

Template-based introductory guide to LaTeX for Economics

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[Latest minor update: 5/17/2010] [Latest major update: 3/2005]

Abstract

This is a very introductory guide on how to use LaTeX to write Economics papers. The guide is based on a sample file (a “template”) that you can edit to create your first article using LaTeX (you must have something yours to write, of course!). From then on consult more complete guides or search for what you want on the Internet. Warning: this is not for people who already know the basics (you won’t learn anything new here, so look for something better out there)!

Keywords: LaTeX; economics research.

JEL Classification Numbers: Y90 (Miscellaneous Categories -Other -Other).

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1 Introduction

When I started learning to use LaTeX, I couldn't find a sample or template that was useful for learning-by-doing, so I had to learn from scratch (reading manuals!). It took me months to learn! Using the sample/template and guide below, I hope the reader can write her first working paper using LaTeX in a couple of days!!!

1.1 What you should get

First of all, if a URL link is broken, search for the resource using your preferred search engine (e.g., Google).

There are several editors that can be used with a LaTeX compiler. The “standard” (most used) compiler out there seems to be MiKTeX. You can use it with a text editor like TeXnicCenter (free – I use this!) or Winedt (proprietary), which are interface editors (they still require to learn some coding, but (if you don't want to learn math codes) you can use Mathtype or TeXaide (free), which write mathematical language in WYSIWYG (“What You See Is What You Get”) like MS-Word Equation Editor does and then simply copy-and-paste into the LaTeX file that you are editing).

Thus, to get started, download and install MiKTeX and TexnicCenter (search on the internet for their current links). After installing MiKTeX, it is recommended that you check whether it is configured to install new packages on the fly (go to the Windows Start Menu, All Programs, MiKTeX, Maintenance, Settings, and find the “Package Installation” option – choose “yes” for “Install missing package on the fly”), otherwise you might get an error when compiling your .tex file (packages are like extensions, which allows you to do something in addition to the basics). Now, you need a basic guide that will help you with the most basic commands. I wrote the one below, which uses the approach of learning-by-copying (i.e., you get a sample file so that you can start practicing by just changing the parameters and the text content). A more complete manual available in the web is Oetiker's [(2008)] “Not-so-short introductory manual” (download this manual and use it as a reference).

I also highly recommend to get these two programs:

- Excel-to-LaTeX: a free Excel macro that convert an Excel selection to a LaTeX table. You can do most of the work on tables using Excel and then just converting it to LaTeX code with this macro.

- LaTeX2rtf: free software to convert from LaTeX to rtf file (which can be converted to doc files). The conversion is not perfect (there are problems with footnote numbering, table alignments, citations, references, etc.) Some journals still cannot accept LaTeX or pdf files when you submit a manuscript (what????? unfortunately it's true!), thus requiring you to

convert to a doc file!).

An alternative to the LaTeX editors above is Scientific Word (proprietary), which is a complete package to write texts that get converted to LaTeX on the go (the need to learn LaTeX codes is highly reduced and the math environment is fully incorporated, i.e., you edit math in a WYSIWYG environment). Last time I used there were compatibility problems with other LaTeX programs and some bugs. I personally recommend to avoid this software and learn in the hard way (writing LaTeX codes) because it gives you much more flexibility (and compatibility).

1.2 Other (less useful) resources

To insert figures in a LaTeX file: It is common to get your original graphs and other figures as a jpg file, so you need to convert it to pdf or eps to insert it in your LaTeX file. 1) easiest option: convert figure to pdf (use a pdf creator software like PrimoPdf or CutePdf); the resulting file must have only one page. Insert all figure at the end of the paper, one figure per page, so that you don't have to worry about the size of the figures (the guide below tells you how to insert figures). 2) if you want figures to have a proper size (for instance, if you want to insert figures within text), you need to crop the blank margins of the pdf file that you created (so that the resulting file has only the figure and almost no margin) before inserting it in the LaTeX file. To crop pdf files, use a pdf editor program (PDFill PDF Tools or PDF-Xchange Viewer). Then, insert the resulting file where you want it to be in your paper. 3) you may prefer to insert eps files (instead of pdf files). Then, you can use jpeg2ps, which is a free software to convert from jpg to eps. This little program generates high quality small eps files, but it works in DOS environment (so you must learn how to operate in this environment).

1.3 Other resources for other uses

- Rtf2LaTeX2e - free software to convert from rtf (MS-Word) file to LaTeX. It saves a lot of work when converting existent papers written in Word like programs, but it is not perfect (tables, graphs, equations, and formats may not convert well).
- LaTeX.org - information and free programs for lots of uses
- Ctan.org - information and free programs for lots of uses (Boston College) Economics' resources - information and links for LaTeX typesetting (includes an introduction manual)
- Sourceforge - free open source LaTeX programs for lots of uses (look for LaTeX in the software search)

1.4 Links for publication of economics research

Search for these useful links on the web (I'll add the links to this document later).

- JEL Classification Numbers
- How to publish in Economics by Prof. Kwan Choi (Editor, Review of International Economics)
- <http://econpapers.repec.org/> or <http://www.ssrn.com/> - to share working papers
- Rejected ideas by Prof. Xavier Sala-I-Martin.

Tip: Look for instructions on formatting your paper in the journal's website (where you are submitting your paper). In general, you don't have to follow the instructions strictly when you submit a manuscript for refereeing (you only really need to follow the instructions when you submit the final version for publication after your paper is accepted - good luck with that!).

2 Template-based guide

This needs revision and update; feel free to copy and make your own improved version. In the following, LaTeX codes are typically preceded by a “\”. Typically, parameters are inside brackets (some of them are highlighted in bold so that you know you have to personalize it, like the name of a section, captions, etc).

2.1 Sample working paper and software needed

Use the .tex file below as a template for your first LaTeX working paper! This file is based on an earlier version of my Ogura[(2010)] paper. The *figure.pdf* file (below) refers to a figure that is inserted in the working paper (objects can be inserted in several ways; I prefer to insert them as a pdf file). Download both files and put them in the same folder (create an folder for your working paper where you can have all the associated files, i.e., figures, backup, log, etc.). Click on the links below to download:

- [workingpaper.tex]
- [figure.pdf]

The output you should get after compiling the .tex file with MiKTeX is here (click on the link to download): [workingpaper.pdf].

The sample above is just a very simple template to get you started. There are many things that you will learn over time to make your life even easier. For instance, how to make better looking tables, change the way citations appear, use BibTeX. And so on. Use the LaTeX editor (TexnicCenter) to open the *workingpaper.tex* file and then learn how to

compile and build a pdf output (it's pretty easy - explore the commands at the top - later, learn to customize the toolbar buttons in TexnicCenter as they will be VERY helpful). Notice that you may have to ask twice to compile the file (the first attempt sometimes doesn't work well - you will see errors in the log file, not sure why). You should be able to get an output that is exactly the same as the one I posted above (the pdf file). After that, it's up to you: change text, format, etc. to your taste or work. Good luck and have fun!

For figures, it might be better to choose file names that have no space in it (I had problems before with file names with space, but I'm not sure if it was a constraint or was just bad luck). Also, put all the associated files (LaTeX file and figures) in the same folder.

When generating pdf output, you must close the previous pdf file (which has the same name) before generating a new one (or you will see an error message). Pdf output may not work properly if there are eps figures in your file (in that case, you may have to create a dvi file first, and then convert to pdf with a pdf creator). When you are working in your paper, it's easier to generate a dvi output (instead of pdf output) because it is faster and the dvi previewer will open the file on the page where you made the last change (if you are using Yap as your dvi previewer; also, you don't have to close a previous dvi file before generating a new file). The only problem with requesting a dvi output is that pdf figures won't be shown (if you have figures as pdf files in your LaTeX file, you have to generate a pdf output to be able to see the figures in the paper).

All files generated will be saved in the folder where your .tex file is located.

Additional tips on how to personalize your paper according to your needs are given next. There may be mistakes and there are definitely easier ways to do some of the stuff described below. I learned some of the better ways, but this guide wasn't seriously revised since years ago when I was still a newbie. If you find this guide useful, would you please kindly email me to let me know that I didn't waste my time with this? The more people write to me, the more I'll be willing to improve and update this guide in the future. Thanks! (In four years, about 15 people wrote me back! Thanks to all of them for their consideration! Oh, and in any case: "you are welcome!" Recently, another five or six people wrote me back, so I got excited and revised this document a little bit, fixing grammar, typos, and adding how to insert URLs.)

In the following text, periods might have been skipped at the end of sentences to avoid confusion (a reader might think the period was part of a code). Sorry for the disrespect to good grammar (there are many other typos or grammar errors too, since I never seriously revised this).

2.2 Using packages

For most changes in the format of your document, you must use packages. Packages must be inserted by writing the following in the preamble (the preamble is the initial part of the .tex file, which has the specifications to be followed when creating the final output; it comes before the actual text, i.e., before the Title, Author, etc.):

```
\usepackage{package name}
```

2.3 Forcing a given authorship date

If you don't want the current automatic date to be shown below the Title/Author, add the following after `\title{ }` or after `\author{ }`. For example:

```
\title{Title}  
\date{\small date you want}  
\author{Name,Affiliation,etc.}
```

2.4 The Navigator in TexnicCenter

TexnicCenter has a very useful feature called Navigator, which allows you see a tree with sections, subsections, figures, tables, etc. to help you navigate inside your file. To use the Navigator, you have to start a project (File, New Project) and then copy your .tex file into it (so that it gets associated with the project). Then, when you reopen the project (or .tex) file later, the .tex (or project) file will be opened together automatically.

3 Format and layout

3.1 Page number

To force an initial page number (other than 1), write:

```
\setcounter{number for this page}
```

(example, `\setcounter{2}` makes the page where this command is written to be “2” and the following pages will follow this value.

If you don't want page number on a particular page (usually on the first page in a working paper), write the following in the part of the text that corresponds to that page:

```
\thispagestyle{empty}
```

3.2 Line spacing

The package `{setspace}` must be added and then write the following where you want spacing to have effect:

```
\singlespacing
```

or

```
\onehalfspacing
```

or

```
\doublespacing
```

If you add this command before the start of the text, the spacing that you set will valid for the entire document. To set different line spacing for a portion of the document, add the corresponding command in the start of the portion and then, at the end of portion, write the original spacing command to return to the original spacing. Instead of the spacing commands above, you can use:

```
\setstretch{n}
```

where **n** is a decimal number and represents the spacing parameter (1=single, 1.5=one and half, 2=double, 3=triple, etc.).

3.3 New line or paragraph

To start a new line **with indent** like for a new paragraph, skip one line in your `.tex` file.

To start a new line **without indent** add `\\` at the point where you want the new line to start.

3.4 Indent

To eliminated the indent in a given paragraph (useful when preparing presentation slides), start the paragraph with `\noindent`

To increase the indent, add a `\quad` or `\hspace{Xcm}`, where **X** is the number of centimeters to skip (you can use `in=inch` too).

3.5 Margins

To change page layout margins, alter the parameters in

```
\geometry{left=1.0in,right=1.0in,top=1.0in,bottom=1.0in}
```

Instead of inches (in), you could use centimeters (cm). You must be using the geometry package, i.e., make sure the following is in the preamble of your `.tex` file:

```
\usepackage[nohead]{geometry}
```

3.6 Hyphenation

To avoid excessive hyphenation (i.e., word-breaks between lines), add the following to where you want the command to start having effect (usually before the beginning of your text):

```
\sloppy
```

This command does not completely eliminate hyphenation, but makes it very rare. LaTeX was create to generate a nice looking output, so the compiler tries the best it can to avoid hyphenation, but sometimes it would create large spaces between words, so the compiler prefers to hyphenate the last word of the line.

3.7 Justification

Justification is generally not needed for working papers, but here it is. To have text justified to the left, use `\flushright` at the point you want justification to start. To have text justified to the right, use `\flushleft` at the point you want justification to start. To have text centered, use

```
\begin{center}
```

```
    Text that you want to be centered
```

```
\end{center}
```

3.8 Font size

Font sizes depend on the initial shell. In the `{article}` shell (a shell is like a template with predetermined formats, which is specified in the preamble of the `.tex` file), which is the one you will be using mostly, the following is the most used font sizes if the standard size is set to **12pt** (this is the case in the *workingpaper.tex* file that you downloaded). Write the command for font size before the text that you want to have that size. If you want to go back to the initial size (or change to another size) later, write a new font size command. If you want to change the font size for a table, you have to write the font size command inside the table environment (i.e., just after you write the `\begintable`):

- `\Huge` for size 25 (useful for presentations)
- `\LARGE` for size 20 (useful for presentations)
- `\Large` for size 17 (useful for presentations)
- `\large` for size 14
- `\normalsize` for size 12
- `\footnotesize` for size 10

- `\scriptsize` for size 8 (useful only to reduce large tables)

Instead, TexnicCenter also allows you change font size by selecting the text and then clicking in Format/Font size (other size options are possible; the ones above are just the most useful).

3.9 Font format

This is obvious if you are using TexnicCenter (find Format > Characters in the menu), but here it is otherwise.

- `\textbf{text}`, which yields **text**
- `\textit{text}` or `\emph{text}`, which yields *text*
- `\underline{text}`, which yields text

4 Adding special content

4.1 Footnotes or endnotes

Footnotes are inserted with `\footnote{Footnote_text}`. You should write this just at the place where you want to have the footnote mark shown. Numbering of footnotes is automatic. Be careful that you should not include footnotes in equations or equation arrays (or any other math environment).

To have all footnotes shown at the end of the document, write in the preamble

```
\renewcommand{\footnote}{\endnote}
```

Then, at the point of the text that you want your notes to begin (usually before or after the references), write

```
\begingroup  
  \theendnotes  
\endgroup
```

4.2 References

You may want to learn how to use BibTeX. In the long term, it should be worth. Search for a BibTeX guide somewhere else (try Bibedit, a little software that helps writing and storing references). For your first paper, just use a simpler method (see the example in the working paper file). To add references at the end of your paper, write

```
\begin{thebibliography}{9}
```

```
\bibitem[(year)] {label}Your reference (author, article, journal, year, volume, page, etc)
```

```
\bibitem[(year2)] {label}Your reference2 (author, article, journal, year, volume, page, etc)
```

```
\end{thebibliography}
```

The “[**year**]” is optional. It’s not that useful, but you will see how it can be used below. The label (anything you want, but make it short so you remember) allows you to cite the reference in the text by calling it. The number **{9}** after `\begin{thebibliography}` is the size of the widest-label (I don’t know if it actually matters, but I guess if you use short labels, then it doesn’t). For numbered references, like **Smith** [4], using labels are useful! The numbering is automatically sorted by the order in your list of references. So, if the Smith reference is the forth that you listed, then it will appear numbered as [4]. In order to automatically show the number in the text, you have to call the label by writing `Smith \ref{labelforSmith}`. For references with year, like Smith (1996), using labels is not that useful because it is faster to just write the year yourself. But if you want to get the year automatically using the label, write `Smith\cite{labelforSmith}` or, if the reference is already within parentheses, write `(Smith, \citeyear{labelforSmith})`.

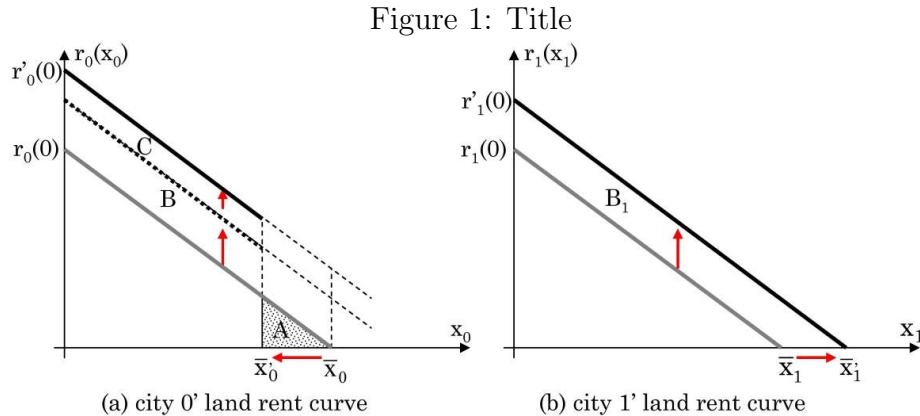
4.3 Figures and pictures

To add a picture, use eps or pdf files. If you want to use pdf figures within your text (not at the end of paper), you have to crop the margins of the pdf page so that the file has only the picture (and no large blank spaces as margins). I guess this is easier to do then to use eps figures, but if you don’t know how to create a pdf version of your figure and then to crop it, you can try to use an eps version of the figure. I won’t explain this here because I think it’s too much work and confusing. Add the figure (where you want it to be) with:

```
\begin{figure}[htbp]
  \caption{Title}
  \centering \includegraphics[width=0.75\textwidth]{filename.pdf} \\
  A note you want to add here (like the source of the data for a graph).
  \label{your_key}
\end{figure}
```

where **htbp** is for the location on the page: here, top of the page, bottom, of floating in an exclusive page, **Title** is the title that appears at the top of the figure (automatically precedes with “Figure X:”, where X is the number of the figure), `0.75\textwidth` gives the width as a proportion of the text width (you can use a measure in inches or cm instead),

filename.pdf is the name of the file of the figure, which should be in the same folder of your .tex file, and **your_key** is the key that you can use to refer to the figure in the text (you have to write `\ref{your_key}` in order to have the reference (the number of the figure) shown in the text). Notice that you can add a note at the bottom of the figure for sources or other remarks. The example above should give something like the following figure (using the option “h”, i.e., print it here).



A note you want to add here (like the source of the data for a graph).

Tip: how do you create pretty figures? MS-Powerpoint is great to draw diagrams. MS-Excel draws several types of graphs. Mathematica, Matlab, Stata, etc. can create plots from data (or simulations) that might be useful.

4.4 Unnumbered sections

If you don't want to have the number of the Section (or subsection, or sub-subsection) showed in your final document, write “*” after `\section` like this:

`\section*{section_name}`

Note that this section won't be automatically counted (if other sections are numbered). This is useful when adding an Appendix (there is another way to add an appendix, but I prefer to just add an unnumbered section called Appendix) or an end-of-paper acknowledgment (again, LaTeX has its own way to add acknowledgments, although most Economics journals ask you to write the acknowledgments with your contact information on the first page).

4.5 URL with hyperlink

First, add the package `hypertext` in the preamble:

```
\usepackage[hypertex]{hyperref}
```

Then, write the following where you want the hyperlink to be in your text:

```
\href{url}{label}
```

where **url** is the full URL (including `http://`) and **label** is what you want to be shown in the text (if you want to show the full URL, just repeat the URL for the label).

5 Slides

There are several ways to make slides in LaTeX. The easiest way (which I use), although not the prettiest one, is to make a copy of your article file, then change the format to landscape, reduce margins, and increase letter size to `\Huge` (use smaller font sizes for tables). Use `\bullet`, `\Rightarrow`, `\blacktriangleright`, etc. to organize your presentation. The advantage of this method is that the font size will be just right! and you won't be able to overstuff each page with lots of words, equations, etc. The greatest advantage, however, is that you don't have to learn anything else!!! It's pretty obvious what you can do and, to make your presentation, you can just delete parts of your article! To change the page orientation to landscape, write **landscape** as an argument in `\documentclass[12pt, landscape]{article}` at the very start of the .tex file. Add the `\Huge` after the `\maketitle` command (just after the title and author names). You will have to add size commands to alter the size of anything in the title section (the title, author names, etc.) by adding `\huge` or `\LARGE` or `\Large` or `\large` (as you prefer) to the text, as shown below:

```
\title{\huge Title of Paper}
\author{\LARGE Author Name \\
\Large School Name \\
\large Preliminary work: do not cite it.}
\date{\Large 3/29/2010}
```

You can make dynamic presentations with LaTeX, but for that you need special shells and learn to use them (search over the internet on how to). The `{beamer}` class has been used frequently lately (see <http://latex-beamer.sourceforge.net/>).

6 Concluding remarks

Good luck! Yes, luck is helpful during this learning process (avoiding silly mistakes will save you a lot of time).

This is an open-source document. Feel free to write and distribute your own improved version based on this one (just don't forget to cite this document). The original .tex file of

this document is available at <http://faculty.gvsu.edu/ogural/>

Future topics to be covered here include how to use Bibtex ...

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