Chapter 1

The Corporation and Financial Markets

1-1. A corporation is a legal entity separate from its owners. This means ownership shares in the corporation can be freely traded. None of the other organizational forms share this characteristic.

1-2. Owners' liability is limited to the amount they invested in the firm. Shareholders are not responsible for any encumbrances of the firm; in particular, they cannot be required to pay back any debts incurred by the firm.

1-3. Corporations (all shareholders have limited liability). Limited partnerships provide limited liability for the limited partners, but not for the general partners.

1-4. Advantages: Limited liability, liquidity, infinite life. Disadvantages: Double taxation, separation of ownership and control.

1-5. The corporation that only holds real estate must pay corporate income taxes. The real estate investment trust (REIT) does not pay corporate taxes but must pass through substantially all of the income to the trust unit holders to whom it is taxable.

1-6. First, the corporation pays the taxes. After taxes, $\$2 \times (1 - 0.34) = \$1.32$ per share is left to pay dividends. Once the dividend is paid, personal tax on this must be paid, leaving $\$1.32 \times (1 - 0.18) = \$1.0824$ per share. So after all the taxes are paid, you are left with $1.0824 per share.

1-7. As a real estate investment trust (REIT) pays no corporate tax, the full amount of $2 per unit can be paid out to you as a trust unit holder. You must then pay personal income tax on the distribution. So you are left with $\$2 \times (1 - 0.4) = \$1.20$ per unit.

1-8. As the manager of an iPhone applications developer, you will make three types of financial decisions.

i. You will make investment decisions such as determining which type of iPhone application projects will offer your company a positive NPV and should, therefore, be developed by your company.

ii. You will make the decision on how to fund your iPhone application investments and what mix of debt and equity your company will have.

iii. You will be responsible for the cash management of your company, ensuring that your company has the necessary funds to make investments, pay interest on loans, and pay your employees.

1-9. Shareholders can

i. ensure that employees are paid with company stock and/or stock options.

ii. ensure that underperforming managers are fired.

iii. write contracts that ensure that the interests of the managers and shareholders are closely aligned.

iv. mount hostile takeovers.

1-10. This will affect and hurt the customers. It will have a negative impact on the customers, for they will likely get sour milk. It will also have a negative impact on shareholders because, in the long run, customers will realize that the supermarket sells sour milk and will switch to other supermarkets. Thus, the value today of the future income and cash flow streams generated by the supermarket will drop because of the long-term loss of customers caused by this strategy. This will negatively affect the current stock price as shareholders anticipate these long-term drawbacks.

1-11. The agent (renter) will not take the same care of the apartment as the principal (owner), because the renter does not share in the costs of fixing damage to the apartment. This problem can be mitigated by having the renter pay a deposit and agree to share in the costs of fixing any problems that are caused by the renter. Such an arrangement should motivate the renter to keep damages to a minimum.

1-12. An ethical dilemma arises when the CEO of a firm has opposite incentives to those of the shareholders. In this case, you (as the CEO) have an incentive to improve your pay and prestige by buying another company, but the potential overpayment involved in the deal would be damaging to your shareholders.

1-13. No. They are a way to discipline managers who are not working in the interests of shareholders.

1-14. For each of (a) to (d), you must determine if your personal change in monetary wealth more than offsets the value of the leisure time you would lose (valued at $51,000). If it does, then you would decide to proceed with the new project.

a. If you owned 100% of the company and the project were accepted, your personal shares of stock would increase in value by 100% of $1 million = $1 million. This would more than offset your personal cost of lost leisure; therefore, your decision would be to proceed with the project.

b. If you owned 1% of the company and the project were accepted, your personal shares of stock would increase in value by 1% of $1 million = $10,000. This would not be enough to offset your personal cost of lost leisure; therefore, your decision would be to reject the project.

c. If you owned 3% of the company and the project were accepted, your personal shares of stock would increase in value by 3% of $1 million = $30,000. In addition, you would receive a bonus of $25,000, so in total your monetary wealth would increase by $55,000. This more than offsets your personal cost of lost leisure; therefore, your decision would be to proceed with the project.

d. If you accept the project, your monetary wealth would increase by $25,000 + 3% of $X. For you to decide to accept the project, this must be greater than $51,000 (the value of your lost leisure). Solving for X, we get:

$$\$25{,}000 + 0.03X > \$51{,}000$$
$$0.03X > \$26{,}000$$
$$X > \$866{,}666.67$$

e. In part (a), you (as the CEO) are perfectly aligned with the owners of the company as you actually own the whole company. Thus, you receive the full benefit of the $1 million increase in equity value and this offsets the value of your lost leisure. There is no principal-agent problem in this case as you own the entire company. In part (b), your incentives are not aligned with those of the shareholders because the project should be accepted to maximize shareholder wealth, but you reject it because the increase in your monetary wealth does not offset the cost of your extra effort and lost leisure time. Here the principal-agent problem results in a decision that is costly to shareholders as a whole. In part (c), your incentives are aligned with those of the shareholders as you receive enough of a monetary benefit to offset your cost of lost leisure. In part (d), though, we can see that the bonus scheme does not always solve the principal-agent problem. Your incentives are aligned with those of all shareholders when the project increases the equity value by an amount greater than $866,666.67. However, if the increase in equity value is lower, you would decide to reject the project even though accepting it would maximize shareholder wealth. So, bonuses do not always solve principal-agent problems and, in some cases, bonuses can encourage suboptimal behaviour.

1-15. There are many considerations for you as CEO. One is the cost-benefit analysis of constructing the SD project and reaping the savings in disposal costs—that should show whether the SD project increases shareholder value. In addition, if your bonus is tied to earnings, you may be tempted to accept the project because of higher bonuses for each of the next 10 years. There are other considerations, though. For example, is the SD

method legal? If not, then the company could face substantial fines and reputational damage by using SD. Also, the toxic waste disposed using SD may leak into the ground water—that could further damage SPB's reputation and cause major lawsuits and environmental clean-up charges. These costs would surely affect the cost-benefit analysis. This situation ties into the principal-agent problem in that, as CEO, you may accept SD due to your higher bonus, but the ultimate effect may be a drop in SPB's shareholder value due to the negative factors outlined above.

1-16. Without patent protection, the developer of the drug would be forced to lower prices to compete with generic manufacturers. Because this price competition would lower expected future profits, the developer would be willing to spend much less in R&D to develop the drug initially, and drug innovation would be curtailed.

Alternatively, by allowing the drug's developer to earn higher profits that are commensurate with the value of the drug to society, drug developers will find it in their best interests to spend more on R&D, and drug innovation is enhanced. Thus, patent protection can align the corporation's and society's interests and provide for more efficient spending on drug R&D.

1-17. The shares of a public corporation are traded on an exchange (or "over the counter" in an electronic trading system) while the shares of a private corporation are not traded on a public exchange.

1-18. Investors always buy at the ask and sell at the bid. Since ask prices always exceed bid prices, investors "lose" this difference. It is one of the costs of transacting.

1-19. Using the data provided, we can calculate the gains or losses as follows:

a. With a market order to buy, you pay the quoted ask on September 14 times the number of shares purchased: \$14.60 per share × 500 shares = \$7300. You then sell using a market order, so you receive the quoted bid on September 15 times the number of shares sold: \$15.04 per share × 500 shares = \$7520. Your gain is \$7520 – \$7300 = \$220.

b. Using the limit order prices, you pay \$14.58 per share × 500 shares = \$7290 when purchasing the shares and you receive \$15.08 per share × 500 shares = \$7540 when selling the shares. Your gain is \$7540 – \$7290 = \$250.

c. The tradeoffs between using market orders and limit orders are as follows:

   i. Market orders are executed instantaneously, while it may take some time before a counterparty accepts your limit order or it may be the case that your limit order is never executed.

   ii. Using market orders, you buy at the ask and sell at the bid, so the bid-ask spread is an implied transaction cost. Using limit orders, you can buy closer to the bid and sell closer to the ask, thus avoiding much or all of the bid-ask spread as a transaction cost.

1-20. Using the data provided, we can calculate the gains or losses as follows:

a. With a market order to buy, you pay the quoted ask on September 16 times the number of shares purchased: \$15.14 per share × 1000 shares = \$15,140. You then sell using a market order, so you receive the quoted bid on September 17 times the number of shares sold: \$15.12 per share × 1000 shares = \$15,120. Your gain is \$15,120 – \$15,140 = –\$20 or, put another way, you have incurred a loss of \$20. Note that, even though the stock price went up, you lost money because of the high bid-ask spread.

b. Using the limit order prices, you pay \$15.08 per share × 1000 shares = \$15,080 when purchasing the shares and you receive \$15.18 per share × 1000 shares = \$15,180 when selling the shares. Your gain is \$15,180 – \$15,080 = \$100.

c. The tradeoffs between using market orders and limit orders are as follows:

   i. Market orders are executed instantaneously, while it may take some time before a counterparty accepts your limit order or it may be the case that your limit order is never executed.

   ii. Using market orders, you buy at the ask and sell at the bid, so the bid-ask spread is an implied transaction cost. Using limit orders, you can buy closer to the bid and sell closer to the ask, thus avoiding much or all of the bid-ask spread as a transaction cost. Note that, in this example, you lost money with the market orders even though the stock price rose—this is due to the high bid-ask spread. By using the limit orders, you avoid the bid-ask spread and are able to have a gain of $100 due to the stock price rising.

1-21.

a. Best bid = $25.25, Best ask = $25.50

b. Bid-Ask spread = $25.50 – 25.25 = $0.25

c. Buy 100 shares at $25.50 and 100 shares at $26, for an average price of $25.75

d. Best bid = $25.75, Best ask = $26, Bid-Ask spread = $0.25

1-22. The financial industry has very large profits and is very competitive. Adopting the latest technology can lead to a competitive advantage. Given the large profits that a competitive advantage provides, the incentives to use the technology are high.

1-23.

a. Wealthsimple is a multi-national financial planning and robo-advisor that provides services in Canada. It used the advances in artificial intelligence to provide computer based investment advice.

b. Wealthbar is Canada's first full service robo-advisor and can provide portfolio management services in all provinces and territories.

c. Lending Loop is Canada's first peer-to-peer alternative lending platform that links small businesses to individual lenders using their online platform.

d. Metromile is a U.S. based car insurer that allows consumers to pay by the number of miles they drive. The data on how much its customers are driving is collected automatically through a small wireless device located in each insured car.