CHAPTER 2

ASSET ALLOCAITON AND SECURITY SELECTION

Answers to Questions

1. In answering this question, one assumes that the young person has a steady job, adequate insurance coverage, and sufficient cash reserves. The young individual is in the accumulation phase of the investment life cycle. During this phase, an individual should consider moderately high-risk investments, such as common stocks, because he/she has a long investment horizon and much earnings ability over time.

2. In answering this question, one assumes that the 63-year-old individual has adequate insurance coverage and a cash reserve. Depending on her income from social security, she may need some current income from her retirement portfolio to meet living expenses. At the same time, she will need to protect herself against inflation. Removing money from her company's retirement plan and investing it in money market funds and bond funds would satisfy the investor's short-term and income needs. But some long-term investments, such as common stock mutual funds, are needed to provide the investor with needed inflation protection.

3. Typically investment strategies change during an individual's lifetime. In the accumulating phase, the individual is accumulating net worth to satisfy short-term needs (e.g., house and car purchases) and long-term goals (e.g., retirement and children's college needs). In this phase, the individual is willing to invest in moderately high-risk investments in order to achieve above-average rates of return.

    In the consolidating phase, an investor has paid off many outstanding debts and typically has earnings that exceed expenses. In this phase, the investor is becoming more concerned with long-term needs of retirement or estate planning. Although the investor is willing to accept moderate portfolio risk, he/she is not willing to jeopardize the "nest egg."

    In the spending phase, the typical investor is retired or semi-retired. This investor wishes to protect the nominal value of his/her savings, but at the same time must make some investments for inflation protection.

    The gifting phase is often concurrent with the spending phase. The individual believes that the portfolio will provide sufficient income to meet expenses, plus a reserve for uncertainties. If an investor believes there are excess amounts available in the portfolio, he/she may decide to make "gifts" to family or friends, institute charitable trusts, or establish trusts to minimize estate taxes.

4. A policy statement is important for both the investor and the investment advisor. A policy

statement assists the investor in establishing realistic investment goals, as well as providing a benchmark by which a portfolio manager's performance may be measured.

5. The 45-year old uncle and 35-year old sister differ in terms of time horizon. However, each has some time before retirement (20 versus 30 years). Each should have a substantial proportion of his/her portfolio invested in equities, with the 35-year old sister possibly having more equity investments in small firms or international firms (i.e., can tolerate greater portfolio risk). These investors could also differ in current liquidity needs (such as children, education expenses, etc.), tax concerns, and/or other unique needs or preferences.

6. Before constructing an investment policy statement, the financial planner needs to clarify the client's investment objectives (e.g., capital preservation, capital appreciation, current income, or total return) and constraints (e.g., liquidity needs, time horizon, tax factors, legal and regulatory constraints, and unique needs and preferences). Data on current investments, portfolio returns, and savings plans (future additions to the portfolio) are helpful as well.

7. Student Exercise

8. CFA Examination III (1993)

8(a). At this point we know (or can reasonably infer) that Mr. Franklin is:
- unmarried (a recent widower)
- childless
- 70 years of age
- in good health
- possessed of a large amount of (relatively) liquid wealth intending to leave his estate to a tax-exempt medical research foundation, to whom he is also giving a large current cash gift
- free of debt (not explicitly stated, but neither is the opposite)
- in the highest tax brackets (not explicitly stated, but apparent)
- not skilled in the management of a large investment portfolio, but also not a complete novice because he owned significant assets of his own prior to his wife's death
- not burdened by large or specific needs for current income
- not in need of large or specific amounts of current liquidity

Taking this knowledge into account, his Investment Policy Statement will reflect these specifics:

Objectives:

Return Requirements: The incidental throw-off of income from Mr. Franklin's large asset pool should provide a more than sufficient flow of net spendable income. If not, such a

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need can easily be met by minor portfolio adjustments. Thus, an inflation-adjusted enhancement of the capital base for the benefit of the foundation will be the primary return goal (i.e., real growth of capital). Tax minimization will be a continuing collateral goal.

Risk Tolerance: Account circumstances and the long-term return goal suggest that the portfolio can take somewhat above-average risk. Mr. Franklin is acquainted with the nature of investment risk from his prior ownership of stocks and bonds, he has a still long actuarial life expectancy and is in good current health, and his heir—the foundation, thanks to his generosity—is already possessed of a large asset base.

Constraints:

Time Horizon: Even disregarding Mr. Franklin's still-long actuarial life expectancy, the horizon is long-term because the remainder of his estate, the foundation, has a virtually perpetual life span.

Liquidity Requirement: Given what we know and the expectation of an ongoing income stream of considerable size, no liquidity needs that would require specific funding appear to exist.

Taxes: Mr. Franklin is no doubt in the highest tax brackets, and investment actions should take that fact into account on a continuing basis. Appropriate tax-sheltered investment (standing on their own merits as investments) should be considered. Tax minimization will be a specific investment goal.

Legal and Regulatory: Investments, if under the supervision of an investment management firm (i.e., not managed by Mr. Franklin himself) will be governed by state law and the Prudent Person rule.

Unique Circumstances: The large asset total, the foundation as their ultimate recipient, and the great freedom of action enjoyed in this situation (i.e., freedom from confining considerations) are important in this situation, if not necessarily unique.

8(b). Given that stocks have provided (and are expected to continue to provide) higher risk-adjusted returns than either bonds or cash, and considering that the return goal is for long-term, inflation-protected growth of the capital base, stocks will be allotted the majority position in the portfolio. This is also consistent with Mr. Franklin's absence of either specific current income needs (the ongoing cash flow should provide an adequate level for current spending) or specific liquidity needs. It is likely that income will accumulate to some extent and, if so, will automatically build a liquid emergency fund for Mr. Franklin as time passes.

Because the inherited warehouse and the personal residence are significant (15 percent)

real estate assets already owned by Mr. Franklin, no further allocation to this asset class is made. It should be noted that the warehouse is a source of cash flow, a diversifying asset and, probably, a modest inflation hedge. For tax reasons, Mr. Franklin may wish to consider putting some debt on this asset, freeing additional cash for alternative investment use.

Given the long-term orientation and the above-average risk tolerance in this situation, about 70 percent of total assets can be allocated to equities (including real estate) and about 30 percent to fixed income assets. International securities will be included in both areas, primarily for their diversification benefits. Municipal bonds will be included in the fixed income area to minimize income taxes. There is no need to press for yield in this situation, nor any need to deliberately downgrade the quality of the issues utilized. Venture capital investment can be considered, but any commitment to this (or other "alternative" assets) should be kept small.

The following is one example of an appropriate allocation that is consistent with the Investment Policy Statement and consistent with the historical and expected return and other characteristics of the various available asset classes:

	Range (%)	Current Target (%)
Cash/Money Market	0 – 5	0
U.S. Fixed Income	10 – 20	15
Non-U.S. Fixed Income	5 – 15	10
U.S. Stocks (Large Cap)	30 – 45	30
(Small Cap)	15 – 25	15
Non-U.S. Stocks	15 – 25	15
Real Estate	10 – 15	15*
Other	0 – 5	0
		100

*Includes the Franklin residence and warehouse, which together comprise the proportion of total assets shown.

9. The major advantage of investing in common stocks is that generally an investor would earn a higher rate of return than on corporate bonds. Also, while the return on bonds is pre-specified and fixed, the return on common stocks can be substantially higher if the investor can pick a "winner" – i.e., if the company's performance turns out to be better than current market expectations. The main disadvantage of common stock ownership is the higher risk. While the income on bonds is certain (except in the extreme case of bankruptcy), the return on stocks will vary depending upon the future performance of the

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company and could well be negative. A line graph of returns over time should indicate a lower average level of return and lower variability of returns over time for bonds than for common stock.

10.   The three factors are:
       (1) Limiting oneself to the U.S. securities market would imply effectively ignoring more than 50 percent of the world securities market. While U.S. markets are still the largest single sector, foreign markets have been growing in absolute and relative size since 1969.
       (2) The rates of return available on non-U.S. securities often have substantially exceeded those of U.S. securities.
       (3) Diversification with foreign securities reduces portfolio risk.

11.   International diversification reduces portfolio risk because of the low correlation of returns among the securities from different countries. This is due to differing international trade patterns, economic growth, fiscal policies, and monetary policies among countries.

12.   There are different correlations of returns between securities from the U.S. and alternate countries because there are substantial differences in the economies of the various countries (at a given time) in terms of inflation, international trade, monetary and fiscal policies, and economic growth.

13.   The correlations between U.S. stocks and stocks for different countries should change over time because each country has a fairly independent set of economic policies. Factors influencing the correlations include international trade, economic growth, fiscal policy, and monetary policy. A change in any of these variables will cause a change in how the economies are related. For example, the correlation between U.S. and Japanese stock will change as the balance of trade shifts between the two countries. Closer economic ties and increased trade will likely result in higher correlations between financial markets. For example we expect larger correlations between the U.S. and Canada; Canada is the largest trading partner of the U.S. Looking at regions with lower trade flows with the U.S., Exhibit 2.16 shows a correlation (using the Wilshire 5000 cap-weighted index) of 0.726 with the MSCI Europe index and a correlation of 0.542 with IFC Emerging Market index.

14.   The major risks that an investor must consider when investing in any bond issue are business risk, financial risk, and liquidity risk. Additional risk associated with foreign bonds, such as Japanese or German bonds, are exchange rate risk and country risk. Country risk is not a major concern for Japanese or German securities. Exchange rate risk is the uncertainty that arises from floating exchange rates between the U.S. dollar and the Japanese yen or Euro.

15.   The additional risks that some investors believe international investing introduces include foreign exchange risk and country risk. For example, according to Exhibit 2.9, in 2010

the U.S. return of 15.30 was higher than that of Germany (7.10 percent) and Japan (13.80 percent), while in 2007 the U.S. return was only 3.80 percent, while the German market rose to 30.50 percent and the Japanese market fell to 6 percent. The returns for these two countries include the domestic return in the issuing country and an adjustment for any exchange rate movement between their currencies and the dollar.

16.   There are four alternatives to direct investment in foreign stocks available to   investors:
(1) purchase American Depository Receipts (ADRs)
(2) purchase of American shares (issued by a transfer agent)
(3) direct purchase of foreign shares listed on a foreign or U.S. exchange
(4) purchase of international mutual funds.

17.   Unlike corporate bonds, interest on municipal bonds is exempt from taxation by the federal government and by the state that issued the bond, provided the investor is a resident of that state. For instance, a marginal tax rate of 35 percent means that a regular bond with an interest rate of 8 percent yields a net return after taxes of only 5.20 percent [.08 x (1 -.35)]. A tax-free bond with a 6 percent yield would be preferable.

18.   The convertible bond of the growth company would have the lower yield. This is intuitive because there is a greater potential for the price of the growth company stock to increase, which would make the conversion feature of the bond extremely attractive. Thus, the investor would be willing to trade off the higher upside potential resulting from conversion for the lower yield.

19.   Liquidity is the ability to buy or sell an asset quicklyat a price similar to the prior price assuming no new information has entered the market. Common stocks have the advantage of liquidity because it is very easy to buy or sell a small position (there being a large number of potential buyers) at a price not substantially different from the current market price. Raw land is relatively illiquid because it is often difficult to find a buyer immediately and often the prospective buyer will offer a price that is substantially different from what the owner considers to be the true market value. A reason for this difference is that while common stock data are regularly reported in a large number of daily newspapers and several magazines and closely watched by a large number of individuals, raw land simply lacks this kind of interest. Further, the speculative nature of raw land investment calls for high risk and longer maturity before profits can be realized. Finally, the initial investment on a plot of raw land would be substantially greater than a round lot in most securities. As a result, the small investor is generally precluded from this kind of investment.

20.   Art and antiques are considered illiquid investments because in most cases they are sold at auctions. The implication of being traded at auctions rather than on a developed exchange is that there is tremendous uncertainty regarding the price to be received and it takes a long time to contact a buyer who offers the "right" price. Besides, many buyers of art and antiques are accumulators rather than traders, and this further reduces trading.

Coins and stamps are more liquid than art and antiques because an investor can determine the "correct" market price from several weekly or monthly publications. There is no such publication of current market prices of the numerous unique pieces of art and antiques and owners are forced to rely on dealer estimates. Further, while a coin or stamp can be readily disposed of to a dealer at a commission of about 10–15 percent, the commissions on paintings range from 30–50 percent.

To sell a portfolio of stocks that are listed on the New York Stock Exchange, an investor simply contacts his/her broker to sell the shares. The cost of trading stocks varies depending on whether the trade is handled by a full service broker or a discount broker.

21. The results of Exhibit 2.16 would tend to support adding some stocks from emerging markets to your portfolio. The table indicates a low positive correlation with U.S. stocks (0.542 with the Wilshire 5000), which implies reasonable diversification opportunities. However, such markets tend to be less liquid than markets of developed countries.

22. International stocks versus U.S. stocks – Problems:

   1. Information about foreign firms is often difficult to obtain on a timely basis and once obtained, can be difficult to interpret and analyze due to language and presentation differences.
   2. Financial statements are not comparable from country to country. Different countries use different accounting principles. Even when similar accounting methods are used, cultural, institutional, political, and tax differences can make cross-country comparisons hazardous and misleading.
   3. Stock valuation techniques useful in the United States may be less useful in other countries. Stock markets in different countries value different attributes.
   4. Currency and political risk must be considered when selecting non-U.S. stocks for a portfolio.
   5. Increased costs: custody, management fees, and transactions expenses are usually higher outside the United States.

23. Arguments in favor of adding international securities include:

   1. Benefits gained from broader diversification, including economic, political, and/or geographic sources.
   2. Expected higher returns at the same or lower (if properly diversified) level of portfolio risk.
   3. Advantages accruing from improved correlation and covariance relationships across the portfolio's exposures.
   4. Improved asset allocation flexibility, including the ability to match or hedge non-U.S. liabilities.
   5. Wider range of industry and company choices for portfolio construction purposes.
   6. Wider range of managers through whom to implement investment decisions.
   7. Diversification benefits are realizable despite the absence of non-U.S. pension

liabilities.

At the same time, there are a number of potential problems associated with moving away from a domestic-securities-only orientation:

1. Possible higher costs, including those for custody, transactions, and management fees.
2. Possibly reduced liquidity, especially when transacting in size.
    3. Possible unsatisfactory levels of information availability, reliability, scope, timeliness, and understand-ability.
4. Risks associated with currency management, convertibility, and regulations/controls.
5. Risks associated with possible instability/volatility in both markets and governments.
6. Possible tax consequences or complications.
7. Recognition that overseas investments may underperform U.S. investments.

CHAPTER 2
Answers to Problems

1. Most experts recommend that about six months' worth of living expenses be held in cash reserves. Although these funds are identified as "cash," it is recommended that they be invested in instruments that can easily be converted to cash with little chance of loss in value (e.g., money market mutual funds, etc.).

    Most experts recommend that an individual should carry life insurance equal to 7–10 times an individual's annual salary, but final determination needs to include the expected expenses and needs facing one's dependents over their lifetime. An unmarried individual may not need coverage but should consider purchasing some insurance while they are "insurable." A married individual with two children should definitely have coverage (possibly 9–10 times salary as a starting point, to be refined after consider living expenses of loved ones, desire to provide for college education of children, and so on).

2(a). $10,000 invested in 9 percent tax-exempt IRA (assuming annual compounding)

   in 5 years: $10,000(FVIF @ 9%) = $10,000(1.5386) = $15,386
   in 10 years: $10,000(FVIF @ 9%) = $10,000(2.3674) = $23,674
   in 20 years: $10,000(FVIF @ 9%) = $10,000(5.6044) = $56,044

2(b). After-tax yield = Before-tax yield (1 - Tax rate)
   $$= 9\% \ (1 - .36)$$
   $$= 5.76\%$$

   $10,000 invested at 5.76 percent (assuming annual compounding)

   in 5 years: $10,000(FVIF @ 5.76%) = $13,231
   in 10 years: $10,000(FVIF @ 5.76%) = $17,507
   in 20 years: $10,000(FVIF @ 5.76%) = $30,650

3(a). $10,000 invested in 10 percent tax-exempt IRA (assuming annual compounding)

   in 5 years: $10,000(FVIF @ 10%) = $10,000(1.6105) = $16,105
   in 10 years: $10,000(FVIF @ 10%) = $10,000(2.5937) = $25,937
   in 20 years: $10,000(FVIF @ 10%) = $10,000(6.7275) = $67,275

3(b). After-tax yield = Before-tax yield (1 - Tax rate)
   $$= 10\% \ (1 - .15)$$
   $$= 8.50\%$$

   $10,000 invested at 8.50 percent (assuming annual compounding)

in 5 years: $10,000(FVIF @ 8.50%) = $15,037
in 10 years: $10,000(FVIF @ 8.50%) = $22,610
in 20 years: $10,000(FVIF @ 8.50%) = $51,120

4.   With inflation growing at 3% annually, the above figures need to be deflated by the following factors:
in 5 years: $(1.03)5 = 1.1593$
in 10 years: $(1.03)5 = 1.3439$
in 20 years: $(1.03)5 = 1.8061$

The real values of the answers from 4(a) are: $10,000 invested in 9 percent tax-exempt IRA (assuming annual compounding)

in 5 years: $15,386/1.1593 = $13,271.80
in 10 years: $23,674/ 1.3439 = $17,615.89
in 20 years: $56,044/ 1.8061 = $31,030.40

The real values of the answers from 5(a) are: $10,000 invested in 10 percent tax-exempt IRA (assuming annual compounding)

in 5 years: $16,105/ 1.1593= $13,892.00
in 10 years: $25,937/ 1.3439 = $19,299.80
in 20 years: $67,275/ 1.8061 = $37,248.77

5.   Student Exercise

6.   Student Exercise

7.   Student Exercise

8.

8(a).   The arithmetic average assumes the presence of simple interest, while the geometric average assumes compounding or interest-on-interest. The geometric mean internal rate of return is a critical concept in security and portfolio selection as well as performance measurement in a multi-period framework.

8(b).   Ranking is best accomplished by using the coefficient of variation (standard deviation/ arithmetic mean, multiplied by 100):

        1 - Real Estate   36.88
        2 - Treasury Bills   48.93
        3 - Long Gov't Bonds 104.92

4 - Common Stocks   164.40
5 - Long Corp. Bond   166.96

8(c)   Expected mean plus or minus two standard deviations:
        Arithmetic: 10.28% +/-16.9%(2) = -23.52% to +44.08%

9.   If inflation is 3%,
        real rate of return = (1 + return)/ (1+ inflation rate) -1

        T-bills: real return = 1.035/1.03 -1 = 0.0048
        Large-cap common stock: real return = 1.1175/1.03 -1 = 0.0850
        Long-term corporate bond: real return = 1.0550/1.03 -1 = 0.0243
        Long-term government bond: real return = 1.0490/1.03 -1 = 0.0184
        Small cap common stock: real return = 1.1310/1.03 − 1 = 0.0981

APPENDIX 2

Answers to Problems

1. Lauren's average return   Kayleigh's average return

$$\overline{L} = \frac{(5+12-11+10+12)}{5}$$ $$\overline{K} = \frac{(5+15+5+7-10)}{5}$$

$$= 28/5 = 5.6$$ $$= 22/5 = 4.4$$

$L - \overline{L}$		$K - \overline{K}$	
5 - 5.6 =	-0.6	5 - 4.4 =	0.6
12 - 5.6 =	6.4	15 - 4.4 =	10.6
-11 - 5.6 =	-16.6	5 - 4.4 =	0.6
10 - 5.6 =	4.4	7 - 4.4 =	2.6
12 - 5.6 =	6.4	-10 - 4.4 =	-14.4

$$COV_{LK} = \frac{\Sigma(L - \overline{L})(K - \overline{K})}{N}$$

$$= \frac{(-.6)(.6)+(6.4)(10.6)+(-16.6)(.6)+(4.4)(2.6)+(6.4)(-14.4)}{5}$$

$$= \frac{-23.2}{5} = -4.64$$

2. Calculation of Correlation Coefficient

Observation	$L - \overline{L}$	$(L - \overline{L})^2$	$(K - \overline{K})$	$(K - \overline{K})^2$
1	-0.6	.36	0.6	.36
2	6.4	40.96	10.6	112.36
3	-16.6	275.56	2.6	6.76
4	4.4	19.36	0.6	0.36
5	6.4	40.96	-14.4	207.36
		377.20		327.20

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$$\sigma_L^2 = \frac{377.2}{5} = 75.44 \qquad\qquad \sigma_K^2 = \frac{327.2}{5} = 65.44$$

$$\sigma_L = \sqrt{75.44} = 8.69 \qquad\qquad \sigma_K = \sqrt{65.44} = 8.09$$

$$r_{LK} = \frac{COV_{LK}}{\sigma_{:L}\sigma_K} = \frac{-4.64}{(8.69)(8.09)} = -.066$$

While there is a slight negative correlation, the two securities are essentially uncorrelated. Thus, even though the two companies produce similar products, their historical returns suggest that holding both of these securities would help reduce risk through diversification.