3 Investors

3.1 Learning outcomes

After studying this text the learner should / should be able to:

1. Appreciate the ownership distribution of equities.
2. Analyse the motivation for holding equity.
3. Outline the statutory environment of investors.
4. Describe the various measures of return.
5. Describe the related concepts of return.
6. Describe the concept of risk.
7. Discuss the risk predisposition of investors.
8. Describe the measurement of risk.
9. Appreciate the relationship between risk and return.

3.2 Introduction

In this section we discuss the issues surrounding the investors in equities, including the concepts of risk and return in the equity market. The following are the main sections:

- Ownership distribution.
- Motivation for holding equity.
- Statutory environment of investors.
- Measures of return.
- Other concepts of return.
- Risks faced in holding financial assets.
- Risk predisposition or preference.
- Measurement of risk in the financial markets.
- Relationship between risk and return.
- Risk and return: the record.

3.3 Ownership distribution

Any discussion on the ownership distribution of equities should be done within the framework of the financial system; this is depicted in Figure 1.[11]

Equities are *issued by companies* (mainly local and to a small degree foreign) and held by:

- Certain financial intermediaries.
- Certain ultimate lenders.

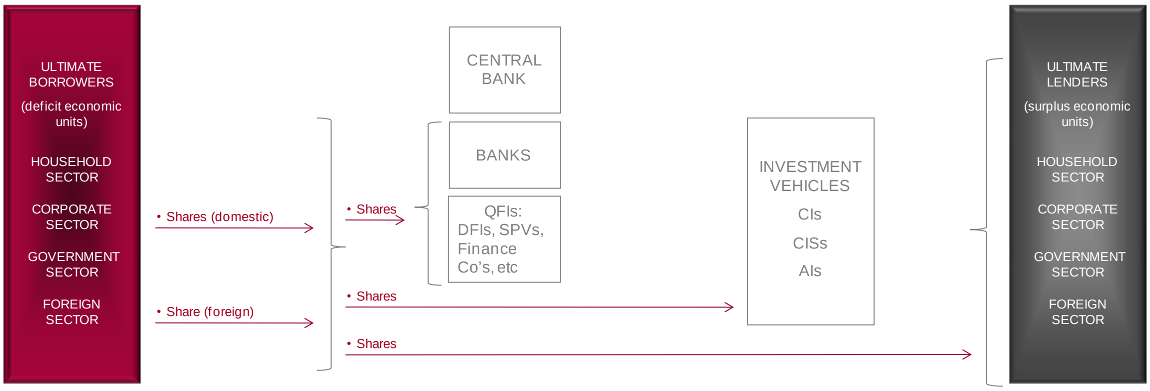


Figure 1: equity issuers & investors

DEPOSIT INTERMEDIARIES	
Central bank (CB)	0%
Private sector banks	<1%
NON-DEPOSIT INTERMEDIARIES (INVESTMENT VEHICLES)	
Contractual intermediaries (CIs)	
Insurers	40%
Retirement funds	40%
Collective investment schemes (CISs)	
Securities unit trusts (SUTs)	10%
Property unit trusts (PUTs)	0%
Exchange traded funds (ETFs)	8%
Alternative investments (AIs)	
Hedge funds (HFs)	2%
Private equity funds (PEFs)	<1%

Table 1: Estimated proportional investment in equities by the mainstream financial intermediaries

In most countries ownership distribution numbers of listed equities are not readiwy available for all the financial intermediaries. However, it is safe to assume that central banks are not holders at all and that the QFIs (probably only investment trusts / companies) and the private sector banks are relatively small holders of listed equities. This leaves the investment vehicles as the main holders (of the financial intermediaries), i.e. the contractual intermediaries, collective investment schemes and the alternative investments (hedge funds specifically).

It is safe to assume the numbers indicated in Table 1 is a fair reflection of the holdings of equities[12]. The insurers (long-term insurers mainly) and the retirement funds are the largest holders by a large margin. Next in line is the unit trust industry with about 10%, followed by the ETFs with about 8%. The hedge funds hold the balance of around 2%.

The split of the holding of equities between financial intermediaries and the ultimate lenders is not known, but an estimate of 30% / 70% respectively would not be unreasonable.

Of the ultimate lenders, it is safe to assume that the government sector is not a large holder of listed equities. It does hold equity in parastatals, some of which are listed. This leaves the foreign sector, the corporate sector and the household sector.

The foreign sector in many countries is a large holder of listed equities, but no clean data is available on their holdings. The corporate sector will also be a holder of listed equities as many listed companies have listed subsidiaries, but its holding will not be large.

The household sector is also large holder of equities. Many individuals have portfolios that are managed by themselves (of course because equities can be purchased in small denominations), by their stockbrokers and by fund managers. As in the case of the foreign and corporate sectors, numbers are not available in this regard.

3.4 Motivation for holding equity

The motivation for holding equity (and investment horizon) differs from investor to investor. The *household sector* (individuals) may hold equity for speculative reasons (short term horizon), to invest to earn a return for a special holiday planned for 5 years' time (medium term horizon), or for retirement reasons (long-term horizon).

Companies may hold equity in subsidiaries (long term) or, in the case of investment companies / trusts, for investment reasons on behalf of their shareholders (medium-term to long-term). The *foreign sector* may hold equity for a variety of reasons, such as long-term strategic holdings, making short-term capital gains, making a gain on the currency, or because the prices of local shares are inexpensive relative to their home equity market or other international equity markets.

Banks are small holders, and may also hold equity for a number of reasons, the main one being opportunistic profits (i.e. speculation). The *contractual intermediaries* and *CISs*, however, hold equity for long-term investment reasons. They are the custodians of much of the wealth of the nation, and because their funds under management increase continuously, they are permanent and increasing holders of equity.

In all the above cases, the other issue that influences decisions in respect of equity investment is of course the tax regime: tax rates and type of tax (capital gains, tax on dividends on investment vehicles and on individuals.

The common reason for all of the above holding equity is the *return* enjoyed in the long-term. Equities deliver superior returns relative to the other asset classes in the long-term. This significant issue is exploited in some detail later.

3.5 Statutory environment for investors

As noted above, the holders of equity may be categorised as follows:

- Ultimate lenders:
  - Household sector.
  - Corporate sector.
  - Government sector.
  - Foreign sector.
- Financial intermediaries:
  - Banks.
  - Investment vehicles:
    - CIs
    - CISs
    - AIs.

The household sector (individuals) is not constrained by any statutes in terms of their investment in the equity market. The same applies to the *corporate sector* (in their case there will of course be internal controls in this regard). The *government sector* holds equities mainly in public enterprises and there are no constraints in this regard. The *foreign sector* will be constrained by statutes applying in their respective countries.

For the *financial intermediaries*, there is an extensive statutory environment. The *banks* are constrained by the capital and other requirements of the banking statute.

The contractual intermediaries and the CISs have constraints placed on their equity investments and exposures to single companies under the statutes that apply to them.

3.6 Measures of return

3.6.1 Introduction

Risk is ever-present in all financial markets, and there is a trade-off between risk and return. As such it is important to understand these concepts and how to measure them. We consider the sources of return and explain how to measure *historical*, *average historical*, and *expected return*, and then elucidate the concept of *risk* and how to measure risk.

There are various ways in which returns may be computed. Here we consider:

- Holding period return (HPR).
- Annualised HPR.
- Arithmetic mean return.
- Geometric mean return.

3.6.2 Holding period return

The *sources of return* are twofold:

- Income (dividends in the case of equity; interest in the case of the debt market)
- Change in price (capital gain or loss).

The time an investment is held is the *holding period* (HP); *holding period return* (HPR) is therefore:

HPR = (price change + income) / purchase price.

This may also be written as:

$$HPR = [(P_1 - P_0) + I] / P_0$$

where:

P_0 = purchase price of share
P_1 = selling price of share
I = income amount.

Example:

I = LCC10
P_0 = LCC100
P_1 = LCC115

$$\begin{aligned} HPR &= [(115 - 100) + 10] / 100 \\ &= (15 + 10) / 100 \\ &= 0.25 \\ &= 25\%. \end{aligned}$$

The HPR in the case of debt instruments is the same as above but with the prices being the *all-in prices*: $HPR = [(AIP_1 - AIP_0) + I] / AIP_0$.

3.6.3 Annualised HPR

Individuals calculate the HPR of an investment for the period over which it was held; thus this measure of return is rarely an annual return. The annual return is captured in the *Annualised HPR*:

For example, if the HP in the example in the previous section was 2 years, the *Annualised HPR* is (n = number of years; less that a year = months / 12):

$$\begin{aligned}\text{Annualised HPR} &= (1 + \text{HPR})^{1/n} - 1\\ &= (1 + 0.25)^{1/2} - 1\\ &= 0.1180\\ &= 11.80\%.\end{aligned}$$

Similarly, if the HP in the example above was 6 months, Annualised HPR is:

$$\begin{aligned}\text{Annualised HPR} &= (1 + \text{HPR})^{1/n} - 1\\ &= (1 + 0.25)^{1/(6/12)} - 1\\ &= (1 + 0.25)^{2} - 1\\ &= 0.5625\\ &= 56.25\%.\end{aligned}$$

3.6.4 Arithmetic mean return

Other measures used in the financial industry are the *arithmetic mean return* (AMR) and *geometric mean return* (GMR). These are used to measure *average returns* over a *number of years* (n), because in some years returns are negative while in other years returns are positive.

The *arithmetic mean return* (AMR) is (Σ = Greek sigma = sum of):

$$\text{AMR} = \Sigma\ \text{HPR} / n$$

An example (non-dividend-paying share) is presented in Table 2.

	Share price	Income	Share price	HPR	AMR
Start of year 1	LCC20.0				
End of year 1		LCC0.0	LCC25.0	0.25	
End of year 2		LCC0.0	LCC20.0	-0.20	0.025 or 2.5%

Table 2: Example of mean return

$$\begin{aligned} \text{HPR (end of year 1)} &= [(P_1 - P_0) + I] / P_0 \\ &= [(25.0 - 20.0) + 0.0] / 20.0 \\ &= 5.0 / 20.0 \\ &= 0.25 \end{aligned}$$

$$\begin{aligned} \text{HPR (end of year 2)} &= [(P_1 - P_0) + I] / P_0 \\ &= [(20.0 - 25.0) + 0.0] / 25.0 \\ &= -5.0 / 25.0 \\ &= -0.20 \end{aligned}$$

$$\begin{aligned} \text{AMR} &= \Sigma\ \text{HPR} / n \\ &= [0.25 + (-0.20)] / 2 \\ &= 0.025 \\ &= 2.5\%. \end{aligned}$$

The problem here will be apparent: even though the investor earned zero return over the period of two years, this calculation says that the investor earned an average annual return of 2.5%.

3.6.5 Geometric mean return

The correct method to determine the annual rate of return over a number of periods (such as years) is the geometric mean return (GMR). Using the same example, the GMR is:

$$\begin{aligned} \text{GMR} &= [\Pi(1 + \text{HPR})]^{1/n} - 1 \\ &= [(1.0 + 0.25) \times (1.0 - 0.20)]^{1/2} - 1 \\ &= (1.25 \times 0.8)^{0.5} - 1 \\ &= 0.0. \end{aligned}$$

This says that the GMR is the nth root of the product (Π) of 1 + HPR for n years. It will be clear that the GMR measure is accurate, while AMR is considered a "rough" indicator.

3.7 Other concepts of return

3.7.1 Introduction

In the previous section we outlined the main return measures that are applied in the financial markets. In this section we cover the return concepts that are found in financial literature and have practical and theoretical significance:

- Risk-free rate.
- Expected rate of return.
- Required rate of return.

3.7.2 Risk-free rate

The risk-free rate (rfr) is a concept that has a centre-stage place in finance. It is a concept that some scholars have difficulty in defining (some have even said that it does not exist).

In our view the rfr is the rate on government securities (treasury bills – TBs – and government bonds) of the applicable term to maturity. For example, the applicable rfr in a 3-month option is the 3-month TB rate. If the intention is to hold shares for 5 years, then the relevant rfr (in the CAPM and the CGDDM[13]) is the 5-year government bond ytm, and so on…

The rfr is the lowest rate that can be earned for the relevant period with certainty. It is certain that the rfr rate will be earned because governments don't default[14] (because they have the authority to borrow and tax).

3.7.3 Expected rate of return

The expected rate of return (ER) applies to the future in the case of risky assets (particularly shares). An investment now in a 6-month treasury bill will provide a certain return, whereas an investment in a single share or a portfolio of shares will provide a return in the future that is unknown. It may be expressed as:

$$ER = [(P_1 - P_0) + I] / P_0$$

where:

P_0 = purchase price of share
P_1 = expected selling price of share
I = income amount expected (dividend).

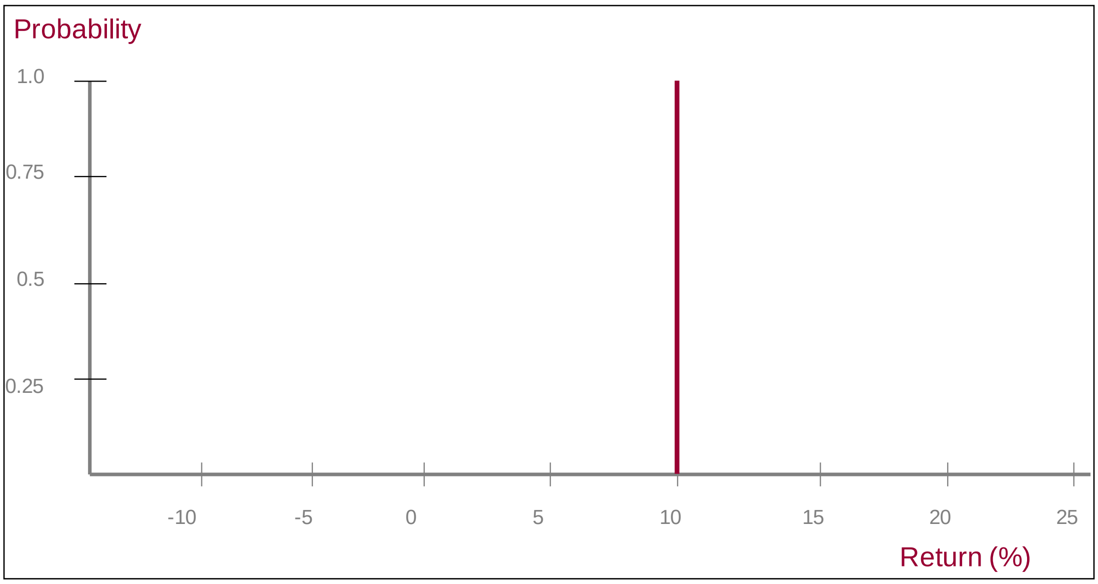


Figure 2: expected return and probability of return on a risk-free security

For example if the present price of the share is LCC10 and it is expected to be LCC12 in 6-months' time, and the expected dividend is LCC0.6, the ER is:

$$
\begin{aligned}
ER &= [(EP - P_0) + EI] / P_0 \\
&= [(LCC12 - LCC10) + LCC0.6] / LCC10 \\
&= LCC2.6 / LCC10 \\
&= 0.26 \\
&= 26\%.
\end{aligned}
$$

The concept *expected rate of return* introduces the *probability of return* because the return is not certain. Any person in the investment game *expects a particular return* from an investment but can *never be certain* about the return – except in the case of a risk-free asset. The latter case may be portrayed as in Figure 2. An investor buys a 3-month TB at a rate 10% pa and intends to hold it to maturity; the probability of receiving the return = 1.0.

Market conditions	Probability	Rate of return
Boom economic conditions ahead; inflation rising	0.25	15%
Moderate economic conditions; little inflation	0.60	10%
Weak economic conditions; falling inflation	0.15	2%
Total	**1.00**	

Table 3: Example of expected returns and associated probabilities

With the purchase of a share, no such certainty exists. The investor intuitively assigns or consciously is obliged to assign *probabilities* to the possible outcomes of the investment in equities. S/he may decide that the expected returns and associated probabilities are as presented in Table 3 and portrayed in Figure 3.

The ER on this investment (call it investment A) is the product of the weighted (by the probabilities – P) returns (R):

$$\begin{aligned} ER_A &= P_1R_1 + P_2R_2 + P_3R_3 \\ &= (0.25 \times 15\%) + (0.60 \times 10\%) + (0.15 \times 2\%) \\ &= 3.75 + 6.0 + 0.30 \\ &= 10.05\%. \end{aligned}$$

Another (ridiculous) example is presented in Table 4 (investment B).

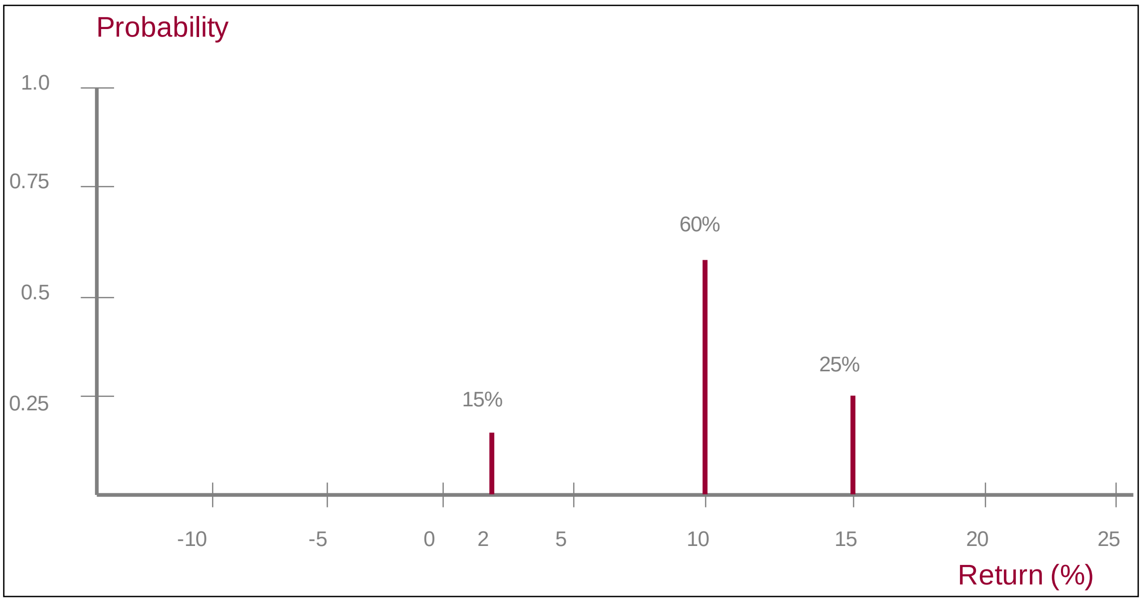


Figure 3: possible returns and probability distribution of returns on a risky security

Outcome number	Probability (P)	Rate of return (R)	Product (P x R)
1	0.1	-75%	-7.5
2	0.1	-60%	-6.0
3	0.1	-30%	-3.0
4	0.1	-15%	-1.5
5	0.1	0%	0.0
6	0.1	25%	2.5
7	0.1	45%	4.5
8	0.1	60%	6.0
9	0.1	70%	7.0
10	0.1	80%	8.0
Total	**1.0**		10.0 = ER

Table 4: Example of expected returns and associated probabilities

In this example the ER is the same as the ER in the case of investment A, i.e. 10%. However, it will be apparent that investment B is substantially more risky than in the case of investment A because the *outcome is highly uncertain.*

If the investor has a choice between the risk-free asset, investment A and investment B, s/he will no doubt choose the risk-free asset. Second choice is investment A, and last is investment B. This is because investors are *risk averse*, meaning that they will choose assets that offer greater certainty of return, or least uncertainty of return. To these concepts we shall return.

3.7.3 Required rate of return

The required rate of return (rrr) is a return concept that has pride of place in the CAPM, developed by Nobel Economics Laureate Prof William Sharpe. The essence of the model is that buyers of equity *require a particular rate of return* that is above the risk-free rate (rfr) and compensates them for the risk inherent in equity investments. Thus the rrr is made up of two elements: the rfr and a premium for risk.

What is the size of the premium? Is it a gut-feel approximation or is it based on something that can be measured? The answer is that, generally, the thinking investor would most like to base it on something, and that something is what happened to the particular market of which the share is a part (obviously the share market).

The accepted measure is the *volatility of return relative to the market* of which the share is a part. This "risk" is measured by the so-called *beta coefficient*. It measures the tendency of a share's return to fluctuate relative to fluctuations in the market (in practice a market index). We will return to this issue a little later.

3.8 Risks faced in holding financial assets

What is risk in financial terms? It is the degree of uncertainty that the realised return on an investment will not equal the expected return. It may also be expressed as the degree of volatility or variability in returns.

Past volatility is easy to measure. Future volatility is not and this is where the probability of return enters the picture.

Above we identified two sources of investment return: income and price change. To this we now add a third: reinvestment of income, which plays a substantial role in the final investment outcome. Thus we have three sources of investment return in the case of the financial markets:

- Income (dividends in the case of equity).
- Change in price (capital gain or loss).
- Reinvestment of income.

Investment risk thus arises from the *variability of return* in these sources. For example:

- Companies may perform badly from year to year and some may even go out of business. These events will affect the prices of the relevant shares.
- Earnings may change from year to year.
- Dividends may change from year to year.
- Interest rates may be volatile at times, which affects reinvestment income.

In investment literature risk is classified into two “types”: systematic risk and unsystematic risk. *Systematic risk* is defined as risks that are inherent in the financial and/or economic *system* (hence the name). Little can be done about this risk-type. Examples of this type of risk are:

- Tax changes.
- Upward changes in the central bank accommodation rate.
- Sudden change in the economic growth rate.
- Declaration of a war.
- A major change in the exchange rate.

Unsystematic risk is *security-specific* risk. This risk-type arises from the activities of the issuers of shares, i.e. the companies, and the industry of which they are a part, and may be seen as the *major factors* that affect the *income flows* of companies. Analysts generally categorise this risk-type into *business risk* and *financial risk*.

Business risk is the uncertainty of income produced by the company itself and/or the industry the company is a part of. Examples of business risk:

- Prolonged labour strike.
- Arrival of serious competition from offshore.
- Harmful management decisions.
- Negative change in product / service quality.

All these factors have an effect *on sales variability*, and this is one of the main determinants of income / earnings variability.

Financial risk is introduced when debt is utilised as a source of capital, and is used injudiciously by the company. Examples are borrowing at a time when rates are high and are about to fall, borrowing in excess of funding requirements and misuse of the funds so that the funds do not contribute to the income of the company.

Some analysts include *liquidity risk* as a third type of *unsystematic risk*. This is the risk of the segment of the share market in which the relevant share is being illiquid so that fair market value cannot be obtained.

Risk may be portrayed as in the Figure 4. Market (systematic) risk is out of the sphere of influence of the investor and the companies and this type of risk cannot be "diversified away". However, unsystematic risk can be "diversified away", by which is meant that risk is reduced by increasing the number of shares in the portfolio. Although this subject is the domain of portfolio theory, it is touched upon in the following section.

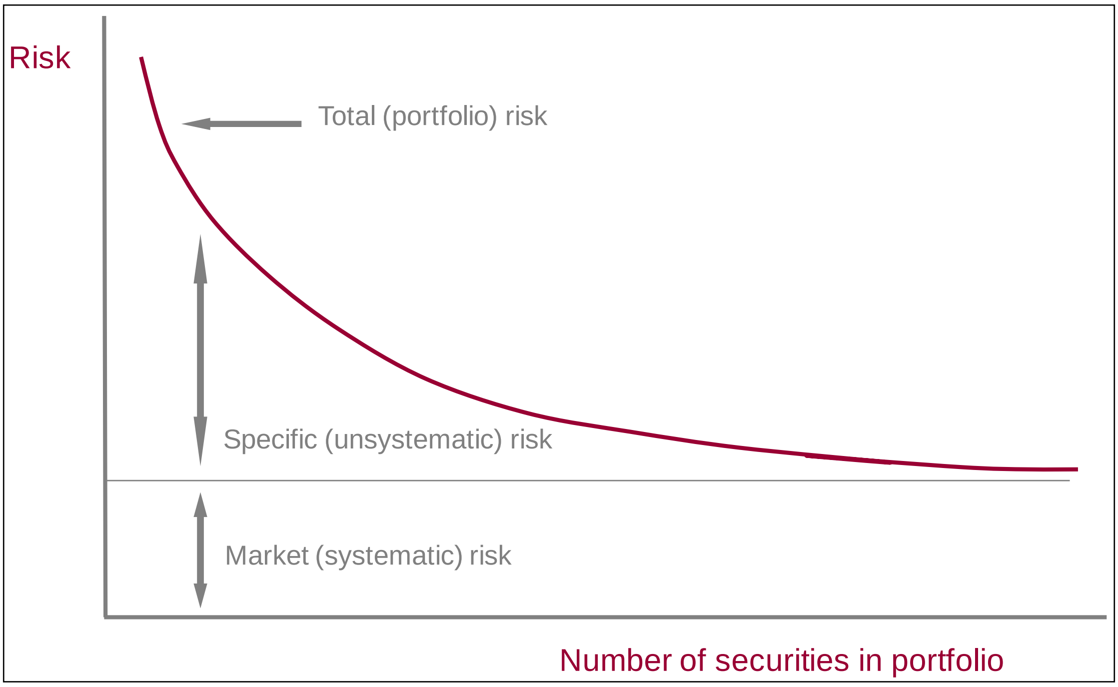


Figure 4: risk

3.9 Risk predisposition

Investors have one of three basic predispositions or preferences for risk: risk-seeking, risk-indifferent and risk-averse (see Figure 5). The *risk-indifferent investor* is not a wise one because s/he is willing to accept more risk without expecting / requiring a higher rate of return.

The *risk-seeking investor* has a brain problem because s/he is willing to accept more risk for a decline in return (in fact the risk-seeker will not be an "investor" for long, but a deficit economic unit). The *risk-averse investor* is the normal investor, i.e. s/he has a healthy attitude toward risk, and will only accept more risk if there is a chance of a higher return. This means that s/he requires or expects a higher return for a greater level of risk.

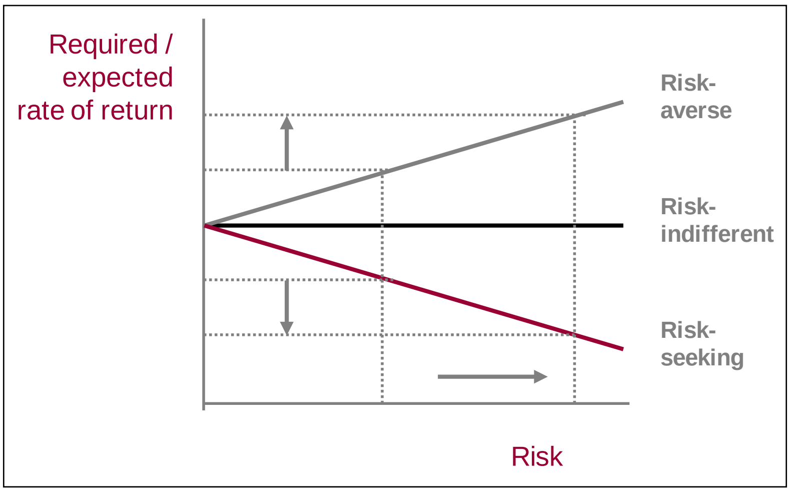
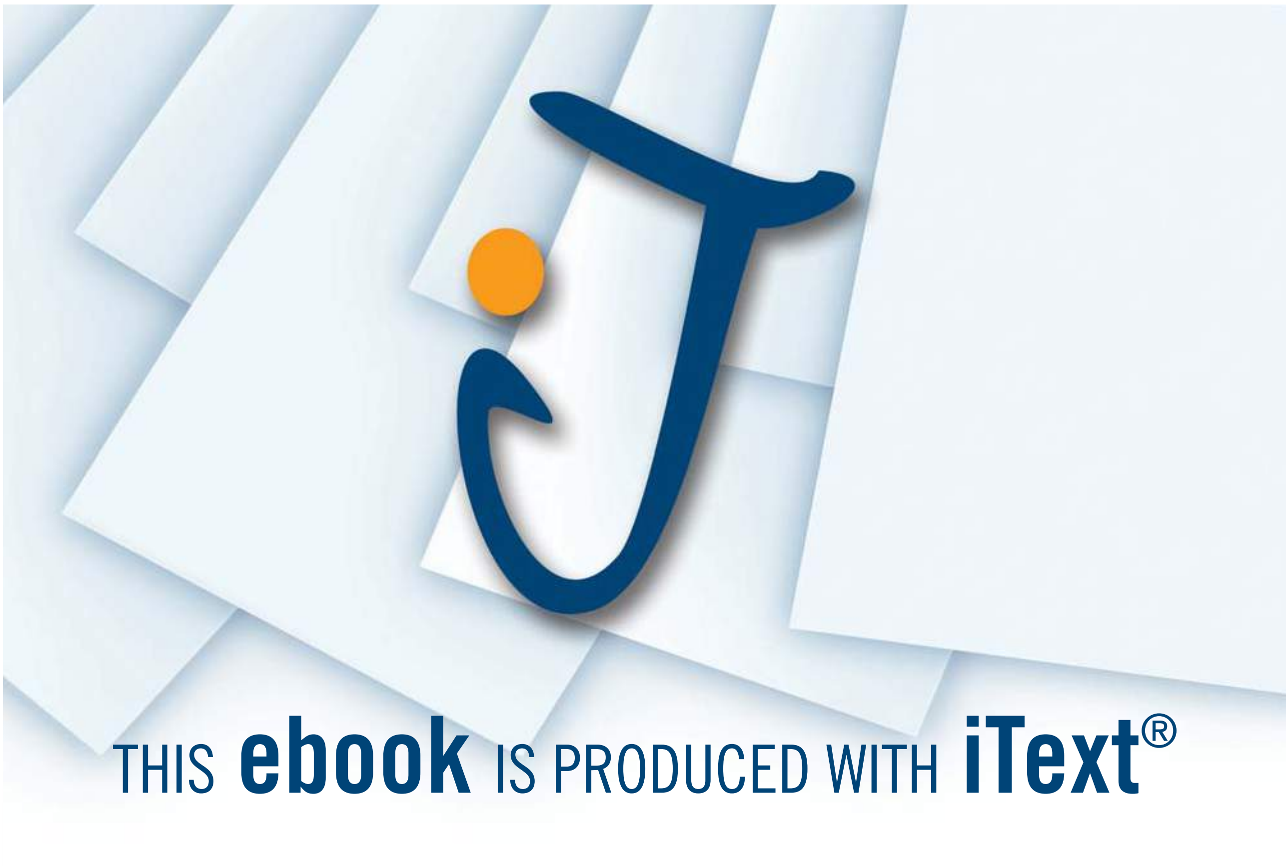


Figure 5: risk profile



3.10 Measurement of risk in the financial markets[15]

3.10.1 Introduction

Risk is defined as uncertainty in respect of whether the realised return will equal expected return. Risk is seen as either:

- The extent to which return varies from the average return, i.e. *variability of return*. This is measured by the *standard deviation* of expected rates of return. This measure measures total risk.
- The *volatility of return relative to the market* of which the security is a part. This risk is measured by the so-called *beta coefficient*. It measures systematic risk (the area below the horizontal line in Figure 4).

Both *historical data* and *expected rates of return* may be used in the computation of risk. The former employs existing "hard" data and the latter employs expected rates of return (ER) and their associated probabilities (P).

Thus we have two measures of risk: *standard deviation* and *beta*. It must be added that some analysts also regard *variance* as a measure of risk; it is, but it is a blood relative of standard deviation (it is the square of the standard deviation as we shall see).

3.10.2 Standard deviation (one asset)

We start with four possible outcomes of an investment (share A) and associated probabilities of outcome (see Table 5).

We showed earlier that the *expected rate of return* on share A (ER_A) is computed as follows:

$$ER_A = P_1R_1 + P_2R_2 + P_3R_3 + \dots$$

Using the numbers in Table 5:

$$\begin{aligned} ER_A &= (0.15 \times 25\%) + (0.40 \times 15\%) + (0.25 \times 0\%) + (0.20 \times -5\%) \\ &= 3.75\% + 6.0\% + 0\% + -1\% \\ &= 8.75\%. \end{aligned}$$

Outcome: Number	Expected rate of return (R) (share A)	Probability (P)
1	25%	0.15
2	15%	0.40
3	0%	0.25
4	-5%	0.20
		1.00

Table 5: Expected rates of return and their associated probabilities (on one share)

We are now able to compute the *variance of expected rate of return* (σ^2), and the *standard deviation*, which if the square root of the σ^2, i.e. σ. The variance is the weighted sum of squared deviations from the expected return. The reason the deviations are squared is that positive and negative deviations from the ER contribute in the same way to the measure of variability.

We can now calculate the σ^2 on share A:

$$\sigma^2_A = [P_1 \times (R_1 - ER_A)^2] + [P_2 \times (R_2 - ER_A)^2\} + [P_3 \times (R_3 - ER_A)^2] + [P_4 \times (R_4 - ER_A)^2]$$

$$= [0.15 \times (25.0 - 8.75)^2] + [0.40 \times (15.0 - 8.75)^2] + [0.25 \times (0.0 - 8.75)^2] + [0.20 \times (-5.0 - 8.75)^2]$$

$$= (0.15 \times 264.06) + (0.4 \times 39.06) + (0.25 \times 76.56) + (0.2 \times 189.06)$$

$$= 39.61 + 15.62 + 19.14 + 37.81$$

$$= 112.18\%.$$

The σ, as noted above, is the square root of the σ^2, and it is equal to 10.59%. Again, this is a measure of the *dispersion around the mean* (i.e. the average return). The higher the standard deviation, the higher the risk is.

It may be useful to provide an example of computation of the variance in the case of the use of *historical data* (see Table 6).

$$\sigma^2_A = \Sigma\,(R_t - R_A)^2 / n - 1$$

$$= [(25.0 - 8.75)^2 + (15.0 - 8.75)^2 + (0.0 - 8.75)^2 + (-5.0 - 8.75)^2] / 3$$

$$= (264.06 + 39.06 + 76.56 + 189.06) / 3$$

$$= 568.74 / 3$$

$$= 189.58$$

$$\sigma_A = 13.76\%.$$

Year	Annual return (share A)
1999	25%
2000	15%
2001	0%
2002	-5%
Mean	**8.75%**

Table 6: Annual return on share A

3.10.3 Standard deviation (a portfolio of shares)

The standard deviation of a portfolio may also be computed by including more than one asset. A portfolio has an average return and dispersion around the average return.

The standard deviation of a portfolio is the square root of the sum of (in the case of a two share portfolio):

- The squared standard deviation of the return of the first asset times its squared weight in the portfolio, plus
- The squared standard deviation of the return of the second asset times its squared weight in the portfolio, plus
- Two times the weight of the first asset times the weight of the second asset times the covariance of the two assets.[16]

This will not be discussed further here; it is the matter of *portfolio theory.*

3.10.4 Beta

As seen above, the second risk measure is the *volatility of return relative to the market* of which the security is a part. This risk is measured by the so-called *beta coefficient*. It measures the tendency of a share's return to fluctuate relative to fluctuations in the market (in practice a market index).

If a share has a beta of 2, this means that the share has a tendency to rise / fall twice as much as the market over the chosen period of time, i.e. when the chosen index rises by z percent over a period, the share has a tendency to rise by 2 × z percent.

The beta is an important input in the *required rate of return* (rrr), which is the "rate" mostly used in the valuation of equity (the CGDDM).

Essentially, the rrr has to be determined in some way to take account of the risk inherent in equity, i.e. there must be a risk premium for equity. Much research has been done on determining the correct rrr, and the one most followed is the *Capital Asset Pricing Model* (CAPM) estimate.

According to the CAPM the rrr is equal to the risk-free rate of interest plus a multiple of the market risk premium as represented by the share's beta coefficient:

$$\text{rrr} = \text{rfr} + (\beta \times (\text{mr} - \text{rfr}))$$

where

rfr	= risk-free rate
β	= beta
mr	= market rate of return, i.e. the return observed over the period chosen
mr – rfr	= the premium over the risk-free rate.

3.11 Relationship between risk and return

In penultimate conclusion we touch upon the relationship between risk and return. Figure 6 shows this relationship, and it is evident that the relationship is positive, i.e. the return required increases as risk increases. This is so because investors are *risk averse*.

The relationship is represented by what is termed the *capital market line* (CML which is used extensively in portfolio literature). If investors were risk seeking, the CML would be negatively sloped.

The slope of the CML depicts the extent of additional return expected / required for additional each unit of risk assumed.

There is ample empirical evidence to support the slope of this line: money market at bottom left, bonds in the middle and equities top right. This is covered next.

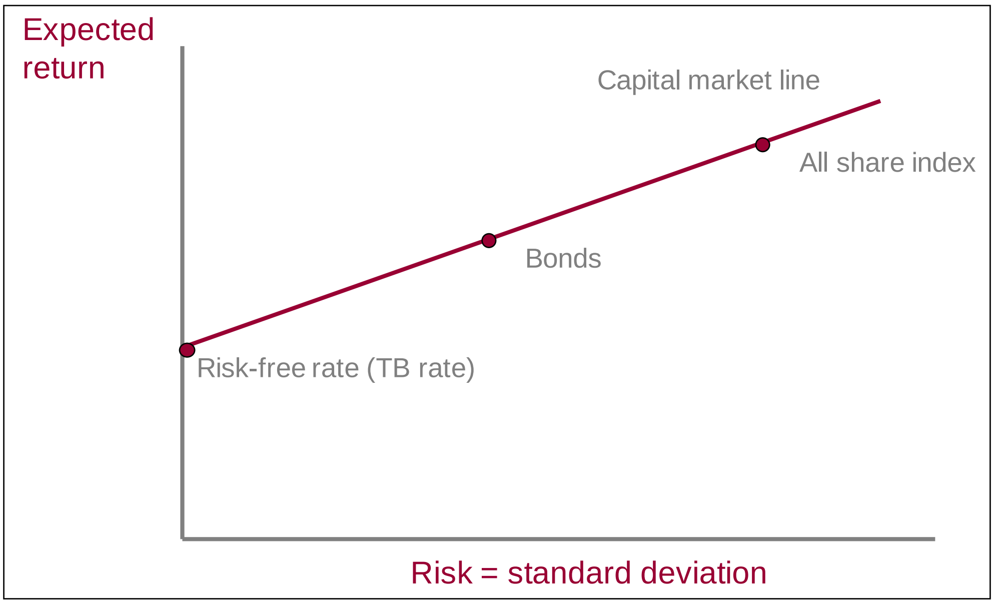


Figure 6: relationship between risk & return

3.12 Risk and return: the record

Fortunately, data is available on the risk and return relationship of the three main asset classes:

- Equities
- Bonds
- Cash (i.e. money market).

Figure 7 shows the average annual returns and the standard deviations of the asset classes for a period of 108 years (1900–2007). The evidence is indisputable: higher returns are accompanied by higher risk (= dispersion around the mean return). This fits in well with Figure 6.

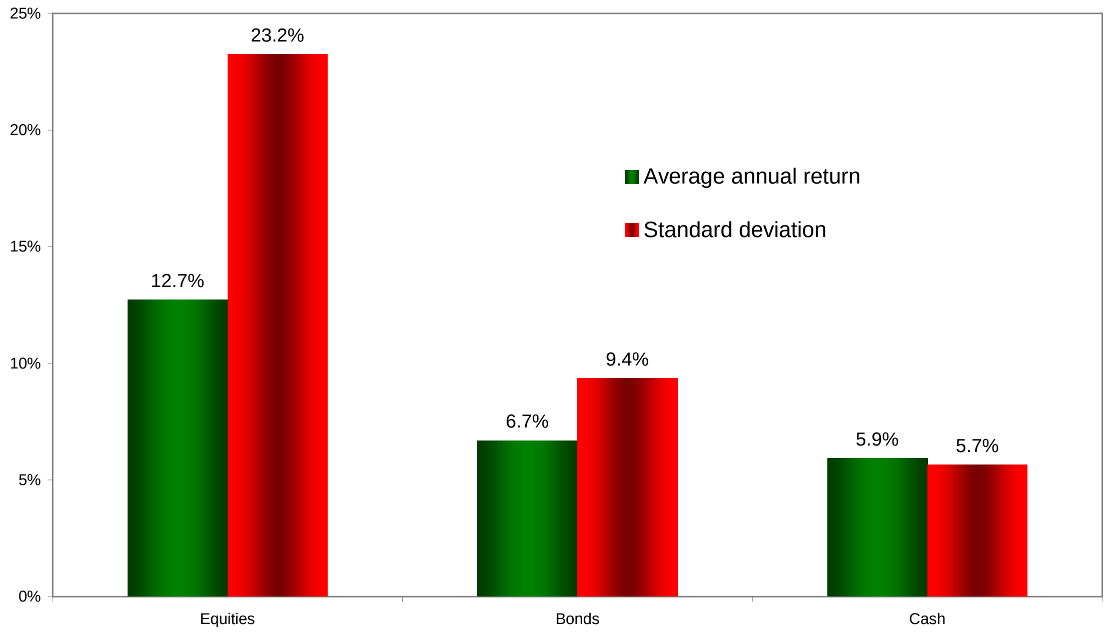


Figure 7: RSA: average annual returns & STD (108 years)

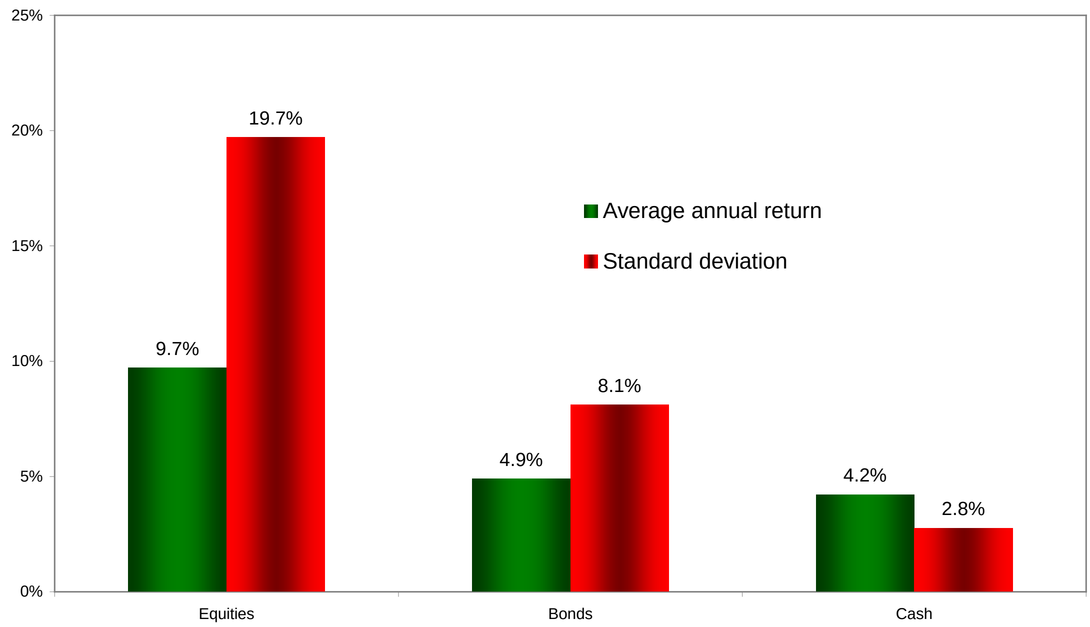


Figure 8: USA: average annual returns & STD (108 years)

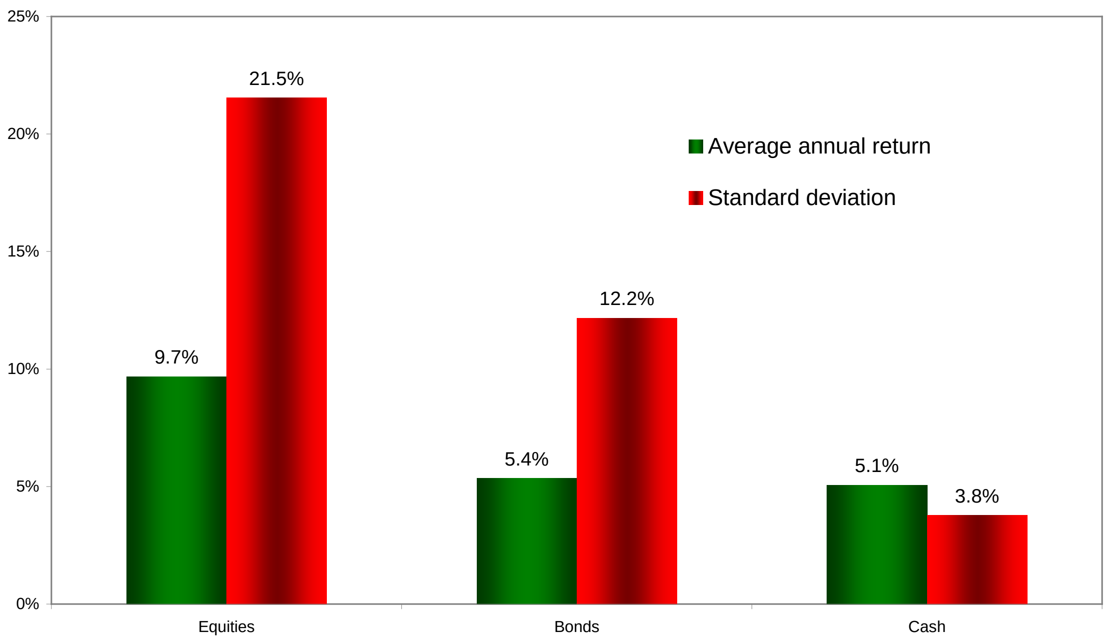


Figure 9: UK: average annual returns & STD (108 years)

Similar numbers are recorded for the USA and the UK (see Figure 8 and Figure 9).

It will be understood that when the averaged numbers are disaggregated into higher frequency numbers the variability of returns (risk) is revealed. Figure 10 shows the annual average returns for bonds and Figure 11 shows the same for cash. Note that the scales are the same.

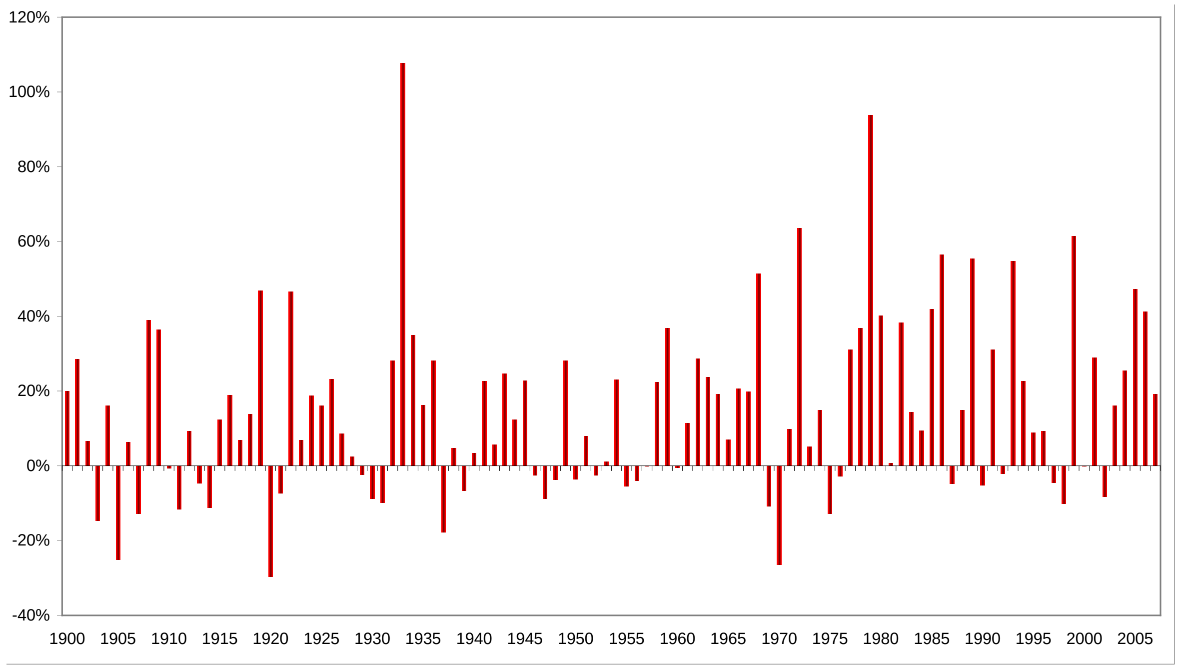


Figure 10: SA: equities: annual returns (1900–2007)

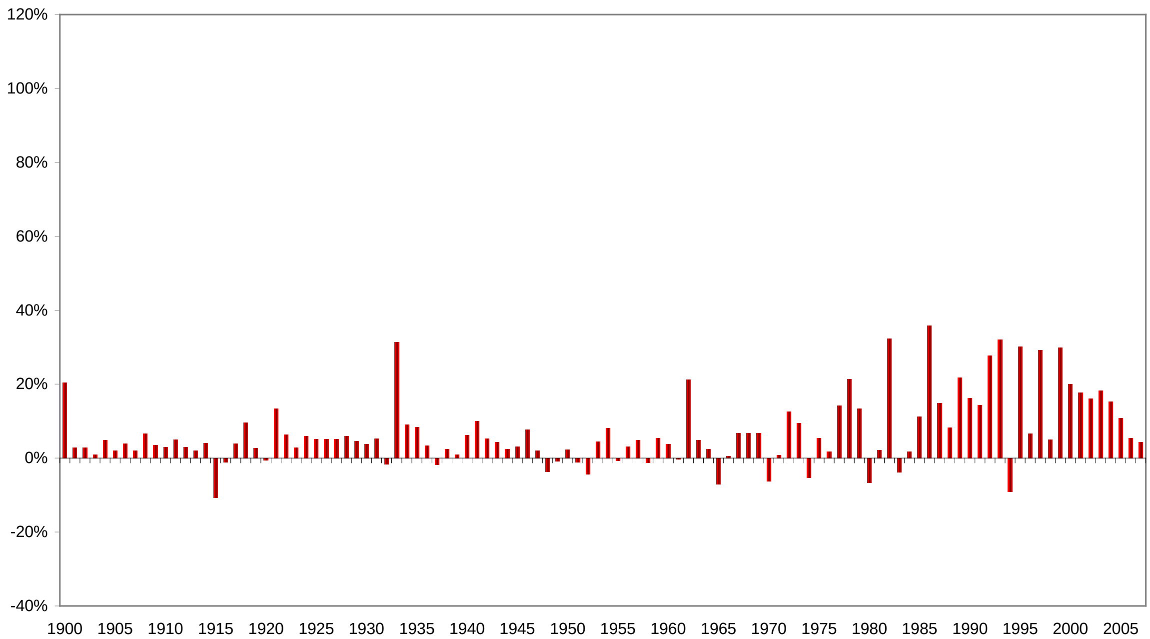


Figure 11: SA: bonds: annual returns (1900–2007)

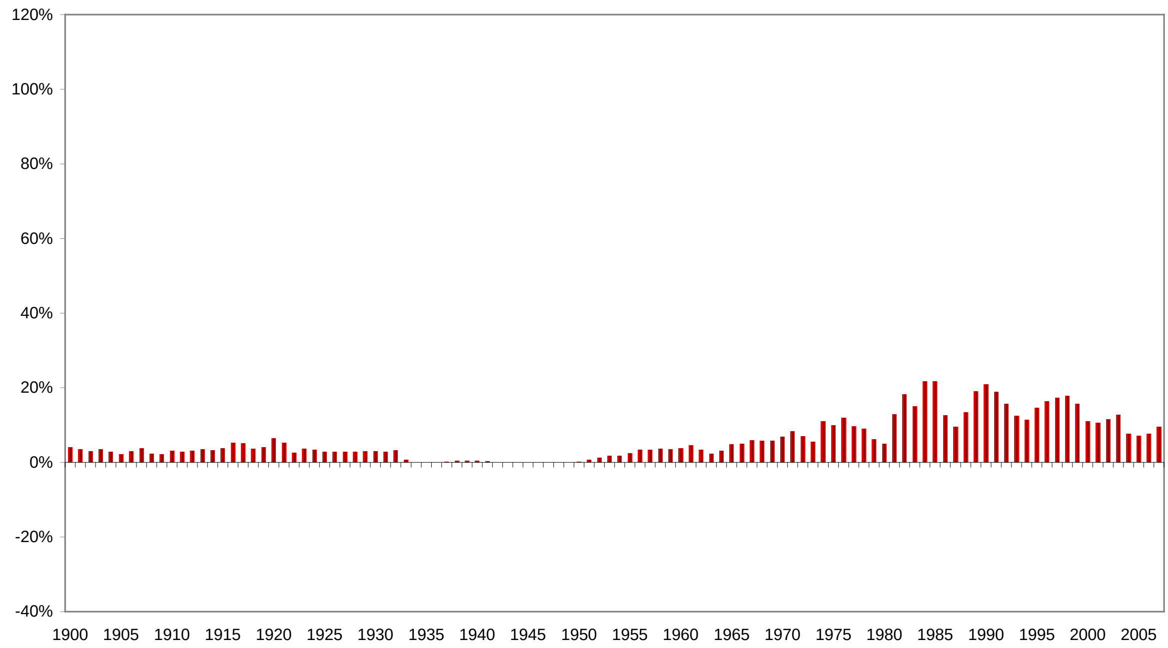


Figure 12: SA: cash: annual returns (1900–2007)

3.11 Summary

Equity is held by all the ultimate lenders and certain of the financial intermediaries (particularly the retirement funds, insurers and the CISs). There are risks in holding equity and this is measured by the standard deviation of expected returns and beta. Investors are risk averse and express this by demanding more return for more risk, as reflected in the securities market line. The risk and return relationship is borne out in the risk-return records over many decades.

3.12 Bibliography

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