount.

The company decides to borrow from its local bank at an annual rate of 10% to pay its suppliers before 10 days. Is this a prudent move by the company?

Solution

We need to calculate the effective annual rate on the trade credit:

EAR of Supplier Financing

$$\begin{aligned} &= \left[\left(1 + \frac{\text{Discount \%}}{100\% - \text{Discount \%}} \right)^{\frac{\text{Days in Year}}{\text{Payment Period} - \text{Discount Period}}} \right] - 1 \\ &= \left[\left(1 + \frac{2\%}{100\% - 2\%} \right)^{\frac{365}{30-10}} \right] - 1 = 44.59\% \end{aligned}$$

Since the effective annual rate of 44.59% on supplier financing is higher than the 10% interest rate on the bank loan, the company should take the bank loan. Consequently, the company retains the cash and pays a lower interest rate on the financing.

Implication of Long Cash Conversion Cycle

A long cash conversion cycle can be an indicator of business model or industry characteristics. However, analysts are concerned about a longer cash conversion cycle than competitors and its lengthening over time. This can be an indicator of poor customer credit quality, declined customer demand, or the loss of bargaining power with suppliers.

Working Capital

In addition to the cash conversion cycle, working capital is also used to measure the efficiency of business operations. A broad measure of working capital is the total working capital defined as:

$$\text{Total working capital} = \text{Current assets} - \text{Current liabilities}$$

Net working capital is a measure of working capital that does not include items minimally associated with the cash conversion cycle or business operations. Such items include cash, marketable securities, and short-term debt.

$$\begin{aligned} \text{Net working capital} &= \text{Current assets (excluding cash and marketable securities)} \\ &\quad - \text{Current liabilities (excluding short-term and current debt)} \end{aligned}$$

Total or net working capital is often expressed as a percentage of sales to control for

comparability across firms. The ratio of working capital and cash conversion cycle are interrelated. A long cash conversion cycle is associated with a high working capital-to-sales ratio and vice versa. Industry such as the pharmaceutical industry that hold large inventory due to regulation generally have a high ratio of working capital to sales.

Example: Calculating Total Working Capital and Net Working Capital

Consider the following balance sheet for Company ABC (in \$ million):

Cash	150
Marketable securities	400
Accounts receivable	500
Inventory	900
Prepaid expenses	600
PPE	20,000
Total Assets	22,550
Accounts payable:	600
Accrued expenses	80
Short-term debt	1,200
Total liabilities	1,880

Calculate total working capital and net working capital.

$$\text{Total working capital} = \text{Current assets} - \text{Current liabilities}$$

$$\begin{aligned} \text{Current assets} &= (\text{Cash} + \text{marketable securities} + \text{Accounts receivable} \\ &\quad + \text{Inventory} + \text{Prepaid expenses}) \end{aligned}$$

$$= 150 + 400 + 500 + 900 + 600 = 2,550$$

$$\begin{aligned} \text{Current Liabilities} &= \text{Accounts Payable} + \text{Accrued Expenses} \\ &\quad + \text{Short term debt} \end{aligned}$$

$$= 600 + 80 + 1,200 = 1,880$$

$$\therefore \text{Working Capital} = 2,550 - 1,880 = 670$$

Net working capital

$$= \text{Current assets(excluding cash and marketable securities)}$$

$$- \text{Current liabilities(excluding short-term and current debt)}$$

$$= [2,550 - (150 + 400)] - [1,880 - (1,200)] = 1,320$$

Question

Due to limited cash flow, an issuer must decide which supplier terms are the least costly. The credit term with the lowest effective interest rate (EAR) of supplier financing is *most likely*:

- A. $\frac{2}{10}$, net 50
- B. $\frac{3}{10}$, net 40
- C. $\frac{2}{15}$, net 60

Solution

C is correct.

Foregoing a discount offered by the supplier or vendor has an implicit financing cost depending on the amount of the discount forgone and the length of the payment period after the discount period. Calculations of the cost of financing, expressed as an effective annual rate, for each set of credit terms, are as follows:

EAR of Supplier Financing

$$= \left[\left(1 + \frac{\text{Discount \%}}{100\% - \text{Discount \%}} \right)^{\frac{\text{Days in Year}}{\text{Payment Period} - \text{Discount Period}}} \right] - 1$$

$$\text{EAR of } \frac{2}{10}, \text{ net 50} = \left(1 + \frac{2}{100\% - 2} \right)^{\frac{365}{50-10}} - 1 = 0.2024 \text{ or } 20.24\%$$

$$\text{EAR of } \frac{3}{10}, \text{ net 50} = \left(1 + \frac{3\%}{100\% - 3\%} \right)^{\frac{365}{40-10}} - 1 = 0.4485 \text{ or } 44.85\%$$

$$\text{EAR of } \frac{2}{15}, \text{ net 60} = \left(1 + \frac{2}{100} \right)^{\frac{365}{60-15}} - 1 = 0.1780 \text{ or } 17.80\%$$

Therefore, the credit terms with lower EAR of supplier financing is $\frac{2}{15}$, net 60.

LOS 4b: explain liquidity and compare issuers' liquidity levels

Liquidity is the degree to which a corporation can satisfy its short-term obligations using cash flows and assets that can be quickly converted into cash. In this context, liquidity refers to the available cash, borrowing power, and ability to turn other assets into cash.

Liquidity management describes a company's ability to generate cash whenever it needs to meet its short-term obligations. Effective liquidity management means that a company can manage its significant sources of liquidity efficiently. Although these sources of liquidity tend to vary from one company to another, they include primary and secondary sources of liquidity.

Primary Sources of Liquidity

Primary liquidity sources refer to funds readily accessible to a company at a relatively low cost. They can be held as cash or cash equivalents, and they include the following:

- **Cash and marketable securities on hand:** The liquidation of near-cash securities, investment income, and bank balances are three examples.
- **Borrowings:** These consist of a company's short-term investment portfolios, trade credit, and bank lines of credit.
- **Cash flow from the business:** These are operating cash flows after taxes and fewer short- and long-term investments.

Primary sources of liquidity demonstrate how well an organization's cash management processes are working. The more decentralized a company is, the more limited a firm's free cash flow is. Analysts track an issuer's cash flow information using the statement of cash flows. Analysts can calculate cash flow measures from the statement of cash flows.

1. **Cash flow from operations:** It measures an issuer's primary business activities' cash profit over time, calculated as follows.

Cash received from customers.

Plus: Interest and dividends received on financial investments

Minus: Cash paid to employees and suppliers

Minus: Taxes paid to governments

Minus: Interest paid to lenders

Cash flows from operations

2. **Free cash flow:** Cash flow from operations does not account for the capital investments an issuer makes to expand or improve operations. Thus, we calculate free cash flow to account for this.

Cash flows from operations

Minus: Investments in long-term assets

Free cash flow

Secondary Sources of Liquidity

Secondary sources of liquidity include:

- Renegotiating debt contracts to reduce high-interest payments or principal repayment burdens.
- Selling assets.
- Reducing or suspending shareholders' dividends.
- Issuing equity through share issuance in private or public markets. The effect is that the existing shareholders' equity will be diluted.
- Filing for bankruptcy protection and reorganization.
- Reducing capital expenditures.

Using secondary sources of liquidity can impact a company's financial and operating positions. In this respect, secondary liquidation sources are unlike primary sources of liquidity, which usually have no such impact. Using secondary sources of liquidity can also signal that a company's

financial health is worsening. Consequently, under such circumstances, liquidity is provided at a higher cost than usual.

Drags and Pulls on Liquidity

Drag on Liquidity

The timing of cash receipts and disbursements can significantly affect a company's liquidity position. When receipts infrequently occur, especially after payments are made, a 'drag on liquidity' occurs due to the decreased availability of funds. Drags on liquidity include:

1. Uncollected receivables.
2. Obsolete inventory.
3. Borrowing constraints.

Pull on Liquidity

A 'pull-on liquidity' occurs when disbursements are paid too early. This is because companies will be forced to spend money before receiving funds from sales. Pulls on liquidity include:

- Early payments.
- Reduced credit limits.
- Limits on short-term lines of credit.
- Low liquidity positions.

Measuring and Evaluating Liquidity

A company's liquidity determines its creditworthiness and capacity to borrow at cheaper rates and with better credit conditions, increasing its flexibility. The less liquid a company is, the more likely a corporation will go bankrupt.

The liquidity of a corporation may be evaluated using the following financial ratios:

Liquidity Ratios

Liquidity ratios assist in measuring the ability of a company to satisfy short-term obligations when they fall due. Comparing a company's liquidity ratios with those of peer companies in the same industry can determine the relative creditworthiness of the company.

Common liquidity ratios include:

Current ratio

A company with a positive total working capital is likely to have a current ratio greater than one. A higher current ratio implies greater liquidity under this measure, including short-term assets.

$$\text{Current ratio} = \frac{\text{Current assets}}{\text{Current liabilities}}$$

Quick ratio

The quick ratio removes the inventory since they are not easy to convert to cash. A firm that can meet its short-term cash obligations without liquidating inventory is likely to have a quick ratio greater than one.

$$\text{Quick ratio} = \frac{\text{Cash} + \text{Short term marketable instruments} + \text{Receivables}}{\text{Current liabilities}}$$

Cash Ratio

The cash ratio compares short-term marketable securities and cash with current liabilities. A cash ratio greater than or equal to one indicates that a firm could meet all its short-term obligations without collecting receivables or waiting to sell inventory.

$$\text{Cash ratio} = \frac{\text{Cash} + \text{Short term marketable instruments}}{\text{Current liabilities}}$$

Example: Calculating Liquidity Ratios

Consider the following balance sheet for Company ABC (in \$ million):

Cash	150
Short-term marketable securities	400
Accounts receivable	500
Inventory	900
Prepaid expenses	600
PPE	20,000
Total Assets	22,550
Accounts payable:	600
Accrued expenses	80
Short-term debt	1,200
Total liabilities	1,880

Calculate the current ratio, quick ratio, and cash ratio.

Solution

$$\text{Current ratio} = \frac{\text{Current assets}}{\text{Current liabilities}} = \frac{2,250}{1,880} = 1.20$$

$$\begin{aligned}\text{Quick ratio} &= \frac{\text{Cash} + \text{Short term marketable instruments} + \text{Receivables}}{\text{Current liabilities}} \\ &= \frac{150 + 400 + 500}{1,880} = 0.56\end{aligned}$$

$$\begin{aligned}\text{Cash ratio} &= \frac{\text{Cash} + \text{Short term marketable instruments}}{\text{Current liabilities}} \\ &= \frac{150 + 400}{1,880} = 0.29\end{aligned}$$

Question

Which of the following are *most likely* primary sources of liquidity?

- A. Negotiating debt contracts and liquidating assets.
- B. Ready cash balances and short-term funds.
- C. Filing for bankruptcy and cash flow management.

Solution

The correct answer is B.

Readily available cash balances and short-term funds are examples of primary sources of liquidity.

A is incorrect. Negotiating debt contracts and liquidating assets are examples of secondary sources of liquidity.

C is incorrect. Whereas cash flow management is a primary source of liquidity, filing bankruptcy is a secondary source of liquidity.

LOS 4c: describe issuers' objectives and compare methods for managing working capital and liquidity;

The main objective of liquidity and working capital management is to maximize the value of a firm while ensuring ready access to capital to pay creditors and for day-to-day operations. To accomplish this, reducing the cash conversion cycle, gauging liquidity requirements, and reducing surplus funds is essential. This ensures the company can divert money to profitable ventures or give it back to shareholders while aligning with its business framework.

Different industries and businesses within the same industry have different working capital requirements. Manufacturing businesses with complex production processes may require holding inventory for extended periods, while distributors of less complex goods may have minimal inventory. Retail businesses with multiple sales locations and credit sales require more working capital in inventories and accounts receivable.

Service and software businesses generally have lower working capital requirements as they don't have inventories and receive upfront payments.

Working Capital Management

Firms approximate working capital requirements based on revenue. Moreover, firms forecast future working capital requirements based on future revenue forecasts. While estimating the working capital requirements, firms usually do the following:

- Differentiating **permanent** and **variable** current assets. Permanent current assets include base levels of inventory, staffing, and receivables, which are usually constant over time. Variable current assets are additional inventory and labor required at peak production and sales or growth phase.
- Weighing the cost against the benefits using different inventory and receivables policies. For instance, easy credit policies may result in high billing costs and payment delinquencies.

Working Capital Management and Funding Method

Businesses adopt various strategies regarding the magnitude of their current assets and the type of financing they use to sustain those assets. They include:

Conservative Approach

A conservative approach entails maintaining a higher proportion of inventory, cash, and receivables relative to sales and leaning more toward long-term financing. While this method offers optimal financial adaptability to cater to its requirements, it comes at a higher cost. Organizations in their early-stage growth stage tend to gravitate towards this approach due to restricted short-term borrowing options.

Firms may choose a conservative working capital strategy for the following reason:

- I. Lesser dependence on capital during market stress.
- II. Anticipation of flat or increasing interest rates
- III. Avoidance of rollover risk of short-term debt in favor of cash flow stability.
- IV. The higher financing costs are perceived to be offset by the benefits of greater certainty and permanent capital.

Advantages of the conservative working capital approach

- Permanent, stable financing prevents the risk of rollover associated with short-term debt.
- The costs of financing are known in advance
- Working capital required to buy inventory is certain.
- Short-term cash needs to service debts are reduced due to extended payment terms.
- More significant cash or marketable securities positions provide greater flexibility during market disruptions.

Disadvantages of the conservative working capital approach

- Higher interest rates due to the use of long-term debt.
- High equity cost.
- The opportunity to borrow on need be basis is eliminated by permanent financing.
- Establishing the financing position often requires a longer lead time.
- Business operations may be restricted by long-term debt.

Aggressive Working Capital Approach

In an aggressive strategy, a company aims to limit surplus cash, receivables, and inventory relative to sales and leans more towards short-term financing to cater to both fluctuating and constant working capital requirements.

Intuitively, by allocating fewer dedicated resources to current assets, the company trades off short-term financial flexibility for increased investor returns.

Working capital policies may be more aggressive in industries with lower profit margins to gain a cost advantage over competitors. When markets are stressed, a firm is more susceptible to debt rollover risk when relying more on short-term financing than a conservative approach.

Firms may choose an aggressive working capital approach for the following additional reasons.

- I. Ability to predict future sales and cash requirements with high accuracy.
- II. Anticipation of decreasing or stable interest rates.
- III. Expectation that the firm will reduce its cash conversion cycle by decreasing the duration of its accounts receivable and inventory periods while lengthening its accounts payable period.
- IV. Ability to minimize accounts receivable and quickly liquidate inventory.

Advantages of an aggressive working capital approach

- Low financing cost
- Interest expense is low due to the flexibility of borrowing on a need-be basis.

- Fewer restrictions on business operations due to the use of short-term debt.
- If rates fall, it is easier to refinance.

Disadvantages of an aggressive working capital approach

- As rates of short-term financing change, interest expense may fluctuate.
- Higher short-term cash needs may arise to settle debt maturities.
- The refinance risk associated with short-term debt heightens the threat of bankruptcy, especially during market upheavals.
- If refinancing on favorable terms is unattainable, there might be a need to depend on pricier trade credit, restrict customer credit, or liquidate receivables.

Moderate Working Capital Approach

Moderate working capital approaches balance long-term financing for permanent current assets with short-term debt for variable assets. Moderate working capital strategies have lower financing costs and refinancing risks than aggressive approach.

Additionally, these firms can use long-term debt and equity to support permanent needs in addition to reducing working capital. A firm might pursue a moderate approach to working capital management include the following reasons:

- I. Capability to precisely predict fundamental current asset needs, though there's less assurance regarding fluctuating demands.
- II. Lower financing expenses compared to a conservative strategy, coupled with decreased refinance risk and enhanced financial flexibility compared to an aggressive approach.
- III. To achieve a balance between the use of less costly short-term financing and the security of permanent working capital backed by long-term financing.

Advantages of moderate working capital approach

- Lower risk compared to the aggressive approach and lower financing cost than the

conservative approach.

- The flexibility to increase financing for varying requirements or expansion when necessary.
- With a more disciplined approach to balance sheet management, thus diversified sources of funding.

Disadvantages of moderate working capital approach

- Limited access to short-term capital needed for growth or seasonal needs.
- During the market disruption, the cost of short-term debt for variable needs may be uncertain.
- If the company cannot refinance at a favorable rate, it may have to rely on more expensive trade credit to meet seasonal or growth requirements.

Liquidity and Short-Term Funding

Companies can boost their financial flexibility by crafting a short-term financing strategy and routinely evaluating available funding alternatives. Firms that neglect to thoroughly explore these options or capitalize on cost savings from existing forms of financing may encounter higher financing costs or even financial distress, where they find themselves incapable of borrowing from any source.

An astute short-term financing strategy, encompassing decisions on when and how to borrow, accomplishes several goals, such as:

- Ensuring enough and varied sources of credit to fund ongoing cash requirements.
- Obtaining sufficient financing capability to address the company's evolving cash demands, which might encompass catering to peak seasonal requirements or anticipated expansion.
- Ensuring that the provided financing rates, along with their terms and conditions, are

competitive and recognizing how these rates may vary in different capital market scenarios and economic climates.

- Making sure that both implicit costs, such as supplier financing costs and explicit funding expenses, are taken into account when determining the company's actual borrowing cost.

Several factors will influence a company's short-term borrowing strategies:

- **Size:** The size of a company plays a pivotal role in defining its financing options. For instance, privately-owned businesses might only have access to short-term credit boosts from one bank. In contrast, substantially larger firms can tap into short-term fixed-income markets in addition to other funding avenues.
- **Creditworthiness:** The credibility of a company not only dictates if a financial institution will grant a loan and the interest rate charged but also the terms and stipulations tied to the loan. A company with lesser creditworthiness might find lenders imposing conditions that limit its asset utilization in specific ways.
- **Legal considerations:** Companies operating in emerging markets, where legal frameworks might be less established, could face limited financing choices from financial intermediaries or markets compared to developed economies.
- **Regulatory requirements:** Certain industries, especially in developed markets, are subject to stringent regulations. For instance, banks or utilities might encounter restrictions in their borrowing amount or the nature of available borrowing options.
- **Asset nature:** Companies, based on their business model, might possess assets like inventory, which can be deemed valuable collateral for secured short-term loans.

Question

Which of the following factors will *least likely* influence a company's short-term borrowing strategies?

- A. Size and creditworthiness.
- B. Legal and regulatory considerations.
- C. Capacity to handle sudden cash needs.

Solution

The correct answer is C.

Ensuring the capacity to handle sudden cash needs is an objective of a short-term borrowing strategy.

A is incorrect. Size and creditworthiness are factors influencing a company's short-term borrowing strategy. A company's size influences the options at its disposal, while its creditworthiness influences the interest rate it will pay.

B is incorrect. Legal and regulatory considerations influence a company's short-term borrowing strategy since there may be regulatory restrictions on the amount a company can borrow.