Module # 4 – Component # 1

Introduction to Investing in Equities

This Component:

- focuses on the basics of the Introduction to Investing in Equities.
- assumes a base level of financial theory, but attempts to add a level of practical application. We attempt to "fill the gap" between theory and practice.
- is one of many comprising the Investor Campus "Basics of Series".

Objectives

This module is designed as a basic introduction to Investing in Equities.

The following topics are covered:

- Investor's Required rate of return
- Real Risk Free Rate of return
- Nominal Risk Free rate of return
- Risk premium
- Security Market Line

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Introduction

Within the finance and investment setting, we will discuss an international perspective of risk and return aspects as well as other capital market concepts relating to portfolio management.

- **The investment setting:** relates to the concepts of rates of return, risk and security.

- **The asset allocation decision:** we discuss the importance and relevance of the asset allocation decision to the investor's lifecycle, whilst we also consider the goals and constraints of policy statements and institutional investments.

- **Global investments:** this discussion refers to diversification by entering global investment markets as well as factors such as exchange rates and risk that must be considered when investing internationally.

- **Portfolio management:** both locally and internationally, portfolio management refers to diversification of the investor's risk, assessing risk, understanding and comparing asset values and distinguishing between different portfolios.

- **Asset pricing models:** this includes the role of the capital market line (CML), assessing the security market line (SML) and its relationship to the capital asset pricing model (CAPM). We also consider arbitrage-pricing theory.

Investor's Required Rate of Return

The investor's required rate of return is one of the factors to consider when selecting securities for an investment portfolio. The required rate of return is the minimum rate of return an investor should accept from an investment, in order to compensate him or her for deferring consumption. In other words, an investor invests in an investment today in order to enjoy the benefits and rewards at a later stage.

The components of an investor's required rate of return that will compensate her for the risk taken are:

- The time value of money during the investment period
- The expected rate of inflation during the investment period
- The risk involved

We examine each of these components.

1) **The time value of money during the investment period.** The time value of money refers to the value of a sum of money at a future date that has been invested at a certain rate of compound interest over a certain period of time. For example, one may need to determine the future value (FV) of an investment of $100,000 over a 10 year period invested at a particular rate.

   Investors generally prefer to receive money from an investment sooner rather than later. Obviously, money received by an investor today can be invested in order to generate a greater or additional return tomorrow. Therefore, the earlier cash is received, the greater the potential for increasing wealth. If an individual is prepared to sacrifice the use of money for a specified time, some compensation is required in return.

2) **The expected rate of inflation during the investment period.** The rise (or fall) in inflation must be included in any calculation in order to reflect the value of the investment at a later date.

   This means that in times of rising prices the spending power of money decreases over time. Any lender would expect to be compensated for this decline in spending power. If the interest rate does not compensate the lender for inflation, the lender would be poorer when the capital is repaid than at the time when the loan was made.

3) **The risk involved** must also be included in the assessment of the required rate of return on an investment. Risk factors vary from one type of instrument to another or from one type of environment to another. The risk of investing in venture capital firms is high, but the returns expected should compensate for the risk taken.

   If there is some uncertainty that the capital amount will be repaid, a premium will be required by an investor. When there is a high degree of certainty about an investment's return, for example, in the case of treasury bills, the premium will be low. This is consistent with the most fundamental principles of financial management: that the return must be commensurate with the risk taken.

   The minimum rate of return required from any investment changes over time. This means that the rate of return does not remain constant but depends upon expected changes in the three variables that have been discussed. It is important however, for the investor to achieve a return that compensates him or her for the amount invested, taking into account any element of risk involved.

The Real Risk-Free and Nominal Rate of Return

The real risk-free rate (RRFR) is considered to be the basic interest rate, ignoring fluctuations in inflation as well as any type of future exposure to any circumstances that may arise and threaten the value of an investment. This means, that when determining the **RRFR** there is no accommodation for inflation or uncertainty.

In an economy where inflation does not exist, and where an investor can identify exactly what cash flows will be received at specific times, that investor will require the real risk-free rate as the rate of return on an investment.
Regarded as the 'pure time value of money', the real risk-free rate of interest is essentially **the price charged for the transfer between goods today and goods in the future.**

This exchange price is influenced by a **subjective factor,** which is the time preference of individuals for the consumption of income. In other words there is a trade-off for the investor. The investor invests today in order to increase his or her wealth in the future.

An **objective factor** that influences the real risk-free rate is the group of investment opportunities available in the economy.

In terms of the **subjective factor,** the strength of an individual's desire for current consumption impacts on the rate of compensation required. Time preferences differ amongst individuals, and the market establishes a composite rate of return that covers the preferences of all investors. The composite rate of return of all investors changes slowly over time. This is because investors in the economy, whose changes in preferences may offset one another, influence this composite rate of return.

The objective factor of available opportunities relates to the real growth rate of the economy, where a faster growing economy presents greater opportunities for investment and higher returns. A change in the growth rate over a long period of time can affect investment opportunities and hence the required rate of return on all investments. The real growth rate in the economy is linked to the RRFR.

Illustrative Example - Calculating the RRFR

If the rate of return that an investment yields during any particular year is 10%, and the rate of inflation is 7% during the same year, then the **RRFR** on this investment would be calculated as follows:

$$RRFR = \left[\left[\frac{(1 + \text{Nominal Rate of Return})}{(1 + \text{Rate of Inflation})}\right] - 1\right] * 100$$

$$RRFR = \left[\left[\frac{(1.10)}{(1.07)}\right] - 1\right] * 100$$

$$RRFR = [1.028 - 1] * 100$$

$$RRFR = 0.028 * 100$$

$$RRFR = 2.8\%$$

Nominal rate of return

While real rates of interest adapt to changes in the general price level, nominal rates of interest are recorded in actual money terms. This means that nominal rates of interest that predominate in the market are determined by real rates of interest, as well as anything that may influence the nominal rate of interest. In simple terms, the nominal rate of return will be determined by the real rate of return plus an adjustment for the rate of inflation as well as any other risk factors that may cause investor's to demand a higher return.

While the basic determinants of the RRFR may remain relatively stable over a period of time, the nominal rate of interest on a default investment tends to fluctuate over time. A T-bill is an example of a default investment. Studies on T-bills indicate that their nominal rates of return fluctuate dramatically over time; therefore the nominal rate of interest on a default investment is not stable.

Factors influencing the nominal risk-free rate (NRFR) are: the general flexibility in the capital markets (affected by supply and demand, that is the decrease in the growth rate of the money supply will reduce the supply of capital and increase interest rates), and the anticipated rate of inflation. The nominal rate of interest on a risk-free investment can change rapidly and is therefore not a good estimate of the RRFR.

Illustrative Example - Calculating the NRFR

If the RRFR is 18%, and the inflation is 7% the NRFR is calculated as follows:

$$NRFR = \left[\left[(1 + RRFR)(1 + \text{Rate of Inflation})\right] - 1\right] * 100$$

$$NRFR = \left[\left[(1.18)(1.07)\right] - 1\right] * 100$$

$$NRFR = \left[1.2626 - 1\right] * 100$$

$$NRFR = 0.2626 * 100$$

$$NRFR = 26.26\%$$

The Risk Premium

The risk premium is the excess return required by an investor over and above the NRFR as a result of the uncertainty about the expected rate of return. In other words, if there were no uncertainty about the return that an investment could yield, then an investor's required rate of return would equal the NRFR. However, there is uncertainty in the environment and so investors seek a risk premium in order to compensate them for bearing this risk.

An anticipated higher rate of return is generally required, if the risk involved is perceived as being high. The increase in the investor's required rate of return over the nominal risk-free rate is therefore referred to as the **risk premium (RP).** The risk premium arises due to a combined pool of all uncertain factors that may make the investment riskier for the investor. There are various factors that influence the risk and create uncertainty.

These factors include:

Business risk refers to the volatility of income flows as a result of the nature of an organization's business. If there is a degree of uncertainty as to when the organization's income will be received, investors perceive a higher risk and hence demand a higher return should they invest in the stock of that organization.

For example, a retail-clothing store may have seasonal peaks and troughs, but will still receive a steady flow of income over any particular business cycle. On the other hand, a mining company may experience spurts of income on a less frequent basis, and thus its earnings will fluctuate more dramatically over the business cycle. In the latter instance, the business risk is substantially higher for the investor than the former.

Financial risk is the uncertainty that relates to how a firm finances its investments. If a company uses common stock to finance the company, then this company will be subject to business risk only. Borrowing money from a bank or other financiers involves interest charges being paid by the company before providing income or returns to the shareholders, thereby increasing the uncertainty of the return to investors. The use of debt creates a fixed financing cost for the company, as interest has to be paid. The company is therefore exposed to greater risk, as it has to pay its interest. This risk is known as **financial risk.**

Liquidity risk refers to the uncertainty or ability of the investor to be able to convert an investment into cash in the secondary market, in order to use that cash for other purposes.

An investor expects an investment to mature and become saleable at a particular price in the future.

Liquidity risk is influenced by the time it will take to convert an investment into cash and the certainty of the price to be received.

An investment in a unit trust, for example, is a more liquid investment than an artwork, as it is saleable immediately at a market related price. Artworks usually take time to increase in value and unless the right buyer is found, it may not be saleable for some time. Therefore the risk of investing in unit trusts is lower.

Exchange rate risk is the uncertainty that investors experience when they purchase securities in a currency other than their own domestic currency. With globalization, investment in foreign assets is becoming more common and more risky as there is greater volatility in currencies worldwide. A British investor purchasing shares for investment purposes in South Africa, must not only be aware of the potential stock market fluctuations in South Africa, but also the currency uncertainty, so as not to lose out when he/she needs to convert the investment back to British pounds.

The more volatile the exchange rate between two countries, the less certain an investor would be regarding the exchange rate, the greater the exchange rate risk, and therefore the larger the exchange rate risk premium required.

Country risk or **political risk** relates to the uncertainty of returns as a result of political issues or changes in a country that may impact upon the economy. Developed countries such as the USA, UK and Germany are believed to have relative stability in the political environment and hence are regarded as low risk countries to invest in. However, countries like Zimbabwe and Argentina are developing countries with an unstable political environment and therefore present a high country risk for the potential investor.

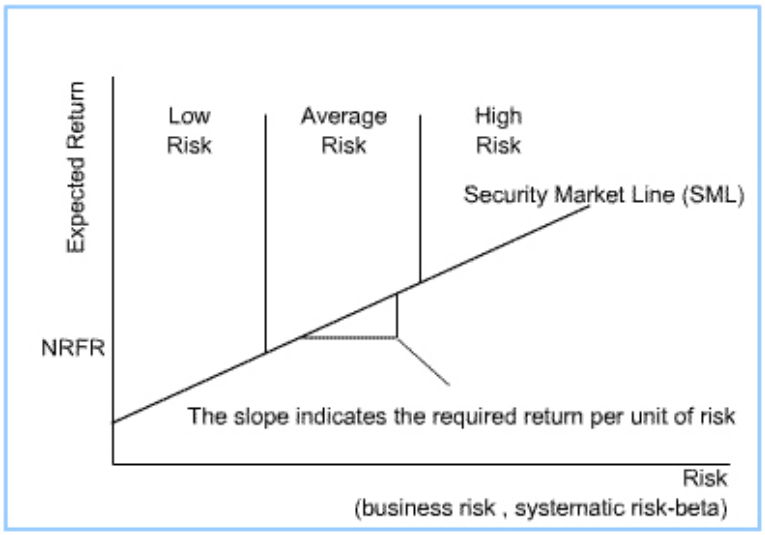
The risk premium is a composite of all the risk factors mentioned above. Therefore, investors should take cognizance of all of these issues when making an investment decision. For example, whilst the country risk may appear to be low, the liquidity risk within the stock market of that country may present a high risk.

The Security Market Line (SML)

The security market line reflects the various possible combinations of risk and return relationships of alternative investments.

As indicated previously there is a relationship between the risk and the return, required by an investor. The relationship between risk and return is such that investors require increased rates of return as perceived risk increases. The security market line (SML) indicates how the required rate of return increases as the perceived risk or uncertainty increases.

Investors will choose to invest in projects that suit their required risk profile. The slope of the security market line as indicated in the graph below, illustrates the required return per unit of risk. We see in the first part of the diagram that when the risk is low, the corresponding expected return is low. As one moves along the SML, the increasing risk indicates a corresponding increase in the expected return.



Factors that Cause Changes SML

Changes include: movements along, changes in the slope of, and shifts of the line

Three changes can occur with respect to the initial security market line. These are:

- Individual investments can change positions on the SML; movements along the SML
- The slope of the SML can change
- The SML can experience a parallel shift

Movements along the SML

Movements along the SML reflect changes in the perceived risk of a security. If a firm's investment risk changes due to a change in one of the risk sources, such as business risk, it will move along the SML. A movement up the SML signifies more risk and vice versa.

For example, if a company diversifies into a high-risk industry, an investment in its common stock (let us call this Asset A) will be perceived as being a more risky investment and therefore shareholders will require a higher rate of return. As an investment in a company's common stock becomes more risky for shareholders, Asset A will change its position on the SML. Asset A will move up the SML, indicating a change in the risk-return relationship of Asset A. Any change in the environment that results in a change in the risk factors that affect a particular investment will induce the asset to move along the SML line. Investors will consequently require a higher rate of return to compensate them for the higher levels of risk.

As an investment in the common stock of any company becomes riskier, the investment will change its position on the SML, as indicated in the graph above. Any change in the risk profile of an asset that signifies a change in that investment's primary risk factors or its market risk (beta), will cause a movement along the SML.
It is important to note that the SML is unchanged; only the position of individual assets on the SML can change.

Changes in the slope of the SML

Changes in the slope of the SML illustrate how the return required by investors per unit of risk has changed. The SML rotates counter clockwise about the risk-free rate when there is an increase in the risk and vice versa.

Assuming that the SML is a straight line as indicated in the graph above, it is possible to select any point on the SML and calculate an investor's required risk premium using the equation:

$$RP_i = E(R_i) - NRFR$$

Where:

- RP_i is the risk premium for asset i
- $E(R_i)$ is the return for asset i
- NRFR is the nominal return on a risk-free asset

A market risk premium can be determined if a point on the SML is identified as a portfolio that contains all the risky assets in the market, i.e. the market portfolio. Market risk premium can be calculated as follows:

$$RP_m = E(R_m) - NRFR$$

- RP_m is the risk premium on the market portfolio
- $E(R_m)$ is the return on the market portfolio
- NRFR is the nominal return on a risk-free asset

The market risk premium is not constant since the slope of the SML changes over time. The causes of the changes in the slope are not clearly understood, but we do know that there are changes in the yield differences between assets with different levels of risk, even though the intrinsic risk differences are constant.

The differences in yields are referred to as yield spreads, and these yield spreads change over time. Significant changes in a yield spread over a period where there is no major change in the risk characteristics of an investment, imply a change in the market risk premium. Although the risk levels of investments remain constant, investors have changed the yield spreads they demand to accept this relatively constant difference in risk. In other words, the slope of the SML changes as a result of the increased risk premium.

A shift or change in the slope (risk premium) of the SML will affect the required rate of return for all risky assets. Regardless of the position of an investment on the original SML, its required return will increase, although its unique risk characteristics remain unchanged.

Shifts of the SML

The SML will experience a parallel shift when there are changes in one of the following factors:

- anticipated real growth;
- capital market conditions; or
- the expected inflation rate.

An increase in anticipated real growth, capital market conditions or the expected inflation rate cause the SML to shift upwards and vice versa.

The parallel shift occurs as a result of changes in the above factors that affect all types of investments, regardless of their levels of risk.