Fundamentals of Investing 14th edition Smart Solutions Manual

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Chapter 1 The Investment Environment

■ Outline

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Concepts in Review

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Concepts in Review

Summary

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1.1 Investments or Golf?
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■ Key Concepts

1. The meaning of the term *investment* and the implications it has for individual investors
2. Review the factors used to differentiate between different types of investments

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3. The importance of and basic steps involved in the investment process
4. Popular types of investments including short-term investments, common stock, mutual funds and exchange-traded funds, fixed-income securities such as bonds, preferred stock, and convertibles
5. Derivative securities such as options and futures
6. Other popular investments such as real estate, tangibles, and tax-advantaged investments
7. Writing an investment plan
8. Building a diversified portfolio consistent with investment goals
9. Sources of taxation, types of taxable income, and the effect of taxes on the investor
10. Developing an investment program that considers differing economic environments and the life cycle
11. The use of short-term securities in meeting liquidity needs
12. The merits and suitability of various popular short-term investments, including deposit accounts and money market securities

■ Overview

This chapter provides an overview of the scope and content of the text.

1. The term *investment* is defined, and the various investment opportunities available to investors are classified by types.
2. The structure of the investment process is examined. This section explains how the marketplace brings together suppliers and demanders of investment funds.
3. The key participants in the investment process—government, business, and individuals—are described, as are institutional and individual investors.
4. *Returns* are defined as rewards for investing. Returns to an investor take two forms—current income and increased value of the investment over time. In this section, the instructor need only define return, since there will be another opportunity to develop the concept of return in Chapter 4; also, providing information about recent investment returns always engages students' attention. In classrooms with Internet access, viewing charts of stock returns over the last month, year, 5 years, and recent changes in interest rates will be especially useful.
5. Next, the following investments available to individual investors are discussed: short-term investments common stock, fixed-income securities, mutual funds, exchange-traded funds, hedge funds, real estate, tangibles, tax-advantaged investments, and options and futures. The text describes their risk-return characteristics in a general way. The instructor may want to expand on the advantages and disadvantages of investing in each, although they will be treated in greater detail in subsequent chapters. It is vital for any investor to establish investment goals that are consistent with his or her overall financial objectives.
6. Writing an investment plan involves summarizing one's current situation, specifying investment goals, articulating an investment philosophy, setting investment selection guidelines, and assigning responsibility for selecting and monitoring investments.
7. Personal taxes are discussed in terms of types of income and tax rates. The investment process is affected by current tax laws. Examples of tax shelters, especially tax-advantaged retirement vehicles, and tax planning are provided.
8. Once investment goals are established, it is important to understand how the investment process is affected by different economic environments. The chapter talks about types of investments such as stocks, bonds, and tangibles as they are affected by business cycles, interest rates, and inflation.

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9. Liquidity is defined, and short-term securities that can be used to meet liquidity requirements are described. The discussion includes a look at short-term interest rates and the risk characteristics of various short-term securities.
10. The next section covers the various types of short-term vehicles available to today's investor. The text provides enough detail about everything from passbook accounts to money market funds to commercial paper that students should get a good grasp of the differences between the vehicles. Information on current rates brings realism into the classroom and enhances student perception of the lecturer as a knowledgeable instructor.

■ Failures in Finance: Critical Thinking Question

The ability to borrow short-term funds at low interest rates was critical to Lehman Brothers operations. By disguising these repurchase agreements as sales of assets rather than very short-term loans, Lehman inflated revenues and made their balance sheet look much stronger than it actually was. At this point in its history, Lehman was highly leveraged and facing declining liquidity. The inability to obtain cheap, short-term loans would mean the death of the company which, of course, did ensue. For the individuals involved, large sums in the form of bonuses and investments in the firm were riding on the firm's survival. It might be worth mentioning that the practice was borderline acceptable under British law, but it did not conform to U.S. GAAP.

■ Answers to Concepts in Review

1.1 An *investment* is any asset into which funds can be placed with the expectation of preserving or increasing value and earning a positive rate of return. An investment can be a security or a property. Individuals invest because an investment has the *potential* to preserve or increase value and to earn income. It is important to stress that this does *not* imply that an investment will in fact preserve value or earn income. Investing often involves taking risk, so an investment's actual performance will often differ from its expected performance.

1.2 (a) Securities and property are simply two classes of investments. *Securities* are investments issued by firms, governments, or other organizations that represent a legal claim on the resources of the issuer. For example, a bond represents a loan that the borrower is legally obligated to repay, and a stock represents a proportionate ownership in a firm. An option, on the other hand, represents the legal right to either buy or sell an asset at a predetermined price within a specified time period. *Property* constitutes investments in either real property (land and buildings) or tangible personal property (e.g., Rembrandt paintings, Ming vases, or gold coins). These days, some students are likely to ask about cryptocurrencies, which have characteristics of both transactional currencies and speculative security investments.

(b) With a *direct investment*, an individual acquires a direct claim on a security or property. For example, an investment in one share of IBM stock directly provides the stockholder a proportionate ownership in IBM. An *indirect investment* provides an indirect claim on a security or property. For example, if you buy one share of Fidelity Growth Fund (a mutual fund) or an ETF that tracks the S&P 500 index, you are in effect buying a portion of a portfolio of securities owned by the fund. Thus, you will have a claim on a fraction of an entire portfolio of securities. Many funds also invest in a variety of debt instruments.

(c) An investment in *debt* represents funds loaned in exchange for the receipt of interest income and repayment of the loan at a given future date. The bond, a common debt instrument, pays specified interest over a specified time period, then repays the face value of the loan. (Chapters 10 and 11 cover bonds in detail.) An *equity investment*

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provides an investor an ongoing fractional ownership interest in a firm. The most common example is an investment in a company's common stock. We will study equity instruments in greater detail in Chapters 6 through 8. *Derivative securities* are securities derived from debt or equity securities and structured to exhibit characteristics and value based upon the underlying securities. *Options* are derivative securities that allow an investor to sell or buy another security or asset at a specific price over a given time period. For example, an investor might purchase an option to buy Facebook stock for $50 within nine months.

(d) *Short-term investments* typically mature within one year while *long-term investments* have longer maturities, including common stock, which has no maturity at all. However, long-term investments can be used to satisfy short-term financial goals.

1.3 Investors expect to be paid for accepting risk. Low or no risk investments typically offer low rates of return while riskier investments, meaning that returns are less predictable, tend to offer potentially higher returns.

1.4 In finance, *risk* reflects the uncertainty surrounding the return that an investment will generate. Risk refers to the chance that the return from an investment will differ from its expected value. *Low-risk investments* are those considered safe with respect to the return of funds invested and the receipt of a positive rate of return. *High-risk investments* are those that have more uncertain future values and levels of earnings.

1.5 *Foreign investments* are investments in the debt, equity, derivative securities of foreign-based companies, and property in a foreign country. Both direct and indirect foreign investments sometimes provide investors more attractive returns or lower-risk investments compared to purely domestic investments, but beyond that they are useful instruments to diversify a purely domestic portfolio.

1.6 The *investment process* brings together suppliers and demanders of funds. This may occur directly (as with property investments). More often the investment process is aided by a *financial institution* (such as a bank, savings and loan, savings bank, credit union, insurance company, or pension fund) that channels funds to investments and/or a *financial market* (either the money market or the capital market) where transactions occur between suppliers and demanders of funds.

1.7 (a) The various levels of government (federal, state, and local) generally require more funds for projects and debt repayment than they receive in revenues. Thus, governments are *net demanders* of funds. The term *net* refers to the fact that, while governments both supply and demand funds in the investment process, on balance they demand more than they supply.

(b) Businesses are also *net demanders,* requiring funds to cover short- and long-term operating and investment (growth) needs. While business firms often supply funds, on balance they also demand more than they supply.

(c) Individuals are the *net suppliers* of funds to the investment process. They put more funds into the investment process than they take out. Individuals play an important role in the investment process—supplying the funds needed to finance economic growth and development.

1.8 *Institutional investors* are investment professionals who are paid to manage other people's money. They are employed by financial institutions like banks and insurance companies, by nonfinancial businesses, and by individuals. *Individual investors* manage their own personal funds in order to meet their financial goals. Generally, institutional investors tend to be more sophisticated because they handle much larger amounts of money, and they tend to have a broader knowledge of the investment process and available investment techniques.

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1.9 *Short-term investments* usually have lives of less than one year. These investments may be used to store temporarily idle funds until suitable long-term investments are found. Due to their safety and convenience, they are popular with those who wish to earn a return on temporarily idle funds or with the very conservative investor who may use these short-term investments as a primary investment outlet. In addition to their storage function, short-term investments provide liquidity—they can be converted into cash quickly and with little or no loss in value. This characteristic is very useful when investors need to meet unexpected expenses or take advantage of attractive opportunities.

1.10 *Common stock* is an equity investment that represents a fractional ownership interest in a corporation. The return on a common stock investment derives from two sources: *dividends,* which are periodic payments made by the firm to its shareholders from current and past earnings, and *capital gains,* which result from selling the stock at a price above the original purchase price. Because common stock offers a broad range of return-risk combinations, it is one of the most popular investments s.

1.11 a. *Bonds* are debt obligations of corporations or governments. A bondholder receives a stated interest return, typically semi-annually, plus the face value at maturity. Bonds are usually issued in $1,000 denominations, pay semi-annual interest, and have 10 - to 30-year maturities. Bonds offer fixed/certain returns, if held until maturity.

b. A *convertible security* is a fixed-income security, either a bond or preferred stock, which has a conversion feature. Typically, it can be converted into a specified number of shares of common stock. Convertible securities are quasi-derivative securities, as their market value would depend on the price of the common stock and the conversion ratio.

c. *Preferred stock* is very much like common stock in that it represents an ownership interest in a corporation. But preferred stock pays only a fixed stated dividend, which has precedence over common stock dividends, and does not share in other earnings of the firm.

d. A *mutual fund* is a company that invests in a large portfolio of securities, whereas a *money market mutual fund* is a mutual fund that solely invests in short term "money market" securities. Investors might find mutual funds appealing because a large, well-diversified portfolio may be more consistent with their investment goals in terms of risk and return. As we will see later, a mutual fund offers the investor the benefits of diversification and professional management. Mutual funds do not offer fixed/certain returns. Exchange-traded funds are similar to mutual funds but are traded throughout the day on exchanges and priced continuously.

e. Similar to mutual funds, *hedge funds* pool investors' funds to invest in securities, but hedge funds are open to a narrower group of investors than mutual funds. Hedge funds may employ high-risk strategies. They do not offer a fixed return and the management fees are much higher than for typical mutual funds. Although the term hedge implies limiting risks with derivatives, many hedge funds use derivatives to increase leverage rather than for managing risk.

f. *Options* are derivative securities that provide holders the right to buy or sell another security (typically stock) or property at a specified price over a given time period. Factors like the time until expiration, the underlying stock price behavior, and supply and demand conditions affect the returns.

g. *Futures* represent contractual arrangements in which a seller will deliver or a buyer will take delivery of a specified quantity of an asset at a given price by a certain date. Unlike an option, which gives the investor the *right* to purchase or sell another security, futures

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contracts *obligate* the investor to deliver or take delivery of the asset. The primary factor affecting returns on commodity contracts is the price of the underlying asset.

1.12 Before establishing an investment program, an investor should write down an Investment Policy Statement. The elements of this statement include an overview of the investor's current situation, a description of the investor's goals and investment philosophy, a list of investment selection guidelines, and a statement explaining how, when, and by whom the investment portfolio will be monitored.

1.13 Federal income taxes are charged against all income individuals receive from all sources (with the exception of interest received on some bonds issued by state and local governments).

a. *Active (ordinary "earned") income* is the broadest category and includes income from wages, salaries, bonuses, tips, pension income, and alimony. It is made up of income earned on the job as well as most other forms of noninvestment income.

b. *Portfolio (investment) income* is earnings generated from various types of investment holdings. For the most part, it consists of interest, dividends, and capital gains earned on most types of investments. *Passive income* is a special category that consists of income derived chiefly from real estate, limited partnerships, and other forms of tax shelters.

c. *Capital gains* are the profits earned on the sale of capital assets—pleasure or investment. They are measured by the amount by which the proceeds from the sale of the capital asset exceed its original purchase price. Currently, long-term capital gains are taxed at preferential rates to ordinary income. Capital gains are appealing to investors because they are not taxed until they are actually realized.

d. A *capital loss* is the amount by which the proceeds from the sale of a capital asset are less than its original purchase price. Up to $3,000 of net losses can be applied against ordinary income in any one year, with the unused portion carried forward to offset future income.

e. Due to the opportunities and challenges created by the tax laws, *tax planning* is an important part of the investment process. Tax planning involves looking at an individual's current and projected earnings and developing strategies that will defer or minimize the level of his or her taxes. Tax plans involve current income, capital gains, or tax-sheltered investments. For example, one strategy is to take losses as they occur and to delay realizing profits in order to minimize current taxable income.

f. In general, tax-advantaged retirement plans allow individuals to defer taxes on the contribution and/or portfolio earnings until some future date when retirement withdrawals take place. There are employer-sponsored plans (such as 401(k) accounts), individual-created plans (such as Keogh plans), and individual retirement accounts (IRAs).

1.14 Investors tend to follow different investment strategies as they move through different stages of their life cycle.

a. Investors who are in their twenties and thirties tend to prefer growth-oriented investments that stress *capital gains* rather than income. These investors have little investable funds, and capital gains are seen as the quickest way to build up investment capital.

b. By middle age, investing becomes less speculative or aggressive. *Quality-growth* investments, such as conservative stocks and mutual funds, are employed, and more attention is given to income-producing securities, such as high-quality bonds. The foundation is being set for retirement.

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c. As the investor moves into the retirement years, preservation of capital and current income become the principal concerns. High-quality stocks and bonds and money market instruments are used as the investor's objective is to live as comfortably as possible from the investment income.

1.15 Stocks and equity-related securities (such as mutual funds and convertibles) are highly responsive to the economic cycle. During recovery and expansion, stock prices are up. As the decline approaches, stock prices begin to decline as well. The months just prior to a recession tend to show the lowest returns on stocks while the months immediately following the end of a recession have the highest returns. Unfortunately, turning points in the business cycle are notoriously hard to predict and can only be pinpointed with certainty well after they have happened.

1.16 An asset is *liquid* if it can be converted to cash (sold) easily and quickly, with little or no loss in value. You would want to hold liquid assets as emergency funds or to accumulate funds for some specific purpose. IBM stock is a liquid investment. IBM common shares are heavily traded, and investor can sell IBM shares quickly without incurring high transactions costs or triggering a decline in the value of the shares. Keep in mind, however, that the value of IBM shares fluctuate, so it is not necessarily a safe investment even though it is a liquid investment. While the common stock of large, widely traded companies is a liquid investment, some stocks are not heavily traded, so selling shares in some companies would trigger significant transactions costs and perhaps even a decline in the value of the shares.

1.17 *Purchasing power risk* for short-term investments occurs when the rate of return on these investments falls short of the inflation rate. This generally happens to fixed-rate investments such as passbook savings accounts. Most other short-term investments have managed to provide rates of return about equal to the inflation rate when one looks at these short-term rates over long periods of time. *Default (nonpayment) risk* is very small with most high quality or money market short-term investments. The deposits in banks and other federally insured savings institutions are protected up to $250,000 per account by the Federal Deposit Insurance Corporation, an agency of the federal government. U.S. Treasury bills are perfectly safe and sometimes called a risk-free investment. Commercial paper and repurchase agreements are extremely safe, based upon past experience, even though there have been rare instances of problems. These latter two instruments are also not insured. Money market mutual funds have also had an exceptionally safe history. Of course, the safest money market funds are those that invest solely in government securities and are virtually default-risk-free.

1.18 *Passbook savings accounts* and *NOW accounts* (a checking account), offered by banks, generally pay a low rate of interest and have no minimum balance. Passbook savings and NOW accounts are primarily used by investors as savings accounts, providing the investor with a highly liquid pool of funds. MMDAs are bank deposit accounts with limited check-writing privileges. Asset management accounts are comprehensive deposit accounts and combine checking, investing, and borrowing activities. MMDAs and asset management accounts are more likely used by investors to earn a competitive short-term return while maintaining liquidity. Each type of account, except for asset management accounts, is insured. All but the passbook account typically require a minimum balance, which varies.

1.19 a. *I bonds* are savings bonds issued by the U.S. Treasury. They earn interest at a rate that varies with inflation. Interest is exempt from state and local taxes. They are issued in denominations that make them affordable to everyone and mature in 30 years but can be redeemed after one year.

b. *U.S. Treasury bills* are short-term (less than one year) debt obligations of the federal government. T-bills are exempt from state and local income taxes. They are regarded as

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the safest but generally lowest yielding of all investments, and the secondary market for T-bills is highly liquid.

c. *Certificates of deposits (CDs)* are savings instruments that must remain on deposit for a specified period. Premature withdrawals incur interest penalties. Because of the requirement that they remain on deposit, CDs are less liquid than T-bills, but they are convenient to buy and hold, offer competitive returns, and have federal insurance protection.

d. *Commercial paper* is unsecured short-term debt issued by corporations with very high credit standings. The secondary market for commercial paper is very limited and yields are comparable to yields on large-denomination CDs. Typically, only larger institutions deal directly in this market because the denominations range from $25,000 to the more commonly issued $100,000. Commercial paper is not federally insured.

e. *Bankers' acceptances* are short-term credit arrangements between business firms and banks. Firms use banker's acceptances to finance transactions, most often involving firms in foreign countries or firms with unknown credit capacities. Banker's acceptances typically are denominated in $100,000 units, are low-risk securities, and have active secondary markets. Yields are slightly below CD yields and commercial paper and above T-bills.

f. *Money market mutual funds (MMMFs)* pool capital of many investors and invest it exclusively in high-yielding, short-term securities, such as T-bills, large CDs, commercial paper, and other similar "money market" securities. Because these high-yielding securities are in denominations of $10,000 to $1 million, the MMMF makes them available in a format that is affordable to individual investors. MMMFs are convenient, offer check writing privileges, and yields are based on the ability of the fund manager to invest in various short-term securities. Although they are not federally insured funds, their default risk is nearly zero because the securities they invest in are very low risk and the fund is relatively diversified.

1.20 The senior managers in a corporation, such as the chief financial officer (CFO), have the primary responsibility of managing the firm's capital resources and investments. Because so much of the CFO's primary responsibilities require an understanding of investment principles, a CFO must understand market forces but more importantly communicate in such a way that investors understand the value of the firm and the securities the firm has issued.

1.21 Because insurance companies have large sums of investment capital under management, they require the skills of a person highly trained in investment principles. Since this person is asked to manage risk for individuals as well as businesses, the decisions they make and the strategies they devise will assist the insurance companies' customers in the creation of their individual successful asset and risk management strategies.

■ Suggested Answers to Discussion Questions

1.1 a. Because you fall into the category of a young investor, after meeting basic liquidity needs your key investment goals should be to save for the education of your children and quite possibly to purchase a house. Appropriate investments should focus on longer term goals, such as the education of your children and, though it may seem remote, retirement.

b. You should consider the effects of taxes when investing, maximizing your use of tax sheltered investments such as 401(k) plans and taking advantage of the preferential tax treatment of capital gains and dividends. Your focus should be on maximizing the *after-tax return* on your investments. Finally, it is important to know that the tax treatment of

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various investments and forms of income can and does change. For example, in 2018 the treatment of state and local taxes and mortgage interest on federal income tax returns radically affected the value of home ownership, especially in states with high taxes, incomes, and property values.

c. Because you have a relatively long investment horizon, it is appropriate to focus your portfolio on higher-risk investments such as common stocks.

1.2 Short-term investments play an important part in your investment program. Most importantly, they will provide a pool of reserves that can be used for emergencies such as replacing cars, appliances, and clothing that wear out over time. Returns on safe, short-term investments were well below the inflation rate during the period 2009–17. In 2018, the Federal Reserve began a program to "normalize" interest rates so that they might more closely keep pace with inflation and provide some cushion for stimulus in a future recession.

Type of Investment	Minimum Balance	Interest Rate	Federal Insurance	Method and Ease of Withdrawing Funds
a. Passbook savings account	None	Close to 0.00% in recent years.	Yes, up to $250,000 per account	In person or through teller machines; very easy
b. NOW account	No legal minimum, but often set at $500 or $1,000	At or near passbook rates	Yes, up to $250,000 per account	Unlimited check-writing privileges
c. Money market deposit account (MMDA)	No legal minimum, but often set at $2,500	Slightly above passbook rates	Yes, up to $250,000 per account	Limited check-writing privileges
d. Asset management account	Typically $5,000 to $20,000	Similar to MMDAs	Yes, up to $250,000 in banks, varies elsewhere	Limited check-writing privileges
e. Series I savings bond	Initial deposit is 50% of face value	At or near 0.00% in recent years.	No, but federal government issue	Penalty of three months interest for early withdrawal
f. U.S. Treasury bill	$100	Slightly above passbook and NOW accounts	No, but federal government issue	Secondary market exists
g. Certificate of deposit	Tailored to investor needs	Slightly above asset management account	No, but as secure as most bank savings and checking accounts	Penalty for early withdrawal
h. Commercial paper	$100,000 plus. Often included in MMMF portfolios	Comparable to certificates of deposit	No	Very liquid

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i.	Banker's acceptance	Large denominations; not a typical retail investment	Comparable to certificates of deposit	No	Active secondary market, but not open to individual investors except through funds
j.	Money market mutual fund (money fund)	No legal minimum	Slightly below passbook savings account	No, but invests in government and bank issues	May take a few days to receive check from fund

■ Solutions to Problems

1.1 a. Goal $500,000
$44,300 at 8% for 25 yrs. 150,000
Additional requirement $350,000

b. Saving $104.75 each year produces $5,000 in savings at retirement, but Stefani needs to accumulate 70 times that much ($350,000 is 70 times greater than $5,000). Stefani needs to save 70 times $104.74, or $7,332.50 each year. If she does, then the combined value at age 65 of all of her assets will be very close to $500,000. (Note: The problems assumes that Stefani's average rate of return will be about 8.4%.)

1.2 a. Tax on the Smith's income of $130,000. Looking at the joint tax return rates, we find:
(10% × $19,050) + [12% × ($77,400 – $19,050 + [22% × ($130,000 – 77,400]
= $20,479 (rounded to nearest whole dollar)
Tax on the Jones's income of $65,000. Looking at the joint tax return rates, we find:
(10% × $19,050) + [12% × ($65,000 – $19,050)]
= $7,419

b. The Smiths make twice as much as the Joneses.
The ratio of the Smith's to the Jones's taxable income is ($130,000/$65,000) = 2
The ratio of the Smith's to the Jones's taxes is ($20,479/$7,419) = 2.76.
Hence higher income earners pay a higher proportion of their income as tax.

1.3 The solution uses the current tax rate on dividends, which is 15%. In addition, this solution ignores the 3.8% tax on net investment income imposed by the Affordable Care Act on high income families or individuals even though the Consalvo family's annual income likely meets the income thresholds.

a. $50,000/$50 = 1,000 shares of stock.

b. 1,000 shares × $2 = $2,000 per year before tax. $2,000 × 0.85 = $1,700 after tax.

c. ($1,700 × 10) + $50,000 = $67,000.

d. $50,000 × 0.05 = $2,500 per year before tax. $2,500 × 0.68 = $1,700 after tax.

e. ($1,700 × 10) + $50,000 = $67,000.

f. Both investment options generate the same expected after-tax income. Therefore, ignoring risk, the Consalvos would be indifferent to either investment.

1.4 a. Their ordinary income is $128,000, consisting of $125,000 of salary and wages, $1,000 in interest income, and $2,000 of short-term capital gains.

Mike and Julie will be in the 22% marginal tax bracket based on their taxable income, which includes the ordinary income and the other investment income ($3,000 in dividends and $2,000 in long-term capital gains). Therefore, on the $1,000 of interest income they will pay $220 in tax.

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b. The $3,000 in dividends is subject to the lower 15% tax rate, so they will pay $450 in taxes on their dividend income.

c. This is a long-term capital gain and is therefore subject to tax at 15% given the Bedard's tax bracket. They will pay $300 in taxes on this gain.

d. This gain is a short-term capital gain and is taxed like ordinary income. Because the Bedard's are in the 22% tax bracket, they will pay $440 in taxes on this $2,000 gain.

1.5 a. If they remain single, their tax bills will be the same because they make the same income. So each will pay:

0.10($9,525) + 0.12($38,700 – $9,525) + 0.22($70,000 – $38,700) = $11,339.50 each.

Their total tax bill will be double this amount, or $22,679.

If they are married, their combined income will be $140,000. Using the tax brackets for married taxpayers filing joint returns, their taxes will be:

0.10($19,050) + 0.12($77,400 – $19,050 + 0.22($140,000 – $77,400) = $22,679.

In this case, Kim and Kanye pay the same total taxes whether they are married or single.

b. If they remain single, they will each pay the following in taxes:

0.10($9,525) + 0.12($38,700 – $9,525) + 0.22($82,500 – $38,700) + 0.24($157,500 – $82,500) + 0.32($200,000 – $157,500) + 0.35($400,000 – $200,000) = $115,689.50

So their combined tax bill is double that amount or $$231,379.

As a married couple, here is their tax bill:

0.10($19,050) + 0.12($77,400 – $19,050) + 0.22($165,000 – $77,400) + 0.24(315,000 – $165,000) + 0.32($400,000 – 315,000) + 0.35($600,000 – $400,000) + 0.37($800,000 – $600,000) = $235,379

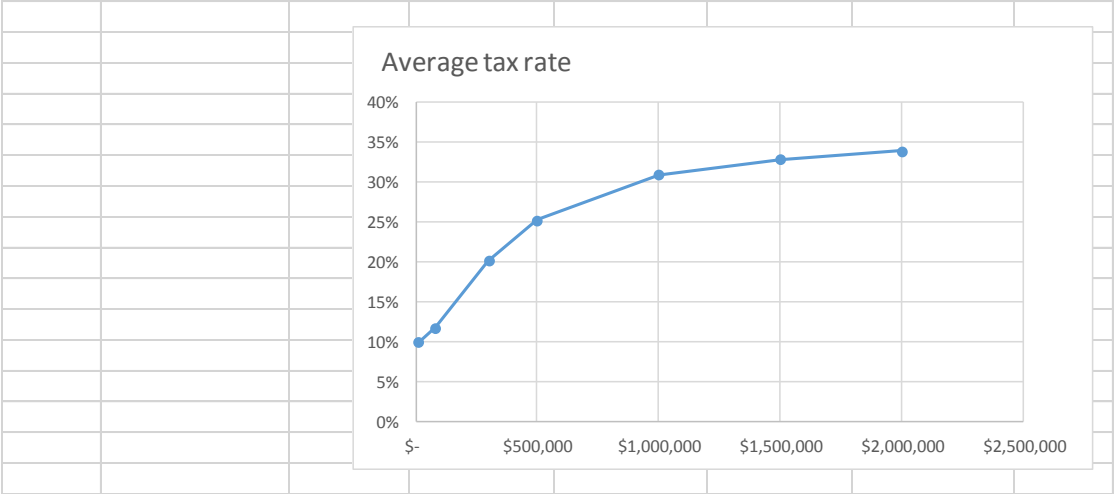
Notice that in this scenario, Kim and Kanye pay a "marriage penalty" because their combined taxes are higher when they are married than when they are single. This happens because income above $400,000 is taxed at higher rates, 35% and 37%, that would not be reached if they filed as individuals.

1.6

Rate	Joint	Amt. taxed at rate	Tax at top of bracket	Income	Tax	After-tax earning	Average tax rate
10%	0-19,050	$ 19,050	1,905.00	$ 10,000	$ 1,000	$ 9,000	10%
12%	19,051–77,400	$ 58,350	8,907.00	$ 80,000	$ 9,479	$ 70,521	12%
22%	77,401–165,000	$ 87,600	28,179.00	$ 300,000	$ 60,579	$ 239,421	20%
24%	165,001–315,000	$ 150,000	64,179.00	$ 500,000	$ 126,379	$ 373,621	25%
32%	315,001–400,000	$ 85,000	91,379.00	$1,000,000	$ 309,379	$ 690,621	31%
35%	400,001–600,000	$ 200,000	161,379.00	$1,500,000	$ 494,379	$1,005,621	33%
37%	600,000+			$2,000,000	$ 679,379	$1,320,621	34%

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b. The table and the chart clearly illustrate that average tax rates are progressive, that is, they are higher on higher levels of income. Note: These calculations assume joint filing rates, but the conclusions

■ Solutions to Case Problems

Case 1.1 Investments or Golf?

This case illustrates the many facets of the investment process; it involves much more than common stock. The authors recognize the value of physical education and emphasize the importance of sports, but a course in investments offers the student a lifetime of financial benefits. Thus, our arguments for selecting the investments course should not be interpreted as a negative statement on physical education but rather as a positive discussion of the merits of investments.

a. The term *investments* refers to the process of identifying, evaluating, selecting, and monitoring the placement of funds with a view toward preserving or increasing value and/or earning a positive return. Joshua has simply identified one investment (stock). He will not know how to evaluate, select, or monitor other investments nor will he know how to adjust his investments in appropriate ways at various stages in the life cycle without a course in investing. In addition to looking at his own investments, a course in investing will give Joshua a new perspective on the role of investments in the economy. He will learn that as an investor, he is actually supplying funds to government and business, which will enable the continued strength and growth of the general economy.

b. Clearly, Joshua has ignored short-term securities, bonds, options, commodities and financial futures, mutual funds, real estate, tangibles, tax shelters, and limited partnerships. Each one of these choices offers another risk-reward relationship that may meet certain unique investment requirements that cannot be met by common stock alone.

c. Joshua does not have the knowledge needed to carry out the investment process described in question a. Knowing about common stocks is not the same as understanding investments, and it is not necessarily true that common stock is the best investment available to Joshua. Besides, the investment decision has to be compatible with his goals and risk preferences. Individual stocks are far riskier than, say an investment in CDs or even mutual funds that invest in a well-diversified portfolio of stocks.

There are other considerations, too. Does Joshua have plans for the future when he will need the money? If so, is it a short-term or a long-term need? Answers to these questions will

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help determine whether he should make short-term or long-term investments. In summary, to gain an understanding of the investment decision and management process, Joshua should pass up the golf course in favor of the investments course.

Case 1.2 Preparing Susan Bowen's Investment Plan

This case allows students to evaluate a proposed investment plan aimed at achieving certain retirement goals.

a. The amount currently available to Susan includes $120,000 from the proceeds of the life insurance and $75,000 from her savings account, or a total of $195,000. At 6% compounded annually, her money will be worth:

If she retires at age 62 (seven-year investment):

$$\$195{,}000 \times (1.03)^7 = \$239{,}825$$

(You can find this in Excel by typing the formula = fv(0.03,7,0,– 195,000.)

Add $112,500 from the sale of her home, and Susan will have $425,000.

If she retires at age 65 (10-year investment):

$$\$195{,}000 \times (1.03)^{10} = \$262{,}064$$

(You can find this in Excel by typing the formula = fv(0.03,10,0, –195,000).)

Add $225,000 from the sale of her home, and Susan will have $302,108.

b. Value of Susan's assets at 62 = Value of savings account + Value of house:

$$\$239{,}825 + \$225{,}000 = \$464{,}825$$

Similarly, value of assets at 65 = $262,064 + $255,000 = $517,064.

Because Susan receives $79 for each $1,000 that she invests in the annuity, we can calculate her annual income starting at age 62 as follows:

$$(\$464{,}825/\$1{,}000) \times \$79 = \$36{,}721 \text{ per year}$$

Similarly, if Susan's assets at age 65 are $517,064 and if for each $1,000 that she invests in the annuity she will receive $89.94 in income, her income starting at age 65 would be:

$$(\$517{,}064/\$1{,}000) \times \$89.94 = \$46{,}505$$

c.

	Annual Retirement Income	
	Age 62 Retirement	**Age 65 Retirement**
Annual Social Security & Pension Fund Benefits	$31,200	$38,400
+Annuity Income	36,721	46,505
Total Annual Retirement Income	$67,921	$84,905

d. Susan believes she needs $85,000 per year (before taxes) of retirement income. Without considering the change in her tax status upon retirement, she will not satisfy this goal if she retires at age 62. At age 65, she very nearly meets her requirement. The nature of tax legislation and the reduction in Susan's tax liability upon retirement may make retirement at age 65 viable.

e. Susan's plan is extremely conservative and low risk. The returns from the plan are very secure and probably assured. Susan can be confident that the accumulated worth of her investments will be available to her at retirement. Her plan to retire at age 65 meets her retirement-income goal. Susan's plan offers low risk and low return. Through only a slight

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increase in risk, she might improve her return on investment and have more "cushion" to allow for inflation and unexpected expenditures. Susan could purchase highly rated bonds, CDs, and other blue chip security investments. In this manner, her risk aversion would be satisfied, and she would earn a higher return on her investments. This should permit more likely achievement of her retirement-income objectives. Therefore, with very little increase in risk, Susan could invest her funds so as to increase the probability that she will meet or surpass her requirement of an annual retirement income of $85,000. As much as she values the opinions of her psychic consultants, she should periodically get a second opinion from her health care provider and update her financial plan accordingly.

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