MODULE 6

Asset Markets

This lesson builds on the lesson entitled *Interest Rates and Asset Values*, analyzing the nature and functioning of asset markets. The distinction is first made between the markets for the services of capital and the markets for ownership of the capital itself. Market failure with respect to one or both of these markets in certain cases is noted and explained. The idea of capital gains is then developed, leading to a discussion of what is meant by the term speculation. The concept of market efficiency together with the meaning of the term market fundamentals and the notion of speculative bubbles is then discussed. This leads into a discussion of the problem of portfolio selection, the principle of diversification, and the evaluation of risk. These concepts are then applied to the investment decision problems of the individual asset holder.

1. Markets for the Sources of Income

Directly or indirectly, asset markets are markets for the sources of income—for the capital that produces income. One can own a capital good directly, or own shares in an organization that directly owns the capital good or own bonds issued by individual or corporate direct owners of the capital good. Intermediate assets represent the indirect ownership of these income streams. Institutions that borrow from one group of people and lend to others are called *financial intermediaries*.

Two different types of markets are involved in setting the prices of real capital goods—first, the rental market for capital services which determines the magnitude of the income stream produced by the capital, and second, the market for the ownership of these income streams and hence for the capital goods themselves. *Market failure* can occur in either or both markets. It arises when the market price of the services of capital or of the capital itself does not fully reflect their social value—indeed, in some cases exchange may not take place and market prices may not exist. Of special interest is the widespread absence of markets for human capital as a result of the unacceptability of slavery. The markets both for knowledge and technology and for the services of these forms of capital are also frequently absent or incomplete—the reason is that once these forms of capital are used by one person they automatically become available free of charge to everyone else. Production of new capital occurs when the cost of production is below the market price or, when there is some degree of market failure, below the capturable portion of the present value of the services of that capital.

2. Speculation and Capital Gains

A perceived change in the future earnings of an asset will lead to a change in its present value and market price, even when the current earnings from the asset are unchanged. Increases in asset values are called *capital gains*. Capital gains arise from new information about the future earnings of the asset. Evaluation of the effects on future earnings of new information is usually a subjective matter. And since future capital gains constitute earnings from holding an asset, the expectation of future capital gains will cause the price of the asset to be bid up. Because future returns can not be forecasted with certainty, asset prices sometimes deviate from what would be warranted by the "fundamental" factors determining future earnings. A situation where asset prices deviate from the present value of future earnings is called a *spec-*

ulative bubble. More generally, *speculation* can be defined as the attempt to obtain capital gains by acquiring information about the future earnings of assets that other market participants do not have or second-guessing what other market participants believe about future asset values. Since the fundamental factors determining the future earnings of assets are usually not fully observable, it is impossible to determine conclusively whether an observed movement in the price of an asset is entirely the result of a shift in the fundamentals or is in whole or in part a speculative bubble.

It should be noted that capital gains can occur on bonds and other assets whose principal and interest is fixed in nominal amount through changes in investors' perceptions about the future rate of inflation.

3. Efficient Markets

The question arises as to whether the markets for financial assets—stocks, bonds, etc.—are efficient in the sense that the prices of these assets fully reflect the available information about their earnings streams. Otherwise, asset prices would not truly reflect the present values of the earnings of those assets.

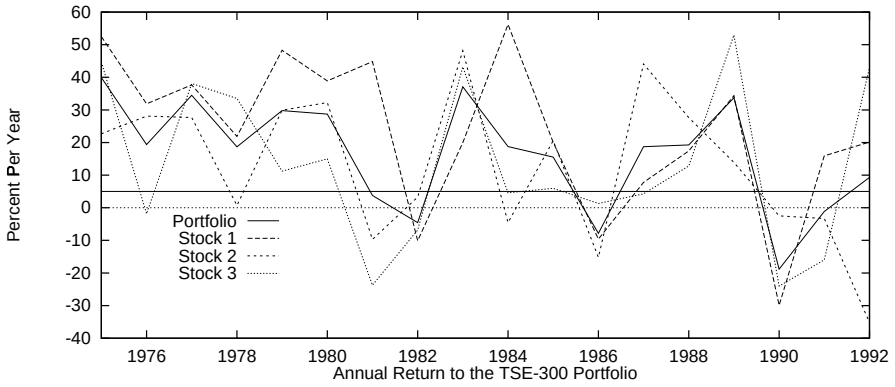
Apart from occasional situations where speculative bubbles arise, we would expect financial markets to be efficient—otherwise, investors could on the basis of publicly available information profit by shifting their portfolios in the direction of assets that are "undervalued". For markets to fully reflect existing information only a subset of investors need be willing to act on the basis of that information.

Market efficiency has two important consequences. First, since current asset prices reflect all public information about the future earnings of those assets, one can only make abnormal profits (i.e., profits in excess of a reasonable return to effort expended and risk borne) if one has information that other market participants do not have. Second, asset prices change only on the basis of new information and since new information is equally likely to be good as bad compared to what is currently known (otherwise it would not be new) asset prices are just as likely to rise as fall relative to market trends determined by inflation, productivity change and the reinvestment of earnings.

4. Diversification

Even when one has the same information as other investors have there are criteria for choosing which assets to hold in one's portfolio. One of these is the principle of diversification. By holding a collection of assets rather than a single asset, one earns a more stable return because losses on some assets tend to be averaged out by gains on others. A more stable return means less risk. Figure 4.1 presents the returns to three selected stocks trading on the Toronto Stock Exchange together with the return to an equally weighted portfolio of them—the return on the portfolio shows less variability.

Figure 4.1:



Implementation of this principle is not as easy as it might seem. While the average return to a collection of assets is always less variable than the return to the most volatile assets in the portfolio, it will frequently exceed the variability of the return to the lowest-variability asset in the group. This is obvious in Figure 4.2 where a high-variable-return asset is pooled with a low-variable-return asset. The average return is clearly more variable than the return to the asset with the lowest variability. To make the average return less variable than the return to every asset in the portfolio a large fraction of the portfolio must be put in the least-variable-return asset.

Figure 4.2:

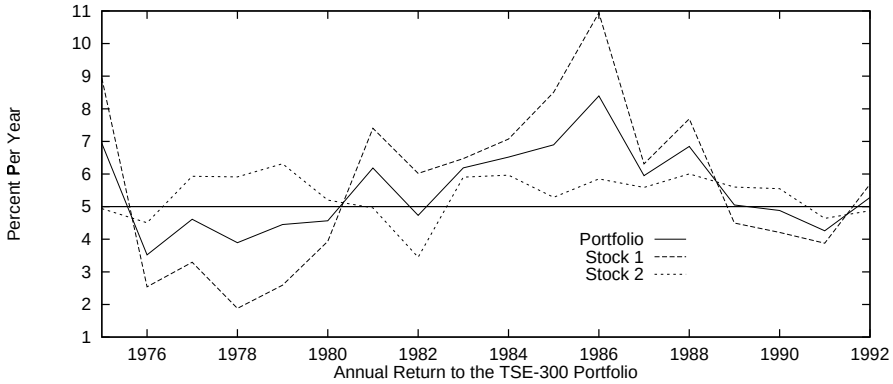
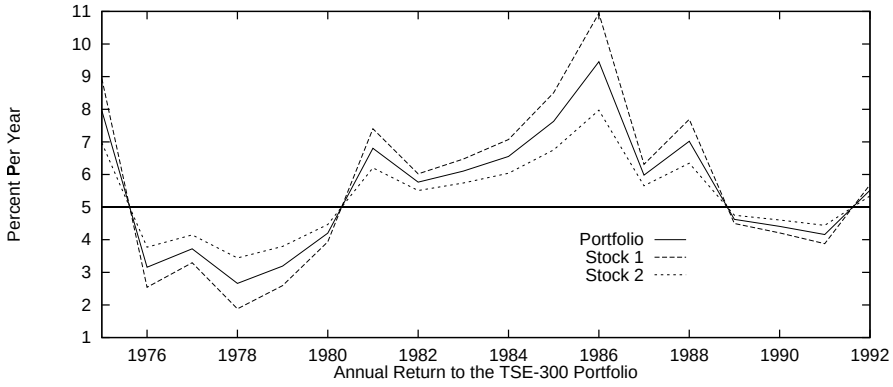


Figure 4.3:



The situation becomes more complicated when the returns to the assets have a tendency to move together—i.e., are *correlated* with each other. In Figure 4.3, the returns to the two assets pooled are perfectly positively correlated. When the asset returns X and Y are perfectly correlated but equal on average,

$$X = \mu Y \tag{1}$$

where μ is a constant greater than zero. There is no gain from diversifying—the optimal strategy is to hold the entire portfolio in the asset with the least variable return. When two assets are perfectly negatively correlated with each other and have the same average return—i.e., μ is negative in equation

(1)—they can be mixed together in proportions that will render their average return constant.

In practice, common stocks tend both to be positively correlated with each other and to exhibit a high degree of independent variability. The task of choosing an "optimum" portfolio of them is complex and is inextricably related to the problem of managing risk, the subject of the next topic. In general, however, where one's wealth consists of stocks, bonds, pension funds, human capital, real estate, automobiles, household effects, etc., the variabilities of the returns to the various assets are unlikely to be known with any precision. In this case, diversification prevents the return to the broad portfolio—i.e., one's income—from being dominated by a small number of assets whose returns turn out in retrospect to be highly variable.

5. Risk and Asset Returns

Figure 5.1 plots the annual returns to a portfolio consisting of the 300 stocks that make up the TSE300 index, each weighted by its share of the value of all stocks outstanding. The return to this highly diversified portfolio exhibits substantial variability. Moreover, it is not difficult to find a subset of these 300 stocks whose average return varies more than the average return to the TSE300 portfolio, or a subset whose average return varies less. Variations in the portfolio return remain regardless of the extent of diversification because the returns to the stocks tend to move up and down at the same time in response to economy-wide developments.

Figure 5.1:

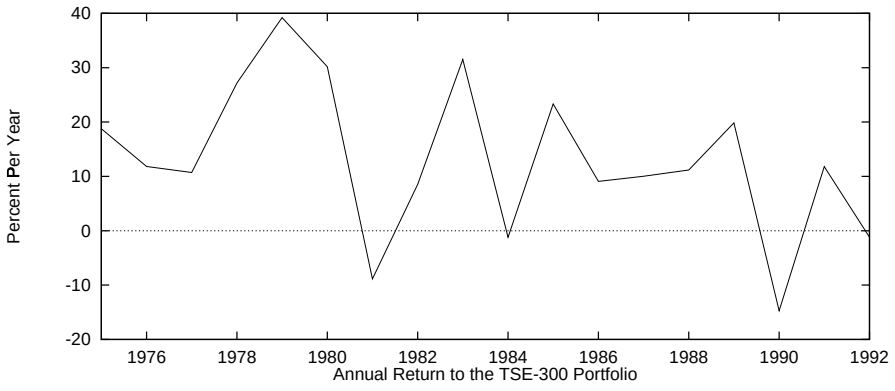


Figure 5.2:

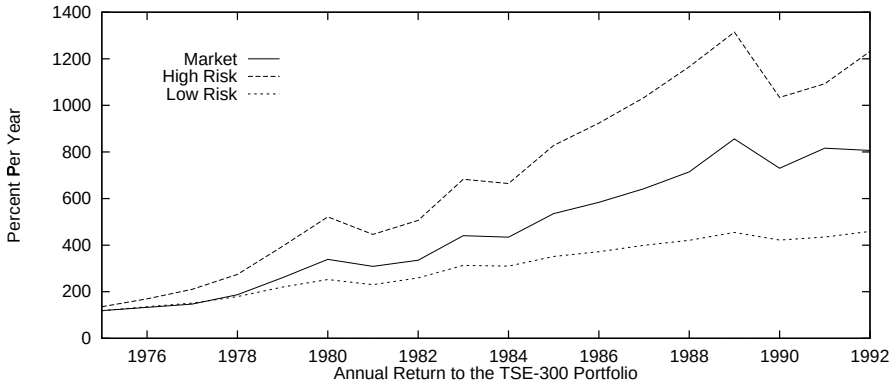
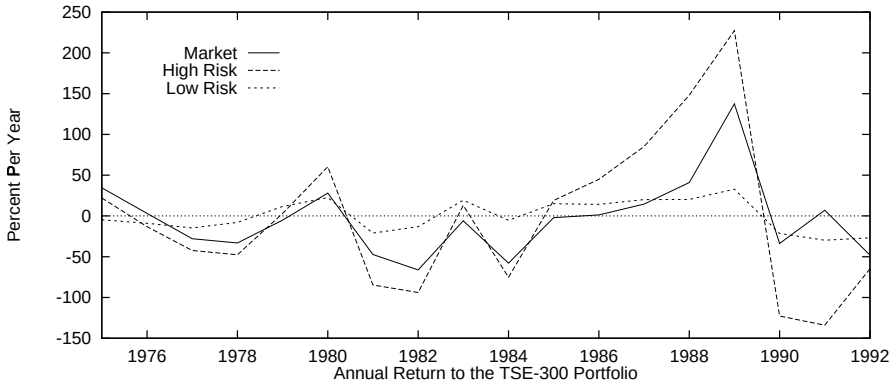


Figure 5.3:



Diversified portfolios whose returns vary a lot in response to economy-wide forces are more risky than those whose returns vary little. This is illustrated in Figure 5.2 which plots the market values of three hypothetical diversified portfolios of stocks, the earnings of which are continually reinvested. The solid line represents the value of a "market" portfolio containing every stock traded in the market. The other two lines present the values of diversified portfolios consisting of subsets of the market portfolio—one is labelled high risk and the other low risk. The high risk line is steeper and the low risk line flatter than the market portfolio line. This reflects a higher return to high risk portfolio, and a lower return to the low-risk portfolio, than the return to the market portfolio. As Figure 5.3 indicates, the value

of the high risk portfolio also exhibits a greater variability around its trend than the market portfolio, and the value of the low risk portfolio exhibits a smaller variability around its trend.

Risk averse asset holders will prefer, given equal rates of return, to hold their wealth in the portfolio of stocks with the least variability. They will thus bid the prices of the stocks in the low risk portfolio up, and the returns (or interest rate at which the earnings from the stocks are discounted) down relative to the asset prices and returns of the market portfolio. And they will bid the prices of the stocks in the high risk portfolio down, and the returns up, relative to the prices and returns of the market portfolio. This explains why portfolios whose value is more variable around trend in Figure 5.3 must exhibit greater growth of market value in Figure 5.2—the reinvestment of earnings that are higher in relation to capital value causes the value of the portfolio to grow at a higher rate.

Stocks whose returns show greater amplitude of variation in upswings and downswings than the average stock in the market contribute greater variability to any portfolio that contains them. So the earnings streams from such stocks are less valuable than equivalent earnings streams from stocks that show the same variability of return as the market average. Similarly, the earnings streams from stocks whose returns show a smaller amplitude of variation in upswings and downswings than the market portfolio are more valuable.

The riskiness of a stock to an investor with a diversified portfolio does not depend on the variability of its return *per se*. It depends on that part of the variability that cannot be diversified away by pooling it with other stocks. This is the variability that is correlated with variations in the returns to the market portfolio. The risk that can be diversified away is called the *diversifiable or idiosyncratic risk*—one would only bear it if one had a portfolio consisting of a single stock or small number of stocks. The part of the variability of the return to a stock that cannot be diversified away is called the *non-diversifiable or systematic risk*. One can earn a greater return than the average of the market by investing in a diversified portfolio of stocks that have high non-diversifiable risk. And if one wants a portfolio of stocks that have a low non-diversifiable risk, one must be satisfied with a lower return.

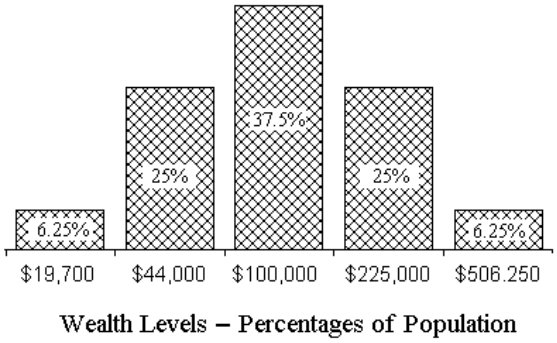
Bonds incur two types of risk. One is the risk of unforeseen changes in the price level. This cannot be diversified away by holding a portfolio of bonds but it can be diversified away, at least in part, by holding bonds in a portfolio with stocks, real estate, and other assets. The second is the risk of default. Default risk has a substantial systematic component due to the

tendency of default to occur in economy-wide slumps.

6. Portfolio Management

In an environment where perceptions about the future earnings of assets are subjective, some of those who are successful investors will inevitably claim expertise. While expertise in forecasting future economic developments and in understanding market psychology cannot be conclusively ruled out, chance plays an important role in investment success.

Figure 6.1:



Consider an economy subject to a sequence of four developments that cannot be forecasted by anyone in advance. Suppose that each individual faces a 50-50 chance that his/her wealth will either go up by one half or down by one third, independently of any investment decisions that are made, as a result of each of these developments. Assume that each individual has an initial wealth of $100,000. Figure 6.1 shows the distribution of wealth after the four totally unforeseen events have occurred. The uninformed might be tempted to take (and pay for) advice about future investment prospects from the 6.25 percent of investors who did well!

The prospect that a financial advisor cannot usefully forecast future developments better than other market participants does not preclude an important advisory role in the management of risk.

Study Questions

1. "Speculation and market efficiency are fundamentally incompatible. Moreover, since we can never determine whether an observed change in the price of an asset is due to speculative factors or fundamentals, we can never establish that financial markets are efficient." Evaluate this statement.

2. There are a number of agencies that evaluate the default risk on corporate and government bonds. Three of them are Moody's Investor Service, Standard and Poor's Corp. and Fitch Investor Service. Would you expect an announcement from one or all of these agencies that the risk attached to a particular bond has increased to affect the market price of that bond?

3. Your broker calls you on the telephone and suggests that you replace a particular stock in your portfolio with an alternative stock recommended by his company's research department which, he correctly points out, is widely regarded as the best in the industry. What should your reaction be?

References

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