How to Write a Term Paper in Economics

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1. Introduction

> *Bad writing, to repeat, does not get read. The only wretched prose that we literally must read is that from our gracious servants at the Internal Revenue Service. All other writers are on sufferance, competing minute-by-minute with other writers in an atomistic market for ideas. To put it less grandly, the writer who wants to keep his audience bears always in mind that at any moment it can get up and leave (McCloskey, 1985).*

The purpose of this handout is to give some concrete guidelines concerning how to write your seminar paper. Our main focus is on the writing *process*, on style and structure, and on how to find suitable sources and use them. We provide guidelines for academic writing in English; however, most of our advice also applies to German academic writing. We also try to provide specific guidance to non-native speakers by pointing out the main pitfalls and the mistakes typically made by authors who do not have English as their native language.

2. The Writing Process

Good academic writing is an art, but there are some simple rules of thumb that can improve the quality of your work substantially. First of all, it is important to accept the fact that writing is an **iterative** process. When you write the second draft of your project you will probably think you are working on the final version, but in reality (at least if you want it to be good) there may well be several more drafts to go! Furthermore, there are no **shortcuts** to good writing: you will always need to know your topic very well in order to produce something interesting and innovative. In this section, we give you some simple advice concerning the writing process.

2.1. Choosing a Topic

Once you have been provided with a general topic, it is helpful to summarise your project idea as *one question*, which is then the main theme of the whole essay. For example: "Is the increasing income inequality in developed countries due to changing relative wages, changing demographic structures, increasing educational inequalities, or something else?".

2.2. Planning Ahead

We already mentioned that writing is an iterative process. Some thoughts take time to mature, and you will most certainly keep spotting new mistakes every time you go through your manuscript. This means that if you are a perfectionist, you might never feel that your paper is ready for submission. Luckily, we typically work toward a fixed deadline so this is not really a problem.

However, there is no corresponding safeguard against the opposite risk: that you allow too little time for the revision of your manuscript, so that you have to finish the paper in a rush. Only you can prevent this from happening by planning ahead. You do this by defining your own deadlines for when different parts of the work need to be finished. Start at the final deadline, i.e. the time at which a complete version of your paper has to be finished, and work your way backwards. It is always good to leave an extra week at the end, since something always goes wrong. It is also advisable to schedule a first draft of the paper relatively early, since this gets your thought process started.

2.3. Reading

Before you start writing, you need to familiarise yourself with the literature on the topic. Useful sources are library books and scientific articles. There are some internet resources that may simplify your search significantly. *Econlit* is a database of articles in economics and related disciplines. The *Web of Science* allows you to track an article forwards in time so that you find all subsequent articles that quote the article you are interested in. This way, you will get a very up to date literature review. *Google scholar* is a search engine that is restricted to academic work. It has the same type of forward tracking function as Web of Science. Finally, the working paper series of the *NBER* tends to be useful for most topics.

The generally accepted sources for academic work are text books or articles taken from peer-reviewed scientific journals (such as the *Quarterly Journal of Economics* or the *American Economic Review*). The peer review which texts of this type have been subject to can be seen as a very valuable stamp of quality. For other types of texts, you have to carry out the quality control yourself. This means that you need to think about whether the source – be it a daily

newspaper or an internet website – typically delivers reliable and accurate information. Moreover, you need to think about whether the author, or people they quote, might have an agenda. How reliable are claims from the oil industry that global warming is a myth? How credible are the views of Greenpeace on the same issue? Obviously, these questions might be useful also when you study peer-reviewed academic texts. But whenever you consult alternative sources, they are absolutely essential. However, concluding that a text is biased does not necessarily disqualify it as a source. It simply means that you need to refer to it with certain qualifications – since otherwise you will convey the impression that your view is equally biased, or that you are terribly naïve as a person.

In some instances, you might end up with many more articles on your topic than you can possibly read. This is bound to happen if you are writing on a topic (such as income inequalities) which has been at the centre of attention of the economics profession for several decades. Whenever you face this problem, you need to define crude selection criteria even before you start looking at the articles. Such criteria can be defined either in terms of the *publications* you include, or in terms of *publication year*, or both. Concerning publications, it can be useful to restrict attention to journals which have a particularly strong reputation – such as the top five journals (i.e. the *QJE*, the *AER*, the *JPE*, *Econometrica* and the *Review of Economics Studies*). A less exclusive delimitation would be to restrict attention to so-called "A journals". One useful ranking to rely on is published by the Handelsblatt newspaper.

It is also commendable to restrict your literature search to publications appearing after a certain year. The appropriate cut-off year may vary from topic to topic, but for most, a review covering the past ten years would be sufficient. Of course, we can make exceptions for particularly distinguished contributions and authors (e.g. Nobel laureates).

Once you have identified the sources available, you can start reading. As a first step, you should skim through the abstracts/introductions of your sources to see whether they are really relevant for your topic. The sources that stand the test should then be read very carefully. One way to do this is to take down bullet points of the most important points of each source. The nice thing about this strategy is that at the end, you will have a good summary of each source. Then you can start building your own thoughts and arguments together with the bullet points from the different documents. This way your work will refer to all the important sources and will still be independent from them in its structure and wording.

2.4. Writing

Once you have gone through all your sources and summarised them as described above, you can start writing. You might want to start with the introduction, but in general it is actually a good idea to leave that section to the end (unless you feel you need it to structure your own thoughts). You should also leave the abstract and the conclusion to the end. Instead, it is a good idea to start with the literature review, as it gives you an opportunity to summarise the most important writings on your topic.

3. Organisation of the Paper

The structure of your paper is, to some extent, a matter of choice and your own judgement. You should keep in mind, however, that the main purpose is *clarity*: you want to communicate your ideas in the clearest way possible. Thus, the structure of your paper, as well as your writing style (which we discuss in the next section) should both serve this main purpose.

There are some parts that are necessary in each dissertation. These are:

- The title
- Abstract
- Introduction
- Main Content
- Conclusion
- List of references

In this section, we describe the purpose of the various sections, and give some suggestions on how to structure them. As we mentioned in *Section 2*, it is recommended *not* to start with the abstract or introduction, but with your literature review and/or your main analysis. Hence, we go through the sections in that order below. First, however, we give some general guidelines that apply to all the sections between the introduction and the conclusion.

3.1. General Guidelines

When you write your paper, it is important always to have an **imaginary reader** in mind. This imaginary reader will not be as familiar as you with your topic, and will not necessarily be able to follow your thoughts and arguments. Hence, it is very important to make the structure of your work explicit to the reader. Moreover, the reader will probably not have as much time as you do to devote to the paper. For this reason, it should be possible to grasp your main question, your methods used, and your main findings without actually reading the paper.

There are some simple ways to organise the paper that have the further advantage that they help you structure your own thoughts. Firstly, each section between the introduction and the conclusion should **start** with an opening paragraph. This paragraph is very short and explains two things:

- **what** you are going to do in that section
- how it **fits together** with the other sections of the dissertation

Furthermore, at the **end** of each section, you write a concluding paragraph. It can also be very short and should:

- **Summarise** your main findings from the section
- Explain what comes **next**

These two paragraphs – the opening one and the concluding one – could be written *after* the rest of the section is done. Once you have written them, you should revise the entire section and make sure that:

- you **deliver what you promise** in the opening paragraph
- you **emphasise and explain** the main findings that you mention in the concluding paragraph

3.2. Main Content

This is the most important part, the 'body' of the paper. It is here that you develop your own ideas, present extensive facts and arrive at your results. This section will look different depending on the method you choose.

Irrespective of the topic, however, you always need to provide some kind of literature review; possibly in a separate section. In the literature review you are supposed to tell the reader what prominent researchers in the field have said about the topic; *i.e.*, your aim is to give the reader an introduction to the topic, to present the general ideas and perspectives that dominate the literature. This overview should, if possible, cover different levels of generality, hence ranging from general theorising on the topic to previous applications to the particular problem you want to study. Please try to avoid presenting the literature in a linear, chronological order or as a dry enumeration of research articles. Instead, make sure you structure the various contributions to the literature in a way that makes intuitive sense to the reader. We provide two examples below, and leave it with you to decide which version makes the most pleasant reading.

Example 1. Gerdtham and Johannesson (2004) study the RIH in Sweden, and find evidence of a positive effect on mortality. Eibner and Evans (2005) find relative deprivation to be associated both with worse self-reported health and mortality. Luttmer (2005) reports a negative relative income effect on individual happiness. Li and Zhu (2006), on the other hand, study the effect of relative income on health, and find no evidence of such an effect. Miller and Paxson (2006) do however report a positive RIH effect on mortality. Lorgelly and Lindley (2008) do not find any effect. Finally, Jones and Wildman (2008) find evidence of a negative RIH on male psychological well-being.

Example 2. Existing empirical research examines the RIH in a high-income context. The evidence is relatively weak, with several of the studies finding virtually no such effects (Lorgelly and Lindley, 2008; Li and Zhu, 2006). Both the negative and the positive RIH have found support among the few articles with significant coefficients of average incomes. Studying the U.S context, Luttmer (2005) finds evidence of a **negative RIH** when individual happiness is used as a dependent variable and Eibner and Evans (2005) find relative deprivation to be associated both with worse self-reported health and mortality. Moreover, Jones and Wildman (2008), using a semi-parametric method, find support for a negative RIH when examining the relation to male psychological well-being in the UK. In contrast, both Gerdtham and Johanesson (2004) and Miller and Paxson (2006) find evidence of a **positive RIH** effect on mortality.

3.3. The Introduction

The introduction is a very important section. It is here that you 'sell' your paper, i.e. you convince your reader why this topic is extremely relevant and exciting, and motivate the reader to keep going.

The introduction serves the following purposes:

- To **open** the paper.
- To answer the **"who cares?"**-question, *i.e.* you are supposed to convince your reader that your topic is fascinating and relevant.
- To define and delimit your topic.
- To explain your **methodology** and your main **findings**.
- To give an **overview** – a road map – to the structure of the paper

Before you write your introduction, it is a good idea to sit down and think of **three reasons** why your topic is such an interesting one. Once you have done that, you could structure your introduction in the following way:

- An opening paragraph (use your imagination).
- **WHY:** Three paragraphs explaining the **relevance** of your topic (using the three reasons mentioned above), supported with facts if possible.
- **WHAT:** One paragraph **defining and limiting** your research topic.
- **HOW:** One or two paragraphs briefly explaining your **method** - i.e. how you intend to answer your research question.
- One paragraph giving a short glimpse of your **main findings**.
- One paragraph explaining the **structure** of the rest of the dissertation.

The last point – that you should deliver a 'road map' in the introduction – should not be taken as an excuse to deliver a poorly structured paper. Instead, see this paragraph as a useful check that the structure of your paper makes logical sense. And bear in mind throughout that a really good paper should also be easy to read without these traffic directions, and even without headings.

3.4. The Conclusion

The conclusion is also an important section and it serves the following ends:

- To close the paper.
- To **remind** the reader of **what** you have done, **why** you have done it, and **how** you have done it.
- To highlight your **main findings** and explain them.

- To explain the **relevance and implications** of your findings.
- To give an **outlook**, perspectives for the future etc.

You should remember two things when writing the conclusion: firstly, that it should not contain any new information (apart from possibly discussing the implications of your findings and putting them in perspective). Secondly, somebody who has read the introduction should be able to understand the conclusion without having read the main content.

The conclusion can follow a structure similar to the introduction, but the emphasis should be much more on findings and their relevance/implications. Moreover, the conclusion should clarify which questions are still open and what could be done in the future to make progress in the research area. One possible structure is:

- **Why:** One paragraph reminding the reader of the relevance of your topic.
- **What/How:** One paragraph reiterating what you have done and how.
- **Main Findings:** Three paragraphs summarising and explaining your main findings – one for each finding.
- **Closing paragraph**: Outlook. Here you can be a bit speculative/visionary: discuss the implications of your findings, what you think is going to happen in the future or anything else you deem appropriate.

3.5. The Abstract

The abstract is the shortest part of the paper. It should contain all the information needed for a potential reader to understand what the paper is about. Hence, the abstract should only contain information on **what** you have done, **how** you have done it and what you have **found**. In connection with the abstract, you might also want to provide a few **keywords**. These should be listed in declining order of importance, and each one of them should also appear in the abstract.

3.6. The Title

Obviously, the title should be as informative about the content as possible. Typically, the title announces the topic of the paper: “The effect of minimum wages on employment”. Sometimes, there is also a hint about the main finding: “Minimum wages reduce employment in Germany”. Depending on your topic and the results of your analysis, you will need to decide whether such a glimpse of your findings is desirable. Another possibility is to combine a catchy title with a descriptive subtitle, such as “Tools or Toys? The Impact of High Technology on Scholarly Productivity” (Hamermesh and Oster, 2002). However, you need to be sure that your reader understands your catchy allusions because it is very embarrassing to use a title that requires explanation.

3.7. Concluding Remarks

Finally, we provide two additional tips that might be useful, which we borrowed from Thomson (2001). The first one concerns the hierarchy of the paper. Once you have understood the general principles of how to structure your material, you will also become aware that there is a certain hierarchy between different parts of your paper. This natural

hierarchy should be respected, since otherwise your reader will be disturbed or confused. For example, in the main text you should never refer to concepts, terms or ideas that have been introduced in a footnote. Conversely, you should never provide information that is required to understand the main text in a footnote.

We have emphasised throughout that it is important to make sure the different parts of the paper are logically connected. There is an easy way to actually test whether they are. First, if you want to check whether the paragraphs of a section are well-connected, do as follows: summarise each paragraph in one sentence. If this string of sentences makes sense, you are fine. If not, something is obviously missing. After that, you may proceed to summarise each subsection, and then finally, each section. If your paper survives all these three tests, you have found a good structure. If not, reorganise your material and try again.

In this section, the overall structure of the paper, and the functions of different sections, have been discussed. In the next section, we give some general hints on formatting and style.

4. Style and Formatting

In this section, we give hints on style and formatting. These aspects are not as important as the content, but, unfortunately, if your language is incomprehensible and your layout is untidy, you will not be able to make up for it with brilliant content.

4.1. Style

Concerning the general style, you need to make sure that your language is correct. If you are not a native speaker, this might require asking somebody to proof read your document. But getting the grammar right will not be enough. You also need to make sure that the text makes enjoyable reading, that it is clear how the different parts fit together, and that the text is divided into paragraphs that are internally consistent and logically connected to one another.

A good writing style cannot really be taught, but rather requires a lot of practice. Thus, you should see the writing of the paper as a good opportunity to gain some experience. Generally, it is recommended that you give your drafts to a friend (preferably in the course) to read, and tell them to spot grammatical errors, gaps and inconsistencies. The friend should be able to read the whole paper through from cover to cover within a couple of hours and feel that it is clear what topic was being tackled, that it was clear how it was tackled, that the results have been sufficiently explained and that the conclusions relate satisfactorily to the aim of the project. In other words, the story being told should make perfect sense!

On this note, we would like to emphasise that your own mistakes can be instrumental in the writing process. Thus, do not feel embarrassed about your own initial difficulties to understand key concepts or ideas in the literature. Your reader may of course fall victim to the same misunderstandings as you did. Hence, keep them in mind so as to make your own explanations as articulate as possible. As Thomson (2001) puts it: “There is nothing like having misunderstood something to really understand it”.

You can avoid misunderstandings by providing clear **definitions** of all the concepts you are using. You should never assume that the reader is familiar with all the terms and definitions you are using, and even if they are, you should not count on their having the same definition in mind as you do. Thus, you need to *define* your concepts, and you need to be explicit that it is a definition you are providing. This can be done in various ways:

A country’s fiscal policy is *expansionary* if...

A country’s fiscal policy is “expansionary” if...

A country’s fiscal policy is said to be *expansionary* if...

So why is it important to spell out that it is actually a *definition* (as we do above by using italics or quotation marks)? The reason is that otherwise, a statement containing “if” may have a double meaning. For example, the statement “A country’s fiscal policy is expansionary if the minister of finances exhibits a severe lack of judgement” might be perfectly true, but it is not a valid definition of expansionary fiscal policies.

So clear definitions are good, but they should not be left alone. It is typically very useful to supplement definitions with *examples* of the concept you just defined. The definition of

expansionary fiscal policies could, for example, be illustrated with reference to Obama's stimulus package, which the reader might be familiar with.

Finally, we would like to emphasise the fact that economics is particularly prone to use certain set concepts that have a well-defined and in most cases unambiguous meaning. For example, a "normal good" is a good for which the income elasticity of demand is positive. A "natural monopoly" describes a situation where, for technological reasons, it is most efficient to have production concentrated in one single firm. There are numerous other set terms like this, and it is important to be aware of them, as in a sense they limit our freedom. For example, if I am writing an essay on arms trade and I want to contrast trade in arms with trade in other goods, I have to resist the temptation to refer to these other goods as "normal goods". Conversely, if my essay is really about goods that are referred to as normal goods, it would be very confusing to the informed reader if I came up with some home-made term instead. In short: respect the set terms, and make sure you use them appropriately!

4.2. Punctuation

In what follows, we go through the most common rules for comma use in English. It is important, however, to keep in mind that for most rules there are exceptions and you can probably find contrasting information. The most important thing is consistency. In English, a comma is thought of as a pause. Therefore, if you are reading the sentence and you think there is a shift in tone in the sentence, a comma can sometimes be appropriate, provided it is not overused.

Never use a comma to separate a subject from its coordinating verb.

Example: **The only new variable which is significantly correlated with overall care costs, is the median income of the elderly population.**

In this sentence, '**The only new variable which is significantly correlated with overall care costs**' is the subject of the sentence and must be connected with the verb '**is**'. The comma is, therefore, inappropriate.

Before we proceed, some definitions will be useful. An **independent clause** is a group of words that contain a subject and a verb (or predicate) and can stand on its own as a sentence. Correspondingly, a **dependent clause** is group of words that also contain a subject and a verb (or predicate) but cannot stand on its own as a sentence. It must be paired with an independent clause.

Having introduced these essential terms, we will now provide a short list of comma rules.

4.2.1. Always use a comma after an introductory word, phrase or dependent clause when it comes before the independent clause.

Examples: First, our analysis will examine the relationship between...

For instance, an individual may match with others on the basis of education...

Using Swedish data, the paper poses five questions about these determinants...

If they are at a lower risk, their risk type can operate by offsetting costs.

Take note: When the independent clause comes first in the sentence, do not use a comma. *Example*: Their risk type can operate by offsetting costs if they are at a lower risk.

Exception: It is acceptable to use a comma after the independent clause, and before the dependent clause, when the dependent clause is used in extreme contrast to the independent clause. *Example*: Their findings suggest that TTD is the main cost driver, even though being married reduces its importance.

4.2.2. Use commas to separate words or groups of words in a list of three or more.

Example: Factors considered in the reference group included one's past, his aspirations, his family members, friends with similar characteristics and neighbours.

Take note: a comma may or may not be used between the last two things listed when *and* or *or* is included. It is most important to be consistent.

4.2.3. Use commas to separate two or more adjectives that are used to describe the same noun.

But be careful: only put a comma between adjectives when they are describing the same noun.

Example: These are important, influential findings.

There are exceptions to this and sometimes it can be confusing to be sure when to use commas in this instance. A good rule of thumb is to ask yourself if you can reverse the order of the adjectives. You can say, "These are important, influential findings ." or "These are influential, important findings ." Because the word order is interchangeable, a comma should be included.

4.2.4. Use commas for addresses and dates.

Examples: Her address is Gleimstrasse 33, 10437 Berlin, Germany.

She lives in Berlin, Germany.

Take note: in the first example, there is no comma between the street and the number and between the postal code and the city.

She was born on the 25 July, 2000. (British English)

or

She was born on July 25, 2000. (American English)

Take note: there is a comma between the specific date and the year but not between the day and the month.

4.2.5. Use commas to separate any phrase in a sentence that is not essential information.

Two things you can ask yourself to find out if the phrase should be surrounded by commas are:

a. Can the sentence stand alone and give you the same information without that phrase?

b. Can you move that phrase to a different part of the sentence?

Example: **This is proven by including, in our dissatisfaction equation, the average income, district of residence and unemployment rate.** (Here a comma is necessary because the phrase *in our dissatisfaction equation* is not necessary for the sentence to be understood. It is simply giving you more information about where the information was included.) You can also check if the information surrounded by commas could be moved to a different position in the sentence. For example, *in our dissatisfaction equation* could come at the beginning of the sentence: **In our dissatisfaction equation, this could be proven by including the average income, district or residence and unemployment rate.** or at the end of the sentence: **This could be proven by including the average income, district or residence and unemployment rate in our dissatisfaction equation.**

Take note: whenever the word *that* is used in a clause that follows a noun or a verb indicating a thought process, it is essential information and should not be surrounded by commas.

Example: The information that we compiled for our study was taken from the Swedish Statistical Office. (Here, the phrase *the information that we compiled* is the subject.)

4.2.6. Use commas before a question tag.

Example: You have not answered all of my questions, have you?

4.2.7. Use a comma to separate the main discourse from a quote.

For example: Franklin D. Roosevelt said, "True individual freedom cannot exist without economic security and independence. People who are hungry and out of a job are the stuff of which dictatorships are made."

4.2.8. Do not use a comma before the word *because*.

4.2.9. Use commas whenever necessary to prevent misunderstanding.

4.3. Other things to consider

- Use first person plural – i.e. "we" rather than "I" – whenever you need a pronoun for yourself as the narrator; and use the present tense (e.g. "We calculate the premiums under those assumptions").[1]

- It is uncommon to address the reader directly; we would not write "Now you have hopefully understood the main ideas behind the Barro-Gordon model".[2]

- It is also generally inappropriate to include personal value judgments concerning anything else than the subject-matter of the paper. Thus, we do not write "We really enjoyed writing this paper and we learnt a lot in the process" as it is of no immediate

[1] Please note that there is a huge difference between the English and the German languages concerning the use of pronouns in academic texts. In English academic texts, using "we" is not only allowed but even recommended, whereas passive voice tends to look quite odd. In German academic writing, it is exactly the other way around!

[2] As you might have noticed, we make an exception in this manual!

interest to the reader. On the other hand, as long as you provide reasonable arguments, it is fine to take a stand in the debates that have been going on in the literature. You will, however, need to present a balanced view of the strengths and weaknesses of your standpoint.

- When discussing an individual in third person, use the *singular they/their* (as in: "Every respondent was asked to express how they feel about the war in Iraq"). Using only "he" looks sexist, using only "she" exhibits misplaced political correctness, and "he or she" is too long. So we write "they", even if it might feel weird to begin with.

- Avoid direct quotes unless absolutely essential. Instead, you should paraphrase what others have said, but still reference them if appropriate. This demonstrates to the reader your analytical ability. If, instead, you quote directly, it looks lazy and does not demonstrate anything other than your ability to cut and paste!

- Do not use contractions like "n't" and "it's" as they are examples of how we talk, but not how we write in formal terms – *e.g.* write "cannot" and "it is" in full.

- Avoid exclamation marks ("!") as they are too informal.

- Avoid "etc" – it usually suggests that you cannot think of anything else!

- Do not overuse rhetorical questions, i.e. questions posed without the expectation of a reply.

- Emphasise important aspects of your paper. But keep in mind that if *everything **IS** emphasised, **NOTHING** IS!*[3]

4.4. Formatting

Concerning formatting, you should have the ambition to learn how to use **automatic formatting**. Microsoft word has several functions that facilitate formatting so you should **not** do it manually. If you write your paper in Latex, this will typically not be an issue since automatic formatting is the default.

Some general guidelines on formatting are given below:

- Use A4 paper format and standard margins (for example, 2.54 cm on all sides). The text should be written in Times New Roman, 12 points, or in a similar font.

- Use justified text alignment as in this document. Use line spacing which is a bit larger than 1 line (preferrably 1.2 or 1.5 lines spacing). Paragraphs are marked with blank lines at the end, and not with indents.

- Use automatic formatting styles for headings and body text. Hence, section titles should be "Heading 1", subsections "Heading 2", etc.

- Change the formatting styles so that sections are **automatically numbered**, just as in this document.

[3] This piece of advice has been borrowed from Thomson (2001).

- When making a reference to another section in the paper, use the built-in cross-reference facility.

- Insert automatic page numbers. The numbering should start with the introduction.

- Insert an automatic **Table of Contents**. It should appear after the abstract and before the introduction.

- **Figures and tables:** Figures and tables need to be independently numbered. Both should be centred. It is not allowed to include a figure or a table without explaining it in the text: each figure and table included in the paper has to be mentioned in a form like "…, see Figure 1.", "… as shown in Table 4". Sometimes it is necessary to copy figures from other sources, but in general you should draw figures by yourself, not copy them! If you copy figures from somewhere else, you have to make clear from which source they originate. You may also use a list of figures and a list of tables which should be placed below the Table of Contents.

- Each figure and table should have a **caption** (inserted using the caption function) with a **label** attached to it (hence, remove the title from the figure/table itself).

- Always introduce a figure/table in the text *before* it appears (i.e. leave no surprises for the reader). You do this by:

    - Inserting a **cross reference** ('only label and number') to the table/figure in question.

    - Explaining what the table/figure contains.

    - Explaining how to read it (i.e. "the column labeled 'growth' shows annual growth in real GDP per capita").

- Use column and row headings, and captions that make intuitive sense. The tables and figures should be understandable also without the text accompanying them!

- Highlight the most important aspects of the figure/table, i.e. what is it good for?

- Be consistent with paragraph **alignment** (preferably justified), **line spacing** (preferably leave a line after each paragraph) etc.

4.5. Notation

In economics, we sometimes use mathematical notation such as equations and other types of formulae. A paper full of equations can look very elegant, or impressively complicated, but please bear in mind that the mathematical abstractions are there to help us convey our message, and not to impress our reader.

Thus, include just as much mathematics as you need to convey your message, but not more. And please make efforts to keep your notation simple, consistent and intuitive. To begin with, use standard notation whenever there is one. For example, it is standard to denote utility functions by u, to call prices p, and wages or income y. Also, we typically index time periods by t and individuals by i (cf. Thomson, 2001). If you use other variables for which there is no established standard notation, try to use a notation that helps the reader tell the concepts

apart. And concepts that only appear once or twice hardly deserve a symbol: it is much more effective to refer to them verbally instead!

But using a clear and consistent notation for mathematical expressions, although helpful, will not be enough. You also need to ensure that you guide your reader through the *intuition* behind all the mathematical expressions. And you should never let your reader stumble over an equation before explaining *verbally* what it is there for. What we have said above about presenting figures and tables in the text is possibly even more important when mathematical formulae are concerned. We will now illustrate our view by means of a simple example.

Suppose, for example, that you wish to explain Kydland and Prescott's (1977) model of **time inconsistency**. The main building blocks of their model are *policies* (denoted π) and *decisions* that economic agents take (denoted x). Now, before we present the main equations of the model, it might be a good idea to provide simple examples that our reader can keep in mind. The typical example to which this model is applied is the interaction between a central bank and economic agents in society. However, this example requires the usage of relatively abstract concepts such as, e.g., expectations. We might not want to challenge our readers by using such a complex example to begin with. Instead, let's focus on a situation where there are two players: a bank and a potential borrower. In the initial period, the borrower wants a loan due to be paid back in the next period. Thus, if the borrower gets the loan, their decision (x_b) will be whether or not to pay back the loan. Obviously, the borrower would prefer not to pay back the loan, if possible. Now consider a possible policy (π) requiring that an enforcement agency is set up which assures that loans are paid back on time. In the first period, the borrower clearly prefers this option, since it increases the probability of getting a loan at all. However, in the second period, the borrower would probably opt for not having an enforcement agency if given the choice. Having made this observation, we can introduce the definition of time consistency:

"A policy π is consistent if, for each time period t, it maximises welfare taking as given previous decisions and that future policy decisions are similarly selected" (adapted from Kydland and Prescott, 1977).

Thus, the policy of requiring an enforcement agency clearly suffers from time inconsistency: it maximises borrower welfare in the first period, but not in the second. Now that we have introduced the concept of time consistency by means of a very simple example, we can proceed with heavier machinery. We can now extend the time horizon and refer to the classical example of central banks and economic agents instead. Also, we can introduce the social welfare function and state the dynamic optimisation problem in full length.

The main point of this exposition is that mathematical models need to be accompanied by intuition. Whenever you have a model with several variables, most people will be unable to follow the mathematical derivations – or at least unable to see the point – unless you provide simple stories that everyone is familiar with. Moreover, you need to keep in mind that equations and other formulae can never stand alone: each one of them, and each of their respective elements, need to be explained in the text. You should always aim for being so clear verbally that it is possible to grasp all important aspects of the model without looking at the equations. In other words: equations are not there to fill in gaps in your narrative – they are there to demonstrate your verbal arguments with mathematical exactness.

5. Referencing

It is *absolutely essential* to give a reference to *every* source that you use! Any ideas or facts that appear in the essay that are not your own *have to* be documented in the essay in this way. You will need to use your own judgement in individual cases – for example, if you claim that Paris is the capital of France, there is no need to reference it, of course. But whenever the reader might otherwise get the impression that what you say is your own idea, you need to provide a reference. It is better to have one reference too many than one too few!

When you refer to such an idea in the main text, you do so by putting name and year of publication either in parentheses (Karlsson, 2005) or in the main text itself, e.g. "As Karlsson (2005) points out, this does not apply to all situations". [4]

All references should be listed in a separate section after the conclusion. There are standard formats for how to do this. Our suggestion is to use the following standard:

Single-author journal article

Chaloupka, Frank (1991), "Rational addictive behavior and cigarette smoking". *Journal of Political Economy* 99 (August): 722–42.

Two-author journal article

Becker, Gary S., and Kevin M. Murphy (1988), "A theory of rational addiction". *Journal of Political Economy* 96 (August): 675–700.

More than two authors

Becker, Gary S., Michael Grossman, and Kevin M. Murphy (1991), "Rational addiction and the effect of price on consumption". *American Economic Review Papers and Proceedings* 81 (May): 237–41.

Forthcoming articles

Wright, Randall (forthcoming), "Search, evolution and money". *Journal of Economic Dynamics and Control*.

Working papers and other unpublished works

Laitner, John (1990), *Random earnings differences, lifetime liquidity constraints, and altruistic intergenerational transfers.* University of Michigan, Ann Arbor. Photocopied.

Books

McCullagh, Peter, and John A. Nelder (1989), *Generalized Linear Models*. 2d ed. London: Chapman & Hall.

[4] You may also use footnotes, but try to avoid them to increase readability.

Book chapters

Lerman, Steven R., and Charles F. Manski (1981), "On the use of simulated frequencies to approximate choice probabilities". In: *Structural Analysis of Discrete Data with Economic Applications*, edited by Charles F. Manski and Daniel McFadden. Cambridge, Mass.: MIT Press.

Signed newspaper articles

Rose, Robert L. (1990), "For welfare parents, scrimping is legal, but saving is out". *Wall Street Journal*. 6 February.

Anonymous newspaper articles

Economist (1994), "China's pig of a problem". 17 September: 35–36.

6. Last-Minute Checklist

Once you have written everything up, you should go through the checklist below before you submit.

- Is the title accurate and descriptive?
- Do I deliver what I promise in the introduction?
- Does the introduction give an overview of the structure?
- Are page numbers in the Table of Contents correct?
- Are there captions with labels for all tables and figures?
- Are all tables and figures introduced in the text before they appear?
- Did I reference all sources?
- Is the list of references complete (i.e. do all references in the main text also appear in the 'Reference' section, and do all references in the list appear in the main text?)
- Have I got the same formatting throughout?
- Did I have the paper proof-read?
- Have I used "spell check" on the whole project to try to make sure all words are spelt correctly?
- Are paragraphs logically connected to one another?

7. Concluding Remarks

This paper has given you some guidelines on how to write a seminar paper. It has covered topics like the writing process, the structuring of the paper and style and formatting. If you want to learn more on the topic, two good references are Theisen (2009) for academic writing in German, and Thomson (2001) for academic writing in English. For the more advanced author, a very good guide to academic writing in economics is provided by McCloskey (1985).

However, reading these texts cannot replace, but only complement relentless training. In this manual, we have emphasised the fact that academic writing is an iterative process, where you keep improving gradually in an unremitting trial and error process. Another way of improving your writing skills is to read the works of good writers. Economists known for their good writing style are Angus Deaton, Deidre McCloskey, George Akerlof, and Robert Lucas. Whenever you read the works of a famous economist, it is useful to pay particular attention to what you like (or dislike) about their writing style. What are the strategies they use to convince their readers of the quality of their work? Is there anything you can use in your paper as well? Even though plagiarism is a mortal sin, there is nothing preventing you from drawing inspiration from prominent writers, and trying to imitate their style.

You may also try to find inspiration outside the discipline: for example, the world's most prominent novelists have all become famous thanks to their exceptional writing skills. Thus, we conclude this booklet with George Orwell's (1946) six rules for effective writing:

1. Never use a metaphor, simile, or other figure of speech which you are used to seeing in print.

2. Never use a long word where a short one will do.

3. If it is possible to cut a word out, always cut it out.

4. Never use the passive where you can use the active.

5. Never use a foreign phrase, a scientific word, or a jargon word if you can think of an everyday English equivalent.

6. Break any of these rules sooner than say anything outright barbarous.

References

Hamermesh, Daniel S. and Oster, Sharen M. (2002), "Tools or Toys? The Impact of High Technology on Scholarly Productivity," *Economic Inquiry*, Vol. 40, No. 4, 539-555.

Kydland, Finn E and Edward C. Prescott (1977), "Rules Rather Than Discretion: The Inconsistency of Optimal Plans", *Journal of Political Economy*, Vol. 85(3), 473-91.

McCloskey, Donald (1985), "Economical Writing", *Economic Inquiry* 24(2) (April): 187-222.

Orwell, George (1946), "Politics and the English Language". *Horizon* (April).

Theisen, Manuel R, (2009). *Wissenschaftliches Arbeiten. Technik – Methodik – Form.* München: Vahlen.

Thomson, William (2001). *A Guide for the Young Economist. Writing and Speaking Effectively about Economics*. Cambridge, Massachusetts: The MIT Press.

Appendix I: Presentation and Discussion

Below we provide some simple rules-of-thumb for your seminar presentation and for your role as a discussant.

Presentation

Many of the recommendations for the writing process are also valid for the presentation, since in both cases the ultimate aim is c*larity*.

- Introduce yourselves at the beginning of your talk.
- Provide a clear and succinct definition of your topic…
- …and try to get the audience's attention from the very beginning by showing how relevant and fascinating your topic is.
- Present an outline of the presentation…
- …and then make explicit references to the outline as you go along.
- Do not read from a script! At a maximum, keep some key words on a note – but it is even better if you speak completely freely.
- Keep regular eye contact with the audience.
- Try not to show the audience your back
- Do not overload the slides with information. Use a large font (>20 pt) and only a few lines on each slide.
- Use uniform slides and writing style.
- Keep in mind what the level of knowledge of the audience is, and try to pick them up where they are.
- Avoid fancy animation and colours and fonts that are difficult to read.
- It is important to keep the attention of the audience. Things that reduce monotony are good: pause, move around, ask questions to the audience, and prepare surprises of different kinds.
- Keep track of your voice pitch. Make sure that even people in the back row can hear you.
- Rehearse your presentation and clock it so that you know the time given will suffice.

Discussion

- It is preferable to address the author(s) directly instead of mentioning them in third person.
- You may prepare a few slides to accompany your discussion.

- At the beginning of your discussion, it is a good idea to summarise the main points of the paper.

- Please bear in mind that the purpose of the discussion is not to score points, cheap or otherwise, at the expense of others, but to be constructively helpful to authors.

- The best approach is to imagine that the authors were to write a new version of the paper in a few weeks' time and that they have turned to you for advice on how to proceed.

- You may bring up formal issues (referencing and citing of sources, structure, grammar and style, labeling of sections…) but the emphasis should be on *contents*.

The discussant's presentation can be closed with a short agenda for the following discussion.

Appendix II: Common Mistakes for Native German Speakers

The following is a brief list of grammatical mistakes that are often made by native-speakers of German:

Writing Numbers: The use of a decimal and a comma in English are the opposite from German. When you would normally use a comma in German, you should use a decimal in English and when you would normally use a decimal in German, you should use a comma. For example: $3.452 becomes $3,452 or 7,2% becomes 7.2%.

Quotation marks in English are BOTH high. For example: She said, "Don't use the fine china."

The word "information" has no plural and never gets an "s". This also means that when using this word, the writer must match the corresponding verbs accordingly. For example: There **is** a lot of information in the most current article. NOT There **are** a lot of information (or certainly not there **are** a lot of information**s**) in the most current article.

The word "data" never gets a plural "s". It can be argued that it is a plural noun in and of itself or it can always be treated singularly. The choice is yours but make sure that you are consistent. For example: The current **data show** an increased usage of solar power. or The current **data shows** an increased usage of solar power.

Most vs. The most: The word **most** is most often used as an adjective to mean *almost all*. For example: "She has read most of George Orwell's books." (But not all.) or "Most people who live in the United States speak English.". The words **the most** are used as a superlative before other adjectives. For example: My husband is the most handsome man I know. (No one is more handsome than him.)

Few vs. Less: **Few** is used for countable nouns. For example: There were few questions after he finished his lecture. **Less** is used for uncountable nouns. For example: You should eat less sugar and more protein.

By vs. Until: Both by and until are used to talk about a time before the stated date, but not after.

- **Until** tells us how long a situation continues. It is used to describe a period of time. For example: "They lived in the center of Manhattan until they had a child" (When they had a child, they stopped living there.) or "I will be on vacation until May 1." (I will come back on May 1.)

- **By** is used to describe a point in time and is often used when speaking about deadlines. For example: "You have to finish your dissertation by the end of the semester." (The paper will not be accepted after the semester ends.) or "We will have the application online by the 5th of April." (It will be online no later than the 5th April.)

At First vs. Firstly:

- **At first** is always used to contrast two or more thoughts. For example: At first I didn't like my brother's girlfriend, but the more I got to know her, the more I liked her.

- **Firstly** is an enumerative adverb. It is used at the beginning of a sentence or paragraph to list ideas in an order and should be followed by a comma. First is acceptable instead and sometimes even preferred.

Former: The word former is used to talk about something that came before and is no longer current. For example: The former president of the company now works for a competitor. (He is no longer the president of the company but he was at one time.) *Never* use 'former' for an entity which still retains the quality or function embodied in the noun: in a literature review, we speak of 'previous research' and *not* 'former research'!

The words **former and latter** can be used together in a sentence to describe two thoughts - the former being used to talk about the first idea in the list and the latter being used to talk about the second. For example: Some people prefer artificial sweetener to pure sugar because the former has fewer calories than the latter. In this sentence, the former is referring to artificial sweetener and the latter is referring to pure sugar.