

## Chapter 22 Insolvency and Financial Distress

### Chapter Overview

What Companies Do concerns Australia's insolvency regime and recent history. It seemed as if some decrease had occurred in the level of Australian companies entering external administration; but changes in components of the data suggest that not all numbers were declining.

### What Companies Do Discussion Questions:

1. What factors might drive changes in the overall level of company insolvencies?
2. What factors may influence the alternative forms of declarations of insolvency?

This chapter discusses:

- 22-1. Insolvency and Business Failure
- 22-2. Insolvency Processes
- 22-3. Priority of Claims
- 22-4. Predicting Insolvency

### Technology

1. **Smart Solutions.** A step-by-step solution to Problem 22-5, concerning predicting bankruptcy.

After studying this chapter you should be able to:

- describe and differentiate between business failure, insolvency, financial distress and bankruptcy, and discuss why companies may seek insolvency
- explain how companies in Australia undertake the process of appointing an administrator and what that role entails
- describe the alternatives that are available to companies that find themselves in financial distress
- review the tools used by many analysts in attempts to predict the occurrence of insolvency.

### Lecture Guide

Three executives were arguing about who would pay for lunch that day. The first said, 'I'll pay. I'll use this as a tax write-off.' The second said, 'No, I'll take it. I'll charge it to my company expense account.' The third one said, 'No, let me have it. I'm declaring my company insolvent tomorrow.'

### 22-1 Insolvency and Business Failure

Financial distress is defined as when a company's cash flows are insufficient to pay its current obligations. There are many types of distress in addition to insolvency. This section discusses these types and their implications. Insolvency can be a very vague term. There are different kinds of failure including economic failure (earning a return less than the cost of capital), technical insolvency (failing to pay bills as they come due) or a liquidity crisis (technical insolvency when the company's assets are still greater than its liabilities). Insolvency occurs when a company is unable to pay its debts when they are due.

### Table 22.1 Largest Bankruptcies in US History to 2012

### **Figure 22.1 The Voluntary Administration Process**

This Figure indicates the steps in Australia for a company going into voluntary administration.

## **22-2 Insolvency Processes**

### **22-2a The Voluntary Administrator's Role**

#### **22-2b Deed of Arrangement**

- *Student Involvement:* Have students get into small groups and look at recent insolvencies and identify the type and causes of the insolvency. Students may speculate that larger companies declare insolvency sooner than smaller companies, they may have better legal advice, or they may be overvaluing their assets.

This is where conflicts may emerge between shareholders and creditors. One is dividend payout policies. If allowed by debt contracts, shareholders will want to pay out as much as possible in dividends in a failing company, assuring them some of the company's wealth. Asset substitution is a second problem. Managers may have nothing to lose and may be willing to take on risky, negative net present value projects, if this will transfer wealth from bondholders to shareholders. A third problem is underinvestment. Shareholders will be reluctant to invest more money in the company, even in positive net present value projects, if the investment gains would go to bondholders.

#### **22-2c Other Processes in External Administration**

This sections covers other critical issues involved with the external administrator's role, including payments to this role and the activities of the creditors' committee.

The formal process of insolvency involves several groups, with a key role played by the creditors, who have first claim on the company.

#### **22-2d Affected Parties in Administration**

While the focus in administration tends to be on the administrator and the creditors, we need to understand the impacts on other parties: employees, shareholders, and directors. The impacts vary, and this section provides a good outline of them. The content is drawn heavily from ASIC documents, available at the website: <http://www.asic.gov.au/asic/asic.nsf/byheadline/Information+for+creditors?openDocument#>

This section discusses the roles of shareholders and directors of the company as it goes into the state of insolvency.

### **Table 22.2 Creditor Priority in Insolvency**

### **22-3 Priority of Claims**

The priority of claims is listed and discussed in this section.

### **Table 22.3 Balance Sheet for Oxford Company**

### **Table 22.4 Distribution of the Liquidation Proceeds of Oxford Company**

### **Table 22.5 Pro Rata Distribution of Funds Among the Unsecured Creditors of Oxford Company**

## 22-4 Predicting Insolvency

Altman's Z score is commonly used in predicting insolvency. It uses inputs including working capital, retained earnings, earnings before interest and taxes, market value of shares, book value of debt and sales to predict the likelihood of company failure.

### Table 22.6 Balance Sheet for Poff Industries

### Table 22.7 Income Statement for Poff Industries

These sections provide a numerical example of calculating the Z score for a company.

## Insolvency and Financial Distress summary

This section summarises the key points of insolvency and reorganisation.

## Answers to Concept Review Questions

1. Financial distress occurs when a company's cash flows are not enough to pay its current obligations, while the term insolvency means the legal process that a company undergoes when it files papers with the court in cases of financial distress.
2. No, most companies that file for insolvency will reorganise and continue operations. Extreme cases will end the life of the company.
3. Insolvency law allows time and provisions for a company to continue operations and reorganise into a more efficient company. The appointment of an administrator manages the process to prevent current creditors from collecting immediately. Normal contract law would not allow for these company-saving features. Insolvency law is designed to help the company survive and jobs and markets to thrive by weeding out the unsuccessful companies from companies that are simply in a difficult economic downturn. Insolvency laws allow for an orderly liquidation or reorganisation of a company. Without a formalisation of the rights of the parties involved, creditors and supplier might be reluctant to enter into agreements with companies. The existence of insolvency courts allows for a legal body with expertise to settle disputes. Normal contracting is insufficient because of the number of claims likely to occur in an insolvency case – creditors would be fighting with each other for a share of the company, instead of allowing liquidation or reorganisation in an orderly manner.
4. Business failures help the overall economy by weeding out unsuccessful companies. The companies that are left are stronger, have better business models and better management and make better use of resources than the failed companies. While the employees who are left unemployed because of an insolvency case are certainly worse off, the overall economy is stronger because the less productive companies are no longer operating.
5. It would make sense to reorganise rather than liquidate if the company has the expectation of future cash flows sufficient to bring the company back to solvency. If its assets are worth less than its liabilities, with little hope of change in the future, liquidation may be the best alternative. If the company just needs time to make changes in its operations or to sit out a bad turn in the economy, then reorganising may create more value for creditors and shareholders. Ultimately, the company should look at the value under each option, liquidation or reorganisation and go with the plan that would create the most value.

6. Subordinating a claim means that claim has a lower priority. Secured creditors have a claim on the assets listed in their contract as security. Unsecured creditors have a claim on the company's other assets. Some unsecured creditors may be given a higher priority than other unsecured creditors, whose claims are subordinated.
7. Paying the expenses of administering the insolvency proceeding is given the highest priority. If this were not the case it would be difficult to find trustees to agree to administer insolvencies. If they know the business is failing they want to be assured up front that their expenses will be met.

TWO ANSWERS ARE MISSING HERE – QUESTIONS 8 AND 9 ON PAGE 794

8. Why is predicting insolvency useful?
9. How are the five factors that determine a Z score related to the financial health of a business?

### Solutions to Self-Test Problems

**ST22-1.** A company has \$8 million in funds to distribute to its unsecured creditors. Three possible sets of unsecured creditor claims are presented. Calculate the settlement, if any, to be received by each creditor in each case shown in the following table.

Unsecured Creditors' Claims	Case I	Case II	Case III
Unpaid balance of second mortgage	\$ 2,000,000	\$ 2,500,000	\$ 5,000,000
Accounts payable	2,500,000	3,000,000	4,000,000
Notes payable – bank	3,500,000	3,500,000	1,500,000
Unsecured bonds	4,000,000	5,000,000	5,500,000
Total	<u>\$12,000,000</u>	<u>\$14,000,000</u>	<u>\$16,000,000</u>

**A:** In Case I, assuming each unsecured creditor has equal priority, each creditor will receive  $\$8,000,000/\$12,000,000 = \$0.6667$  on the dollar.

In Case II, each creditor will receive  $\$8,000,000/\$14,000,000 = \$0.5714$  on the dollar.

In Case III, each creditor will receive  $\$8,000,000/\$16,000,000 = \$0.5000$  on the dollar. The actual amounts received are as follows:

Unsecured Creditor	Case I	Case II	Case III
Second mortgage	\$1,333,333	\$1,428,571	\$2,500,000
Accounts payable	1,666,667	1,714,286	2,000,000
Notes payable	2,333,333	2,000,000	750,000
Unsecured bonds	2,666,667	2,857,143	2,750,000
Total	<u>\$8,000,000</u>	<u>\$8,000,000</u>	<u>\$8,000,000</u>

**ST22-2.** Oxygen Filtration Systems recently failed and will be liquidated by a court-appointed trustee who will charge \$500,000 for his services. The pre-liquidation balance sheet follows. Assume that the trustee liquidates the assets for \$10.2 million, with \$5.8 million coming from the sale of current assets and \$4.4 million coming from fixed assets. Also assume that the unsecured bonds are subordinate to the notes payable. Prepare a table indicating the amount to be distributed to each claimant. Do the company's owners receive any funds?

Oxygen Filtration Systems  
Balance Sheet as at 31 December 2012

Assets		Liabilities and Shareholders' Equity	
Cash	\$ 600,000	Accounts payable	\$ 2,500,000
Marketable securities	750,000	Notes payable – bank	4,000,000
Accounts receivable	1,750,000	Accrued wages <sup>a</sup>	750,000
Inventories	2,250,000	Unpaid employee benefits <sup>b</sup>	500,000
Prepaid expenses	900,000	Unsecured customer deposits <sup>c</sup>	500,000
Total current assets	<u>\$ 6,250,000</u>	Taxes payable	1,000,000
		Total current liabilities	<u>\$ 9,250,000</u>
Land	\$ 3,000,000	First mortgage <sup>d</sup>	\$ 3,000,000
Net plant	5,000,000	Second mortgage <sup>d</sup>	2,000,000
Net equipment	6,250,000	Unsecured bonds	3,500,000
Total fixed assets	<u>\$14,250,000</u>	Total long-term debt	<u>\$ 8,500,000</u>
Total assets	<u>\$20,500,000</u>	Preferred shares (10,000 shares)	\$ 500,000
		Ordinary shares (20,000 shares)	2,000,000
		Retained earnings	250,000
		Total shareholders' equity	<u>\$ 2,750,000</u>
		Total	<u>\$20,500,000</u>

<sup>a</sup> Represents wages of \$4,000 or less per employee earned within 90 days of filing for insolvency for 200 of the company's employees.

<sup>b</sup> Unpaid employee benefits that were due in the 180-day period preceding the company's insolvency filing, which occurred simultaneously with the termination of its business.

<sup>c</sup> Unsecured customer deposits not exceeding \$1,800 each.

<sup>d</sup> First and second mortgages on the company's total fixed assets.

**A:** Amount available for distribution: \$10,200,000.

Distributions to Claimants		Cumulative Total
Trustee expenses	\$ 500,000	\$ 500,000
Employee wages	750,000	1,250,000
Employee benefits	500,000	1,750,000
Customer deposits	500,000	2,250,000
Taxes due	1,000,000	3,250,000
First mortgage	3,000,000	6,250,000
Second mortgage	1,400,000*	7,650,000
<b>Unsecured Creditors</b>		
Accounts payable	\$ 2,500,000	
Notes payable	4,000,000	
Second mortgage**	600,000	
Unsecured bonds	3,500,000	
Total	<u>\$10,600,000</u>	

Creditors through the first mortgage-holder will be paid in full, and the second mortgage-holder will receive \$1,400,000 from the sale of secured assets, for a total initial payment of \$7,650,000. This left \$10,200,000 – \$7,650,000 = \$2,550,000. The unsecured creditors' claims total \$10,600,000.

Assuming the unsecured creditors have equal priority, they will receive  $\$2,550,000 \div \$10,600,000 = \$0.2406$  on the dollar. This will be paid as follows:

	Shares of Proceeds	Actual Payouts
Accounts Payable	\$ 601,415	\$ 601,415
Notes payable	962,264	1,804,245***
Second mortgage	144,340	144,340
Unsecured bonds	<u>841,981</u>	0
Totals	<u>\$2,550,000</u>	<u>\$2,550,000</u>

Note that because the unsecured creditors' claims are not fully repaid, no funds are available for distribution to the company's owners – both the preferred and ordinary shareholders.

\*\$4,400,000 fixed asset sale proceeds – \$3,000,000 first mortgage repayment

\*\*\$2,000,000 second mortgage – \$1,400,000 paid from final asset sale proceeds

\*\*\*Because the unsecured bonds are subordinated to the notes payable, their claim of \$841,981 passes to the notes payable, thereby increasing the notes payable proceeds to \$1,804,245 (of \$4.0 million due) and decreasing the amount recovered by the unsecured bonds to \$0.

**ST22-3.** Express Trailers has a working capital/total assets ratio of 0.3, a retained earnings/total assets ratio of 0.15, an earnings before interest and taxes (EBIT)/ total asset ratio of 0.20, a market value of equity/book value of equity ratio of 0.5, and a sales/total assets ratio of 0.75. Calculate and interpret the company's Z score.

**A:** Altman's  $Z = 1.2 \times X_1 + 1.4 \times X_2 + 3.3 \times X_3 + 0.6 \times X_4 + 1.0 \times X_5$

Where

$X_1$  = working capital /total assets = 0.45

$X_2$  = retained earnings/total assets = 0.25

$X_3$  = EBIT/total assets = 0.35

$X_4$  = Market value of equity/book value of debt = 0.60

$X_5$  = sales/total assets = 0.85

Altman's  $Z = 1.2 \times 0.45 + 1.4 \times 0.25 + 3.3 \times 0.35 + 0.6 \times 0.60 + 1.0 \times 0.85 = \underline{3.255}$

With a Z score of 3.255, the company has a low probability of failure.

### Answers to End-of-Chapter Questions

**Q22-1.** Discuss why it makes sense to offer subsidies to companies that reorganise rather than liquidate.

**A22-1.** It makes sense to offer subsidies to companies that reorganise as an incentive to restructure the business and continue productive operations. Perhaps the company simply needs a little more time to ride out an unfavourable economic climate. It may continue to operate productively if it is given that time.

**Q22-2.** Explain why the option to delay entering insolvency has value for corporate managers.

- A22-2.** The option to delay entering insolvency has value for corporate managers because even if current management continues to run the company during insolvency, management will still lose some freedom – decisions will need to be approved by the court. Insolvency is also expensive to management. The managers will need to spend time and energy dealing with the court, lawyers, accountants, etc., rather than being able to focus on bettering the business.
- Q22-3.** Why do creditors usually accept a plan for financial rehabilitation rather than demand liquidation of a business?
- A22-3.** Creditors will accept a plan for financial rehabilitation if there is a possibility that they will receive a greater percentage of what they are owed. Creditors recognise that sometimes a company simply needs more time to turn around the business, which can continue to be productive in the future once the liquidity crisis is past. Creditors also may be reluctant to write off their debt and recognise a loss, as would likely happen in liquidation.
- Q22-4.** 'A certain number of insolvencies are good for the economy.' Discuss why you agree or disagree with this statement.
- A22-4.** Business failures help the overall economy by weeding out unsuccessful companies. The companies that are left are stronger, have better business models and better management and make better use of resources than the failed companies. While the employees who are left unemployed because of an insolvency are certainly worse off, the overall economy is stronger because the less productive companies are no longer operating.
- Q22-5.** 'A business should always be liquidated when the liquidation value exceeds the business's value as a going concern.' Discuss why you agree or disagree with this statement.
- A22-5.** In general, if liquidation provides more value than continuing the business, then the company should be liquidated. The main difficulty with this position is that it is often difficult to value the going concern. It is easier to determine current market values of the company's assets and determine a liquidation value. It is harder to predict future economic conditions and determine the value of the company in the future.
- Q22-6.** What are the advantages and disadvantages of a voluntary workout to resolve financial distress? What are the advantages and disadvantages of claiming insolvency to resolve financial distress?
- A22-6.** The primary advantage of a voluntary workout is that it is less costly than going through the courts. It avoids court costs and legal fees. The disadvantages are that it may be difficult to get all of the creditors to agree to a plan, particularly if the company has many creditors. The advantages of declaring insolvency are obtaining DIP (debtor in possession) financing and being able to force reluctant classes of creditors to agree to a settlement. The primary disadvantage is that formal insolvency is more costly than a voluntary workout.
- Q22-7.** A business can be liquidated for \$700,000, or it can be reorganised. Reorganisation would require an investment of \$400,000. If the company is reorganised, earnings are projected to be \$150,000 per year, and the company would trade at a price/earnings ratio of 8.0 times. Should the company be liquidated or reorganised?

**A22-7.** At a price earnings ratio of 8 times, the earnings are worth  $8 \times \$150,000 = \$1,200,000$ . Minus the investment of \$400,000, this leaves a value of \$800,000. This is greater than the liquidation value of \$700,000 and the company should be reorganised. *Note:* Students may argue that there is a time value of money involved, and the \$1,200,000 really should be discounted at an appropriate discount rate, then subtract \$400,000 and then compare to the \$700,000 liquidation value. You could add a discount rate and say the \$150,000 will occur in one year. Then the \$1,200,000 will be discounted before being compared to \$700,000.

**Q22-8.** Explain why the priorities for liquidation are determined as they are. Do you agree with the order?

**A22-8.** The priorities are designed to give the claimants with the strongest claims the highest priority. Secured creditors with fixed charges are first, which makes sense because creditors who have tied specific assets to their claim should have rights to those assets. Expenses of the insolvency proceedings are part of the next set of claims because it would be difficult to get anyone to administer an insolvency if they were not assured of being paid for their work. Business expenses incurred after filing and employee wages and benefits are then in line. This is designed to protect employees. Secured creditors with floating charges are next. Unsecured creditors are in a riskier position, and presumably receive a higher return for the greater risk that they are taking. Preferred shares are like debt – it is a fixed obligation rather than a share in the company, and ordinary shareholders have the last claim on the company's assets.

**Q22-9.** Why would some creditors be willing to subordinate their claims to the claims of other creditors?

**A22-9.** Creditors might be willing to subordinate their claims for a higher reward. For example, a subordinated loan would carry a higher interest rate than a safer, secured loan. As usual in finance, there is a risk-reward relationship. Investors are willing to bear risk if they are appropriately rewarded for taking risk.

**Q22-10.** Who would use Altman's Z score to predict insolvency? Why would the ability to predict insolvency be useful to them?

**A22-10.** Predicting insolvency is useful to investors. They could apply Altman's Z to companies in their portfolios to measure the probability of future failure. They then could sell these companies before they become insolvent to limit losses in their investments. A company can also measure its possibility of insolvency, look for the causes, and work at correcting problems before the company actually becomes financially distressed.

## ***Solutions to End-of-Chapter Problems***

### **Insolvency and Business Failure**

**P22-1.** Go to <http://www.bankruptcydata.com>, and identify the ten largest US public company insolvencies during the previous year. Compare the list of the ten largest insolvencies in US history presented in Table 22.1 with the current list at <http://www.bankruptcydata.com>. Have any recent bankruptcies made the list?

**A22-1.** Internet exercise – answers will vary.

### **Priority of Claims**

**P22-2.** A company has \$450,000 in funds to distribute to its unsecured creditors. Three possible sets of



unsecured creditor claims are presented. Calculate the settlement, if any, to be received by each creditor in each case shown in the following table.

<b>Unsecured Creditors' Claims</b>	<b>Case I</b>	<b>Case II</b>	<b>Case III</b>
Unpaid balance of second mortgage	\$300,000	\$200,000	\$ 500,000
Accounts payable	200,000	100,000	300,000
Notes payable – bank	300,000	100,000	500,000
Unsecured bonds	100,000	200,000	500,000
Total	<u>\$900,000</u>	<u>\$600,000</u>	<u>\$1,800,000</u>

- A22-2.** In Case I, assuming each unsecured creditor has equal priority, each creditor will receive  $\$450,000/\$900,000 = \$0.50$  in the dollar.  
 In Case II, each creditor will receive  $\$450,000/\$600,000 = \$0.75$  in the dollar.  
 In Case III, each creditor will receive  $\$450,000/\$1,800,000 = \$0.25$  in the dollar.

The actual amounts received are as follows:

<b>Unsecured Creditor</b>	<b>Case I</b>	<b>Case II</b>	<b>Case III</b>
Second mortgage	\$150,000	\$150,000	\$125,000
Accounts payable	100,000	75,000	75,000
Notes payable	150,000	75,000	125,000
Unsecured bonds	50,000	150,000	125,000
Total	<u>\$450,000</u>	<u>\$450,000</u>	<u>\$450,000</u>

- P22-3.** A company has \$5 million in funds to distribute to its unsecured creditors. Three possible sets of unsecured creditor claims are presented. Calculate the settlement, if any, to be received by each creditor in each case shown in the following table.

<b>Unsecured Creditors' Claims</b>	<b>Case I</b>	<b>Case II</b>	<b>Case III</b>
Unpaid balance of second mortgage	\$1,000,000	\$2,000,000	\$3,000,000
Accounts payable	2,000,000	1,000,000	3,000,000
Notes payable – bank	3,000,000	2,000,000	1,000,000
Unsecured bonds	1,000,000	3,000,000	2,000,000
Total	<u>\$7,000,000</u>	<u>\$8,000,000</u>	<u>\$9,000,000</u>

- A22-3.** In Case I, assuming each unsecured creditor has equal priority, each creditor will receive  $\$5,000,000/\$7,000,000 = \$0.714$  in the dollar.  
 In Case II, each creditor will receive  $\$5,000,000/\$8,000,000 = \$0.625$  in the dollar.  
 In Case III, each creditor will receive  $\$5,000,000/\$9,000,000 = \$0.556$  in the dollar.

The actual amounts received are as follows:

<b>Unsecured Creditor</b>	<b>Case I</b>	<b>Case II</b>	<b>Case III</b>
Second mortgage	\$ 714,000	\$1,250,000	\$ 1667,000
Accounts payable	1,428,000	625,000	1,667,000
Notes payable	2,142,000	1,250,000	556,000
Unsecured bonds	714,000	1,875,000	1,111,000
Total*	\$4,998,000	\$5,000,000	\$5,001,000

\*Totals do not exactly equal \$5,000,000 due to rounding of amount received per dollar.

**P22-4.** Keck Business Forms recently failed and will be liquidated by a court-appointed trustee who will charge \$300,000 for her services. The preliquidation balance sheet follows. Assume that the trustee liquidates the assets for \$4.8 million, with \$2.6 million coming from the sale of current assets and \$2.2 million coming from fixed assets. Also assume that the unsecured bonds are subordinate to the notes payable. Prepare a table indicating the amount to be distributed to each claimant. Do the company's owners receive any funds?

Keck Business Forms Balance Sheet as at 31 December 2012			
<b>Assets</b>		<b>Liabilities and Shareholders' Equity</b>	
Cash	\$ 100,000	Accounts payable	\$1,200,000
Marketable securities	50,000	Notes payable – bank	1,100,000
Accounts receivable	1,100,000	Accrued wages <sup>a</sup>	300,000
Inventories	2,400,000	Unpaid employee benefits <sup>b</sup>	200,000
Prepaid expenses	400,000	Unsecured customer deposits <sup>c</sup>	250,000
Total current assets	\$4,050,000	Taxes payable	100,000
		Total current liabilities	\$3,150,000
	\$1,000,000	First mortgage <sup>d</sup>	\$1,500,000
Land Net plant	2,100,000	Second mortgage <sup>d</sup>	1,000,000
Net equipment	2,300,000	Unsecured bonds	2,000,000
Total fixed assets	\$5,400,000	Total long-term debt	\$4,500,000
Total assets	\$9,450,000	Preferred shares (5,000 shares)	\$ 500,000
		Ordinary shares (10,000 shares)	1,000,000
		Retained earnings	300,000
		Total shareholders' equity	\$1,800,000
		Total liabilities and share holders' equity	\$9,450,000

<sup>a</sup> Represents wages of \$4,000 or less per employee earned within 90 days of claiming insolvency for 200 of the company's employees.

<sup>b</sup> Unpaid employee benefits that were due in the 180-day period preceding the company's insolvency claim, which occurred simultaneously with the termination of its business.

<sup>c</sup> Unsecured customer deposits not exceeding \$1,800 each.

<sup>d</sup> First and second mortgages on the company's total fixed assets.

**A22-4.** Amount available for distribution: \$4,800,000

**Distributions to Claimants**

		<b>Cumulative Total</b>
Trustee expenses	\$ 300,000	\$300,000
Employee wages	300,000	600,000
Employee benefits	200,000	800,000
Customer deposits	250,000	1,050,000
Taxes due	100,000	1,150,000
First mortgage	1,500,000	2,650,000
Second mortgage	700,000*	3,350,000

**Unsecured Creditors**

Accounts payable	\$1,200,000
Notes payable	1,100,000
Second mortgage**	300,000
Unsecured bonds	2,000,000
Total	<u>\$4,600,000</u>

\*\$2,200,000 fixed asset sale proceeds – \$1,500,000 first mortgage repayment

\*\*\$1,000,000 second mortgage – \$700,000 paid from final asset sale proceeds

Creditors through the first mortgage-holder will be paid in full, and the second mortgage-holder will receive \$700,000 from the sale of secured assets, for a total initial payment of \$3,350,000. This leaves \$4,800,000 – \$3,350,000 = \$1,450,000. The unsecured creditors' claims total \$4,600,000. Assuming the unsecured creditors have equal priority, they will receive \$1,450,000 / \$4,600,000 = \$0.315 on the dollar. This will be paid as follows:

	<b>Shares of Proceeds</b>	<b>Actual Payouts</b>
Accounts payable	\$ 378,000	\$ 378,000
Notes payable	346,500	976,500*
Second mortgage	94,500	94,500
Unsecured bonds	630,000	0
Totals**	<u>\$1,449,000</u>	<u>\$1,449,000</u>

\* Because the unsecured bonds are subordinated to the notes payable, their claim of \$630,000 passes to the notes payable, thereby increasing the notes payable proceeds to \$976,500 (of \$1.1 million due) and decreasing the amount recovered by the unsecured bonds to \$0.

\*\* Totals of \$1,449,000 rather than \$1,450,000 due to rounding.

Note that because the unsecured creditors' claims are not fully repaid, no funds are available for distribution to the company's owners – both the preferred and ordinary shareholders.

**Predicting Insolvency**

**P22-5.** Sosbee Foods has a working capital/total assets ratio of 0.2, a retained earnings/total assets ratio of 0.1, earnings before interest and taxes/ total asset ratio of 0.25, market value of equity/book value of equity ratio of 0.6, and a sales/total assets ratio of 0.8. Calculate and interpret the company's Z score.

**A22-5.** Altman's  $Z = 1.2 \times X_1 + 1.4 \times X_2 + 3.3 \times X_3 + 0.6 \times X_4 + 1.0 \times X_5$

where

$X_1 = \text{Working capital / Total assets} = 0.2$

$X_2 = \text{Retained earnings / Total assets} = 0.1$

$X_3 = \text{EBIT / Total assets} = 0.25$

$X_4 = \text{Market value of equity / Book value of debt} = 0.6$

$X_5 = \text{Sales / Total assets} = 0.8$

$$\text{Altman's } Z = 1.2 \times 0.2 + 1.4 \times 0.1 + 3.3 \times 0.25 + 0.6 \times 0.6 + 1.0 \times 0.8 = \underline{2.365}$$

With a Z score of 2.365, the company has an unsure probability of failure. The model places this score in the grey area between a high probability of failure and unlikely failure.

**P22-6.** The following balance sheet and income statement are for Weber Industries. The company's shares currently are priced at \$6.00 per share. Calculate and interpret the company's Z score.

Weber Industries  
Balance Sheet as at 31 December 2012

<b>Assets</b>		<b>Liabilities and Shareholders' Equity</b>	
Cash	\$ 400,000	Accounts payable	\$ 5,000,000
Accounts receivable	3,000,000	Notes payable – bank	<u>1,000,000</u>
Inventories	<u>4,000,000</u>	Total current liabilities	<u>\$ 6,000,000</u>
Total current assets	<u>\$ 7,400,000</u>	Mortgage	\$ 4,000,000
Land	\$ 1,000,000	Debentures	<u>6,000,000</u>
Net plant	5,000,000	Total long-term debt	<u>\$10,000,000</u>
Net equipment	<u>8,000,000</u>	Preferred shares (100,000 shares)	\$ 1,000,000
Total fixed assets	<u>\$14,000,000</u>	Ordinary shares (500,000 shares)	1,000,000
Total Assets	<u><u>\$21,400,000</u></u>	Paid-in capital in excess of par	2,000,000
		Retained earnings	<u>1,400,000</u>
		Total shareholders' equity	<u>\$ 5,400,000</u>
		Total liabilities and equity	<u><u>\$21,400,000</u></u>

Weber Industries  
Income Statement for the Year  
Ending 31 December 2012

Sales:	\$6,000,000
Less: Cost of goods sold	(3,500,000)
Less: Selling and administrative expenses	(1,000,000)
Earnings before interest and taxes	\$1,500,000
Less: Interest	1,100,000
Earnings before taxes	\$ 400,000
Less: Taxes (39%)	120,000
Net income	<u>\$ 280,000</u>

**A22-6.** Altman's  $Z = 1.2 \times X_1 + 1.4 \times X_2 + 3.3 \times X_3 + 0.6 \times X_4 + 1 \times X_5$

Working capital/total assets =  $(\$7,400,000 - \$6,000,000)/\$21,400,000 = 0.0654$

Retained earnings/Total assets =  $\$1,400,000/\$21,400,000 = 0.0654$

EBIT/Total assets =  $\$1,500,000/\$21,400,000 = 0.07$

Market value of equity/Book value of debt =  $(\$6/\text{share})(500,000 \text{ shares})/\$10,000,000 = 0.30$

Sales/Total assets =  $\$6,000,000/\$21,400,000 = 0.28$

Where

$X_1$  = Working capital /Total assets = 0.0654

$X_2$  = Retained earnings/Total assets = 0.0654

$X_3$  = EBIT/Total assets = 0.07

$X_4$  = Market value of equity/Book value of debt = 0.30

$X_5$  = Sales/Total assets = 0.28

Altman's  $Z = 1.2 \times 0.0654 + 1.4 \times 0.0654 + 3.3 \times 0.07 + 0.6 \times 0.30 + 1.0 \times 0.28 = \underline{0.865}$

With a Z score of 0.865, which is well below the 1.800 cut off, the company has a high probability of failure.

**P22-7.** Compute the Z score for Giant Motors Corporation (GMC) given the following information for year-end 2012:

GMC financial information (year-end 2012)	
Current assets	\$55,515,000
Current liabilities	\$74,892,000
Retained earnings	\$14,428,000
Total assets	\$482,029,000
Total liabilities	\$451,877,000
Shares outstanding	565,100,304
Share price	\$29.27
Sales	\$193,517,000
EBIT	\$11,920,000
All values in thousands except share price and shares outstanding.	

At what share price would GMC have a Z score equal to 3.00? How does the future look for GMC?

$$\text{A22-7. } 1.2 * [(\$55,515,000 - \$74,892,000) \div \$482,029,000] + 1.4 * [\$14,428,000 \div \$482,029,000] + 3.3 * [\$1,192,000 \div \$482,029,000] + 0.6 * [(\$29.27 * 565,100.304) \div \$451,877,000,000] + 1.0 * [\$193,517,000 \div \$482,029,000] = 23.366$$

The share price that will make GMC have a Z-score of 3.00 is \$3.46, which is well below the current share price. The future looks good for GMC given the existing high Z score.

$$\$451,877,000,000 * [3.00 - \{1.2 * [(\$55,515,000 - \$74,892,000) \div \$482,029,000] + 1.4 * [\$14,428,000 \div \$482,029,000] + 3.3 * [\$1,192,000 \div \$482,029,000] + 1.0 * [\$193,517,000 \div \$482,029,000]\}] \div (0.6 * 565,100.304) = \$3.46$$

**P22-8.** Compute the Z score for Central Manufacturing Corporation (CMC) given the following information for year-end 2012:

CMC financial information (year-end 2012)	
Current assets	\$41,224,000
Current liabilities	\$73,911,000
Retained earnings	-\$70,610,000
Total assets	\$91,047,000
Total liabilities	\$176,387,000
Shares outstanding	610,500,684
Share price	\$2.83
Sales	\$148,979,000
EBIT	-\$27,467,000
All values in thousands except share price and shares outstanding.	

Based on its Z score, is CMC likely to become insolvent in the near future?

$$\text{A22-8. } 1.2 * [(\$41,224,000 - \$73,911,000) \div \$91,047,000] + 1.4 * [(-\$70,610,000) \div \$91,047,000] + 3.3 * [(-\$27,467,000) \div \$91,047,000] + 0.6 * [(\$2.83 * 610,500.684) \div \$176,387,000] + 1.0 * [\$148,979,000 \div \$91,047,000] = 5.001$$

With a Z-score above 2.99, CMC is not likely to become insolvent in the near future. However, the main reason for this Z score is the share price being \$2.83 which could change drastically in the near future with continued poor performance.

**P22-9.** Compute the Z score for FAST Motor Company given the following information for year-end 2012:

FAST financial information (year-end 2012)	
Current assets	\$34,124,000
Current liabilities	\$49,178,000
Retained earnings	-\$16,145,000
Total assets	\$218,328,000
Total liabilities	\$235,639,000
Shares outstanding	-412,000,000
Share price	\$2.29
Sales	\$146,277,000
EBIT	-\$13,812,000
All values in thousands except share price and shares outstanding.	

What proportion (measured as a percentage) of the Z score is composed of  $0.60(X_4)$ ? Is FAST likely to become insolvent in the near future?

**A22-9.**  $1.2 * [(\$34,124,000 - \$49,178,000) \div \$163,429,000] + 1.4 * [-\$16,145,000 \div \$163,429,000] + 3.3 * [-\$13,812,000 \div \$163,429,000] + 0.6 * [(\$2.29 * 2,412,000,000) \div \$49,178,000] + 1.0 * [\$146,277,000 \div \$163,429,000] = 14.339$

$X_4 * 0.60$  provides approximately 98% of the Z-score value.  
 $(0.60 * \$2.29 * 2,412,000,000 \div \$235,639,000) \div 14.338 = 98.08\%$

With a Z-score above 2.99, FAST is not likely to become insolvent in the near future. However, a decrease in share price will adversely affect the Z-score substantially given how the Z-score is so dependent on  $X_4$ .

**P22-10.** Compute the Z score for Win-Mart, given the following information for year-end 2012:

Win-Mart financial information (year-end 2012)	
Current assets	\$48,949,000
Current liabilities	\$55,390,000
Retained earnings	\$63,600,000
Total assets	\$163,429,000
Total liabilities	\$98,144,000
Shares outstanding	3,925,000,000
Share price	\$47.12
Sales	\$405,607,000
EBIT	\$22,798,000
All values in thousands except share price and shares outstanding.	

What proportion (measured as a percentage) of the Z score is composed of  $0.60(X_4)$ ? What

proportion (measured as a percentage) of the Z score is composed of 1.00( $X_5$ )? Is Win-Mart likely to fail in the near future?

**A22-10.**  $1.2 * [(\$48,949,000 - \$55,390,000) \div \$163,429,000] + 1.4 * [\$63,660,000 \div \$163,429,000] + 3.3 * [\$22,798,000 \div \$163,429,000] + 0.6 * [(\$47.12 * 3,925,000,000) \div \$98,144,000] + 1.0 * [\$405,607,000 \div \$163,429,000] = 1134.101$

$X_4 * 0.60$  provides approximately 100% of the Z-score value.

$$([0.60 * \$47.12 * 3,925,000,000) \div \$98,144,000] \div 1134.101 = 99.70\%$$

$X_5 * 1.00$  provides approximately 0% of the Z-score value.

$$([1.00 * \$405,607,000 \div \$163,429,000] \div 1134.101 = 0.22\%)$$

With a Z-score well above 3.00, Win-Mart is unlikely to become insolvent in the near future.



## Answer to MiniCase

### Insolvency and Financial Distress

Flanan Photography Studios (FPS) is preparing for a claim of insolvency and has issued the following preliquidation financial statements.

Flanan Photography Studios Balance sheet as at 31 December 2012			
Assets		Liabilities and shareholders' equity	
Cash	\$ 800 000	Accounts payable	\$ 2 600 000
Marketable securities	24 000	Notes payable	2 200 000
Accounts receivable	3 500 000	Accrued wages	700 000
Inventories	4 000 000	Unpaid employee benefits	385 000
Prepaid expenses	<u>1 000 000</u>	Taxes payable	<u>250 000</u>
Total current assets	\$ 9 324 000	Total current liabilities	\$ 6 135 000
Land	\$10 000 000	First mortgage	\$ 8 500 000
Net plant	28 000 000	Second mortgage	27 000 000
Net equipment	<u>32 000 000</u>	Unsecured bonds	<u>28 000 000</u>
Total fixed assets	<u>\$70 000 000</u>	Total long-term debt	\$63 500 000
Total	<u>\$79 324 000</u>	Preferred shares (15 000 shares)	\$ 1 500 000
		Ordinary shares (1 500 000 shares)	7 500 000
		Retained earnings	<u>689 000</u>
		Total stockholders' equity	<u>\$ 9 689 000</u>
		Total	<u>\$79 324 000</u>

Flanan Photography Studios Income statement for the year ending 31 December 2012	
Sales	\$14 420 000
Cost of goods sold	−7 210 000
Selling and administrative expenses	<u>−787 000</u>
Earnings before interest and taxes	\$ 6 423 000
Interest expense	<u>−5 715 000</u>
Earnings before taxes	\$708 000
Taxes (30%)	<u>−283 200</u>
Net income	<u>\$424 800</u>

TruValue Administration Services (TAS) has been appointed to oversee the sale and disbursement of funds from the liquidation and will charge \$450,000 for the service. TAS can obtain \$7,250,000 from the sale of FPS's current assets and \$49,850,000 from the sale of fixed assets. Accrued wages represent wages of \$4,000 or less per employee, and the wages were earned within 90 days of claiming insolvency. Unpaid employee benefits represent an amount that was due within the 180-day period preceding the insolvency claim. The first and second mortgages are secured by the company's total fixed assets. The company's shares are currently trading for \$3.25 per share.

### Assignment

1. Calculate the amount to be received by each claimant.
2. Calculate and interpret the company's Z score.

**Answers**

1.

Proceeds from liquidation (\$7,250,000 + \$49,850,000)	\$57,100,000
Expenses of administering insolvency	\$450,000
Wages owed workers	\$700,000
Unpaid employee benefits	\$385,000
Taxes owed governments	<u>\$250,000</u>

Funds available for creditors	\$55,315,000
First mortgage, paid from \$49,850,000 proceeds	\$8,500,000
Second mortgage, paid from remainder of \$49,850,000 proceeds	<u>\$27,000,000</u>
Funds available for unsecured creditors	\$19,815,000

The settlement percentage is \$19,815,000/\$32,800,000 or approximately 60%.

Unsecured Creditors' Claims	Amount	Settlement @ 60%
Accounts payable	\$2,600,000	\$1,570,701
Notes payable	\$2,200,000	\$1,329,055
Unsecured bonds	\$28,000,000	\$16,915,244
Total	\$32,800,000	\$19,815,000

2.

Factor	Weight	Amount	Weighted Amount
Working capital/total assets	1.2	0.0402	0.0482
Retained earnings/total assets	1.4	0.0087	0.0122
EBIT/total assets	3.3	0.0810	0.2672
MV of equity/BV of debt	0.6	0.0800	0.0480
Sales/total assets	1.0	0.1818	0.1818
		Altman Z =	0.5574

The Z-score is well below 1.81, making insolvency likely.