Geneva Graduate Institute (IHEID)

Topics in Econometrics (EI137)

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Term Paper Guidelines

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Introductory Remarks

The following document is meant to guide students through the process of writing a term paper for the course *Topics in Econometrics* (EI137). However, most of its contents are useful more generally, guiding students through the process of i) writing a proposal to pitch a research idea to a supervisor or a possible coauthor as well as creating an outline and a to-do list to tackle a larger project (see Section 1), ii) writing an initial, rough draft (see Section 2) and iii) turning the draft into a full paper or thesis (see Section 3), all supplemented with general writing guidelines (see Section 4). The document applies to methodological and empirical economic papers, not to papers in economic theory.

Contents

1   Term Paper Proposal

The idea of the term paper is that you apply a method of your choice discussed in the courses *Econometrics I* (EI035), *Econometrics II* (EI062) or *Topics in Econometrics* (EI137). There is an expectation that the chosen method is not too trivial to implement (e.g. you cannot simply run a bunch of standard linear regressions).

The proposal should be two pages long (excluding any potential bibliography)(see the term paper guidelines in Section 2 to better understand the proposal guidelines). The first page

- briefly motivates and outlines the empirical or methodological research question,
- clearly states the specific method(s) to be applied,
- mentions the data to be used or outlines the simulation study to be conducted, and
- identifies the results to be generated to answer the research question.

The second page

- outlines a preliminary structure of the paper, dividing the main part logically into sections (and subsections) and briefly stating their contents, and
- shows a planned to-do list based on which the term paper can be written.

Besides allowing me to validate the general topic and methodological scope of your term paper, the purpose of the proposal is to allow me to give you feedback early on, before you delve deeper into your analysis and the process of writing the term paper. You can deviate from your submitted proposal without consulting me, provided that these deviations do not completely overturn your paper.

Choose a narrow research question that you can then treat elaborately and answer precisely. (You can mention a more general, even somewhat abstract motivation, but your research question must be precise and scientifically answerable.) The goal of a paper is not to present a general and vague "explanation of reality".

The formal requirements and general writing advice from Section 4 apply. The deadline to submit the term paper proposal is indicated on Moodle.

2   Term Paper

Your term paper should contain the following:

1. Title page (including title (and subtitle), your name, university, course, semester, professor's name, date, ...)

2. Main text (introduction, intermediate sections (body part), conclusion)

3. References/Bibliography

4. Appendix

The main part should be 5-10 pages. Paper length is not an attribute of quality. The more concisely you can describe a given content, the better.

Just as with master theses/research papers, there are two types of term papers you can write:

(a) Methodological paper. Primary focus (research question/message of your paper) is on a particular method you analyze (e.g. its theoretical properties or performance in simulations). The empirical economic question(s) to which the method is applicable is (are) secondary (and there might be no particular application you consider).

(b) Empirical paper. Primary focus (research question/message of your paper) is on a particular empirical economic question. Nevertheless, for the purposes of this course, you keep the description of the economics (and data) short, just enough to understand the methodological part, on which you "zoom in".

In either case, you should describe in detail every step of the methodology you use. Main results/ideas in the derivation/explanation of the methodology should be in the main text. Algebraic manipulations can be delegated to the appendix.

In case of a methodological paper, the "hook" to grab reader's attention should be some methodological issue. For example, there might be a set of empirical settings for which current methods are shown to not work well (or they are not applicable at all). There might also be a more theoretical issue with some method that you investigate. Generally, any method's performance is affected by its environment (sample size, number of parameters, other peculiarities of the Data Generating Process (DGP)). For the purposes of this term paper, you can also simply take a method you're interested in and analyze its performance in simulations, under different DGPs.

In case of an empirical paper, the "hook" should be given by the empirical economic question itself. Clearly describe it and its relevance. If necessary, use a separate section after the introduction to do that. However, keep enough space for describing the methodology and presenting the (main) results. Briefly explain the data you use. Spend time on peculiarities of the data only insofar as they are relevant for the methodological part or to make sense of your results. If your data is not yet ready, you can use simulated data, all while keeping the primary focus on your planned economic

application. In this case, briefly mention your desired data, say it is not ready yet, and describe in greater detail the DGP you use to construct simulated data (with the properties of your desired data in mind). It is always a good idea to make sure your method works well by applying it to simulated data where you know "the truth" before applying the method to an empirical question to find out "the truth".

The formal (formatting) requirements and general writing advice from Section 4 apply. The deadline to submit the term paper is indicated on Moodle. Criteria and (point-)grading scale:

Criterion	Points
Satisfies formalities	1
Clear motivation (methodological and/or economic)	1
Discussion of data/DGP	1
Methodology	
Clear derivation of estimators, incl. assumptions made	2
Discussion of assumptions, applicability of method, advantages/disadvantages, relation to alternatives	1
Clear link between derived estimators and obtained results (incl. practical implementation in case of numerical approaches)	1
Overall coherent methodology-approach and -presentation	1
Clear and concise results discussion	2
Total	**10**

3   Turning Term Paper into Master Thesis/Research Paper

The formal (formatting) requirements and general writing advice from Section 4 apply. However, in case some of these requirements conflict with official university requirements, the latter take precedence.

Relative to the contents of the term paper, you should add an abstract and your main text should be 15-35 pages long. Again, more concise is better.

Again, there are two types of papers you can write.

(a) Methodological paper. All comments from the above discussion of methodological term papers apply. While for the term paper it is enough to analyze a method's performance under different DGPs, to write a more interesting final paper you should

- augment your simulation study with some theoretical analysis that complements your simulation study (e.g. motivates its exact setup or provides intuition for its results); and/or

- apply the method to a particular, relevant empirical application.

For actual research papers, the criteria for the motivation and/or application are higher than for Master theses. In particular, there has to be a clear methodological contribution, i.e. the current method must have a clear shortcoming that you analyze theoretically/in simulations, and, ideally, you should propose and illustrate a remedy. In absence of such a strong methodological contribution, you can turn a methodological term paper also into an empirical paper (with a smaller methodological contribution).

(b) Empirical paper. As with the empirical term paper, the primary focus (research question/message of your paper) is on a particular empirical economic question. Apart from that, you do the opposite of the former: you should keep the description of the methodology short, just enough to understand your empirical economic analysis, and "zoom in" on the latter. However, if you also have a methodological contribution, you should spend time motivating and explaining it. You can do so theoretically and/or with a simulation study (see above).

4 General Writing Guidelines

4.1 Formalities

Labeling & Information Provision:

- Add a date and your name on the title page.
- Label the (pdf-)file sensibly; along with some indication of document type or paper name (e.g. `masterthesis` or `fiscalpolicyanalysis`), it should surely include your (last) name or initials, and ideally also the date. My typical file would be names as `250218_MM_documentXYZ.pdf`.

Formatting: use

- a commonly used font in size 12pt
- 1.25 line spacing
- DIN A4 or US letter size paper with 3cm margins on all sides
- page numbering with arabic numbers, starting from the first page of the introduction (title page is unnumbered, other pages before introduction (abstract, table of contents, list of tables/figures/abbrevations, etc.) are numbered with roman numbers in lower-case letters (i,ii, etc.), pages of appendix may or may not be numbered separately from main text (e.g. as A.1, A.2, etc.))
- in-text citations (rather than in footnotes or using numbers whose corresponding papers are listed in the bibliography) and an APA-style bibliography

- arabic numbers for footnotes, tables and figures (all continuously numbered throughout the paper)

In empirical work, in particular if there are methodological and/or theory sections, it is strongly encouraged to write the paper with Latex. It facilitates formatting and the use of mathematical notation. It also simplifies reference-management and the creation of a bibliography; references are stored via Bibtex in a `.bib`-file, whereby reference-entries can easily be generated using a software like Mendeley reference manager and Latex takes care of correct citation (provided that all information on a reference is added, either manually or by entering the DOI-link in Mendeley). However, using other text processing programs (e.g. Word) is also possible.

Use abbreviations for lengthy notions that are repeatedly used. Define them when you write out the full notion for the first time. For example: "I consider Ordinary Least Squares (OLS) estimation. [...] The OLS estimator ...". This can greatly facilitate the ease of reading.

Use short and clear titles for tables and figures. Avoid including too much details in the titles. Rather, add a description below the table/figure using footnote-sized font, which explains in greater detail what the table/figure shows. The analysis and interpretation of the table/figure should be in the main text, but this description should allow the reader to understand what the table/figure shows without resorting to the analysis in the text. In tables, use sensible column- and row-names and subtitles (no variable names like *educ_male*), and use a sensible number of digits (as few as possible, as many as needed; if dealing with particularly large or small numbers, consider reporting all numbers e.g. in thousands or as multiples of 1e-6).

Put important details in footnotes rather than in the main text. This makes it easier to follow your main argument. Such imortant details include non-essential references to additional literature or to other parts of the thesis as well as deviations from the main line of argument. However, avoid using footnotes to include various "nice-to-know" stuff that is irrelevant to the message of your paper.

Clearly define all symbols used in mathematical formulas the first time they are used. Center all major formulas and all longer formulas in separate lines rather than writing them in-line with text. Number only the equations you actually refer to in the main text.

Link your arguments in the main text to the relevant equations, tables, figures and paper-parts (sections, subsections, etc.). In Latex, you can do that easily by labeling these objects using the command `\label{}` and referring to labeled objects using the command `\cref{}` from the package `cleverref`.

It is all right to write a single-authored paper using "I", "me" and "my". Whether you choose this approach or use "we", "us" and "our" is a question of style. With multiple authors, the latter approach should be used.

4.2   Content

Structure of the paper:

- Abstract. It should be on a separate page right after the title page. It gives a brief summary of your paper and should include a few (1-3) stencences on each of the following: scientific question and its relevance, methods used, most important results.

- Introduction. It motivates the paper, briefly discusses what exactly the paper does and its results, and it puts the paper in perspective by relating it to the relevant literature.

  - Try to come to the point quickly. The initial motivation should be "short and sweet"; it should grab the attention of the reader without discussing at length different aspects of the research question or citing literature. At the latest at the end of the first page, but ideally much earlier, you should start discussing your contribution in light of the preceding motivation, followed by a short description of what exactly you do and the results you obtain.

  - Put the literature review as the second part of the introduction. It should be clearly structured by the ways you contribute to the literature and/or by the different literature strands you contribute to. You are allowed and encouraged to summarize the relevant literature strands and individual studies in your own words, whereby you should do that always in relation to your study rather than discussing at length what these other studies do. Their motivation, methodology or results are only relevant insofar as they relate to yours!

- Intermediate sections. They should mirror the line of argument from the introduction, but in more detail: they explain the economic background and the particular empirical question you investigate, they explain the methodology you apply, the data you use and the results you obtain.

  - To make it easier for readers to follow your argument, make sure that the reader knows the purpose of each section and its link to the preceding (and subsequent) sections. For this purpose, it is useful to have a short introductory text at the start and a short conclusion at the end of each section.

  - Structure the main part of your paper wisely. The arrangement of sections, subsections, subsubsections and paragraphs is an integral part of the paper and should follow a logical structure. This will greatly help convey the message of your paper to the reader.[1]

  - Avoid giving too many details in the main part. Instead, put them in the Appendix. This includes longer algebraic manipulations, details on data treatment and secondary

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[1]Subordinate parts on the same level need to have the same overarching theme; e.g. subsubsections 2.2.1, 2.2.2 and 2.2.3 all treat the theme of subsection 2.2. Each section or subsection should be followed by none or at least two sub-parts (subsection and subsubsections, respectively); e.g. section 2.2 must have either no subsection or at least two subsections. A single separate sub-theme can instead be separated using paragraphs (\paragraph*{} in Latex).

and tertiary results (e.g. figures and tables showing robustness checks or repeating the main results for different countries, time periods, etc.).

– Keep the results discussion focussed. Your goal is to make the reader remember one or a few main takeaways. For this purpose, structure your results discussion clearly and state the main takeaways in your own words before corroborating them with invidiual, particular results (e.g. particular coefficients in particular regressions). Also, to not dilute your main message(s), avoid discussing every single result (every figure in a table (e.g. every single regression coefficient and its standard error) or every aspect of a graph).

• Conclusion. State very briefly what you do in the paper. This should be even more brief than the abstract. You can choose whether you want to point out the relevance of your contribution, the particular methodology you used, or a particular result you obtained. All this should be in line with the second part of the conclusion, where you give an outlook on what future studies could explore differently than you did or on top of what you did.

The more concisely you can convey the message of your paper, the better. There are amazing papers written on about 20 pages! Avoid filling up space by repeating yourself too often, by discussing every single result or by including a too lengthy discussion of other studies without relating them to yours.

In all parts of your paper, get to the point quickly, i.e. first state your main point, then fill in details. For example, when discussing two contributions of yours in the introduction, first state them both briefly, then explain the first in more detail, then the second. This way it is much easier to follow your argument and remember your contributions than when you state and immediately explain thoroughly the first contribution, followed by a thorough explanation of the second.[2] Similarly, when discussing results, first state the main point you want to make (without reference to a particular estimate or figure), then go over the particular results that corroborate your point, and – in case of a more lengthy corroborating discussion – restate your main point. This is preferred to boring the reader e.g. with particular coefficient estimates from numerous regressions with different controls and concluding only in the end that the effect of interest is significant/large/small in all/none of them or depends on the inclusion of a particular other variable.

Make sure each point is treated in accordance with its importance. Primary results should be highlighted clearly and whole sections should be structured so as to convey them in the most memorable way. They can and should be repeated throughout the paper (in the main part, but also abstract, introduction and possibly conclusion). Secondary results (e.g. a salient result that is not directly related to your research question or a robustness check for an estimate of your primary object of interest) should be stated and illustrated in tables/figures without going into too much detail. They should be repeated little or not at all, and they should be stated only very briefly in the introduction, if at all. Particular secondary results do not belong in the abstract or conclusion, but

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[2] In short, do "A. B. Details of A. Details of B." rather than "A in detail. B in detail.".

at most a summarizing sentence on them can be stated (saying that the main result is robust across countries or robust to inclusion of X, Y or Z, or that it reveals other interesting determinants of phenomenon X (besides the main determinant you analyze)). On top of this, there can be tertiary results, which belong to the appendix. In the main text you should state that they exist and refer the reader to the appendix, without analyzing them in much detail.

4.3   Writing/Research Process

It is a good idea to write first the main part of your thesis, then the introduction (a concise and focussed summary of your main part, along with a motivation and literature discussion), then the abstract (a concise summary of your introduction, i.e. an even more concise summary of your main part, along with some motivation and possibly contrast to literature), and finally the conclusion. Thereby, before writing out your arguments in full text, it is advisable to start from a clear outline of the main part, structuring it into sections, subsections, etc., and filling in short statements and bullet points about what should be discussed where. To make sure the structure is logical, it is useful to create and occasionally look at the table of contents during the process of writing, even if the latter may be deleted in the end.

Given your research question, it is advisable to start the exploration of related literature by reading textbooks and overview essays, going from newer to older ones. Then consult papers that treat specific research questions, again going from newer to older papers. The citations in these textbooks, essays and papers will help guide you through the literature relevant for your paper. To come up with a creative and novel research question, you should conducting a detailed literature analysis too early. Rather, given some introductory analyses of high-level treatments (textbooks, overview essays, newspaper articles, etc.), think thoroughly through your subject from a "meta" point of view and let you mind wander thorugh various "what if"-scenarios. Only once you know roughly your research question should you consult specific literature that does related things.

Make sure your empirical results are reproducible. This regards not only the econometric analysis of your data, but it starts from the treatment of raw data, where no undocumented editing of original (publicly or privately available) data is permissible. The codes used to generate your results, the raw data (even if publicly available) and a short document outlining how your codes can be used to replicate the results from your paper should all be compressed into a zip-file or put on a file-sharing platform like Github. Special rules apply if the data is confidential.

4.4   Further Resources

Good resources are *Elements of Style* by William Strunk Jr. or *Elements of Rhetoric* by Ryan N. S. Topping. Further commonly consulted resources are *On Writing Well* by William Zinsser or *A Guide for the Young Economist* by William Thomson.