

Faculty of Science and Engineering

Coursework 2023/24 Academic Year

Module Code: MATH525
Module Title: Business Analytics
Module Leader: A. Cardinali
School: Engineering, Computing and Mathematics

DEADLINE FOR SUBMISSION: 3pm, Thursday 14 December 2023

SUBMISSION INSTRUCTIONS FOR CANDIDATES

Referred coursework must be submitted electronically using the online submission facility in the DLE by the published deadline.

If you have any queries on submission or in relation to the referred work, please contact the Module Leader in the first instance, if they are unavailable please contact the Faculty of Science and Engineering on 01752 584584 immediately so any problems can be rectified.

Answer **ALL** questions.

If you require any part of this publication in larger print, or an alter-native format, please contact:

Faculty of Science and Engineering

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Notes

The candidates should read these notes before attempting the task.

Rationale

An important area of study in this module is the ability to analyse company financial statements and market data. This report is a group assignment that will involve the analysis and interpretation of two companies' financial data comparing two reporting years (2022 and 2021). The two companies that you will analyse and compare are listed in the file 'List of Companies' on the DLE.

You will analyse the two companies assigned to your group. If you consider other companies the assignment will not be marked.

The Coursework will assess the following learning outcomes for MATH525:

- Analyse and critique a range of financial statements included in company annual reports in the context of business decision making.
- Effectively present and communicate the analysis results to suggest appropriate solutions for management decision problems.
- Critically evaluate, apply and communicate data analytical solutions for decision making to practical financial and business case applications.

Data Collection

You can download complete company reports for the required years from the company websites.

Alternatively, you can download from FAME Database the 2021 and 2022 Statement of Financial Position and Income Statements for the two companies assigned to your group. You can access FAME Database via PRIMO (Electronic Library).

You will also need market data (share values) for the two companies, covering at least the two years 2021 and 2022. You can download these data from the Yahoo Finance website.

Software

We recommend the use of R/Rstudio software as discussed during lectures and workshops. The various analyses could also be accomplished using other software (e.g. Excel) and the final choice is left to the students.

Coursework task

Preliminary tasks

Before analysing the financial statements you will need to aggregate some items. Two templates are available through the DLE webpage as Excel (.csv) spreadsheets. You can use those to perform the required aggregation. This will simplify significantly the successive analyses. You will need to list the aggregations, as discussed during the relevant Workshop sessions. This list will be included in the relevant appendices (see below).

Report content

Your report should include the following content:

- An introduction which includes the aim of the report and a short profile of each company. This can include a size analysis of the statements based on appropriate figures.
- A critical analysis of the financial statements of the two companies. This should include a vertical and horizontal analyses and a ratio analysis based on relevant ratios. The analysis should be coherently linked, rather than being just descriptive. You will use the ratios described in Lecture 4 slides (from the DLE webpage), and two more ratios which are relevant according to the changes in the financial statements between two periods. Relevant tables and figures and their captions are required here and will be excluded from the word count.
- A critical analysis of the share prices data conducted by means of the Capital Asset Pricing Model (CAPM). You will calculate the log-returns for the series of closing prices for the companies, then will evaluate whether the shares for the two companies are overpriced/under-priced, and therefore which of the two companies represents the best investment opportunity. Relevant figures and their captions are also required here, and will be excluded from the word count.
- Your conclusions should include recommendations as to which company represents the best investment and why. The recommendations should be coherently linked with the previous tasks, i.e., the analysis of financial statements and the analysis of market data. This section is a summary (conclusion) of the overall analysis performed.
- At the end of your report you will include the following appendices (max one A4 page each):
 - A. List of aggregations to fit the balance sheet template.
 - B. List of aggregations to fit the income statement template.
 - C. Aggregated balance sheet and income statement for company A.
 - D. Aggregated balance sheet and income statement for company B.
 - E. Calculations of the two additional ratios chosen by you, see above.

- Individual reflective reports (one for each peer), discussing each contribution to this Coursework and your reflections on the tasks you performed and on the skills you acquired.

Report structure

The report should be formatted in terms of the sections listed below. Size limits are applied to each section as follow:

1. Cover page
2. Table of contents
3. Introduction & Company Profiles (between 900 to 1000 words)
4. Analysis of the Financial Statements (between 900 to 1000 words)
5. Analysis of market data (CAPM) (between 900 to 1000 words)
6. Recommendations & Conclusion (between 900 to 1000 words)
7. References (max one A4 page)
8. Appendices (overall, max five A4 pages)
9. Reflective reports (between 400 to 500 words)
10. Peer assessment factors (add this page only if weights are not equal)

You will be penalised if you exceed either word count limits for each section.

Reflective reports

Each report should be titled by the corresponding student registration number. All the individual reports should be included in each submission, since all candidates are expected to submit the same material.

Peer assessment factor (PAF)

In case the workload has not been equal among all peers, you should include a page where the workload split is represented by percentages associated to the corresponding student registration numbers. You should not include this page If this page in case of equal workload.

Submission

The report should be submitted as a PDF file, along with the original data files (financial statements data and market data), and should be uploaded to the submission point on the DLE webpage for this module. Marks for submissions received up to 24 hours past the deadline will be capped to 40%. Submissions receive after 24 hours past the deadline will receive 0.

Plagiarism

Please note that the university guidelines on plagiarism will be adhered to. This report *must* be your own work and steps will be taken to investigate *all* instances of plagiarism, in any form, and appropriate action *will* be taken. This includes using the work of another student or copying directly from a company's annual report. If you take information from an annual report it should be referenced appropriately or including in quotation marks if you haven't summarised the information in any way. You may also self-review coursework prior to submission using the University's Turnitin software. This tool assesses the originality of pieces of academic writing and detects potential academic offences such as plagiarism.

Main Report Marking Guide

Please see the full rubric – full marking criteria below

- To obtain a **pass (40 - 49%)** you will be expected to produce a report which gives a basic comparison of the companies' financial position and performance. This may be mainly descriptive in nature but some analysis is expected. You will be expected to use ratio analysis as a part of your comparison. It is up to you to decide which ratios you will use for the analysis but you will be marked on the relevance and accuracy of the ratios chosen.
- A **good (50 - 59%)** report, however, would provide more evidence of analysis and interpretation of the information presented and would not restrict itself to ratio analysis. The report would include some further analysis such as vertical or horizontal analysis. There may be some consideration of limitations to the analysis. The company profile would contain some comparable information.
- A **very good (60 - 69%)** report would include more extensive analysis of the financial statements of both companies with evidence of critical analysis and evaluation. The report will consider key risks. Limitations to the analysis will also be considered although these may be at a basic level considering mainly general limitations. The company profile would contain a range of comparable financial metrics.
- An **excellent (70%+)** report would include an extensive analysis providing evidence of excellent critical analysis. The report will support the analysis with a wide range of evidence and take into consideration key risk factors. There will be a clear indication of key limitations to the analysis of these particular annual reports rather than just general limitations to ratio analysis. There will be a good clear comparison of both companies with evidence of various comparative analyses, rather than pure description. The company profile would contain a range of comparable financial metrics, recent performance indicators and data which will assist the reader understand the differences in size and nature of the two companies.

Individual Reflective Report Marking Guide

Please see the full rubric – full marking criteria below

- To obtain a **pass (40 - 49%)** you will be expected to produce a report which lists your tasks and briefly discuss your overall experience.
- A **good (50 - 59%)** report would contain, in addition to the above content, more reflections on your tasks.
- A **very good (60 - 69%)** report would include, in addition to the above content, more extensive reflections, including what you learned in terms of business analytics skills
- An **excellent (70%+)** report would include, in addition to the above content, more in-depth reflections overall, and will also include some individual reflections on the comparison of the two companies

Final Coursework mark

This is calculated as:

$$\text{Individual mark} = \text{main report mark} * \text{PAF} * 0.8 + \text{individual report mark} * 0.2$$

where PAF is the Peer Assessment Factor. For example, given a score of 30 (%) in a group of four, this is calculated as:

$$\text{PAF} = \text{your score} / \text{equal score} = 30/25 = 1.2.$$