Chapter 19 Cash, Payables and Liquidity Management

Chapter Overview

Managing the speed at which collections are made and vendors are paid is an important financial management activity. The Opening Focus looks at two companies collaborating to offer in Australia EIPP – electronic invoice presentment and payment. While businesses expect to place an order and have it shipped immediately, they still would prefer to pay for the product later. EIPP is an electronic invoice, allowing customers to pay and view their accounts online. Its acceptance has been slow because companies, exercising reasonable financial management, would prefer to delay payment to their suppliers. However, there appear to be major cost savings with electronic invoicing – it is considerably cheaper than paper invoicing, which could cost $100 or more per invoice. Growth in EIPP is expected to be gradual.

***What Companies Do* Discussion Questions:**

1. What are the benefits and costs to the supplier of using EIPP? What are the benefits and costs to the customer? Who stands to benefit the most? How can these benefits be distributed equitably among suppliers and their customers? In other words, what incentives can be given to customers to encourage EIPP's usage?
2. Why are there concerns about technical standards and security issues concerning the implementation of EIPP?

This chapter looks at:

19-1. Cash Management
19-2. Collections
19-3. Accounts Payable and Disbursements
19-4. Short-Term Investing and Borrowing

Technology

1. **Smart Solutions.** A step-by-step solution to Problem 19-1, calculating collection float and the costs and benefits of a lockbox system.

After studying this chapter you should be able to:

- understand float, its components and the financial manager's responsibilities with regard to cash position management
- review the objective of cash collections, the key types of collection systems and the role of lockbox systems in cash collection
- describe the role of cash concentration and various mechanisms used by companies to transfer funds from depository banks to concentration banks
- explain accounts payable management with regard to the average payment period and the effect of cash discounts on timing the payment of accounts payable
- discuss popular disbursement products and methods and recent developments in accounts payable and disbursements
- describe popular investment vehicles for short-term surpluses and the key sources of borrowing used to meet short-term deficits.

Lecture Guide

Companies are increasingly concerned with minimising their working capital requirements. In general, this has meant collecting money as quickly as possible and paying bills as late as possible.

19-1 Cash Management
In particular, companies generally want to keep as little of their assets in the form of cash as possible. Cash is a negative net present value investment, earning little return, compared to returns earned by investment in the company's core business. Cash managers work to optimise the collection, concentration and disbursement of a company's cash.

19-1a Float
Float is the time it takes for money sent to the company to be usable by the company. Students may have made use of personal float – written a cheque without the funds to support that cheque, knowing that they will be able to deposit sufficient funds before the cheque clears. This section discusses not only the different types of float (mail, processing, availability and clearing) but also discusses the responsibilities of the cash manager.

19-1b Cash Position Management
Cash position management involves looking at the costs and benefits of collecting funds quickly and disbursing them slowly, along with managing the company's short-term borrowing position. Does the company have the capacity to borrow to meet short-term needs? What is the cost of this additional borrowing? How much does the company need to have in its chequeing account? What are the costs and benefits of keeping cash on hand in a chequeing account vs borrowing to meet temporary short-term cash needs? The primary method for many companies for determining cash balances is based on transaction requirements or minimum balance required by the bank.

19-2 Collections
The choice of collections systems is largely a matter of the nature of the business. For example, a utility company may have many local offices at which customers can pay their bills conveniently, an example of a field-banking system. These sections describe the different types of collection systems and provide a numerical example of the costs and benefits of using a lockbox.

19-2a Types of Collection Systems
- *Mail-Based Collection System*: In this type of mail-based system, the company usually has several collection points which will take and process the incoming payments.
- *Electronic Systems*: Electronic payment systems were first patented in 2000 and are becoming more and more popular. See the opening scenario for more details and examples.

19-2b Lockbox Systems
The lockbox system is a popular technique for speeding up collections because it affects float. Lockboxes are dispersed geographically based on the location of the customers, which reduces mail float and clearing time. Also since the bank deposits payments before the company processes them, processing time is reduced to nearly zero. There is a cost factor with lockbox systems so the company should do a complete cost–benefit analysis before beginning this type of system.

19-2c Cash Concentration
Many companies bring in all of their deposits into a single bank. Generally more economies of scale can be realised when the company is dealing with larger amounts of funds.

19-2d Funds Transfer Mechanisms
This section details the different vehicles for funds transfer, including depository transfer cheques, automated clearinghouse debit transfers and wire transfers.

19-3 Accounts Payable and Disbursements
Many creditors supply terms to customers to encourage faster payment. The company must perform a cost-benefit analysis to determine whether paying sooner and taking advantage of supplier discounts is more beneficial than delaying payments and investing the delayed funds elsewhere.

19-3a Overview of the Accounts Payable Process
This section introduces the accounts payable process. It includes an overview of the purpose of the accounts payable function and the types of payment systems.

19-3b Cash Discounts
This section presents the formula for determining whether it is better to pay at the end of a credit period or take the cash discount.

19-3c Disbursement Products and Methods
This section looks at companies' collections strategies including zero balance accounts, controlled disbursements and positive pay. Students can discuss the costs and benefits of each. Each of these strategies has strong benefits.

- *Zero Balance Accounts (ZBAs*): ZBAs allow the company to keep cash in interest-bearing accounts, while controlled disbursements give companies a heads up when cheques are going to be charged against the company's account, allowing the company to put cash in to cover the cheques at the last minute.
- *Controlled Disbursement:* Controlled disbursement is a bank service that provides notifications of cheques that will be presented against a company's account on any given day.
- *Positive Pay*: this is a bank service that is used to combat the most common types of cheque fraud. It allows the company to find out if the cheque is fraudulent early in the process.

19-3d Developments in Accounts Payable and Disbursements
The developments in accounts payable and disbursements are very timely. Companies – and individuals – are very concerned with fraud and identity theft, problems that have increased with greater internet usage. Some of the most common issues are:

- *Integrated Accounts Payable*: This is an outsourcing of accounts payable.
- *Purchasing/Procurement Cards*: This process allows employees to have a limited procurement card which they will use to purchase and travel from select vendors.
- *Fraud Prevention in Disbursements*: This section provides a checklist of some of the most common methods companies are utilising to fight fraud.

The instructor can lead a discussion about ways in which company and consumer concerns intersect. The company does not want to allow fraudulent purchases any more than consumers want thieves to use their identity and personal information to make fraudulent purchases. Another topical is outsourcing.

- *Student Involvement*: Ask students how many of them have contacted a company's customer service department and had their questions handled by non-domestic customer service representatives.

19-4 Short-Term Investing and Borrowing
A company will want to earn the most interest on its funds and still have them available when needed.

19-4a Motives for Holding Cash and Short-Term Financial Investments
This section discusses the three motives for holding cash and short-term investments.

- *Transaction Motive*: This is the motive to keep cash for the daily transactions companies need money for such as materials and wages.
- *Safety Motive*: This motive is present to protect the company from unexpected cash demands for cash.
- *Speculative Motive:* This motive is present to allow the company to take advantage of investment opportunities that arise.

All three of these motives can be addressed with the appropriate degree of liquidity and the appropriate mix of cash and short-term investments.

19-4b Short-Term Investing
Making sure that cash is available when and where they are needed is a top concern for the cash manager. Because short-term investments are a substitute for cash, they should be carefully considered. Some of the options are listed below:

- *Money Market Mutual Funds*: These funds are professionally managed portfolios, which have investments in the same type of short-term instruments in which cash managers invest. They are available from independent companies and most large banks.

19-4c Short-Term Borrowing
Short-term lines of credit are often necessary for some companies. The cash manager needs to make sure that the lines of credit are available if needed.

Cash, Payables, and Liquidity Management Summary
This section presents a summary of the main points from Chapter 19.

Answers to Concept Review Questions

1. Float refers to funds that have been sent by the payer but are not yet usable funds to the payee. The four components of float are:
   - Mail float – the time delay between when payment is placed in the mail and when it is received.
   - Processing float – the time between receipt of the payment and its deposit into the company's accounts.
   - Availability float – the time between deposit of the cheque and the availability of the funds to the company.
   - Clearing float – the time between the deposit of the cheque and the presentation of the cheque back to the bank on which it is drawn.

2. Cash position management involves looking at, on a daily basis, the collection, concentration and disbursement of funds for the company. The cash manager looks at the amount of funds to be collected, moves balances to appropriate accounts and funds projected disbursements. The cash position can be managed into the future when future cash flows can be properly forecasted.

3. Smaller companies that do not engage in active cash position management may set a target cash balance for their chequeing accounts. Generally this is determined based on transactions requirements or a minimum balance set by the bank. The transactions requirement is determined by how much cash a company needs for its day-to-day operations. A bank account analysis statement determines the value of the balances a company leaves on deposit and matches that to the value of the services provided by the bank.

4. The primary delay in the collections prices is collections float, a function of mail float, processing float and availability float. A primary goal in the collection area is to reduce each of these float components as much as possible. The most common types of collection systems are field-banking system, mail-based system, electronic systems and lockbox systems.

5. A lockbox system affects all three components of float. Customers mail payments to a post office box, which is emptied by the company's bank. The bank processes each payment and deposits the payments in the company's account. The bank sends deposit slips to the company so they can be credited to the customers' accounts. Because lockboxes are located near the company's customers, mail time is reduced and often clearing time is also reduced. Processing time is reduced to almost zero because the bank deposits payments before the company processes them. The company assesses the economics of a lockbox system by performing a cost-benefit analysis based on the float value reduction in dollars, the company's cost of capital, the annual operating cost of the lockbox system and the company's tax rate.

6. Companies use cash concentration techniques to bring in lockbox and other deposits to a single bank, the concentration bank. Cash concentration creates a large pool of funds for use in making short-term cash investments, which in turn reduces the transactions costs of short-term investing. The larger investment pool allows the company to choose from a larger variety of marketable securities. Concentrating the company's cash in one account improves the tracking and internal control of the company's cash. Having one concentration bank allows the company to more effectively implement payment strategies that preserve investable balances for as long as possible. Mechanisms for transferring cash include depository transfer cheques, ACH transfers and wire transfers.

7. The company must balance the benefits and costs of concentrating cash to determine the type and timing of transfers from its lockbox accounts to its concentration account. The transfer mechanism should be the one that is the most profitable, in other words, maximise profit per period, which equals earnings on the increased funds' availability minus the cost of the transfer system. Most companies use wire transfers for large amounts and EDTs for high volume, low dollar transfers from small deposit banks.

8. Accounts payable management is concerned with the time between the purchase of raw materials and the mailing of payment to the supplier. The A/P function examines all incoming invoices and determines the proper amount to be paid. The cash manager matches the invoice to the purchase order and assures that the goods were actually received. Companies may make full use of any credit period offered. Once payment has been authorised (vouchering), the cash manager generally manages the preparation and mailing of cheques or initiates the electronic transfer of funds. In a centralised system, all invoices are sent to a central accounts payable department where payment is authorised and cheques or other forms of payment are initiated. Centralised systems offer easier concentration of funds, improved access to cash position information, better control and reduced transaction and administrative costs. There may, however, be slow payment times and a need to coordinate between central payables and field offices to resolve disputes. In a decentralised approach payments are authorised and in some cases initiated at the local level. The approach may help improve relationships with vendors and local management autonomy, it is harder to concentrate funds and obtain daily cash position information and increases the chance of unauthorised disbursements.

9. The difference between the payment amount with and without taking the cash discount is in effect the interest payment made by the company to the supplier. The company must compare the interest rate charged by its suppliers to the best rate charged by its short-term lenders. If the company's outside financing is more costly, then it should take the cash discount and pay its suppliers early.

10. A zero balance account always has an end-of-day balance of zero. This eliminates non-earning cash balances in corporate chequeing accounts. A controlled disbursement account is a bank service that provides early notification of cheques that will be presented against a company's account on a given day. This allows the company to determine its cash position and make any necessary investment/borrowing decisions in the morning. Controlled disbursement accounts can be set up as zero balance accounts for automatic funding through a company's concentration account.

11. Recent developments include integrated accounts payable, providing a company with outsourcing its accounts payable or disbursement operations; and purchasing/procurement cards allowing low-dollar purchases to be collected, with a single, large payment. Technology has made fraud easier, for example by creating fraudulent cheques using scanners, computers and laser printers. Common fraud prevention measures include: written policies and procedures for creating and disbursing cheques, separating duties such as approval, signing and reconciliation, using safety features on cheques, setting maximum dollar limits or requiring multiple signatures, using positive pay services and increasing the use of electronic payment methods.

12. Short-term investments must be liquid so the company can cash them in easily when needed. Preservation of principal is also important since the company will want to know how much cash it will have available when needed. A short-term investment policy should look at instruments that earn a competitive return. Guidelines should specify the purpose of the investment portfolio and provide recommendations and/or restrictions on acceptable investments and diversification.

13. The key base rates used in variable rate short-term borrowing are the cash rate, the rate of interest charged by the largest Australian banks on short-term loans to each other, the Bank Bill Swap Rate (BBSW) rate which is charged to their best business customers and LIBOR (London Interbank Offered Rate), the rate that most creditworthy international banks that deal in Eurodollars charge on interbank loans. Banks may charge the company BBSW plus a specified number of basis points, and the bank may charge fees that also impact the effective borrowing rate. Factors that affect the effective borrowing rate include the amount of interest and fees paid, usable amount of the loan and term of the loan.

Solutions to Self-Test Problems

ST19-1. Gale Supply estimates that its customers' payments are in the mail for 3 days and, once received, they are processed in 2 days. After the payments are deposited in the company's bank, the funds are made available to the company by the bank in 2.5 days. The company estimates its total annual collections, received at a constant rate, from credit customers to be $87 million. Its annual opportunity cost of funds is 9.5%. Assume a 365-day year.

a. How many days of collection float does Gale Supply have?
b. What is the current annual dollar cost of Gale Supply's collection float?
c. If the installation of an *electronic invoice presentment and payment (EIPP) system* would result in a 4 day reduction in Gale's collection float, how much could the company earn annually on this float reduction?
d. Based on your findings in part (c), should Gale install the *EIPP system* if its annual cost is $85,000? Explain your recommendation.

A:

a. Collection float = Mail float + Processing float + Availability float
= 3.0 days + 2.0 days + 2.5 days
= 7.5 days

b. Average daily receipts = Annual receipts ÷ 365 days
= $87 million ÷ 365 days
= $238,356

Collection float ($) = Collection float (days) × Average daily receipts
= 7.5 days × $238,356
= $1,787,670

Annual dollar cost = Collection float ($) × Opportunity cost
= $1,787,670 × 9.5%
= $169,829

c. Annual earnings = Float reduction (days) × Average daily receipts × Opportunity cost
= 4.0 days × $238,356 × 9.5%
= $90,575

d. Gale should install the proposed EIPP system. The annual earnings of $90,575 exceed the annual cost of $85,000, thereby resulting in an annual profit contribution of $5,575 ($90,575 – $85,000).

ST19-2. Derson Manufacturing wishes to evaluate the credit terms offered by its four biggest suppliers of raw materials. The prime rate is currently 7.0% and Derson can borrow short-term funds at a spread of 2.5% above the prime rate. Assume a 365-day year and that the company always pays its suppliers on the last day allowed by their stated credit terms. The terms offered by each supplier are listed below:

Supplier 1: 2/10 net 40
Supplier 2: 1/15 net 60
Supplier 3: 3/10 net 70
Supplier 4: 1/10 net 50

a. Calculate the interest rate associated with not taking the discount from each supplier.
b. Assuming the company needs short-term financing and considering each supplier separately, indicate whether the company should take or not take the discount from each supplier.
c. If the company did not need any short-term financing, when should it pay each of the suppliers?
d. If the company could not obtain a loan from banks and other financial institutions and needed short-term financing, when should it pay each of the suppliers?
e. Suppose that Derson could stretch its accounts payable (net period only) to 90 days without damaging its credit rating. What impact, if any, would this have on your recommendation with regard to Supplier 1 in part (b)? Explain your answer.

A: a. Rate = [%Discount ÷ (1.00 – %Discount)] × [365 ÷ (Credit per. – Cash disc. per.)]

Supplier	Calculation	Rate
1	[0.02 ÷ (1.00 – 0.02)] × [365 ÷ (40 -10)] = 0.0204 × 12.17 =	24.83%
2	[0.01 ÷ (1.00 – 0.01)] × [365 ÷ (60 -15)] = 0.0101 × 8.11 =	8.19%
3	[0.03 ÷ (1.00 – 0.03)] × [365 ÷ (70 -10)] = 0.0309 × 6.08 =	18.79%
4	[0.01 ÷ (1.00 – 0.01)] × [365 ÷ (50 -10)] =0 .0101 × 9.13 =	9.22%

b. Bank loan rate = Prime rate + Spread = 7.0% + 2.5% = 9.5%

Supplier 1: Take the discount: Interest rate of 24.83% > 9.5% Bank loan rate.
Supplier 2: Don't take discount: Interest rate of 8.19% < 9.5% Bank loan rate.
Supplier 3: Take the discount: Interest rate of 18.79% > 9.5% Bank loan rate.
Supplier 4: Don't take discount: Interest rate of 9.22% < 9.5% Bank loan rate.

c. If the company needs no short-term financing, it should pay each supplier at the end of its cash discount period – days 10, 15, 10 and 10 for Suppliers 1, 2, 3 and 4, respectively. Clearly, the company in this case should take the discounts rather than not take them and borrow unneeded funds from their suppliers.

d. If the company needs short-term financing and cannot obtain a loan from banks and other financial institutions, it should not take the discounts offered by its suppliers and pay them at the end of the credit period – days 40, 60, 70 and 50 for Suppliers 1, 2, 3 and 4, respectively. This strategy results in borrowing from suppliers, given the need for funds and the lack of alternative lenders.

e. If Derson can stretch the net period for Supplier 1 to 90 days without damaging its credit rating, the company would effectively be getting 2/10 net 90 terms from Supplier 1. The interest rate associated with not taking the discount under these terms would be:

Rate = [.02 ÷ (1.00 − .02)] × [365 ÷ (90 – 10)] = .0204 × 4.56 = 9.30%

This result would change the recommendation for Supplier 1 given in part b to Take the discount because the interest rate of 9.30% < 9.5% bank loan rate.

ST19-3. Rosa Pty Ltd has arranged a 1-year $2 million credit line with its lead bank. The bank set the interest rate at the prime rate plus a spread of 1.50%. The prime rate is expected to remain stable at 5.25% during the coming year. In addition, the bank requires Rosa to pay a 0.50% commitment fee on the average unused portion of the line. Assume a 365-day year.

a. Calculate the *effective borrowing rate (EBR)* on Rosa's line of credit during the coming year assuming an average loan balance outstanding during the year is $1.8 million.
b. Calculate Rosa's *EBR* on the line of credit during the coming year assuming the average loan balance outstanding during the year is $0.8million.
c. Compare and contrast the *EBRs* calculated for Rosa Pty Ltd in parts (a) and (b). Explain the causes of the differences in *EBRs.*

A: a. Interest rate = Prime rate + Spread = 5.25% + 1.50% = 6.75%

EBR = [{(Interest rate × Average. loan) + [Commitment fee × (Total credit line – Average loan)]}÷ Average loan] × (365 ÷ Days loan outstanding)
= [{(0.0675 × $1.8 mil.) + [0.0050 × ($2.0 mil. – $1.8 mil.)]} ÷ $1.8 mil.] × (365 ÷ 365)
= [($121,500 + $1,000) ÷ $1,800,000] × 1.00
= 6.81%

b. EBR = [{(Interest rate × Average loan) + [Commitment fee × (Total credit line – Average loan)]} ÷ Avg. loan] × (365 ÷ Days loan outstanding)
= [{(0.0675 x $0.8 mil.) + [0.0050 x ($2.0 mil. – $0.8 mil.)]} ÷ $0.8 mil.] × (365 ÷ 365)
= [($54,000 + $6,000) ÷ $800,000] × 1.00 = 7.50%

c. Note that the *EBR* of 6.81% in part a, where the average loan balance outstanding is $1.8 million and the average unused portion is $200,000 ($2.0 million – $1.8 million), is nearly 0.7% lower than the *EBR* of 7.50% in part b, where the average loan balance outstanding is $0.8 million and the average unused portion is $1.2 million ($2.0 million – $0.8 million). The higher cost in part b is primarily attributable to the fact that the commitment fee on the average unused portion in part b is $6,000 (0.0050 x $1.2 million) versus a commitment fee of only $1,000 (0.0050 x $200,000) in part a. When the higher commitment fees in part b are expressed as a percentage of its lower average loan ($0.8 million), its *EBR* is driven above the *EBR* in part a where the commitment fee is lower and the average loan ($1.8 million) is higher.

Answers to End-of-Chapter Questions

Q19-1. What is *float?* What are its four basic components? Which of these components is the same from both a collection and a payment perspective? What is the difference between *availability float* and *clearing float,* and from which perspective – collection or payment – is each relevant?

A19-1. Float refers to funds that have been sent by the payer but are not yet usable funds to the payee.

The four components of float are

- Mail float, the time delay between when payment is placed in the mail and when it is received.
- Processing float, the time between receipt of the payment and its deposit into the company's accounts
- Availability float, the time between deposit of the cheque and the availability of the funds to the company.
- Clearing float, the time between the deposit of the cheque and the presentation of the cheque back to the bank on which it is drawn

From a collection and payment perspective, mail and processing float are generally the same. Availability and clearing float are concerns of the company, not the payer of funds to the company.

Q19-2. What is *cash position management?* What types of companies set a *target cash balance?* Why? What is the purpose of a bank's requiring the company to maintain a minimum balance in its chequeing account? How does this relate to a *bank account analysis statement?*

A19-2. Cash position management involves looking at, on a daily basis, the collection, concentration and disbursement of funds for the company. The cash manager looks at the amount of funds to be collected, moves balances to appropriate accounts and funds projected disbursements. The cash position can be managed into the future when future cash flows can be properly forecasted. Smaller companies that do not engage in active cash position management may set a target cash balance for their chequeing accounts. Generally this is determined based on transactions requirements or a minimum balance set by the bank. The transactions requirement is determined by how much cash a company needs for its day-to-day operations. A bank account analysis statement determines the value of the balances a company leaves on deposit and matches that to the value of the services provided by the bank. Minimum balances somewhat offset the fees charged by the bank for its services.

Q19-3. What is the company's goal with regard to cash collections? Describe each of the following types of collection systems:

a. Mail-based collection system
b. Electronic system

A19-3. The company's goal is to collect moneys as quickly as possible. In a field-banking system, most collections are made over the counter or at a collection office. These systems typically have many collection points, each of which may have a depository account at a local bank. In a mail-based system, the company typically has one or more collection points that process the incoming mail payments. In electronic collection systems, customers are sent bills in electronic format and then can pay their bills via electronic means. Most systems are web-based.

Q19-4. What is a *lockbox system?* How does it typically work? Briefly describe the economics involved in performing a cost-benefit analysis of such a system.

A19-4. A lockbox system affects all three components of float. Customers mail payments to a post office box, which is emptied by the company's bank. The bank processes each payment and deposits the payments in the company's account. The bank sends deposit slips to the company so they can be credited to the customers' accounts. Because lockboxes are located near the company's customers, mail time is reduced and often clearing time. Processing time is reduced to almost zero because the bank deposits payments before the company processes them. The company assesses the economics of a lockbox system by performing a cost-benefit analysis based on the float value reduction in dollars, the company's cost of capital, the annual operating

cost of the lockbox system and the company's tax rate.

Q19-5. Briefly describe each of the following funds transfer mechanisms:
- Automated clearinghouse (ACH) debit transfer
- Wire transfer

Why are wire transfers typically used only for high-dollar transfers?

A19-5. An automated clearinghouse debit transfer is a pre-authorised electronic withdrawal from the payer's account and is generally known as an electronic depository transfer. A wire transfer is an electronic communication that removes funds from the payer's bank and deposits the cheque in the payee's bank on the same day, eliminating mail and clearing float and possibly reducing processing float. Wire transfers are generally used only for high dollar transfers because of their cost.

Q19-6. What is the goal with regard to managing accounts payable as it relates to the cash conversion cycle? Briefly describe the process involved in managing the accounts payable function.

A19-6. Accounts payable management is concerned with the time between the purchase of raw materials and the mailing of payment to the supplier. The A/P function examines all incoming invoices and determines the proper amount to be paid. The cash manager matches the invoice to the purchase order and assures that the goods were actually received. Companies may make full use of any credit period offered. Once payment has been authorised (vouchering), the cash manager generally manages the preparation and mailing or cheques or initiates the electronic transfer of funds.

Q19-7. How can a company in need of short-term financing decide whether or not to take a cash discount offered by its supplier? How would this decision change in the event the company has no alternative source of short-term financing? How would it change for a company that needs no additional short-term financing?

A19-7. The difference between the payment amount with and without taking the cash discount is in effect the interest payment made by the company to the supplier. The company must compare the interest rate charged by its suppliers to the best rate charged by its short-term lenders. If the company's outside financing is more costly, then it should take the cash discount and pay its suppliers early.

Q19-8. Briefly describe each of the following disbursement products/methods:
- Zero-balance accounts (ZBAs)
- Controlled disbursement
- Positive pay

How does a ZBA relate to the company's *target cash balance?*

A19-8. A zero balance account always has an end-of-day balance of zero. This eliminates non-earning cash balances in corporate chequeing accounts. Controlled disbursement is a bank service that provides early notification of cheques that will be presented against a company's account on a given day. This allows the company to determine its cash position and make any necessary investment/ borrowing decisions in the morning. Controlled disbursement accounts can be set up as zero balance accounts for automatic funding through a company's concentration account. Positive pay is a bank service used to combat cheque fraud. In positive pay, the company transmits a cheque-issued file to the bank. The bank matches the presented cheques against this file and rejects any items that do not match. ZBA relates to a company's target cash balance, particularly if the bank requires a minimum balance to be maintained. If the company were using ZBA, then it would have to amend this to the bank's minimum balance requirement to be in compliance with the bank's requirements.

Q19-9. Briefly describe each of the following developments in accounts payable and disbursements.
a. Integrated accounts payable
b. Purchasing/procurement cards
c. Fraud prevention in disbursements

A19-9. a. Integrated accounts payable, also known as *comprehensive accounts payable,* provides a company with outsourcing of its accounts payable or disbursement operations.
b. Purchasing (or procurement) card programs serve as a means of reducing the cost of low-dollar indirect purchases. The purchasing cards are issued to designated employees, and both dollar amounts and vendors where they can be used are limited.
c. Some of the common fraud prevention measures include the following:
1. Written policies and procedures for creating and disbursing cheques
2. Separating duties (approval, signing, and reconciliation)
3. Using safety features on cheques (microprinting, watermarks, tamper resistance, etc.)
4. Setting maximum dollar limits and/or requiring multiple signatures
5. Using positive pay services
6. Increasing the use of electronic payment methods

Q19-10. Briefly describe each of the three basic motives for a company holding cash and short-term investments. For each of the motives indicate the general form in which the funds are typically held.

A19-10. The three basic motives are *transactions motive, safety motive,* and *speculative motive.* With the transactions motive, a company maintains cash and short-term investments to make planned payments for items such as materials and wages. The safety motive, sometimes called the *precautionary motive*, is fulfilled by maintaining a pool of liquid funds that can quickly be accessed in an emergency. And the speculative motive exists because the company has no other use for certain funds or because it wants to be able to quickly take advantage of opportunities that may arise. Typically this motive is pursued only after the company meets its safety motive.

Q19-11. What is the company's goal in short-term investing?

A19-11. Short-term investments must be liquid so the company can cash them in easily when needed. Preservation of principal is also important since the company will want to know how much cash it will have available when needed. A short-term investment policy should look at instruments that earn a competitive return. Guidelines should specify the purpose of the investment portfolio and provide recommendations and/or restrictions on acceptable investments and diversification.

Q19-12. How are the rates on short-term borrowing typically set? What role does either the *BBSW* or *LIBOR* play in this process? What is the *effective borrowing rate (EBR)?* How does the *EBR* differ from the stated *all-in* rate*?*

A19-12. The key base rates used in variable rate short-term borrowing are the BBSW rate, the rate of interest charged by the largest Australian banks on short-term loans to their best business customers and LIBOR (London Interbank Offered Rate), the rate that most creditworthy international banks that deal in Eurodollars charge on interbank loans. Banks may charge the company BBSW plus a specified number of basis points, and the bank may charge fees that also impact the effective borrowing rate. Factors that affect the effective interest rate include the amount of interest and fees paid, the usable amount of the loan, and the term of the loan.

Solutions to End-of-Chapter Problems

Cash Management

P19-1. Nickolas Industries has daily cash receipts of $350,000. A recent analysis of the company's collections indicated that customers' payments are in the mail an average of 2 days. Once received, the payments are processed in 1.5 days. After the payments are deposited, the receipts clear the banking system, on average, in 2.5 days. Assume a 365-day year.

a. How much collection float (in days) does the company have?
b. If the company's opportunity cost is 11%, would it be economically advisable for the company to pay an annual fee of $84,000 for a lockbox system that reduces collection float by 2.5 days? Explain why or why not.

A19-1. a. The company's collection float is 2 + 1.5 + 2.5 = 6 days

b. Savings from reducing float by 2.5 days: 2.5 × $350,000 = $875,000 × .11 = $96,250

The annual savings of $96,250 are greater than the $84,000 cost of the lockbox. The lockbox system should be adopted; it will contribute $12,250 ($96,250 – $84,000) annually to the company's profits.

Collections

P19-2. Qtime Products believes that use of a lockbox system can shorten its accounts receivable collection period by four days. The company's annual sales, all on credit, are $65 million, billed on a continuous basis. The company can earn 9% on its short-term investments. The cost of the lockbox system is $57,500 per year. Assume a 365-day year.

a. What amount of cash will be made available for other uses under the lockbox system?
b. What net benefit (or cost) will the company receive if it adopts the lockbox system? Should it adopt the proposed lockbox system?

A19-2. a. Additional cash available: $65,000,000/365 × 4 = $712,329

Benefit of additional cash: $712,329 × 0.09 = $64,110

b. The net benefit of the lockbox is $64,110 – $57,500 = $6,610. The company should adopt the lockbox given its $6,610 annual net benefit.

P19-3. Company A has annual revenues of $1.6 billion and can reduce its float by four days using a lockbox system. Due to A's significant risk, A has a high cost of capital of 22%. Company B has annual revenues of $850 million and can reduce its float by three days using a similar lockbox system. Company B is less risky than Company A, as evidenced by B's cost of capital of 10%. Assuming the lockbox system costs $2 million, which company benefits more from using the system? If the two companies merge, making it necessary to have only one lockbox system for the combined company, then how much is the net benefit of having the lockbox system under this circumstance?

A19-3. Company A savings: $1.6 billion × (4 / 365) × 22% = $3,857,534

NPV for Company A of lockbox = $3,857,534 – $2,000,000 = $1,857,534

Company B savings: $850 million × (3 / 365) × 10% = $689,630

NPV for Company B of lockbox = $689,630 – $2,000,000 = –$1,301,307

The lockbox benefits Company A, but does not benefit Company B.

Combined company savings = $3,857,534 + $689,630 = $4,556,164

Net benefit of lockbox on combined company = $4,556,163 – $2,000,000 = $2,556,164

P19-4. Quick Burger, a national chain of hamburger restaurants, has accumulated a $27,000 balance in one of its regional collection accounts. It wishes to make an efficient, cost-effective transfer of $25,000 of this balance to its corporate concentration account, thus leaving a $2,000 minimum balance in the regional collection account. It has the following options:
Option 1: EDT at a cost of $2.50 and requiring one day to clear
Option 2: Wire transfer at a cost of $12 and clearing the same day (zero days to clear)

a. If Quick Burger can earn 6% on its short-term investments, assuming a 365-day year, which of the options would you recommend to minimise the transfer cost?
b. Compare Options 1 and 2, and determine the minimum amount that would have to be transferred in order for the wire transfer (Option 2) to be more cost-effective than the EDT (Option 1).

A19-4. Option 1: Opportunity cost of 1/365 × 0.06 × $25,000 = $4.11 + $2.50 = $6.61

Option 2: Cost of $12

Option 1, the EDT at a cost of $6.61 is the least cost option.

The minimum amount that would make Option 2 the best option can be found by solving:

1/365 × .06 × X = $12

The minimum amount = $X = \frac{\$12}{1/365 \times 0.06} = \frac{\$12}{0.000164}$ = $\underline{\underline{\$73,000}}$

P19-5. Company OPL has average daily cash inflows (Monday to Saturday) of $15,890, $13,267, $20,654, $24,956, $37,923, and $42,516, respectively. A wire transfer deposits money into a concentration account faster by one day if executed Monday to Thursday and by three days if executed Friday. Assuming that the additional cost of a wire transfer is $15.62 and that OPL has a cost of capital of 16% annually, on which days should wire transfers be considered? (*Note:* Saturday inflows should be combined with Monday inflows because banks close too early on Saturday to recognise the cash inflow.)

A19-5. Monday Savings: ($15,890 + $42,516) × (16% / 365) = $25.60
Tuesday Savings: $13,367 × (16% / 365) = $5.82
Wednesday Savings: $20,654 × (16% / 365) = $9.05
Thursday Savings: $24,956 × (16% / 365) = $10.94
Friday Savings: $37,923 × (3 × 16% / 365) = $49.87
Based on the potential savings, the wire transfer is beneficial on Mondays and Fridays because the potential savings exceeds the cost of the wire transfer.

Accounts Payable and Disbursements

P19-6. Assume a company receives the following credit terms from six suppliers and a 365-day year.

Supplier 1: 2/10 net 50
Supplier 2: 1/10 net 30
Supplier 3: 2/10 net 150
Supplier 4: 3/10 net 60
Supplier 5: 1/10 net 45
Supplier 6: 1/20 net 80

a. Determine the interest rate associated with not taking the cash discount and paying at the end of the credit period for each of the six suppliers' credit terms.

b. In part (a), you calculated the interest rate associated with not taking the discount for each supplier's credit terms. Now you must decide whether or not to take the cash discount by paying within the discount period. To pay early, you will need to borrow from your company's line of credit at the local bank. The interest rate on the overdraft is the prime rate plus 2.5%. Suppose the prime rate is currently 5% per annum. For each supplier's terms, use the current prime rate to determine whether the company should borrow from the bank or, in effect, borrow from the supplier.

A19-6. a. $r = d/(1 - d) \times 365/(CP - DP)$

Supplier 1: 2/10, net 50

$0.02/(1 - 0.02) \times 365/(50 - 10) = 18.6\%$

Supplier 2: 1/10, net 30

$0.01/(1 - 0.01) \times 365/(30 - 10) = 18.4\%$

Supplier 3: 2/10, net 150

$0.02/(1 - 0.02) \times 365/(150 - 10) = 5.3\%$

Supplier 4: 3/10, net 60

$0.03/(1 - 0.03) \times 365/(60 - 10) = 22.6\%$

Supplier 5: 1/10, net 45

$0.01/(1 - 0.01) \times 365/(45 - 10) = 10.5\%$

Supplier 6: 1/20, net 80

$0.01/(1 - 0.01) \times 365/(80 - 20) = 6.1\%$

b. Internet exercise – answers will vary.

P19-7. Access Enterprises is vetting four possible suppliers of an important raw material used in its production process, all offering different credit terms. The products offered by each supplier are virtually identical. The following table shows the credit terms offered by these suppliers. Assume a 365-day year.

Supplier	**Credit Terms**
A	1/10 net 40
B	2/20 net 90
C	1/20 net 60
D	3/10 net 75

a. Calculate the interest rate associated with not taking the discount from each supplier.
b. If the company needs short-term funds, which are currently available from its commercial bank at 11%, and if each of the suppliers is viewed *separately,* which, if any, of the suppliers' cash discounts should the company not take? Explain why.
c. Suppose that the company could stretch its accounts payable to supplier A (net period only) by 20 days. How would this affect your answer in part (b) concerning this supplier?

A19-7. a. The interest rate from not taking the discount for

Supplier A: 1/10, net 40
0.01/(1 – 0.01) × 365/(40 – 10) = 12.3%

Supplier B: 2/20, net 90
0.02/(1 – 0.02) × 365/(90 – 20) = 10.6%

Supplier C: 1/20, net 60
0.01/(1 – 0.01) × 365/(60 – 20) = 9.2%

Supplier D: 3/10, net 75
0.03/(1 – 0.03) × 365/(75 – 10) = 17.4%

b. Suppliers B and C have interest rates lower than the bank's 11 per cent rate. The interest rates for suppliers A and D are higher than the bank's rate and therefore Access should take the discounts from them instead of borrow from the bank.

c. If supplier A allowed stretching payables by 20 days, the effective interest rate is:

0.01/(1–0.01) × 365/(60–10) = 7.4%

In this case supplier A's terms would now become more attractive than borrowing from the bank and Access would not take the discount rather than borrowing from its bank at 11 per cent.

P19-8. Union Company is examining its operating cash management. One of the options the company is considering is a zero-balance account (ZBA). The company's bank is offering a ZBA with monthly charges of $1,500, and the bank estimates that the company can expect to earn 8% on its short-term investments. Determine the minimum average cash balance that would make this ZBA a benefit to the company. Assume a 365-day year.

A19-8. The company must earn 0.08 × Minimum = $1,500
The minimum is $1,500/0.08 = $18,750 a month

Short-Term Investing and Borrowing

P19-9. Matthews Manufacturing is negotiating a one-year overdraftwith its bank, Worldwide Bank. The amount of the overdraft is $6.5 million with an interest rate set at 1.5% above the prime rate. A commitment fee of 0.50% (50 basis points) will be charged on the unused portion of the overdraft. No compensating balances are required, and the loan is made on a 365-day basis.

a. If the prime rate is assumed constant at 4.25% during the term of the loan and Matthews' average loan outstanding during the year is $5.0 million, calculate the company's *effective borrowing rate (EBR)*.
b. What effect would an increase in the prime rate to 4.75% for the entire year have on Matthews' *effective borrowing rate (EBR)* calculated in part (a)?
c. What effect would a decrease in Matthews' average loan outstanding during the year to $4.0 million have on the *effective borrowing rate (EBR)* calculated in part (a)?
d. Using your findings in parts (a), (b), and (c), discuss the effects on Matthews' *EBR*s of interest rate changes versus changes in the average loan outstanding.

A19-9. The effective borrowing rate (EBR) is
(IR × AL) + [CF × (CL – AL)]/AL × 365/Days loan outstanding

IR = Interest rate = 1.5% over prime = 4.25 % + 1.5% = 5.75%
AL = Average loan outstanding = $5,000,000
CF = Commitment fee = .005
CL = Total credit line = $6,500,000

a. $$\text{EBR} = \frac{(.0575 \times \$5{,}000{,}000) + [.005 \times (\$6{,}500{,}000 - \$5{,}000{,}000)]}{\$5{,}000{,}000} \times \frac{365}{365}$$

$$= \frac{\$287{,}500 + \$7{,}500}{\$5{,}000{,}000} = \frac{\$295{,}000}{\$5{,}000{,}000} = \underline{\underline{5.90\%}}$$

b. IR = Interest rate = 4.75% + 1.50% = 6.25%

$$\text{EBR} = \frac{(.0625 \times \$5{,}000{,}000) + [.005 \times (\$6{,}500{,}000 - \$5{,}000{,}000)]}{\$5{,}000{,}000} \times \frac{365}{365}$$

$$= \frac{\$312{,}500 + \$7{,}500}{\$5{,}000{,}000} = \frac{\$320{,}000}{\$5{,}000{,}000} = \underline{\underline{6.40\%}}$$

It would increase by the amount of the increase in the prime rate, i.e. .50% (6.40% – 5.90%).

c. AL decreases to $4,000,000 in part (a)

$$\text{EBR} = \frac{(.0575 \times \$4{,}000{,}000) + [.005 \times (\$6{,}500{,}000 - \$4{,}000{,}000)]}{\$4{,}000{,}000} \times \frac{365}{365}$$

$$= \frac{\$230{,}000 + \$12{,}500}{\$4{,}000{,}000} = \frac{\$242{,}500}{\$4{,}000{,}000} = \underline{\underline{6.06\%}}$$

The decrease in average loan outstanding raises the effective borrowing rate from 5.90% to 6.06%, an increase of .16% or 16 basis points.

d. Interest rate changes translate directly into effective borrowing rate changes. A decline in the average loan balance raises the EBR because the fixed costs of the commitment fee increase with declining average loan balances.

P19-10. Company MGST is reviewing its 1-year overdraft, currently with an interest rate of 9.15%. The overdraft is for $1 million, but the company intends to use only half of it throughout the year. The commitment fee is 42 basis points. Calculate MGST's *effective borrowing rate. (EBR)*. MGST is considering lowering the overdraft to $0.7 million. The commitment fee increases to 55 basis points, but the interest rate decreases to 9.00%. Should MGST lower the overdraft based on *EBR*?

A19-10. [{9.15% × $500,000 + 0.42% × ($1,000,000 - $500,000)} ÷ $500,000] × (365 / 365) =
[$47,850 ÷ $500,000] × (365 / 365) = 9.57% for $1 million overdraft

[{9.00% × $500,000 + 0.55% × ($700,000 - $500,000)} ÷ $500,000] × (365 / 365) =
[$46,100 ÷ $500,000] × (365 / 365) = 9.22% for $700,000 overdraft

The $700,000 overdraft is better based on the EBR.

Answer to MiniCase

Mini-Case: Liquidity Management

Foah's Designs sells precious metal jewellery throughout the east coast of Australia. It is based in Hobart, Tasmania, and currently all customers mail their payments to the Hobart office. The average amount of float is 6.5 days. The company is considering implementing a lockbox system in Melbourne. Total annual sales that are expected to be routed to the Melbourne lockbox are $68,000,000, with an average cheque amount of $1,300. The lockbox system would be administered by Bank of Melbourne which will charge a fee of $0.25 per cheque and an annual fixed charge of $10,000. Foah's Designs has a cost of capital of 12% per year, and the lockbox is expected to reduce float to 4 days. However, there is some chance that the lockbox will only reduce float to 5 days.

The company must also decide between using EDT or wire transfers when transferring funds between Bank of Melbourne and its local bank, Hobart Savings Bank. Using the wire transfer method would cost $20 per transfer whereas the EDT method would cost only $1.50 per transfer. However, the wire transfer method would result in the funds arriving at Hobart Savings Bank one day sooner.

Foah's Designs is also faced with a decision concerning its accounts payable. Foah's purchases its inventory from Jewellery Findings on credit. Jewellery Findings' terms of trade are 3/15 net 45, and Foah's Designs normally pays after exactly 45 days. However, it has been considering accessing a line of credit from Hobart Savings Bank to pay its accounts payable after exactly 15 days instead. The commitment fee on the unused portion of the credit line is 0.3%, and the interest rate on the loan from Hobart Savings Bank is 8.9%. There are no compensating balance requirements. Assume a 365-day year.

1. Should Foah's Designs implement the lockbox system?
2. Suppose Foah's Designs plans to transfer money on a weekly basis (every Tuesday) from Bank of Melbourne to Hobart Savings Bank. Which transfer method should it use if the interest paid on its funds in Hobart Savings Bank is 0.5% higher than what they earn from Bank of Melbourne?
3. Assuming that Foah's Designs has a $2 million line of credit and that its accounts payable average $1,417,000, determine whether the company should continuing paying Jewellery Findings after 45 days or instead should begin accessing the line of credit from Hobart Savings Bank.

Answer

1. Lockbox System:

Net benefit (cost) = (Float reduction value in dollars × cost of capital) – annual operating cost of lockbox

- $68,000,000 ÷ 365 = $186,301 sales per day × 2.5 days = $465,753 = float reduction in dollars
- $68,000,000 ÷ $1,300 = 52,308 cheques per year × $0.25 per cheque = $13,077 + $10,000 = $23,077 = annual operating cost of lockbox
- ($465,753 × 0.12) = $55,890
  Net benefit of lockbox if 2.5 days of float are freed up = $55,890 – $23,077 = $32,813

If only 1.5 days of float are freed up:

- $68,000,000 ÷ 365 = $186,301 × 1.5 days = $279,452
  $279,452× 0.12 = $33,534
  Net benefit of lockbox if 1.5 days of float are freed up = $33,534 – $23,077 = $10,457

Since the net benefit of either scenario is greater than zero, the lockbox system should be implemented.

2. EDT vs Wire Transfer:

   - Daily deposits to Bank of Melbourne: $68,000,000 ÷ 365 = $186,301
   - Weekly transfer amount: $186,301 × 7 days = $1,304,107
   - Interest earned from investing in Hobart Savings Bank for 1 extra day from wire transfer: $1,304,107 × 0.005 × (1/365) = $17.86

   Since the differential cost of the wire transfer ($20 – $1.5 = $18.5) exceeds the expected benefit ($17.865), the company should use the EDT method.

3. Paying Accounts Payable early:

   - The cost of not taking the discount is currently: 0.03/(1 – 0.03) × (365 ÷ (45 – 15)) = 37.63%
   - Borrowing from their line of credit at Hobart Savings Bank would have an effective annual cost of: [(((0.089 × $1,417,000) + (.003 × ($2,000,000 – $1,417,000)) × (45–15)/365) ÷ $1,417,000] × (365/(45 – 15)) = 9.02%

   Therefore, Foah's Designs should borrow from their line of credit and pay their accounts payable at Jewellery Findings within the 15-day discount period.