A Guide to Writing in Economics

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Introduction

When I tell people I was for several years the writing tutor for an economics department, I am usually met with a surprised reaction. And why not? Most people associate writing with English departments and, only to a slightly lesser extent, with the other disciplines in the humanities; they do not normally associate writing with economics and the other sciences. You may be one of them. You may be asking yourself, What does writing have to do with economics? Well, a lot, as it turns out. Economists, as much or even more than other scholars and analysts, write. Although we may think of economics as involving problem sets or mathematics, the fact remains that the results of economic research are "written up." Economics articles, especially empirical papers, consist mainly of text, not equations or tables. Assistant economics professors must publish articles to earn tenure; economic staffers at research institutes and other financial organizations write reports and other documents; economists hired as research consultants produce written reports detailing their results; members of the president's Council of Economic Advisers write reports and briefings. The list could go on. "In talking about the economist's craft," says Richard Schmalensee, an economist at MIT, "it is almost impossible to overstate the importance of clear and persuasive writing." Writing is as much a part of economics as are models and data sets.

What follows is a writing manual originally written for the Department of Economics at Duke University. As such, it responds in large part to the writing demands of the undergraduate curriculum at Duke. But it also discusses writing in a more general way, for writing in economics involves a mix of general principles of writing and discipline-specific conventions of writing. Most writing manuals are prescriptive in that they tell writers what they *should* do: be clear, be concise, and so on. Although the present manual offers some prescriptions, the advice found herein responds mainly to how economist-writers actually write; in that

regard the manual is primarily descriptive.

The present manual deals mainly with those genres and aspects of economics writing that involve normal prose. It is primarily designed to help students understand how economics essays and papers are constructed and the kinds of information they usually contain. It is less helpful when it comes to such things as constructing models (although writing about models is treated in section 17). The guide is thus stronger in its discussion of empirical papers than in its discussion of theoretical ones.

The manual is divided into five parts. The first part, "Writing Itself," addresses aspects of writing in general; the discussion in that part can apply to writing in any discipline. Part II, "Researching Economic Topics," tries to explain the scholarly and analytical approach behind economics papers. The third part, "Genres of Economics Writing," briefly surveys some of the kinds of papers and essays economists write. It is in the fourth part, "Writing Economics," that the manual homes in on discipline-specific writing. What kinds of information are usually contained in an introduction, and how is it organized? How should one end a paper? And so on. Part V offers concluding remarks.

Part I: Writing Itself

Let's not kid ourselves: Writing a paper can be stressful, especially when your object is to get a good grade, which nowadays means no less than an A. To many students, getting an A is less a matter of writing a good paper and more a matter of "figuring out" what the professor or instructor "wants." As long as writing is graded—and personally, I do not think it should be, but that is a different subject altogether—students will have to write to please an audience of one. But although writing a paper can be stressful, it can also be one of the most intellectually exciting, satisfying, and challenging enterprises you will undertake as a student. It is also a highly complex cognitive and scholarly task that requires planning and a felicitous attitude. Our writing problems often arise when we fail to acknowledge and respect the writing process for the sophisticated, unpredictable, and time-consuming endeavor that it is. In this part of the manual, I will offer a few tips that I hope will help you write a successful paper—or at least help you retain your wits as you go through the process.

1. Writing Is Thinking

Let me begin by stressing something that is fundamental to good writing: we write to learn what we want to say. To some readers, that may seem obvious; but many inexperienced writers have a different—and I think debilitating—conception of the purpose of writing. For many inexperienced writers, writing, they imagine, is something you do only *after* you figure out what you want to say. I cannot think of a single attitude that is more antithetical to the writing process. The attitude is particularly prevalent in the sciences, including economics. "Let me get my results first," I often hear graduate students say, "and then I'll 'write them up.'"

Rather than seeing writing as a final step in the research process, I ask you to see it as part and parcel of the research process from the very start. In other words, writing is thinking.

The economist Deirdre McCloskey, in her often provocative short guide *Economical Writing*, explains the idea nicely. "Economically speaking," she writes, "the production function for thinking cannot be written as the sum of two subfunctions, one producing 'results' and the other 'writing them up.' The function is not separable. You do not learn the details of an argument until writing it in detail."

Many an argument or line of thought sounds good in our minds until we try to express it in writing. It is not until we write that we discover if we really know what we want to say, and how to say it, or if what we thought were brilliant, lucid arguments are actually only confused and ill-formed ideas.

With all this in mind, writing—the actual process of writing—should be held in warm regard. It is a useful tool for discovering what you want to say.

2. Writing a Paper—a Good Paper

Writing a paper—a good paper—takes time. By *good*, I don't mean an A paper: lots of papers get A's that are not necessarily good. (The relationship between the grade a paper receives and the quality of the paper is a separate issue that I will not discuss here. Any good paper is quite likely to earn an A; but not all A papers are good.) By a good paper, I mean a paper that fulfills its potential, meets the expectations established by you the writer, and, most important, communicates with its intended reader.

It is worth repeating: To produce a good paper takes time. How much time? I can't say for sure, but probably more than you may realize or want to accept. To give you the right order of magnitude, for a term paper of twenty pages or so, I'm talking dozens of hours: hours spent thinking about the paper, researching the paper, trying things out on paper (free-writing, or brainstorming, or just plain noodling around), writing a first draft of the paper, revising the paper, revising the paper again, proofreading the paper—and not necessarily in the order listed here. I'm not saying that you can't pull an all-nighter and write a

paper that will get an A; chances are, you have already done that, maybe several times. But I am saying that you cannot pull an all-nighter and write a good paper, a paper that represents the best that you can do.

Allowing for enough time is especially critical when it comes to papers that require you to collect and analyze numerical data—what we call "empirical" papers in economics. Finding appropriate data is often a big problem. And even after the data is in hand, you must make time to analyze it. Analyzing the data can take time because computers will typically be involved. Software programs may not run; hard drives crash; USB drives disappear; and printers mysteriously stop working. (I thank Dr. Craig Newmark at North Carolina State University for pointing this out.)

In addition to requiring lots of time, writing a paper involves a *recursive* process: one step forward, two steps back, and certain steps—drafting, researching, revising, outlining, etc.—are repeated and revisited. In junior high school and even in high school, writing was probably taught as a linear process: first you pick a topic, then you read about your topic, then you write an outline of your paper, then you write a first draft of your paper, then you revise your paper, and finally you proofread your paper, in that order. But research shows that that's not the way the majority of adults write. Adults write using a recursive process. You may begin writing before you even know for sure what you want to write about. You may research your topic and begin writing, only to stop and research your topic some more. You may write certain parts of your paper out of order (for example, you may write the introduction last). You may write a draft, *then* outline it, and see that you need more material or more evidence. You may begin drafting a paper, decide you need to take an entirely different tack, and start drafting again. The combinations are too numerous to count.

Give it time, and relish the recursiveness. If you do those two, you are off to a good start. Here are a few other pieces of advice to help you along.

Adopt learning as a goal. In our concern about grades, we often forget about one very important thing: learning. Approach the writing assignment as a chance to learn: to learn about a subject, to learn about research methods and sources of information, to learn about your writing and research habits (and whether you may need to change them).

Think of yourself as a writer. Too often students think of themselves as, well, students, and they view their assignments as required tasks in which they have no real investment. The problem with that is it puts you in the wrong position in relation to what you want to accomplish. If you were taking an exam, you would do well to regard yourself as a student. But writing a paper is not about taking an exam or even studying per se. It is about writing and all that writing entails—planning, researching, drafting, revising, thinking. Therefore, do not think of yourself as a student but as a writer, an economist, a scholar. For models and inspiration, read the series of interviews with writers in the *Paris Review* and the testimonials of economists in *Passion and Craft: Economists at Work*.

Surrender to the process. Researching and writing a paper is not a strict matter of completing a series of tasks that take a finite amount of time and that yield a predictable result. Researching and writing a paper is instead a recursive and sometimes uncertain and unpredictable process that refuses to fall completely under your control. The more you surrender to the process, the happier you will be.

Start early. That means today. Not after this weekend's parties, or after spring break, or after the big game, but today. How? Make a list of possible topics. Compile a bibliography of books and articles on your topic. Read about your topic, and take notes as you read. Formulate a tentative thesis. Write what you know, and what you would like to know, about your topic.

Set a schedule. Do not trust that you will work efficiently and in a timely manner. Set a schedule for your writing project, and stick to it. Show up at the same time every day so the muse

will know when to find you. Tip: Set Monday mornings as deadlines; that way, you won't be tempted to spend the entire weekend away from your project.

Understand the need for information. Information comes primarily from two sources: thinking and research. If you don't know what to write, you have not thought enough about your topic or researched it enough—or both.

Write before you are ready to write. Students often see writing as the final activity of a linear process, as the thing you do after you have conducted your research and formulated your ideas. But in reality, researching and thinking and writing are all of a piece. Start writing something—anything—before you have finished your research. Write even before you know what you want to say. Indeed, it is often only by writing that we work out and discover what we truly want to say.

Important: Please keep track of your sources as you work out your ideas on paper. Do not rely on your memory! When you come across a passage or a statistic you might use in your paper, write down precisely where it comes from. Accurate and scrupulous note-keeping in the pre-writing stage will save you lots of extra work and headaches later when you draft your paper.

3. The Paper as a Whole

In your economics courses, you might be asked to write all manner of papers. You may be asked to review a book or review the literature on a particular topic; you may be asked to take a policy position and defend it, or to describe someone else's position and assess its strengths and weaknesses. You may be asked to pose an interesting economic question and answer it, or to explain a real-world situation, using economic theories and concepts. You may be asked to write other kinds of papers as well.

Regardless of the kind of paper you are asked to write, it may be helpful to think of the paper as having three major parts: a beginning, a middle, and an end. In the beginning, you want to introduce your topic and indicate the purpose of the essay. If your

essay states and defends a point of view or an interpretation—that is, if it has a thesis—you will want to state it, usually at the end of the introduction (or near the end: in many economics papers, the introduction ends with a brief paragraph previewing the sections or content to come). Depending on the length and genre of the paper, not to mention the complexity of the argument, the introduction can be as short as a single paragraph or as long as four or five (or more). As a rough guide—and only as a rough guide—figure to have one paragraph of introductory material for a five-page essay; two paragraphs for a ten-page essay; and three or more for essays fifteen pages or longer.

The middle of your paper should be the longest part; it is where you fulfill the expectations you raised or keep the promises you made in the introduction. The middle is where you actually do what your introduction says your paper will do. If your paper states a thesis, the middle should be used to support the thesis, by presenting supporting evidence, usually in ascending order of importance.

The end, or conclusion, is usually short, often just a paragraph, maybe two. Whereas introductions often end with the thesis statement, conclusions often *begin* with the thesis statement. The conclusion is where you want to restate your main point or main purpose. Depending on the assignment, your conclusion can be used to suggest lines of further research, to call readers to action, or to direct attention to larger issues. Conclusions often refer back to the introduction as a way of stressing the main point of the essay.

4. Six Principles of Clear, Cohesive, and Coherent Writing

For anybody who is interested in writing clearly and with flow and coherence, I recommend buying and working through Joseph Williams's short book *Style: Ten Lessons in Clarity and Grace*. Short of that, I offer the following six principles. Most come from Williams (as do many of the examples) and can be found in similar

or exact form in any number of good composition books. They apply to all kinds of genres, especially the kinds of documents you are likely to write on the job: memos, reports, letters, and the like.

Before we discuss the principles, let's consider perhaps *when* and *when not* you should put them into practice. I certainly would not worry about them while you are drafting a paper. When you are drafting, the aim is to get words and ideas down, period, without worrying about being correct or elegant or accurate. Thus, I would not worry about the principles when you are writing your first draft. And then even after you have a finished draft, I would not necessarily begin subjecting every sentence to the principles. No, I'd let your own sense of your text be your guide. I would treat these principles as tools to use when you or your readers think a sentence or passage could be improved. If there is a passage that you or your readers have trouble with, then just maybe one or more of the following principles can help you out.

PRINCIPLE 1: Keep your complete grammatical subjects short.

Readers like to get past the subject to the verb as quickly as possible. Therefore, as much as possible, structure your sentences so that they have complete grammatical subjects that are short. Here are two versions of the same sentence, the first with a long complete subject (italicized), the second, with a short one:

> Long subject: *A full explanation of why the model cannot accommodate this particular case of omitted variable bias* is given in the appendix.
>
> Short subject: *The appendix* explains in full why the model cannot accommodate this particular case of omitted variable bias.

Needless to say, the occasional sentence with a long grammatical subject is fine and may even be desirable. But generally speaking, keep your complete subjects short.

Here is an example from the literature. Note how in each passage, the complete subjects are short and thus you come quickly to the verb.

> *No one* has the right, and *few* the ability, to lure economists into reading another article on oligopoly theory without some advance indication of its alleged contribution. *The present paper* accepts the hypothesis that *oligopolists* wish to collude to maximize joint profits. *It* seeks to reconcile this wish with facts, such as that *collusion* is impossible for many firms and *collusion* is much more effective in some circumstances than others. *The reconciliation* is found in the problem of policing a collusive agreement, which proves to be a problem in the theory of information. —George J. Stigler, *Journal of Political Economy*, 1964

PRINCIPLE 2: Express key actions as verbs.

Express key actions as verbs. That may sound obvious, but we often do not express key actions as verbs. Rather, we often "hide" key actions in abstract nouns or, as they are also called, *nominalizations*—noun forms of words that can also be verbs. Examples of nominalizations are *analysis* (the nominalization of *to analyze*), *assumption* (*to assume*), and *resistance* (*to resist*). Many nominalizations end in *-tion*, *-ment*, *-ence*, and so on. Here are some examples of sentences with nominalizations, along with those same sentences revised to eliminate the nominalizations. Note that for some words, the verb form and the noun form are the same.

> There is *opposition* among many voters to nuclear power plants.
> Many voters *oppose* nuclear power plants.
>
> Economists made *attempts* to define full employment.
> Economists *attempted* to define full employment.
>
> We conducted a *review* of the matter.
> We *reviewed* the matter.

> The model makes the *assumption* that people engage in utility *maximization*.
> The model *assumes* that people *maximize* their utility.
>
> There is a *need* for further *study* of the problem.
> We *need* to *study* the problem further.

The occasional nominalization may not present many problems to your readers. But when writing with nominalizations becomes a habit, your prose can become a chore (not to mention a bore) to read. Here is a passage with no fewer than six nominalizations. Can you identify them?

> Writing that demonstrates a reliance on nominalizations is often the result of a misguided desire to make an impression on readers.

In case you are having trouble identifying the nominalizations, consider that same sentence without them (or at least without most of them):

> Writers often rely on nominalizations when they want to impress their readers.

According to Joseph Williams, there is nothing that typifies the dense, occluded style of academic writing more than the use of nominalizations. If you want to be clear, try to avoid them as much as possible.

PRINCIPLE 3: Begin sentences with "old" information.

Here are two passages that say the same thing. Which flows better?

> 1a. An effective way to write sentences that "flow" is to use the rhetorical device known as *conduplicatio*. To repeat a key word or phrase from a preceding sentence, especially

> when the word or phrase comes at the end of the preceding sentence, is to use conduplicatio.
>
> 1b. An effective way to write sentences that "flow" is to use the rhetorical device known as *conduplicatio*. Conduplicatio repeats a key word or phrase from a preceding sentence, especially when the word or phrase comes at the end of the preceding sentence.

Most readers consider 1b to flow better. Why? Because in 1b, the second sentence begins with a term that the reader has already encountered: *conduplicatio*. In other words, in 1b, the second sentence begins with *old information*.

Clear writing is writing that *flows*, and the best way to create flow is to begin sentences with old information. (In other words, use conduplicatio!) Old information is information—names, words, phrases, and their equivalents—that your reader has already encountered or can reasonably anticipate; it is information that refers back to something already stated. Here is an example. The old information is in boldface; the information it refers back to is italicized.

> *The Methods of Ethics* is the key to understanding *Sidgwick's* work. **It** was his first and most important book and is fundamental to his thought in that his ethics underlie his writings on economics and politics. **Sidgwick** oversaw the publication of five editions between 1874 and 1893, and was in the midst of producing a sixth when he died in 1900. **It** occupies a central place in the history of moral philosophy. —Roger E. Backhouse, *History of Political Economy*, Spring 2006

Old information is not just words or phrases that have been stated before. Often, old information appears as a sentence connector or transitional word or phrase that indicates the relationship between a sentence and the one that preceded it: *for example*, *thus*, *however*, *in contrast*, *moreover*. The point is to begin your sentences with a

piece of information that tells the reader how it relates to the sentences that just preceded it.

PRINCIPLE 4: End sentences with new information.

Just as it is wise to begin sentences with old information, it is wise to end them with new information. New information is just that: information that your reader has not encountered yet or could not anticipate. Generally speaking, new information is the most important in a sentence; it thus should receive the most emphasis, and the place of most emphasis in a sentence is at the end.

This principle—that of placing new or important information at the ends of sentences—is persuasively discussed by the composition expert George Gopen. In his excellent guide to writing, *Expectations: Teaching Writing from the Reader's Perspective*, Professor Gopen says that if he could give writers only one piece of advice, it would be to put important or "stress-worthy" information at the ends of sentences.

PRINCIPLE 5: Make the subjects of your sentences the person, place, or thing that the sentence is about.

In *Expectations*, Professor Gopen says that the subject of a sentence should answer the question, *Whose story?* In other words, the subject should tell the reader who or what the sentence is about.

To see this principle at work, read the following two passages. They each have the same content; but each has a different "character" as the subjects of its sentences, and each thus is about different things:

> *Omitted variable bias* has plagued studies of student achievement. *It* has prevented researchers from reaching confident conclusions about the best way to reform the education system. (This "story" is about omitted variable bias.)

> *Educational researchers* have long been stymied by the problem of omitted variable bias. *They* therefore cannot be confident that their studies yield reliable conclusions about the best way to reform the education system. (This "story" is about educational researchers.)

Got it? Let's see. Here are three sentences. Which sentence is best?

1. Gary Becker was awarded the Nobel Prize for economics in 1992.
2. The 1992 Nobel Prize for economics was awarded to Gary Becker.
3. The year 1992 saw Gary Becker win the Nobel Prize for economics.

Answer: It depends. If I were writing a biographical note on Gary Becker, sentence 1 would be best. If I were writing a story about the Nobel Prizes awarded in 1992, sentence 2 would be best. And if I were reviewing the events of the year 1992, I'd pick sentence 3.

PRINCIPLE 6: Make the first few words of your sentences constitute a limited set of concepts.

If you begin your sentences with old information, you will create a passage that flows, a passage that is cohesive. But is it *coherent*? Maybe not. Consider the following passage, which comes from Joseph Williams's *Style*. Every sentence begins with old information. But what's the point?

> Sayner, Wisconsin, is the snowmobile capital of the world. The buzzing of snowmobile engines fills the air, and their tanklike tracks crisscross the snow. The snow reminds me of Mom's mashed potatoes, covered with furrows that I would draw with my fork. Her mashed potatoes usually make me sick, which is why I play with them. I like to

> make a hole in the middle of the potatoes and fill it with melted butter. Butter is good on rolls, too.

According to Professor Williams, most readers will judge the passage to be rambling, incoherent. Why? Because the subjects of the sentences do not demonstrate a consistent pattern:

> Sayner, Wisconsin, is the . . .
> The buzzing of snowmobile engines . . .
> The snow reminds me of . . .
> Her mashed potatoes . . .
> I like to make a hole . . .
> Butter is good on rolls . . .

Each beginning presents readers with new information. For that reason, the passage is incoherent. Here is another passage, written in a more sophisticated style, but suffering from the same vice (it also comes from *Style*):

> The particular ideas toward the beginning of sentences define what a passage is "about" for a reader. Moving through a paragraph from a cumulatively coherent point of view is made possible by a sequence of topics that seem to constitute a limited set of related ideas. A seeming absence of context for each sentence is one consequence of making random shifts in topics. Feelings of dislocation, disorientation, and lack of focus in a passage occur when that happens.

As with the first passage, most readers consider this one incoherent as well. Why? Again, look at the first few words of each sentence:

> The particular ideas toward the beginning . . .
> Moving through a paragraph from a . . .
> A seeming absence of context . . .

> Feelings of dislocation, disorientation, and . . .

The string of words that begin each sentence is inconsistent and diffuse; thus, our attention is not focused on a limited set of ideas. Now compare that version with this one:

> **Readers** look for the topics of sentences to tell them what a whole passage is "about." If **they** feel that its sequence of topics focuses on a limited set of related topics, **they** will feel **they** are moving through that passage from a cumulatively coherent point of view. But if **topics** seem to shift randomly from sentence to sentence, then **readers** have to begin each sentence from no consistent point of view, and when that happens, **readers** feel dislocated, disoriented, and the **passage** seems out of focus.

Most readers judge the revised passage to be much more coherent. Why? Because the words that begin each sentence focus on a limited set of concepts: *readers*, *topics*, *passage*. For good measure, note too that the grammatical subjects are short.

Part II: Researching Economic Topics

An important part of writing economics papers is researching economic topics. What's more, the way in which economic topics are researched sheds a lot of light on the way in which economics papers are written. One of the themes of this manual is that advances in economic research are made incrementally, at the margins of what we presently know or accept as knowledge. As such, the secondary literature—papers and books by economists on a given topic—figures importantly in writing economics papers.

5. Finding a Niche and Making a Contribution

In order to write effective economics papers, it is important to understand how research questions and ideas usually develop in the discipline. Most research projects are extensions of or complements to the "literature," the existing body of published articles (and books) on a particular subject. (Indeed, as you will read about in the section on introductions, many economics papers begin by engaging the literature on the topic at hand.) Regardless of the subject that interests them, most economists first become intimate with the literature on the subject, paying especial attention to the questions asked, the data used, and the models and estimation techniques employed. What are the major issues? Why is the subject important? What problems have previous researchers encountered? How have they attempted to circumvent or minimize them? What are the standard models used in the literature? Are the results consistent from study to study, or are they mixed? Where is more research needed?

As economists become more and more familiar with a body of literature, they begin to understand ways in which the existing studies can be improved or extended. They begin to notice opportunities to "make a contribution" to the literature.

A contribution can take many forms; the most common involve some adjustment to one or more of the three elements just

mentioned: the question, the data, or the model and technique. An economist may, for instance, use the same model and data that a previous paper uses but ask a different question. Or she may use the same model and ask the same question but test the model with different data. Or he may take the same data but test a different model, one perhaps with different assumptions or variables. Or an economist may develop a theoretical model of an economic phenomenon that differs from other models. There can be many more "contributions" than those mentioned here.

A few examples from actual research papers may be helpful. An honors student at Duke became interested in the effects of spending on public education. She noticed that most studies compared results from countries as a whole; very few looked at a single country and the effects of spending on the several school districts that make up the country's educational system. So that was precisely what she examined. Here's another: In a 2005 article published in the *Journal of Public Economic Theory*, Huseyin Yildirim modeled the decision to volunteer for a large public project, such as projects to create open-source software. He took a model devised by two previous researchers and modified it by changing the way in which certain kinds of information (e.g., a volunteer's "cost" of contributing to the project) were treated. For a final example, a 2008 paper by V. Joseph Hotz and Mo Xiao explored the effect of minimum standards of quality on the child care industry. The two authors pointed out the potential biases that plagued the results in previous studies; using a richer data set than had been available in the past, Hotz and Xiao sought to avoid the potential biases in earlier studies by including fixed effects and by controlling for a number of important variables.

It is worth repeating that none of the economics papers just described was made out of whole cloth; instead, each picked up where others had left off. The same is true of the vast majority of economics papers. Whether it is "improving" an existing model, using richer data, or asking a slightly different question, most

research in economics operates on the margins of an existing body of work.

A final note. Most scholarly economics papers do not address urgent matters of the moment. In part, that is because the discipline, rather than current events, determines what gets researched. In addition, scholars simply cannot go whichever way the wind blows: scholarship is too complex and time-consuming to respond quickly to a particular issue, and many scholars are financially committed to multi-year investigations that do not permit them to drop their present research agenda to pursue another. If you want to study, say, the impact of a law passed in the last year, you may likely find little in the secondary literature. If that is the case, your literature review will have to use articles whose subject can only approximate yours.

6. Locating and Getting a Handle on the Secondary Literature

Many students begin researching a topic in economics by searching Google Scholar or some other general electronic database. There is nothing wrong with that method *if* one has an understanding of the research on the topic as a whole: who the leading authorities are, what the important issues have been, how research on the topic has evolved. Truth be told, very few students have such an understanding—and how could they? They are new to the discipline. I would therefore like to propose a different model of researching economic topics, one that takes advantage of resources that help one get a handle on the literature on a topic and that can make searching an electronic database much more effective.

The number of scholarly articles written on economics is large and is growing larger by the year. Pick any subject—public goods, family economics, business cycles—and the secondary literature on the topic is bound to be enormous. To give you an example, take the last topic, business cycles: a search of the electronic bibliographic database EconLit—which will be

discussed below—in February 2009 yielded no fewer than 392 journal articles published between 2000 and 2008 with the phrase *business cycles* in the title. The situation with the other two was even more daunting. For the phrase *public goods*, the yield was 564 articles; and for *health care*, it was a stratospheric 980. And no telling the additional number of articles on those topics that did not contain the eponymous phrases in the title. And those were just the articles published after 1999!

But the number of articles is not the only source of grief a novice researcher will face; there is also the task of identifying which articles are really important—that is, which articles are by leading authorities and published in the leading journals—and the articles that are of secondary or even tertiary significance. For not all journals are created equal. Among the community of academic economists, some journals have a higher standing than others. Economics journals can be divided into two major groups. The first group contains the so-called core journals, journals that publish articles on subjects in any number of economic fields (such as labor economics or industrial organization). They are the highest in prestige. Although there is no official list of the core journals, one list might include the journals identified by George Stigler (a Nobel Prize winner), Stephen Stigler, and Claire Friedland in a 1995 article published in the *Journal of Political Economy*: the *American Economic Review*, the *Journal of Political Economy*, the *Quarterly Journal of Economics*, *Econometrica*, the *Economic Journal*, the *Journal of Economic Theory*, the *Review of Economic Studies*, the *Review of Economics and Statistics*, and the *Journal of Monetary Economics*. The second group consists of the rest, mostly the leading journals in each of the several fields: the *Journal of Applied Econometrics*, for instance, or the *Journal of Human Resources* or the *Journal of Money, Credit, and Banking*.

In short, a young researcher is bound to encounter an overwhelming amount of material with little knowledge or experience to help him sort through it. If that's the case, narrowing or refining one's topic helps a lot. In economics, there are four

common dimensions along which to narrow a topic: time period, demographic group, geographic region, and event or policy action. A topic such as the participation of women in the labor force is too broad. But narrowed by a specific policy, and the topic becomes a bit more manageable: The effect of the Family and Medical Leave Act on participation. The topic can be narrowed further still by geography: The effect of the Family and Medical Leave Act on women's labor force participation in North Carolina. Now you have a topic you can work with.

But even if refining a topic significantly reduces the number of potentially relevant articles on the subject, there is still the challenge mentioned at the outset: the challenge of understanding the body of literature as a whole. Who are the leading authorities and what are the leading journals that deal with the subject? What have been the important issues and points of dispute? What important questions remain to be addressed? In what direction is research on the topic going? Do sufficient data and models exist?

Fortunately, there are resources that will help you answer those questions. There are several economics encyclopedias, for example, whose entries are often reviews of the literature; they outline a topic as an area of economic inquiry and research. The most useful are *The New Palgrave Dictionary of Economics* (a new edition of which appeared in 2008) and the *International Encyclopedia of the Social and Behavioral Sciences* (also newly updated in 2008). In addition to defining the topic, the entries often take readers on a tour of the important articles and point out the significant issues as they have evolved over time. They usually end with a substantial bibliography.

For longer treatments of the literature and overviews of a topic, students should consult the *Journal of Economic Literature* (*JEL*) and the *Journal of Economic Perspectives* (*JEP*). Both are published by the American Economic Association (the leading association of economists in the United States) and both contain articles on all manner of economic subjects. The articles in the two

journals are less technical than one finds in the typical scholarly journal; that is especially the case with the *JEP*, which is specifically intended for the educated public interested in economic research and policy proposals.

Literature reviews such as one finds in the *JEL* and the *JEP* are not confined to those two journals. Journals that are devoted to a particular subdiscipline (environmental economics, industrial organization, game theory) from time to time publish reviews of the literature on a particular issue important to the subdiscipline. The reviews often have the phrase "Literature Review" or "Review of the Literature" in the title.

Once encyclopedia entries have been consulted, once literature reviews in the *JEL*, the *JEP*, and subdisciplinary or field journals have been read, then, and only then, is one in an optimum position to search an online database and to make sense of the many results such a search is likely to yield. The best online database that deals solely with economics is EconLit, which is the electronic bibliography of the American Economic Association, the same association that publishes the *JEL* and *JEP*. I would suggest searching it first rather than a more general-interest database such as Google Scholar. If you search databases such as JSTOR, limit your search (if you can) to economics journals.

7. Making Economic Arguments

Economics has its own way of making an argument—of "proving" or supporting a hypothesis—that distinguishes it from other disciplines.

First of all, economic arguments address an economic topic. But wait: this is not entirely accurate, for, as recent economists have shown, almost any behavior can be subjected to economic analysis. So let's amend this to say the following: Economic arguments subject a phenomenon to economic analysis. This leads us to the next two criteria.

Second, economic arguments use economic assumptions, concepts, and theories to explain or understand the phenomenon in

question. The assumptions, concepts, theories are, as you might imagine, the ones found in your college textbooks: the assumption that people respond to incentives, the law of supply and demand, opportunity cost, the marginal principle, the notion of spillovers or externalities—the list can go on.

Third, economic arguments use certain kinds of evidence to support hypotheses. There are at least four kinds of evidence that are most common and most accepted in economics. The first you just heard about: the assumptions, theories, and concepts found in economics textbooks. Better yet is to back up those assumptions and theories and concepts with the second kind of evidence: quantitative data. By quantitative data, I mean data on things that can be measured, that one can put a number on: income, or years of schooling, or hours spent working, or number of papers published. And the more observations in the data set, the better. Economists are used to working with data sets that contain hundreds, and often thousands, or even tens of thousands, of observations. The next step in economic analysis is to use data to test a model, and that brings us to the third kind of evidence: econometrics. Econometrics is evidence in that it constitutes a method of hypothesis testing that is accepted by the discipline. Econometrics often and most familiarly takes the form of regression analysis, in which the change in one variable (the "dependent" variable) is explained as a function (not a cause!) of other variables (the "independent" variables). Finally, there is a fourth kind of evidence: economic modeling. Economic models are mathematical equations that represent a simplified version of the economy or the decision-making process of an economic agent such as a consumer or a firm. The models are based in part on economic assumptions, theories, and concepts—the first kind of evidence discussed above.

The building blocks of an economic argument may be seen more clearly if we consider a counterexample. Suppose someone wanted to find out how fast-food employers would respond to an increase in the minimum wage. Will they hire less labor, as

economic theory predicts? Someone unfamiliar with economics and its methods might respond by saying, "If I want to know how fast-food employers will react to an increase in the minimum wage, why don't I simply go ask a dozen or so of them and find out?" However valuable such an effort might be, it is not the economic way. Economists prefer evidence on what people actually do, rather than on what they say. They would be much more persuaded by statistics and models that show how hiring actually changed in the wake of a wage increase. They prefer large numbers of observations. The statements of a dozen managers (or two dozen or three) simply do not constitute a large enough sample to take seriously. And economists prefer random samples. The managers a particular person interviews likely represent a sample whose composition was determined by certain factors (perhaps the interviewer spoke to only those managers who live in his neighborhood).

Let's conclude by turning our attention to what is probably the most important conceptual problem in making economic arguments: determining the direction of causality. Perhaps the best way to understand this is by considering the following example. Suppose data indicate that college graduates earn more over their lifetimes than non-college graduates. How should we explain this? Is it because what students learn in college classrooms makes them more valuable employees? Or is it that the type of people who can finish a college degree are the type of people who make valuable employees even if they learn nothing in college? Are both true? Is a third story possible—it's not the classroom so much as the acquaintances and friends college students make that become valuable contacts in their later careers? The point is that determining causality can be complicated and tricky; the researcher would be well advised here to exercise caution.

Part III: Genres of Economics Writing

Recall the point made in the preface that economists write a lot. It should come as no surprise therefore that economists write several kinds documents. When it comes to economics writing, we often think of the theoretical and empirical papers that appear in such journals as the *American Economic Review* and *Econometrica*. But economics writing appears in a number of forms. Here are the most common.

8. Empirical Papers

Empirical papers, along with theoretical papers, are the papers most economists publish to get tenure. Although there are more genres of economics writing than just empirical and theoretical papers, when it comes to measuring the true mettle of an economist, it is only the empirical and theoretical papers that really count to the mainstream discipline.

Empirical papers test a model with data to see how well the model represents reality—or more precisely, to what degree the model yields predictions that are consistent with "observed" behavior as captured by a data set. The models that are tested are usually adaptations of models constructed by other researchers. In other words, when an economist conducts an empirical study, he or she normally does not construct the model from scratch. The data usually come from large surveys administered by some third party such as the government. Some commonly used surveys in economics are the Survey of Income and Program Participation, the National Longitudinal Survey of Youth, and the U.S. Census.

Empirical papers are divided into sections, usually these six—introduction, data, model, estimation technique or methodology, findings, and conclusion—and in the order just given. They contain a literature review that is either part of the introduction or in a section of its own that follows the introduction; they may also contain a section headed "Background" or some

similar word that often provides historical and statistical information about the subject at hand.

The findings of empirical papers usually consist of coefficient estimates derived from regression analyses. The results are presented in tables. Some recent, provocative empirical papers are David Card and Alan Krueger's "Minimum Wages and Employment: A Case-Study of the Fast Food Industry in New Jersey and Pennsylvania" (*American Economic Review*, September 1994) and John J. Donohue and Steven D. Levitt's "The Impact of Legalized Abortion on Crime" (*Quarterly Journal of Economics*, May 2001). For examples of more standard empirical papers, a good journal to browse is the *Journal of Human Resources*.

For a detailed discussion of empirical papers, see section 17 below.

9. Theoretical Papers

In *theoretical papers* a model is extensively developed, one that is internally logically consistent. Much like proofs in geometry, the conclusions of models in theoretical papers are "proved." That is, the model is shown with a sufficient degree of internal logical consistency to "prove," for example, that an economic agent will choose one course of action over others. (The next step—the work of the empirical paper—would be to test the model with data.) The model may begin as an adaptation of a model constructed by another researcher; or it may be constructed more or less from scratch by the author himself.

Unlike empirical papers, which normally contain more prose than mathematics, theoretical papers can, for pages at a time, contain as much mathematics as prose. Whereas in most empirical papers the mathematical models are usually confined to a single section, in theoretical papers one can find mathematics, and often a lot of mathematics, on many, if not most, pages.

Theoretical papers are identified by lots of "propositions," "proofs," "theorems," and "lemmas" and by an absence of data.

Some famous theoretical papers are Robert Solow's "A Contribution to the Theory of Economic Growth" (*Quarterly Journal of Economics*, February 1956), George Akerlof's "The Market for 'Lemons': Quality Uncertainty and the Market Mechanism" (*Quarterly Journal of Economics*, August 1970), and Paul Krugman's "Increasing Returns and Economic Geography" (*Journal of Political Economy*, December 1991). For a current and excellent representative of the genre, see Huseyin Yildirim's "Getting the Ball Rolling: Voluntary Contributions to a Large-Scale Public Project" (*Journal of Public Economic Theory*, vol. 8, 2006). See also section 17c, "Describing Your Model," below.

Note: Although most papers are either empirical or theoretical, one should not get the impression that papers are always either one or the other. A small number of papers are hybrids, involving the theoretical development of a model as well as the testing of the model with data.

10. Economic History Papers

Economic history papers examine changes over time in economic institutions, economic conditions, economic practices, and the like. How did the boll weevil affect the U.S. cotton market in the 1930s? What methods did the British government use in the late eighteenth century to collect taxes? What was the impact of the 1925 Portuguese bank-note crisis? Whereas in an empirical paper the sources of evidence are usually the data contained in large data sets and the application of econometric techniques to that data, in economic history papers the sources of evidence are such things as statistics, archival materials, and contemporary sources (e.g., newspapers, magazines, and government documents dating from the period under study). For examples, see any article in the *Journal of Economic History*. Economic history is not to be confused with the history of economic thought or the history of economics.

11. History-of-Thought Papers

History-of-economic-thought papers document and assess the evolution of economics as a discipline and the origin and development of economic ideas. How did John Maynard Keynes revolutionize our understanding of economics? What was the true meaning of Adam Smith's "invisible hand"? What were the origins of econometrics? Much like economic history papers, history-of-thought papers use as evidence primary texts (e.g., Adam Smith's *Wealth of Nations* or Karl Marx's *Capital*), secondary sources (books and articles *about* Smith and Marx), and archival materials (letters, diaries, notes of meetings, and so forth). The leading journal that publishes history-of-thought papers is *History of Political Economy*. Other good journals of the kind are the *Journal of the History of Economic Thought* and the *European Journal of the History of Economic Thought*. The history of economic thought is also known as the history of economics (the discipline and its ideas) and is not to be confused with economic history. For more, see section 23 below.

12. Literature Reviews

Nearly every economics paper has a literature review, in nearly all cases a short assessment of other works on the topic at hand. The literature reviews referred to here are something much more substantial: they are article-length treatments of a large body of studies. These valuable articles take stock of what we know, and do not know, about an economic topic. Along the way they survey the important papers (and books) written on a subject and outline the trends in research and the challenges that still remain. The reviews usually proceed chronologically or thematically. The best sources for such articles are the *Journal of Economic Literature* and the *Journal of Economic Perspectives*, both published by the American Economic Association. Some of these serve as primers in effect for new subdisciplines; good examples are David

Throsby's "The Production and Consumption of the Arts: A View of Cultural Economics" (*Journal of Economic Literature*, March 1994) and Laurence Iannaccone's "An Introduction to the Economics of Religion" (*Journal of Economic Literature*, September 1998). For more, see section 22 below.

13. Handbook and Encyclopedia Entries

So-called handbooks are becoming popular these days. Handbooks are collections of essays or chapters written by specialists in the field, each essay providing a broad treatment of a topic; think of a handbook entry as an extended encyclopedia entry. The handbook essays are often technical and can therefore be hard reading for nonspecialists. The massive *Handbook of Econometrics* is now at least five volumes and over 3,000 pages long.

Encyclopedias are usually much less technical than handbooks and thus are typically much more accessible to the nonspecialist. The most sophisticated economics encyclopedia is *The New Palgrave Dictionary of Economics*, now in its second edition (2008).

14. Book Reviews

The primary source for these is the *Journal of Economic Literature*. But a few other journals (the *Economic Journal*, for instance) publish reviews as well. Reviews appear in a section of their own at or near the end of an issue; they are brief, typically 1,500 words or less. Book reviews are not to be confused with the *review essay*, which is longer (5,000 words or more) and usually appears not in the book review section but in the main part of the journal. For more on book reviews, see section 24 below.

15. *Freakonomics* and the Like

A small number of economists write accessible books intended for the educated public. Thomas Sowell's *Basic Economics* and Stephen D. Levitt and Stephen J. Dubner's popular *Freakonomics*

are recent examples, as is Dan Ariely's *Predictably Irrational*. Milton Friedman, with his wife Rose, used to write books for the general public, *Free to Choose* being the most famous. Another celebrated example, from the 1950s, is John Kenneth Galbraith's *Affluent Society*. It should be said that economists by and large neglect this genre; most books on economics intended for a general readership are written by journalists. An example of the latter is Thomas Friedman's *The World Is Flat*.

16. Textbooks

Although they are members of a discipline whose principles do not change much, economists produce every year an astonishingly large number of textbooks. The reason is very simple: It is publishing houses, rather than the needs of the discipline, that encourage the writing of textbooks. Successful textbooks reach a level of profitability that journals (where the most serious scholarly work is published) never do. If a textbook becomes popular, the publisher and the author stand to make a lot of money.

As with most textbooks in other subjects, economics textbooks are referred to by the author rather than by the title. Some of the most famous ones are the late Paul Samuelson's (later editions were written with William D. Nordhaus), N. Gregory Mankiw's, and William Baumol and Alan Blinder's.

Part IV: Writing Economics

This part of the manual provides guidelines for writing some of things that economists often write. Its suggestions are based primarily on observations of actual economics writing rather than on any idea of what economics writing should or should not resemble.

17. The Empirical Economics Paper

This section will take a closer look at one of the scholarly economics papers, the empirical paper. Recall that an empirical paper tests a model with data. It is the kind of paper that applied economists, the largest group of subspecialists in the discipline, typically write. An empirical paper might try to determine the effects of certain incentives (say, increased tax subsidies) on the demand for health care, or determine which factors have a statistically significant relationship to graduating from high school, or the effect of a natural disaster on earnings in the local labor market—the list, of course, could be endless.

One part of the empirical paper, the literature review, is not treated in this section but in a section of its own (section 22).

17a. The Organization and Composition of Empirical Papers

Empirical papers follow a fairly standard format. They are written in sections, and the sections are usually the following, or appropriate variations thereof, and usually in this order: Introduction; Literature Review; Data; Model; Estimation Techniques; Findings; Conclusion. Each section will be discussed further below. Sources are documented using in-text, author-date citations, which in turn correspond to a reference list at the end of the paper. Empirical papers usually contain tables in which are presented statistics, findings, and other numerical information; they may or may not have graphs or figures. George Tauchen, William Henry Glasson Professor of Economics at Duke, often

talks of writing a paper from the inside out. When economists write papers, Professor Tauchen explains, "we start from the innermost spot, the model and equations. We do the empirical work, and then write a narrative around selected tables and figures. We gradually expand the paper outwards in both directions towards the introduction and conclusion. Those two sections are written last: it's impossible to write them until the author knows what is inside the paper." With that in mind, we will first discuss writing those "innermost" parts.

17b. Describing Your Data and Their Sources

One of the innermost parts of an (empirical) economics paper is the data section. In empirical economics papers, it is customary to describe the data one uses. The best way to learn about writing a data section is to read several data sections in the literature on your topic and pay attention to the kinds of information they contain. Most data sections are short—a page or so.

What you tell your readers about your data will depend in large part on the kind of analysis you are conducting. Generally speaking, however, your data section should do at least the following.

Identify the data source. This means a sentence that explicitly says where your data come from (e.g., "This study uses data from the 1999 wave of the Panel Study of Income Dynamics.").

Describe the data source. You should tell your readers such things as the number of observations, the population groups sampled, the time period during which the data were collected, the method of data collection, etc.

State the strengths and weaknesses of the data source. How do your data compare with other data sources used in the literature? Does yours provide more observations, and/or more recent observations, than other sources? Was the data collected in a more reliable manner? Why is the data source particularly suited (or not) to your study?

Note any features of the data that may affect your results. Were certain populations overrepresented or underrepresented? Is there attrition bias or selection bias? Did the method of data collection change?

Explain any computations or adjustments you made. Sometimes, a data source does not give you something directly; you perhaps had to add/subtract/multiply/divide two given pieces of data to get a third. Describe how you constructed your sample. Did you have to eliminate certain kinds of observations, for instance?

You should pay attention to what aspects of your data will be most relevant to your project; you might devote more space to discussing your dependent variable than a control variable.

Data sections often contain a table of descriptive statistics, statistics of relevance about the sample. These statistics usually include the mean (e.g., mean income, mean age, mean years of schooling, etc.) and standard deviation. For categorical data (like race), however, you do not report a mean; instead, you report the percentage of the observations in each group. Again, the nature of your project will determine how best to describe your data.

It bears repeating that the best way to learn how to write a data section is to read several data sections in the literature and pay attention to the kinds of information they contain.

Finding appropriate data often takes a lot of time, and once found, analyzing it can also be a challenge: computers crash, printers stop working, software programs may malfunction. Be wise and allow for enough time to find and analyze your data.

17c. Describing Your Model

Economic analysis largely concerns the construction and testing of models. Models are abstract, simplified representations of an economy, of a function (such as a utility function), of a decision-making process, and so on; they are expressed in a combination of words and mathematics.

It is customary in empirical economics papers to have a section devoted to describing your model. Although the length of the description varies from paper to paper, a typical model section in an empirical paper will be four or five pages long. If the paper presents a simple regression, the model might simply be the regression equation. More complicated papers might present notation, develop a basic model of economic behavior, report the first-order conditions necessary for agents' to optimally set prices or choose investment or whatever, and then interpret those conditions.

In the model section, the writer takes the reader through the series of equations that constitute the model. The model may have been briefly described in the introduction; but in this section, it is described in detail. The description should begin verbally. Here is how Paul Krugman, in a famous paper published in 1991 on economic geography, begins his discussion of his model.

> We consider a model of two regions. In this model there are assumed to be two kinds of production: agriculture, which is a constant-returns sector tied to the land, and manufactures, an increasing-returns sector that can be located in either region.

You should also indicate the source of the model. Did you construct it yourself, or, as is more common, was it borrowed or adapted from someone else? Here is how Krugman continues describing his model:

> The model, like many of the models in both the new trade and the new growth literature, is a variant on the monopolistic competition framework [i.e., model] initially proposed by Dixit and Stiglitz.

As you describe your model, its corresponding mathematical form is presented. Krugman's paper is no exception:

All individuals in this economy are assumed to share a utility function of the form

$$U = C_M^{\mu} C_A^{1-\mu},$$

where C_A is consumption of the agricultural good and C_M is consumption of a manufactures aggregate.

Note how Krugman immediately defines the variables in the model—a good example to follow.

A second example: Here is how Craig Burnside, in a 1993 article on labor hoarding and the business cycle, began describing his model:

> In this section we present a variation of Hansen's indivisible labor model modified to allow for labor hoarding. Our model economy is populated by a large number of infinitely lived individuals. To go to work each individual must incur a fixed cost, ξ, denominated in terms of hours of foregone leisure. Once at work, an individual stays for a fixed shift length of f hours. The momentary utility at time t of such a person is given by
>
> $$\ln(C_t) + \theta \ln(T - \xi - W_t f).$$
>
> Here, T is a scalar denoting the individual's time endowment, θ is a positive scalar, C_t denotes time t privately purchased consumption, and W_t denotes the level of time t effort.

Professor Burnside goes on to give models of output, of sudden changes ("shocks") in technology, and resource constraints, among others. Notice how in the excerpt above Professor Burnside begins by stating the origin of his model (it is a variation of a model developed by Hansen) and verbally describes the economic agents in the economy. And as did Professor Krugman, the first model he gives is of utility, followed by a definition (verbal) of the variables.

You should lay out all the assumptions you make in your model, as well as explain the intuition behind those assumptions. In your models, the notation should either (a) follow the standard notation in the literature or (b) be very self-explanatory. You should liberally use subscripts, superscripts, and Greek letters, and you will find it very helpful to use specialized equation editors (like the Equation Editor or MathType in Word).

In writing about your model, you present your assumptions about the economic agents you will consider and lay out the decisions and information they have available to them. On what basis do they make decisions? When are those decisions made—all at once, or in a series of steps or moments? What is the optimal way of acting based on the circumstances you have constructed?

In *A Guide for the Young Economist*, William Thomson gives this advice about writing models. "Introduce your model by moving from infrastructure to superstructure," Thomson says. "In specifying an economy, introduce and describe each actor category separately before bringing them together." For example, if your model contains consumers and producers, introduce the consumers first—"their endowments, their preferences, and what they know"—and only then introduce the producers and their technologies. Thomson also says to state your most plausible and general assumptions first, moving successively to your most restrictive and least plausible.

Again, let published economics papers be your guide. How do the papers on your subject typically describe their models?

17d. Describing Your Estimation Methods and Techniques

Models often contain constants or "parameters" whose values need to be estimated. How will you estimate the parameters? What technique will you use? You will need to state the statistical technique you will use—reduced-form regression, two-stage least squares, etc.—to estimate the parameters of your model. Here is an example from a paper by Patrick Bayer and Robert McMillan; the paper investigates the relationship between the houses people

choose to buy and the racial composition of neighborhoods. The authors begin describing their estimation technique as follows.

> Estimation of the model follows a two-step procedure related to that in Berry, Levinsohn, and Pakes (1995). A rigorous presentation of the estimation procedure is included in a technical appendix that follows Bayer, McMillan, and Rueben (2005), including a discussion of methods for simplifying the computation and a description of the asymptotic properties of the estimator. In this section, we outline the estimation procedure, focusing on the identification of the model.

In this case, the authors have adapted a technique found in another paper, Berry, Levinsohn, and Pakes 1995. As they tell us, the procedure for estimating the parameters takes place in two steps. They let the reader know that a "rigorous" (and long) demonstration of the technique can be found in an appendix to the paper (it was put in an appendix so that the flow of the text-proper was not disrupted).

Describing one's estimation technique often involves equations; to make the equations easier to follow, you should first explain the notation used in the equations. Here is how Professors Bayer and McMillan do it:

> It is helpful to first introduce some notation. In particular, we rewrite the indirect utility function as
>
> (7) $V_h^i = \delta_h + \lambda_h^i + \varepsilon_h^i$,
>
> where
>
> (8) $\delta_h = \alpha_{0x} X_h + \alpha_{0Z} Z_h - \alpha_{0p} p_h + \xi_h$.
>
> In equation (8), δ_h captures the portion of utility provided by housing type *h* that is common to all households.

After introducing the necessary notation, the authors begin explaining their estimation technique in earnest.

> The first step of the estimation procedure is equivalent to a Maximum Likelihood estimator applied to the individual location decisions. The estimator is based simply on maximizing the probability that the model correctly matches each household observed in the sample with its chosen house type. In particular, for any combination of the heterogeneous parameters in λ and mean indirect utilities (δ_h), the model predicts the probability that each household *i* chooses house type *h*.

As Professors Bayer and McMillan report, they use a procedure that is, in essence, the maximum likelihood technique, which, by the way, is one of several popular methods of estimating parameters (another you may have heard of is ordinary least squares). The authors then describe the second step of the procedure in a similar manner.

The length and detail with which you describe your methods will be determined by the complexity of your analysis. Did you need to estimate a price function or some other kind of function? Did you have to control for certain fixed effects in order to avoid potential biases (such as biases arising from omitted variables)? Did you have to weight the data? What about any corrections you had to make for autocorrelation, which arises when regression residuals for certain observations are related to residuals for other observations? Or for multicollinearity, a condition in which your explanatory variables are not independent of each other? Or for heteroskedasticity (i.e., changes in the variance of errors)? You are expected to describe the corrections you made for any of those problems.

17e. Reporting—and Interpreting—Your Results

The results section of an empirical paper is usually the longest. In an empirical economics paper, you test a model with data; in the

results section, you report the outcome of that test. What are the answers to your research questions? What is the relationship between your dependent variable and the several independent variables you have chosen to examine? Does the model "fit" the observed data?

In most cases, when you report the results of your analysis, you are at the same time referring the reader to a table in which the results are presented. When you present information in a table, there are at least two expectations that you need to fulfill. The first is that you explicitly introduce the table. You are expected to point out to your readers that the table exists and indicate, briefly, its general content. Usually, those two things can be accomplished in a single sentence: "Table 1 shows the incomes earned by full-time workers in the United States," or "In table 1, I present the results of the three regressions that explore the relationship between income and education." Once you introduce the table and briefly describe its general contents, you can discuss the table more particularly. That brings us to our second expectation.

The second expectation is that you should, in your narrative, identify the main points made by the data in the table, the points that most closely correspond to your research question. The table cannot, and should not be expected to, "speak for itself." Rather, you should explicitly tell your readers the important realities that the data show: "Table 1 reveals several significant characteristics of our sample that could affect our results: one-third of women in the sample had less than a high-school education; nearly two-thirds were unmarried; and exactly one-half had at least one child under 3," or "As expected, the coefficient on education is, in every regression, significant and positive." You may also wish to point out any counterintuitive results or results that are especially large or small. Please note, however, that you are not expected to comment on or restate every piece of information that a table contains; but you are expected to point out to your readers the "meaning" or your interpretation of the data in it. What do you most want your reader to take away from the table?

In stating your results, you should draw your reader's attention to the applicable numerical figure in the table. "As seen in column 1, the coefficient on education is 0.583 and is statistically significant at the 5 percent level." The reader should be able to look at column 1 in the table and find that figure for education.

All of this is to say that you have to describe the contents of the table in the text. You cannot simply refer to a table (or worse, not refer to it at all!) and leave it at that.

There is a useful discussion of the process in *The Student's Guide to Writing Economics*, by Robert Neugeboren. Here is the situation that Professor Neugeboren sets up; I'm quoting him almost verbatim:

> Suppose you are writing about the effect of education on wages. Your main regression places an individual's wage on the left-hand side and regressors such as education, race, gender, seniority at the individual's job, labor market experience, and state of residence on the right-hand side. You believe that the regressor of interest—education—is correlated with the error term of the wage equation: that is, more "able" people earn more at their jobs and also obtain more education. Because of this correlation between the error term and education, the measured effect of education in the regression will reflect not only the true causal effect of education on wages but also some of the effect of ability on wages. To circumvent this "ability bias" you use a separate measure as a proxy for ability. Though such a proxy is not available, assume for the sake of exposition that a special data set contains an individual's evaluation by his or her second-grade teacher. When presenting your results, you want to focus only on the estimates of the education effect and the ability effect. (39–40)

Professor Neugeboren draws up a table with hypothetical results:

Table 1 OLS Estimates of the Effect of Education on Wages. Dependent Variable: Log of Yearly Earnings, 1985–1995

	1	2	3	4
Years of Education	.091 (.001)	.031 (.003)	.086 (.002)	.027 (.005)
Ability Dummy		.251 (.010)		.301 (.010)
State Dummies Included?	No	No	Yes	Yes
No. of Observations	35,001	35,001	19,505	18,505
No. of Persons	5,505	5,505	4,590	4,590
Adjusted R^2	.50	.55	.76	.79

Note: Standard errors are in parentheses. Data are from the Tennessee Second Grade Ability Survey and Wage Follow-up, and include individuals evaluated between 1962 and 1971. The "ability dummy" equals 1 if the individual's second-grade teacher classified the individual as "able," and 0 otherwise. Each regression also includes yearly dummies, ten one-digit industry and twenty Census-defined occupation dummies, labor market experience (defined as one's age minus 6), experience squared, seniority on the current job, seniority squared, Census region of current residence, marital status, race, gender, and a dummy variable denoting whether the individual lives in a city of more than 100,000 persons. Columns 3 and 4 have fewer observations because the state of residence is not available for some individuals.

How would a discussion of the results presented in this table likely go? Here is one possibility, as presented in Professor Neugeboren's book (again, I am quoting almost verbatim):

> Table 1 presents the OLS estimates of the effect of education on wages. It shows that including a measure of ability in the wage equation dramatically lowers the predicted effect of education on

> earnings. Column 1 does not include an ability measure and indicates that a year of education raises wages by 9.1 percent. Column 2 adds the ability measure; the education effect now drops to 3.1 percent. Columns 3 and 4 show that this general pattern is repeated even when state-level dummy variables are included. The estimates in table 1 are therefore consistent with the hypothesis that the OLS estimates suffer from an upward ability bias.

A few points about the preceding example are instructive. First, the discussion begins by introducing the table and indicating its content ("Table 1 presents the OLS estimates . . ."). Second, the meaning or conclusion to be drawn from the table is explicitly stated ("It shows that including a measure . . ."). Indeed, the conclusion is even restated in a different way at the end of the discussion ("The estimates in table 1 are therefore . . ."). And third, the discussion does not mention every single piece of data in the table. Instead, it selects for discussion only those data that are important for the task at hand.

18. Writing Introductions

If there is one section of an economics paper that seems to give writers the most trouble, it is the introduction. Every economics paper contains an introduction, a section that brings your reader into your paper. A good introduction gives your reader a context, a frame, for ordering and understanding the information you present in the body of your paper.

Introductions should normally answer the following questions: What is the purpose of the paper? That is, what does the paper "do"? What important economic question does it try to answer, or what issue does it try to shed light on? What contribution does the paper make, and how does it relate to previous work on the topic?

In their excellent book *Academic Writing for Graduate Students*, John Swales and Christine Feak suggest that when it comes to economics papers, it is helpful to think of your

introduction as progressing through four "moves." Move 1 is to establish a research territory. Move 2 is to review the relevant literature. Move 3 is to establish a niche. Move 4 is to occupy the niche. Let's look at each of these in more detail.

Move 1: Establish a research territory. In Move 1 in your introduction, you introduce your subject and indicate its important. Why should we care about it? Why is it important to economics, or to human welfare?

Move 2: Review the literature. Place your own study in the context of other studies, in a way that will highlight your study's contribution.

Move 3: Establish a niche. In this move, you identify a gap or problem or deficiency in the current literature. It will be the gap or problem or deficiency that your study will address.

Move 4: Occupy the niche. In Move 4, you state your study's purpose, what it will "do," what it will contribute. This is in direct response to the gap etc. you identified in Move 3. In this move, you may also state your main findings. It is also customary to end with an outline of your paper ("In section 2 I will . . .").

It is not necessary to make these moves in the order just given. Some articles, for instance, begin with Move 4; think of the many articles that begin, "This paper will . . ."

Here is an illustration of the four-move pattern:

> More immigrants entered the United States during the past decade than in any comparable period since the 1920s. Among the issues raised by this influx, none is as controversial as its effect on the labor market opportunities of native-born workers. Evidence on the labor market consequences of immigration is limited (see Greenwood and McDowell 1986 and Borjas 1990). This paper presents new evidence on the effects of immigration, based on changes in the distributions of wages in 24 major cities during the 1980s. Although immigrant inflows are small relative to the populations of most cities, recent immigrants are a significant fraction of less-educated workers in many cities. We therefore concentrate on measuring the effects of immigration at

> the lower tail of the wage distribution. In particular, we ask whether recent declines in the real earnings of the least-skilled workers in the U.S. economy are related to immigration. Our empirical analysis reveals large differences across cities in the relative growth rates of wages for low- and high-paid workers. Nevertheless, these differences bear little or no relation to the size of immigrant inflows. Our results therefore confirm the findings of earlier studies, based on 1970 and 1980 Census data, that suggest that the labor market consequences of higher immigration are relatively small. —Kristin F. Butcher and David Card, "Immigration and Wages: Evidence from the 1980s," *American Economic Review*, May 1991

The introduction begins with move 1, in which the topic is introduced and its significance suggested:

> More immigrants entered the United States during the past decade than in any comparable period since the 1920s. Among the issues raised by this influx, none is as controversial as its effect on the labor market opportunities of native-born workers.

The next sentence combines moves 2 and 3: the literature review (the citations to Greenwood and McDowell 1986 and to Borjas 1990) and the problem in the literature ("evidence . . . is limited"):

> Evidence on the labor market consequences of immigration is limited (see Greenwood and McDowell 1986 and Borjas 1990).

Move 4 takes place in the next sentence:

> This paper presents new evidence on the effects of immigration, based on changes in the distributions of wages in 24 major cities during the 1980s.

The rest of the introduction elaborates on move 4 and presents the results of the study.

The present discussion of introductions should be read along with "Finding a Niche and Making a Contribution" and the section on writing literature reviews.

How to actually begin a paper can be challenging. Although economics papers can begin in any number of ways, many begin by simply stating what the paper does, or by announcing the topic, or by stating the main argument, as in the following example:

> This paper develops a consumption-based model of asset pricing which integrates the real financial and monetary sectors of the economy. Unlike most earlier consumption-based models which treated the probability distributions of asset payoffs and future commodity prices as exogenous, we derive these distributions endogenously within a general equilibrium model by assuming rational expectations. This yields new insights into the implications of inflation and real sector activity for asset pricing. —Glenn W. Boyle and Leslie Young, "Asset Prices, Commodity Prices, and Money: A General Equilibrium, Rational Expectations Model," *American Economic Review*, March 1988

Often, papers begin by describing an economic problem, reality, or phenomenon, as in this example:

> How do increases in competition affect equilibrium bidding at auctions? According to the Walrasian analogy of markets as auctions, an increase in the number of bidders should encourage more aggressive bidding so that, in the limit, as the number of bidders becomes arbitrarily large, the imperfectly competitive auction setting approaches the efficient perfectly competitive outcome. —Han Hong and Matthew Shum, "Increasing Competition and the Winner's Curse: Evidence from Procurement," *Review of Economic Studies*, October 2002

Relevant statistical or historical background is always acceptable material for openers:

> For 20 years following 1949, average total fertility per woman in

> China hovered just above six children. The year 1970 marked the beginning of persistent fertility declines. By 1980, the rate had dropped to 2.75, and since 1992 it has remained under 2. —Marjorie McElroy and Dennis Tao Yang, "Carrots and Sticks: Fertility Effects of China's Population Policies," American Economic Review, May 2000

Finally, a discussion of previous studies of your topic is also a common way to begin. In fact, it may be the most common. Here is the first paragraph of an introduction from a paper on random-walk behavior:

> Several recent papers have studied the univariate time-series process for U.S. GNP, including Campbell and Mankiw (1986), Clark (1986), Cochrane (1986), Nelson and Plosser (1982), Quah (1986), Stock and Watson (1986), and Watson (1986). A major focus of these papers has been the extent to which GNP movements are well approximated by a process with a unit root with drift, as opposed to stationary movements around a time trend. The empirical evidence on this is mixed. Campbell and Mankiw, Nelson and Plosser, and Stock and Watson conclude that the random-walk (unit-root) approximation is quite good. Clark, Cochrane, and, perhaps, Quah and Watson say that it is not. —Kenneth D. West, "On the Interpretation of Near Random-Walk Behavior in GNP," *American Economic Review*, March 1988

So what is the bottom line? I would suggest you begin by mastering the four-move pattern described above: announce your topic; review previous research; indicate a gap or problem with the previous research; state how your paper will fill the gap or respond to the problem; state your main point, your thesis; and preview the content of the paper. It would be hard to go wrong with that. Once you have mastered that, look for ways to introduce style into your introductions. But remember: a little style goes a long way. Less is decidedly more.

19. Writing the Conclusion

Just as introductions are often written after the body of the paper has been developed, so are conclusions. Your conclusion should function in tandem with your introduction. Indeed, conclusions are, in a way, upside-down versions of introductions: whereas in introductions you usually build up to your thesis statement, in conclusions you usually *begin* with it. Let's take a closer look at this often neglected part of a paper.

Conclusions to economics papers are usually brief. At their most pedestrian, they recap what has already been said in the paper. You may use your conclusion to restate your research question or purpose and to restate your principal findings. You may discuss the policy implications of your results. You may identify ways in which your present project can be extended or improved.

But think of conclusions as much more than that. The conclusion is your chance to sum up your argument in a clear and concise manner, and in a way that does not simply repeat, word for word, what has been already said. It is also the place to suggest other lines of inquiry or broader implications of the topic and findings that you didn't have the space to explore. The conclusion helps answer the question, "So what?" That is, why should readers care? Why should they find your subject important?

I would suggest reading your introduction and your conclusion side by side. They should be consistent with one another: the thesis or question or conclusion you state in your introduction should be the one you state in your conclusion. But the conclusion should be more than just a mirror of the introduction. Consider that whereas the introduction speaks to the contents of the paper that are actually to come, the conclusion should speak more to issues slightly beyond the paper. In other words, while looking back at the paper just presented, the conclusion should also look ahead.

Let me conclude this discussion of introductions and conclusions by emphasizing the importance of reading—and rereading. The more introductions and conclusions to economics

papers you read, the more familiar you will become with their conventions and style, and the better prepared you will be to write them.

20. Writing the Abstract

Most economics articles contain abstracts, a paragraph-long condensation of the main elements and features of a given paper. The content of an abstract can vary, but they often state what the paper does, the data and methodology used, and the principal findings. What you choose to put in your abstract should depend on the contribution of your paper. If you had only 150 words to say something about it, what would you say?

Abstracts are by definition brief—usually 150 words or less. Here, for instance, is an abstract of only 58 words. It confines itself to stating what the paper does.

> We selectively survey, unify and extend the literature on realized volatility of financial asset returns. Rather than focusing exclusively on characterizing the properties of realized volatility, we progress by examining economically interesting functions of realized volatility, namely realized betas for equity portfolios, relating them both to their underlying realized variance and covariance parts and to underlying macroeconomic fundamentals.
> —Torben G. Anderson, Tim Bollerslev, and Francis X. Diebold, "A Framework for Exploring the Macroeconomic Determinants of Systematic Risk," NBER Working Paper no. 11134, 2005

Of course, an abstract can contain additional details. Here is one by the same trio of authors that states not only what the paper does, but what the findings, and the implications of those findings, are.

> A rapidly growing literature has documented important improvements in financial return volatility measurement

> and forecasting via use of realized variation measures constructed from high-frequency returns coupled with simple modeling procedures. Building on recent theoretical results in Barndorff-Nielsen and Shephard (2004a, 2005) for related bi-power variation measures, the present paper provides a practical and robust framework for non-parametrically measuring the jump component in asset return volatility. In an application to the DM/$ exchange rate, the S&P500 market index, and the 30-year U.S. Treasury bond yield, we find that jumps are both highly prevalent and distinctly less persistent than the continuous sample path variation process. Moreover, many jumps appear directly associated with specific macroeconomic news announcements. Separating jump from non-jump movements in a simple but sophisticated volatility forecasting model, we find that almost all of the predictability in daily, weekly, and monthly return volatilities comes from the non-jump component. Our results thus set the stage for a number of interesting future econometric developments and important financial applications by separately modeling, forecasting, and pricing the continuous and jump components of the total return variation process. — Torben G. Anderson, Tim Bollerslev, and Francis X. Diebold, "Roughing It Up: Including Jump Components in the Measurement, Modeling, and Forecasting of Return Volatility" NBER Working Paper no. 11775, 2005

What you choose to include in an abstract depends on your interpretation of the paper's important or interesting features and its contribution or what distinguishes it from other papers.

21. Designing Tables

Tables are excellent for presenting a large amount of data in a concise, easy-to-read form. A well-designed table can

communicate in brief what may otherwise take several paragraphs if presented textually, and can do so more clearly.

In economics papers, tables may be used for any number of purposes, but two are more common than others. In empirical papers there is usually a table of *descriptive statistics*. Also called "summary statistics," descriptive statistics usually give a socio-demographic profile of a sample population. Also common in empirical papers are tables presenting *regression results*. In a single paper, there may be several tables that present regression results, coefficient estimates, and the like.

The main parts of a table are the following.

- *Table number*. Every table should have a number, and the tables should be numbered consecutively throughout a document.
- *Title*. The title should be brief but descriptive. It should not be a complete sentence, but a collection of words that indicate the subject of the table: "Percentage of Women Aged 45-60 Who Smoke, by Educational Attainment," or "Effect of Class Size on Student Achievement: OLS Regression Results," or "Summary of Income Data from Survey in Rural Georgia, 1920–1945."
- *Column heads*. Every column of information should have a column head, a word or phrase that identifies the information. Columns are read down. *Spanner heads* are used when column heads are in two or more levels, that is, when there are both a collective head and individual heads.
- *Stub*. The stub is the very left-most column in a table.
- *Body*. The body of a table consists of the columns to the right of the stub and below the column heads.
- *Footnotes*. There are three main kinds of footnotes that may be included at the end of a table. A *source note* identifies either the source of the data used in the table or, if the table was reproduced without change from a published work, the published work (it is possible that both things need to be identified). To reproduce a table without change from a

published work that is still protected by copyright requires formal permission. *General notes* apply to the table as a whole. *Specific notes* pertain to specific numbers or rows or columns in the table.

- *Rules*. Rules are the lines that visually separate the table into parts. In general, only horizontal rules should be used. Vertical rules may in some cases be necessary, but current publishing norms require that they be avoided whenever possible.

The parts are identified on the sample table in the appendix.

Not all data need to be presented in a table. Sometimes there is simply not enough information to justify a table. A good rule is that a table should contain at the very least two columns and at least six cells of information: two columns and three rows, or three columns and two rows. (Please note: the left-most column, called the "stub," does not count as a column for this purpose.)

22. Writing Literature Reviews

Remember the four-move pattern discussed in section 18 on introductions? You might recall that move 2 of the pattern reviews the literature. Literature reviews are standard in scholarly economics articles; they are either included in the introduction or are put in a section of their own. (A literature review can also be expanded and published as an article of its own; but what I am discussing here are literature reviews in standard empirical and theoretical papers.)

So just what is a literature review? First, let me say what it is not. A literature review is not just a description of a series of papers; it is not a mere catalog or annotated bibliography of papers written on a subject. A series of paragraphs, each recapping or summarizing a particular paper or set of papers, in no particular order, does not a literature review make.

Instead, a literature review has much more shape and purpose than that. A good literature review is an account of previous research that is *carefully constructed* to tell a particular

story. The story is usually this: Here is what previous researchers have done on my subject; here is something unsatisfactory or incomplete or troubling about that research; here is how I am going to redress what is unsatisfactory or incomplete or troubling about that research.

To put it differently, a literature review is a story hinging on a *however* or an *although* (or any other equivalent word), whether explicitly stated or not; it is a discussion that "turns" on a word or observation that signals to the reader a problem and a solution to the problem. "Smith and Jones have done a wonderful job in their papers. *However*, they make one dubious assumption. In this paper, I will make another assumption, one that is more realistic or plausible." Sometimes the reviews pull no punches. "The existing empirical work has substantial limitations that the present study seeks to overcome," write Alma Cohen and Liran Einav in their 2003 paper on seat belt laws (*Review of Economics and Statistics*, November). Other times the "turn" is more subtle: "In contrast to traditional models of the lending channel, our model does not rely on reserve requirements or on deposit insurance, or even on sticky prices," write Douglas W. Diamond and Raghuram G. Rajan in a 2006 article in the March issue of the *American Economic Review*. (In the paragraphs just before, the authors explained why relying on reserve requirements, deposit insurance, and sticky prices might compromise the traditional model.) And for a third example of a turn, "Although there have been many studies which develop consistent estimators of the number of factors [in large factor models], the corresponding estimates of the number of factors driving stock returns and macroeconomic time series often considerably disagree. The purpose of this paper is to develop formal statistical tests of various hypotheses about the number of factors in large factor models" (Alexei Onatski, *Econometrica*, September 2009).

A literature review is, in a sense, a sales job. What is it selling? The value added by the present paper. Why should the present paper take its place among the existing literature? What

does it do that is, in its own small way, different from what other papers have done? Those are the questions that should be answered in a literature review.

A good literature review has structure. That is, in a good literature review, there is a discernable order in which previous studies are discussed; there is a principle of organization at work. Just to take one example, suppose you identify many things wrong with an existing body of literature. Suppose further that one of those things is more important (in your view) than the others. Your review should be structured so that it builds to a discussion of that most important thing.

A review should do at least four things. First, it should analyze critically, and organize, a body of research. Second, it should put your own study in the context of other studies. Third, your review should highlight your study's contribution. And fourth, it establishes your scholarly "bona fides" by showing you have done your homework.

Here are some guidelines to consider when writing your literature review.

Begin with comments about the body of research as a whole. This should be your assessment of the literature as a whole. Have there been many studies, or few studies? Do the studies focus on methodological issues, or data issues, or some other issue? Have the studies been mostly empirical, or theoretical, or both? Have they focused on a similar set of questions? Is there a general consensus on the major issues in the literature? What are the landmark studies? Who are the leading authorities?

Organize your review according to themes (data, methodology, results, etc). Your principle of organization should make sense for your particular review. Here, for example, is a review organized according to rural vs. urban development: "All four studies took a position on **whether rural or urban development should be favored.** Epstein and Joseph (2000) favor rural development. In contrast, Bhattarchya (2001) and Van Neer (2000) believe urban development is more important. Marshall

(2003) concludes that it does not matter: either kind of development is equally beneficial."

Begin paragraphs with a sentence that puts in explicit *context what follows.* Don't leave it to your reader to infer the point you are making. "**The sources of data used in the studies vary greatly.** Smith (1999) uses data from the Survey of Income and Program Participation. As he explains, the SIPP is well-suited to explore the relationship between hourly wages and participation in the Food Stamp Program. Jones (2000) uses data from the High School and Beyond Survey. . . ."

Explain the merits, and the shortcomings, of the existing studies. Be explicit about this. Do not leave it to your readers to infer this information. "Although Rodriguez (2001) and Dudley (2000) ask the right questions, their studies are hampered by data sets with an insufficient number of observations."

Explain how your study will make a contribution. You may have already done this in your introduction, but it never hurts to remind readers. "Although Rodriguez (2001) and Dudley (2000) ask the right questions, their studies are hampered by data sets with an insufficient number of observations. The present study hopes to avoid the flaw in Rodriguez's and Dudley's analyses by using a new data set with over 1,600 observations."

You will find it helpful to read the literature reviews in published economics papers. Sometimes those reviews will be in the introduction; other times the review will appear in a section of its own. A good source for literature reviews is the *Journal of Economic Literature*. Pay attention to the kinds of information given in reviews and to any principles of organization the author uses. How does the author construct the review to bear on his or her subject?

23. Writing History-of-Thought Papers

The history of economic thought (sometimes called the history of economics) is concerned with the history of the discipline of economics—the history of economic ideas, of economic

methodology, of economic practice. How, and why, has economics become so mathematical? What accounts for the rise and influence of the Chicago school (Friedman, Becker, et al.)? What are the origins of rational choice theory? How did the labor theory of value change over the nineteenth century? What circumstances attended the composition of Keynes's *General Theory*? To what degree did the French economists of the eighteenth century influence John Stuart Mill? Just what was the *methodenstreit* all about? What role have funding agencies played in the evolution of the discipline? How did the demand theory we know and love come to be? Practitioners of history of thought (HET) need to be skilled on two fronts: they need to understand the economic concepts they encounter; and they need to know the tools and techniques of the historian. (Note that HET is *not* economic history. That is, it is not the history of economic institutions or economic activity, such as a history of the Federal Reserve would be, or a history of the changes in tobacco manufacturing. Economic history is a separate subject altogether.)

The format of HET papers has not become as standardized as we see in empirical and theoretical economics papers. Still, HET papers are usually written in sections, with section heads.

As mentioned earlier, introductions to HET papers are expected to present certain pieces of information: what the paper is about, what is new or valuable about the paper, what the thesis of the paper is.

HET papers rely on two sources of evidence: primary and secondary. Primary evidence refers to the writings of an economist himself, or the writings in which a particular idea was set forth. Primary evidence may be divided into published sources (Keynes's *General Theory*, for instance) and unpublished sources (e.g., Keynes's papers in King's College Library). Secondary evidence refers to other HET papers—articles and (sometimes) books *about* a particular economist or idea. Suppose you wanted to research the rise of the Chicago school. Primary sources would be such things as the minutes of department meetings, department

memos, and the writings (published and unpublished) of the people involved (say, Milton Friedman's autobiographical writings). Your paper, once finished, would constitute a secondary source.

HET papers usually state and support a thesis. A thesis is simply an interpretation or argument that may or may not be true and hence needs to be supported with evidence. The evidence, as indicated above, comes from primary and secondary sources.

Thesis-driven inquiries may begin explicitly with a research question. To what degree did the French economists of the eighteenth century influence John Stuart Mill? The answer would constitute a thesis. Or with only the vaguest notion of a question in the foreground, a thesis may emerge inductively as one reads and rereads—and reads again!—the primary sources. That is, the substance of a thesis may emerge by reading *between the lines* of a text. The substance of the interpretation is then usually implicit, rather than explicit, in the text; it is not plainly evident to the casual or superficial reader. Whatever the thesis is, and however it was determined, it is usually stated in the introduction of the paper.

The body of the paper is by far the longest part. It is where you present your evidence that supports your thesis. In many HET papers, the body begins by setting the historical context for the topic you are about to discuss. It then usually moves on to consider the evidence you have gathered in support of your thesis. It is usually helpful to readers to point out the way in which the evidence you present supports the thesis, rather than letting readers figure it out for themselves.

As with empirical and theoretical economics papers, conclusions to HET papers are often brief—one, two, perhaps three paragraphs. And whereas in introductions you usually build up to your thesis statement, in conclusions you usually *begin* with it. The conclusion is your chance to sum up your argument in a clear and concise manner, and in a way that does not simply repeat, word for word, what has been already said. It is also the place to suggest other lines of inquiry or broader implications of the topic

and findings that you didn't have to space to explore. The conclusion helps answer the question, "So what?" In any event, it should not essentially repeat the opening paragraph or simply restate the theme and findings.

24. Writing Book Reviews

Book reviews play a vital role in the discipline: They allow economists, with a minimum of effort, to keep up with what is current in the literature.

I like the book review because of all the genres of economics writing, the book review is one of the few places where an economist's personality and style are permitted to be flagrantly displayed. Scholarly articles are usually sober and tied down to a particular format. Not so with book reviews. In a book review, you have license to begin with a catchy opening, as Robert Solow, a Nobel Prize winner, once did:

> Like all good things for body and soul, this book is going to hurt. —Review of *Activity Analysis of Production and Allocation*, from the *American Economic Review*, June 1952

Or, to take a more recent example, this time by another Nobel winner, Amartya Sen:

> This is a great book. But it begins terribly. —Review of *Poverty, Inequality, and Development*, from the *Economic Journal*, March 1983

But it's not just the beginning that can be catchy. The ending can be clever, too:

> Were there a Surgeon General of neoclassical economics, this book would carry a warning label. —Bruce J. Caldwell, final sentence, review of *Against Machines: Protecting Economics from Science*, from the *Journal of Economic Literature*, June 1990

So cut loose and have fun with this genre. But (there's always a *but*, isn't there?): Remember that the book review has a serious, utilitarian purpose. All fun with no content makes for a failed review. With that in mind, here are a few things to consider when writing a review.

Come to the point quickly. Is this a book your audience is likely to find worthwhile?

Give readers an overview of the main contents of the book. What is the book about? What is its thesis or emphasis?

State the strengths and weaknesses of the book. Is the book well written? Does it support its arguments? Does it fulfill the expectations it raises? Is it unsatisfactory in some way?

Explain how the book fits in with the existing literature. Has the author written other books of its kind? How does the book respond to or continue other studies?

State the author's credentials. Is the author a professor of economics, or is he or she of another discipline? Is the author a known ideologue or does he or she come from a particular milieu that might color their attitudes and positions?

Note any miscellaneous, interesting, or useful features of the book.

Above all, keep this in mind: A book review is not just a summary or recap of a book's content—it is not a book report!—but an appraisal of the book: its contribution, its importance, its usefulness.

For a particularly engaging review that is fun and useful, see Paul Krugman's review of *Against the Tide: An Intellectual History of Free Trade*, which appeared in the June 1997 issue of the *Journal of Economic Literature*.

25. Writing about Numbers

The present guide is mainly concerned with the prose that is big part of economics writing. But economics writing also involves numbers. One of the best guides to writing about numbers is *The*

Chicago Guide to Writing about Numbers, by Jane E. Miller. Miller's book provides instruction on creating effective tables and charts, choosing examples and analogies, and writing about distributions and associations, among other things. In chapter 2, she lays out seven basic principles. The following brief remarks are distilled from that chapter.

Establish the context. It does no good to report that one million teenagers dropped out of high school in 2006. How does that number compare with numbers in other years? How does it compare to the total population of high school students? What other contexts might be needed to fully understand the number?

Report and *interpret*. When you write about your findings, you should do more than just report numbers. You should also interpret the numbers. What do they mean with respect to your thesis or research question? Recall the discussion about the table in the section on reporting and interpreting your results (section 17e), above. It wasn't enough to simply report the coefficient estimates. In addition, a good account will interpret them too: "The estimates in table 1 are therefore consistent with the hypothesis that the OLS estimates suffer from an upward ability bias."

Use magnitudes that make sense or are easy to comprehend. The U.S. national debt is over twelve trillion dollars. In most contexts, that number is too large for anyone to comprehend. But by putting it in per-capita terms—almost forty thousand dollars a person—the number may be better understood.

Specify the direction and magnitude of an association. Suppose you find that education is associated with voting. Yes, but in what direction? Are people more likely to vote as their education goes up? Or the opposite? Make sure you specify the direction of any association you report. Similarly, specify the magnitude of the association. By how much does the likelihood of voting increase (or decrease) as education increases by a certain amount?

To sum up the advice about writing about numbers, keep in mind that numbers cannot speak for themselves. A statement such

as “The average American earned $38,500 in 2007” does not mean much at all on its own. Numbers must be put in context and interpreted and expressed in the proper units and magnitudes.

Part V: Final Words

Needless to say, I hope you find this manual helpful. I hope it at least addresses specific concerns you may currently face and provides at least some guidance on how to deal with any difficulties you may have. But despite the manual's pretensions to the contrary, no one can learn to write simply by reading a few tips or heeding a few guidelines. There is no one way to write. Writing is not a "problem" that can be "fixed" in a single semester or single course.

No, learning to write better takes commitment and practice. I think N. Gregory Mankiw, a well-known contemporary economist, said it best when he said, "I think of myself as a mediocre writer. I do not come by my mediocrity naturally. It is the result of hard work and determination."

Read economics papers to see how they are put together and what kind of information they contain. Read papers by Nobel Prize winners and John Bates Clark winners. Ask your classmates to read your drafts; do so by giving them specific instructions. Rather than just saying, "Tell me what you think," ask them to, say, see if they can identify your main argument and how you prove that argument, or what the discussion on pages 8 and 9 is trying to accomplish. It is only through practice and feedback that one can really improve.

Further Reading

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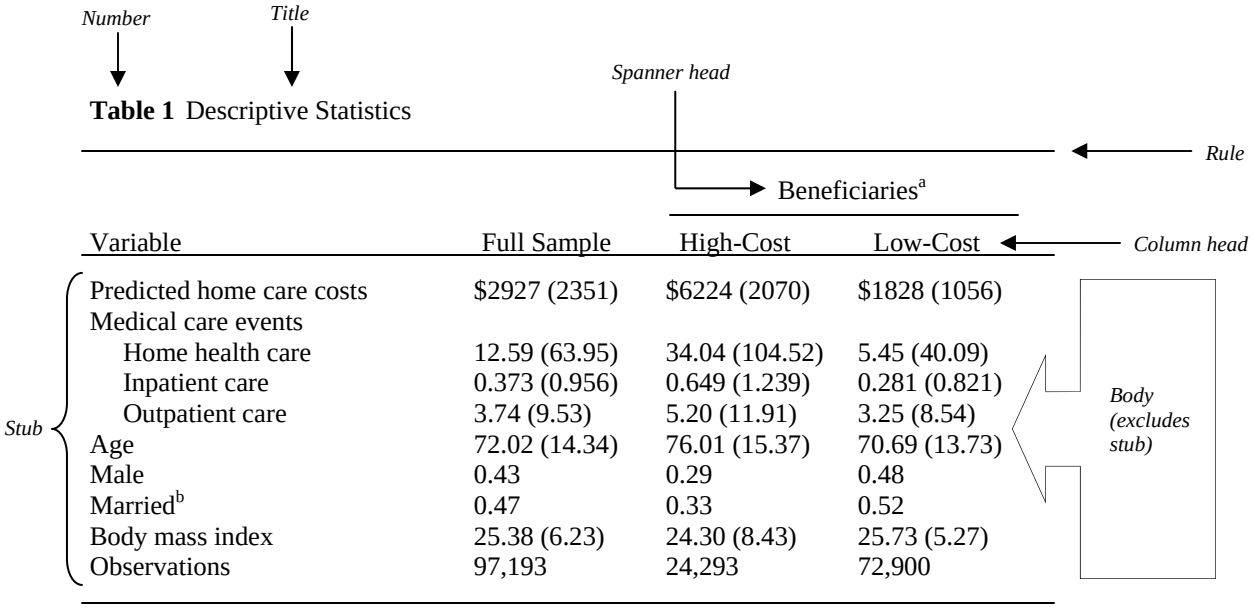
Wyrick, Thomas L. *The Economist's Handbook: A Research and Writing Guide*. St. Paul: West Publishing Company, 1994.

Appendix: Annotated Table

Here is a sample table of descriptive statistics. The main parts are identified.



The following details about the example should be pointed out. (1) In a table of descriptive statistics, it is customary to provide standard deviations, where applicable. In this case, the standard deviations are given in parentheses, right next to the means. (2) The heading "Beneficiaries" is a spanner head because it "spans" or applies across two or more column heads; a spanner rule indicates the relationship between the spanner head and the column heads. (3) The general note applies to the table as a whole. (4) The specific note "a" applies only to the category "Beneficiaries"; likewise, the specific note "b" applies only to the figures for "Married." (5) Note the absence of vertical rules, which are not considered professional and thus should be avoided if at all possible. (6) In this example, in column heads, all substantive words are capitalized, whereas in the stub entries, only the first word and any proper nouns are capitalized; it is customary to do one or the other: that is, to capitalize all substantive words in the column heads but only first words and proper nouns in the stub, or vice versa. (7) Note that when a stub entry has sub-entries—as in the case of "Medical care events"—the sub-entries are indented. (8) The figures in the body of the table should be aligned in some consistent way; here, they are aligned on the left. (9) The column heads should be aligned in some consistent way over the columns of figures; here, they are centered. (10) The column head for the stub, as well as the main entries in the stub, are always flush left.