CHAPTER 1: THE INVESTMENT ENVIRONMENT

PROBLEM SETS

1. Ultimately, it is true that real assets determine the material well being of an economy. Nevertheless, individuals can benefit when financial engineering creates new products that allow them to manage their portfolios of financial assets more efficiently. Because bundling and unbundling creates financial products with new properties and sensitivities to various sources of risk, it allows investors to hedge particular sources of risk more efficiently.

2. Securitization requires access to a large number of potential investors. To attract these investors, the capital market needs:

   (1) a safe system of business laws and low probability of confiscatory taxation/regulation;
   (2) a well-developed investment banking industry;
   (3) a well-developed system of brokerage and financial transactions, and;
   (4) well-developed media, particularly financial reporting.

   These characteristics are found in (indeed make for) a well-developed financial market.

3. Securitization leads to disintermediation; that is, securitization provides a means for market participants to bypass intermediaries. For example, mortgage-backed securities channel funds to the housing market without requiring that banks or thrift institutions make loans from their own portfolios. As securitization progresses, financial intermediaries must increase other activities such as providing short-term liquidity to consumers and small business, and financial services.

4. Financial assets make it easy for large firms to raise the capital needed to finance their investments in real assets. If General Motors, for example, could not issue stocks or bonds to the general public, it would have a far more difficult time raising capital. Contraction of the supply of financial assets would make financing more difficult, thereby increasing the cost of capital. A higher cost of capital results in less investment and lower real growth.

5. Even if the firm does not need to issue stock in any particular year, the stock market is still important to the financial manager. The stock price provides important information about how the market values the firm's investment projects. For example, if the stock price rises considerably, managers might conclude that the market believes the firm's future prospects are bright. This might be a useful signal to the firm to proceed with an investment such as an expansion of the firm's business.

   In addition, the fact that shares can be traded in the secondary market makes the shares more attractive to investors since investors know that, when they wish to, they will be able to sell their shares. This in turn makes investors more willing to buy shares in a primary offering, and thus improves the terms on which firms can raise money in the equity market.

6. a. Cash is a financial asset because it is the liability of the federal government.

   b. No. The cash does not directly add to the productive capacity of the economy.

   c. Yes.

   d. Society as a whole is worse off, since taxpayers, as a group will make up for the liability.

7. a. The bank loan is a financial liability for Lanni. (Lanni's IOU is the bank's financial asset.) The cash Lanni receives is a financial asset. The new financial asset created is Lanni's promissory note (that is, Lanni’s IOU to the bank).

   b. Lanni transfers financial assets (cash) to the software developers. In return, Lanni gets a real asset, the completed software. No financial assets are created or destroyed; cash is simply transferred from one party to another.

   c. Lanni gives the real asset (the software) to Microsoft in exchange for a financial asset, 1,500 shares of Microsoft stock. If Microsoft issues new shares in order to pay Lanni, then this would represent the creation of new financial assets.

   d. Lanni exchanges one financial asset (1,500 shares of stock) for another ($120,000). Lanni gives a financial asset ($50,000 cash) to the bank and gets back another financial asset (its IOU). The loan is "destroyed" in the transaction, since it is retired when paid off and no longer exists.

8. a.

Assets		*Liabilities & Shareholders' equity*	
Cash	$ 70,000	Bank loan	$ 50,000
Computers	30,000	Shareholders' equity	50,000
Total	$100,000	Total	$100,000

Ratio of real assets to total assets = $30,000/$100,000 = 0.30

b.

Assets		*Liabilities & Shareholders' equity*	
Software product*	$ 70,000	Bank loan	$ 50,000
Computers	30,000	Shareholders' equity	50,000
Total	$100,000	Total	$100,000

*Valued at cost

Ratio of real assets to total assets = $100,000/$100,000 = 1.0

c.

Assets		*Liabilities & Shareholders' equity*	
Microsoft shares	$120,000	Bank loan	$ 50,000
Computers	30,000	Shareholders' equity	100,000
Total	$150,000	Total	$150,000

Ratio of real assets to total assets = $30,000/$150,000 = 0.20

Conclusion: when the firm starts up and raises working capital, it is characterized by a low ratio of real assets to total assets. When it is in full production, it has a high ratio of real assets to total assets. When the project "shuts down" and the firm sells it off for cash, financial assets once again replace real assets.

9. For commercial banks, the ratio is: $107.5/$10,410.9 = 0.010

For non-financial firms, the ratio is: $13,295/$25,164 = 0.528

The difference should be expected primarily because the bulk of the business of financial institutions is to make loans; which are financial assets for financial institutions.

10. a. Primary-market transaction

b. Derivative assets

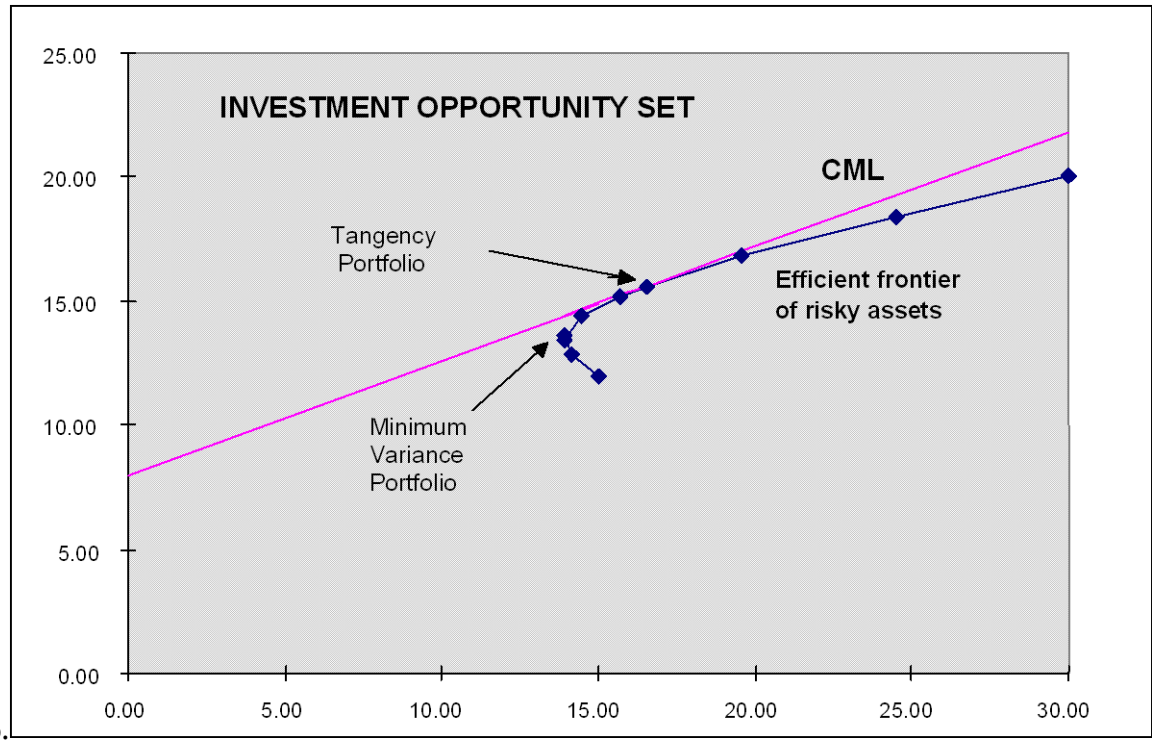
c. Investors who wish to hold gold without the complication and cost of physical storage.

5.

Proportion in stock fund	Proportion in bond fund	Expected return	Standard Deviation	
0.00%	100.00%	12.00%	15.00%	
17.39%	82.61%	13.39%	13.92%	minimum variance
20.00%	80.00%	13.60%	13.94%	
40.00%	60.00%	15.20%	15.70%	
45.16%	54.84%	15.61%	16.54%	tangency portfolio
60.00%	40.00%	16.80%	19.53%	
80.00%	20.00%	18.40%	24.48%	
100.00%	0.00%	20.00%	30.00%	

Graph shown below.

6.



The graph indicates that the optimal portfolio is the tangency portfolio with expected return approximately 15.6% and standard deviation approximately 16.5%.

4. Two reasons why behavioral biases might not affect equilibrium asset prices are discussed in Quiz Problems (1) and (2) above: first, behavioral biases might contribute to the success of technical trading rules as prices gradually adjust towards their intrinsic values, and; second, the actions of arbitrageurs might move security prices towards their intrinsic values. It might be important for investors to be aware of these biases because either of these scenarios might create the potential for excess profits even if behavioral biases do not affect equilibrium prices.

5. Efficient market advocates believe that publicly available information (and, for advocates of strong-form efficiency, even insider information) is, at any point in time, reflected in securities prices, and that price adjustments to new information occur very quickly. Consequently, prices are at fair levels so that active management is very unlikely to improve performance above that of a broadly diversified index portfolio. In contrast, advocates of behavioral finance identify a number of investor errors in information processing and decision making that could result in mispricing of securities. However, the behavioral finance literature generally does not provide guidance as to how these investor errors can be exploited to generate excess profits. Therefore, in the absence of any profitable alternatives, even if securities markets are not efficient, the optimal strategy might still be a passive indexing strategy.

6. $$\text{Trin} = \frac{\text{Volume declining} / \text{Number declining}}{\text{Volume advancing} / \text{Number advancing}} = \frac{766{,}901{,}460 / 2{,}068}{467{,}560{,}150 / 1{,}233} = 0.978$$

   This trin ratio, which is below 1.0, would be taken as a bullish signal.

7. Breadth:

Advances	Declines	Net Advances
1,233	2,068	-835

   Breadth is negative. This is a bearish signal (although no one would actually use a one-day measure as in this example).

8. This exercise is left to the student; answers will vary.

9. The confidence index increases from (7%/8%) = 0.875 to (8%/9%) = 0.889
   This indicates slightly higher confidence. But the real reason for the increase in the index is the expectation of higher inflation, not higher confidence about the economy.

11. a. PV of obligation = \$2 million/0.16 = \$12.5 million

Duration of obligation = 1.16/0.16 = 7.25 years

Call w the weight on the 5-year maturity bond (which has duration of 4 years). Then:

$(w \times 4) + [(1 - w) \times 11] = 7.25 \Rightarrow w = 0.5357$

Therefore: $0.5357 \times \$12.5 = \$6.7$ million in the 5-year bond and

$0.4643 \times \$12.5 = \$5.8$ million in the 20-year bond.

b. The price of the 20-year bond is:

[\$60 × Annuity factor (16%, 20)] + [\$1,000 × PV factor (16%, 20)] = \$407.12

Therefore, the bond sells for 0.4071 times its par value, and:

Market value = Par value × 0.4071

\$5.8 million = Par value × 0.4071 ⇒ Par value = \$14.25 million

Another way to see this is to note that each bond with par value \$1,000 sells for \$407.12. If total market value is \$5.8 million, then you need to buy approximately 14,250 bonds, resulting in total par value of \$14.25 million.

12. a. The duration of the perpetuity is: 1.05/0.05 = 21 years

Call w the weight of the zero-coupon bond. Then:

$(w \times 5) + [(1 - w) \times 21] = 10 \Rightarrow w = 11/16 = 0.6875$

Therefore, the portfolio weights would be as follows: 11/16 invested in the zero and 5/16 in the perpetuity.

b. Next year, the zero-coupon bond will have a duration of 4 years and the perpetuity will still have a 21-year duration. To obtain the target duration of nine years, which is now the duration of the obligation, we again solve for w:

$(w \times 4) + [(1 - w) \times 21] = 9 \Rightarrow w = 12/17 = 0.7059$

So, the proportion of the portfolio invested in the zero increases to 12/17 and the proportion invested in the perpetuity falls to 5/17.

13. a Both current assets and current liabilities will decrease by equal amounts. But this is a larger percentage decrease for current liabilities because the initial current ratio is above 1.0. So the current ratio increases. Total assets are lower, so turnover increases.

14. a Cost of goods sold is understated so income is higher, and assets (inventory) are valued at most recent cost so they are valued higher.

15. a Since goods still in inventory are valued at recent versus historical cost.

16. Considering the components of after-tax ROE, there are several possible explanations for a stable after-tax ROE despite declining operating income:

1. Declining operating income could have been offset by an increase in non-operating income (i.e., from discontinued operations, extraordinary gains, gains from changes in accounting policies) because both are components of profit margin (net income/sales).

2. Another offset to declining operating income could have been declining interest rates on any interest rate obligations, which would have decreased interest expense while allowing pre-tax margins to remain stable.

3. Leverage could have increased as a result of a decline in equity from: (a) writing down an equity investment, (b) stock repurchases, (c) losses; or, (d) selling new debt. The effect of the increased leverage could have offset a decline in operating income.

4. An increase in asset turnover could also offset a decline in operating income. Asset turnover could increase as a result of a sales growth rate that exceeds the asset growth rate, or from the sale or write-off of assets.

5. If the effective tax rate declined, the resulting increase in earnings after tax could offset a decline in operating income. The decline in effective tax rates could result from increased tax credits, the use of tax loss carry-forwards, or a decline in the statutory tax rate.

b. *Critique*. The Coastal proposal produces a real, after-tax expected return of approximately 5.18%, which exceeds the 3% level sought by Fairfax. The expected return for this proposal can be calculated by first subtracting the tax-exempt yield from the total current yield: 4.9% – 0.55% = 4.35%

Next, convert this to an after-tax yield: 4.35% × (1 – 0.35) = 2.83%

The tax exempt income is then added back to the total: 2.83% + 0.55% = 3.38%

The appreciation portion of the return (5.8%) is then added to the after-tax yield to get the nominal portfolio return: 3.38% + 5.80% = 9.18%

Finally, the 4% inflation rate is subtracted to produce the expected real after-tax return: 9.18% – 4.0% = 5.18%

This result can also be obtained by computing these returns for each of the individual holdings, weighting each result by the portfolio percentage and then adding to derive a total portfolio result.

From the data available, it is not possible to determine specifically the inherent degree of portfolio volatility. Despite meeting the return criterion, the allocation is neither realistic nor, in its detail, appropriate to Fairfax's situation in the context of an investment policy usefully applicable to her. The primary weaknesses are the following:

- Allocation of Equity Assets. Exposure to equity assets will be necessary in order to achieve the return requirements specified by Fairfax; however, greater diversification of these assets among other equity classes is needed to produce a more efficient, potentially less volatile portfolio that would meet both her risk tolerance parameters and her return requirements. An allocation that focuses equity investments in U.S. large-cap and/or small-cap holdings and also includes smaller international and Real Estate Investment Trust exposure is more likely to achieve the return and risk tolerance goals. If more information were available concerning the returns and volatility of the Reston stock, an argument could be made that this holding is the U.S. equity component of her portfolio. But the lack of information on this issue precludes taking it into account for the Savings Portfolio allocation and creates the need for broader equity diversification.
- Cash allocation. Within the proposed fixed-income component, the 15% allocation to cash is excessive given the limited liquidity requirement and the low return for this asset class.
- Corporate/Municipal Bond Allocation. The corporate bond allocation (10 percent) is inappropriate given Fairfax's tax situation and the superior after-tax yield on municipal bonds relative to corporate (5.5% vs. 4.9% after-tax return).
- Venture Capital Allocation. The allocation to venture capital is questionable given Fairfax's policy statement indicating that she is quite risk averse. Although venture capital may provide diversification benefits, venture capital returns historically have been more volatile than other risky assets such as U.S. large- and small-cap stocks. Hence, even a small percentage allocation to venture capital may be inappropriate.