Chapter 1

Introduction to the Financial Environment

Learning Outcomes

Upon completion of this chapter, you will be able to:

1. Explain the significance of the financial environment and how this environment influences the decisions of business managers and individuals.
2. Distinguish between financial markets and financial institutions.
3. Identify the major participants in the financial markets.
4. Understand the key aspects of the demand and supply of money.
5. Identify the key characteristics of financial assets.
6. Provide examples of investments in financial assets and explain the overall investment process.
7. Demonstrate how the holding period return is calculated.
8. Explain the variability of returns of different assets and identify the determinants of returns.

Preview

Since the book deals with the financial environment (financial institutions and financial instruments such as marketable securities) we will undertake in this introductory chapter to provide an overview of the structure and functioning of the financial system where businesses and individual investors operate. As such, in this chapter we will provide an overview of the financial markets and institutions that mobilize funds from the savers to the borrowers. We will highlight the changes in the financial landscape and briefly preview the key features of the major financial assets. Since business and individual investors expect a certain return from any financial or business investment, we will preview the concepts of *time value of money, holding period returns* and *expected returns*.

Businesses raise and use investment funds from the financial system (the stock, bond or money market) funds which have been saved by individuals. In turn these investments in capital equipment, in research and development, in new products and new markets, etc. provide growth prospects for the companies and income and capital gains prospects to the individuals that have invested in these companies by buying their stock or debt securities. Here we will preview the major objectives of business and provide the basic theoretical explanations of why different profit potentials exist in different sectors of the economy.
The Financial System

It doesn’t take much to convince anyone that the financial sector (or system) is vital for the smooth functioning of the economy since it helps money to be channeled efficiently from savers (or surplus units) to prospective borrowers (or deficit units). In this way, the financial system makes it easier (1) for firms to obtain financing for profitable investments opportunities (investments in new technology, capital equipment, or for acquisition of other companies), and (2) for individuals to borrow against future income (e.g., to pay for university, to buy a house or car, etc). This fundamental intermediation function of the financial system is presented graphically in Figure 1.1.

Figure 1.1: The Intermediation Function of the Financial System

Without financial markets and institutions, borrowers would have to borrow directly from savers. In such a case it is easy to imagine that not much borrowing would take place since it would be very difficult for people in need to borrow to find other people able and willing to lend the same amounts and with exactly the same terms (time, interest rate, collateral, etc). In other words, we need to have “a double coincidence of wants”. Therefore, we can easily conclude that a well-functioning financial system is necessary for a well-functioning economy. A schematic structure of the financial system is provided in Figure 1.2.

Figure 1.2: Structure of the Financial System
Changes in the Financial Services Industry

The financial services industry has undergone, and continues to undergo, dramatic changes in makeup and operations, facilitated by deregulation, globalization and the revolution in information technology. The traditional industry boundaries (banking, insurance, investments, brokerage, etc) are increasingly getting blurry and the financial services industry of today has little resemblance to the makeup and operations of the industry of 50 or even 25 years ago.

The development of financial supermarkets, chiefly through mergers and acquisitions, which engage in all aspects of the broader financial sector, has replaced to a large extent the specialized firms that because of regulation their operations were restricted within their national boundaries or even within their narrower industry boundaries. Today, there are large financial groups that engage in the full spectrum of activities including retail, wholesale and investment banking, insurance, brokerage, fund/asset management, currency and derivatives trading, real estate, etc.

Of course, some firms have decided not to be all things to all people. These are the “boutique”, specialty operators which seek to provide unique, specialized financial products and services.

Beyond this blurring of industry boundaries, the advances in information technology continue at an accelerated pace and is certain to continue (as it has so far) to affect and shape how the markets will be organized and operate in the future. The developments in the computerized trading systems are bound to introduce numerous additional changes in markets around the world. The development of new, sophisticated products (so called “financially engineered” products) and new markets will also be facilitated by more experience and know-how and technological advancements. Direct trading across the globe 24 hours a day is just one such development.

The financial crisis of 2007-2009 has brought to the surface a number of weaknesses and gaps in the supervisory function and prudent management of risks by banks and other financial firms (even of central banks). Since these gaps have been blamed to have caused the financial crisis and the significant economic downturn around the world, it is certain that the bank regulators and the legislators will introduce appropriate amendments to the current regulatory regime.

Financial Institutions

Financial institutions are firms that provide access to financial markets, both to savers who want to place their savings in financial instruments and to borrowers who want to borrow from banks or issue debt securities. Among other services, financial institutions allow individuals to earn a return on their money while at the same time avoid (or at least reduce) risk. Financial institutions are called financial intermediaries (businesses that connect savers with borrowers) since they serve as middlemen between individuals, firms, and financial markets.

Types of Financial Institutions

We provide below a brief explanation of the various financial institutions that constitute the major players and make up the structure of a financial system. Their primary function is to provide financial intermediation.

Financial intermediation or indirect finance is the process of obtaining funds or investing funds through third-party institutions like banks and mutual funds. In the US, the most common method of raising funds for businesses is indirect finance rather than direct finance.

1. Depository institutions (banks, co-operatives, savings & loan associations). Their main liabilities are deposits (sources of funds), and their main assets are loans.
2. **Insurance companies.** They collect premiums (regular payments) from policy-holders, and pay compensation to policy-holders if certain events occur (e.g., death, fire, theft). They invest the premiums in securities and real estate, and these are their main assets.

3. **Pension funds.** They accept contributions from current workers and make payments to retired workers. Like insurance companies, pension funds invest the contributions in securities and real estate, and these form their main assets.

4. **Securities firms** (provide businesses and individuals with access to financial markets):
   a. **Investment banks:** sell new securities for companies. Unlike regular banks, they don't accept deposits, or make loans.
   b. **Brokers:** buy/sell existing (already issued) securities on behalf of individuals.
   c. **Mutual fund companies:** pool the money of individuals, who buy shares in the fund, and invest that money in stocks, bonds, and/or other assets.

5. **Finance companies.** Like banks, they use people's savings to make loans to businesses and households, but instead of holding deposits, they raise the cash to make these loans by selling bonds and commercial paper. They tend to specialize in certain types of loans, e.g., automobile or mortgage loans.

### The Role of Money and the Supply of Money

In its simplest form, money is a medium of exchange. It is that universally accepted unit of account for exchanging goods and services between economic agents (individuals and firms). It has been documented that during World War II prisoners of war used cigarettes as the unit of account for exchanging goods amongst them. Money can also be used as a means of deferred payment and as a store of value.

Many transactions (especially for small denominations) are paid with cash, but increasingly most transactions in modern societies (especially for larger denominations) are paid with checks drawn on bank accounts, or with credit cards (which combine features of the drawing privileges on a bank account and credit facilities, albeit temporary, from a financial institution). Money is important to the performance of an economy, and therefore it is important to be able to identify exactly what money is and to measure how much of it is in the economy at each time. Economists consider two measures of money: the narrow form or definition of money (which satisfies mostly the transactions demand for money) and the broader form of money which incorporates the other two motives for holding money as well.

### Definitions of Money

**Narrow Money Supply (M1):** This includes currency in circulation (coins and paper currency classified as legal tender), demand deposits (or checking accounts at commercial banks), NOW accounts (which stands for Negotiable Order of Withdrawal) because these are used as checking accounts, and traveler’s checks. All these components have a common characteristic: they can readily be transformed into liquid form for transactions purposes, and are easily accepted as a form of payment.

**Broad Money Supply (M2):** The components of M2 are less liquid than M1 but satisfy many of the attributes of money (store of value, measure of deferred payment, etc). It includes all the components of M1 plus savings accounts, time deposits, and certificates of deposits (CDs), as well money market mutual funds which have check-drawing privileges.

### Credit and the Role of the Banking System

First, it is important to understand that money and credit are different concepts. Money is a specific, measurable magnitude (quantity) such as M1 or M2; credit, on the other hand, is the capacity to borrow money from a financial institution under certain conditions.

Credit and money, however, are related. The amount of money circulating in the economy limits the availability and terms of credit extended by financial institutions and private corporations. Conversely, the
broader banking system through its ability to extend credit (to loan out the part of the surplus liquidity that banks hold for the saving public in the form of demand deposits) facilitates the expansion of the money supply through the *money multiplier process*. 

The banking system is comprised of the commercial banks and the central bank. Banks play the role of the middle man (the intermediary) between the surplus units in the economy (those units whose incomes exceed their expenditures and deposit their *savings* with a financial institution in return for the interest rate), and the deficit households which require financing and borrow at the lending rate, to bridge the gap between their incomes and their expenditures, or the business units which require financing to invest in order to expand their productive capacity in the future.

**The Central Bank & Monetary Policy**

In most modern economic systems, the right, power and responsibility to issue legal currency (in the form of coins and paper money) is delegated to the *Central Bank*. Aside from issuing currency, the central bank regulates and supervises the banks (setting rules on the types and composition of assets of banks, the relationship between deposits and loans, etc). As such, the central bank in any economic system is the key player in determining the supply of money in the economy. Other functions of the central bank are to be the banker of the government, to serve as the bank of banks (acting where needed as the lender of last resort for the banks), to manage the foreign exchange reserves of the country, as well as manage the payments system (clearing system) between banks.

Essentially, the central bank controls the money supply ($M_1$ and $M_2$) through its power to manage the *monetary base* (currency in circulation held by the public, plus currency in banks’ vaults, plus bank reserves deposited with the central bank). The principal mechanism central banks use to change the monetary base is *open-market operations*, the buying and selling of government securities (treasury bills and bonds). Recall that these securities are IOUs sold by the government to finance government deficits (expenditures in excess of tax revenues). Individuals, firms and banks buy these securities to earn interest.

**Responses of Central Banks to Financial Crises**

Experience has shown that unless central banks take quick and decisive measures, banking crises evolve into deep and lasting economic recessions. How did the major central banks (e.g., the Federal Reserve in the US, the European Central Bank and the Bank of England) respond to the 2007-2009 financial crisis? It is worth mentioning three central banks interventions that took place:

**Regulation and Protection: Central Bank as Lender of Last Resort**

Financial panics and loss of confidence in the financial system are to be avoided like the worst epidemic! Central banks, acting as *lenders of last resort*, may help to avoid panics by providing the necessary liquidity. This will normally mean a temporary rise in the money supply, which the Central Bank will subsequently try to bring back to ‘normal’. In other words, central banks stand ready to lend to any bank that might temporarily be in trouble, and thus prevent a domino-like loss of confidence in the banking system. If the trouble at a bank is of a more severe nature, caused by reckless management, a central bank may use its rules regarding *capital adequacy ratios* (the required minimum value of a bank’s capital relative to its outstanding loans and investments).

If a bank’s capital adequacy ratio is low (below 9% by international standards, known as the *Basle rules*), the bank has to quickly find new funding to recapitalise itself, and this is usually done by asking the existing shareholders to supply this capital reserves so that depositors’ money is safeguarded. This is the situation that Greek and Cypriot banks are facing following the “hair cut” of the Greek Government bond holdings. They need massive amounts of recapitalisation in order to bring their capital adequacy ratios up to the required level.
There are, of course, situations where the bank may be in serious trouble and may go bankrupt (such as occurred in the Barings Bank scandal in the 1990s or the Northern Rock Bank in 2007 in the UK). The crisis in the USA subprime loans market had shocked the US financial system for much of 2007 and 2008. In fact, the debt problem in the US had spread to the UK, the EU and all over the World in a “globalized financial system”.

**Timely and Decisive Monetary Easing**

One of the problems that a financial crisis creates is a “credit crunch”, a severe shortage of liquidity as banks and other lending institutions basically no longer provide sufficient lending to the market. So the market “dries up”.

With the experience of past financial crises (such as during the Great Depression), the major central banks (the European Central Bank, the Federal Reserve, the Bank of England, etc) provided generous liquidity support to the banking system. In addition, monetary policy was significantly relaxed to provide growth prospects to the real economy (consumer spending, business investments, employment growth, etc.) by reducing interest rates. For example, in Europe, the ECB reduced the interest rate from 4.25% in October 2008 to 1% by mid-2009.

**Flexible and Innovative Interventions**

Monetary policy, relying largely on interest rate changes to stimulate the economy, takes time to take effect. But, time was not on the side of central banks. In addition, “conventional” monetary policy is “too blunt a tool”, according to Fed Chairman Ben Bernanke, to be used to address financial crises. To do this, monetary authorities need more targeted tools. They need to intervene in the financial markets and provide the necessary liquidity with measure that supplemented the traditional tools (as discussed in the previous section).

In the case of the 2007-2009 financial crisis, there was a danger that the credit crunch would paralyze the financial intermediation role of the banking system and stop the monetary transmission mechanisms from reaching efficiently the real sector of the economy. So central banks introduced and used new tools and instruments. New credit facilities were created to provide financing to banks by buying private and public debt securities.

In the euro area, where banks are dominant, adequate liquidity was injected into the system using “unconventional” methods that circumvented traditional restrictions, which complemented the more "conventional" policy measures such as interest rates. Interest rates were already very low, so it was time for central banks to innovate in the design and implementation of monetary policy.

For the Euro area, the most important shift took place in October 2008, when the Governing Council of the ECB decided to allocate liquidity to banks in unlimited amounts at the policy rate.

**Cooperation and Convergence of Policy Interventions**

The financial crisis of 2007-2009 hit the world at about the same time (due to globalization and the free movement of financial capital). So it became clear early on that the policy measure had to be taken in a coordinated fashion. For example, on 8 October 2008, the seven major central banks of the world made in a synchronized fashion the largest reduction in interest rates in history. Because of the existence of an efficient network of international financial markets, interest rates have converges to very similar rates around the world.

**Types of Financial Assets**

A security or financial asset represents a financial claim on an asset that is manifested by some form of legal documentation. It refers to *a claim to receive some future benefits under certain conditions*. The task of security analysis is to provide a quantification of these future benefits (expected returns) under different risk-return conditions. We discuss traded securities, such as stocks and bonds, in Chapter 6 while in Chapter 7 we will discuss specialised financial instruments such as derivatives (options and futures).
An indicative list and brief explanation of financial assets, categorized by broad asset classes, is provided below:

1. Short-term Debt Securities (Money Market Instruments)
   This broad asset class comprises cash and cash equivalents or money market instruments, which are securities that can be converted easily and readily into cash. They are appropriate for investors that are primarily interested for capital protection, and understand and are ready to accept fairly modest returns. Bank deposits and Treasury bills are the best known examples.
   - **Bank savings & time deposits**: These are the standard savings accounts at deposit money banks. Time deposits (or notice accounts) are special savings accounts that have a maturity and cannot be withdrawn before the expiry of the time (6-month period, 12-month period, etc).
   - **Treasury bills**: These are short-term obligations of the Government. Their maturity is less than 12 months, with the most known maturity being the 90-day (or 3-month) bills. As much as they are guaranteed by the Government and the maturity is short, they are the closest we can get to a risk-free security. We will be using this rate as the risk-free rate (RFR) in our discussion in Chapter 18.
   - **Commercial paper**: These are unsecured promissory notes issued by large companies with maturities of 30, 60 or 90 days (though they may be issued for as long as six months). Commercial papers are as good as the credit worthiness of the issuers. In other words, to be able to sell commercial paper, a company has to have a good rating from the rating agencies. Their yield is comparable to that of large CDs, but usually higher than Treasury bills. The smaller denomination is usually $25,000.

2. Long-term Debt Securities
   This asset class comprises bonds and notes of the Government (including state and local authorities) and of corporations, which are long-term obligations of the issuers. Since they are interest-bearing securities, they are appropriate for investors that are primarily interested for income, and who are ready to accept moderate risk. This is because, as we will see in more detail in Chapter 6, the price of bonds varies inversely with the direction of interest rates. So, there is always the risk of loss of principal, as seen in the annual returns in Table 1.1. *A priori*, an investor can get an idea of the risk involved in a particular bond security by the rating issued by various rating agencies (such as Standard & Poor’s or Fitch)
   - **Government securities (Notes, Bonds)**: These are long-term obligations of governments. Since the risk of default is low, they represent the lowest risk securities of this asset class. Of, course, risk is not entirely absent, as explained above because of the variability of interest rates (and the inverse relationship between interest rates and bond prices). If the maturity is between 2 and 10 years, the securities are called notes, whereas if they maturity is over 10 years they are called bonds.
   - **Municipal notes and bonds**: These are obligations issued by state and local governments and related government agencies.
   - **Corporate bonds**: These are debt obligations issued by corporations.

3. Direct Equity Securities
   - **Common stocks**: These equity securities represent part ownership of companies and allow investors to benefit from the growth potential of the company. The total return is the sum of distributed dividends plus the potential for price appreciation of the shares. This appreciation potential depends on the future profitability of the company as well as on the overall market conditions and sentiment. Stocks are appropriate investment vehicles for growth investors (though certain stocks, called income stocks, are appropriate for more risk averse investors). We will discuss the key characteristics of stocks further in Chapter 6, while their risk-return characteristics will be discussed in many chapters.
   - **Preferred stocks**: Unlike common stocks, preferred stocks do not represent ownership in the issuing company, and as such preferred stockholders do not vote. Preferred stock pays a stipulated annual dividend. Thus, as an investment instrument, preferred stock falls somewhere between bonds and common stock as regards the protective provisions for the investor.
4. Financial Derivatives

These are financial instruments that «derive» their value from the value of the underlying security (stock, bond, index, commodity, currency, etc). Though not strictly speaking new in the investments community, their popularity for the average investor grew since the 90s following the financial liberalization and the «financial engineering» that took place. We will discuss these products (primarily options) in Chapter 7.

- **Options**: An option is a contract issued by one party which gives to the other party (the holder or owner) the right, but not the obligation, to buy or sell a security (stock, bond, etc) at a specified price (the *exercise price*) within or at a designated time period. Options are typically short-term instruments (up to a year).
- **Forward**: An agreement between two parties (firms or individuals), whereby one party agrees to buy from the other an underlying asset (index, stock, bond, commodity, currency, etc) at a specified price and future time. They are not traded in organized exchanges. Effectively they are private contracts.
- **Futures**: Similar agreements with *forwards*. But *futures* are traded in organized derivatives exchanges, and so have trading prices and the profits or losses are determined daily (*marked-to-market*).

5. Indirect Investment Vehicles

These are financial «vehicles» through which individuals can invest indirectly in a particular asset class or combination of assets classes, without directly owning the individual securities in the portfolio.

- **Mutual Funds & Unit Trusts**: These are collective investment companies that pool sums of money from a large number of (usually) small investors. The investor is issued shares (or units) in proportion to the funds invested. Professional fund managers actively manage these funds, by investing these sums in marketable securities according to the stated objective of the fund (growth, income, stock, bond, balanced, etc). There are, of course, some funds, called index funds, which are not actively managed.
- **Real estate investment trusts (REITs)**: Similar in concept and functionality to mutual funds or exchange traded funds (ETFs). They invest in various real estate assets and their shares may be traded in organized exchanges like stocks.
- **Pension funds and life insurance policies**: Individuals can also invest regular sums of money through their employers or on an individual basis in pension funds or though their life insurance. These pools of money are then invested in marketable and other assets by professional managers of the pension fund or the insurance company.

In the remainder of this book, we will examine more fully many of the sub-classes of financial assets.

**Return of Financial Assets**

As we mentioned above in defining investments, individuals buy financial assets so that they have a return on their investments, either from interest, dividends or capital gains due to an appreciation of the price of the asset(s) held. Conceptually, the *return* of an investment is straight-forward to measure. We can view (or measure) return in two ways:

- **Absolute Return** (say in Euro or Dollars): The return on an investment measured in dollars that accounts for all cash flows and capital gains or losses.
- **Percent Return** (%): The return on an investment measured as a percentage of portfolio value that accounts for all cash flows and capital gains or losses.

Measuring the return of investments allows us to compare investment alternatives. Throughout the book, we will deal with a number of different measurement methods, based on the type of security held (e.g., stock or bond) and whether we want to measure the *historical returns* or the *expected returns*, which take into consideration risk elements (the probability of occurrence of the outcome). We will briefly discuss these two measures below.
The Holding Period Return

As we already mentioned, when individuals use their surplus funds for investment purposes, they expect to receive such a return that they consider sufficient compensation for deferring the current use of their funds. The return of an investment (real or financial) is measured by the change in the individual’s accumulated wealth over the period that he/she holds the asset(s). This period is the holding period and the calculated return over this period is the holding period return (HPR). The formula for calculating the HPR is the following:

\[
HPR = \frac{V_1 - V_0}{V_0} \times 100\%
\]

where \( V_1 \) = Value of asset or wealth at the end of the period/year. It should be noted that in the ending value of the asset we include interest, dividends and price appreciation. \( V_0 \) = Value of asset or wealth at the beginning of the period/year (purchase price or acquisition cost).

Example 1.1: Calculation of Holding Period Return

Assume you bought 10,000 stocks of Hellenic Bank at €0.85 at the beginning of 2011. At the end of the year the share price is €0.40 plus you received dividends of €0.10 per share. What is the HPR? The acquisition cost of your investment (\( V_0 \)) is €8,500, while the ending value (\( V_1 \)) is €5,000 (€4,000 being the current market value plus €1,000 dividends you received during the year). So applying the HPR formula we get:

\[
HPR = \frac{5,000 - 8,500}{8,500} \times 100\% = \frac{-3,500}{8,500} = -41\%
\]

You say: “Wow! I can lose over 40% of my money in one year?” Yes, you can! After completing this book you will understand why.

Table 1.1 presents the 30-year historical annual returns (the HPR) of three asset classes in the United States (stocks, bonds, and Treasury bills) and compares them with the annual inflation rate.

<table>
<thead>
<tr>
<th>Year</th>
<th>Common Stocks (S&amp;P500) (%)</th>
<th>10-year Treasury Bonds* (%)</th>
<th>3-month Treasury Bills* (%)</th>
<th>Inflation (%)</th>
</tr>
</thead>
<tbody>
<tr>
<td>1980</td>
<td>32.4</td>
<td>-3.95</td>
<td>11.5</td>
<td>12.5</td>
</tr>
<tr>
<td>1981</td>
<td>-4.9</td>
<td>1.86</td>
<td>14</td>
<td>8.9</td>
</tr>
<tr>
<td>1982</td>
<td>21.4</td>
<td>40.36</td>
<td>10.7</td>
<td>3.8</td>
</tr>
<tr>
<td>1983</td>
<td>22.5</td>
<td>0.65</td>
<td>8.6</td>
<td>3.8</td>
</tr>
<tr>
<td>1984</td>
<td>6.3</td>
<td>15.48</td>
<td>9.6</td>
<td>3.9</td>
</tr>
<tr>
<td>1985</td>
<td>32.2</td>
<td>30.97</td>
<td>7.5</td>
<td>3.8</td>
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<tr>
<td>1986</td>
<td>18.5</td>
<td>24.53</td>
<td>6</td>
<td>1.1</td>
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<tr>
<td>1987</td>
<td>5.2</td>
<td>-2.71</td>
<td>5.8</td>
<td>4.4</td>
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<tr>
<td>1988</td>
<td>16.8</td>
<td>9.67</td>
<td>6.7</td>
<td>4.4</td>
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<tr>
<td>1989</td>
<td>31.5</td>
<td>18.11</td>
<td>8.1</td>
<td>4.6</td>
</tr>
<tr>
<td>1990</td>
<td>3.2</td>
<td>6.18</td>
<td>7.5</td>
<td>6.1</td>
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<tr>
<td>1991</td>
<td>30.6</td>
<td>19.3</td>
<td>5.4</td>
<td>3.1</td>
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<tr>
<td>1992</td>
<td>7.7</td>
<td>8.05</td>
<td>3.5</td>
<td>2.9</td>
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<tr>
<td>1993</td>
<td>10.0</td>
<td>18.24</td>
<td>3</td>
<td>2.7</td>
</tr>
</tbody>
</table>
In Figure 1.3 we present the graph of the average ten-year holding period returns for these three asset classes and the 10-year average inflation rate.

**Figure 1.3: Ten-Year Average Returns of Alternative Financial Assets**

<table>
<thead>
<tr>
<th>Year</th>
<th>Stock</th>
<th>Bonds</th>
<th>T-bills</th>
<th>Inflation</th>
</tr>
</thead>
<tbody>
<tr>
<td>1961-1970</td>
<td>9.1</td>
<td>1.5</td>
<td>4.4</td>
<td>3.0</td>
</tr>
<tr>
<td>1971-1980</td>
<td>10.3</td>
<td>4.2</td>
<td>6.8</td>
<td>8.1</td>
</tr>
<tr>
<td>1981-1990</td>
<td>15.3</td>
<td>12.5</td>
<td>8.5</td>
<td>4.5</td>
</tr>
<tr>
<td>1991-2000</td>
<td>18.4</td>
<td>10.9</td>
<td>4.7</td>
<td>2.7</td>
</tr>
<tr>
<td>2001-2010</td>
<td>7.4</td>
<td>6.4</td>
<td>2.1</td>
<td>2.6</td>
</tr>
</tbody>
</table>

*The Treasury bill rate is a 3-month rate and the Treasury bond is the constant maturity 10-year bond.


**Variability of Returns**

Notice that as expected, and as we will explain in many chapters in this book, the **long-term** return of stocks is consistently above all the other asset classes. We have shown in Table 1.1 that over the long-term the return from the stock market (as measured in the US by the S&P 500) has averaged around 10% to 12% annually over the last 100 years. But in any one year, it is not certain that the return will be 10% or 12%. You will have, of course, realized from Example 1.1 as well as have observed from Table 1.1 that on
an annual basis, the annual HPR of stocks varies significantly, ranging from large positive returns to large negative returns. The return has varied from as high as 53.8% to as low as -43.4%. One of the worst was in 2008 when the return was -36.6%! Actually, in any given year, the chance of having a down-market is one-in-four.

This is clearly seen in Figure 1.4, which shows the annual returns of stocks from 1980 to 2010. We will come to consider this variability as a measure of risk for holding stocks. We briefly refer to risk in the following sections, but more extensively we deal with the concept and measurement of risk in Chapter 4.

![Figure 1.4: Variability of Annual Stock Returns in the US (1980-2010)](image)

We can also get a different picture of the variability of returns by looking at the distribution of annual returns of US common stocks for the period of 1926 to 2010. These annual returns are shown in Table 1.2.

<table>
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Does this distribution resemble anything you are familiar with? What about the bell-shaped normal distribution? We will come to see that over time investment returns tend to mirror a normal distribution. As mentioned above, we will discuss the distribution of returns (or variability of returns) as a measure of risk in Chapter 4.
Determination of the Market Interest Rate

The level of the interest rate is established in the money and capital markets by the forces of supply and demand as shown in Figure 1.5, just like in the market for any good. In this case, the “good” in question is money and its “price” is the interest rate, which represents the cost of money. Thus, at any moment in time, the interest rate is determined by comparing the supply of funds (savings, or money supply) available to be invested, with the demand for funds for borrowing by the individuals and businesses to finance spending and investments (capital spending by businesses). The equilibrium level of interest ($i^*$) is determined at the point where the demand for money (i.e., borrowing) is equal to the supply of funds (i.e., savings) as shown in Figure 1.5.

![Figure 1.5: Money Market Equilibrium](image)

The Role of Inflation

In an environment of stable prices, if you can “exchange” or trade-off, with certainty, €100 of current income for next year’s income of €104, then the rate of exchange, or rate of return, on this presumed risk-free investment (i.e., the time value of money) is 4%.

Of course, in real life we don’t have price stability (and no certainty!). On the contrary, we usually expect a certain rate of increase of prices over time (the inflation rate). In such a setting, the modern investor, who is well aware of the eroding effects of inflation on the purchasing power of savings (or future consumption), will require a higher rate of return to compensate for it. Thus, if the investor expects an inflation rate of 2% during the period of investment in the above example, he/she will require a rate of return by 6% (a 2% higher than the “risk-free” rate of 4%).

Furthermore, if the future payments from the investment are not certain, the investor (who by nature is averse to risk and uncertainty) will demand a return that exceeds the rate of interest (the pure value of money) plus the inflation rate. This uncertainty of the future stream of income or payments from an investment is what we call investment risk, and the extra amount of compensation over and above the interest rate required by the investor is known as risk premium. We elaborate on the concept of risk premium and the expected rate of return below (and again in Chapter 4).

The Expected Rate of Return

In an uncertain world, investment decisions have to be made on the basis of expected returns, which may or may not turn out to be the same as the returns that actually arise. In order to determine what the expected return would be, an investor or a firm must first assign probability values to all possible outcomes (returns). These probability values can range from zero to 1. To generalize, the expected return from an investment may be specified as:

$$E(R) = \sum (P_i \times R_i)$$
In other words, the expected value is simply a weighted average of all possible outcomes (returns) of an investment portfolio. Each of the possible outcomes is weighed by the probability of its occurrence.

**Example 1.2: Expected Value of a Future Dividend Income Stream**

Let’s use some hypothetical dividend returns as shown in column 2 of Table 1.3 to understand the expected value concept. In column 3 we assume that the investor is able (at least in a subjective manner) to assign probabilities to each dividend outcome. Notice that the numbers of the third column add up to 1.0. The expected values of all dividend income streams over the five years are presented in the last column of Table 1.3.

<table>
<thead>
<tr>
<th>Year</th>
<th>Annual Dividend Stream (€)</th>
<th>Probability of each dividend outcome</th>
<th>Expected value of dividend income</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>€1000</td>
<td>0.25</td>
<td>250.0</td>
</tr>
<tr>
<td>2</td>
<td>2000</td>
<td>0.25</td>
<td>500.0</td>
</tr>
<tr>
<td>3</td>
<td>2500</td>
<td>0.20</td>
<td>500.0</td>
</tr>
<tr>
<td>4</td>
<td>2500</td>
<td>0.15</td>
<td>370.5</td>
</tr>
<tr>
<td>5</td>
<td>3000</td>
<td>0.15</td>
<td>450.0</td>
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</tbody>
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Adding these weighted values in column 3 would give us the overall expected value of the dividend income flows over the 5-year period:

\[
\text{Total Expected Value (Return)} = E(R_i) = \sum (P_i) (R_i) = €2070.5
\]

**Determinants of the Required Rate of Return**

**The Real Risk-Free Rate (RFR)**

This is the basic interest rate, assuming no inflation and no uncertainty about future flows (that is, before considering any specific risk for the investment). This is the pure time value of money: the exchange rate (price) between current goods and future goods. This is the return investors demand for foregoing the immediate use of their money.

Two factors influence this exchange price: one subjective and one objective. The subjective factor is the time preference of individuals for the consumption of current income. The objective factor is the set of investment opportunities available in the economy, as determined by the long-run real growth prospects of the economy (see Footnote 1). When an economy is growing rapidly, there are more and better opportunities to invest funds and experience positive rates of return; hence the required rate of return is higher. Therefore, there is a positive relationship between the real growth potential of the economy and the RFR.

**Nominal Risk-Free Rate: The Impact of Inflation**

One of the basic premises in economics and finance is that the rational investor does not suffer from “money illusion.” In other words, ultimately people are concerned with the true purchasing power, the real value, of their money. Therefore, to get the real RFR (that is after explicitly considering the inflation risk), we need to subtract the anticipated inflation rate from the nominal RFR. In other words, \( r = i - \pi \). It should be noted that though this is the common method (“rule of thumb”) to calculate the real interest rate, the exact value is derived using what is referred to as the Fisher equation as follows:

\[
r = \frac{1 + i}{1 + \pi} - 1
\]

---

Note that inverting the Fisher equation and solving to find \( i \) (the nominal interest rate) we get the following equation:

\[
i = \left[ (1 + r)(1 + \pi) \right] - 1
\]
where $i =$ nominal RFR  
$r =$ real RFR  
$\pi =$ inflation rate

**Example 1.3: Calculation of the Real and Nominal RFR**

*Scenario 1*: Consider an investor who requires a nominal rate of return without any risk of 5% (expressed as 0.05) and the anticipated rate of inflation is 3% (expressed as 0.03). As mentioned above, a common practice is to use a “rule of thumb” method whereby we simply subtract the inflation rate from the nominal rate to get the real RFR ($5\% - 3\% = 2\%$). To get an exact value, we use the Fisher equation, which gives us a value of 0.0194 ($r = \frac{1 + 0.05}{1 + 0.03} - 1 = 0.0194$). In other words, the real RFR is approximately 2% (as we found by the rule of thumb method). Thus, the real RFR of 2% applies to any investment as the minimum required rate of return to provide the investor with a 5% nominal return (before adjusting for inflation), but after any risk considerations (the risk premium).

*Scenario 2*: Consider now an investor who requires a real risk-free rate of return of 2% and as in Scenario 1 the anticipated rate of inflation is 3%. Using the formula in Footnote 2 we find that the nominal RFR is 0.0506 (or 5%), which is the minimum required rate of return to provide the investor with a 2% real return (after adjusting for inflation).

**Risk Premium**

We defined a risk-free investment as one for which the investor is certain of its outcome, that is, of the amount and timing of the expected return, $E(R)$. Though some investments may exhibit returns that meet or approach this pattern, the typical investment (financial investment, business venture, real estate asset) does not. Neither the amount of the return nor the timing of receiving the return is known with certainty. The higher the uncertainty level, the higher the return over the RFR required by investors to be compensated for. This difference of the required rate of return over the nominal RFR is the risk premium. We summarize the components of required return in Figure 1.6.

The risk premium will be different for different investments. For example for a short-term government bond (such as Treasury bills) the risk premium is close to zero and this return approaches our definition of the nominal RFR (the real rate of return plus expected inflation). For an investor considering to invest in a certain portfolio, he/she would presumably require a return that incorporates a risk premium over the RFR of a few percentage points.

Like the real rate of return and the anticipated inflation rate, the risk premium is not constant, but rather changes over time as economic and business conditions change causing the level of uncertainty to change.

**Figure 1.7: Components of Required Return**
Sources of Risk and Uncertainty

The major sources of uncertainty which determine the risk premium are the following:

Business risk
This is the uncertainty of income flows caused by the nature of the firm’s business.

Financial risk
This is the uncertainty related to the methods and ability of the firm to finance its investments. Debt financing (loans, bonds, debentures, etc) increases a firm’s leverage ratio and thus the cost of financing expansion.

Liquidity risk
This is the uncertainty relating to how easy and at what price is possible to dispose of an asset (in the secondary market).

Exchange rate risk
It measures the uncertainty of returns of an investment denominated in a currency other than the investor’s base currency.

Country risk (also known as political risk)
This is the uncertainty of returns associated with the possibility of major changes in the political, social and economic environment of a country where the asset is held. This includes, but is not limited to war, rebellion, civil strife, foreign exchange restrictions on the repatriation of capital or profits, expropriation or nationalization of assets, barriers to trade, etc

These risk premia (or determinants) can be considered as an investment’s fundamental risk because they are the intrinsic factors that should affect an investment’s standard deviation ($\sigma$) of returns over time. The standard deviation, as you recall, is a measure of the investment’s risk.

Study Questions

Multiple Choice Questions

1. Financial markets promote economic efficiency by
   A) channeling funds from investors to savers.
   B) creating inflation.
   C) channeling funds from savers to investors.
   D) reducing investment.

2. You borrow money. Your cost (expressed as % per year) is commonly referred to as the
   A) inflation rate.
   B) interest rate.
   C) exchange rate.
   D) aggregate price level.
3. The primary function of banks and other financial institutions is:
   A) sound investment.
   B) financial intermediation.
   C) anticipation of market trends.
   D) facilitation of mergers.

4. When a bank helps to channel funds from savers to borrowers it engages in
   A) barter.
   B) indirect finance.
   C) financial intermediation.
   D) philanthropy.

5. Financial intermediaries
   A) act as middlemen between those with excess funds and those that need to borrow funds.
   B) play an important role in the money supply process.
   C) enhance the efficiency of the economic system.
   D) of the above.
   E) (A) and (C) only.

6. Commercial banks are different from non-bank businesses because their assets and their liabilities are:
   A) not liquid.
   B) mostly financial.
   C) only in real estate.
   D) owned by the government.
   E) regulated.

7. Which of the following is a depository institution?
   A) a commercial bank
   B) an life insurance company
   C) a pension fund
   D) a hire-purchase finance company

8. Which of the following are examples of financial intermediaries.
   A) Commercial banks
   B) Insurance companies
   C) Investment companies
   D) Credit unions
   E) All of the above

9. Firms that specialize in helping companies raise capital by selling securities are called
   A) commercial banks
   B) investment banks
   C) savings banks
   D) credit unions
   E) all of the above.

10. Investment bankers perform the following role(s)
    A) market new stock and bond issues for firms
    B) provide advice to the firms as to market conditions, price, etc
    C) design securities with desirable properties
    D) all of the above
    E) none of the above

11. Important trends changing the contemporary investment environment are
    A) globalization.
    B) securitization.
C) information and computer networks.
D) financial engineering.
E) all of the above

12. Markets in which funds are channeled from the surplus units (those who have excess funds) to the deficit units (those who have a shortage of funds) are called
A) commodity markets.
B) financial markets.
C) derivative markets.
D) real estate markets.

13. Financial intermediaries
A) act as middlemen between those with excess funds and those that need to borrow funds.
B) are not needed because they don’t really produce anything of value.
C) help promote a more efficient and dynamic economy.
D) all of the above.
E) (A) and (C) only.

14. Financial assets
A) directly contribute to the country's productive capacity
B) indirectly contribute to the country's productive capacity
C) contribute to the country's productive capacity both directly and indirectly
D) do not contribute to the country's productive capacity either directly or indirectly
E) are of no value to anyone

15. Which of the following are examples of financial assets?
A) bonds
B) houses
C) stocks
D) all of the above
E) (A) and (C) only

16. Financial assets permit all of the following except:
A) consumption timing
B) allocation of risk
C) separation of ownership and control
D) elimination of risk
E) all of the above

17. The securities that represent debt of governments or companies and pay periodic interest to investors as well as promise to repay the loan are:
A) mortgages
B) common stocks
C) bonds
D) commercial paper
E) none of the above

18. Investment banks
A) underwrite and sell new issues of stock and bonds on behalf of issuing firms
B) buy and sell securities on behalf of clients
C) design securities with desirable properties
D) all of the above
E) (A) and (C) only

19. The modern financial (and business) environment is changing due to
A) globalization.
B) securitization.
C) revolution in information and communications technologies.
D) financial engineering.
E) all of the above

20. Commercial banks, credit unions, and savings and loan associations that accept deposits that can be withdrawn with a check or a debit card:
A) create money in concert with the FED.
B) print U.S. currency.
C) directly buy and sell stocks.
D) are called thrift institutions.
E) invest all deposits in mortgage loans.

21. The major economic purpose of any financial system is to:
A) channel savings to their most productive uses.
B) collect taxes to support government spending.
C) generate monopoly profits for Wall Street.
D) provide checking and savings accounts.
E) balance surpluses between business and government.

22. Financial institutions facilitate economic efficiency primarily because:
A) laissez faire markets handle asymmetric information poorly.
B) corporate ownership must be stabilized.
C) they channel funds from individuals or organizations with surplus funds to those with shortages of funds.
D) market forces determine fair interest rates.

Essays, Problems and Applications

1. What is the role of financial intermediaries in an economy?

2. Describe in each of the following situations the concept, institution or instrument involved:
   a. Channeling funds from savers to borrowers.
   b. Market participants are price takers.
   c. Issuing loans for business investments or housing by individuals.
   d. Supervision of the banks that they follow prudent banking practices.
   e. The discount rate that banks pay to borrow from the Central banks influences the market interest rates.

3. Describe briefly the role of the following institution in the intermediation process:
   a. Depository institutions.
   b. Insurance companies.
   c. Pension funds.
   d. Securities firms.
   e. Finance companies.

4. Discuss the recent developments in the financial system and indicate what are the major financial innovations over the last 25 years.

5. Critically discuss the role and responsibilities of the financial system in the recent financial crisis and the severe economic recession.

6. Discuss the role of the following global change drivers on the financial system and on the field of investments: globalization, liberalization, financial engineering, securitization, ICT revolution,
7. Discuss the following ongoing trends as they relate to the field financial environment: globalization, financial engineering, securitization, and computer networks.

8. Identify and explain the various sources of uncertainty which affect the level of risk of various investments.

9. You bought 10,000 shares of Bank of Cyprus (BOCY) at the beginning of 2011 at €2.50 each share. The Bank distributed dividends during the year of 20 cents per share. The share price ended the year at 60 cents. What is the holding period return for the year?

10. An investor requires a nominal rate of return of 12% over the next year, and expects the inflation rate to be 4%. Using the Fisher equation, calculate the real required rate of return.