Assessment of the Senior Economics Thesis  
Teagle Project: Haverford Economics Department 2012-2014  
Prof. Anne E. Preston

Introduction

The Haverford Economics Department began the Teagle project in fall of 2012. There was some disagreement over the usefulness of the project, but over a series of meetings we developed a set of student learning goals which are presented on our website (See appendix A) and a plan for assessment. The department had undertaken a curriculum overhaul in 2009 with the goal of introducing research skills earlier in the student’s course of study and ensuring that each student is adequately prepared for independent senior thesis work by fall semester senior year. As a result, the economics department decided to assess its final learning goal: students will develop and execute an original economics research project. Our intention was to assess whether the senior thesis achieves the objectives associated with our expectations for the original economics research project.

Developing the Assessment Tool

Over the fall and winter of 2012-2013 we developed a rubric that measures success on a number of different dimensions associated with defining a research question, writing a literature review, using economic analysis to create testable hypotheses, and presenting the work and its finding professionally. Because theoretical and empirical theses differ in how they answer the research question, we wrote two separate rubrics specifying that the student conducting the empirical thesis collect, manage and analyze data to answer the question and the student conducting the theoretical thesis develop a theoretical model to answer the question. The rubric was (and is) a living document. When Giri Parameswaran, a theorist, joined the faculty in fall of 2013, he made important additions and edits to the theoretical rubric. Each time we have used the rubric, to judge proposals in Winter 2014 and to judge the final theses in Spring 2014, we have made important
corrections in line with better articulation of our expectations. The current rubric is given in Appendix B and will be posted on our website along with the learning goals.

**Testing the Assessment Tool**

The department conducted an initial test of the rubric in winter 2014 as we assessed the senior thesis proposals, the culmination of the students’ work in the fall senior thesis seminar. Each student had been given a copy of the rubric early in the fall semester so that they were aware of the extent of faculty expectations. Most of the proposals were read by two faculty members, so in addition to discussing how students performed, we compared assessments across faculty members. While the proposals only contained a subset of the categories included in the rubric, it was clear to faculty members that the students had read the rubric and were trying to conform. Further, faculty agreed that it was a good general gauge as to how the students performed. However there were some theses, especially those done by students in a double major, that were not easily judged with the rubric. The faculty agreed to be flexible in these cases and to communicate with the student during the thesis process about how the thesis might deviate from the more traditional economics paper. While we agreed that the rubric would be helpful for grading, it could not be a strict formula. More generally it should give us a measure of where our curriculum is succeeding and where we have weaknesses.

**Assessing the Senior Thesis**

Each faculty member assessed their own advisees’ theses and at least two other theses. Therefore for many theses there were two faculty assessors. While there was some difference in how hard each faculty member graded, they were similar in relative rankings of how well a give student performed in the different categories. The faculty members all agreed that, as a group, the theses were the best that we had received. We expect that the improved quality may be the result of the rubric which clearly guided the students’ work. We also agreed that the rubric was very helpful in assessing student performance and how well we had prepared the
students for the senior thesis project. Generally the early faculty misgivings surrounding the Teagle project gave way to very positive feelings about the process.

While the median scores were all 3 out of 4, except a 3.5 for documentation of empirical work, we did identify some problem areas. First, while research questions were ultimately well formulated, there was concern about how much time the formulation took for many students in the fall semester. Time spent formulating the research question is time not spent working on answering the question. Further, some research questions, while well formulated, were not important and even trivial. As a result two faculty members decided to create a document detailing the activities students should engage in as they look for a research question. This document (displayed in Appendix C) is still subject to modifications, but we are giving it to students in the junior research seminar and in the senior research seminar. General writing can also be a problem for economics majors who are not used to writing papers, much less one as extensive as a thesis. Therefore the two faculty members from above also wrote a document on best practices for writing an economics thesis (displayed in Appendix D) which has been given to seniors in the fall senior seminar. Our hope is that these best practices documents will help guide students in these areas. As noted above, the category in which students scored highest was the documentation of empirical work. Richard Ball has established a series of best practices in this category and has required students to follow them in his probability and statistics course, a required economics course. Clearly the early introduction of students to these methods has worked. We are hoping that these new best practice documents will have similar success.

The expectation is that we will continue to use the rubric each spring in order to document improvements or setbacks and to identify areas where we can work harder to prepare students.

**Sharing our Experiences**

During the spring of 2013, I made a video in which I discussed the early thinking by the department about learning goals and assessment. This video was made available to all faculty members and will be
accessible from the Economics Department website. During the spring of 2014, I, together with the other Teagle project leaders, hosted a faculty lunch titled “The thesis you want to read.” This fall, we will devote part of one faculty meeting to the Teagle projects, making each final report available to all faculty members and having a question and answer period.
Appendix A
Haverford College—Economics Department
Student Learning Goals

Students will achieve competency in the building blocks of economic theory.

Students will be able to:
- Know/recognize/apply economic theory’s assumptions about the behavior of economic actors and the choices they make as they contribute to the working of markets.
- Know/recognize/apply economic theory’s predictions concerning outcomes of markets in perfect competition and in environments where market failures occur.
- Know/recognize/apply a macroeconomic school of thought that describes the workings of the aggregate economy in a domestic and a world setting.

Students will learn to think like economists.

Students will be able to:
- Contextualize and critique theoretical arguments developed from or alternative to economic theory.
- Use economic arguments to understand and explain real world problems and assess policy proposals.

Students will achieve competency in statistics and econometrics.

Students will be able to:
- Collect, manage and analyze economic data to test hypotheses derived from economic theory.
- Read and critique economics articles which use contemporary econometric techniques.

Students will communicate as economists.

Students will be able to effectively and persuasively present their work:
- Mathematically
- Graphically
- In writing
- Orally

Students will develop and execute an original economics research project.

Students will be able to:
- Summarize the economic scholarship on this topic while discovering and articulating relationships among texts and contextualizing the research question within the broader literature.
- Collect, manage, and analyze data on the research question.
- Construct and execute an analytic argument that culminates in well-grounded conclusions.
- Write a professional-quality research paper that presents their work and findings.
Appendix B: Empirical and Theoretical Thesis Rubrics

Student ______________________________                       Date____________________

Faculty Reader ____________________________

Rubric for Empirical Economics Theses

<table>
<thead>
<tr>
<th>Criteria</th>
<th>Excellent</th>
<th>Proficient</th>
<th>Basic</th>
<th>Unacceptable</th>
</tr>
</thead>
<tbody>
<tr>
<td>Abstract</td>
<td>Brief, clear, and concise summary of work; includes research question, data, methods, and results; no more than 250 words.</td>
<td>Brief, clear, and concise summary of work; includes most necessary components; no more than 250 words.</td>
<td>Brief but often unclear summary of work; includes most necessary components; no more than 250 words.</td>
<td>Confusing summary of work which is difficult to read and may be either too long or too short.</td>
</tr>
<tr>
<td>Research question</td>
<td>Research question is clearly stated but with some digression; importance and relevance is discussed without being overly convincing.</td>
<td>Research question is stated somewhat vaguely – more as a topic area than a question; unfocused and unconvincing discussion of importance.</td>
<td>Trivial research question; generally unclear and unfocussed; hard to determine what the topic of study is; no attempts to contextualize the question.</td>
<td></td>
</tr>
<tr>
<td>Literature review</td>
<td>Draws from many high quality journal articles and books; synthesizes existing knowledge in topic area; identifies areas of consensus, debate, and gaps in knowledge; contextualizes the project in this larger intellectual landscape and establishes its contribution.</td>
<td>Draws from many high quality journal articles and books; synthesizes existing knowledge without identifying areas of consensus, debate, and gaps in knowledge; contextualizes project without establishing contribution.</td>
<td>Quality and quantity of journal articles is lower than optimal; summarizes each source without making connections between them or to existing project.</td>
<td>Very few sources and of limited quality; unclear articulation of sources’ contributions to topic area; displays little understanding of existing knowledge.</td>
</tr>
<tr>
<td>Conceptual grounding of research question in theoretical and methodological foundations</td>
<td>Well-articulated economic arguments are used to generate testable hypotheses related to the research question; a clear discussion of how the analysis will test these hypotheses.</td>
<td>Economic arguments used to generate testable hypotheses are vague or confusing; a clear discussion of how the analysis will test these hypotheses.</td>
<td>No use of economic arguments when generating testable hypotheses. Lack of clarity when connecting analysis to hypotheses.</td>
<td>No clear testable hypotheses identified. Little attempt to relate analysis to the research question</td>
</tr>
<tr>
<td>Data description</td>
<td>Identifies important aspects of the data: population, sample, observation, structure, variables,</td>
<td>Identifies important aspects of the data: population, sample, observation, structure, variables,</td>
<td>Identifies most but not all important aspects of the data: population, sample, observation,</td>
<td>Confusing introduction of the data making it unclear how the data is constructed and what it contains. No</td>
</tr>
<tr>
<td>Empirical methods and analysis</td>
<td>Identifies clearly the econometric models and techniques that will test hypotheses; estimates models proficiently and extends econometric techniques beyond simple OLS; conducts robustness checks on results.</td>
<td>Identifies clearly the econometric models and techniques that will test hypotheses; estimates models proficiently; conducts robustness checks on results.</td>
<td>Confusing discussion of econometric models and techniques that will test hypotheses; models estimated with some error.</td>
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</tr>
<tr>
<td>Description of results</td>
<td>A clear and thorough discussion of the results of the empirical estimation with the use of visual aids; gives accurate interpretation and evaluation of magnitude and importance of results; ties results back to the research question.</td>
<td>A confusing and error ridden discussion of the results of the empirical estimation or theoretical modeling with or without the use of visual aids.</td>
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</tr>
<tr>
<td>Conclusions</td>
<td>A concise summary of the work performed while highlighting the results; contextualizes the results in the larger body of literature; identifies any caveats that should be noted in interpreting or generalizing the results; relates results to broader issues such as policy if relevant.</td>
<td>A perfunctory or rambling summary of the work performed and main results; Little attempt to think about the results in any broader context.</td>
<td></td>
<td></td>
</tr>
<tr>
<td>General Writing</td>
<td>Ideas are arranged logically to support the argument. Transitions link paragraphs which have solid topic sentences. Subheadings are used throughout the paper allowing the reader to</td>
<td>Ideas are arranged logically to support the argument. Transitions between paragraphs and topic sentences of paragraphs are sometimes weak. Subheadings are</td>
<td>Ideas are not arranged in a logical manner. Transitions between paragraphs and topic sentences of paragraphs are weak. Subheadings are not used. Sentences are</td>
<td></td>
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move easily through the text. Sentences are well phrased with no run-ons or fragments; word choice is precise and accurate; writing is free of grammatical errors.

used throughout the paper allowing the reader to move easily through the text. Sentences are generally correct with occasional run on or fragment; word choice is generally good with occasional unnecessary words; a few grammatical errors but not distracting.

often weak. Subheadings are used throughout the paper but they do not facilitate easy movement through the paper. Some sentences have awkward and distracting construction; run-on and fragment sentences are noticeable; some word choice is questionable with inappropriate and unnecessary words; several distracting grammatical errors.

awkward and incorrect; words are used inappropriately to an extent that the reader cannot understand the meaning; grammatical errors are so plentiful that the meaning is obscured.

### Visual Aids

| Uses tables and figures to aid in presenting results; all tables and figures are professionally rendered with titles and numbers; all tables and figures are clear, self-explanatory, and visually pleasing; the author refers to the tables and figures clearly and concisely tying them to the arguments and instructing the reader. |
| Tables and figures are professional and visually pleasing with numbers and titles, but are not totally self-explanatory and the references in the text do not always tie to the arguments and hypotheses being tested. |
| Tables and figures are not professional and are not self-explanatory. References to the tables and the figures in the text are perfunctory without being instructive. |
| Tables and figures have no titles, are not numbered, and confuse rather than instruct; tables and figures are not referred to in text. |

### Documentation of empirical work

| Attaches raw data and do files which create the final data file(s) and conduct all the analysis for tables in the thesis. The do files identify which analysis relates to which table. Attaches a separate file instructing the reader on how to conduct all the work. The advisor is able to replicate the data construction and the analysis without a hitch. |
| Attaches raw data and do files which create the final data file(s) and conduct all the analysis for tables in the thesis. The do files identify which analysis relates to which table. Attaches a separate file instructing the reader on how to conduct all the work. The advisor is able to replicate the data construction but only with some further instruction from the thesis writer. |
| Attaches raw data and do files which create the final data file(s) and conduct all the analysis for tables in the thesis. The do files do not clearly identify which analysis relates to which table. Attaches a separate file instructing the reader on how to conduct all the work, but the advisor needs to do considerable exploratory work to actually conduct the analysis. |
| Does not attach the instruction file, the raw data and the do files which create the final data file(s) and conduct all the analysis for tables in the thesis; or does attach the files but they are incomplete and cannot be used to replicate the empirical work. |
Rubric for Theoretical Economics Theses

<table>
<thead>
<tr>
<th>Criteria</th>
<th>Excellent</th>
<th>Proficient</th>
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<th>Unacceptable</th>
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<tbody>
<tr>
<td><strong>Abstract</strong></td>
<td>Brief, clear, and concise summary of work; includes research question, proposed mechanism, and results; no more than 250 words.</td>
<td>Brief, clear, and concise summary of work; includes most necessary components; no more than 250 words.</td>
<td>Brief but often unclear summary of work; includes most necessary components; no more than 250 words.</td>
<td>Confusing summary of work which is difficult to read, and may be either too long or too short.</td>
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<tr>
<td><strong>Research question</strong></td>
<td>Research question is important, clearly stated and readily apparent to the reader. Importance and relevance of question is well established</td>
<td>Clearly stated but with some digression; importance and relevance is discussed without being overly convincing</td>
<td>Stated somewhat vaguely – more as a topic area than a question; unfocused discussion of importance</td>
<td>Trivial research question; generally unclear and unfocussed; hard to determine what the topic of study is; no attempts to contextualize the question.</td>
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<td>Draws from many high quality journal articles and books; synthesizes existing knowledge in topic area; identifies areas of consensus, debate, and gaps in knowledge; contextualizes the project in this larger intellectual landscape and establishes its contribution.</td>
<td>Draws from many high quality journal articles and books; synthesizes existing knowledge without identifying areas of consensus, debate, and gaps in knowledge; contextualizes project without establishing contribution.</td>
<td>Quality and quantity of journal articles is lower than optimal; summarizes each source without making connections between them or to existing project.</td>
<td>Very few sources and of limited quality; unclear articulation of sources’ contributions to topic area; displays little understanding of existing knowledge.</td>
</tr>
<tr>
<td><strong>Conceptual grounding of research question in theoretical foundations</strong></td>
<td>Well-articulated economic arguments are used to provide plausible explanations for observed phenomenon. A simple bare-bones example is used to convey the main theoretical ideas clearly and concisely.</td>
<td>Economic arguments are generally clear, but could benefit through presentation of thoughtfully chosen example.</td>
<td>Economic arguments used to provide plausible explanations are vague or confusing; Lack of clarity when connecting example to analysis and theoretical explanations.</td>
<td>No use of economic arguments when describing observed phenomenon. Little attempt to relate analysis to the research question.</td>
</tr>
<tr>
<td><strong>Development of theoretical model</strong></td>
<td>Identifies and discusses important model attributes; decision making agents, objectives, constraints; necessary assumptions;</td>
<td>Identifies the important model attributes without a full discussion of their implications, or motivation for modeling choices;</td>
<td>Identifies the important model attributes without a full discussion of their implications or motivation for modeling choices;</td>
<td>Vague and imprecise discussion of agents making decisions under constraints.</td>
</tr>
<tr>
<td>Description of results</td>
<td>Using theoretical model to answer the research question</td>
<td>Conclusions</td>
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<td>A clear and thorough discussion of the results of the theoretical modeling with the use of visual aids; gives accurate interpretation and evaluation of magnitude and importance of results; identifies possible empirically testable hypotheses of the model; ties results back to the research question. Uses comparative statics to show sensitivity of result to changes in parameters. Thoughtful discussion of importance/limitations of simplifying assumptions in the model and validity and robustness of results in comparison to competing models.</td>
<td>Presents main results with a theorem, that is clearly and logically argued. Summarizes intuition/understanding gained from the exercise.</td>
<td>A concise summary of the work performed while highlighting the results; contextualizes the results in the larger body of literature; identifies any caveats that should be noted in interpreting or generalizing the results; relates results to broader issues such as policy implications.</td>
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<tr>
<td>A clear and thorough discussion of the results of the theoretical modeling with the use of visual aids; ties results back to the research question. Uses comparative statics to show how endogenous variables change as parameters change. Acknowledges simplifying assumptions in model, but fails to consider performance of model when these assumptions fail. Comparison to competing models is superficial.</td>
<td>Presents main results, but logic is unclear or incomplete, and/or missing intuition/understanding gained from the exercise; Uses vague discussion and intuition to explain result. Many errors in formal argument. No attempt to summarize intuition/understanding gained from the exercise.</td>
<td>A concise summary of the work performed while highlighting the results; contextualizes the results in the larger body of literature; Fails to identify caveats or relate results to relevant broader issues.</td>
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<tr>
<td>A clear discussion of the results of the theoretical modeling. Poor use of visual (or other) aids to assist understanding. Uses comparative statics to show how endogenous variables change as parameters change with some error. Fails to consider effect of simplifying assumptions on model robustness. No comparison to competing models.</td>
<td>Results presented fail to address research question. No attempt to summarize intuition/understanding gained from the exercise.</td>
<td>A perfunctory or rambling summary of the work performed and main results; Little attempt to think about the results in any broader context.</td>
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<td>Ideas are arranged logically to support the argument. Transitions between paragraphs and topic sentences of paragraphs are sometimes weak. Subheadings are used throughout the paper allowing the reader to move easily through the text. Sentences are generally correct with occasional run on or fragment; word choice is generally good with occasional unnecessary words; a few grammatical errors but not distracting.</td>
<td>Ideas are not arranged in a way to guide the reader through the argument. Transitions between paragraphs and topic sentences of paragraphs are often weak. Subheadings are used throughout the paper but they do not facilitate easy movement through the paper. Some sentences have awkward and distracting construction; run-on and fragment sentences are noticeable; some word choice is questionable with inappropriate and unnecessary words; several distracting grammatical errors.</td>
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<td>Tables and figures are professional and visually pleasing with numbers and titles, but are not totally self-explanatory and the references in the text do not always tie to the arguments and hypotheses being tested.</td>
<td>Tables and figures are not professional and are not self-explanatory. References to the tables and the figures in the text are perfunctory without being instructive.</td>
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Appendix C: Choosing and Investigating Your Research Topic

Choosing a thesis topic

The topic that you choose for your thesis might be something you have read about in the newspaper or heard about on the news, an issue you have touched upon in a previous class, or simply something you are curious about. There are a number of different things you can do to develop an idea for a thesis topic. You can read the newspaper, blogs, history books, novels or anything else that helps you think about some kind of social or economic issue. Talking to friends can also be productive. Developing a research topic is necessarily idiosyncratic, and it is impossible to give any more general advice about how to go about them.

Once you have chosen your area of interest, the next step is something that can be more narrowly defined. Briefly, you must read previously published academic research about your topic, and use those sources as a way of stimulating your own thinking about your thesis. Regardless of how you arrive at your topic, it is essential to develop an understanding of the work published in Economics Journals. Books, blogs and magazines can help shape your interests, but it is crucial, at an early stage, to assess the landscape of the academic literature related to your topic. Perhaps your research question has already been answered. Maybe it is difficult to find appropriate data to answer your question, which is why the question remains unanswered. If one of the previous two sentences applies, it does not mean that you need to abandon your topic. Use the ideas you find in the previous literature to help generate or refine your own topic. Thinking about the previous studies will help you think about what your topic might be.

Once you have put together a good set of sources, peruse them to get a broad picture of how the research on the topic has developed over time and what the contours of current thinking on the topic look like. Look at titles, abstracts, introductions and conclusions, key sections of articles or chapters of books. Look at the bibliographies of the works that you find the most interesting. These are gold mines of new sources, and enhance your understanding of the landscape of the field. Organize the studies you review in a way that represents how they relate to one another: an outline, Venn diagram, network graph, note cards that you can pile up and organize in a way that makes sense to you, whatever works for you.

Out of the landscape of previous research you have surveyed and organized, choose a small number of sources that appear most promising or relevant for your purposes. Consult with your advisor about the ones you choose.

Then:

- Read each one carefully

- As you read, make notes about anything that seems important: e.g., conceptual ideas, hypotheses, conclusions; sources of statistical data used; analytical methods; other sources cited by these initial few sources.

- Take a big-picture approach: forget that you are trying to develop a topic for a thesis; just read and think about the articles.

- Identify areas of the literature that have been under-studied, or that could benefit from being viewed through a different lens.
• Compare the sources with one another, on the basis of the notes you have made for them and your thoughts. Continue to consider the big picture, and resist the temptation to jump to conclusions about your own thesis topic.

• With the broad lay of the land as a background, and the particular issues that come up in the small number of papers you chose to read carefully, hope that an idea begins to gel. Alternatively, you may come up with a few possible ideas that you still need to choose among, but that are more nuanced, focused and informed by previous research than the thoughts you had before beginning this process.

• After one or more ideas have begun to form, go back to the longer list of references. Look it over again with the perspective of the more focused ideas you have about your topic.

Some random advice on choosing a topic:

• A good thesis question is interesting (especially to you), unanswered (at least in the way that you will address it), and answerable (by you).

• Always bear in mind that you will have to answer the following questions in three sentences or less: What is your research question? What is your null hypothesis?

• Be specific when you choose your research question. Theses are more likely to fail because they are too broad than because they are too narrow.

• For an empirical project, it helps to think in terms of data. What is your ideal dependent variable? What are your ‘dream’ independent variables? If you cannot imagine the perfect data set to answer your research question, perhaps the question needs to be refined or abandoned.

• Sometimes, you can approach a thesis in reverse. Find an interesting data source, and let the available data lead you to a question, rather than the other way around.

• Be persistent yet flexible in narrowing your research area into a research question. Pertinent literature and data can make themselves known to you at any point. Research questions often evolve as they do.

Choosing and Obtaining Data

When possible, use data obtained from “primary sources.” That is, you should obtain your data from the source or sources that originally collected them, in the format in which they were originally stored. For instance, you might find that a certain think-tank has used data collected by the US Bureau of Justice Statistics to create an Excel file with data on rates of violent and non-violent crimes in the 50 states of the US and Washington, DC, from 1984 through 2009. Even if the data from the think-tank are available, use the original data from the Bureau of Justice if possible.
As you identify one or more sources of statistical data to use for your thesis, think concretely about how you will need to organize the data—how will it have to be organized for you to do the kind of analysis you want to do.

Think hypothetically about how your data will fit together in a spreadsheet. Eventually, you will have to obtain data, combine it into a spreadsheet, and import it into Stata or another statistical package. From the beginning, think ahead to how this spreadsheet will look: what variables will it contain? From what source will each variable be taken? If you will be combing data from more than one file, will you be stacking the data from one file on top of the other, or merging them by observation? If the former, do the variables from the files you are stacking match up? If the latter, are the units of observation in the different files the same? Literally sketching out by hand how all of the data will fit together will make your life much easier when you finally construct the actual spreadsheet with your real data.

After you obtain your data, make sure that you know, and can describe, its details. Is there one observation for each firm, or one for each firm in each year? Are any of your key variables missing a significant number of observations? Which are dummy variables? Which are categorical, which ordinal, and which cardinal? Are they normally distributed, skewed or multimodal? Knowing these things about the data is critical in constructing your empirical strategy.
Appendix D: Writing Your Thesis

Writing Style and General Writing Advice

By the time you start writing your thesis, you will have read extensively from the segment of academic literature to which you wish to contribute. As such, the style and structure should not differ significantly from the articles that you have read. Articles that appear in top economics journals do not read as personal narratives, and neither should your thesis. You should not write about your personal interests or the process of coming up with your research question, reviewing the existing literature, manipulating the data or writing the paper. You should write as a detached investigator, rather than as someone trying to prove a point.

Advice on writing specific sections of the paper follow. Two points are worth emphasizing before we begin.

1. Your paper must be a single, unified piece of scholarship. It is important that each section is well constructed in itself, but all parts need to fit together to convey a coherent message. Do not think of the sections as too isolated from one another. If you decide on a significant change to your ‘Results’ section, for example, it is likely that you will need to adjust other sections to keep the overall message consistent.

2. There are guidelines below that describe some specific purposes for each section of your paper. As you read them, remember the broader purpose of each section: to make your paper better. Indeed, not all papers will contain all of the sections that we detail below, and some will have sections that we do not describe. As you write your ‘Literature Review,’ for example, the narrow purpose is to give your reader an overview of the landscape of the field. The trick is to do so in a way that contextualizes and motivates the importance of your own paper.

Writing an Abstract

While the Abstract appears as the first part of your paper, it may well be the last thing that you write. Though it should be short, roughly 100-200 words, it must synthesize all other parts of the paper. For this reason, it is likely to be the most challenging part to construct. The best way to learn about Abstracts is to read other Abstracts carefully, from the perspective of a writer.

Writing an Introduction

The Introduction should be written such that a reader can understand the methods and takeaways of your paper, even if this is the only section of the paper that she reads. Above, it was suggested that you read the Introduction and Conclusion sections of multiple papers as you craft your own research topic. Your own Introduction and Conclusion sections should be written as though they may be the only part of your paper that someone else will read.

The introduction should also explain the motivation and importance your research. Was the project motivated by a current public policy issue? An ongoing theoretical debate that might be elucidated by some empirical evidence? Results of previous empirical research that led you believe further study was required? Reports about the topic found in the popular press? There was a reason the topic sparked an interest in you, and you can use
your experience in sparking an interest in your reader. *You can do this without turning the section into a personal narrative.*

The research question should be stated as clearly, succinctly and unambiguously as possible. The reader must be able to identify it when she reads it, and this should happen early in the paper. The statement of the research question should be stated neutrally, even if you harbor an opinion on the topic. “This paper aims to test the effectiveness of government-funded preschool in New York City” is better than “This paper aims to show that government-funded preschool in New York City is good.” If you show an opinion, the reader may begin to doubt the evenhandedness of your methodology, and thus your findings.

The introduction should also mention the kind of data you used and the kind of analysis you did. And the introduction should give a brief overview of the main findings of your study (which you will of course present and discuss in more detail later in the paper). For some kinds of assignments, students are told to present their conclusions at the end of the paper, after they have constructed an argument and marshaled the evidence upon which the conclusions are based. Do not take that approach in your thesis. Include a concise statement of your main results and conclusions somewhere in your Introduction section. End the section with and a brief overview of the structure of your paper.

**Writing a Literature Review**

The lit review should simultaneously help two types of readers. It should help “experts” understand your contribution by relating it to papers they are likely to know. For the novice reader, the lit review should provide a guide through the literature in case they wish to understand your paper better. Organize the literature review like a funnel. Start with the seminal papers and then, then progress to the work that is most closely related to your own. In the process, tell the reader how the literature evolved, how the field got to where it is now, and why the current questions of interest are what they are.

As described above, the process of choosing a thesis topic is very closely tied to reviewing the existing literature. The literature review section of your thesis should reflect—indeed highlight, showcase and spotlight—the close connection between the way you have formulated your topic and what is out there in the existing literature; it should describe how previous research has shaped your work on this project. How did your survey of existing studies (i) stimulate your thinking about the broad conceptual issues you are investigating and help you develop a compelling focus or “hook” for your project; (ii) alert you to substantive or methodological issues that previous researchers have found should be taken into account in studies on your topic, and (iii) make you aware of sources of data that might be useful for your investigation—or in what other ways did your survey of existing studies inform your development of a topic and your thinking about it?

A good literature review does not simply summarize the questions asked and the main results of the studies you discuss, but makes clear how these methods and results relate to your project. One purpose of the literature review is to acknowledge and summarize the existing literature, but a more important purpose is to contextualize and motivate the importance of your own work.

It is very helpful to have a paragraph that starts… “The article most closely related to this project is XXX…”, and describes XXX. In this paragraph, you should explain how XXX is related to your project and, most importantly, explain how your project differs. If you mention a previous study, let the reader know why you have included it and what its significance is. That usually means stating what the questions addressed in the
research were, as well as what the main findings were. Still, do not turn the Literature Review into a book report. The purpose of the section is to motivate your own work, not the literature that you cite.

**Writing a Methodology/Data Section**

The Methodology section should be a clear and specific discussion of why and how your empirical strategy addresses your research question. Often, it will consist of two parts: (i) information about the original data files you obtained, and (ii) information about the final data set that you constructed from these original data files.

You should mention and give some information about every source from which you obtained any of the data that you plan to use for your project. How much you should say about each source of data will vary, depending on the nature of the source. If you are using a well-known source (like the Current Population Survey produced by the Bureau of Labor Statistics, or the World Bank’s World Development Indicators), just naming the source may be sufficient. If the data source is not well known, you should provide more information.

A general principle is to describe anything about the data that a reader would need to know to understand what you plan to do for your study and how you will interpret the data. Examples of what you might discuss include: who collected the data, frequency with which it is collected (e.g., annual) and from what broader population the data was collected. Emphasize which variables you believe will be useful for your project. You should specify the particular variables you plan to use in enough detail to allow another researcher (or another student in this class) to go to the original source of the data and find the variables you refer to.

Thinking about questions like the following might help you decide what to include in this section. However, these questions are examples, not a checklist. Use your judgment to decide what questions are relevant for your project and how to organize and present the relevant information.

- What is the “unit of analysis” of your data? Usually this just means indicating what each row of the data represents (e.g., a person who responded to an interview, a country, a country/year pair, or one incident of an event such as a crime or a recession).

- How many observations (rows) are there in your dataset?

- Is your dataset a cross-section? A time-series? A panel?

- If your data contains sub-samples, what are the categories (which countries? Which years?), and how many observations do you have for each category?

- What is the scope of your sample? For instance, does your sample have observations for certain countries for a certain year (in which case you should indicate which countries are included—possibly in a table—and what year the data represent)? Or does it consist of annual observations for a certain group of countries over a certain number of years (in which case you should indicate which countries and years you have data for)? Or monthly observations?

- What population was your sample drawn from? All adults in the US? All adults in PA? All counties in the US? All individuals convicted of felonies in the US during a certain time period?
- What is your null hypothesis? What is your alternative? Explain why you have chosen your hypotheses as such.

**Descriptive statistics**

You may want your readers need to know something about your data to help them understand your analysis and interpret your results. For example, if the distribution of a variable is highly skewed to the right, you might want to use it in log form in the analysis. In that case, you might want to present histograms of the variable both in its original units and in natural log units, and explain that you will use the variable in log form to remove the skew revealed in the histogram based on the data measured in its original units. As another example, if you are looking at a variable like GDP per capita, which varies more across countries than it does for any single country over time, it might be helpful to include in your descriptive statistics a figure that illustrates that. One more example: suppose you are using data from a survey that asked people to rate their overall satisfaction with their lives on a scale of 1 (least satisfied) to 7 (most satisfied). Since your reader may not have a sense of how people would respond to this question, it would be helpful to present a bar graph, showing the distribution of responses. Are the responses about evenly divided among the 7 categories? Are most responses in the range of 1-4, with responses of 5-7 being quite rare? It is good practice to let readers see this for themselves. All of the above are examples: reflect on the peculiarities of your own data and your analysis, and consider what you need to communicate to your readers.

After presenting any relevant information about the univariate distributions of your variables, you may want to present some graphs and/or tables that illustrate *relationships* that exist among some of your variables. For example, it is often revealing to present graphs and/or tables that show the relationship between two variables when you “control for” the value of a third variable. These visual aids may be constructed to give information about the data, or to give preliminary answers to your research questions. Consider which visual aids will best prepare your reader to understand your analysis and results.
Writing a Results Section

The Results section is usually the most important part of the paper. After you finish your analysis, one strategy is to write the Results section first (even though it does not appear first) and to build the paper outwards from there. All other parts of your paper will be affected after you get your results. The relevant literature will be affected, the Introduction must change, as must your conclusions.

It often makes sense to begin the Results section with summary statistics, if you have not done so in the “Data/Methodology” section. You should use visual aids, such as tables and figures. Your discussion of the visual aids should complement and enhance the value of the aids themselves, rather than duplicating the information that they contain.

When discussing quantitative results such as regression tables, the writing should be more nuanced and interesting than listing the coefficients and interpreting them quantitatively. Draw the readers’ attention to the coefficients or results specifically relevant to your research question. As you describe the results, make sure that you explain in words what those results mean and what their significance is for your project. If any of the results relate in a direct or striking way to anything you found in the previous literature on your topic, you might want to comment upon that as you report the results. It is possible to find a statistically reliable relationship that is so small that it is almost meaningless. Be sure to discuss the magnitude as well as the statistical significance of your findings. Help the reader discern which coefficients are impactful in this way.

It is not necessary to discuss every entry that appears in a table—but do not include a table or figure without discussing in the text of the thesis what the point of it is.

Conduct robustness checks. Economists are skeptical by nature. If your methodology includes discrete data and you use a linear probability model, they will wonder if your results would be different if you used a logit or probit model. Assuage their fears and run all three. It may be appropriate to include all in the paper, maybe to relegate some to the Appendix, or maybe even include in a footnote that your conclusions are robust to other models.

After you have your results, revisit the existing literature. Have your results steered you toward another strand of inquiry that is now relevant? If so, investigate this strand in full, and make sure that your Literature Review still contextualizes your work appropriately.

Writing a Conclusion Section

Like the Introduction, the Conclusion section of your paper should stand alone, and make sense to someone who has not read the rest of your paper. It also should synthesize your paper, tie up loose ends, and draw connections for someone who has read the paper in its entirety. Summarize the analysis that you discussed in detail in the Results section. Highlight those that are most revealing with respect to the questions you investigated, and explain the conclusions you can (or cannot) draw about those questions on the basis of your statistical results. Contextualize your results within the landscape of the literature. Add any thoughts or observations that you think would be noteworthy. Mention questions that you think are still open to further study, and especially on avenues for future research that have been opened up by your work.