

# **Writing Economics**

## A Guide for Harvard Economics Concentrators

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# Introduction

Economists study everything from money and prices to child rearing to the environment. They analyze small-scale decision-making and large-scale international policy-making. They compile data about the past and make predictions about the future. Many economic ideas have currency in everyday life, cropping up in newspapers, magazines, and policy debates. The amount you pay every month to finance a car or new home purchase will depend on interest rates. Business people make investment plans based on expectations of future demand, and policy makers devise budgets to achieve a desired macroeconomic equilibrium.

Across the broad range of topics that interest economists is a unique approach to knowledge, something common to the way all economists see the world. The purpose of this guide is to help you understand how economists approach and produce research so you too can think about – and write research as – an economist.

## ECONOMICS RESEARCH

In your introductory economics courses, you were introduced to key principles in economics such as scarcity, rationality, and incentives. Thus, good economics research questions generally embody these fundamental principles. The wide applicability of these principles means the range of topics that economists study is vast. Will school vouchers improve the quality of education? Do politicians manipulate the business cycle? What sort of legal regime best promotes economic development? Why do cities have ghettos? What can be done about grade inflation? Why do people procrastinate in saving for retirement – or in doing their homework?

Indeed, insofar as it can be characterized as choice under constraint, any kind of behavior falls within the scope of economic analysis. As Lord Lionel Robbins (1984), one of the great economists of the twentieth century, put it:

We do not say that the production of potatoes is economic activity and the production of philosophy is not. We say rather that, in so far as either kind of activity involves the relinquishment of other desired alternatives, it has its economic aspect. There are no limitations on the subject matter of Economic Science save this.

## WRITING AND RESEARCH OPPORTUNITIES IN THE CONCENTRATION

As an economics concentrator at Harvard, you will have many opportunities to undertake writing and research in economics. Chief among them are the sophomore tutorial, junior seminars, and the honors thesis.

## **Sophomore Tutorial (Economics 970)**

The goal of the Sophomore Tutorial is to help you learn to read and understand economics research, as well as to undertake your own research project. To this end, you will receive several assignments throughout the semester:

- *Final Research Paper* (15-18 pages). All tutorials require you to write a research paper that addresses a topic in depth and combines skills developed throughout the semester. It usually builds on earlier short assignments, including a prospectus, in which you propose a question and detail how you will try to answer it. The research paper typically includes a discussion of relevant literature, an empirical component, a discussion of results, and perhaps a discussion of policy implications.
- *Empirical Exercises* (page length varies). All Ec 970 students have to complete empirical exercises in which you analyze economic data using a standard statistical software package (Stata). These exercises give you experience in using statistical software to organize and analyze data, which is an important part of your final paper.
- *Short Essays* (4-6 pages). Short essays may require you to analyze two articles and compare their policy implications, explain a model, criticize an argument, present a case study, extend a theory, evaluate an intellectual debate, and so on.
- *Response Papers* (1-2 pages). Response papers might involve summarizing the weekly readings or answering a specific question. These will help get you thinking and stimulate class discussion. They can also build the skills needed for writing successful longer papers.
- *Other writing assignments* vary by tutorial and may include referee reports, peer feedback, preliminary pieces of the final research paper, and so on.

Make sure you clear up any confusion about the assignment by asking your tutor specific questions about what he or she is looking for. The earlier you get clarification, the better able you will be to complete the assignment. Additionally, you may be required to hand in rough drafts. Getting feedback improves your writing considerably and generally makes for more interesting papers.

## **Junior Seminar (Economics 980)**

Junior seminars offer another (more advanced) exposure to the research process. All junior seminars require a major research paper. During the semester, students build towards this goal with smaller intermediate writing assignments. The end product is an empirical and/or theoretical exploration of an idea related to the seminar's topic. Junior seminars provide students with a wonderful opportunity to apply the analysis and writing skills developed during the sophomore tutorial. They also provide a great experience for students thinking about embarking on a senior thesis.

## **Senior Honors Thesis**

The senior honors thesis provides students with an opportunity to investigate some idea, theoretical issue, policy problem, or historical situation of keen interest. Perhaps equally important, a thesis stretches students' intellectual muscles.

The Senior Thesis Research Seminars (Ec 985) are full-year seminars required of seniors writing honors theses. It is a venue for students to regularly present their work-in-progress and to discuss their thesis individually with their Ec 985 instructor. The seminar focuses on research design, methodology, data sources, analysis methods, and bringing this all together in a coherent, well-motivated, interesting economics thesis.

## **PLAN OF THIS GUIDE**

This handbook should serve as a companion to the above courses and as a reference anytime you are writing and doing research in economics. Chapters One through Four take you through the various aspects of writing a research paper, and Chapter Five guides you on putting all your work together into creating a coherent, interesting, thorough research paper.

In addition, three appendices provide useful information for your research process. Appendix A lists some key electronic indices and databases for searching through academic literature. Appendix B lists some basic sources and Appendix C provides a short discussion of some key fields in economics to help discover broad areas you might find interesting.

# One | Writing Economically

Pick up any economics journal and you will discover a few things about writing economics. First, the discourse is often mathematical, with lots of formulas, lemmas, and proofs. Second, writing styles vary widely. Some authors are very dry and technical; a few are rather eloquent.

You don't have to be a great "writer" to produce good economics writing. This is because economics writing is different from many other types of writing. It is essentially technical writing, where the goal is not to turn a clever phrase, hold the reader in suspense, or create multi-layered nuance, but rather to achieve clarity. Elegant prose is nice, but clarity is most important. A clear, organized paper allows the strength of your underlying analysis and the quality of your research to shine through.

If you've ever pulled an all-nighter and done reasonably well on the assignment, you may be tempted to rely on your ability to churn out pages of prose late at night. This is not a sensible strategy. Good economics papers don't just "happen" without time spent on preparation; you cannot hide a lack of research, planning, and revising behind carefully constructed prose. More time will produce better results, though returns to effort will be diminishing at some point. Here, too, the principles of economics apply.

## THE KEYS TO GOOD ECONOMICS WRITING

Writing in economics, as in any academic discipline, is never simply a matter of asserting your opinions. While your ideas are important, your job includes establishing your credentials as a writer of economics by demonstrating your knowledge of economic facts and theories, identifying and interpreting the underlying economic models, understanding what others have said about the relevant issues, evaluating available evidence, and presenting a persuasive argument. Even if you don't write particularly well, you can produce good economics papers by attending to the following:

### **Research**

Research entails reading previous literature in a subject area (see Appendix A) and, for empirical work, finding and analyzing data (see Appendix B). The more thorough your research, the stronger your paper. This is discussed in Chapter Three.

### **Analysis**

Regardless of your topic, a good research paper requires a careful analysis in order to make conclusions about the originally posed question. Analytical skills are particularly important when using mathematics or statistics to create models or analyze data in order to answer your question. This is discussed in Chapters Two and Five.

## Organization

Once you have found data sources and relevant literature, you will need to organize your ideas and outline your paper. An excellent research effort can easily be overshadowed by a disorganized presentation of ideas, methodology, and/or findings. This is discussed in Chapter Five.

## Clarity

An overarching goal to strive for in writing a research paper is *clarity*. **Clear writing is easy to read but hard to write. It rarely occurs without considerable effort and a willingness to revise and rework.** As McCloskey (1985), the dean of economics writing, tells us: “it is good to be brief in the whole essay and in the single word, during the midnight fever of composition and during the morning chill of revision” (McCloskey, 1985). The rules of clear writing apply not only to the organization of the entire paper, but also to the order of paragraphs, sentences, and words. Few writers achieve clarity without continual editing. Once you have your basic ideas down, be sure to reread and revise your work.

Clarity can be achieved in stages:

- Clearly state your research question/hypothesis.
- Organize your ideas into an argument with the help of an outline.
- Avoid excess verbiage.
- Edit your paper seriously, remove what is not needed, and keep revising until you get down to a simple, efficient way of communicating.

This last stage is crucial. Take, for example, the following excerpt from a student’s short response paper:

In the beginning of the 1980’s, the problem of homelessness in the United States became apparent (Freeman and Hall, 1989). Since then, the number of homeless in this country has continued to grow. While the problem of homelessness, in itself, is obviously a problem that is quite relevant to other fields of economic study, it has also given rise to a phenomenon that is an interesting topic for the study of behavioral economics: the donation of money to help the homeless population.

With a little revision, the author could have achieved a more clear and concise introduction:

In the early 1980s, increasing homelessness in the United States became apparent (Freeman and Hall, 1989). Since then, the number of homeless has continued to grow. While homelessness is studied in many fields of economics, the phenomenon of donating of money directly to the homeless is particularly interesting to behavioral economists.

On the following page are some additional tips to achieving clarity, with examples. These and many other useful tips can be found in Strunk and White (1979).

**Use the Active Voice**

Turn a weak, passive statement into a more direct assertion:

(weak, passive voice) *In this paper, the effect of centralized wage-setting institutions on the industry distribution of employment is studied.*

(direct, active voice) *This paper studies the effect of centralized wage-setting institutions on the industry distribution of employment.*

**Put statements in Positive Form**

*Many day-traders did not pay attention to the warnings of experts.*

This statement is more concisely conveyed as:

*Many day-traders ignored the warnings of experts.*

**Omit Needless Words**

*In spite of the fact that the stock market is down, many experts feel that financial markets may perform reasonably well this quarter.*

A better way to express the same thing is:

*Although the stock market is down, financial markets may still perform reasonably well this quarter.*

**Generally Stick to One Tense**

*This study showed that dividend payouts increase when dividend income was less tax-disadvantaged relative to capital gains.*

Instead, use present tense throughout:

*This study shows that dividend payouts increase when dividend income is less tax-disadvantaged relative to capital gains.*

# Two | Types of Economics Papers

The economy is a complex web of interdependent elements, and understanding any part is a significant accomplishment. The price of tea in the U.S. is determined by many factors, including individual preferences, labor costs, weather conditions and the price of tea in China, among others. These factors are in turn connected to other factors, including the price of coffee, which in turn can affect the price of tea. All of these parts can be moving simultaneously, making it hard to see what is causing what.

To write effectively about economics, you have to understand how economists think about such complicated phenomena. In general, to make their task easier, economists try to focus on simple causal connections - often between two variables - *ceteris paribus*, or “other things being equal.” “Other things being equal,” what is the effect of a change in labor costs on the price of tea? “Other things being equal,” how does a change in the price of coffee affect the price of tea?

This kind of analysis allows economists to say something very precise about well-defined relationships and to run rigorous tests to measure the strength and direction of their connections. Of course, focusing on one relationship at a time means other relationships are artificially held constant, so that our analyses necessarily diverge from reality. A good economist knows the real world is more complex and uses their simplifications as first steps towards understanding reality.

Such analyses are formally investigated and written as a paper in one of three broad categories: theoretical papers, empirical papers, and papers that present a theoretical model with a related empirical test. As with anything, there are always exceptions. There exist excellent writings on economic thought, intellectual analyses of historical events, review pieces of large areas of research, and much more.

## THE THEORY PAPER

A theory paper presents some aspect of the world through the lens of a model. Economic models are simplified representations of how economic phenomena work, rendered in precise, usually mathematical, terms. The goal of the theory paper is to help us understand the world and make predictions about it. Supply and demand, cost/benefit analysis and comparative advantage are examples of basic theoretical models.

A theory paper can introduce an entirely new model, or it can critique or extend an existing model. In both cases, the theory paper improves the conceptual underpinnings of the analytical tools we use to understand the actual economy. A theory paper, for instance, may present a better model of how firms behave in uncertain market conditions, or a new way to measure the level of national economic activity, or a synthesis of existing theories to produce a new, more general theory.

A classic example of the theory paper is Gary S. Becker’s “Theory of Marriage” (1973), in which the author applies the theory of preferences to model the marriage market. He derives from his model various behavioral implications (such as how the division of labor occurs within marriages). The economic motivation that Becker provides for his model is that marriage plays a central role in many phenomena of

interest to economists (population growth, labor force participation trends, and inequality, to name just a few).

### **Theoretical Models**

A theory paper is generally characterized by a model: a simplified representation of an economic phenomenon. Economists build models the way curious scientists do: reduce the phenomenon to its basic elements and combine these elements so as to produce a model that resembles the original in relevant respects.

Economic models specify relationships between two kinds of variables: *exogenous* and *endogenous* variables (Mankiw, 1997). Exogenous variables are inputs to the model, factors that influence what happens but are themselves determined “outside” the model. They are “givens”: fixed values that are assumed not to change over the period of analysis. Endogenous variables are outputs of the model, determined “within.” Usually, a mathematical function is used to represent the relationship between exogenous and endogenous variables. Systems of relationships, in which changes in one area have different consequences in others, are often conveniently represented by systems of functions.

Models allow one to make predictions about the real world economy; both forward-looking predictions about, say, future interest rates and backward-looking predictions about, say, the savings rate during the depression. Models also provide guidance about where to look for and how to look at data, and they provide a structure on which the rest of the paper can hang.

While not all theoretical papers involve a mathematical model, the majority do. Economic theory was not always so mathematical, and the mathematization of economic theory has had costs as well as benefits. The benefits are that, in many cases, more can be said quickly and precisely, because mathematics is a powerful language and convenient shorthand. The cost is that not all relevant phenomena are easily cast in mathematical terms or can be only crudely captured mathematically. Another cost is that economic theory becomes somewhat less accessible to students and to the world at large, in which public policy debates are conducted. Thus, a well-written theoretical paper additionally provides a simple, intuitive explanation of the key implications of the mathematical analyses.

## **THE EMPIRICAL PAPER**

A theoretical model’s predictions about the future or the past are essentially empirical hypotheses: claims about how an economic phenomenon works. If theory papers help us frame the way we see the world, understand it, and make predictions about it, empirical papers enable us to test theories and measure relationships. By how much does police presence reduce crime rates? How much does an additional year of schooling boost earnings? These types of questions often have significant policy implications.

Most economists, aspiring to be good social scientists, would like to test their hypotheses under laboratory conditions. This is often not possible, although it is becoming increasingly common in the field of psychology and economics. In many cases, though, we need to gather data from the real world - by looking at census reports, balance sheets and the like - and use statistical methods to test our models and hypotheses.

Much economic data come in, or can be transformed into, numerical terms. But a long list of numbers is just that until a relationship among them can be specified that imparts some order. By building and using statistical tools, economists are able to focus on simple, sometimes subtle, relationships in the data and explain the causal links at work. Finding a pattern in the data allows one to say something about how the economy works. Such analyses tend to be complex; thus, empirical papers make use of a variety of different statistical tools and approaches (such as regression discontinuity designs, propensity scores, and instrumental variables), as you will learn in your econometrics course(s).

In the field of development economics, randomized trials<sup>1</sup> have grown dramatically in popularity over the last few years. The rigorous impact evaluations that such experiments enable have driven a growing body of empirical literature on “what works” in development. One of the earliest examples of such randomized trials is the Progresa program in Mexico, which provides cash transfers to poor households in villages randomly assigned treatment status. The cash transfers were conditional on recipients taking specific steps to promote good health (such as immunizations, preventive check-ups, and nutritional monitoring and supplementation) (Gertler, 2004). Gertler (2004) uses Progresa data to analyze the impact of these conditional cash transfers on child health outcomes in Mexico. Because the cash transfers were randomly distributed among eligible villages, a simple OLS regression analysis is, broadly speaking, enough to identify the effect of the cash transfers. Gertler’s (2004) finding that conditional cash transfers have significant, sizeable impacts on children’s health outcomes is a valuable contribution to the policy debate on how to improve health outcomes in developing countries.

Writing up and discussing empirical results is a skill to develop all its own; this is discussed in detail in Chapter Five.

## THE COMBO PAPER

Papers with both a theoretical and empirical component arise under a number of different circumstances. Sometimes a paper may require a theoretical “backbone” on which the empirical analysis can hang. Other times, the author of a theoretical paper analyzes some data to *calibrate* the model (that is, to estimate values of key parameters of the model) or to test certain implications of the model “in the real world.” And still other times, the empirical findings of a paper warrant the generation of a theoretical model to better understand those findings. For example, Autor et al. (2006) dissect data on wages and employment to describe the rising polarization of the labor market into high-skill and low-skill jobs at the end of the twentieth century. The authors follow this empirical analysis with a theoretical model that explains this polarization as the result of computerization: automation substitutes for routine, repetitive tasks but provides a complement for workers performing skill-intensive tasks.

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<sup>1</sup> “Randomized control trials” (RCTs) broadly refer to providing a ‘treatment’ (such as a good or service or implementing a policy) to some individuals or areas but not to others. The goal is to be able to reliably measure any differences between groups that did versus did not receive the treatment, in order to see if the treatment leads to any changes in particular outcomes.

# Three | Finding and Researching a Topic

Economists view the world through the lens of efficiency, focusing on individuals' behaviors and the problem of allocating scarce resources. From this common analytical perspective, economists study a wide range of topics, involving the behavior of individuals, organizations and nations. The economic approach can be applied so broadly that choosing a topic to write on can be difficult. Indeed, once you start looking at the world through the eyes of an economist, almost anything can be analyzed in terms of choice under constraint.

## GETTING STARTED

Getting started is often the hardest part of a research project. The world of possibilities before you can make the process of a writing research paper seem daunting. Don't let these concerns paralyze you; **break down the project into smaller parts, and get started on the simpler tasks.** For example, your project will likely consist of finding a topic, reviewing relevant literature, finding data, carrying out empirical analyses, and so on. You can further divide each of these tasks into smaller parts. For example, when you're ready to start exploring the literature (more on this in Chapter Five), you can break this seemingly straightforward task into smaller parts:

- list the papers you already know
- search EconLit (see Appendix A) to identify a list of potential papers to read
- read through those papers' abstracts a few at a time
- choose some papers to read more carefully.

In Chapter 5, we discuss all the key parts of the paper; you can use this as a guide for creating your list of smaller tasks.

It is also important to manage your time. The best laid plans for writing a good paper can be wrecked by poor time management. Clear up any confusion about the assignment right away. Set yourself deadlines for completing each phase of the project. Hold yourself to the deadlines you set, and allow yourself time to revise and polish the paper. The payoff will be a better product and less anxiety throughout.

## FINDING A TOPIC

You need a topic before you can begin. If your instructor gives you a list of topics, a review of related research may help you choose among them. If the research question is entirely up to you, a literature search might not be the best way to begin. Immersing yourself in the literature before you have found a topic may make you feel like all the interesting questions have already been tackled. Instead, reflect on issues you think

are interesting and important. You can also browse the list of fields in economics (Appendix C) to see what broad areas you find interesting.

Though there is no one way to find a topic, thinking of the issues that interest you is a great place to begin. While the range of possible topics is large, there are some well-defined fields in economics, and your own interests are likely to fit into one of these (see Appendix C). Course materials, textbooks, handouts, and so on are obvious and convenient places to look, especially since your topic will most likely have to pertain to the course subject. But reading the newspaper and keeping an eye on current events can also be helpful. Once you have a general idea of what you're interested in researching, you should go to the literature and see how economists have tried thinking about it.

For example, say your interest is piqued by recent shootings in both schools and workplaces. What role has the availability of guns played in these events? What are the effects of banning guns? Implementing tougher gun control laws? Though this might initially strike you as a government or law project, many of the underlying issues are fundamentally economic - gun control measures explicitly place limits on supply and attempt to put guns in disfavor or reduce demand. Once you have identified guns and gun control as an area of interest, do your literature search (more on this later). Pick out the relevant articles and scour them for content as well as for additional sources. Try to narrow down your topic. Have the authors pointed out any future research areas? Are there any issues that you think have not been fully addressed?

In addition to finding something that interests you, you will also need a project that can be done within the parameters of the assignment (for example, length, due date, access to research materials). If the topic doesn't interest you, you probably won't put in the effort needed to do a good job or ask the right questions along the way. On the other hand, a profoundly interesting topic may not be manageable given the time and other constraints that you face.

As another example say you are interested in the stock market and want to know what determines stock prices. From basic economic theory, you know that prices are determined by supply and demand, but what specific relationships do you need to study and what data do you need to gather? You think about it for a while and realize there are many parts to your question. What determines the price of a particular company's stock is a different question from what determines the level of stock prices in general (as measured by Dow Jones or another index), though the two may be related. And what determined stock prices yesterday might be different from what explains changes in stock prices in the future. Each of these questions could be the subject of an interesting paper. Your original topic was overly broad; you should focus on a single, manageable question.

Get started on your research once you have a general idea of what you're interested in, and recognize that your specific question will evolve along the way. Your initial question may become less interesting, and something new may draw your attention. You may be persuaded by an argument you encounter or find data that pose a problem you hadn't considered. You may find no data on one topic and a goldmine on another. Shaping your topic in this way is perfectly fine, but don't get trapped in an endless maze of new, or just slightly revised, topics. You want your search to converge on a manageable topic in a reasonable amount of time. Set yourself a deadline by which you settle on a specific question to explore; then, get to work.

## **FINDING AND USING SOURCES**

Economic sources come in two basic types. The first is academic literature: books, articles, and other written works addressing a particular issue. The second is data: numbers and statistics about the world that come in, or can be converted into, numerical form (for example, prices, quantities, income levels).

### **Academic Literature**

Periodical literature was once indexed in cumbersome, hardbound volumes. Nowadays, one can access a huge array of academic journals, working papers, articles, books, and more through online indices and

databases. Many are publicly available on the internet, although some reside on the college's proprietary system (see Appendix A for sources frequently used by economists, such as EconLit.)

Depending on the service you're using, your search can be very deep, including title, author and subject as well as abstracts, tables of contents and related topic fields. This makes electronic searching extremely powerful. As you find relevant articles, review their abstracts and decide on the most relevant, interesting, and useful papers, which you will need to read thoroughly.

Reading academic journals and other scholarly literature on your topic will allow you to invoke the authority of experts in the field to sanction your analysis or to establish the point of departure for your own original contribution. You need to become familiar with what others have written so that you can communicate your findings and originality. These scholarly works will also point you to additional sources. Bibliographies, citations and footnotes may reveal a single, seminal forerunner. Read it. If you come across a "review" or "survey" article (such as those in the *Journal of Economic Literature* or in various *Handbooks in Economics* series), you have hit the jackpot. It will contain an authoritatively complete summary of the literature in the field.

### ***Taking and Organizing Notes***

Because you will find so many sources to help with your research, you need to be meticulous about recording information. You must document your findings and give proper credit to the sources you use (details on this in Chapter Four). To this end, it is immensely useful to become familiar with a citation software at the start of the research process. EndNote, RefWorks, and Zotero<sup>2</sup> are all commonly used and supported programs that will make your early stages of note-taking—and your later stages of putting together the final paper—much easier and more organized.

In addition to keeping track of your sources with a citation software, you should also maintain a file of notes on everything you read. This can be a word processing document or a spreadsheet that, at a minimum, includes the main points of the article, the data and methods used (if applicable) and the main results. Make sure to clearly set off direct quotations by using quotation marks. Avoid paraphrasing, because it will be difficult to separate the original wording from your own later on. You can add your own comments afterwards, but it is important to keep an accurate record of your first encounter with the source.

As your notes grow, group them by topic, alphabetically, chronologically, or otherwise. Pick out important themes and periodically 'reorganize' your document, grouping related papers together. These notes should help motivate your project and will naturally help you create an interesting, coherent review of previous research that will be an important part of your final paper.

These steps will help you have all your references at hand when you are writing the paper, so you won't waste time searching for information later. Additionally, this will help you to separate your own ideas and results from those you found in your sources. This is important for avoiding plagiarizing, which can happen inadvertently as your own ideas blur into what you have "learned" from others. The unacknowledged use of another writer's words *or ideas* is plagiarism, whether intended or not. Poor note taking and sloppy documentation can lead to plagiarism, but such mistakes are easy to avoid with good note taking.

### **Data**

Empirical economics research typically begins with a (large) set of numerical data – say, a list of per capita incomes for every country in the UN or the history of daily closing prices for shares of XYZ Corporation over the last year. In these long lists of numbers, economists look for patterns that reveal some underlying relationship between economic variables and help explain how some part of the economy works. A data set could include hundreds, thousands, or even millions of entries; thus, statistical tools are used to summarize this information and ease your job of communicating with your audience.

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<sup>2</sup> This software – as well as training on how to use them – are freely available through Harvard Library.

In general, you will not have the time or resources to go into the field and compile your own data - administer questionnaires, study individual balance sheets, budgets, etc. (though there are always exceptions. Each year, several students use surveys or computer experiments in a lab setting for their course papers or senior theses).<sup>3</sup> Most students will rely on others to collect their data, including other economists as well as demographers, auditors, and “official” statisticians. These data are compiled in a number of data sources with detailed information such as public and private spending, wage and tax rates, and work force size and education levels, as well as large amounts of other information at the industry, state, and national levels (see Appendix B).

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<sup>3</sup> If you are interested in gathering your own data, you should be aware of the Committee of the Use of Human Subjects (CUHS), which serves as the Institutional Review Board (IRB) for Harvard.  
<http://cuhs.harvard.edu>

## Four | Citations and References

Citing the sources you use when you write a paper is a matter of honesty, credibility, and courtesy. When you indicate to your reader that a fact or theory derives from a source, you are being honest by not falsely implying to have originated the fact or theory yourself. You gain credibility by showing your reader that you've done your research. And you are behaving courteously by letting your reader know where to find the same information, in case they want to do further reading.

Each academic journal has their own style particularities for acknowledging sources. However, styles are broadly similar across journals: Writers briefly indicate sources in the text of the paper and provide fuller bibliographical information in a "References" section at the end of the paper. The key is being consistent in whatever style you use. Footnotes are reserved for such substantive matters as suggestions for further reading, an elaboration of a point, an interesting but not germane rebuttal of a source's opinion, and so on.

There are many software packages that make organizing and citing references easier as well as ensuring the use of a consistent style (as discussed in Chapter Three).

### PLACING CITATIONS IN YOUR PAPER

When citing a theory, fact, or idea from a source, cite the source in the text of your paper. Your in-text citation will contain the name of the author(s) and year of publication. The format of this information depends on whether the mention of the source is explicitly part of your sentence.<sup>4</sup>

#### Loud Citation

If you acknowledge the source of an idea in the explicit text of a sentence, cite the name of the author(s) in the body of your sentence and place the publication date in parentheses.

For example:

These theories come in two guises: explicit dynamic theories, i.e., Canning (1992) and Nöldeke and Samuelson (1992), and static solution concepts, i.e., Blume et al. (1993) and Wärneryd (1993).

- Use "et al." (et alias = and others) when authors number three or more.
- Place punctuation, if any is called for, after the parenthetical date.

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<sup>4</sup> Throughout this chapter, we use citation and bibliographic style of the *American Economic Review* (AER), which uses the *Author-Date System* of the Chicago Manual of Style. <http://www.chicagomanualofstyle.org>

### Soft Citation

To evoke a source that substantiates a claim you make, cite the name of the author(s), as well as the date, in parentheses.

For example:

Such “babbling equilibria” are proper (Myerson 1978; Blume 1994), and even strategic stability (Kohlberg and Mertens 1986) does not rule out uninformative equilibria in general.

- Authors are listed in order of publication date.
- Separate multiple sources with a semi-colon.

### Quoting a Source

When quoting directly from a source, you need to provide the page number. This is generally given at the end of the sentence containing the quote.

For example, from Feldstein (1974):

Ever since Harrod’s (1948) discussion of “hump savings,” economists have recognized the importance of saving during working years for consumption during retirement (p. 906).

## LISTING YOUR REFERENCES

When readers want to know more about a source –its title, where it was published, and so on – they will look to the references at the end of a paper. The bibliographical information there makes it possible for readers themselves to track down the source.

The style of the references section varies across journals. Indentation, capitalization, punctuation, and the ordering of information in references define a particular documentation style and should be scrupulously followed. Even boldface, italics, and spacing are important. Whatever style you choose, be consistent in following that style throughout the references section. Using a citation software such as EndNote, RefWorks, or Zotero ensures that your references section is consistent. It also allows you to easily change the style of your references section.

### Types of Sources

The information and formatting of each entry in the references section depends largely on the type of source being referenced. Is the source an article in a journal? A reference work? A book by a single author? An essay in a collection? A working paper? An unpublished doctoral dissertation? In order to format the entry correctly, you need to know.

There are three main types of sources: journal articles, books, and unpublished sources.

- *Journal articles* appear in publications that are issued at regular intervals, or periods; hence “periodical,” a synonym for “journal.” A telltale sign of the journal is the publication date: month (or season) and year. Another sign is the absence of a publisher’s name (such as “Cambridge University Press”).
- The opening pages of a *book* will give such information as author (if there is one), title, name of the publisher, and place and year of publication. A book that is a collection of essays (also

known as an “anthology”) will give the name(s) of its editor(s) and will feature a *Table of Contents* listing the essays in the collection. Such a collection should not be confused with a periodical.

- *Unpublished sources* are available from the individuals who wrote them or the institution that sponsored them. For example: the mimeograph (a photocopied paper or report), the unpublished doctoral dissertation, and the working paper. Other unpublished sources include course lectures, websites, and e-mail messages.

See below for examples of these three types of sources. Note: when accessing sources online, you can usually export the bibliographic information directly to your citation software.

### Basic Guidelines

Whether a source is a journal article, a book, or an unpublished source, you should follow these basic guidelines when formatting it for your references section.

- *Alphabetical listing.* Sources are listed in alphabetical order, according to the last name of the author (or the primary author, if there’s more than one). If the source has no author - e.g., U.S. Bureau of the Census - it should be listed alphabetically according to its initial letter.
- *Author names.* The lead author’s last name is listed before their first name. Subsequent authors are listed first name first.

One author:

Davis, Donald R.

Two authors:

Kohlberg, Elon and Jean-Francois Mertens.

Three authors:

Kandori, Michihiro, George J. Mailath, and Rafael Rob.

Four authors:

Berg, Joyce E., Lane Daley, John Dickhaut, and John O’Brien.

- *Repeat authors.* Sometimes your references will contain multiple sources by the same author(s). In this case, do not spell out the author name(s) again after the first entry; instead, use an underscore (\_\_\_) to signify the name(s). List sources by the same author(s) in order of publication date.

**Krugman, Paul R. and Anthony J. Venables.** 1990. “Integration and the Competitiveness of Peripheral Industry.” In *Unity with Diversity in the European Economy*, ed. Christopher Bliss and Jorge Braga de Macedo, 56-77. Cambridge: Cambridge University Press.

\_\_\_\_\_. 1995. “Globalization and the Inequality of Nations.” *Quarterly Journal of Economics* 110 (4): 857-80.

Note that the second source has the same authors as the first. If the second source had instead been written by Krugman and Young, their names would have to be written out. If the second source had been written during the same year as the first, the first source would be listed as 1990a, the second as 1990b.

- *Inclusive page numbers.* Page numbers are inclusive, referring to the pages on which the entire source may be found, not just the page(s) from which you drew information. If the first and last page numbers share an initial numeral, drop the initial numeral of the last page number: for example, pp. 367-98 (and not pp. 367-398).

### Sample Reference Section Entries

There are many ways to format your references section, depending on the venue. A good rule of thumb is to use the style of a reputable economics journal and to be consistent in using that style. Below are some examples according to the style of the *American Economic Review* (which uses the *Author-Date system* from the Chicago Manual of Style). There are also plenty of resources online about how to format a references section. Once again, the beauty of citation software becomes apparent: it can create a references section for you in almost any style you'd like.

#### *Article Published in a Journal*

An entry for a journal article will contain the following information:

**Author.** Year. "Title of the Article." *Name of the Journal* Volume (Issue Number):  
X-Z.

Note the boldfaced author name and italicized journal name and issue numeral. The second line is indented, as are all lines after the first one.

- No author:  
**Economist.** 1992. "The Economist Survey of China." 325 (7787): 1-22.
- One author:  
**Davis, Donald R.** 1995. "Intra-Industry Trade: A Heckscher-Ohlin-Ricardo Approach." *Journal of International Economics* 39 (3-4): 201-26.
- Two authors:  
**Kohlberg, Elon and Jean-Francois Mertens.** 1986. "On the Strategic Stability of Equilibrium." *Econometrica* 54 (5): 1003-37.
- Three authors:  
**Kandori, Michihiro, George J. Mailath, and Rafael Rob.** 1993. "Learning, Mutation, and Long-Run Equilibria in Games." *Econometrica* 61 (1): 29-56.
- Four authors:  
**Berg, Joyce E., Lane Daley, John Dickhaut, and John O'Brien.** 1986. "Controlling Preferences for Lotteries on Units of Experimental Exchange." *Quarterly Journal of Economics* 101 (2): 281-306.

#### *Books*

In its most basic form, a book will contain the following information:

**Author.** Year of Publication. *Title of the Book.* City of Publication: Name of the Press.

Note the boldfaced author name and the italicized title. The second line is indented, as are all lines after the first one. Even the period after the author name is in boldface.

- Reference works:  
**U.S. Bureau of the Census, Department of Commerce.** 1992. *U.S. Census of Manufactures*. Washington, DC: U.S. Government Printing Office.  
**National Science Foundation/Division of Science Resource Studies.** 1992. *Research and Development in Industry*. Washington, DC: U.S. Government Printing Office.
- By a single author:  
**Rosenberg, Nathan.** 1976. *Perspectives on Technology*. New York: Cambridge University Press.  
**Helpman, Elhanan and Paul R. Krugman.** 1985. *Market Structure and Foreign Trade*. Cambridge, MA: MIT Press.

MA, the abbreviation for “Massachusetts,” is used with “Cambridge” to avoid confusion with the first Cambridge: Cambridge, England.

- An essay in an edited collection:  
**Whinnom, Keith.** 1997. “Linguistic Hybridization and the ‘Special Case’ of Pidgins and Creoles.” In *Pidginization and Creolization of Languages*, ed. Dell Hymes, 91-116. Cambridge: Cambridge University Press.  
**Krugman, Paul R. and Anthony J. Venables.** 1990. “Integration and the Competitiveness of Peripheral Industry.” In *Unity with Diversity in the European Economy*, ed. Christopher Bliss and Jorge Braga de Macedo, 56-77. Cambridge: Cambridge University Press.

The name of the essay is in quotation marks. Note the capitalization scheme. The editor(s) of the collection is noted by the abbreviation “ed.” Inclusive page numbers help the reader easily locate the essay.

### *Unpublished Sources*

- Unpublished Ph.D. dissertation:  
**Clausing, Kimberly A.** 1996. “Essays in International Economic Integration.” Ph.D. dissertation, Harvard University.
- Working paper or discussion paper:  
**Kramarz, Francis.** 1992. “When Repeated Cheap Talk Generates a Common Language.” Institut National de la Statistique et des Etudes Economiques (INSEE) Working Paper.  
**Sopher, Barry and Iñigo Zapater.** 1994. “Communication and Coordination in Signalling Games: An Experimental Study.” Rutgers University Working Paper.  
**Wei, Shang-Jin.** 1996. “How Reluctant Are Nations in Global Integration?” National Bureau of Economic Research Working Paper 5531.  
**Green, Jerry and Nancy Stokey.** 1980. “A Two-Person Game of Information Transmission.” Harvard Institute of Economic Research Discussion Paper 751.

- Mimeograph (i.e., photocopied material)  
**Fujita, Masahisa, Paul R. Krugman, and Anthony J. Venables.** “Agricultural Transport Costs.” Mimeo, MIT, 14 December 1996.
- Class lecture or speech:  
**Foote, Christopher L.** “Introduction to Economic Theory.” Lecture in Economics 970 class, Harvard University, 12 February 1999.
- Website:  
**U.S. Census Bureau.** Accessed 21 February 1999. <http://www.census.gov>
- E-mail message (this often isn’t included in a references section. Instead, an author will mention the electronic communication in the main text or a footnote):  
**Neugeboren, Robert.** “Economic Models.” Personal e-mail correspondence with author, 16 January 1999.

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- Azzimonti, Marina, Eva de Francisco, and Vincenzo Quadrini.** 2014. "Financial Globalization, Inequality, and the Rising Public Debt: Dataset." *American Economic Review*. <http://dx.doi.org/10.1257/aer.104.8.2267>.
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- Bachmann, Rüdiger, and Jinhui H. Bai.** 2013. "Politico-Economic Inequality and the Comovement of Government Purchases." *Review of Economic Dynamics* 16 (4): 565–80.
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# Five | Putting it All Together: The Research Paper

You have chosen your topic, done your research, settled on your ideas, and now you have to write the paper. You should have some data and plenty of notes on what you have read. Now, you need to focus on your question and ideas and assemble the pieces into a structure that makes a solid, interesting, compelling argument.

Remember: writing is a process. Start with a few lines - perhaps an outline of section headings - and then build up detail and flesh out your analysis. While you want enough structure to get started, you also want to allow the overall shape of your paper to evolve somewhat along the way.

## OUTLINE OF A PAPER

While there is no magic formula for guaranteeing a perfect paper, there are several key things to include in a strong, well-crafted research paper.

- Introduction: Pose an interesting question or problem
- Review of Relevant Literature: Synthesize the literature on your topic
- Data/Methodology: Describe your data and discuss your empirical strategy
- Results: Present your results with the help of Tables and Figures
- Discussion: Highlight key results, discuss policy implications, critique methods
- Conclusions: Summarize your work and pose questions for further research

Not every paper will require all of these parts in this particular order. Sometimes the discussion of relevant literature will stand in a section on its own, while other times it will make sense to combine it with the introduction. And, in a theory paper, an in-depth discussion of your model and assumptions, propositions and proofs, and various calibrations will take the place of discussing data and empirical strategies. But, as a general guideline, this is a good model to start with in terms of content and organization. As you read other papers, take time to notice the writing style and organization. Take note of what you like, what works, and what makes for a good, clear, interesting paper.

## THE INTRODUCTION

The introductory section is the place to grab your reader's attention and show that you are writing about an interesting, important, relevant topic. You want to present your question and motivate it. The introduction is also the place to provide a brief summary of your main findings. This is not a suspense novel; there are no points for subtlety or surprise. You should prepare your audience for what you are going to do, and tell them what your key findings are; then, use the rest of the paper to show how you did it.

### **An Example from the Literature**

Generally, in the first few paragraphs of a paper, economists clearly state their research question as well as giving a quick preview of the model and data they use to think about it. This style can be useful to both writer and reader as it establishes the structure of the work that follows and prepares the reader for what is coming. An excerpt from a piece by two of the field's most eloquent authors, Claudia Goldin and Lawrence F. Katz (1996), illustrates a skillful approach to setting up a research question, placing it in the literature, and outlining how the work to follow extends existing research. Notice, in particular, that these steps need not be completely independent.

The piece, taken from the authors' work on the historical relationship between technology, human capital, and the wage structure, starts by presenting the facts motivating the question:

Recent technological advances and a widening of the wage structure have led many to conclude that technology and human capital are relative complements. The possibility that such a relationship exists today has prompted a widely held conjecture that technology and skill have always been relative complements.

Next they explain the existing theories behind this relationship:

According to this view, technological advance always serves to widen the wage structure, and only large injections of education slow its relentless course. A related literature demonstrates that capital and skill are relative complements today and in the recent past (Zvi Griliches 1969). Thus capital deepening appears also to have increased the relative demand for the educated, serving further to stretch the wage structure.

Then they clearly and simply state their question:

Physical capital and technology are now regarded as the relative complements of human capital, but have they been so for the past two centuries?

Next they cite more of the related literature:

Some answers have already been provided. A literature has emerged on the bias to technological change across history that challenges the view that physical capital and human capital have always been relative complements.

Finally they clearly preview their proposed answer to this question:

We argue that capital-skill complementarity was manifested in the aggregate economy as particular technologies spread, specifically batch and continuous process methods of production.

Their paper goes on to establish the empirical evidence that backs up this assertion. As evidenced by the example above, the clarity of your prose, the quality of your research, the organization of your argument, and the rigor of your analysis are the keys to your success as an economics writer.

## REVIEWING RELEVANT LITERATURE

Depending on your assignment, preparing a literature review might entail an in-depth search or referencing the single paper your instructor has assigned. You should have notes on the books and articles you have read (see Chapter Three). Read over your summaries and comments and begin to look for common themes that can organize your review. What is the main point of the article, and how does it relate to your topic? Do other authors offer a similar position? An opposing one? Can you group together and discuss related papers?

As you think through these questions, keep in mind that the literature review has two functions. The first is simply to demonstrate your familiarity with scholarly work on your topic - to provide a survey of what you have read, trace the development of important themes and draw out any tensions in prior research. The second function is to lay the foundations for your paper, to provide motivation. The particular issues you intend to raise, the terms you will employ, and the approach you will take should be defined with reference to previous scholarly works.

In some instances, these two functions will pull in opposite directions: the first toward including as many sources as possible, the second toward selecting only those that are useful for your argument. Your goal is to be thorough but selective. Try to resist the urge to include any paper you get your hands on. Instead, make sure you clearly understand why you're including each paper.

For example, Martin Feldstein begins his article "Social Security, Induced Retirement and Aggregate Capital Accumulation" (1974) with a discussion of the development of economists' thinking on lifetime savings patterns. He starts with a famous early work in the field:

Ever since Harrod's (1948) discussion of "hump savings," economists have recognized the importance of saving during working years for consumption during retirement (p. 906).

"Hump-savings" refers to the shape of an individual's savings curve over time: low at the beginning, higher in the middle, lower at the end. This basic model is used throughout the paper and holds together all that follows. Feldstein cites a number of authors who have observed this regularity in empirical data on personal savings patterns as confirmation of the model. He goes on to argue that while the "hump-savings" model works well to explain most of the observed data, the effect of certain government policies on individual savings has never been measured empirically. In particular, he poses the question: What is the effect of social security on individuals' lifetime savings? He then cites the work of three other authors as well as his own earlier work as examples of this neglect.

In this way, Feldstein presents his current research as a necessary development out of well-established research program, the next question to ask on a line stemming from important ancestors to contemporary scholarly research. The reader is thus prepared for the empirical analysis that follows, which shows that "social security depresses personal savings by 30-50 percent" (Martin Feldstein, 1974).

There are two common mistakes often made by new authors in discussing previous literature: (1) discussing too much literature by including work that is not relevant to the paper at hand and (2) *summarizing* each piece of literature instead of *synthesizing* the existing literature into key ideas. On the second, recognize that, as the author, you need to intelligently and clearly familiarize your reader with the relevant previous research; a lengthy, individual summary of numerous papers does not accomplish this. Instead, you can pull together common findings among several papers or sort a large literature into meaningful strands of findings. Sometimes there is a particular paper worth focusing on; but most of the time, your job as the author is to synthesize a large literature and extract the most relevant, important information for the reader.

Grennen (2013) presents a good example of synthesizing together several papers:

Despite the ambiguity of the predictions from theoretical work on price discrimination and bargaining, the empirical literatures in these areas are still relatively small. This is largely because empirical studies of business-to-

business markets (where both often occur) have been limited by the difficulty of accessing data on transfers between buyers and suppliers. Of the recent empirical studies involving price discrimination (Duggan and Scott Morton 2006; Hastings 2008; Villas-Boas 2009), bargaining (Dranove, Satterthwaite, and Sfekas 2008; Dafny 2010; Ho 2009; Crawford and Yurukoglu 2012), and vertical contracting relationships more generally (Ho, Ho, and Mortimer 2012), only Hastings (2008) and Dafny (2010) have had access to data on the actual buyer-supplier transfers. Hastings (2008) looks at the effects of price discrimination versus uniform pricing between gasoline stations and wholesalers, but does not consider bargaining. Dafny (2010) is interested in diagnosing the presence of market power among providers of employee health insurance, but not analyzing bargaining or price discrimination per se. This paper builds on previous empirical and theoretical research by quantifying several mechanisms previously illustrated in theory and demonstrating new interactions between price discrimination and bargaining in a context where both are important.

This excerpt illustrates how a discussion of previous literature both motivates the importance of your paper and demonstrates your familiarity with what others have written on the topic. Additionally, in light of this discussion of previous work, you want to re-motivate your paper, highlighting what you are contributing to the existing literature.

Depending on the paper, the discussion of previous research might stand alone or might instead be incorporated into the introductory section. Neither way is always right or wrong; it depends on each paper and the style of the writer. Here too, you can look to previous papers for guidance.

## **PRESENTING YOUR DATA AND PROPOSED METHODOLOGY**

Empirical research papers generally have a section(s) dedicated to describing the data used in the paper and the empirical methods you use to try to use that data to answer your research question.

In discussing the data, you should say where you found the data and provide a table of simple statistics to summarize them. You should explain how the data relate to your hypothesis and note any problems they pose. If you have only a small set of observations, or have to use proxies for data you cannot directly observe, you should explicitly acknowledge this. For example, Madrian (1994) writes:

To study the phenomenon of job-lock, one would like information on individual and family health status, worker mobility, and the health insurance plans of both the firm for which and individual works and to which one could move.

Unfortunately, information on health status and health insurance is not widely available in labor force surveys, information on worker mobility is not typically available in health surveys, and information on insurance plans of companies for which an individual could have worked is nonexistent.

Madrian goes on to offer an alternative method to study job-lock by looking at two groups of workers who are similar in all respects but one: one group has employer provided health insurance and the other does not. She then measures the number of times the workers change jobs and observes a significant negative relationship between employment-based health insurance and job turnover.

You also want to clearly discuss the empirical techniques you will use to try to answer your posed question. In doing this, you will need to write out your econometric equation and make clear the units of analysis. Are the variables in your equation clearly defined? Have you made clear which is/are the

coefficient(s) of most interest in your equation(s)? Are these country, state, city, company or individual level observations? Over what time period? Once again, other papers can be an excellent guide on how to clearly and completely inform your reader of your econometric plans.

## **PRESENTING YOUR RESULTS / BY CHRIS FOOTE**

One of the more common mistakes made by authors of economic papers is to forget that their results need to be written up as carefully and clearly as any other part of the paper. There are essentially two decisions to make. First, how many empirical results should be presented? Second, how should these results be described in the text?

### **How Many Results Should I Report?**

Less is usually more. A common mistake made by virtually all novice researchers (including graduate students) is to include every parameter estimate from every regression specification that was run. Such a “kitchen sink” approach is usually taken to show the world that the researcher has been careful and done a lot of work and that the main results of the paper are not sensitive to the choice of sample period, minor changes in the list of regressors, etc. However, pages of parameter estimates usually muddy the message of the paper. The reader will get either lost or bored. A good general rule is to present only those parameter estimates that speak directly to your topic.

For example, 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 - more “able” people earn more at their jobs, i.e. have a high residual in the wage equation, 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 probably not available, assume for the sake of exposition that a special dataset 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. Your table might look something like this:

**TABLE I: 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 Obs.	35,001	35,001	19,505	19,505
No. of Persons	5,505	5,505	4,590	4,590
Adj. $R^2$	.50	.55	.76	.79

Notes to Table I: 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 one if the individual’s second grade teacher classified the individual as “able,” zero otherwise. Each regression also includes yearly dummies, 10 one-digit industry and 20 Census defined occupation dummies, labor market experience (defined as age - 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 state of residence is not available for some individuals.

Note that Table I does not present the parameter estimates of your control variables, regressors such as marital status and seniority, but presents any details that helps interpret the parameters of interest (including the identification of the dependent variable, which is annoyingly left off of many tables). For example, explain how you define labor market experience as well as why the third and fourth regressions have fewer observations than the first and second regressions. The notes to your table should be extensive enough so that the reader does not have to look back at the text to understand what is being presented. The cardinal sin, to be avoided at all costs, is to report your estimates in terms of “a” or “b” (the actual Greek letters from your equations) without stating what these coefficients mean. Using eight-letter abbreviations from your Stata or SAS program (YEDUCT1 or ABIL25A) is not much better.

Don’t worry about repeating yourself in the text and the notes - this will often be necessary so the reader can understand your table without looking back at the text. You should present enough information in total so that a researcher could replicate your results. For very detailed projects, this may require a data appendix. Finally, the notes to the table should indicate whether you are reporting standard errors or t-statistics in the parentheses underneath the coefficients. Both are seen in the literature, so you must be clear which you are using. As a general rule, it is better to report standard errors. That way, your readers can more easily choose the statistical method they would like to use in evaluating your numbers.

After presenting these results you may want to discuss any additional robustness checks that you performed. The third and fourth columns of Table I are robustness checks of sorts; they show that the effect of including ability in the regression is the same whether or not we include state level dummy variables. We may also have checked whether the estimate of the education effect is lower when ability is included, if we subset only on male household heads or if we restrict the sample to the 1990s. Sometimes all that is necessary is to let the reader know in the text that you performed these tests and that the main results were

unaffected. For a single robustness check, this information can even appear in a footnote keyed to the relevant portion of the text. If there are many robustness checks however, you may want to present these results in another, more parsimonious table.

### **How Should I Describe My Empirical Results in the Text?**

After you decide how to make your tables, graphs, and figures, you should clearly and precisely describe them in the text. Establish the main point of the table in the topic sentence of a paragraph. For example, you can describe the above table like this:

Table I 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 and the education effect 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 I are therefore consistent with the hypothesis that the OLS estimates suffer from an upward ability bias.

Note that the first and last sentences in this paragraph are “big picture” statements, describing how the results in this table fit into the overall theme of the paper.

Too often, authors do not pay close attention to the paragraphs that describe their results. The results are already in the table. What difference does it make how they are described in the text? The reason to craft these descriptive paragraphs carefully is that any well-designed empirical project is complex; a lot of factors must be considered in order for any single factor to be precisely estimated. You want to guide the reader and focus his or her attention on the important parts of the table, and in the right order. Moreover, no empirical paper turns out perfectly. Usually the data do not resoundingly support each and every idea. In these cases, it is crucial to discuss your results as honestly and carefully as possible.

For example, assume that you are studying the effect of the population share of lawyers in a city on the subsequent growth rate of that city. Your theory says that cities with lots of lawyers will grow more slowly than other cities, but the same is not true of cities with lots of other highly education professionals, such as doctors. You get data on the population percentage of both doctors and lawyers in 25 cities in 1950 and on the growth rates of these cities as well as the Census region for each city (Mountain, Pacific, Mid-Atlantic, etc.) from 1950 to 1990. Your regression places the 1950-1990 growth rate of the city on the left hand side; the regressor of interest is the “lawyer share” of population. The results are presented in the table below:

**TABLE II: Estimates of the Effect of Lawyers on City Growth**

*Dependent variable: City's Population Growth Rate, 1950-1990*

	(1)	(2)	(3)
Share of Lawyers in Population, 1950	-.09 (.01)	-.08 (.03)	-.07 (.05)
Share of Doctors in Population, 1950		.05 (.03)	.05 (.05)
Region Dummies Included?	No	No	Yes
No. of Obs.	25	25	25
Adj. $R^2$	.10	.12	.50

Notes to Table II: Standard errors are in parentheses. The shares of doctors and lawyers are taken from the Five Percent Public Use Micro Sample of the 1950 U.S. Census and are defined as the share of each profession among employed persons in the population aged 25-64. A "city" is defined as Standard Metropolitan Statistical Area; constant SMSA definitions are used from 1950 to 1990. Region dummies correspond to the 10 "major regions" as defined by the Census Bureau.

A bad way to write up this table is:

The first column of Table II shows the main effect predicted by theory. The second column shows that doctors do not have the same effect on city growth. Finally, the inclusion of regional dummy variables does not significantly affect the main point estimates, though statistical precision is lost.

A better way to write up the table is like this:

Table II shows that a high share of lawyers in a city's population appears to lead to slower growth. Yet, when all the determinants of city growth (such as Census Region) are accounted for, the estimate of this effect becomes less precise. The first column shows that a 10 percentage-point increase in the lawyer share of population decreases the future city growth by about .9 percentage points. Column 2 shows that, by contrast, a high doctor share does not lead to lower growth. In fact, the point estimate for the doctor share is positive, though not statistically significant. Note however that the estimates in Column 2 are less precise than those in Table 1, as the standard error for the lawyer effect rises from .01 to .03. Since the doctor and lawyer share are strongly (positively) correlated, multicollinearity reduces the precision of the regression. Statistical precision becomes even more of a concern in Column 3, when we add dummy variables for Census region. The size of the lawyer effect remains about the same (-.07 compared with -.09 and -.08), but adding so many new regressors causes the standard errors to rise to the point that the lawyer effect is statistically indistinguishable from zero. The implication is that lawyers do have a negative effect on city growth; however, although the point estimate is robust to the

inclusion of other relevant variables, it is not precisely estimated because of the small sample size.

### **The Bottom Line**

When writing up your empirical results, focus on what is important and be as clear as possible. You may feel that you are repeating yourself and that the reader may be offended at how closely you are leading him or her through your tables and graphs but, to paraphrase John Kenneth Galbraith, both smart and dumb readers will appreciate your pointing things out directly and clearly. The dumb readers need the help, and the smart ones will take silent pleasure in the knowledge that they didn't need your assistance!

## **DISCUSSING YOUR FINDINGS**

Many of the topics that interest economists have real world policy implications. Your own research may present strong findings about the effects of existing or proposed policies. While this is fine, you should not conclude that "this should be done" or "this should not be done." You should avoid making value judgments and rely instead on economic facts and analyses. Even when you have reached your own conclusions about which policy is desirable, your reader should be able to consider the facts and make the policy decision for himself or herself.

For example, you may find that substituting policy X for current policy Y would raise GDP by two percent. That is an appropriate conclusion in a term paper. Be careful, however, not to simply assert that policy X should be substituted for policy Y. For one thing, it can be very difficult to measure the welfare consequences of a given set of policies. Dollars and cents may be easy to measure, but individuals' well-being is not. In addition, your own research may not have accounted for certain distributional issues, legal issues, matters of national sovereignty or any number of other things that ultimately affect the desirability of a given policy.

In the discussion of your findings, you should also point out the limitations of your research, say the relatively small number of observations you have or the simplicity of the functional form you have tested. In an undergraduate term paper, such limitations are expected. You may have incomplete data, or your regression coefficients may not be significant, or you may not have controlled for all the factors involved. It is better to acknowledge these shortcomings than to make overly broad and unsupported statements. In general, it is better to show your instructor that you understand the limits of your method than make broad claims you do not support. You can also suggest questions or alternative approaches for further research.

Once you have completed the discussion of your findings, you can add a short conclusion summarizing what you have done. Then go back and write an introduction that provides a roadmap for the reader. If you have budgeted your time, you should have a chance to revise the paper, with the goal of achieving greater clarity. Finally, ask a friend to proofread your work.

# Appendix A | Searching through Existing Literature

## **EconLit**

Produced by the American Economic Association, EconLit is the premier source for searching for economics research. It “indexes over 120 years of economics literature from around the world,”<sup>5</sup> including journal articles, articles in collected volumes, books, book reviews, dissertations, and working papers licensed from the Cambridge University Press’ Abstracts of Working Papers in Economics. Available through Harvard Library: <http://library.harvard.edu>

## **National Bureau of Economic Research (NBER) Working Papers Database**

The NBER’s website indexes the working papers of affiliated faculty. This is an excellent source for empirical work in progress. Full copies of working papers are available free to subscribers and for a small fee to others from the website or through the mail. They are also available in many academic libraries. <http://papers.nber.org>

## **Social Science Research Network (SSRN)**

The SSRN Electronic Library has a large collection of downloadable full text documents from various working paper series, economics departments around the world, and more. <http://papers.ssrn.com/sol3/DisplayJournalBrowse.cfm>

## **LexisNexis Academic**

This database indexes and abstracts the statistical content of selected United States government publications, state government as well as business and association publications. The abstracts include a detailed description of a publication’s statistical contents and primary bibliographic information. Available through Harvard Library: <http://library.harvard.edu>

## **RePEc (Research Papers in Economics)**

This website calls itself a “decentralized database of working papers, journal articles and software components.” <http://www.repec.org>

## **Individual Economics Departments’ Websites**

Many economics departments make faculty working papers available on their websites. They can be particularly good sources for theoretical work in progress or for empirical work done by researchers not affiliated with the NBER. For links to economics departments around the world, see <http://edirc.repec.org>.

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<sup>5</sup> From <http://www.aeaweb.org/econlit>.

# Appendix B | Data Sources

There are many sources of data available in hard-copy as well as on the internet. Here is a small sampling of some commonly used data to help with your research. This list is by no means exhaustive; it's simply something to let you know what's out there and to help you get started on a data searching adventure.

## UNITED STATES DATA

### **Bureau of Economic Analysis (BEA)**

The BEA is an agency of the Department of Commerce, provides data on GDP, industrial output and investment as well as international trade. <http://www.bea.gov>

### **Bureau of Labor Statistics (BLS)**

The BLS reports on a diverse set of indicators including unemployment, the consumer price index as well as lesser known data on topics such as work stoppage, collective bargaining, occupational injury and illness rates, and more. <http://stats.bls.gov>

### **Census**

Conducted every ten years, the census serves as a vital source of a variety of data on the people and economy of the U.S.. <http://www.census.gov>

### **Consumer Expenditure Survey (CES)**

Conducted since 1889, the CES obtains data on frequently purchased items, such as food or housekeeping supplies, as well as on major items of expense, such as property or vehicle purchases. This is a key source of consumption data. <http://www.bls.gov/cex>

### **Current Population Survey (CPS)**

A monthly survey of about 50,000 households, the CPS has been conducted since 1968. In addition to providing estimates of employment, unemployment, earnings, and hours of work by occupation, industry, and class of worker, it also sheds light on a variety of demographic characteristics including age, sex, race, marital status, and educational attainment of the labor force. Supplemental questions provide information on a variety of topics, including school enrollment, income, previous work experience, health, employee benefits, and work schedules. <http://www.census.gov/cps>

### **Data.gov**

[Data.gov](http://data.gov) provides access to a large amount of data collected by the government. The site launched in 2009 and took the place of Fedstats, <http://www.fedstats.gov>.

### **Economic Report of the President**

Published annually, the Economic Report of the President includes: (1) current and foreseeable trends in and annual goals for employment, production, real income, and Federal budget outlays; (2) employment objectives for significant groups of the labor force; and (3) a program for carrying out these objectives.

<http://www.gpo.gov/erp>

### **Federal Reserve Economic Database (FRED)**

FRED provides historical U.S. economic and financial data, including daily U.S. interest rates, monetary and business indicators, exchange rates, balance of payments, and regional economic data for Arkansas, Illinois, Indiana, Kentucky, Mississippi, Missouri, and Tennessee. <http://www.research.stlouisfed.org/fred2>

### **Integrated Public Use Microdata Series (IPUMS)**

Census and Current Population Survey (CPS) data from the U.S., as well as around the world. This website also has links to other U.S. data on health, time-use, the environment, and more. <https://www.ipums.org>

### **National Longitudinal Survey (NLS)**

The NLS currently provides 6 panels of information about the labor market experiences and other aspects of the interviewees. The surveys also include data about a wide range of events such as schooling and career transitions, marriage and fertility, training investments, child-care usage, and drug and alcohol use. The breadth of these surveys allows for analysis of a variety of topics such as the transition from school to work, job mobility, youth unemployment, educational attainment, and the returns to education, welfare reciprocity, the impact of training, and retirement decisions. <http://www.bls.gov/nls>

### **Panel Study of Income Dynamics (PSID)**

A longitudinal household survey of socioeconomic and health issues, collected since 1968.

<http://psidonline.isr.umich.edu>

### **Statistical Abstract of the United States**

Published annually from 1878 until 2012, the Statistical Abstract is a collection of statistics on social and economic conditions in the United States. Selected international data are also included. It is a great source of information on relevant primary data sources available from the Census Bureau, other Federal agencies, and private organizations. <http://www.census.gov/compendia/statab>

## **INTERNATIONAL DATA**

### **Bill Goffe's Resources for Economists on the Internet**

Hundreds of links to U.S., non-U.S., and financial data, as well as data from many journal articles.

<http://rfe.org>

### **Bureau for Research and Economic Analysis of Development (BREAD)**

They have provided a large list of potential data sources.

[http://ipl.econ.duke.edu/dthomas/dev\\_data/index.html](http://ipl.econ.duke.edu/dthomas/dev_data/index.html)

### **Global Development Finance (GDF Online)**

You need to use the Harvard Library website to access their data.

<http://publications.worldbank.org/GDF>

### **Harvard Center for International Development (CID) Datasets**

<http://www.cid.harvard.edu/ciddata/ciddata.html>

### **Harvard-MIT Data Center (HMDC)**

Part of Harvard's Institute for Quantitative Social Science (IQSS) and provides access to a large amount of social science data. The HMDC is also a source of research and computing support.

<http://projects.iq.harvard.edu/hmdc>

### **Integrated Public Use Microdata Series, International (IPUMS-International)**

Census data from around the world. <https://www.ipums.org>

### **International Food Policy Research Institute (IFPRI)**

In particular, check out the "Resources" and "Countries" tabs.

<http://www.ifpri.org>

### **International Monetary Fund (IMF)**

You need to use the Harvard Library website to access some of their data.

<http://www.imf.org/external/data.htm>

### **Inter-University Consortium for Political and Social Research (ICPSR)**

ICPSR culls a wide variety of data on topics such as education, aging, mental health, criminal justice, terrorism, and more. <http://www.icpsr.umich.edu>

### **National Bureau of Economic Research (NBER)**

A wide variety of both current and historical macro, industry-level, and individual data. Their listings include the CPS and extracts from the CES. <http://www.nber.org>

### **Organization for Economic Co-operation and Development (OECD) Aid Statistics**

<http://www.oecd.org/investment/stats>

### **Penn World Tables**

<https://pwt.sas.upenn.edu>

### **United Nations**

<http://data.un.org>

### **World Bank**

Some data are available through their website; but for some, you will need to gain access through the Harvard Library website. <http://data.worldbank.org>

### **World Bank PovcalNet**

A particularly useful data source from the World Bank for calculating poverty lines as well as common poverty measures like the headcount ratio, Gini, poverty gap, and more.

<http://iresearch.worldbank.org/PovcalNet/jsp/index.jsp>

# Appendix C | Fields in Economics

The economics approach is applicable to a wide range of issues, which can make finding a topic for your paper feel overwhelming. But this also means you can probably find a topic about which you are really interested. If you have not been exposed to the variety of fields of economics, below is a sample of some fields in economics to help you get started. Note that list this is by no means exhaustive!

## DEVELOPMENT

Development economics studies the unique aspects of and situations in developing countries, considering social, political, institutional and cultural aspects. Research in development economics can range from broad, macroeconomic questions such as what factors impact economic growth in poorer countries, to specific questions of what policies best help particular individuals in particular regions of particular countries; from questions about farming decisions and productivity in rural areas to questions about housing, disease and informal labor in urban areas; from questions about corruption and governance to questions about the role of assistance from foreign countries; and more.

## ECONOMIC HISTORY

It is hard to gain a coherent picture of an economy without understanding how it evolved and what history teaches us about how different economies function. It is important to learn about qualitative and quantitative consequences of the industrial revolution for levels of wealth, the sectoral distribution of production, the distribution of income, the state of technology, the role of government, and the development of commerce. It is important to learn which of current economic institutions and behavioral relationships have persisted over long stretches of time and which are relatively new. It is also important to be exposed to the wide range of past economic problems, so they can know how standard micro and macro techniques apply, and where they fail. Things change, but it can look as if the institutions and practices of today have existed forever. A historical perspective can help bring the issues of today into better focus, just as it can help explain events in the past and offer a trajectory toward the future.

## ENVIRONMENTAL ECONOMICS

Few areas of economics have grown so rapidly in recent years as environmental economics. As people have greater realization that important natural resources are in finite supply, attempts to conserve and recycle have gained momentum. Because very few questions of environmental policy can be cast purely in terms of black

and white, economists, with their long tradition of analyzing trade-offs, have played important roles in designing environmental regulations. Questions asked include: Does it make most sense to reduce pollution by setting emission standards or through using tax policy to create incentives for emissions reductions? How can we decide which species have the greatest priority for protection? What does “sustainability” consist of?

## **FINANCE**

Robert Merton and Myron Scholes won the 1997 Nobel Prize in Economics for their options pricing model, a relatively simple equation that spawned the field of financial economics. Financial economics studies the behavior and structure of financial markets and institutions, including commercial banks, insurance companies, investment banks, mutual funds - players in the stock and bond markets. Some research focuses on corporate finance and the capital structure of firms, the kinds of analyses that go on inside a corporate finance department of a Wall Street investment bank. Others look at portfolio management and the analysis of risk, arbitrage, and time discounting applied to the valuation of various financial assets. Financial economics has taken on an increasingly international perspective, comparing the financial systems of different countries, for instance, or analyzing the links between the development of local capital markets and the real economy.

## **GAME THEORY**

Game theory is a field of economics focused on understanding the behavior of agents in strategic situations. A simple game theoretic example is the *Prisoners' Dilemma*, which you learn in microeconomics. This idea of strategic thinking and decision making can be applied to many fields of economics, such as political decisions in international economics and political economy; farmers' decisions in development economics; pricing strategies between competitors in microeconomics; and much more.

## **HEALTH ECONOMICS**

Like all things we study in economics, the resources available for health issues are finite. The field of health economics is concerned with the allocation of health and health care, and the functioning of health care systems. Research in health economics can cover a variety of topics, ranging from estimating the impact of policies or procedures on health outcomes and the impact of health outcomes on economic outcomes, to analyzing the effect of certain types of health care systems on health and employment outcomes, to studies examining organ donation behavior, pharmaceutical expenditure decisions, and more.

## **INDUSTRIAL ORGANIZATION (IO)**

Industrial organization seeks to apply economic theories of markets to actual industries and firms in the United States and other developed industrial economies. The inquiry starts by comparing the motives of actual enterprises to those that economic models assume the firm possesses. The industrial organization field is built around a structure-conduct-performance framework. The constraints imposed on firms by their environments and their competitors lead them to certain strategic choices and activities, which have impacts on the performance of markets as social allocation devices. It is less business-oriented than policy- and theory-oriented, although IO analyses hold considerable relevance for those planning business careers.

## **INTERNATIONAL ECONOMICS**

Both historically and today the field of international economics has been and is policy-oriented: What should governments do? How should they regulate the cross-border economic relationships that their citizens enter into? As world trade and finance becomes more salient, international economics threatens to become coterminous with the study of economic policy in general. Today, even in such a large economy as the United States, it is very difficult to examine issues in public finance, macroeconomics, industrial organization, or labor economics without paying very close attention to the international context.

## **LABOR ECONOMICS**

Labor economics applies basic tools of microeconomics to the analysis of labor markets and the determination of the wage rate. What are the arguments for and against a minimum wage? What factors explain wage differentials? It distinguishes itself by two features. First, it is an intensely empirical sub-field, in which students are expected to analyze data - often from very large computerized data sets - as part of their study. Second, it is one of the few subfields where actual empirical fieldwork - visits to companies and unions - is encouraged. Labor economics requires a good knowledge of price theory and a sound grasp of statistics.

## **MONETARY AND FISCAL POLICY**

The two principal ways that public policy affects the course of the economy in the United States are the government's monetary policy - implemented in financial markets by the country's central bank, the Federal Reserve - and fiscal policy, implemented through the taxing and spending decisions that Congress and the President make (or fail to make). Politicians assume, and economists believe, that such monetary and fiscal policies can exert very strong influences on such determinants of economic welfare as the rate of inflation, the rate of the economy's growth, the level of employment, and ultimately the standard of living.

## **PSYCHOLOGY AND ECONOMICS (BEHAVIORAL ECONOMICS)**

Behavioral economics is focused on the influence of psychology on individuals' decisions. Of particular interest among behavioral economics is challenging the assumption that economic agents have unbounded rationality and selfishness, using psychological factors to understand individuals' decisions. Research in behavioral economics is hugely diverse, as it can overlap other fields of economics: how do perceptions of risk influence financial agents' decisions? How does one's mood affect valuation of products? How do social norms among doctors influence medical decisions? How do altruism, willpower, aversion to inequity, and trust affect decisions in a variety of circumstances?

## **PUBLIC FINANCE**

Topics stressed in this field include efficiency and equity arguments for government "interference" in market economies, what it means for the government to provide a level playing field on which private economic activity can take place, theories advanced to explain actual choices by representative governments, the effects of government tax and expenditure decisions on the allocation of resources, and the distribution of well-being. Special attention is given to the fiscal institutions of the United States.

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