Here is the Title: Template for the BT*

Trabajo de Fin de Grado de Nombre Apellido para el Grado de Economía

February 2021

Abstract

The Abstract should be concise: usually between 150 and 300 words. It should not be longer than one side and should fit together with the title on the first page of the document. It should collect the main objective of the study, the main analysis methods used, the most important results and the conclusions. It should not include formulas or footnotes. Very exceptionally it could include some reference when all the work is a note on the reference. When you write your abstract, think about what it will be for: in the future, when your BT is part of a database, students or researchers will consult the abstracts of many of them. Your abstract will capture their attention if it is well written.

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Contents

1 Introduction

A reasonable structure for any scientific article is called IMRAD (**I**ntroduction, **M**ethods, **R**esults, **A**nd **D**iscussion). It will be convenient that your BT project develops a similar structure.

The entire work has a maximum of around 20 pages (see specifications in your degree). The Introduction, which should be between 1 and 2 pages, will dedicate approximately one paragraph to each of the following points or aspects of your work:

- Motivation of the research: What you want to explain is why the study is carried out. Many times this implies referring to the social significance of the issue and previous scientific research. A paragraph with references to scientific studies related to the subject and their contributions to our knowledge is usually a convincing way to motivate your work. You will have motivated your work well if it is clear why the topic you are dealing with is interesting for your audience.

- The specific objective of the study: Once you have motivated your study, you must describe as precisely as possible the main question that you are going to address in your work. You want to describe, for example, the hypothesis that you are going to try to test in the most exact way. To do this, you will have to know how to briefly explain the context in which you are going to test the hypothesis (it would be useful if you describe the data you use in one or two sentences). Once correctly contextualized, you should write, probably in a sentence, the fundamental objective of your work. When you write this sentence, think about what would be the sentence that you would like a journalist from a popular science magazine to use to present your work.

- Methods: This part is not essential but, after having described your objective, it may be important that you report on how you are going to achieve it. If the method is very, very, standard (for example, using basic regression techniques or descriptive tables), it may be enough to mention it briefly when stating the objective of the study. But if the method is not so standard, then dedicating a couple of sentences to it in a separate paragraph probably helps to understand the contribution of your work. For example, if you are trying to estimate a causal effect by using an instrumental variable that has not been used in the literature (at least in the years/countries used), then it is important that you describe it and even briefly motivate it here. Sometimes the method is not standard but it has already been used in published works. Then it is enough to describe the method as precisely as you can and cite the author/s who used it for the first time. For example, suppose you want to estimate an urban transport demand model based on the Domencich and McFadden model. So you could write something like:[1]

  "To contrast this hypothesis, I estimate the transport demand model of Domencich and McFadden (1975)."

- Results and conclusions of the investigation: This part is not essential either, and in any case it will be very short. You are probably going to specify a little

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[1] Remember that the bibliographic reference will work in the lyx template if you have the bib file selected at the end of the document in the "BibTeX Generated Bibliography" inlet. You can create a bibliographic base very quickly using tools like Google Scholar. For example, suppose that, somewhat by rally, you want to cite a work by your tutor that has a very long title, such as Mora and San Juan (2004). All you have to do is enable Google Scholar in its Settings to show the links to import the citations into BibTeX. Once this is done, you will have a very useful tool. In Google Scholar search "Geographical Specialization Mora San Juan" and your first result will be the paper you are looking for. Click on "Import to BibTeX" and you will get a text code that is exactly what appears as the second entry in the bib file that I have enclosed. Once you have the reference in your bibliographic base, you can use it in LyX with Insert>Citation or, using short keys, Alt+I, C. In any case, don't forget that the BibTeX code of any article can always be obtained from the online service of the magazine where the article has been published.

more the results already advanced in the summary. It is also common in many scientific articles to add a paragraph in which the content of the rest of the article is described. In your BT this paragraph is not necessary if you keep the Table of Contents that LyX generates automatically. However, if for some reason you think it might be useful to justify the structure of your work, then this is the ideal time.

2 Literature review

In this section you must frame the research based on what the literature and previous studies have said in relation to the topic. If your BT raises an issue from a literature review, in this section you will probably want to present the literature review. If your BT intends to replicate an article to raise a question related to it, then here you could explain the methods carried out in the article.

For a project of the limited length of a BT, you will likely not need sub-sections. However, remember that LyX gives you many options to structure the ideas of your work well. For example, you can use the "Paragraph *" field to highlight paragraphs that have special content.

Theretical contributions: Here you would mention the most interesting theoretical contributions.

Empirical findings: In this paragraph you could mention the most recent empirical results.

3   Theoretical framework

Here you will present the research question, the causal mechanism and a motivated presentation of possible answers, such as hypotheses or goals to be achieved. In the literature review, you may be interested in writing mathematical models used by the authors. It will be very helpful if you strictly adhere to the usual conventions about symbols. For example, if you are going to use a utility function that includes the consumption of the only good of the economy and leisure, it would be convenient that you present it using the usual symbols in literature. For example,

> The basic labor supply model considers the decision to work h hours and consume C units of the only good in the economy. The representative agent will maximize—subject to the budget and time restrictions—the utility that the consumption of the good and the time devoted to leisure, l, gives:

$$\max_{C,l} \quad U\left(C,l\right)$$
$$s.t. \quad C = wh + V$$
$$h = T - l$$

This text is much easier to follow than the next one where no mathematical formatting effort has been made nor the usual symbols have been used:

> The basic labor supply model considers the decision to work h hours and consume C units of the only good in the economy. The representative agent will maximize—subject to the budget and time restrictions—the utility that the consumption of the good and the time devoted to leisure, l, gives:

$$\max d(b,c) \quad st: \ b=ea+f, \ a=g\text{-}c$$

Strictly speaking, the second presentation is just as mathematically correct as the first, but it will clearly take much longer for any social scientist to understand.

4 Data and Methods

In Section 1 you have presented the most relevant aspects of your work. In this section you must explain essential aspects necessary to understand the results of your work.

Remember that it is in this section where you will describe all the necessary details to understand the results. It is therefore possible that the section includes subsections that deal with relatively independent topics. If your BT intends to replicate an article to raise a question related to it, then here you could explain how you extend it with your analysis. If what you want is to develop a tool for an econometric software, such as `gretl` or `Stata`, then in this section you can describe in detail the econometric procedure and the essential aspects of the software to carry out the application.

The following subsections are merely guidance suggestions. You may or may not include them in your BT. You can of course also change the names of the subsections to others that seem more appropriate. Do not forget to label (Insert>Label or Alt+I, L) all subsections and sections to be able to reference them (Insert>References) easily anywhere in your BT.

4.1 Data

At the very least, you must specify the unit of analysis and the sources of information. If you are going to use several databases, or you think the description of some variables is important (because they will be used as instruments, for example), it may be useful to include a subsection in the main text where you include all the information about
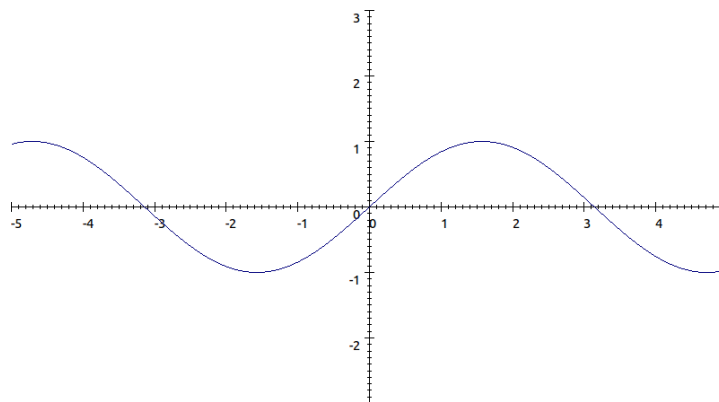
Figure 1: *The sine function.*

the data that seems relevant to you. In many empirical work, this is the ideal place to insert a graph or a Table of Descriptive Statistics for your data.

Figures or graphs can be inserted into the document in various ways. The most flexible way is to insert it as a floating object using Insert> Float> Figure. A frame and a figure caption will be created. With the cursor inside the box, one or more figures can be inserted using the menu Insert> Graphics. A window will appear so that you can select the file that includes the graph. LaTeX supports all common graphic formats. Also use the file selection panel to set the most appropriate graphic size. A convenient option is to set the size as a percentage of the page size. So that the images are centered, select Center in the Paragraph Settings option. To assign a label to a figure (to be able to refer to it from anywhere in the text) you must position the cursor inside the bottom of it and choose menu Insert> Label (Alt + I, L), just as you would label any other environment. In Figure 1 I have inserted the graph of the sine function $sine\,(x)$ that I saved in a png file.

You can also create tables as you insert graphs: Insert> Float> Table. After putting a title in the Table footer, you can create a table with Insert> Table choosing its dimen-

sions (although they can be modified later). However, if you are going to input results from econometric programs like `Stata` or `gretl`, this is not the most efficient way. The reason is that these econometric programs (and spreadsheets such as LibreOffice Calc or Excel) have utilities that allow you to export results to LaTeX code.[2] Insert a Table in LaTeX format is as simple as: (a) copy the LaTeX code of the table from any text editor; (b) within the LyX document, open (Ctrl + L) a "devilish red text" (ERT, **E**vil **R**ed **T**ext) where you would like to show the table; and, (c) paste (Ctrl-V) the LaTeX code inside the ERT box. In this way you can pass your main results to the final document with the assurance that you will not go wrong with the numbers.

4.2   Model

You are probably going to estimate some kind of econometric model and you will need to insert several equations. There are many ways to do it. The basic modes of the equations are three:

- Equations that are expressed in the same line of text, which serve to indicate small equalities, such as $N = 5000$ or $y = \frac{Y}{N}$. You can create them either using the menu (Insert> Math> Inline Formula) or the shortcut (Ctrl + M).

- Equations that are larger and require more attention, but will not be cited again. They should be placed on separate lines, but you don't need to number them. Use the menu (Insert> Math> Display Formula) or the shortcut (Ctrl + Shift + M).

- Numbered equations (Insert> Math> Numbered Formula or Ctrl + Alt + N). This will create a box in which we will write the equation using the symbols palette or, if you know them, directly LaTeX codes. The equation will have a number

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[2] If you want to know how to do it in `gretl`, you can consult the manual, page 15.

associated with it. Don't forget to tag it so you can reference it in other parts of the text. 30 minutes spent reviewing a tutorial on formulas in Lyx can help you a lot in your editing of mathematical formulas.

An example of a numbered and labeled equation:

$$y = \alpha + \beta k \tag{1}$$

$$f(x) = \gamma \tag{2}$$

where I include the label "eq: y" which is invisible in the final document. Whenever I want to refer to this equation, I just insert a reference to this label. I do it in menu Insert> Reference or Ctrl + I, R and then I choose the correct label. If I want to refer to Equation (1), I just insert the reference to the label. In the label selection menu you have several options, for example, to decide if you want it with parentheses, as in "Equation (1)", or if you want it without parentheses, as in "Equation 1".

5   Results

In this section you must present the main results of your Final Degree Project. What answer was found on the research question? What did the study do? Was the hypothesis tested true?

6   Discussion of results

What can the answer infer and why is it important? How does it fit in with what other researchers have found? What are the prospects for future research?

7 Conclusions

A bit larger than the Abstract, it wraps up hypotheses and results.

A   Appendix

Perhaps the detailed description of the data is not so relevant (Scheuering, 2013). Perhaps the derivation of the basic model is complex and does not add anything essential to the main text. Perhaps you have done more regressions but you don't want to present them in the main text, which you want to reserve for what is really important. All these circumstances—and others—justify the creation of one or more appendices.

References

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