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THE INITB MACROS - USER'S GUIDE: A MACRO COLLECTION TO WRITE BOOKS USING TEX

Gabor Korosi and Laszlo Matyas

Working Paper 9/95 Hugust 1995

**DEPARTMENT OF ECONOMETRICS** 

#### Comments welcome

# The INITB macros — User's Guide

A Macro Collection to write books using  $\mathrm{T}_{\! E}\!\mathrm{X}$ 

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Abstract: The INITB.TEX file consists of a macro collection designed to write books in a form standard to many handbooks using  $T_{EX}$ . It has been used to prepare the camera ready hard copy of several books published by Kluwer Academic Publishers, Avebury, etc. It is easy to use and requires only a basic knowledge of  $T_{EX}$ .

Key words: T<sub>E</sub>X, Desktop publishing, macro package.

Availability: On the Web :\\www.monash.edu.au/econometrics/workpaps.htm.

August 1995

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Gábor Kőrösi and László Mátyás

### THE INITB MACROS — USER'S GUIDE

The INITE.TEX file consists of a macro collection designed to write books in a form standard to many handbooks. The macro file should be input before the text. Macros described in this guide automatically number chapters, sections, and print their titles in proper format. It offers many useful features, like naming chapters, formulae, pages for further references, multi-column pages, etc.

The README.TEX gives a clue to a suitable arrangement for using this macro package:

\input defs
\input initb
\input readme1
\input contents
\bye

First, the definition file is input. It is automatically created (rewritten) at any usage of the macro package and contains the definitions of the references to the just processed text. The file might be missing (empty); in such a case the filename NUL should be specified, when an alternative file is required.

The INITE file cannot be input before DEFS.TEX, because the previous copy of the definition file is automatically deleted in INITE.

**README1.TEX** contains this text. New sections, chapters can easily be inserted in a similar way.

Finally, a table of contents is printed, consisting of the titles of chapters and (sub)sections previously input. When a portion is processed for corrections only, the contents can be omitted by deleting or "commenting out" this line by changing  $\langle \rangle$  to  $\langle \% \rangle$ .

The file is closed by \bye to indicate that processing should end here. No inserted file should end with \bye.

When the INITE file is processed four information files are automatically initialized: the information file for table of contents (TOCFILE.TEX), a file containing the authors and years of all referred works (NAMES.TEX), a file containing entries for the Index (INDEX.TEX), and the previously mentioned file of macro definitions like cross references (DEFS.TEX). If any of these files must be saved for any purpose, rename it before invoking T<sub>E</sub>X.

### Fonts

Some nonstandard fonts are also available.<sup>1</sup> These are the fonts sized at 9 and 6 points: \ninerm, \ninei, \ninesy, \ninebf, \ninett, \nineit, \ninesl, \sixrm, \sixi, \sixsy, \sixbf,\sixtt, \sixit, \sixsl. The 10 point \rm and \bf magnified to magstep 1, 2 and 3 are \rmb \rmbb and \rmbbb, or \bfb \bfbb and \bfbbb respectively.

The standard font family is defined in three different sizes: \tenpoint, \ninepoint and \eightpoint. The \elevenpoint family consists of ten points sized fonts magnified to magstephalf. Character size can be reset by naming one of these families. The text is typeset in \largefont which can be changed by \seteleven (default) or \setten. Footnotes are typeset in \smallfont which defaults to \ninepoint. If you want to change this default, say, to eight points size, \let\smallfont=\eightpoint is needed. Generic font names like \rm, \sl, \it, etc. retain the size of the actual family.

\mpaper sets magnification to 1200 which is useful when correcting the text. The alternative  $\paper$  (default) specifies no magnification.

Two different character sets were used with TEX: The "almost modern" fonts (abbreviated to AM-fonts), and the "computer modern" fonts (abbreviated to CM-fonts). INITE assumes the CM version, but it can easily be converted to AM version, if necessary.

## Naming chapters

Parts, chapters, (sub)sections are numbered automatically and registered in the table of contents file. After naming the appropriate keyword like \part, \chapter, \section, etc. the title should be typed in braces. All formatting is made automatically, a new page is started when necessary, empty spaces are inserted before and after the title. Please continue typing the text after giving the title in braces without starting a new paragraph; the extra space belonging to the paragraph may disturb the balance.

When the title is longer than one line it is normally broken between two words, however, in extreme cases a word might be hyphenated in the title line. To avoid hyphen one may insert \\ to the place where the line should be broken instead.

<sup>&</sup>lt;sup>1</sup> Boldfaced words are keywords, The actual value of fields typeset in italics should be provided when used.

Multi-column output

\part{title}: The title of a new part. It starts on new page. If the part should not be numbered use \npart{title}.

- $\label{eq:chapter} $$ {author(s)}: The title of the new chapter, and the name of the author(s). If you do not want to specify the authors, the second argument should be '0'. It starts on new page. If the chapter should not be numbered \nchapter{title} or \nnchapter{title}{author(s)} can be used. $$$
- $section{title}:$  The title of a new section within the current chapter. It does not start a new page if there is enough room left on the current page for some lines of the new section. If the section should not be numbered use  $nsection{title}$ .

 $subsection{title}$ : The title of a new subsection within the current section.

- $subsection{title}:$  The title of a new sub-subsection within the current subsection.
- \bulitem: It can be used for bulleted lists. The paragraph is aligned and a is placed before it.
- \bulitemitem: It can be used for "secondary" bulleted lists. The paragraph is aligned after the parindent and a • is placed before it.
- \fn{footnote}: Writes a footnote. Footnotes are printed with smaller (nine points sized) characters and numbered automatically.
- \note{text}: Text is typeset in a condensed form with smaller (nine points sized) characters. It is always a separate paragraph. It may be useful for giving background information which is not abslolutely necessary to follow the text.

### Multi-column output

In some cases one might wish to have typeset text (e.g. index) in several columns. There are two ways to do that. There is an automatic mechanism to divide pages up to four columns. In this case the multi-column output always starts on a new page and ends when it is either respecified or a new part or chapter starts. The last page of the multi-column output is not automatically balanced, but it can be manipulated by changing vsize.<sup>2</sup> The macros:

- **\column** {number of columns}: Starts to form output into the given number of columns ( $\leq 4$ ). It starts on new page. The output is automatically turned to single column when a new part or chapter starts. **\column 1** can be used, as well.
- **\colchapter** {number of columns} {title} {author(s)}: Starts a new chapter. The title of the chapter is printed in the standard way, but the text is formatted into multi-column output. If you do not

 $^{2}$  \vsize is automatically reset to its standard value when the page is formatted.

want to specify the authors, the third argument should be '0'.  $\ncolchapter \{number of columns\} \{title\} or \\ncolchapter {number of columns} \{title\} \{author(s)\} can be used, if the chapter should not be numbered.$ 

The other possibility is to give the columns directly. However in this case there may not be more than three columns. The entire multi-columned text must fit in one page, it cannot span over several pages. The macros:

\columnii {text of the first column} {text of the second column}: will produce two columns.

\columniii {text of the first column} {text of the second column} {text of the third column}: will produce three columns.

#### Tables

\table {margin} {title} {heading} {table: The table is boxed, the columns are separated by vertical lines. The distance of the column and the separating line is (at least) margin long. The default value for the margin is 1 em, if the second argument is empty ({}).<sup>3</sup>

Tables are numbered automatically. The heading is separated from the table by a horizontal rule and it contains the names of the columns. Double ampersand (&&) must be placed between the consecutive column names.

Columns must be separated by double ampersand (&&) in the table, as well. Each line of the table must be started with double ampersand (&&) and it must be finished by  $\&\cr$ . The width of a column depends upon its longest element, thus the width of the columns may differ. The columns are adjusted to the right.  $\file\column$  be used to change adjustment (e.g. center headings.) If a column is to be left empty a blank must represent it, otherwise the table might get disordered.

\tablerule: It draws a horizontal line in the table. See the example for sample tables.<sup>4</sup>

<sup>&</sup>lt;sup>3</sup> The { } is not empty, it defines a blank long margin. One may wish to use \enskip or \qquad for margin.

Bigger tables may cause memory problems for older versions of TEX which cannot access all available memory automatically. These TEX compilers may run out of available space when processing a complex table. There may be command line options for increasing memory size which might fix this problem.

#### Cross references

#### Cross references

The sequence number of any automatically numbered entity: chapter, section, table, etc. can be saved in a variable. Later it can be referred to by naming the corresponding variable.<sup>5</sup> Thus new parts may be inserted into the text without the need for changing all cross references.

- \last {section name} {variable name}: The sequence number of the last chapter, section, etc. is stored in the given variable. An existing variable is redefined without warning. The {section name} may be: part, chapter, section, subsection, ssubsection, ssubsection and table. Table references are stored as "Table 4-3", otherwise only the number is retrieved. The variable name may be any character string, but if it is not strictly alphabetic it can only be used with the \man macro. An alphabetic variable name can be used with putting a '\' before it.
- \pageref {variable name}: The page number is stored in the variable. The variable name may be any character string, but if it is not strictly alphabetic it can only be used with the \man macro. An alphabetic variable name can be used by putting a '\' before it.
- \fnref {variable name}: The last footnote number is stored in the variable. The variable name may be any character string, but if it is not strictly alphabetic it can only be used with the \man macro. An alphabetic variable name can be used with putting a '\' before it.
- \form {variable name}: It is a part of a mathematical formula. It assigns a sequence number to the formula. The sequence number of the formula is printed at the right edge of the paper in parentheses. The formula sequence number is stored in the given variable. The variable name may be any character string, but if it is not strictly alphabetic it can only be used with the \man macro. An alphabetic variable name can be used with putting a '\' before it.
- \formal {variable name}: must be used for an aligned formula (\eqalignno) instead of \form. It is a part of a mathematical formula. It assigns a sequence number to the formula. The sequence number of the formula is printed at the right edge of the paper in parentheses. The formula sequence number is stored in the given variable. The variable name may be any character string, but if it is not strictly alphabetic it can only be used with the \man macro. An alphabetic variable name can be used with putting a '\' before it.
- $\mbox{man} \{ variable name \}$ : It makes possible to use variables with names containing other than alphabetic characters. Normally T<sub>E</sub>X accepts alphabetic variable names only. However in the above mentioned macros can set up any character string as a variable name. The variables

<sup>&</sup>lt;sup>5</sup> Forward reference is possible as well as backward reference. However in this case the text must be compiled twice. In the first instance there are some undefined variables, but for the second run all variables should be defined, if not misspelled.

with non alphabetic characters in their name can only be referred with the  $\mbox{man}$  macro. For example if the variable was defined by "...\form{dlthree}\$\$" then it can be referred to either as "\dlthree" or as "\man{dlthree}" in the text. If the variable was defined by "...\form{dl3}\$\$" then it can only be referred to as " $\operatorname{man}{dl3}$ ". Special care should be taken with spaces. All blanks count; e.g.,  $\operatorname{Man}{A4-1}$  and  $\operatorname{Man}{A4-1}$  denote different variables.

### Miscellaneous

 $figure {title} {variable name}$ : It leaves a 4 inch high empty space for the figure, prints its title line(s) prefixed by a figure number and stores the figure number in the given variable in the form of "Figure chapter#-figure#". The variable name may be any character string, but if it is not strictly alphabetic it can only be used with the  $\mbox{man}$  macro. An alphabetic variable name can be used with putting a '\' before it.

- \sizedfigure {title} {variable name} {height}: It leaves empty space for the figure, prints its title line(s) prefixed by a figure number and stores the figure number in the given variable in the form of "Figure chapter#-figure#". The empty space is in given height. The variable name may be any character string, but if it is not strictly alphabetic it can only be used with the \man macro. An alphabetic variable name can be used with putting a  $\langle \rangle$ before it.
- \index {entry}: The entry is written to the index file together with the page number. It may be used for constructing an index. The \index macro should be placed immediately after the word it refers to, without any intervening blank.
- \subindex {entry} {main entry}: The entry is written to the index file together with the main entry, under which it must be sorted, and the page number. It may be used for constructing an index. The **subindex** macro should be placed immediately after the word it refers to, without any intervening blank.
- \ssubindex {entry} {main entry} {subentry}: The entry is written to the index file together with the main entry and the subentry, under which it must be sorted, and the page number. It may be used for constructing an index. The \ssubindex macro should be placed immediately after the word it refers to, without any intervening blank.

\emptyline{number}: The given number of blank lines are inserted. Number may be a fraction, too.

#### Miscellaneous

\eol: end-of-line will start a new line without breaking the paragraph.

- $\operatorname{\{author(s)\}}$  {year}: is designed for references; e.g.  $\operatorname{\{Theil\}}$  {1971} results in *Theil* [1971]. The reference is registered in the NAMES.TEX file which can be used for constructing author index and for checking if all referred works are given.
- underscores the text. Attention:  $T_EX$  is unable to break line in midst of an underscored text.
- \frac {numerator} {denominator}: An alternative definition of fraction. For complicated fractions it may be much simpler than \over. It can only be used in mathematical mode.

**\asim** It is the mathematical symbol of  $\stackrel{A}{\sim}$ .

\plim The mathematical macro is the stochastic equivalent for \lim.

The following set symbols can be used: N, Q, R and Z stand for  $\mathbb{N}$ ; Q,  $\mathbb{R}$  and  $\mathbb{Z}$  respectively. They can be used both in text and in mathematical environment.

The following text demonstrates the usage of the INITB macros. First the  $T_EX$  input is printed in its original form, second the formatted text is printed.

# 1 SAMPLE INPUT

#### \part{Sample output}

\chapter {Chapter title} {Author} A chapter always starts on a new page. Note that the title is automatically capitalized in the heading, but printed as typed in the running head of the consecutive pages. Thus the title should be typed as if it were a normal text, with capital letters only where it is appropriate. \section {The title of the first section} Here some other features are demonstrated, like formulae and figures. Some entries for index are also defined here in the text, although they cannot be seen in the output. \$\$\plim\_{t \to\infty} \frac {x\_t}{1+x\_t}=1\form{a4-3}\$\$ \$\$\eqalignno{y&=\beta X + \epsilon \cr \epsilon&=\nu + \rho \epsilon\_{-1} \formal{autoreg}}\$\$ Formulae \man{a4-3} and\index{formula reference}\subindex {formula} {reference} \man{autoreg} demonstrate the possibility of referring to formulae where necessary. The second formula can also be referred to as \autoreg\ equation. Attention: if the variable name is used in this simpler way, any blank after the variable is lost if not specified directly. A careful examination of the sample input may prevent unexpected concatenations of the referred variable and the following word. Other cases, like here referring to formula \autoreg, need no special attention. A macro after the equation number \autoreg\ssubindex{specifying alphabetic names} {reference} {formula} solves this problem, as well. ({\it C.f.} the sample input.) It might be useful to compile this text once and look up the files, like {\tt INDEX.TEX}, created by the macros. The chapter and section numbers are saved here.\last{chapter}{sampleoutputchapter}\last {section}{sampleoutputsection}\index{last} \sizedfigure{If the figure does not fit to the actual page it is placed on the following one.} {figure1} {2in} \note{This note is printed in a new paragraph, although no paragraph was indicated in the text. Small prints sometimes

#### Sample input

contain important information for special cases. A warning here: never define a figure in midst of a paragraph, because the figure macro contains a line break. And another one: be careful with the alphabetic variable names, many natural candidates are reserved for \TeX\ or for the INITB macros. It is better to use special characters, like numbers, even if such names are more difficult to refer to.\fn{It would not have been wise to name the variable for the \man{figure1} as ''figure", in that case the figure macro would be lost.}}

If somebody wants to refer to different works of the same author, the author should be left out from the second (and consecutive) references, like here: \ref{Judge \& al.}{1980},\ref{}{1982}. In lists the item and itemitem macros can, of course, be used, but it may prove simpler to use bulitem instead of numbering the cases. \item{1.} One may wish to change the order of the list, delete entries or insert new ones. If items are labelled special care is needed to correct them.

\item{11.} The item might look a bit strange when the prefixes
have different length. In extreme cases it might not even fit
into the page.

\itemitem{a.} The same applies to the itemitem, as well. \itemitem{xxxxxx.} A long prefix should be avoided.

\bulitem One may wish to change the order of the list, delete entries or insert new ones. If items are labelled special care is needed to correct them.

\bulitem The item might look a bit strange when the prefixes have different length. In extreme cases it might not even fit into the page.

\bulitemitem The same applies to the itemitem, as well. \bulitemitem A long prefix should be avoided.

\subsection {Title of a subsection} One may go deeper, but
\ssubsection{ssubections} might awfully fragment the text.
If it is absolutely necessary

\sssubsection{sssubection} is also available, but its title is not printed in the table of contents.

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# \section {Second section} %

Some variables, defined in section \sampleoutputsection \ are referred here, like \man{figure1}. Note that this section is still part of chapter \sampleoutputchapter. This sample ends with some tables, or, rather, with one table with slight modifications. One might wish to spend some time with comparing the input and the output. \emptyline 2 \table {\enskip} {Estimates} {variable && parameter && standard error && t--value} {&&constant && 1.235 && 0.432 && 2.854 &\cr \omit&height 5pt& && && &\cr &&\$X\_1\$ && 0.424 && 0.811 && 5.225 &\cr &&\$X\_2\$ && 0.412 && 0.773 && 5.335 &\cr} \emptyline 1 \table { } {Estimates} { variable && parameter && standard error && t--value } {&& constant && 1.235 && 0.432 && 2.854 &\cr \omit&height 3pt& && && &\cr \tablerule \omit&height 3pt& && && &\cr &&X\$\_1\$\hfil && 0.424 && 0.811 && 5.225 &\cr &&X\$\_2\$\hfil && 0.412 && 0.773 && 5.335 &\cr} \emptyline 1 \table { } {Estimates} {variable && parameter && standard error && t--value} {&&constant&&1.235\hfil &&0.432\hfil &&2.854\hfil &\cr &&X\$\_1\$\hfil &&0.424\hfil &&0.811\hfil &&5.225\hfil &\cr &&X\$\_2\$\hfil &&0.412\hfil &&0.773\hfil &&5.335\hfil &\cr} \emptyline 1 \table {} {Estimates} {variable && parameter && standard error && t--value} {&&constant && 1.235\hfill && 0.432\hfill && 2.854\hfill &\cr \tablerule &&\$X\_1\$\hfill && 0.424\hfill && 0.811\hfill && 5.225\hfill &\cr &&\$X\_2\$\hfill && 0.412\hfill && 0.773\hfill && 5.335\hfill &\cr} \emptyline 1 \table {\quad} {Estimates} {variable && parameter && standard error && t--value} {&&constant && 1.235 && 0.432 && 2.854 &\cr &&\$X\_1\$ && 0.424 && 0.811 && 5.225 &\cr &&\$X\_2\$ && 0.412 && 0.773 && 5.335 &\cr}

#### 10

# Part I

# SAMPLE OUTPUT

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#### Author

# 2 CHAPTER TITLE

A chapter always starts on a new page. Note that the title is automatically capitalized in the heading, but printed as typed in the running head of the consecutive pages. Thus the title should be typed as if it were a normal text, with capital letters only where it is appropriate.

#### 2.1 The title of the first section

Here some other features are demonstrated, like formulae and figures. Some entries for index are also defined here in the text, although they cannot be seen in the output.

$$\lim_{t \to \infty} \frac{x_t}{1 + x_t} = 1 \tag{2-1}$$

$$y = \beta X + \epsilon$$
  

$$\epsilon = \nu + \rho \epsilon_{-1}$$
(2-2)

Formulae (2-1) and (2-2) demonstrate the possibility of referring to formulae where necessary. The second formula can also be referred to as (2-2) equation. Attention: if the variable name is used in this simpler way, any blank after the variable is lost if not specified directly. A careful examination of the sample input may prevent unexpected concatenations of the referred variable and the following word. Other cases, like here referring to formula (2-2), need no special attention. A macro after the equation number (2-2) solves this problem, as well. (*C.f.* the sample input.) It might be useful to compile this text once and look up the files, like INDEX.TEX, created by the macros. The chapter and section numbers are saved here.

This note is printed in a new paragraph, although no paragraph was indicated in the text. Small prints sometimes contain important information for special cases. A warning here: never define a figure in midst of a paragraph, because the figure macro contains a line break. And another one: be careful with the alphabetic variable names, many natural candidates are reserved for TEX or for the INITB macros. It is better to use special characters, like numbers, even if such names are more difficult to refer to.<sup>1</sup>

<sup>&</sup>lt;sup>1</sup> It would not have been wise to name the variable for the Figure 2-1 as "figure", in that case the figure macro would be lost.

Figure 2-1. If the figure does not fit to the actual page it is placed on the following one.

If somebody wants to refer to different works of the same author, the author should be left out from the second (and consecutive) references, like here: Judge & al. [1980], [1982].

In lists the item and itemitem macros can, of course, be used, but it may prove simpler to use bulitem instead of numbering the cases.

- 1. One may wish to change the order of the list, delete entries or insert new ones. If items are labelled special care is needed to correct them.
- 11. The item might look a bit strange when the prefixes have different length. In extreme cases it might not even fit into the page.
  - a. The same applies to the itemitem, as well.

xxxxxx. A long prefix should be avoided.

- One may wish to change the order of the list, delete entries or insert new ones. If items are labelled special care is needed to correct them.
- The item might look a bit strange when the prefixes have different length. In extreme cases it might not even fit into the page.
  - The same applies to the itemitem, as well.
  - A long prefix should be avoided.

#### 2.1.1 Title of a subsection

One may go deeper, but

#### 2.1.1.1 ssubections

might awfully fragment the text. If it is absolutely necessary

#### Second section

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**2.1.1.1.1 sssubection**: is also available, but its title is not printed in the table of contents.

# 2.2 Second section

Some variables, defined in section 2.1 are referred here, like Figure 2–1. Note that this section is still part of chapter 2.

This sample ends with some tables, or, rather, with one table with slight modifications. One might wish to spend some time with comparing the input and the output.

#### Table 2–1: Estimates

variable	parameter	standard error	t-value
constant	1.235	0.432	2.854
X1	0.424	0.811	5.225
X2	0.412	0.773	5.335

#### Table 2–2: Estimates

variable	parameter	standard error	t-value
constant	1.235	0.432	2.854
X <sub>1</sub>	0.424	0.811	5.225
X <sub>2</sub>	0.412	· 0.773	5.335

# Chapter title

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## Table 2–3: Estimates

variable	parameter	standard error	t-value
constant	1.235	0.432	2.854
X1	0.424	0.811	5.225
X <sub>2</sub>	0.412	0.773	5.335

Table 2-4: Estimates

variable	parameter	standard error	t-value
constant	1.235	0.432	2.854
$X_1$	0.424	0.811	5.225
X2	0.412	0.773	5.335

Table 2-5: Estimates

variable	parameter	standard error	t-value
constant	1.235	0.432	2.854
X1	.0.424	0.811	5.225
X2	0.412	0.773	5.335

