Guidelines for Writing a Seminar Paper, Bachelor Thesis, or Master Thesis

under the supervision of

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Contents

These guidelines are designed to help you write a paper or a thesis under the supervision of Prof. Rainer Winkelmann. Your adherence to these recommendations helps to avoid time-consuming formal revisions of your work. Thus, please read these guidelines carefully.

1 Technicalities

1.1 Goal, duration of the work, and grading

A Bachelor or Master thesis is a graded piece of work that scientifically treats a topic of the chosen field of study. The candidate composes it autonomously. The duration of work is six months both for Bachelor and Master theses.

At the latest on the last day of the deadline, the thesis must be submitted by 23:59 by email to: deansoffice@oec.uzh.ch. No confirmation of receipt will be sent. You are not permitted to submit your thesis by placing it in the Dean's Office mailbox.

A thesis that is not handed in on time is considered failed. The thesis is then graded. The result is communicated to the candidate in written form. The candidate should make the used data sets and programming codes electronically available upon request.

For further information, read the guidelines on bachelor or master degrees in the Faculty of Economics, Business Administration and Information Technology (available on-line).

1.2 Length

The benchmark for a *seminar paper* is 10–20 pages for the normal text.

The benchmark for a *bachelor thesis* is 20–30 pages for the normal text.

The benchmark for a *master thesis* is 30–40 pages for the normal text.

Note that exceeding these benchmarks without the consent of the advisor is not an attribute of quality, leading to a decreased grade.

1.3 Language

The paper/thesis may be written in German or English. We recommend writing your thesis in English, preferably in American English. In any case, you should pay attention to a neat style. Many typos or grammatical errors affect the grade negatively.

1.4 Font, formatting, and duplication

A common font should be used. The imprint can be one or two sided on DIN A4 paper. There should be a 4cm margin on the left-hand side, all other margins are 3cm. Use a 12pt font (proportional fonts are permitted) and 1.5 line spacing for the normal text. Use 10pt and 1.1 line spacing for the short summary at the beginning (abstract) and for footnotes. The pages are numbered continuously. Grouped style is desired. Hyphenation should be used.

Writing the thesis with the text processing program LaTeX is desired and facilitates in particular complex formulas and formatting the text. Using another text processing program is also possible, e.g., Word.

Make sure that the thesis is printed in high quality. Use a good copying machine when using copies as part of your work. Staple or stitch your thesis (loose leaf binder, spiral binding, adhesive binding).

1.5 Contents and enumeration

The contents shall follow the following structure

1. Title page (see example in attachment)

2. Short summary of the paper (not more than half a page)

3. Table of contents (maybe also list of abbreviations, tables, figures)

4. Text of the paper (Introduction, chapters, conclusion)

5. References / Bibliography

6. Appendix (if needed)

7. Statutory declaration / Affidavit (compulsory for Master thesis)

The page count relevant for the length guidelines in Section 1.2 above starts on the title page, the page enumeration only starts on the following page, however. Including the table of contents, the page enumeration is in small-case roman numbers (i, ii, iii, iv, and so forth). In the normal text, the page enumeration starts anew in arabic numbers (1, 2, 3, and so forth). The page enumeration needs to be consistent within the header or footer.

2 Arrangement of the thesis

The arrangement of the thesis is part of the work and shows to which extent the topic was grasped and treated. The arrangement shall mirror the logical structure of the thesis and needs to be a first indicator of its contents.

2.1 Basic principles

A coherent and self-contained reasoning shows itself in a logically correct arrangement with corresponding structure points. Subchapters that are on the same sub-level need to have a corresponding superordinate issue; e.g., the Subsections 3.2.1 to 3.2.4 all explain the superordinate issue of Section 3.2. There shall be at least two structure points on each sub-level, that is, Subsection 3.2.1 needs to be followed by Subsection 3.2.2.

A well-arranged structure of sections and subsections in the table of contents and an explanation thereof within the introduction help to convey the message of your paper to the reader.

2.2 Form of the arrangement

An arrangement in decimal classification is expedient, e.g.

1 Introduction

2 Parametric and Nonparametric Estimation Methods

>   **2.1** Maximum Likelihood Method
>
> >   **2.1.1** Basics
> >
> >   **2.1.2** Maximum Likelihood Estimator
> >
> >   **2.1.3** Properties of the Estimator
>
>   **2.2** Method of Moments
>
> >   **2.2.1** Basics
> >
> >   **2.2.2** Method-of-Moments Estimator
> >
> >   **2.2.3** Properties of the Estimator
>
>   . . .

Alternatively, mixed alpha-numeric classifications can be chosen (A, B, . . . ; I, II, . . . ; a, b, . . .). To achieve a clear arrangement, the depth of classification shall not entail more than three levels.

2.3 Table of contents

The table of contents needs to contain a comprehensive overview of the sections, captions, and corresponding page numbers.

3 Abbreviations

For the sake of readability, abbreviations shall be used sparingly. Common abbreviations may be used for references. Special abbreviations within the text, the tables, within figures, or within the bibliography need to be explained, if necessary in a separate list of abbreviations.

4 Citations

4.1 Quotations

Each quotation must be verifiable. For this reason, any verbatim or paraphrased text, tables, figures etc. need to be declared as such. Failing to obey these rules may lead to a fail grade for reasons of plagiarism (see affidavit declaration).

Verbatim quotations are enclosed in double quotes. Omitting one word is marked as [..], omitting several words is marked as [...]. A verbatim quotation shall not contain more than two to three sentences. If longer quotations are unavoidable, they need to be clearly marked as such in an optical manner; e.g., indented with single (1) line spacing. Generally, one quotes from the original work. Only if the original work is not available, one can quote from a secondary source. In this case, the quotation declares the secondary source by 'cited by'.

For each quotation, one needs to check whether it is not out of context, whether is is not given another interpretation than the one given by the original author. To verify quotations, the page number needs to be declared in addition to citing the work from which the quotation is made.

Paraphrased quotations need to be fully recognizable as such in their full length and need to be verifiable by a citation.

4.2 Citations within the text

Sources need to be clearly recognizable within the text by short references, which usually contain the author's name, the year of publication, and the page number. One needs to distinguish between publications of the same author in the same year and several authors with identical names.

Examples:

1. If the author appears in ongoing text, the publication year and the page number are written in brackets: Wooldridge (1992: 52). If there are several contributions within the same year, the first is marked as . . . Wooldridge (1994a) . . . , the second as Wooldrige (1994b). When referring to both publications, the years are separated by commas: . . . Wooldridge (1994a, 1994b).

2. If the author's name is not part of the ongoing text, the name, year, and page numbers are written in brackets   . . . (Wooldridge 1994a: 60–64)

3. In case of two authors, both names are mentioned. In case of several authors, only the first author's surname is mentioned, followed by "et al."   . . . Heckman et al. (1997) . . .

4. Several authors within a bracket are separated by a semi-colon.   . . . (Chamberlain 1984; McFadden 1987) . . .

5. Authors with the same surname and publication date are distinguished by the initials . . . H. White (1986) und M.J. White (1986) . . .

6. Use a double hyphen in between page number; e.g., 100–121 instead of 100-121.

If more detailed references with additional information are needed, these can be put into footnotes.

4.3 Bibliography

The references / bibliography contains all citations within the thesis. The references are ordered alphabetically, and chronologically if there are several citations from one author. The formatting of the bibliography is as follows. The first line of each entry starts at the left margin of the page, all following lines of the same entry are indented. There must be an empty line between two entries.

The following list reflects widely-used formatting rules in the references / bibliography.

a) Books

Author's name, Initials (year). *Title.* Publisher, Publisher location, Edition.

b) Essays in Journals

Author's name, Initials (year). Title. *Journal's name*, Volume, pages.

c) Essays in Handbooks / Anthologies

Author's name, Initials (year). Title. Name of Publisher, Initials, Editors, *Title of Handbook / Anthology*, pages, Publisher, Publisher location, Edition.

d) Scientific Reports, Doctoral thesis

Author's name, Initials (year). *Title.* Kind of Source, Location of Source.

e) News paper article

Author's name, Initials (year). Title. *Newspaper's name*, Date, pages.

f) Sources from the internet (Save it locally on your computer!).

Author's name, Initials (year). Title. URL, Day on which the source was downloaded from the URL.

In principle, several authors (or institutions) can occur as "the author". The following is an example of a bibliography:

Andrews, D. W. K. (2000). Inconsistency of the bootstrap when a parameter is on the boundary of the parameter space. *Econometrica*, 68:399–405.

Davidson, R. and Duclos, J.-Y. (2006). Testing for restricted stochastic dominance. Discussion paper 2047, IZA. Available at `http://ssrn.com/abstract=894061`.

Eisenring, C. (2004). Wie hält es die EZB mit der Geldmenge? *Neue Zürcher Zeitung*, Swiss Edition, July 13, 2004, p. 25.

Lehmann, E. L. and Romano, J. P. (2005). *Testing Statistical Hypotheses.* Springer, New York, third edition.

Newey, W. K. and McFadden, D. L. (1994). Large-sample estimation and hypothesis testing. In Engle, R. F. and McFadden, D. L., editors, *Handbook of Econometrics*, volume IV, pages 2111-2245. Elsevier, Amsterdam.

Romano, J. P. and Shaikh, A. M. (2006). Stepup procedures for control of generalizations of the familywise error rate. *Annals of Statistics*, 34:1850–1873.

Scherpenzeel, A. (2002): Why use 11-point scales? http://www.swisspanel.ch/file/doc/faq/11pointscales.pdf, July 13, 2004.

Williams, E. (2003). *Essays in Multiple Comparison Testing.* PhD thesis, UCSD, Department of Economics.

Note the signs and formatting within each of the individual entries.

Note: If the text processor LATEX is used, as recommended, it is advisable to create the bibliography with BIBTEX.

5 Text additions

5.1 Tables and figures

Tables and figures are numbered continuously, maybe within each chapter in decimal classification. In addition to the numbering, a title with a clear description of the contents is needed, e.g.,

Table 1: Number of observations in each census

If one refers to tables and figures within the text, one must be able to find them quickly by the corresponding number and/or page number. Tables and figures are accompanied by a source declaration if they are based on primary sources, e.g.,

Source: Federal Office of Statistics (2001: 32).

Multipage tables should be avoided if possible; separation into several tables or downsizing is advisable. Landscape tables and figures are depicted such that the manuscript needs to be turned clockwise to read it.

Generally, a table should be self-explanatory, should not containing superfluous information, and should be formatted in a simple manner. Self-explanatory means that the table should be readable **without** resorting to the description in the text. The columns need to be labeled accordingly, the variables should be assigned comprehensible names (**no** code names like i00htyg!). A sensible amount of digits after the decimal point should be used (not more than four). Further information for understanding the table may be put beneath the table.

You find good examples of tables in *The American Economic Review*, as available in the library or under www.jstor.org. The tables should be designed according to the standards there.

For the sake of readability, sections with lengthy tables and figures should be placed into one appendix or into several appendices.

5.2 Formulas

Symbols used in mathematical formulas need to be clearly defined within the text the first time they are used. A coherent notation of formulas leads to a better readability. If needed, the used symbols can be listed separately at the end of the thesis.

The formulas need to be enumerated to enable referring to formulas. The enumeration can be structured within each chapter and should be given at the left or right margin of the page throughout. The formulas need to be centered, e.g.,

$$y_i = x_i'\beta + u_i \tag{1}$$

5.3 Footnotes

Footnotes should be applied sparingly. Important pieces of information need to appear in the ongoing text.

Footnotes are mainly used for annotations in scientific work. Pieces of information can be put into footnotes that would disturb the flow of the text; e.g., references to additional literature, references to other parts of the own thesis, deviations from the main line of argument in the text.

The point of reference of a footnote in the text is marked with a superscript arabic digit (e.g., whatever[1]). The text of the associated footnote needs to be placed at the end of the page. Footnotes should be enumerated continuously.

6 Overall structure of the thesis

The **short conclusion** (Abstract) at the beginning of the thesis shall briefly mention the scientific question, the relevant arguments, the used methods, and the most important results. Avoid using formulas or literature references.

The **Introduction** contains the motivation of the thesis. In here, the interest of the reader should be aroused. The scientific question must be clearly described and distinguished from other scientific questions. Briefly discuss your approach and the chosen structure of the thesis.

The **ongoing chapters** mirror the line of argument in the thesis. Depending on the scientific question, the hitherto literature is discussed, the economic background is given, the used data are described, the estimation results are presented, and so forth. Avoid repeated statements; at the end of a long chapter, however, chapter-wise conclusions can facilitate readability.

In a **concluding chapter**, the essential results are given and an outlook on future treatments of the scientific question is given.

It is advisable to write the Introduction and the Conclusion only after the main part of the thesis has been finished.

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[1]Footnote text.

7 Searching the literature

It is advisable to start off searching the literature by reading overview essays, standard-setting textbooks, or essays in international journals of newest date. With the help of bibliographies in such sources, it is usually easy to find previously published literature on the chosen topic.

Use the searching facilities of the library of the University of Zurich, especially from the Department of Economics Library. Literature data bases like *EconLit*, *WISO*, *JSTOR*, or *RePEc*, as well as internet search pages like *Google Scholar* can be very useful as well.

8 Empirical work

Satisfactory knowledge of empirical methods are a prerequisite for an empirical thesis; i.e., having passed these lectures is mandatory.

In an empirical (as well as theoretical) thesis, the basic principle is to narrow the research question to an extent such that the topic can be treated elaborately. In particular, it is not the goal to get an "all-embracing explanation of reality" with the thesis. Therefore, restricting oneself to a fairly narrow topic ought to happen right at the beginning of working on the thesis.

In an empirical thesis, the used data set must be described adequately. Where do the data come from? Which variables does the data set contain? Which selection criteria were used? How were new variables generated? Take care that all steps within data collection and preparation are thoroughly documented. Important: Manual changes of the data that are not documented are not allowed. The usual software packages facilitate saving code files (.R files in *R*, do-files in Stata, .m files in Matlab) such that data transformations can be easily understood by another person, at least if the code file contains comments lines. In any case, the used data needs to be attached in electronic form to the thesis (e.g. CD-ROM).

For the evaluation of the data, it is important to use suitable statistical procedures. In doing so, one needs to distinguish between descriptive and inductive procedures: That is, am I describing a full data set (descriptive), or am I trying to induce from a 'small' sample data set onto the so-called population? All procedures need to be justified according to the data; e.g., using a Probit model for a binary dependent variable. The selection of model variables (dependent and independent variables) always needs to be justified. In particular, it is not advisable to include all available variables in the model. It is advisable to start off with a simple base-line model and to extend it gradually, depending on empirical arguments. Freely adapted from Albert Einstein: "Make everything as simple as possible, but not simpler".

In presenting the results, note the link to the research question and follow the line of argument. Tables and graphs should only contain the essential results, unimportant information should be restricted to a minimum. If needed, essential results can be summarized in a separate table. In any case, the interpretation of the result with respect to the research question is important. Are the hypotheses supported or rejected by the data? Of course, the answer to the former question

critically depends on using adequate methods.

It is important to present the whole course of the thesis such that an independent reader can understand and replicate everything.

9   Mentoring during the thesis

Each candidate is assigned a mentor, who can be contacted for assistance during the course of working on the thesis. It is expected that the topic is treated **autonomously**. Nonetheless, the contact to the mentor is important. The structure of the thesis, the used literature, used methods, and so forth should be discussed with the mentor. A detailed course of work should be fixed before starting off the work. As a rule of thumb: the topic is defined right at the beginning. After three to four weeks, the structure of the work and first results are discussed. After that, the candidate should be able to work autonomously to complete the thesis. If required, up to 2 or 3 additional meetings can be scheduled with the mentor to discuss further questions and the thesis content.

A   Templates

On the following pages, you find templates for

- Title page Master thesis

- Title page Bachelor thesis

- Statutory Declaration / Affidavit

Business Cycles of Marriage Formation:
a Regression Analysis

Bachelor Thesis
Department of Economics
University of Zurich

Prof. Michael Wolf, Ph.D.
Supervisor: Dan Wunderli

Author:	Sabine Musterfrau
Course of studies:	Economics
Student ID:	11111111
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	8000 Zurich
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Date:	14.07.2011

Shrinkage Estimation of Covariance Matrices with Applications to Portfolio Optimization

Master Thesis

Department of Economics

University of Zurich

Prof. Michael Wolf, Ph.D.

Supervisor: Marc Sommer

Author:	Sabine Musterfrau
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Student ID:	11111111
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	8000 Zurich
E-Mail:	s.musterfrau@access.unizh.ch
Date:	14.07.2011

Statutory Declaration / Affidavit

I hereby declare that the thesis with title

Shrinkage Estimation of Covariance Matrices with Applications to Portfolio Optimization

has been composed by myself autonomously and that no means other than those declared were used. In every single case, I have marked parts that were taken out of published or unpublished work, either verbatim or in a paraphrased manner, as such through a quotation.

This thesis has not been handed in or published before in the same or similar form.

Zurich, dd.mm.yyyy

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(Signature)