Handbook for the Preparation of Graduate Dissertations and Theses

Authorized by the University of Toledo Graduate Council

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1 Introduction

1.1 This Handbook

Contact Information: Contact the College of Graduate Studies if you have questions on any material in this Handbook. College of Graduate Studies offices are located in room 3240 University Hall on the Main Campus (419.530.4723, grdsch@utnet.utoledo.edu) and on the first floor of the Mulford Library Building, Room 117 on the Health Science Campus (419.383.4112).

Terminology: Throughout this handbook are references to the Graduate Council and the College of Graduate Studies. The Graduate Council is the faculty governance body that determines all policies and procedures concerning graduate education (such as those in this Handbook). In contrast, the College of Graduate Studies implements those policies and procedures.

Standards: Your dissertation or thesis represents a significant contribution to the knowledge of your particular discipline and it contributes to the intellectual legacy of this university. Accordingly, it is important to ensure that its presentation meets certain standards and requirements in order that it will enjoy the widest possible dissemination and readership. This Handbook specifies the style and format requirements necessary for your document to be acceptable to the Graduate Council. In other words, every doctoral dissertation and master's thesis must be formatted according to the requirements specified in this Handbook.

Style Manuals: Style manuals applicable to your discipline (e.g., APA, Chicago, MLA) may be available in Carlson Library and/or the Bookstore. Students are encouraged to follow such discipline-specific guidelines if, and only if, such established discipline-specific guidelines have been formally adopted by your department or college. In such cases: a) the formatting of page and section headings as well as the enumeration style used for table and figure numbers may follow discipline-specific guidelines and b) the format of all other aspects of your document must follow the instructions specified in this Handbook. If a conflict exists between such manuals and this Handbook you are to follow the instructions in this Handbook. As described below, you may appeal any such conflict.

Sample Pages: To help you visualize formatting requirements specified here, the appendix to this Handbook provides sample pages for every preliminary page and for every other major section in your document. (The sample pages are provided on pp. 26–43.) Students following the APA style should note that a corresponding series of sample pages conforming to APA guidelines are also available at the College of Graduate Studies' website.

Appeals: A student interested in deviating from an instruction, rule, or policy in this Handbook must submit a written appeal not less than 35 business days prior to the last day of classes for the term the degree will be awarded. Appeals are to be delivered to the Dean of the College of Graduate Studies, who will forward them to the Graduate Council Executive Committee (GCEC) for consideration. In turn, within 10 business days of the GCEC receiving the appeal, the GCEC will notify the student and the Graduate Dean of its decision on that appeal. This provides ample time for students to satisfy submission deadlines and requirements specified in section 6.2 (p. 23). No such deviations will be permitted without the GCEC’s written authorization.

1.2 Different Administrative Requirements for Different Graduate Documents

Graduate students across this university produce a wide range of documents, including Ph.D. dissertations, master’s theses, master’s projects, master’s seminar papers, etc. As described below, these different graduate documents are subject to different administrative requirements.
To which office do you submit your completed document?

- The UT Graduate Council has determined that only doctoral dissertations and master’s theses shall be submitted to the College of Graduate Studies. See section 1.3 for the appropriate form(s) that must accompany the submission of such documents.

- All other graduate-level documents such as master’s projects, master’s seminar papers, etc., are not to be submitted to the College of Graduate Studies. Instead, students are to submit these documents to their department or academic college only. Although it is not required, the UT Graduate Council encourages students completing such documents to follow the formatting standards established in this Handbook.

Which master’s student must submit a “Approval of Project” form?

- Students completing a master’s project must submit this form to the College of Graduate Studies. However, students completing other graduate-level documents (e.g., a master’s seminar paper) do not have to do so. Students must consult with their department’s graduate director to determine if they need to submit this form to the College of Graduate Studies.

- The “Approval of Project” form, which is available on the College of Graduate Studies website, must be submitted to the College of Graduate Studies no later than 15 business days prior to the last day of classes for the term the degree will be awarded.

1.3 Required Forms for Dissertations and Theses

The College of Graduate Studies website contains forms that must be submitted after a thesis or dissertation has received final approval from the committee chair and all other committee members. For example, you must submit to the College of Graduate Studies the “Intellectual Protection & Patent Sign-Off” form. Further, depending on whether you have completed a master’s thesis or a Ph.D. dissertation, you must also submit either the “Approval of Thesis” form or “Approval of Dissertation” form.

Please review the listing of forms on the College of Graduate Studies website to determine which forms you must complete and submit. It is the student’s responsibility to submit all forms required for their program and degree requirements. If you have questions about which forms to submit, please contact your advisor or the College of Graduate Studies Office. The completed forms must be submitted to the College of Graduate Studies no later than 15 business days prior to the last day of classes for the term the degree will be awarded.

1.4 Further Instructions

When composing your document, be certain that you fully understand the instructions and directives in this Handbook. Check to make sure that the word processing software you intend to use can handle the margin, page-numbering, and other requirements mandated in this Handbook; checking the software’s capabilities before you begin writing can save a great deal of time at the end of the process. For students preparing a dissertation, please review the ProQuest/UMI information available on the College of Graduate Studies Web-site.

2 General Formatting

An acceptable thesis or dissertation must be legible, formatted according to the specifications in this Handbook, and written in good quality English grammar. If the document is printed, it must
be in suitable condition for binding and printed on one side only (i.e., no double-sided printing).

Students may choose to have their document’s textual material formatted “ragged-right” or “flush” with the right margin. This choice should be made by considering the typesetting capabilities of the software used to prepare your dissertation/thesis. For example, students using Microsoft’s Word should consider the “ragged-right” option. In contrast, students using \LaTeX should use the “flush-right” option (the default setting in \LaTeX).

Hyphenations are permitted, except when the hyphenated word is split over two pages. If your word processing software has a “widow/orphan protection feature,” it is recommended that you use this feature to avoid the first line of a paragraph being at the end of a page or the last line of a paragraph beginning a new page. It is acceptable to have a page end shorter to prevent paragraphs starting or ending in this manner.

The Graduate Council and the College of Graduate Studies reserves the right to require an author to make appropriate style and formatting changes to their document and to refuse any document that is not suitable for binding.

2.1 Text Size and Text Font

The text font and text size used in your dissertation or thesis are chosen for ease in reading. All dissertations/theses are required to use a 12-point text size throughout the textual material of the document’s preliminary pages, body, references, and appendices. This requirement does not apply to text within tables, figures, footnotes, or mathematical expressions.

Students are not permitted to use script-style fonts or san serif fonts in their dissertations/theses (examples of san serif fonts are Arial and Helvetica). All dissertations/theses are required to choose a single serif font as the text font that is used throughout the textual material of the document. Acceptable serif fonts are limited to:

- Book Antiqua
- Garamond
- Century Schoolbook
- Times Roman (a.k.a., “Roman” or “Times New Roman”).

Note: the Times Roman text font is recommended for all dissertations and theses.

2.2 Spacing and Margins

General Spacing: All textual materials must be double-spaced. The following exceptions to this rule may be single-spaced:

- long quotations (approximately forty words or more)
- the content of tables and text within figures
- captions to figures and tables
- footnotes

Section 3.13 (p. 18) describes the formatting of your reference section. It states that when reporting works cited in a dissertation/thesis, students must chose one of the following spacing options for their reference section:

1. Use double-spacing within each reference and between references. This option is illustrated in the appendix (p. 41): Sample References — Example 1.

2. Use single-spacing within an individual reference but use double-spacing between references. This option is illustrated in the appendix (p. 42): Sample References — Example 2.

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1 The issue of printing the document pertains to when the final version of the document is printed for the committee chair, other committee members, department, academic college, or for other personal copies.
Margins: No material may appear in the margins, except a page number (see section 2.3). Every page of the document must have the following margins:

- Bottom margin: one inch (1")
- Right margin: one inch (1")
- Left margin: one and a half inch (1\(\frac{1}{2}\")

Note that the left margin (1\(\frac{1}{2}\")) allows space for binding and trimming of printed copies of the final document.

The value of the top margin depends on whether the page is the first page of a “major division.” A “major division” includes the acknowledgements page, table of contents, list of tables, list of figures, list of abbreviations, list of symbols, preface, chapters, references, appendices, and index.

If the page is the first page of a major section or division, the top margin is 2 inches (2\"). This is the distance from the top edge of the page to the bottom edge of the section heading. Examples of this margin requirement are provided in the appendix: see the “Sample Preface Page” (p. 37) and the “Sample Chapter First Page” (p. 38). Consult section 2.8.1 (p. 8) if your department/college has adopted an established discipline-specific style guide that conflicts with the above specification for the top margin.

The top margin of every other page is one inch (1\") . Examples of this margin requirement are located in the appendix: see the “Sample Table Page” on p. 40.

### 2.3 Page Numbering

Page Number Location: All pages must be present and numbered in the proper sequence. Do not use periods, brackets, hyphens, etc. before or after page numbers. The page number of every page is to be located \(\frac{3}{4}\)" from the bottom edge of the page and centered between the 1.5\" left margin and the 1\" right margin. Page numbers are to be printed in 12-point font size (the same font size required of all textual material).

Preliminary Page Numbers: Page numbers that are printed on “preliminary pages” are in lower-case Roman numerals (i.e., i, ii, iii, iv, \ldots ). Section 3 provides detailed formatting issues for these preliminary pages. Appendix pages 27 through 37 provide examples of each preliminary page. The table below provides a summary of the pagination requirements for preliminary pages. Note that the far-right column of this table indicates the Handbook section that provides additional information for the formatting of each preliminary page.

<table>
<thead>
<tr>
<th>Page</th>
<th>Required or Optional</th>
<th>Included in Pagination</th>
<th>Page Number Printed</th>
<th>Listed in Table of Contents</th>
<th>Described in Handbook Section</th>
</tr>
</thead>
<tbody>
<tr>
<td>Title</td>
<td>required</td>
<td>yes</td>
<td>no</td>
<td>no</td>
<td>3.1 (p. 9)</td>
</tr>
<tr>
<td>Blank/Copyright</td>
<td>required</td>
<td>yes</td>
<td>no</td>
<td>no</td>
<td>3.2 (p. 11)</td>
</tr>
<tr>
<td>Abstract</td>
<td>required</td>
<td>yes</td>
<td>yes</td>
<td>yes</td>
<td>3.3 (p. 12)</td>
</tr>
<tr>
<td>Dedication</td>
<td>optional</td>
<td>yes</td>
<td>yes</td>
<td>yes</td>
<td>3.4 (p. 13)</td>
</tr>
<tr>
<td>Acknowledgments</td>
<td>optional</td>
<td>yes</td>
<td>yes</td>
<td>yes</td>
<td>3.5 (p. 13)</td>
</tr>
<tr>
<td>Table of Contents</td>
<td>required</td>
<td>yes</td>
<td>yes</td>
<td>yes</td>
<td>3.6 (p. 13)</td>
</tr>
<tr>
<td>List of Tables</td>
<td>conditional</td>
<td>yes</td>
<td>yes</td>
<td>yes</td>
<td>3.7 (p. 14)</td>
</tr>
<tr>
<td>List of Figures</td>
<td>conditional</td>
<td>yes</td>
<td>yes</td>
<td>yes</td>
<td>3.8 (p. 14)</td>
</tr>
<tr>
<td>List of Abbreviations</td>
<td>optional</td>
<td>yes</td>
<td>yes</td>
<td>yes</td>
<td>3.9 (p. 15)</td>
</tr>
<tr>
<td>List of Symbols</td>
<td>optional</td>
<td>yes</td>
<td>yes</td>
<td>yes</td>
<td>3.10 (p. 16)</td>
</tr>
<tr>
<td>Preface</td>
<td>optional</td>
<td>yes</td>
<td>yes</td>
<td>yes</td>
<td>3.11 (p. 17)</td>
</tr>
</tbody>
</table>
Chapter, References, Appendix, & Index Page Numbers: All pages within these divisions receive a page number and the page number is printed on the page using Arabic numerals (i.e., 1, 2, 3, …). The first page of the first chapter must be numbered “1” with subsequent pages numbered 2, 3, 4, etc. The page number of the first page of a subsequent chapter is to follow consecutively from the last page number in the previous chapter (i.e., the page number of the first page of a subsequent chapter does not reset to “1”). The same principle is to be applied to the page number of the first page of subsequent major divisions (i.e., References, Appendices, and Index).

To summarize, the first page of the first chapter is numbered “1” with subsequent pages numbered 2, 3, 4, etc., and this pagination continues unbroken to the last page of the document (i.e., page numbers are never again “reset” to 1).

A page number must be printed in an Arabic numeral on every page starting with — and following — the first page of the first chapter. This includes pages that contain a table, figure, blueprint, photograph, etc. The only exception to this requirement are whole-page photographs: such pages need not show a page number, though a page number must be reserved in the sequence. In other words, a whole-page photograph page must be counted in the pagination, though a page number does not have to be printed on that particular page.

2.4 General Rules

Abbreviations, Acronyms, and Symbols: these must be defined in the text the first time they are used in the text. Depending on the context, this definition must appear immediately before or after the abbreviation/acronym/symbol; thereafter the abbreviation/acronym/symbol must be consistently substituted for its definition within the document’s text. The following is an example of an abbreviation/acronym appearing after its definition:

“The eclipse will occur at 9:15, Eastern Standard Time (EST).”

In contrast the following is an example of a symbol proceeding its definition:

“These results depend on the value of Tobin’s $Q$; where $Q$ represents the ratio of the market value of installed capital to the replacement cost of capital.”

See section 3.9 and 3.10 for formatting information on the optional pages List of Abbreviations and List of Symbols.

Beginning a Sentence: No sentence, except in a footnote, should begin with a numeral, symbol or abbreviation (except titles such as Dr., Mrs., Mr.).

Capitalization: A good general rule for titles and/or headings is that nouns, verbs, and any word of four or more letters are capitalized.

Colon: When a colon is used to introduce a list, it should be preceded by an independent clause (e.g., “Our study included five elements: (1) ...”; “The ingredients were as follows: ...”, not “The ingredients were: ...”).

Dates: Typing style for dates that appear in the text must take the following form: Month day, and year. For example: July 10, 1994.
Ellipses: Within a sentence, omissions are indicated by three spaced periods. Between and at the end of sentences where omissions have been made, the final period precedes the three ellipsis points. When typed correctly, it will look like this... In most cases, do not use ellipses at the beginning or end of a quote.

Footnotes: Footnotes to textual material must be numbered consecutively using Arabic numerals (i.e., 1, 2, 3, ...). Throughout the text, footnotes must appear at the bottom of the page and not in a separate section. An exception to this is provided to only those students whose department/college have formally adopted an established discipline-specific style guide (APA, Chicago, MLA, etc.) which requires footnotes to appear in a separate section.

Footnotes to a table (or figure) must be typed directly beneath the table (or figure) and numbered consecutively. They are not to be numbered in sequence with footnotes throughout the text. Instead, footnotes to a table (or figure) are to be enumerated using the “alph” style (i.e., a, b, c, ...). The first footnote of each table (or figure) is to be reset to “a”, with subsequent footnotes to that table (or figure) being “b,” “c,” ... .

Numbers: Numbers should always be written out when they stand as the first word in the sentence. The numbers one (1) through nine (9) are to be written out in the text when not used with abbreviations. All higher numbers will be presented in Arabic figures. Numbers indicating time, weight, and measurement are to be expressed in Arabic figures when followed by an abbreviation (e.g., 1 mm; 1 sec; 3 gm; 10 mm$^3$).

2.5 No College-Specific Pages

No “college signature pages” or other college-specific page(s) shall be permitted in any document submitted to the College of Graduate Studies or any organization publishing the document (e.g., Proquest/UMI Dissertation Publishing).

However, individual colleges are free to ask their students to include “college-specific page(s)” in internal copies of documents kept only by their college. In such cases students must make certain that the table of contents and pagination present in the internal copy kept by their college is identical to their document submitted to the College of Graduate Studies. For this to occur, students must make certain that the following conditions are satisfied:

- college-specific page(s) are located only within the “preliminary pages” of the document kept by the college as an internal document;

- college-specific page(s) do not receive a page number — even in the college’s internal copy of the document;

- college-specific page(s) are not included in the table of contents — even in the college’s internal copy of the document (i.e., the table of contents within the college’s internal copy of the document must be identical to that submitted to the College of Graduate Studies);

- college-specific page(s) shall not be included in the version of the document submitted to (a) the College of Graduate Studies or (b) any organization publishing or archiving the document (e.g., OhioLink or Proquest/UMI).
2.6 Charts, Figures, Graphs, Tables, Photographs, and Maps, etc.

Please note the following requirements for using illustrative material in your manuscript:

- Illustrative material must be concise and accurate.
- Illustrative material must be professional-quality.
  - Distinguishing characteristics within such illustrative material (e.g., lines on a graph or portions of a figure) should be identified by labels or symbols, with colors used only when the use of such labels or symbols is not possible or practical.
  - Shaded areas (e.g., countries on a map) will have better contrast if cross-hatching is used instead of color.
- Each illustrative material is to be enumerated according to its classification (i.e., chart 1, chart 2, ... figure 1, figure 2 ..., table 1, table 2 ..., etc.). See sections 3.7 and 3.8 for discussions of the require enumeration method by chapter.
- Each illustrative material must have a brief descriptive caption accompanying its enumeration. The appendix contains sample captions to tables (p. 40) and sample captions to figures (p. 39).
  
  Note:
  - Captions may be single-spaced.
  - A caption to a table appears above the table.
  - A caption to a graph or figure appears below the graph or figure.
- When possible, illustrative material is to be placed within the text rather than on a separate page. (See the sample table in the appendix on p. 40.)
  - When placed within the text, the illustrative material is to occur on the page it is first cited or at the top of the subsequent page.
  - If the illustrative material is too large to fit between text, it is to appear centered (vertically and horizontally) on the page subsequent to its first citation.
- Photographs must be professional-quality.
- Appropriate permission letters must be included for any copyrighted materials in the document that exceed “fair use.” See section 5.2 (p. 22) for a discussion of using copyrighted material in your document.
- Illustrative material that is larger than the standard \(8\frac{1}{2}'' \times 11''\) page size may be used in your document. These items must be gathered and placed in an appendix (or appendices). An appendix containing extra-large illustrative material must be located after all other appendices.

2.7 \LaTeX\ Users

Note: Information in this section is not relevant for students using Microsoft Word to prepare their dissertation or thesis.

Students using the \LaTeX\ document preparation system should note that a \LaTeX\ document class file (\texttt{UThesis}) has been created to facilitate uniform dissertations, theses, and projects at the University of Toledo.\(^2\) Students enter specific information into a template file (e.g., document title, degree, their name, advisor’s name, etc.) and \texttt{UThesis} transforms their draft document into a form that satisfies all style and formatting requirements set forth in this Handbook. \LaTeX\ users are strongly encouraged to use this style file.

\(^2\)Dr. Michael Dowd’s \texttt{"UThesis - A\ LaTeX\ Document Class for Dissertations and Theses at The University of Toledo."}\ These files are available on the Graduate College website (or office) or from the Department of Economics, University of Toledo; Toledo, Ohio, 43606-3390.
UTthesis automatically generates all preliminary pages and other sections according to the exact formatting requirements of this Handbook. Page numbering and margin specifications of the required (and optional) preliminary pages as well as those of the document's body are also automatically generated to conform to the requirements in this Handbook. To significantly improve the appearance of your dissertation/thesis, UTthesis automatically adjusts inter-line and inter-character spacing of all text — based on the specifications established in this Handbook. In addition, UTthesis also provides a remarkably simple process for formatting other aspects of your dissertation/thesis (e.g., signature lines, captions to tables/figures, etc.). Proper use of the UTthesis file will guarantee the College of Graduate Studies' acceptance of the style and formatting of your document.

The UTthesis file, template, tutorials, and other supporting documents can be obtained from the College of Graduate Studies website, or by contacting the college directly (419.530.4723; grd-sch@utnet.utoledo.edu). Alternatively, you can obtain the files by contacting the Department of Economics (419.530.2572; regina.stambaugh@utoledo.edu).

2.8 Formatting Exceptions

2.8.1 Exceptions for Established Discipline-Specific Style Guides

Section 3 (p. 9) describes the organization of the document and it describes specific formatting requirements for each section of the document. For example, when describing the location of a page heading for preliminary pages, chapters, references, appendices, etc., sections 3.1–3.15 provide explicit instructions for the location of such headings. An exception to such requirements is provided to students whose department/college have adopted an established discipline-specific style guide (APA, Chicago, MLA, etc.) which mandate a different format for such headings (e.g., centered across the page instead of flush-left). At the instruction of their major advisor, students in such departments may follow the formatting of headings dictated by such established style guides. A similar exception is provided for the enumeration style used for table and figure numbers.

2.8.2 Exceptions for Applicable Manuscripts

When applicable, some programs permit students to include manuscripts as chapters. This is under the condition that such manuscripts are self-contained modular units, each written as a single paper, published or submitted (or intended to be submitted) to a refereed scientific journal. Each manuscript (presumptive journal article) must be prepared exactly in the style required for the intended journal, including formats for illustrations (charts, graphs, tables, etc.) and the mode of citation of the references. Typing, margins, and page numbers, however, must meet the requirements for the entire dissertation. Each chapter/journal article shall include the following parts: Abstract; Introduction; Material; Method; Results; Discussion; and complete References.

It is the responsibility of the student’s Advisory Committee to determine the number of chapters and authorship, as well as the quality and probability that these chapters will be published (if they have not already been submitted for publication). If the manuscript has been accepted for publication or has been published, you must include on the title page of the (chapter) manuscript, the name of the journal and note “in press” or the complete citation if already published.

When including manuscripts, the Materials, Methods, Results, and Conclusions sections are omitted. A Discussion/Summary chapter should provide a thread of continuity with all parts of the dissertation and must clearly state the new addition to knowledge.
3 Organization of Document

Sections 3.1–3.15 (pp. 9–19) describe which preliminary pages and major sections are required to be included in every dissertation and thesis and which are optional pages/sections. Sections 3.1–3.15 also describe specific style and formatting requirements for each preliminary page and major section. Note: every dissertation and thesis must present these preliminary pages and major sections according to the sequence listed below. There are no exceptions to this rule: any dissertation or thesis that deviates from the sequence listed below will be rejected by the Graduate College.

- Title page
- Copyright/Blank Page
- Abstract Page
- Dedication Page (optional)
- Acknowledgments (optional)
- Table of Contents
- List of Tables (conditional)
- List of Figures (conditional)
- List of Abbreviations (optional)
- List of Symbols (optional)
- Preface (optional)
- Document Text
- References
- Appendices (if necessary)
- Index (optional)

Some preliminary page numbers are not printed on the page: Every preliminary page is counted in the pagination. When page numbers are printed on a preliminary page they are printed in lower-case Roman numerals (i.e., i, ii, iii, . . . ). However, the page number of some preliminary pages is not printed on the page (see the table in section 2.3, p. 4). For example, the title page is counted in the pagination as page “i” but that page number is not printed on the title page.

3.1 Title Page

The title page is counted in the pagination as page one. However, the page number is not printed on that page. The title page is not listed in the table of contents. The title page text is to be double-spaced (though items #2 and #4 below allow for possible exceptions to this rule).

Figure 1 (p. 10) illustrates the information that must appear on the title page, and the order that information must appear on the page. That figure also demonstrates the general formatting of information and the principle of equal spacing between each major section of the page. A detailed description of each informational component in Figure 1 is enumerated below.

Please note three additional issues. First, no other information may be included on the title page (e.g., there shall be no reference to individual colleges or their administrators). Second, the formatting of the information on the title page is to follow that illustrated in the Sample Title Page (see appendix, p. 27). Third, signatures appearing on the title page must follow the specifications of section 4 (p. 19).

The following provides formatting information for each component in Figure 1 on p. 10.

1. This document is either a “Dissertation,” a “Thesis” or a “Project”. The “A <document> entitled” statement must be double-spaced and centered at the top of the page (i.e., located 1” below the top edge of the page).
A document entitled <title>

by <your name>

Submitted to the Graduate Faculty as partial fulfillment of the requirements for the <degree> Degree in <discipline>

{Name}, Committee Chair

{Name}, Committee Member

{Name}, Dean
College of Graduate Studies

The University of Toledo

<month> <year>

Figure 1: General Formatting of a Title Page (not drawn to scale). See the information below this figure and the Sample Title Page (appendix, p. 27) for specific details on how to format each component on this page.

2. <title>: The title is to be centered and double-spaced. However, single-spacing the title is permitted if space is needed to accommodate additional signature lines (see #5 below). The Sample Title Page in the appendix (p. 27) provides an example of how to format the document title.

You should not use all capital letters for your title. However, in some cases, it is appropriate to use all capital letters for some acronyms, proper nouns and other terms. Whenever possible, use full proper names. Avoid abbreviations for specialized vocabulary, and use word substitutes for formulas, symbols, superscripts, subscripts, Greek characters, etc. You must include all appropriate accents and diacritical marks.

3. <your name>: This, of course, is where you state your name. Consider carefully the style of reporting your name. Examples are a) “Elmer Fudd,” b) “Elmer J. Fudd,” or “Elmer Jehosephat Fudd.” The “by <your name>” statement must be centered and double-spaced.

4. (a) <degree>: This is the exact description of you degree (e.g., Doctor of Philosophy, Master of Arts, Master of Science, etc.).

(b) <discipline>: This is the discipline awarding the degree (e.g., Economics, Education, Engineering, etc.). In many cases <discipline> is just the name of your department, though it’s not so obvious in other cases. For example, a student receiving a masters degree in Civil Engineering would have the statement “Master of Science Degree in Civil Engineering”; however, a student whose Ph.D. work was in Civil Engineering would have
“Doctor of Philosophy Degree in Engineering” (i.e., not “Civil Engineering”). Consult your major advisor and/or the College of Graduate Studies if you have questions on this issue.

The statement beginning with “Submitted to the Graduate Faculty …” and ending with “… <discipline>” is centered and double-spaced. However, single-spacing this statement is permitted if space is needed to accommodate additional signature lines (see #5 below).

5. Signatures: See section 4 (p. 19) for specific information on required/optional signatures appearing on the title page, signature lines, consistent presentation of signatures, etc. Such signature lines are to be double-spaced and presented flush with the right margin. See the Sample Title Page in the appendix (p. 27) for an example of formatting signature lines.

6. <month> <year>: The conferral information consists of the statement “The University of Toledo” followed by the month and year your degree will be conferred. This information must be double-spaced and centered at the bottom of the page.

Do not use commas, brackets, etc. before or after the conferral date (i.e., the month and year). Do not confuse the conferral date with the date the document was defended, approved, or when committee members signed the title page. The conferral date is the month and year the university confers your degree. Consult the Graduate College for the specific month and year your degree will be conferred. See the Sample Title Page in the appendix (p. 27) for an example of formatting conferral information.

3.2 Copyright/Blank Page

The second page of every dissertation/thesis must be either a copyright notice page or a blank page. A copyright notice page may not appear elsewhere in the dissertation/thesis. If a student chooses to not include a copyright page, then the second page of their document must be a blank page. Regardless of whether the second page is a copyright notice page or a blank page, this page is counted in the pagination but the page number is not printed on the page. Further, this page is not listed in the table of contents.

If a student chooses to include a copyright notice page as the second page of their document, then the content of that page shall be limited to the following text:

Copyright <year>, <full legal name>

This document is copyrighted material. Under copyright law, no parts of this document may be reproduced without the expressed permission of the author.

The student must replace “<year>” in the above example with the appropriate year of copyright and replace “<full legal name>” with their full legal name. The above material is to be printed single-spaced at the center of the page just above the bottom margin — with one blank line separating the “Copyright <year>, <full legal name>” line from the subsequent text. From section 2.1 (p. 3), this material must be printed in the same font as is used for all other textual material (i.e., no other font is permitted for this page). The location of this material is illustrated in the Sample Copyright Page in the appendix (p. 28). Note that all copies of a copyrighted document must include this copyright notification page.

Section 5.1 (p. 21) provides additional information on the process of copyrighting your document (including a discussion of legal protection for you).
3.3 Abstract Page

**General Information:** Every dissertation and thesis is required to provide an abstract of the scholarly work contained in the document. The Abstract page must be the third page of the document (following the Title page and the Copyright/Blank page). This page is counted in the pagination and its page number is printed on the page (in lower case Roman numerals). Because the title page and the copyright/blank pages are counted in the pagination, the page number for the Abstract page must be “iii”. The heading “Abstract” appears in the table of contents (as illustrated in the *Sample Table of Contents* in the appendix, p. 32).

The information contained in the Abstract page is comprised of two parts, described below. No other information may be included on the Abstract page. Students are encouraged to compare the information below with the *Sample Abstract Page* provided in the appendix (p. 29). An exception to the formatting presented in that *Sample Abstract Page* is provided only to students whose department/college have adopted an established discipline-specific style guide (see section 2.8.1, p. 8).

**Part One:** The information illustrated in Figure 2 is single-spaced and centered at the top of the Abstract page — with equal spacing between each component (e.g., one blank line). Note that this information (i.e., document title, your name, degree, discipline, and conferral date) must correspond exactly to the information provided on the title page.

Further, from section 2.1 (p. 3), Abstract page material must be printed in the same font as is used for all other textual material (i.e., bold, italics, underline, etc., fonts are not permitted for this page).

An Abstract of

<document title>

by

<your name>

As partial fulfillment of the requirements for the
<degree> Degree in <discipline>

The University of Toledo
<month> <year>

Figure 2: This information is included in “Part One” of your Abstract page. See the discussion on p. 12 for more information on this part of that page. Following directly after this material is “Part Two” of your Abstract page (described below).

**Part Two:** This material follows after the “Part One” material described above. It contains the abstract text, which must be double-spaced. The text must contain a concise statement of the problem, procedure or methods utilized, results obtained and a brief conclusion. There is no word limit on the text of your abstract, however, as ProQuest/UMI will continue to publish print indices and these require word limits of 350 words for dissertations (see the definition of “a word” below). Hence, a dissertation's abstract will be truncated by ProQuest/UMI if it exceeds this word limit. Please see the additional guidelines for preparing your abstract available in the Proquest/UMI “Publishing Your Dissertation” booklet available on the College of Graduate Studies website.
A word is defined as any characters that has a space before and after, i.e., the words “a,” “of,” etc., count as one word each. Hyphenated words such as “post-translational” or “1,1-bis(p-chlorophenyl)-2,2,2-trichloroethane” count as one word each.

3.4 Dedication Page

General Information: This is an optional page. If you choose to include a Dedication page, note that its length shall not exceed one page. A Dedication page is counted in the pagination, but the page number is not printed on the page. This page is not listed in the table of contents (as illustrated by the Sample Table of Contents in the appendix, p. 32).

Format: There is no page heading and the start of the dedication is located 3 inches from the top-edge of the page — as illustrated by the Sample Dedication Page in the appendix, p. 30. Consult section 2.8.1 (p. 8) if your department/college has adopted an established discipline-specific style guide that conflicts with the above specifications.

3.5 Acknowledgments

General Information: This is an optional page. If this page is included in the document then this page shall include the heading “Acknowledgments”. An Acknowledgments page shall not exceed one page in length. This page is counted in the pagination and its page number is printed on the page (in lower case Roman numerals). The heading for this page is listed in the table of contents — as illustrated in the Sample Table of Contents on p. 32.

Format: The page heading (“Acknowledgments”) is located 2 inches from the top edge of the page and flush with the left margin. The text of the acknowledgments shall begin 1 inch below that heading — as illustrated in the appendix’s Sample Acknowledgments Page (p. 31). Consult section 2.8.1 (p. 8) if your department/college has adopted an established discipline-specific style guide that conflicts with the above specifications.

3.6 Table of Contents

General Information: All dissertations/theses are required to include a detailed table of contents (i.e., parts, chapters, sections, subsections, references, appendices, etc.). The first page of the table of contents shall include either the heading “Contents” or “Table of Contents.” The table of contents pages are counted in the pagination and their page numbers are printed on the page (in lower case Roman numerals). The heading for this page is listed in the table of contents (as illustrated in the appendix’s Sample Table of Contents on p. 32).

Format: The heading for this page (i.e., “Contents” or “Table of Contents”) is located 2 inches from the top edge of the page and flush with the left margin. Following 1 inch below that heading and flush with the left margin will begin the list of entries to the table of contents. If the Table of Contents extends beyond a single page, the top-margin of subsequent pages is 1 inch from the top edge of the page. Consult section 2.8.1 (p. 8) if your department/college has adopted an established discipline-specific style guide that conflicts with the above specifications.
3.7 List of Tables

General Information: The first page of this section must include the heading “List of Tables” (see the Sample List of Tables in the appendix, p. 33). The list of tables pages are counted in the pagination and their page numbers are printed on the page (in lower case Roman numerals). The heading for this section is included in the table of contents — as illustrated in the appendix’s Sample Table of Contents (p. 32).

Note: A List of Tables section is a required “preliminary page” if three or more tables are present in the document. If the document contains only one or two tables then the inclusion of this section is left to the discretion of the student.

Format: As illustrated in the Sample List of Tables (p. 33), the heading of the first page of this section (i.e., “List of Tables”) is located 2 inches from the top edge of the page and flush with the left margin. Following 1 inch below that heading and flush with the left margin begins the enumerated list of entries to the List of Tables. If this list extends beyond a single page, the top-margin of subsequent pages is 1 inch from the top edge of the page. Consult section 2.8.1 (p. 8) if your department/college has adopted an established discipline-specific style guide that conflicts with the above specifications.

Table Captions: As is illustrated in the appendix’s Sample Table Page (p. 40), captions to tables are located above the table (in contrast to the placement of figure captions).

Table Numbers: The Sample List of Tables (p. 33) and the Sample Table Page (p. 40) illustrate the default method of enumerating tables. This method is characterized by (1) the table’s number being led by its chapter/appendix location and (2) table numeration is reset to “1” for each chapter/appendix. As examples, the numbers of the first three tables appearing within chapter 1 would be “1-1”, “1-2”, and “1-3”; those appearing in chapter 4 would be “4-1”, “4-2”, and “4-3”; and those appearing in third appendix (Appendix C) would be “C-1”, “C-2”, and “C-3”. Consult section 2.8.1 (p. 8) if your department/college has adopted an established discipline-specific style guide that conflicts with the above specifications.

3.8 List of Figures

General Information: The first page of this section must include the heading “List of Figures” (see the appendix’s Sample List of Figures, p. 34). The list of figures pages are counted in the pagination and their page numbers are printed on the page (in lower case Roman numerals). The heading for this section is included in the table of contents — as illustrated in the appendix’s Sample Table of Contents (p. 32).

Note: A List of Figures section is a required “preliminary page” if three or more figures are present in the document. If the document contains only one or two figures then the inclusion of this section is left to the discretion of the student.

Format: As illustrated in the Sample List of Figures (p. 34), the heading of the first page of this section (i.e., “List of Figures”) is located 2 inches from the top edge of the page and flush with the left margin. Following 1 inch below that heading and flush with the left margin begins the enumerated list of entries to the List of Figures. If this list extends beyond a single page, the top-margin of subsequent pages is 1 inch from the top edge of the page. Consult section 2.8.1 (p. 8)
if your department/college has adopted an established discipline-specific style guide that conflicts with the above specifications.

Figure Captions: As is illustrated in the appendix’s Sample Figure Page (p. 39), captions to figures are located below the figure (in contrast to the placement of table captions).

Figure Numbers: The Sample List of Figures (p. 34) and the Sample Figure Page (p. 39) illustrate the default method of enumerating figures. This method is characterized by (1) the figure’s number being led by its chapter/appendix location and (2) figure numeration is reset to “1” for each chapter/appendix. As examples, the numbers of the first three figures appearing within chapter 1 would be “1-1”, “1-2”, and “1-3”; those appearing in chapter 4 would be “4-1”, “4-2”, and “4-3”; and those appearing in third appendix (Appendix C) would be “C-1”, “C-2”, and “C-3”. Consult section 2.8.1 (p. 8) if your department/college has adopted an established discipline-specific style guide that conflicts with the above specifications.

3.9 List of Abbreviations

General Information: This is an optional section. Not every dissertation or thesis needs a List of Abbreviations. However, such a list can be a very helpful resource to readers if a significant number of abbreviations are used throughout the document. Students are encouraged to consult with their major advisor to determine whether a List of Abbreviations should be included in the preliminary pages.

Completeness: If this list is included in the preliminary pages then, for completeness, every abbreviation appearing in the document must be included in this list. (Further, this list may not contain abbreviations that do not appear elsewhere in the document.) Regardless of whether a List of Abbreviations is included in the preliminary pages, a definition of each abbreviation must appear in the document’s text directly before or after the first use of the abbreviation.

Format: The heading for this section is “List of Abbreviations” (which is also included in the table of contents, as illustrated is the appendix’s Sample Table of Contents on p. 32). This heading is located on the first page of this section, 2 inches from the top edge of the page and flush with the left margin. Following 1 inch below that heading and flush with the left margin begins the single-spaced list of abbreviations. Pages in this section are counted in the pagination and their page numbers are printed on the page (in lower case Roman numerals). If this list extends beyond a single page, the top-margin of list entries on subsequent pages is 1 inch from the top edge of the page. Consult section 2.8.1 (p. 8) if your department/college has adopted an established discipline-specific style guide that conflicts with the above specifications.

As is illustrated in the appendix’s Sample List of Abbreviations (p. 35), this list shall not be enumerated and it must be presented in alphabetic order of abbreviations (not their definition). Each list entry has two components, presented in a two-column format. For example,

AJA ................. American Journal of Archaeology; the Journal of the Archaeological Institute of America
BB ..................... B.B. King
HHS ................... Department of Health and Human Services

The list entry’s left column is the abbreviation, presented flush with the left margin. Its right column is the definition of that abbreviation. If a definition extends beyond one line, the definition
is to wrap the line with succeeding words left-aligned with the start of the definition (such as that for the definition of “AJA” in the above example).

### 3.10 List of Symbols

**General Information:** This is an optional section. Not every dissertation or thesis needs a *List of Symbols*. However, as with the list of abbreviations, a *List of Symbols* can be a very helpful resource to readers if a significant number of symbols are used throughout the document. Students are encouraged to consult with their major advisor to determine whether such a list should be included in the preliminary pages.

**Completeness:** If this list is included in the preliminary pages then, for completeness, every symbol appearing in the document must be included in this list. (Further, this list may not contain symbols that do not appear elsewhere in the document.) Regardless of whether this list is included in the preliminary pages, a definition of each symbol must appear in the document’s text directly before or after the first use of the symbol.

**Format:** The heading for this section is “List of Symbols” (which is also included in the table of contents, as illustrated is the appendix’s *Sample Table of Contents* on p. 32). This heading is located on the first page of this section, 2 inches from the top edge of the page and flush with the left margin. Following 1 inch below that heading and flush with the left margin begins the single-spaced list of symbols. Pages in this section are counted in the pagination and their page numbers are printed on the page (in lower case Roman numerals). If this list extends beyond a single page, the top-margin of list entries on subsequent pages is 1 inch from the top edge of the page. Consult section 2.8.1 (p. 8) if your department/college has adopted an established discipline-specific style guide that conflicts with the above specifications.

As is illustrated in the appendix’s *Sample List of Symbols* (p. 36), this list shall not be enumerated. Each list entry has two components, presented in a two-column format. For example,

<table>
<thead>
<tr>
<th>Symbol</th>
<th>Definition</th>
</tr>
</thead>
<tbody>
<tr>
<td>⊗</td>
<td>magnetic field gradient pulse separation</td>
</tr>
<tr>
<td>‡</td>
<td>the ratio of the M2 money supply to the Monetary Base</td>
</tr>
<tr>
<td>α</td>
<td>angle of rotation around internal rotation axis</td>
</tr>
<tr>
<td>β</td>
<td>correlation coefficient</td>
</tr>
<tr>
<td>Q</td>
<td>Tobin’s q; the ratio of the market value of installed capital to the replacement cost of capital</td>
</tr>
<tr>
<td>Y</td>
<td>Gross Domestic Product (adjusted for inflation)</td>
</tr>
</tbody>
</table>

The list entry’s left column is the symbol, presented flush with the left margin. Its right column is the definition of that symbol. If a definition extends beyond one line, the definition is to wrap the line with succeeding words left-aligned with the start of the definition (such as that for the definition of “Q” in the above example).

The entries to the List of Symbols environment are to be arranged in subgroups of symbols according to discipline conventions (e.g., non-associated symbols first, Greek characters second, English alphabet characters third, etc.). Note: a single blank line must separate each such subgroup of symbols (as in the example above). When possible the list within each subgroup must be in alphabetic order of *symbols* (not their descriptions). For the Greek alphabetic, this would be: \( \alpha, \beta, \Gamma, \gamma, \ldots \Omega, \omega \). In the English alphabet language we’d have: \( A, a, B, b, C, c, \ldots Z, z \).
3.11 Preface

General Information: This is an optional section. If a student chooses to include a Preface, then the first page of this section must include the heading “Preface” — as illustrated in the appendix’s Sample Preface Section (p. 37). The Preface pages are counted in the pagination and their page numbers are printed on the page (lower case Roman numerals). The heading for this page is listed in the table of contents (as illustrated in the appendix’s Sample Table of Contents on p. 32).

Format: The heading on the first page of this section (i.e., “Preface”) is located 2 inches from the top edge of the page and flush with the left margin. Following 1 inch below that heading and flush with the left margin will begin the text of the preface. An example of this is provided in the appendix’s Sample Preface Section (p. 37). If the Preface extends beyond a single page, the top-margin of subsequent pages is 1 inch from the top edge of the page. Consult section 2.8.1 (p. 8) if your department/college has adopted an established discipline-specific style guide that conflicts with the above specifications.

3.12 Document Text

Divisions of Text: The first page of the first chapter begins the document’s text. Any page preceding that page is a preliminary page and must be formatted accordingly (see sections 2.3 and 3.1–3.11). The document’s text is to be divided into explicitly defined divisions (as needed), with the main divisions being designated as chapters (not as ‘parts,’ ‘books,’ etc.). As needed, a chapter may have explicitly defined subdivisions, designated as sections, subsections, subsubsections, etc. Headings for chapters, sections, subsections, etc. must be included in the table of contents.

Your document shall not have a “free-standing” main division or component that does not have an explicit chapter number designation. For example, you shall not have a free-standing “Introduction” section. Instead, you must decide whether that material is best included in a Preface section or as the contents of Chapter 1.

Chapter Page Format: Every chapter title must be numbered using Arabic numerals: “Chapter 1,” Chapter 2,” “Chapter 3,” etc. Chapter titles must be located 2 inches from the top edge of the page and flush with the left margin. The chapter heading is located 1 inch below that title and flush with the left margin. Following 1 inch below the chapter heading and flush with the left margin is the start of the chapter text. An example of this formatting is provided by the appendix’s Sample Chapter First Page (p. 38). The top-margin of subsequent chapter pages is 1 inch from the top edge of the page. An example of this formatting of a subsequent chapter page is found on the appendix’s Sample Table Page (p. 40). Consult section 2.8.1 (p. 8) if your department/college has adopted an established discipline-specific style guide that conflicts with the above specifications.

Section Number and Heading: When establishing a section, a section’s number is followed directly by its heading (i.e., both appear on the same line – and in that order). This information is presented flush with the left margin. No words or symbols may appear prior to a section’s number when establishing a section. The same formatting applies to subsections, subsubsections, etc. Examples of such formatting is provided in the appendix’s Sample Chapter First Page (p. 38).

Sections of chapter 1 are numbered 1.1, 1.2, 1.3, . . . while those of subsequent chapters are to be numbered “2.1”, “2.2”, . . . “3.1”, “3.2”, . . . That is, section enumeration resets to “1” for each new chapter. Similarly, subsection numbers are reset to “1” for each new section. For example,
the subsections of the fourth section of chapter 5 are to be numbered 5.4.1, 5.4.2, 5.4.3 . . . For the same reason, subsubsection numbers are reset to “1” for each new subsection.

Consult section 2.8.1 (p. 8) if your department/college has adopted an established discipline-specific style guide that conflicts with the above specifications.

3.13 References

**General Information:** There is only one acceptable heading for the section that lists works cited in your dissertation/thesis: “References”. This heading is not enumerated (unlike chapters, appendices, sections, etc.) Reference pages are counted in the pagination. This section is included in the table of contents but it is not enumerated (see the appendix’s *Sample Table of Contents* on p. 32). Pages within the Reference section have their page numbers printed on the page in Arabic numerals. The page number of the first page of the Reference section follows consecutively from that of last page of the previous chapter (i.e., its page number is not reset to “1”). As described in the **Spacing Options** section below, the appendix’s *Sample References Pages* (pp. 41–42) provide examples of the first page of a References section.

**Presentation of References:** The presentation of references in the above mentioned “Sample” pages are for illustrative purposes only. How information is presented in your references and the order such information is presented is to be dictated by the convention used in your discipline. Consult your major advisor on the proper method of reporting works cited in your dissertation/thesis.

**Spacing Options:** Students have two spacing options for reporting works cited in their dissertation/thesis:

1. Use double-spacing within each reference and between references. The appendix’s *Sample References — Example 1* (p. 41) illustrates this option.

2. Use single-spacing within an individual reference but use double-spacing between references. The appendix’s *Sample References — Example 2* (p. 42) illustrates this option.

**Format:** As mentioned above, the first page of this section must include the heading “References”. This heading is located 2 inches from the top edge of the page and flush with the left margin. Following 1 inch below that heading and flush with the left margin is the start of your list of references. If the reference list extends beyond a single page, the top-margin of subsequent pages is 1 inch from the top edge of the page. Consult section 2.8.1 (p. 8) if your department/college has adopted an established discipline-specific style guide that conflicts with the above specifications.

3.14 Appendices

**General Information:** The is an optional section. If appendices are necessary, then each appendix must be enumerated by the *Alph* numbering style (i.e., A, B, C, . . .) instead of the *Arabic* style used for chapters (i.e., 1, 2, 3, . . .). The first page of each appendix must include the title “Appendix X” (where X = A, B, C, . . .) followed by its heading. This is illustrated in the appendix’s *Sample Appendix First Page* (p. 43). The enumerated heading to each appendix is listed in the table of contents (as shown in the appendix’s *Sample Table of Contents* on p. 32). Every appendix page has its page number printed on the page in an Arabic numeral. The page number of the first page of the first appendix will follow consecutively from that of last page of the Reference section (i.e., the page number of the first page of that appendix is not reset to “1”).
number of the first page of a subsequent appendix follows consecutively from that of last page of
the previous appendix.

**Format:** The appendix title “Appendix $\mathcal{X}$” (where $\mathcal{X} = A, B, C, \ldots$) is to be located 2 inches
from the top edge of the page and flush with the left margin. The appendix heading is located 1 inch
below that title and flush with the left margin. Following 1 inch below the appendix heading and
flush with the left margin is the start of the appendix text. The appendix’s *Sample Appendix First
Page* (p. 43) provides an example of this formatting. If an appendix extends beyond a single page,
the top-margin of subsequent pages is 1 inch from the top edge of the page. Consult section 2.8.1
(p. 8) if your department/college has adopted an established discipline-specific style guide that
conflicts with the above specifications.

### 3.15 Index

**General Information:** This is an optional page. Not every dissertation or thesis needs an Index,
and some major advisors actively discourage its inclusion in the document due to the work involved
in generating a comprehensive index. Students are strongly encouraged to consult with their major
advisor to determine whether an index should be included in their dissertation/thesis.

**Format:** The first page of this section must include the heading “Index” — located 2 inches
from the top edge of the page and flush with the left margin. Following 1 inch below that heading
and flush with the left margin begins the index. If the index extends beyond a single page, the
top-margin of entries on subsequent pages is located 1 inch from the top edge of the page. Consult
section 2.8.1 (p. 8) if your department/college has adopted an established discipline-specific style
guide that conflicts with the above specifications.

Pages in this section are counted in the pagination and their page numbers are printed on
the page in Arabic numerals. The page number of the first page of the index will follow consecutively
from that of last page of the previous section (i.e., the page number of the first page of the index
is not reset to “1”). The heading for this section is listed in the table of contents (as illustrated in
the appendix’s *Sample Table of Contents* on p. 32).

### 4 Title Page Signatures

#### 4.1 Required Signatures

Signatures may only appear on the title page of a document. The Graduate Council requires the
following signatures to appear on the title page of every dissertation and thesis:

1. the student’s major advisor (committee chair), and
2. Dean of the College of Graduate Studies.

The signature of the student’s major advisor certifies the intellectual advancement achieved by
the student’s dissertation or thesis. The signature of the Dean of the College of Graduate Studies
certifies final approval of the dissertation/thesis with respect to other standards and requirements
established by the *Graduate Faculty*. See the *Sample Title Page* in the appendix, p. 27.
4.2 Other Permitted Signatures

As an option, students may include for signature the names of other committee members serving on the dissertation/thesis committee (i.e., those other than the major advisor). Such signatures serve to confirm the major advisor’s certification of the intellectual advancement achieved by the student’s dissertation or thesis. If the signature of at least one other committee member appears on the title page, then a signature from every committee member must also appear on the title page in order for the dissertation/thesis to be accepted by the Graduate College.

4.3 Signature Lines

Every thesis and dissertation must provide a signature line for each signature that appears on the title page. The name of the committee chair must be printed below her/his signature line. As described above, if the student includes for signature the name of at least one committee member other than the chair, the student must include for signature the names of all committee members. In this case,

- the name of each committee member must be printed below their respective signature line; and
- the names printed must be accompanied by a clear differentiation between the student’s committee chair (i.e., major advisor) and other committee members — in a manner consistent with that illustrated in the appendix’s Sample Title Page (p. 27).

Following the signature line(s) for the committee chair and, optionally, for all other committee members, a signature line must be provided for the Dean of the College of Graduate Studies. The following information must be printed below that signature line, centered across the signature line, and presented in a manner consistent with that illustrated in the appendix’s Sample Title Page (p. 27):

<academic title and name of Graduate College Dean>, <administrative title>
College of Graduate Studies

The dean’s administrative title may be “Dean,” “Interim Dean,” or “Acting Dean.” Consult the College of Graduate Studies for the exact name and administrative title of the current dean. For example,

Dr. Patricia R. Komuniecki, Dean
College of Graduate Studies

4.4 Consistent Presentation of Signatures

For names printed below a signature line, there are two options for reporting the title/degree of those that sign the title page. Option A is to have every named signature line report their respective title prior to their name (e.g., “Dr. Roy Hinkley”). Option B is to have every named signature line report their degree after their name (e.g., “Roy Hinkley, Ph.D.” or “Roy Hinkley, M.D.”). To maintain uniformity, students may choose either Option A or B for every signature line but they may not use Option A for some signature lines and Option B for others. Consult your major advisor to determine whether Option A or B follows the convention used in your discipline.
4.5 No Administrative Signatures

While the signature of the Dean of the College of Graduate Studies must appear on the title page of every dissertation and thesis, in no case shall the name or title of any other administrator appear for signature on any dissertation or thesis submitted to the Graduate College, or any publishing organization, unless that administrator served as the student’s major advisor or as a committee member. In such a case, only the administrator’s academic degree (i.e., Ph.D. or M.D.) or academic title (i.e., “Dr.”) may be printed on the title page. In no case shall a administrative title be included as part of that signature line.

5 Copyright Issues

5.1 Copyrighting Your Document

Your document is automatically copyrighted once it is in a tangible form. While this automatic copyright is expected to be understood and honored by readers, you may wish to include a copyright page as part of your document to ensure copyright protection. As described in section section 3.2 (p. 11), you should have the second page of your document be the copyright notification page. Inclusion of a copyright page does not register your copyright. Registration of copyright is a formal process which takes place through the U.S. Copyright Office. Registering the copyright to your document is optional, but it can be arranged through ProQuest/UMI for an additional charge.

All copies of a copyrighted dissertation or thesis must include a separate copyright notice page. As explained in section 3.2 (p. 11), that copyright notice page must be the second page of the dissertation or thesis. Section 3.2 also describes the exact form the copyright notice page required for all dissertations and theses.

Because copyright law is complicated, students should consult ProQuest’s document “Copyright Information” along with the manual “Copyright Law and Graduate Research,” which is excerpted in this section. More detailed information regarding copyrights can be obtained from other sources.

The copyright notice consists of the following three elements: the symbol ©, or the word “Copyright,” the year of first publication of the work; and the name of the copyright owner in the work. The notice shall be affixed to the copies in such manner and location as to give reasonable notice of the claim of copyright (17 U.S.C. 401). The specifications in section 3.2 (p. 11) satisfy all of these conditions.

By adding the copyright notice, which must be included on all copies, you have copyrighted your document. You have a number of options to consider:

1. You may choose to copyright your document by adding the notice but not registering it. You then will hold the legal rights to your work. However, to protect you rights more in a copyright dispute and in order to be compensated for damages caused by infringement, your copyright must be registered. Having a copyright page does not serve to register one’s copyright; registration of copyright is a formal process which takes place through the U.S. Copyright Office. “Registration of copyright provides a public record and is usually a prerequisite for any legal action” (p. 299), of the 2001 Publication Manual of the American Psychological Association (6th ed.).

2. You may have the copyright registered for you by ProQuest/UMI for a fee. To do so, select this option when completing your Publishing Agreement and pay the associated fee. UMI registers your copyright and submits your document to the Library of Congress.

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4The location of these two document are, respectively, www.utoledo.edu/graduate/files/UMLCopyrightGuide08-09.pdf and www.proquest.com/en-US/products/dissertations/copyright/.
3. You may register the copyright yourself by paying the registration fee and sending two copies of the document to the Library of Congress. In order to have greater protection against infringement, this should be done as soon as possible after the submission of your document to the College of Graduate Studies.

5.2 Using Copyrighted Material

Since the submission of your thesis/dissertation to OhioLink constitutes a form of publication, you must obtain permission to include (or quote) copyrighted material such as that in most journal articles or books unless you are the owner of the copyright or unless the material meets the “fair use” described in the next paragraph. The author is responsible in the matter of copyrighted materials. The agreement form that you sign with Proquest/UMI specifically absolves them of any such responsibility.

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A statement listing such materials should be included in the acknowledgments of the thesis/dissertation and at the end of each applicable chapter. The statement shall (1) inform the reader the permission has been granted, and (2) state the source of the permission.

6 Submitting Your Dissertation or Thesis

6.1 Issues to Consider Prior to Submitting Your Document

6.1.1 Proofread Your Document

You are ultimately responsible for submitting a dissertation/thesis that is free of spelling and other errors, and is a document that conforms to formatting requirements specified in this Handbook. Before you submit your final document, check carefully for correct margins, page numbering, references, citations, and other formatting items. Further, additional information and a submission tutorial are available on the library website. It is strongly recommended that you review the information available on this site before submitting your document. Proofread and correct your document before it is uploaded to OhioLink — because after it is uploaded no changes will be permitted (unless otherwise directed by the College of Graduate Studies).

6.1.2 Department/College Procedures & Deadlines

Department/College Procedures: Uploading your document to OhioLink is the final step towards the completion of your document (along with that described in #5 of section 6.3 on p. 24). Therefore, before you upload your document, you must follow all procedures instituted by your department and home college. These may include particular actions you have to take prior to scheduling the defense of your dissertation/thesis, the defense, or any necessary revisions or actions you have to take after the defense. After making those revisions to your document, you must
verify that your dissertation/thesis satisfy the style and formatting requirements specified in this Handbook.

Department/College Deadlines: Please check with your college office to determine if it has a submission deadline for processing your document. Because such college-level review must take place prior to uploading your document to OhioLink, you must provide your college with sufficient time for processing your document so that the deadline specified by the College of Graduate Studies in section 6.2 is satisfied. In other words, the student and the student’s advisor are responsible for making certain that all department/home college actions and document processing occurs so that there is sufficient time for the student to satisfy the submission deadline specified in section 6.2.

6.2 Deadline for Submission

Theses and dissertations must be uploaded in electronic format to OhioLink no later than fifteen (15) business days prior to the last day of classes for the term the degree will be awarded. No exceptions, waivers, or extensions to this deadline will be granted. Note: for students completing a dissertation, all fees associated with submitting your dissertation to Proquest/UMI must also be paid by this deadline.

See section 1.3 (p. 2) for a discussion of the forms that must be submitted to the College of Graduate Studies when completing a thesis or dissertation.

6.3 Submitting Your Document

The College of Graduate Studies no longer accepts paper copies of dissertations and theses. All dissertations and theses must be submitted in electronic format (i.e., an “ETD” – an electronic thesis or dissertation). That is, when you submit your document you will simply upload an electronic version of that document to OhioLink. However, regardless of which word-processor program you used to write your dissertation/thesis, you cannot simply upload the “word-processor” version of your document. Instead, you must first convert the word-processor document into a “PDF” version of that document. The steps involved in the submission process are as follows:

1. Complete your dissertation/thesis and secure its approval from your committee and your home college. Afterwards, complete and submit all forms required by your home college to the appropriate office within that college.

2. Convert your word-processor document to a PDF file, making certain that fonts are “embedded” in the conversion process. If you need assistance converting your word-processor document to a “font embedded” PDF document, please contact Wade Lee in the library at 419.530.4490.

3. Upload your “font-embedded” PDF file to OhioLink. You must upload the final version of your dissertation/thesis to OhioLink by the posted deadline. NOTE: the uploaded file must not include a scanned image of the title page containing actual signatures. Instead, the title must be “blank” with respect to actual signatures.

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4 Additional information on electronic theses and dissertations (ETDs) is available through the OhioLINK ETD Center (http://www.ohiolink.edu/etd/).

5 If fonts are not embedded, then the reader will read your document using fonts located on her/his computer. If they are not the exact fonts used to generate your document, the reader might see gibberish when attempting to read or print your PDF file. However, if you “embed” fonts, the reader will see exactly what you wrote when you generated your dissertation/thesis.
4. The College of Graduate Studies will review your electronic document to determine whether it satisfies all style and formatting requirements established in this Handbook. (It will not proofread your document for grammar or spelling mistakes.) The College of Graduate Studies will then determine whether your document is either “acceptable” or “unacceptable.” You and your major advisor (i.e., your committee chair) will be notified of this determination via email.

If your document is unacceptable to the College of Graduate Studies their email correspondence will include a list of changes or corrections that must be made to your document before you upload a corrected version to OhioLink. **NOTE:** you will have five (5) days from the date of notification to make the necessary changes and upload your corrected document to OhioLink.

5. In addition to submitting your document to OhioLink, Proquest/UMI, etc., the UT Graduate Council requires every electronic thesis and dissertation (ETD) to be submitted to a repository at the University of Toledo. Storing ETDs locally provides a fail-safe backup of your document — which is an important addition to the intellectual legacy of this university.

Therefore, in addition to submitting your document to OhioLink you must submit the final (“acceptable”) version of your dissertation/thesis to this UT repository. Contact the College of Graduate Studies for specific instructions on how to submit your ETD to this UT repository.

6.4 Required Title Page with Signatures

Upon notification that your submitted electronic document is acceptable to the College of Graduate Studies, you must deliver to the College of Graduate Studies a paper copy of your document’s title page possessing all relevant signatures. See sections 4.1 – 4.5 (pp. 19 – 21) for specific instructions on relevant signatures and signature lines.

6.5 Personal Paper Copies

Arrangements for bound, personal copies of one’s dissertation, thesis, or project can be made with Rocket Copy located on the second floor of the Student Union (419.530.4606). Copies of dissertations can also be ordered through Proquest/UMI. If you make such arrangements for a paper copy of your document, you are strongly encouraged to use white, at least twenty-four (24) pound, acid-free, $8\frac{1}{2}' \times 11'$ paper.

Students wishing to retain extra paper copies of their dissertation/thesis should retain these copies and submit only the additional title pages [with original signature(s)] to the College of Graduate Studies for signature by its Dean. A maximum of five title pages will be signed.

7 Dissertation Publishing Requirement

Microfilming is a requirement for those writing a Doctoral Dissertation in the College of Graduate Studies. The College of Graduate Studies has made arrangements with Proquest/UMI for the microreproduction of dissertations. Proquest makes a master microfilm and retains it in its vaults. It announces the publication in Dissertation Abstracts International and provides positive microfilms and paper bound xerographic copies to all who wish to buy them.

The University of Toledo, as part of its obligation to disseminate research results, requires all Ph.D. dissertations be published. In order to satisfy this requirement, students must choose to have OhioLink forward a copy of the dissertation to Proquest/UMI Dissertation Publishing. ProQuest/UMI will preserve, archive, and publish such documents. Please note the following:
1. students must choose this option when completing the OhioLink submission process; and
2. some master’s programs also require students to submit their theses to Proquest/UMI. It is the student’s responsibility to determine whether they are subject to such a requirement.

The cost for publishing is the obligation of the author. The current charge for publishing can be obtained by contacting the College of Graduate Studies.

In order for the dissertation to be published, the author must certify that any copyrighted materials used in the document that exceed “fair use,” is with the written permission of the owner(s). Copies of permission letters must be submitted with the Pro Quest/UMI Dissertation Agreement Form. If permissions are not supplied, copyrighted materials will not be reproduced.

For assistance and for a sample permission letter, please refer to the ProQuest/UMI “Publishing Your Doctoral Dissertation” booklet.

8 Amending this Handbook

The Graduate Council Executive Committee is authorized to approve minor editorial changes to this Handbook. However, only the Graduate Council may approve a substantive change to the style and formatting requirements established by this Handbook. Under no circumstance may College of Graduate Studies personnel alter the content of this Handbook without prior approval of either the Graduate Council Executive Committee or the Graduate Council.

9 Reference Material for this Handbook

OhioLINK ETD Center (http://www.ohiolink.edu/etd/)

ProQuest/UMI’s ‘Copyright Information’
(http://www.utoledo.edu/graduate/files/UMLCopyrightGuide08-09.pdf)

ProQuest/UMI’s “Copyright Law and Graduate Research”
(http://www.proquest.com/en-US/products/dissertations/copyright/)

ProQuest/UMI’s “Publishing Your Doctoral Dissertation with UMI Dissertation Publishing”.

Virginia Tech’s ETD Web Site (http://etd.vt.edu/)

University of Cincinnati’s ETD Web Site (http://www. etd.uc.edu/ETDCenter.aspx)

University of Toledo Libraries’ Web Site (http://www.cl.utoledo.edu/serv/etd.html)

University of Toledo, College of Graduate Studies (http://www.utoledo.edu/graduate/)
Appendix

A Sample Pages of Handbook Formatting

This appendix provides sample pages illustrating the formatting of all major pages included in a dissertation/thesis. The table below provides the page number of these sample pages formatted according to the specifications included in this Handbook.

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As discussed in section 2.8 (p. 8), certain exceptions to the Handbook formatting are permitted if a department/college has formally adopted an established discipline-specific style guide (e.g., APA or MLA) which mandate a different format for headings or the numeration of tables, figures, etc. To help students using APA formatting, a corresponding series of sample pages for that style guide is provided on the College of Graduate Studies’ website (see section 1.1, p. 1).
A Dissertation
entitled

A Game-Theoretic Approach to a General Equilibrium Model with Asymmetric Price Information and No Goods

by

Elmer J. Fudd

Submitted to the Graduate Faculty as partial fulfillment of the requirements for the Doctor of Philosophy Degree in Economics

Dr. Roy Hinkley, Committee Chair

Dr. Ginger Grant, Committee Member

Dr. Jonas Grumby, Committee Member

Dr. Eunice W. Howell, Committee Member

Dr. Thurston Howell, Committee Member

Dr. Mary Ann Summers, Committee Member

Dr. Noah Lott, Dean
College of Graduate Studies

The University of Toledo
May 2010
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An Abstract of
A Game-Theoretic Approach to a General Equilibrium Model with Asymmetric Price Information and No Goods
by
Elmer J. Fudd
Submitted to the Graduate Faculty in partial fulfillment of the requirements for the Doctor of Philosophy Degree in Economics
The University of Toledo
May 2010

Out-of-sample forecasting experiments are used as an alternative to looking at F-statistics when examining whether money, interest rates or the commercial paper/T-bill spread provide information content for subsequent movements in output, real and nominal personal income, the CPI and the PPI. Here a variable provides information if it improves the forecast of the explained variable. Employing this procedure I find that the paper-bill spread but not monetary aggregates provide information content for industrial production or real personal income when using data over the 1980-97 period. In contrast, I find that monetary aggregates provide information content for the CPI and nominal personal income but not the PPI.
For Margaret, Jack, and Joseph. Before you entered my life, I used to wonder what I might accomplish; now, I want only to be the best Papa I can be.
Acknowledgments

This dissertation would not have been possible without the love, support, and encouragement I received from my parents, brothers and sisters. Only now am I beginning to realize how much my parents sacrificed so that I could attend college. I do not have words to adequately describe my deep gratitude for all they have provided me, though I hope to show them in the years to come.

I have benefited greatly from the mentoring of James Holmes and comments received from David Black and Kristen Keith. I studied economics because of what I saw in James Holmes — a tremendous desire to learn and understand, and a wonderful fascination with Macroeconomics. I am truly indebted to him for fostering the same pursuit and fascination in me and, of course, for his assistance and advice during my years as his student.
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## List of Abbreviations

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<tr>
<td>AAGG</td>
<td>American Association of Solving the World’s Problems by way of Government Grants</td>
</tr>
<tr>
<td>ABMC</td>
<td>American Battle Monuments Commission</td>
</tr>
<tr>
<td>ADA</td>
<td>Americans with Disabilities Act of 1990</td>
</tr>
<tr>
<td>ADD</td>
<td>Administration on Developmental Disabilities</td>
</tr>
<tr>
<td>AFAA</td>
<td>Air Force Audit Agency</td>
</tr>
<tr>
<td>AFDB</td>
<td>African Development Bank</td>
</tr>
<tr>
<td>AFDC</td>
<td>Aid to Families with Dependent Children</td>
</tr>
<tr>
<td>AFSC</td>
<td>Armed Forces Staff College</td>
</tr>
<tr>
<td>AJOKE</td>
<td>A game theoretic solution to an asymmetric general equilibrium model that has no prices and no goods</td>
</tr>
<tr>
<td>ANA</td>
<td>Administration for Native Americans</td>
</tr>
<tr>
<td>AOA</td>
<td>Administration on Aging</td>
</tr>
<tr>
<td>APHIS</td>
<td>Animal and Plant Health Inspection Service</td>
</tr>
<tr>
<td>ARS</td>
<td>Agricultural Research Service</td>
</tr>
<tr>
<td>ATF</td>
<td>Bureau of Alcohol, Tobacco, and Firearms</td>
</tr>
<tr>
<td>ATSDR</td>
<td>Agency for Toxic Substances and Disease Registry</td>
</tr>
<tr>
<td>BEA</td>
<td>Bureau of Economic Analysis</td>
</tr>
<tr>
<td>BIC</td>
<td>Business Information Center (SBA)</td>
</tr>
<tr>
<td>BJS</td>
<td>Bureau of Justice Statistics</td>
</tr>
<tr>
<td>BLM</td>
<td>Bureau of Land Management</td>
</tr>
<tr>
<td>BLS</td>
<td>Bureau of Labor Statistics</td>
</tr>
<tr>
<td>BTS</td>
<td>Bureau of Transportation Statistics</td>
</tr>
<tr>
<td>BVA</td>
<td>Board of Veterans’ Appeals</td>
</tr>
<tr>
<td>CBO</td>
<td>Congressional Budget Office</td>
</tr>
<tr>
<td>CCC</td>
<td>Commodity Credit Corporation</td>
</tr>
<tr>
<td>CDBG</td>
<td>Community Development Block Grant</td>
</tr>
<tr>
<td>CDC</td>
<td>Centers for Disease Control and Prevention</td>
</tr>
<tr>
<td>CEA</td>
<td>Council of Economic Advisers</td>
</tr>
<tr>
<td>CEQ</td>
<td>Council on Environmental Quality</td>
</tr>
<tr>
<td>CFA</td>
<td>Commission of Fine Arts</td>
</tr>
<tr>
<td>CRAP</td>
<td>Council for Regulating American Productivity through Government Oversight</td>
</tr>
</tbody>
</table>
Parentheses in the numerical listings contain measured or estimated uncertainties. For example, the value 1.407(83) should be interpreted as 1.407±0.083. Thus the value in parentheses refers to the last significant digits given.

\( \alpha \ldots \) Angle of rotation around internal rotation axis.
\( \beta \ldots \) correlation coefficient
\( \delta \ldots \) Magnetic field gradient pulse separation
\( \Theta_i \ldots \) the \( i \)th degree to which the flyrod has gone out of skew on tredel
\( \lambda \ldots \) the shadow price of income
\( \mu \ldots \) the ratio of the monetary aggregate to the monetary base
\( \rho \ldots \) Internal rotation interaction constant \( \rho = \left[ \Sigma_x (\lambda_x I_x/\lambda_x)^2 \right]^{1/2} \)

\( A_C \ldots \) crystal surface area
Ba \ldots \ Barium
BB \ldots \ B.B. King
Be\ldots \ Beryllium
Ca \ldots \ Calcium
\( E_G \ldots \) activation energy
\( F \ldots \) Internal rotation dynamical constant (GHz) \( F = \hbar/8\pi^2 r I_a \)
\( I_i \ldots \) Angular momentum quantum number of nuclear spin for the \( i \)th nucleus
\( J \ldots \) Resultant total angular momentum quantum number, excluding nuclear spins
\( k \ldots \) Boltzmann’s constant
Mg \ldots \ Magnesium
N \ldots \ Rotational angular momentum quantum number, excluding electron and nuclear spins, in the case where electron spin is present
\( Q \ldots \) Tobin’s \( q \); the ratio of the market value of installed capital to the replacement cost of capital
Ra \ldots \ Radium
\( S_a \ldots \) area of an active site
Sr \ldots \ Strontium
\( Y \ldots \) Gross Domestic Product
\( Y^P \ldots \) Potential Gross Domestic Product
Preface

Macroeconomics analyzes the economy as a whole; where output, prices, interest rates, exchange rates, and unemployment are the key variables macroeconomists want to explain. In contrast, microeconomics analyzes the behavior of individuals and firms; where prices for particular products are determined by demand and supply. As it is all but impossible to summarize all of the differences between macro- and microeconomic models, I focus only on three theoretic models that have had a substantial impact on economic modeling over the last 60 years. The three classes of models I examine are the IS-LM, overlapping generations, and growth models. The IS-LM is the traditional (static) aggregative macro model which excels in short-run stabilization issues. The overlapping generations model with production is a general equilibrium, intertemporal micro-based macro model. It incorporates both utility and profit maximization. Growth models examine the importance of technology and human capital, convergence to equilibria, and its long-run focus sharply contrasts that of the IS-LM model.

The IS-LM model is a description of the economy’s demand side and whose focus is on short-run analysis of monetary and fiscal policy variables. In varying form, this model has been widely used since its introduction by Sir John Hicks in 1937. An IS-LM model is comprised of a number of postulated relationships between variables, including those describing consumption demand, investment demand, and money demand. Equations (1) – (4) provide a paradigmatic version of a rudimentary IS-LM model. Prior to analyzing these equations it is informative to recall the static nature
Out-of-sample forecasting experiments are used as an alternative to looking at F-statistics when examining whether money, interest rates or the commercial paper/T-bill spread provide information content for subsequent movements in output, real and nominal personal income, the CPI and the PPI.

1.1 A Section Heading

Here a variable provides information if it improves the forecast of the explained variable. Employing this procedure I find that the paper-bill spread but not monetary aggregates provide information content for industrial production or real personal income when using data over the 1980-97 period. In contrast, I find that monetary aggregates provide information content for the CPI and nominal personal income but not the PPI.

1.1.1 A Subsection Heading

Results regarding the contribution of money towards forecasts of the CPI are very robust across two samples. For the early sub-period a combination of money and
Figure 1.1: Rudimentary economic analysis of a change in taxes when the Federal Reserve is following a Money Stock Instrument. This assumes the Goods Market’s sensitivity to a change in taxes is greater than that in Financial Markets.
When forecasting industrial production and real and nominal personal income, $X_t$ represents the measure of price included (i.e., the CPI or the PPI). When forecasting the CPI or the PPI, $X_t$ represents the measure of output/income included (i.e., industrial production or real personal income). $M_t$ and $R_t$ are respectively the monetary aggregate and the interest rate measure used. As described below, in models II and V the $\phi$’s are zero and in model III the $\delta$’s are zero. Table 1.1 provides the mean absolute percentage errors (MAPEs) from 1 to 6 months-ahead forecasts of industrial production generated by the six alternative model specifications considered.

Table 1.1: Errors when forecasting Industrial Production. Below are the Mean Absolute Percentage Errors from 1 to 6 months-ahead Forecasts of Industrial Production from six alternative model specifications.

<table>
<thead>
<tr>
<th>Month</th>
<th>Forecast Errors from Six Alternative Models</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>I</td>
</tr>
<tr>
<td>1</td>
<td>0.502</td>
</tr>
<tr>
<td>2</td>
<td>1.030</td>
</tr>
<tr>
<td>3</td>
<td>1.578</td>
</tr>
<tr>
<td>4</td>
<td>2.146</td>
</tr>
<tr>
<td>5</td>
<td>2.728</td>
</tr>
<tr>
<td>6</td>
<td>3.240</td>
</tr>
</tbody>
</table>

Comparing MAPEs across models will determine whether a variable is a good candidate as an information variable. Comparing the mean absolute percentage error (MAPE) from models I, II and III (or models III, IV and V) examines the relative contributions of money versus the interest rate spread (or money versus the federal funds rate). Moreover, comparing the MAPEs from model II and V and those from models I and IV examines the relative contribution of the federal funds rate versus the interest rate spread.

To examine whether the information content provided by a candidate variable is special to the particular variable being forecasted, we repeated the above analysis...
References


References


Appendix A

The Heading to Appendix A

The Federal Reserve has at its disposal a limited set of instruments through which it can attempt to achieve its objectives of price stability and/or full employment output. Between the time a monetary instrument is adjusted and its ultimate effect on economic activity has occurred there are observable movements in other important economic variables such as monetary aggregates or interest rates. These variables may be used as intermediate targets if immediately subject to influence by policy and if their movements affect output or prices. If the variable does not cause output or prices, it may still be useful as an information variable if its movements consistently lead movements in the variables the Federal Reserve wishes to influence.

Out-of-sample forecasting experiments are used as an alternative to looking at F-statistics when examining whether money, interest rates or the commercial paper/T-bill spread provide information content for subsequent movements in output, real and nominal personal income, the CPI and the PPI. Here a variable provides information if it improves the forecast of the explained variable. Employing this procedure I find that the paper-bill spread but not monetary aggregates provide information content for industrial production or real personal income when using data over the 1980-97 period. In contrast, I find that monetary aggregates provide information content for
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