

## FE5002 Corporate Finance and Investments Assignment 003

### Individual Report on Performance of an Investment Portfolio

#### Background

An investment portfolio was set up on Friday 28<sup>th</sup> February 2020. The sum invested was £1,000,000. The portfolio consisted of two shares in FTSE100 stocks and a Gilt. The portfolio was liquidated a year later on Friday 26<sup>th</sup> February 2021.

#### Requirements

You are required prepare a report that:

- Determines the return before taxation on each of the three securities and the portfolio as a whole over the investment period (52 weeks)
- Assesses the level of risk taken for each of the three securities and for the overall risk of the portfolio.
- Evaluates and comments on the performance of the investment portfolio relative to the FTSE100 with consideration of risk and return.
- Discusses how the portfolio may have been hedged and any difficulties obtaining a perfect hedge.

The report must be supported by spreadsheets that show how the calculations underlying the report have been undertaken.

#### Weighting

50%

#### Word limit

A report of 3000 words in a Microsoft Word Document plus supporting calculations in a Microsoft Excel document.

**Submission date:** Monday 24<sup>th</sup> May 2021 by 3:00 p.m.

**Submission:** Submission should be made online using Turnitin on Weblearn.

Your report and your spreadsheet must have your student number as the first part of filename.

For example: *10004068 Assignment Report.doc* (for the report)  
*10004068 Assignment Calculations.xlsx* (for the calculations)

## **Assessment Criteria**

The assignment will be assessed on the following:

- Demonstration of an understanding of risk and return
- Ability to explain the analysis undertaken in the evaluation
- Selection of appropriate data and analysis using spreadsheets to determine measures of risk and return.
- Quality of interpretation of the results.
- Demonstration of critical and analytical thinking in discussion and the drawing of conclusions.
- Clarity of the report and quality presentation of data.

## **Guidance for the Assignment**

### **Portfolio selection**

You will select the portfolio yourself. In selecting the portfolio you should:

- Select two shares quoted on the FTSE100 and one gilt.
- Determine the amounts invested in each. You may select any proportions of the three investments. However, to make the process straightforward it may be desirable to balance the proportions in a relatively simple way. For example e.g. 1/3 in each or 40% in each of the shares and 20% in the gilt. Each of the three securities should constitute a minimum of 10% of the portfolio.
- Do not try to select the portfolio for any specific criteria. It is not necessary to create a portfolio with any specific risk or return in mind. The report will assume that someone else has selected the portfolio and you are reporting on the outcomes at the year end.

### **Measures of investment performance**

To analyse the risk and the return of the investments you should calculate the following:

- The return on each investment (the bond and the two shares)
- The risk of each investment (the bond and the two shares). You will need to calculate the standard deviation of the share returns and their betas. You may also do this for the bond (but note that you would expect the beta for a bond should be close to zero).
- The portfolio returns and portfolio risk measured by standard deviation and beta
- Use performance measures such as Sharpe, Treynor, Jensen and the differential based on standard deviation for the shares and the portfolio

### **Data sources**

All the data required for the exercise can be obtained from Bloomberg and this is the easiest and fastest source to use. However you may also use Yahoo Finance for source data for FTSE100 shares. This can be accessed at <http://uk.finance.yahoo.com/>. To obtain data on government bonds you can use the UK Debt Management Office website at <http://www.dmo.gov.uk/index.aspx?page=Gilts/Data> but note that this website is quite slow.

### **Simplifying assumptions that can be made**

To simplify the calculations you can make the following assumptions:

- Assume that the investment was made at closing prices on 28<sup>th</sup> February 2020.
- Assume that the investment was liquidated at closing prices on Friday 26<sup>th</sup> February 2021
- You may assume that coupons and dividends were recorded and received on the payment day. This is not technically correct since dividends are paid to the person who holds the investment on the 'record day' which precedes the actual payment. There is a possibility that the share could have been sold at the ex-dividend price just after the record day and the dividend will accrue to the previous owner. The same concept applies to the coupon of a bond.
- Assume that dividends are not reinvested but are held in a bank current account with no interest accruing.
- To determine the risk you only need to consider the annual returns for a same investments maturing during the investment period. You should use **weekly** data for this.
- Beta can be calculated for one year (it is normally calculated over a longer period and hence the beta quoted may differ from your calculation).
- Assume that the risk free rate over the period of investment was 2%

### **Data required**

You will need to download the following data into a spreadsheet.

*For each of the shares*

- Share closing prices from Friday 1<sup>st</sup> March 2019 to Friday 26<sup>th</sup> February 2021. You will require the prices for the year prior to the investment to determine the average return over the year and the standard deviation of returns.
- Dividend payments and their dates during the period Friday 1<sup>st</sup> March 2019 to Friday 26<sup>th</sup> February 2021.

*For the Bond*

- Bond closing prices from Friday 1<sup>st</sup> March 2019 to Friday 26<sup>th</sup> February 2021. Again you will require the prices for the year prior to the investment to determine the average annual return over the year and the standard deviation of returns.
- Coupon payments and their dates during the period Friday 1<sup>st</sup> March 2019 to Friday 26<sup>th</sup> February 2021.

*For the FTSE 100 Index*

- The closing index levels from Friday 1<sup>st</sup> March 2019 to Friday 26<sup>th</sup> February 2021. Again you will require the prices for the year prior to the investment to

determine the average annual return over the year and the standard deviation of returns.

- The annual dividend yield for the index

You may also download other information which is relevant to your report and evaluation.

### **Calculation of return on the investments, the portfolio and the FTSE100**

It is easy to determine the return at the end of the period. The basic equation was covered in the lecture of week 10. This is how to calculate the return on a share.

$$R = \frac{D + P_1 - P_0}{P_0}$$

For a bond the Dividend (D) is replaced by the coupon (C).

For the FTSE100 index the capital gain is the closing index value minus the closing index value. The return in terms of the capital gain is therefore:

$$\text{Return in terms of capital gain (loss)} = \frac{\text{Index Value}_1 - \text{Index Value}_0}{\text{Index Value}_0}$$

To this you will need to add the dividend yield for the index to get the total return

### **Determination of risk**

You should determine the risk of the individual investments and the portfolio as a whole using:

1. Standard deviation (unsystematic risk)
2. Beta (systematic risk)

### **Calculation of average returns on shares and their standard deviation (shares)**

The data required for this is:

- Closing weekly prices for the year from 28<sup>th</sup> February 2020 to 26<sup>th</sup> February 2021
- Closing weekly prices for the year from 1<sup>st</sup> March 2019 to 28<sup>th</sup> February 2020
- Dividends and their dates for the two years.

To calculate the standard deviation of returns (also required for calculating the two share portfolio risk and beta) the annual returns for over the whole year of investment needs to be determined. This requires determining the weekly returns for investments made for one year that were placed in the previous year.

This can be calculated easily on a spreadsheet by listing the share prices for the two years and matching the previous year price with the investment year price to determine the capital gain/loss. It necessary to add to the share prices any dividends that were paid over the period. Dividend are usually paid semi-annually or quarterly with one or three interim dividends and a final dividend (usually larger than the

interims)

The total of capital gain plus dividends is then divided by the investment price at the beginning of the period to obtain the return.

#### **Calculation of average returns on shares and their standard deviation (Gilt).**

The same approach can be taken with the bond but coupons are used in the calculation rather than dividends. Note that coupons are usually paid semi-annually.

#### **Calculation of average returns on shares and their standard deviation (FTSE 100).**

Again the annual return over the whole year of investment needs to be determined this time using two years of FTSE100 data. This requires determining the weekly returns for investments made for one year that were placed in the previous year. In each week the dividend yield for the FTSE100 needs to be added to the capital gain.

### **Calculation functions in EXCEL**

#### **Calculation of average return**

Having calculated the returns over 52 weeks, the average return over the year can easily be found using the AVERAGE function in Excel.

#### **Standard deviation of returns**

This can be calculated using the STDEV function in Excel.

#### **Calculation of Covariance of the two shares**

The COVAR function in excel enables you to calculate the covariance between the returns of the two shares. It can also be used to determine the Covariance between an individual investment and the market (FTSE100 returns over the period)

#### **Calculation of the Correlation Coefficient**

The CORREL function in Excel enables you to calculate the correlation coefficient between the two shares.

## Presentation of your coursework

- You are expected to include elements required by a formal report.
- You should use headings to aim the structure of your report.
- You should submit your coursework with an official cover page which you can generate and download from your Evision. You may also produce your own cover page which may include information such as the title of your report, coursework, module code, module title, name of the school and date for submission. You should **NOT** display **your name** on this cover page and any other pages of your coursework.
- You should choose Times New Roman with font of size 12 and double spacing to present your work.
- Your coursework should be submitted online via Turnitin on Weblearn.

## Warnings

- The coursework submitted should be your own work.
- The use of any other person's work constitutes plagiarism and is an assessment offence.