

An Introduction to the LaTeX Typesetting System

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<http://spot.colorado.edu/~joka5204/latex.html>

Gemmill Library of Engineering, Math & Physics

March 13, 2014

Do you...

- ▶ write scientific documents?
- ▶ typeset math notation?
- ▶ make presentation slides?
- ▶ make conference posters?
- ▶ cite many references?
- ▶ (plan to) write a dissertation?
- ▶ give MC exams?
- ▶ like aesthetic document design?

Or are you...

- ▶ tired of MS Word?
- ▶ running into trouble with large-ish Word documents?

Then you may want to look into $\text{\LaTeX}$.

Because $\text{\LaTeX}$ lets you do these things...

- ▶ more easily,
- ▶ more aesthetically, and
- ▶ more naturally

—with a one-stop setup.

But: high learning curve (depending on your computing background).

$\text{\LaTeX}$ = *la-tech*, since 1977.

A mechanical typesetter for you. This means:

Your content

+

code

via $\text{\LaTeX}$ = Output.

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via $\text{\LaTeX}$ = Output.

You let the computer take care of design & typesetting.

Why not WYSIWYG?

- ▶ Takes time
- ▶ Constant changes
- ▶ Platform dependent
- ▶ Backwards incompatible?
- ▶ Are you trained in typesetting?

What can you make with L^AT_EX?

L^AT_EX Workshop

Johannes Karreth

Motivation &
Background

Output

How-to: Basics

How-to: Some
tricks

Resources

One more thing

- ▶ Papers/articles

Explaining Concessions in GATT/WTO Trade Disputes: The Role of Institutional Environments

Johannes Karreth
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This draft: December 2012

Abstract

Why do states sometimes make concessions in trade disputes, while other disputes do not see any concessions made at all? This paper provides an explanation for variation in the outcomes of trade disputes within the dispute settlement system of the General Agreement on Tariffs and Trade/World Trade Organization (GATT/WTO). The answer reflects on a fundamental debate in international relations: do international institutions affect state behavior, and if so, how? I

What can you make with L^AT_EX?

- ▶ Papers/articles
- ▶ Dissertations

What can you make with L^AT_EX?

- ▶ Papers/articles
- ▶ Dissertations
- ▶ Syllabi

What can you make with L^AT_EX?

- ▶ Papers/articles
- ▶ Dissertations
- ▶ Syllabi
- ▶ Slides

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- ▶ Syllabi
- ▶ Slides
- ▶ Posters

What can you make with L^AT_EX?

- ▶ Papers/articles
- ▶ Dissertations
- ▶ Syllabi
- ▶ Slides
- ▶ Posters
- ▶ Exams (with question randomization)

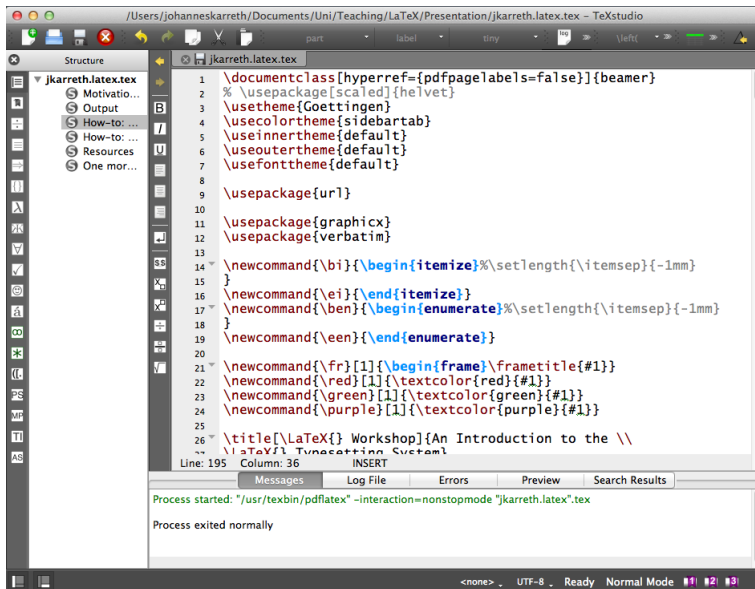
- ▶ Text editor
- ▶ Code structure
- ▶ Compiler
- ▶ Preview
- ▶ Citations
- ▶ PDF (or postscript) output

Text editor

- ▶ Stand-alone: Textmate, Notepad++, ...
- ▶ L^AT_EX-integrated: TexStudio, WinEdt, ...

Software recommendation: TeXstudio

- ▶ Mac, Windows, Linux
- ▶ <http://texstudio.sourceforge.net>
- ▶ Plenty of wizards & help with code
- ▶ Code completion
- ▶ All in one window



Code structure

```
article.tex
1 \documentclass[11pt]{article}
2
3 %%% PACKAGES
4 \usepackage{graphicx}
5
6 %%% METADATA
7 \title{Brief Article}
8 \author{Johannes Karreth}
9 \date{\today}
10
11 %%% DOCUMENT
12
13 \begin{document}
14
15 \maketitle
16
17 \section{First section}
18
19 Your text goes \emph{here}.
20
21 \subsection{A subsection}
22
23 More text. And some math:  $y_i = \alpha + \beta x_i + \epsilon$ ;
24  $h = \sqrt{x^2 + y^2}$ ; and  $\frac{b}{c} = \sin(\beta)$ .
25
26 \end{document}
27
```

Elements of a command

```
\documentclass{article}
```

- ▶ `\` **starts** each command
- ▶ `documentclass` **name** of the command
- ▶ `{article}` **content** of the command

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EDUCATION

University of Colorado Boulder

2014 (expected). Ph.D., Political Science.

Fields: International Relations, Methodology, and Comparative Politics.

University of Georgia Athens GA

Document class: book

- ▶ Chapters
- ▶ ToC
- ▶ Index (!)

For dissertations or theses...

RTAs and concessions

Defendants' participation in regional trade agreements creates incentives for defendants to acquiesce in GATT/WTO trade disputes.

Incentives are present if a state participates in at least one formalized RTA.

Hypothesis

Defendants in GATT/WTO disputes are more likely to make concessions when they are embedded in one or more RTAs.

The preamble

- ▶ Additional “packages”
 - ▶ to add figures (`\usepackage{graphicx}`)
 - ▶ for pretty tables (`\usepackage{booktabs}`)
 - ▶ and many more
 - ▶ most come with your installation
- ▶ Metadata
 - ▶ `\author{My name}`
 - ▶ `\title{My title}`
 - ▶ `\date{\today}`
- ▶ Custom commands
 - ▶ `\newcommand{\bi}{\begin{itemize}}`
 - ▶ `\newcommand{\ei}{\end{itemize}}`

Examples for environments

Document environment: for everything in your document.

```
\begin{document}  
Document text...  
\end{document}
```

Quote environment:

```
\begin{quote}  
Text of a quote. (Author, 2013)  
\end{quote}
```

returns:

Text of a quote. (Author, 2013)

The main document

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23 More text. And some math:  $y_i = \alpha + \beta x_i + \epsilon$ ;
24  $h = \sqrt{x^2 + y^2}$ ; and  $\frac{b}{c} = \sin(\beta)$ .
25
26 \end{document}
27
```

Document structure

```
\section{Section title}
```

```
\subsection{Subsection title}
```

```
\paragraph{paragraph title}
```

- ▶ Table of contents
- ▶ Links within documents
- ▶ Formatting

Inline:

```
$y = \alpha + \beta x + \epsilon$
```

 $y = \alpha + \beta x + \epsilon$

As equations:

```
\begin{equation}  
y = \alpha + \beta x + \epsilon  
\end{equation}
```

$$y = \alpha + \beta x + \epsilon \tag{1}$$

Use the `table` and `tabular` environments:

```
\begin{table}
\caption{My table}
\begin{tabular}{ l | c || r }
\hline
1 & 2 & 3 \\
4 & 5 & 6 \\
7 & 8 & 9 \\
\hline
\end{tabular}
\end{table}
```

Use the `table` and `tabular` environments:

Table 1 : My table

1	2	3
4	5	6
7	8	9

Figures

Use the `includegraphics` command and the `figure` environment:

```
\begin{figure}  
\includegraphics[scale = 0.75]{cu-logo.jpg}  
\caption{My figure}  
\end{figure}
```

Figures

Use the `includegraphics` command and the `figure` environment:



Figure 1 : My figure

Referencing within a document

- ▶ The `hyper ref` package
- ▶ Labels
- ▶ References
- ▶ Clickable links in PDFs

Citations: $\text{\LaTeX}$ handles everything for you

- ▶ The natbib package
 - ▶ `\citet{Author1999}` $\rightarrow$ Author (1999)
 - ▶ `\citep{Author1999}` $\rightarrow$ (Author 1999)
- ▶ Citation styles
- ▶ Use one reference database
 - ▶ BibDesk
 - ▶ Papers
 - ▶ JabRef

- ▶ Write code
- ▶ Compile
 1. pdflatex
 2. bibtex
 3. pdflatex
 4. pdflatex

How your documents look

- ▶ `\emph{italic text}` → *italic text*
- ▶ In the preamble: font type Times Roman
 - ▶ `\usepackage{mathptmx}`
- ▶ For more: see my website

Interact with statistical software

- ▶ Sweave
- ▶ knitr
- ▶ Reproducibility!

Your first L^AT_EX document!

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27
```

Brief Article

Johannes Karreth

October 6, 2013

1 First section

Your text goes *here*.

1.1 A subsection

More text. And some math: $y_i = \alpha + \beta x_i + \epsilon$; $h = \sqrt{x^2 + y^2}$; and $\frac{b}{c} = \sin(\beta)$.

Collaborating

`www.writelatex.com`

L^AT_EX Workshop

Johannes Karreth

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How-to: Basics

How-to: Some
tricks

Resources

One more thing

Most common errors & warnings

- ▶ Environments opened, but not closed
- ▶ Operators: `&`, `%`, `#`, `$`
 - ▶ `&` Column separator (tables)
 - ▶ `%` Comments
 - ▶ `$` Math mode
- ▶ Comment liberally, using `%`
 - ▶ `%` Not processed as code
- ▶ Errors: must fix
- ▶ Warnings: mostly OK
- ▶ Installation (usually unproblematic)

<http://spot.colorado.edu/~joka5204/latex.html>

- ▶ Links to L^AT_EX installation packages for your OS
- ▶ Examples
- ▶ Templates
- ▶ Video seminars and tutorials (by others)
- ▶ Some customization options
- ▶ Source code for these slides

- ▶ `tex.stackexchange.com`
- ▶ L^AT_EX wikibook: `en.wikibooks.org/wiki/LaTeX`

Possible, but:

- ▶ depends on document complexity
- ▶ more complex documents require more time

See my website for links to conversion tools.

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If you frequently collaborate with Word (etc.) users:

Look into **Pandoc** and **Markdown** as foundation for your text processing.

Possible, but:

- ▶ depends on document complexity
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See my website for links to conversion tools.

If you frequently collaborate with Word (etc.) users:

Look into **Pandoc** and **Markdown** as foundation for your text processing.

Submitting manuscripts:

Most journals and publishers in STEM accept (and prefer) L^AT_EX.

Pandoc: Source

```
rtd_treaty-codebook.txt *
1 % River Treaty Database Codebook
2 % Johannes Karreth
3 % Last updated: June 6, 2013
4
5 About this document
6 =====
7
8 This document (*rtd_treaty-codebook.pdf*) defines all variables in the River Treaty Database
9 file:
10 ~~~~
11 ../../RT/TFDD/TFDD Summer 2013/TFDD_Jul_2012_Revised_Karreth.csv
12 ~~~~
13
14 That file is based on previous versions compiled by Jaroslav Tir and Doug Stinnett. Those
15 versions were derived from the TFDD International Freshwater Treaties Database at <http://www.
16 transboundarywaters.orst.edu/database/interfreshreatdata.html>. The River Treaty Database is
17 being revised in Summer 2013. Information from <http://www.transboundarywaters.orst.edu/database
18 /Treaty%20Database%20Design%20(with%20descriptions).doc> was used to recover information on
19 most variables.
20
21 This codebook defines variables at the treaty- and more finegrained levels of analysis. For
22 data at the country and dyad year levels of analysis, see the document *rtd_cd-codebook.pdf*.
23
24 All data management commands to reproduce the files mentioned in this document are contained in
25 the file *rtd_datamgmt.R*.
26
27 History of the River Treaty Database
28 =====
29
30 + *TFDD_June_2011_Revised_Fisher.xlsx*: received in early 2012 (JK)
31 + Revisions leading to *TFDD_Jul_2012_Revised_Karreth.csv*:
32   * Removed signatories not in basin (JK)
33   * General cleanup (JK)
34   * Recoded and encoded categorical variables using *TFDD Summer 2012/tfdd.recode.do* (JK)
35   * Based on recodes, produced *TFDD Summer 2012/TFDD_April2012.dt*. All encoding choices of
36     categorical string variables (mostly binary) are documented in *TFDD Summer 2012/tfdd.recode
37     .do* (JK)
```

River Treaty Database Codebook

Johannes Karreth

Last updated: June 3, 2013



Contents

- About this document
- History of the River Treaty Database
- Variables, definitions, and coding rules
- New variables
 - Indices
 - Additional ID variables
 - Datasets and levels of analysis
 - 1. Treaty-basin-country: `rtd_treaty-basin-country.csv`
 - 2. Treaty: `rtd_treaty.csv`
 - 3. Treaty-year: `rtd_treaty-year.csv`
 - 4. Treaty-country-year: `rtd_treaty-country-year.csv`
 - 5. Treaty-dyad-year: `rtd_treaty-dyad-year.csv`

About this document

This document defines all variables in the River Treaty Database file:

```
/Users/johanneskarreth/Documents/Uni/3 - CU/RT/TFDD/TFDD -  
Summer 2013/TFDD_Karreth.csv
```

River Treaty Database Codebook

Johannes Karreth

Last updated: June 6, 2013

About this document

This document (*rtd_treaty-codebook.pdf*) defines all variables in the River Treaty Database file:

```
../../RT/TFDD/TFDD Summer 2013/TFDD_Jul_2012_Revised_Karreth.csv
```

That file is based on previous versions compiled by Jaroslav Tir and Doug Stinnett. Those versions were derived from the TFDD International Freshwater Treaties Database at <http://www.transboundarywaters.orst.edu/database/interfreshwatdata.html>. The River Treaty Database is being revised in Summer 2013. Information from [http://www.transboundarywaters.orst.edu/database/Treaty%20Database%20Design%20\(with%20descriptions\).doc](http://www.transboundarywaters.orst.edu/database/Treaty%20Database%20Design%20(with%20descriptions).doc) was used to recover information on most variables.

This codebook defines variables at the treaty- and more finegrained levels of analysis. For data at the country and dyad year levels of analysis, see the document *rtd_cd-codebook.pdf*.

Other topics I didn't mention in depth

- ▶ **Bibliography** customization (e.g., natbib, biblatex)
 - ▶ Back-referencing
 - ▶ Citation styles
- ▶ Designing **exams**: examdesign
 - ▶ Randomizing MC questions
 - ▶ Automatic answer keys
- ▶ Templates for **CVs**
 - ▶ moderncv
 - ▶ Build your own
- ▶ **Slides**: the Beamer class
- ▶ **Posters**: the Beamer class
 - ▶ Search for templates, adapt for your purposes
 - ▶ beamerposter