

Thesis Guidelines

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The items enumerated here are applicable primarily to bachelor and master theses. However, they largely also apply to seminar papers and dissertation chapters as the majority of items is on general scientific writing and work techniques in economics.

Finding relevant literature:

- Once you have identified a topic and possibly a research question, you need to obtain an overview of the *entire* relevant literature on that issue up to date. Your thesis has to refer to the *current state of research* regarding your topic.
- It is mandatory that your literature search includes the following three elements:
 - Overview articles: here there are two major sources
 - i. Survey articles in *Handbook* series. The best-known ones are the *Handbooks in Economics* published by Elsevier/North Holland (for example the Handbook of Development Economics or the Handbook of Labor Economics). But other handbooks or the like also exist.
 - ii. Survey articles in the following journals
 - Journal of Economic Literature (long, formal, comprehensive articles)
 - Annual Review of Economics (similar to the first one)
 - Journal of Economic Surveys (similar to the first one)
 - Journal of Economic Perspectives (very accessible in style, concise articles; fewer references; good for a first start)
 - Keyword, author and subject searches in the database Econlit (can be found online through Heidi) for relevant journal articles; also for backward citation searches.
 - Forward citation searches with the database Social Science Citation Index (SSCI; can be found online through Heidi): once you have located key articles for your topic, it is straightforward to locate older relevant articles by consulting the list of references of your key articles. But you also need to locate the most recent articles on the issue. This is accomplished by doing a so-called cited reference search in the SSCI. Toward that, locate your key article in the SSCI and perform a cited reference search. This will yield all articles that have appeared in the meantime and cited your key article.
- To find unpublished and recent working papers on your topic, you may also consult the online platforms SSRN and ResearchGate.

- Only after you have accomplished these tasks, you may also turn to Google Scholar. Never start with Google as it is strong in unpublished working papers, but weaker in published, academically recognized work.
- The bulk of literature processed in your thesis has to come from scholarly economic literature, i.e. published journal articles or books.

Appearance, Formatting and Supplements:

- According to the university's rules and policies (*Prüfungsordnungen*; applies to both bachelor and master):
 - The thesis needs to include the following statement of compliance with good scientific practice (available in German only): *"Hiermit versichere ich, dass ich die vorliegende Arbeit selbstständig und ohne unerlaubte fremde Hilfe verfasst habe und dass alle wörtlich oder sinngemäß aus Veröffentlichungen entnommenen Stellen dieser Arbeit unter Quellenangabe einzeln kenntlich gemacht sind. [Date and Signature]"*
 - The thesis needs to include a summary (*Zusammenfassung*). This can resemble a research paper's abstract in style. I suggest a length of 100 to 300 words.
- The thesis should not exceed 30 pages for BSc and 50 pages for MSc.
- Use page numbers.
- Use one and a half-spacing and 12pt font.
- Leave standard margins (2.5 cm for all margins).
- At the beginning, there has to be a Table of Contents, a List of Figures, and a List of Tables. A List of Abbreviations may be useful.
- For the sake of our environment, save paper by using duplex printing for the main text of your thesis; that is print the main text on both sides of the paper. Use a recyclable binding! A light binding suffices.
- Mathematical formulas are best displayed using Insert → Equation in *MS Word* or by writing the entire document in *LaTeX* or a related software.
- Make sure that all citations in the text show up in the References section at the end of your paper/thesis and that cross-references in the text to equations, tables and figures are correct. Conversely, the References section may not contain any entries which are not referred to in the thesis' text.
- Always make clear where you are presenting another author's derivations or opinions and where you present your own – even if this comes at the cost of some repetitiveness.
- Note that citations in economics are done differently than in other fields. Citations should follow the conventions of an academic journal in economics, e.g. *Quarterly Journal of Economics*, and its respective manuscript submission instructions (or simply look at published papers in that journal and how those authors cite).

- Do not use footnotes excessively. Avoid long footnotes altogether.
- Do not cite *Wikipedia* and *Google* links or the like.
- Preferably, do not reproduce tables, figures or diagrams from other sources. Instead, create your own tables, figures and diagrams.
- If you present your own statistical results, format your tables neatly! They have to look exactly like the ones published in the *Quarterly Journal of Economics* in *every respect*. Make sure explanatory variables have comprehensible names; clearly spell out the dependent variable. No vertical lines. Number columns. Use horizontal lines to improve readability. Avoid coefficients with an excessive number of zeros after the decimal point. For a coefficient of interest, 0.012 is ok, 1.2 is better, while 0.00012 should be avoided. This can be achieved by scaling the dependent or explanatory variable appropriately. Each table has to have notes at the bottom.
- Tables whose content is central to your argument or which contain main results, should be inserted into the text. Supplementary tables may be relegated to an appendix. In your text you can refer to appendix tables.
- Make sure that all tables and figures are referred to and discussed in the text. Otherwise they have to go out.
- If your thesis includes a data analysis, you have to turn in the data you used and the computer code together with the thesis. The files should be such that all results contained in the thesis can be replicated by running the code with only an adjustment to the data file path. The file path has to appear at the beginning of the code. Specify in the code where the path has to be entered to replicate your outputs! If both fit onto a CD or DVD, submit one such storage device together with the physical thesis. You may attach the CD-ROM in a paper or plastic CD pocket to the inside back cover of one of the copies of the thesis you submit. Be sure to flag that copy, e.g. with a post-it sticker on the front saying e.g. "This copy includes data and code CD". If the files are excessively large, you may share them with me through a file transfer service provider or through a HeiBox folder.

Structure:

- Structure the thesis into sections with numbered headings. There has to be an Introduction and Conclusion as well as a Table of Contents and a References section (Bibliography). Avoid too many layers of subsections (for example Section 1.1 is ok, but 1.2.1.3 is not).
- Avoid excessive use of paragraphs. One-sentence paragraphs are not acceptable. There does not have to be a new paragraph for each new argument or idea. It is ok to group several arguments into one para if otherwise the paras are too short. Two to three paragraphs on a page are ok, six are not. Take well-published papers as examples.
- Never use extra spacing between paragraphs.
- Provide definitions of central terms. Ideally these are not arbitrary but derived or taken from received literature.

- The Introduction has to
 - (i) introduce and motivate the topic. This initial part should answer the questions: What is the topic (broadly)? Why should the reader find it interesting? The motivation for most questions in development economics builds on two pillars: a) an intrinsic interest in the topic, which is based on normative judgments that are broadly agreed upon (for example, you may study child under-nutrition because it is broadly agreed upon that nutrition is a central component of human well-being [see Amartya Sen]), b) functional implications of the matter studied, i.e. obvious effects that your object of study has on other variables for which there is an intrinsic interest (for example, you may motivate your study of child under-nutrition by two functional channels: first it has been shown that under-nutrition early in life results in worse labor market outcomes later in life. Hence, under-nutrition during childhood has negative effects on the well-being of the same person when she is an adult. Second, this lower labor productivity later in life will also reduce aggregate, that is economy-wide, productivity and hence economic growth (at least if child labor is a frequent phenomenon in the study context).
 - (ii) state the central research question in a simple, accessible way, and possibly name the research gap in existing work that you seek to fill,
 - (iii) summarize what you do in the thesis as precisely as you can including a brief description of the data you use (in empirical work) and the methods you use (e.g. the empirical or econometric approach). Make clear what is innovative and where you follow existing approaches. Typically this section starts with the sentence “In this paper (or thesis) I ...”,
 - (iv) summarize your findings and results (in empirical work: include magnitude of estimated effects of your main findings not only direction of effects and statistical significance, briefly interpret magnitudes of coefficients),
 - (v) state the contribution(s) to the literature. Be specific here! Identify relevant strands of research literature (you may enumerate them; make plenty of citations here) and, taking each strand in turn, state precisely what you are adding to that strand of literature.
 - (vi) briefly give an overview of the remainder of the thesis (“The remainder of this thesis is structured as follows. In Section 2,...”).

In economics, the Introduction is the most crucial part of a paper. It has to contain all key aspects of the paper. The objective is to fully inform the reader about all major aspects of your research, so that he may skip the rest of the paper if he is not interested in further technical details. In your thesis, you shall adopt and practice this habit of scientific writing in economics.

Read Introductions of published papers relevant for your work carefully and study their structure. Explicitly identify each of the six items enumerated above. This is a good exercise for your own Introduction-writing.

The structure described here is appropriate for theses containing original research, in particular econometric research. If your thesis' focus is on

summarizing existing literature, the structure of the Introduction needs to be adjusted accordingly.

Content:

- Motivation and contribution: Your thesis should speak to a general research question in economics in the first place and to a specific (country-)context only in the second place. Example: In a study of the effects of Syrian refugees on the Jordanian labor market, motivate, formulate the research question and contribution in a general fashion, e.g. “what is the effect of in-migration on the domestic labor market?”, rather than focussing the entire motivation and contribution on just the Jordanian economy. I recommend formulating the research question generally. Subsequently you may argue why the Syria-Jordan case is a particularly relevant one in the context of the more general research question and why that case deserves your attention. It is ok to also spell out the importance of your work for a specific context, but avoid making the specific case the main motivation. If you do so, your work will come across more like a (country) research report than an academic research study.
- If you are doing economic theory based on an existing model it is preferred to not merely reproduce the model you are using but to redo some of the calculations *with a simple example of your own*. Eliminate additional parameters that serve to generalize the central result but that do not provide additional economic insights. This is much preferred to copying and pasting complicated formulae from somewhere else. You should show that you have fully understood the economic argument formalized in the mathematical calculations in the article, which often seem to be overwhelming. Reiterating calculations or analytical derivations literally is not welcome!
Mathematical notation: be sure to define all mathematical notation (that is each variable, also indices, subscripts and superscripts, in turn) even if this seems trivial and repetitive to you.
- When you discuss an empirical paper, focus on the main hypothesis, which is usually a relationship between certain variables, being tested. Explain how this hypothesis is derived (usually from some theoretical reasoning) and how it is being statistically tested (theoretical hypothesis [e.g. $dy/dx < 0$] and statistically testable implication [e.g. the coefficient β in the regression equation $y_i = \alpha + \beta x_i + \varepsilon_i$ is smaller than zero]). Abstract from aspects that are not directly relevant for testing the central hypothesis (e.g. further control variables in a regression analysis).
To summarize, your discussion should focus on the chain: theoretical hypothesis, testable implication, empirical specification, data, (core) empirical results.
- If you are doing original empirical work,
(i) describe the dataset and produce descriptive statistics of *all variables used in subsequent regression analyses*. Make sure that numbers of observations match

between descriptive stats and regressions.

(ii) describe your econometric approach and include regression equations. Define all mathematical notation (that is each variable, also indices, subscripts and superscripts, in turn). Explain what your data set looks like and what an observation is (e.g. a district in a given year; or an individual in a given time period etc). If you are using survey data, you must address the issues sampling weights and clustering of standard errors. Explain how you use weights in your estimations and how you cluster standard errors. The textbook *Mostly Harmless Econometrics* provides guidelines on both of these issues. Results tables should be self-explanatory with notes at the end of each table, which have to include additional control variables not appearing in the table, statistical significance symbols and clustering methodology of standard errors. Sometimes explanations of variables, a reference to sampling weights employed in the regressions and an explanation of the sample used can be appropriate. It has to be clear what is estimated in each column of the table. For examples, consult recently published papers of your thesis supervisor. Discuss empirical identification issues (“identifying assumptions”) and causality. Point out what elements of your approach are taken from existing work and what is original.

Depending on the application, consideration of advanced econometric topics such as bootstrapping of standard errors, multiple hypothesis testing or randomization inference for treatment effects may be appropriate.

(iii) present the results, possibly followed by robustness checks. Refer to (ii) for different econometric specifications.

(iv) interpret the point estimates of interest qualitatively and quantitatively.

(v) distinguish between the magnitude of point estimates and their statistical significance. Do not only discuss statistical significance! Also discuss the economic significance of your point estimates!

Should your central finding be that there are no significant effects, discuss in some detail whether this could be due to a lack of power (i.e. there could be sizable positive effects in the study population or data-generating process but your research design is not able to estimate them with sufficient precision) or whether you have “precisely estimated zeros”, i.e. we should believe that there are no economically important effects in the study population. In this context, you may consult published papers with zero results, e.g. one by Kartik Muralidharan on teacher pay and performance.

(vi) toward the end of that section, summarize the key findings of interest and discuss them in the context of existing literature. Point out how your findings are in accordance or different from previous work, and how they expand our frontier of knowledge. A summary of these key findings has to be included in the Introduction as well (see above).

- Conclusion section: the main findings and contribution to the literature should already be contained in the Introduction. Therefore, the conclusion can be somewhat more general and speculative, and raise questions and directions for

future research. Putting your findings in the context of a broader societal or policy discussion can also be a good idea.

- Cited literature: As a rule of thumb, Bachelor and MSc theses usually contain at least 20 and 40 to 50 academic (not online) references, respectively.
- Scientific writing is all about structure. Make sure that each element of your thesis serves or supports the purpose of bringing out your main finding and contribution to the literature. This has to be the overarching scheme. This is in sharp contrast to writing along a stream of consciousness or a laboratory protocol, where you consecutively write about what you have done in your research preceding the thesis. Instead, once your research is done, figure out a meaningful structure for your thesis, *built around your main finding and contribution to the literature*, and then fill the individual items of your work into that structure. It can be a good idea to first bullet the entire thesis, that is have the section and subsection headings and then bullet points instead of continuous text. I typically first work out the structure of the Introduction, also in bullets, and then turn to the rest of the article, which follows closely the structure of the Introduction. Make sure that the thesis contains no sections which do not feed back into what is being said in the Introduction.
- Be as precise and consistent as possible. Avoid contradictions, brakes and jumps in your argument. Each section or statement has to fit into the overall plan of your thesis.

AI:

For theses/papers/presentations I supervise, the following rules apply:

- In general, I regard the use of AI in theses, papers and presentations as unauthorized aid (“nicht zugelassenes Hilfsmittel” im Sinne von §8 (4) Satz 1 der Prüfungsordnung MSc Economics vom 23.6.2022).
- As exceptions, it is ok to use AI for
 - generating statistical analysis computer code
 - generating visualizations and diagrams
 - helping to locate relevant literature through discussions you have with AI. The literature review and your contribution to the literature has to be spelled out in your own words, however.
 - helping to improve your research design through discussions you have with AI. Ultimately, the research design has to be your own, however, and you have to describe and justify it in your own words.
 - spell checking of your text
 - improving phrasing and expressions in your text.
 - improving the design and appearance of slides in presentations.For these four purposes, I consider AI as permitted aid (“zugelassenes Hilfsmittel”).

- It is not allowed to have generative AI write entire text passages or to take (parts of) your research design from it.
- You have to declare each use of AI on a form I am making available on my website. This form has to be filled in also when you have not used AI at all. This form has to be signed and submitted together with each copy of your thesis, seminar paper or presentation.
- Sufficient evidence of unauthorized use of AI or failure to document the use of AI can lead to a fail grade (5.0). In severe cases, such conduct may be taken as deception or use of unauthorized aids and lead to permanent dismissal from the study program (Prüfungsordnung §8 (4)).

When you think you are done:

- Go through this list item by item again and again, and check whether your entire manuscript conforms to each one. Neglect of any of these guidelines, in particular the formal ones, will result in immediate down-grading.
- Proofread your manuscript several times and finally have somebody else proofread it for formatting, errors and language. A flawless appearance will always improve your grade.
- You may also consult Michael Kremer's "Writing Papers: A Checklist" or John H. Cochrane's "Writing Tips for Ph.D. Students"
- Don't forget to submit data and programming code – if applicable (see above)!