

GUIDELINES FOR MASTER OF SCIENCE INTERNSHIP THESIS

Dear Participant of the MScAS Program,

If you have chosen to follow an internship, one of the requirements is to write a Thesis. This document gives you some guidelines on how your internship thesis should look like.

1 WHAT IS AN INTERNSHIP THESIS?

Your internship should have as content a **practical problem**, and you should apply previously acquired academic knowledge to propose and possibly implement a solution. This means that your thesis should identify the problem, identify alternative solutions, propose one solution, and then indicate how the proposed solution should be implemented within the company or the financial institution in which your internship took place. It is most important that the student demonstrates in this thesis deep understanding of the received body of academic knowledge pertaining to the domain of his or her studies.

The Thesis being, in essence, a **demonstration of academic maturity**, several adjacent criteria follow. The Master's candidate must demonstrate sufficient command of basic academic research activities, including: (1) ability to review and summarize received relevant literature (including an ability to discern which literature is relevant and which is not); (2) ability to identify and accurately define the problem that is being investigated; (3) ability to define and describe tangible objectives for the research work; (4) ability to choose and apply appropriate research methods to solve the problem from a theoretical point of view; (5) ability to analyze empirical data and draw appropriate and reasonable conclusions and recommendations; (6) ability to implement the solution of the problem in actual practice.

Accordingly, the internship Thesis should include the following elements:

- (1) definition of the research problem
- (2) literature review of pertinent received literature on the topic
- (3) choice and description of research methods
- (4) analysis
- (5) identification of alternative solutions
- (6) assessment of alternative solutions with a set of evaluation criteria, recommending one solution
- (7) proposing an action plan for implementing the proposed solution

2 HOW EXTENSIVE SHOULD THE THESIS BE?

There is no established criterion for the extent of an internship Thesis in terms of page numbers (assuming 11 or 12-point font, normal page margins, and 1,5-line line-spacing). What is critical is the content, not extent. Usually, though, an internship Thesis in Actuarial Science tends to range **around 20 to 40 pages**, including the cover sheet, tables of contents, and full references.

3 HOW SHOULD THE THESIS LOOK LIKE?

Every Internship Thesis should be of **publication quality**, meaning that it could be uploaded on the website of the Master's program. This means that the company or financial institution, within which the work got elaborated, could use the document and give it to its clients. You clearly understand that a thesis containing mistakes of language, form or intellectual content could not be distributed.

Depending on the requirements of the company or financial institution, the thesis may be published on the internet, be partially publishable, or confidential. In all cases, following the internship guidelines, the thesis should be distributed to the professor responsible for the grading of the thesis and the supervision, to the expert and obviously to the company where the internship took place. In all cases, the thesis should follow the outline discussed below.

If the company agrees that the thesis may be published on the internet, a non password protected pdf file should be transmitted to the executive assistant of the program who will then place the file on the internet. If the thesis is to be kept confidential, great care should still be paid in the writing of the thesis since the company or financial institution may still wish to distribute the document to its clients. However, in this case, only the paper version should be remitted.

The copyright to the work will belong to the author in any case.

The students are to add the following disclaimer on the first page of the Master of Science internship thesis: "The work is the responsibility of the author, in no way does it engage the responsibility of the University, nor of the supervising Professor".

In case of a professional or commercial use, the University rules apply.

During the internship the usual confidentiality rules apply (see article 321 and 162 of the swiss law).

3.1 Title Page

The title page of the thesis should include the following information (an example copy will be provided later):

- a) Title of the thesis
- b) Author(s) name, institutional affiliation, study program affiliation
- c) Date
- d) Name of company, department where thesis got written, responsible for the thesis
- e) Name of professor who supervised the thesis
- f) Name of expert who participated at the thesis defense.

The title page should be numbered as page 1, even though the page number should not be marked on this page. The subsequent pages (abstract, table of contents, etc) are then numbered consecutively.

3.2 Abstract

The title page will not carry any abstract. Instead, the title page should be followed by an abstract page, which should include, in addition to the information above, English- and French-language abstracts of the thesis. Also, the abstract page should list the thematic keywords of the thesis (see below). The abstract page should not exceed one page, which means that the abstract itself can be up to ½ pages long.

The abstract goes on an unnumbered page after the title page, but before the executive summary (see also below).

3.3 Keywords and JEL Classification

The thematic keywords for the paper should be included in the abstract, under the heading "Keywords".

The JEL (Journal of Economic Literature) Classification should appear following Keywords, under the heading "JEL Classification". You may find the classification codes under <http://www.aeaweb.org/jel/guide/jel.php>
Two to three JEL codes should be provided.

3.4 Executive Summary

The abstract page can be followed by an executive summary, of up to 2-3 pages, in English language. The executive summary should state the research problem, list main findings, and discuss the main conclusions emanating from the work. The goal of the Executive Summary is to explain to the reader what

the question asked is, why it is interesting, as well as to describe the main elements of the answer provided and contrast it with those provided in the antecedent literature..

3.5 Format

The thesis should be printed on A4-size paper, using one-sided printing mode.

3.5.1 Headings

All headings should be consecutively numbered, with arabic numerals, starting from 1. The only exceptions to this rule are: (1) title page; (2) abstract; (3) table of contents; (4) lists of tables and figures; and (5) list of references. These titles are NOT numbered.

Appendices (e.g., statistics software syntaxes, questionnaires, etc) are numbered consecutively, with latin (roman) numerals, starting from I.

All headings should use a sans-serif font, such as Arial.

Higher- and lower-order numerals in second, third, and fourth-order headings should be separated with a dot, as shown in this document. Note that the last numeral must NOT be followed by a dot! (E.g., "3.1.2 Xxx..."). Normally, only up to third-order headings should be used.

Every chapter of the thesis begins with a first-order heading. The first-order heading should always be preceded by a page break (a new first-order heading always starts a new page; note that this custom is not followed in the present document). A 16-point font should be used, with capitalized letters and bold typeface.

Second-order headings should be numbered consecutively, with sub-chapter numbering separated with a dot, as shown in this document. A 14-point bold typeface should be used, with capitalized first letters of the word, using the English custom. Second-order headings should be preceded by two empty lines (altogether 24 points).

Third-order headings should be numbered consecutively. A 12-point bold typeface should be used, with capitalized first letters of the word. Third-order headings should be preceded by one empty line (12 points).

3.5.2 Spacing

1,5 line spacing should be used (i.e., not double- or single-spaced).

3.5.3 Margins

All margins should be 2,5 centimeters: both sides, top, and bottom.

3.5.4 Body Text

All body text should be justified. The body text font should be Times New Roman, with 12 point size. Paragraphs should be separated by an empty line. The first lines of paragraphs should not be indented.

3.5.5 Pagination

All pages are numbered, except the title page. Indicate the page number (total number of pages in parenthesis) on the top right corner of the page. In the page footer, separated by a 0,5 -point paragraph border on top, you should mark your own name and thesis title, as indicated in this document.

3.5.6 Tables, Figures

Tables and figures should be integrated into the paper, not provided at the end of the paper itself. Tables are numbered consecutively for each chapter (e.g., 'Table 4.1' for the first table of the fourth chapter). Table headings are marked above the table.

Figures (includes graphs, charts, diagrams, photos, etc) are numbered consecutively for each chapter (e.g. 'Figure 3.3' for the third figure of the third chapter). Figure headings are marked under the figure.

3.5.7 Table of Contents

The table of contents follows Executive Summary. Sub-headings should be appropriately indented. Page numbers should be indicated.

3.5.8 List of Figures, List of Tables

Lists of figures and tables follow the table of contents. Each list begins a new page.

4 Content

The first paragraph of every thesis should provide the introduction. Typically, the following structure is used:

- 1.1 Research problem
- 1.2 Literature review
- 1.3 Research methods

- 1.4 Analysis
- 1.5 Alternative solutions
- 1.6 Evaluation & recommendation
- 1.7 Action plan (who does what, when, what the critical milestones are, how much it all costs, what risks can be avoided...etc)

The background chapter lays out the **domain of the work** as well as the broad research problem. What are we dealing with here? Why is it important? What is the general issue? What is known and what remains to be answered?

Specific, **tangible research questions** should be stated in a separate chapter. What specific questions do we seek to address? Why are they important?

Tangible, **measurable objectives** should also be listed separately. What are our tangible objectives, and what do we want to achieve? The objectives should be formulated in such a way that it is possible for an external reader to assess whether they have been achieved.

A brief **description of the methods**, as well as the empirical context and sample, should also be provided.

Optionally, the candidate may also wish to define the **scope of the thesis**, in terms of empirics, issues to be included in the exploration, and issues excluded from the thesis.

The introduction chapter provides the blueprint of the thesis. It lays out the foundation upon which the thesis is built.

The introduction chapter is followed with a literature review: a review of received pertinent academic (and sometimes managerial) literature. The literature review should be well structured and discuss potential sub-themes and potential research streams and underlying theories separately. The literature review should document what is known of the research problem and where the gaps are in received knowledge. Quite often, in Master's Theses, the candidate creates a summary or a synthesis of the literature, perhaps in the form of a model, structured illustration, or something of the like. The literature review can also produce a set of hypotheses for empirical testing, for example. Whatever the conclusion, it is important for the candidate to add her own intellectual contribution to the literature review and not simply recite received works. The candidate should also demonstrate an ability to critically review received works and provide her own assessment of these. E.g., what are the limitations of received works? What is their domain of applicability? What explicit and implicit assumptions do they build on? What is the significance of received works for the research problem at hand?

After the literature review, the thesis should proceed to discussing and justifying the choice of empirical context and the research methods to be applied. It is important that the literature review, its synthesis, and the methodological and empirical choices are compatible with one another.

After the method section, the thesis should proceed to discussing analysis and findings. The structuring of this section depends on the research method chosen.

The thesis should conclude by discussing the implications of the findings, both for received theory and for managerial practice. What was found, and how does this add to our received understanding of the problem domain? What do these findings mean for theory? And what are the managerial implications? What should managers do? How does the finding affect the financial institution?

The discussion section should conclude by honestly discussing reliability and validity limitations, as well as general limitations of the study. What were the main contributions, and how strong and generalizable are they? An honest discussion of limitations serves to demonstrate the academic and intellectual maturity of the candidate.

5 Appendices

Appendices should provide the research instruments used (e.g., questionnaires), as well as possible syntax files of statistical software packages. The version number of the software package used should be provided. In empirical theses, also the empirical data, as well as the syntax file, should be included with the thesis so that the analyses can be verified if necessary.

6 Research Ethics and Good Practice

The thesis should appropriately **cite all the articles, books, and internet sources** (e.g., texts downloaded from the internet, program codes and syntaxes obtained from the internet) from which information has been drawn. Direct quotations of received sources can be used, but these must be clearly marked as quotations. Chained referencing of sources should be avoided (i.e., if a source article references another article, the candidate should find the original source and use this as reference).

The input and help obtained from other persons and organizations should be acknowledged in a preface. The thesis should be honest about its own contributions and limitations. Ideas received from others should be

appropriately acknowledged. No confidential information should be published without express consent by the source. When collecting the empirical data, ethical practices should be used. For example, all interviewees should know for which purpose they are being interviewed, and the objectives of the project should be made clear to them. While the recording of semi-structured interviews is recommended, the interviewee should always be asked for permission to record. No direct quotes from individual interviewees should be given, unless the interviewee has given his or her consent, or, alternatively, the identity of the person is concealed. No confidential or unethically obtained information should be used or published.

For established norms in plagiarism avoidance, consult:

<http://www.plagiarism.org/>

or

<http://www.indiana.edu/~wts/wts/plagiarism.html>

Good luck!

Do not hesitate to contact the Professor in charge of your internship supervision if you have any question about your thesis.