# Writing Tips For Economics Research Papers*

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## 1  General Tips about Writing Style

When I read your term papers, I look for your ability to motivate your question using economic logic, your ability to critically analyze the past literature, and your ability to recognize empirical problems as they arise. In particular, it is important that your term paper demonstrates that you are more knowledgeable, analytic, and sophisticated about the economics of health or development economics than we would expect, say, a clever editorial writer for The New York Times to be. You should present evidence, cite literature, explain economic trade-offs, and generally approach the issue from an analytic perspective. Sometimes, a student is tempted to stray into opinion-page, journalistic writing in his or her term paper. Do not do this.

Teaching good economics writing is one of the goals of the departmental writing requirement and is a valuable lesson for potential thesis writers. You will get a lower grade if your writing is

- ungrammatical,

- unclear,

- journalistic.

If you have trouble writing grammatically, please leave yourself some extra time and go to a writing tutor[1]. Clarity is the first priority in economics writing. Do not worry about being "snappy" if you are being clear. Journalistic writing is characterized by the lack of an analytical tone.

Below, you will find some notes about the "economics style" of writing. The desirable style of writing is exemplified by most of the papers on the syllabus. Economists have a certain writing style that can be picked up easily and is useful to learn if you want to be taken seriously by other economists. Some of the points of style may seem arbitrary, but follow them anyway.

- Favor the present tense. For instance: "Feldstein (1976) finds that..." or "In this paper, I attempt to...."

- Cite articles and books as above, not: "Martin S. Feldstein, in a 1976 journal article...."

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[1]See http://www.fas.harvard.edu/~wricntr/

- Favor the active tense.

- Use "I" when you mean "I" and use "we" when you mean "we." For instance, you might use "we" to talk about something that everyone could be expected to appreciate: "We expect that highly selective colleges enroll few students who had low grades in secondary school." Use "I" to talk about what you did: "I use data from...." You are correct if you have noticed that economists often avoid using any personal pronouns. This is not necessarily a good thing, however.

- Avoid adjectives and verbs that are overly dramatic. For instance, "the results shatter our expectations" is too much.

- Do not use contractions or abbreviations such as: e.g., i.e., etc.. Write out the equivalent words: for instance, that is, et cetera. Latin and other foreign languages should be in italics or underlined: "Feldstein et al (1976)...."

- It may seem boring to keep using phrases like "The results show...," "The estimated coefficient on...," or "is not statistically significantly different from zero." Use them anyway or use something equally clear. When reading your "Results" section, readers are trying to keep track of things, so they will tolerate a less than scintillating delivery in the interest of clarity.

- Keep non-economics comments for your first paragraphs and your conclusion. For instance, if your results have interesting political implications, you can motivate them in the introduction and return to them in the conclusion. Leave them out of the body of the paper, however, unless they are actually part of the model.

- If in doubt about whether to include some non-economics content, leave it out. Students tend to include too much, rather than too little, political and social commentary.

- Keep sentences short. Short words are better than long words. Monosyllabic words are best.

- Repetition is boring. I repeat: repetition is boring. Cut, cut, and then cut again.

- The passive voice is avoided by good writers.

- Positive statements are more persuasive than normative statements.

- Use adverbs sparingly.

- Avoid jargon. Any word you don't read regularly in a newspaper is suspect.

- Never make up your own acronyms.

- Avoid unnecessary words. For instance, in most cases, change o "in order to" to "to" o "whether or not" to "whether" o "is equal to" to "equals"

- Avoid "of course, "clearly," and "obviously." Clearly, if something is obvious, that fact will, of course, be obvious to the reader. # The word "very" is very often very unnecessary.

- Keep your writing self-contained. Frequent references to other works, or to things that have come before or will come later, can be distracting.

- Put details and digressions in footnotes.

- To mere mortals, a graphic metaphor, a compelling anecdote, or a striking fact is worth a thousand articles in Econometrica.

- Keep your writing personal. Remind readers how economics affects their lives.

- Remember two basic rules of economic usage: "Long run" (without a hyphen) is a noun. "Long-run" (with a hyphen) is an adjective. Same with "short(-)run." and "Saving" (without a terminal s) is a flow. "Savings" (with a terminal s) is a stock.

- Buy a copy of Strunk and White's Elements of Style. Also, William Zinsser's On Writing Well. Read them—again and again and again.

- Keep it simple. Think of your reader as being your college roommate who majored in English literature. Assume he has never taken an economics course, or if he did, he used the wrong textbook.

- Be your own worst enemy. If you won't, someone else will.

# 2   Organization of the Paper

*(keep much of this section in mind for later when you have actual results from your analysis)*

Figure out the one central and novel contribution of your paper. Write this down in one paragraph. As with all your writing, this must be concrete. Don't write "I analyzed data on the HIV epidemic and found many interesting results." Explain what the central results are. For example, Oster (2009) starts her abstract with: "I estimate behavioral response using a new instrumental variables strategy, instrumenting for HIV prevalence with distance to the origin of the virus. I find low response on average, consistent with existing literature, but larger responses for those who face lower non-HIV mortality and for those who are richer."

Distilling your one central contribution will take some thought. It will cause some pain, because you will start to realize how much you're going to have to throw out. Once you do it, though, you're in a much better position to focus the paper on that one contribution, and help readers to get it quickly.

Your readers are busy and impatient. No reader will ever read the whole thing from start to finish. Readers skim. You have to make it easy for them to skim. Most readers want to know your basic result. Only a few care how it is different from others. Only a few care if it holds up with different variable definitions, different instrument sets, etc.

Although your writing should not follow a journalistic style, its structure can be organized like a newspaper article. Organize the paper in "triangular" or "newspaper" style, not in "joke" or "novel" style. Notice how newspapers start with the most important part, then fill in background later for the readers who kept going and want more details. A good joke or a mystery novel has a long windup to the final punchline. Don't write papers like that — put the punchline right up front and then slowly explain the joke. Readers don't stick around to find the punchline in Table 12.

Many papers get this wrong, and many readers never really find out what the contribution of the paper is until the last page, the last table.

A good paper is not a travelogue of your search process. The reader doesn't care how you came to figure out the right answer. The reader doesn't care about the hundreds of things you tried that did not work. Save it for your memoirs.

# 3 The Introduction Section

The "foot-in-the-door" parts of your written work is the abstract (the summary of the paper, which you will write at the very end once you have actual results) and introduction. Write them clearly and concisely!

The introduction should start with what you do in this paper, the major contribution. As soon as you mention that, mention something unexpected about it! The reader will be much more motivated to read the rest of the paper if you challenge his or her intuition right from the get-go. Your readers are your audience. They have better things to do than read your paper. Make them interested in your thesis and convinced of your argument in the first two paragraphs.

You must explain your contribution so that people can understand it. Don't just state your conclusion: "My results show that the pecking-order theory is rejected." Give the fact behind that result. "In a regression of x on y, controlling for z, the coefficient is q."

The first sentence is the hardest. Do not start with philosophy, "Financial economists have long wondered if markets are efficient." Do not start with "The finance literature has long been interested in x." Your paper must be interesting on its own, and not just because lots of other people wasted space on the subject. Do not start with a long motivation of how important the issue is to public policy. All of this is known to writers as "clearing your throat." It's a waste of space. Start with your central contribution. For example Oster (2009) starts with "For this reason, sexual behavior change is a major focus of HIV prevention efforts and understanding changes in behavior is important for both predicting the future path of the epidemic and for developing policy. I first present new estimates of behavioral response to HIV, which rely on an instrumental variables strategy. I then consider whether variations in behavioral response across individuals are consistent with utility-maximizing choices in the face of HIV."

Two pages is a good upper limit for the introduction. (given the 15-20 page paper range)

## 3.1 Some Suggestions for Points to Cover in the Introduction Section

Introduction/Motivation Here is the place to lay out explicitly:

1. Upper limit is a page or two (at most!) single-spaced.

2. The question you are trying to address (stating the hypothesis to be tested directly is a good way to do this)

3. Why we should care about this question (Is it an unproven theoretical result? An important policy question? Why should we care from an economic perspective?). This is not the place to do a long literature review. If, e.g., there has been a debate in the literature about this question, just briefly describe the uncertainty. For example, you may want to point out the range of previous results.

4. A good idea is to surprise or puzzle the reader's intuition (much like the purpose of the "Economic Naturalist" assignment) in this section so that he or she would be curious to read the rest of the paper. People are naturally curiosity[2]. If you can invoke the curiosity of the reader with a puzzle in your introduction, it will make for a much more engaging reading.

5. Be sure to state in that section what your contribution is? How are you answering the question? You should state whether you are testing a model, evaluating a program or a change in policy, and what data you are using (but only in a preview fashion!).

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[2] The Book Made to Stick has some specific suggestion on how to do that at http://www.chaosscenario.com/main/files/CHAOSstick.pdf

6. What are your main results? Explain briefly how your findings differ from previous work and what the implications of these findings are. If your analysis is inconclusive (which is fine!) be upfront about this and very briefly state why.

# 4   The Literature Review Section

Do not start your introduction with a page and a half of other literature. First, your readers are most interested in just figuring out what you do. They can't start wondering if it's better than what others have done until they understand what you do. Second, most readers do not know the literature. It's going to be hard enough to explain your paper in simple terms; good luck explaining everyone else's too.

After you've explained your contribution, then you can write a brief literature review. Make it a separate section or otherwise set it off so people can skip it who aren't interested. Remember, it will be very hard for people to understand how your paper is different from others' given that they don't understand your paper yet, and most of them have not read the other papers.

Be generous in your citations. You do not have to say that everyone else did it all wrong for your approach and improvements to be interesting.

It is not necessary to cite every single paper in the literature. The main point of the literature review should be to set your paper off against the 4 or 5 closest current papers, and to give proper credit to people who deserve priority for things that might otherwise seem new in your paper.

Depending on your assignment, preparing a literature review might entail an exhaustive library search or referencing a single paper. You should have notes, either on index cards or in files on your computer, on the books and articles you have read. 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?

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. By drawing on such sources, you can find sanction for your own approach and invoke the authority of those who have written on the topic before you.

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. In any case, more research is better than less, and a summary is always selective, insofar as only some things can be included and others left out. The selections you make will necessarily reflect your own interests and, hopefully, lead the reader to take an interest in the argument you will present.

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).

Don't title your literature review section "literature review"! It is sophomoric. Integrate your discussion of previous literature under the common thread of previous work as it ties to your main point. For example if your paper is "Do Traditional Institutions Constrain Female Entrepreneurship?" you might want to call your literature review "Gender norms in India". In other words, tell your readers what is in the section, e.g., A Model Demonstrating the Finiteness of the Universe.

### 4.1 Some Suggestions for Points to Cover in the Literature Review Section

This section should basically consist of two parts (both of which should be brief).

1. Try to stick to about 2 single space pages.

2. The first section should discuss previous research that is directly relevant to your paper (not every single paper written on the topic). The review need not only be topical, but can include research that employs the same methods you are using, analyzes a similar model, uses the same dataset, etc.

3. Keep in mind that your main contribition will be to the economics discipline. This means, you should be able to relate your work mostly to previous *economics* papers! If you are working on an interdisciplinary topic (such as health), it is fine to cite a couple of papers from another discipline (e.g. epidemiology) that examine a related question, but mostly your work will be judged based on its relation to previous economics papers and how it improves our understanding of economic behavior relative to previous economics work. So, be sure that your literature review consists of papers mostly from economics journals[3].

4. The second section should explain your contribution in more detail. You should discuss how your approach is different from what has been done before: Is it new data? A new model? A new identification strategy? Are you answering a question more broadly/specifically? Specifically comparing how you are improving on a previous paper is useful. You should think creatively in this section about issues of external validity: Are your findings relevant for a population/institutional environment that is different from previous work, and could this be the reason your findings differ?

## 5 Data Section

This section should be approximately 1 single-spaced page.

The section should cover two parts:

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[3]A good list of economics journals is http://www.aeaweb.org/econlit/journal_list.php

- The first should simply describe the name and source of the data you are using and the period it covers. Describe whether you have a panel, cross section or time series, what the unit of observation is and how many observations you have. Discuss limitations of the data such as missing variables, missing observations, survey response, small number of observations, etc. Other obvious shortcomings (i.e. no income data; no men interviewed, only people attending school interviewed, etc.). You may want to highlight the important limitations (e.g. those that you might address in a falsification or robustness check later) in the body of the paper and put the rest in a footnote. It is useful to think about what the ideal dataset would be for the hypothesis you want to test and compare your data to it.

  - Do not forget to provide the sources of your data and to help the reader by making a table that offers summary statistics on each variable. You should define each variable carefully and, if necessary, point out how the empirical measure deviates from its theoretical counterpart. Typical summary statistics that are offered include: max, min, average, and SD values for each variable. It is not unusual to offer histograms and other information for variables with skewed distributions. Excel is a fabulous tool here, and it is easy to get carried away. Remember, your goal should be clarity!
  - This section is the place to offer interesting information about the data. You should also point out the limitations, if any, of your data.

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

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

- The second section should present (relevant) descriptive statistics of the data. You should have a couple of tables with means and standard deviations for the variables you will be using in the analysis (all of the outcomes, independent variables and controls). You may want to present these descriptive statistics for different subgroups (e.g. treatment vs. control; attriters vs. non-attriters; pre vs. post, etc.). The names of the variables should be clear to the reader.

# 6  Identification Strategy

This section should be approximately 1.5-2 single-spaced pages.

These tips verge on "how to do empirical work" rather than just "how to write empirical work," but in the larger picture "doing" and "writing" are not that different. What are the three most important things for empirical work? Identification, Identification, Identification. Identification is just another term for your particular approach of estimating causal effects. Describe your identification strategy clearly. (Understand what it is, first!) Much empirical work boils down to a claim that "A causes B," usually documented by some sort of regression. Explain how the causal effect you think you see in the data is identified.

The literature review sets out the issues that motivate your paper and demonstrates your familiarity with what others have written on the topic. The next step is to formulate a specific question, problem, or conjecture, and to describe the approach you will take to answer, solve, or test it. Often, this will take the form of an empirical hypothesis: "social security depresses personal savings;" "high levels of employment are related to high levels of inflation," etc. An empirical hypothesis makes a claim about how some part of the economy works, and can be assessed by analyzing the relevant data.

In presenting your hypothesis, you need to discuss the data set you are using and, in most cases, the type of regression you will run. You should say where you found the data, and use a table, graph, or 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, in "Employment-based Health Insurance and Job Mobility: Is There Evidence of Job-lock?," Brigitte 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. Madrian is careful not to jump to a hasty conclusion, noting that this correlation is not itself conclusive evidence of job-lock. Employers that provide health insurance often provide other benefits that will affect mobility. In addition, unobserved characteristics of workers' health status may independently affect job sorting and mobility because workers with preexisting conditions may have a harder time getting new health insurance. Still, Madrian's careful analysis controls for as many factors as possible and allows her to conclude: "that there is substantial health insurance-related job-lock." In a term paper, it may not be possible to reach conclusive empirical results. You may have incomplete data, or your regression coefficients may not be significant, or you may not have controlled for significantly all the factors involved. It is better to acknowledge these shortcomings than to make overly broad and unsupported statements.

The section describing how you estimate causal effects related to your hypothesis is the heart of an empirical economics paper in answering your specific "A causes B," question. Having set out the question, reviewed the previous literature, explored the theoretical perspective, (probably) worked with the data, and formulated a hypothesis, you are finally ready to do some analysis. But not yet! You want to lay out your plan of action before you do the analysis. This is precisely the part of the paper in which you should tell the reader what your plan of action is.

In this section, you want to set up a compelling argument about your identification strategy in identifying the causal effect of interest. There are various identification strategies that allow you to estimate causal effects that we have discussed already: OLS (with exogenous variation in X), instrumental variable estimation, difference-in-difference estimation, regression discontinuity designs, randomized control trials. Be clear about what specific identification strategy you use! Assume your reader knows the basics of each method (so don't waste time describing why difference-in-difference is a great method in general) but don't assume they how you apply the specific method in your context.

- For example, if you use an an instrumental variable approach, be specific why instrumental variable estimation is appropriate here, what your $Y$ is, what your key $X$ variable is, what instrumental variable you use.

- If you use a regression discontinuity (RDD), discuss the context of the actual RDD rule, how participants are assigned to program or comparison groups solely on the basis of a cutoff score on a pre-program measure.

As we have discussed already, each method has its benefits, downsides and embedded assumptions. Be upfront about what assumptions you'd be making here. It will be good practice to defend some of these assumptions in your analysis/results section later:

- For example, if you use a Difference-in-Difference (D-in-D) approach, don't discuss the parallel trend assumption here, but be ready to discuss how you can convince the reader that it is not a problem for you in the results section.

You should write out the basic econometric specification first and explain each of the variables and the parameters of interest. Why is this the correct specification for the question you wish to address? Was it derived from theory and has it been used in previous empirical work? Why are certain variables included and others not? You should be very clear about where identification is coming from and what assumptions you need to make in order to interpret the parameters as you wish to interpret them (e.g. discussing exclusion restrictions if you wish to interpret certain parameters as causal). After discussing the basic specification, write out any elaborations or additional tests you will perform and why.

## 6.1 Specific Estimation Strategy Suggestions

- What are biases of a "naïve" estimate (just regressing y on x, or using a full sample from any time or place)?

  - Chosen naïve estimate depends on your identification strategy. Examples: Pooling different types; ignoring a key regressor; excluding the interaction term you're using to identify effect; using cross-section instead of changes; looking across rather than within families, looking at wrong outcome, excluding fixed effects, etc.)

- Describe comparison groups, give intuition/justification for this comparison

- Present findings from Table 1 (the table with your basic descriptive data), discuss anything that stands out in comparison of means. You don't have to discuss every single mean in the table.

- Use subheadings to lead the reader through the different levels of your analysis. You might start with a table that compares averages for two groups, then move to a regression analysis, and, finally, correct the regression for heteroskedasticity or autocorrelation. Often, you will estimate more than one regression model. Use tables to lay out results in the conventional format used by most statistical packages (in fact, often you can simply cut results from the statistical software and paste them into the word processing document that is your paper).

# 7 Results

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?

## 7.1  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 | .031 | .086 | .027 |
| | (.001) | (.003) | (.002) | (.005) |
| Ability Dummy | | .251 | | .301 |
| | | (.010) | | (.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 |

TABLE I. 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 detail 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 $\alpha$ or $\beta$ (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.

## 7.2   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 | -.08 | -.07 |
| | (.01) | (.03) | (.05) |
| Share of Doctors In Population, 1950 | | .05 | .05 |
| | | (.03) | (.05) |
| Region Dummies Included? | No | No | Yes |
| No. of Obs. | 25 | 25 | 25 |
| Adj. $R^2$ | .10 | .12 | .50 |

TABLE II 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 growth) 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 but that although the point estimate is robust to the inclusion of other relevant variables it is not precisely estimated because of the small sample size.

### How Many Decimal Places?

An important issue in reporting regression results is the number of decimal places to use for coefficients and other statistics. In principle the theory of significant figures resolves this issue. However, that theory is complicated and most papers in economics do not follow the rules of significant figures anyway. Therefore we offer a compact, basic set of dos and don'ts.

### Don't report 1.23456789

Don't report the many decimal places displayed by your software. Doing this is called *false precision* and is a serious mistake. It is almost never true that the number is correct to that many decimal places, so when you report all the decimal places you are potentially misleading your reader.

Once you understand that reporting many decimal places is wrong, the natural question is: How many decimal places should be reported? This turns out to be a difficult question.

In practice, economists round by applying a variety of rules of thumb that boil down to a guiding principle of enhancing readability. Decisions on display turn on creating a table that is pleasing to the eye, for example one in which every number is reported to the same relatively small number of decimal places. Although this practice is not well grounded logically, it does usually avoid the sin of reporting too many decimal places.

The desire to enhance readability leads to a suggestion to avoid coefficients with many leading or trailing zeroes. Thus, a number like 0.00123456 is typically reported as 1.23456 and the units of the variable associated with that coefficient are appropriately modified. For example, the coefficient of 1.23456 might correspond to Income measured in thousands of dollars and it is interpreted as the effect of a one thousand dollar increase in income (instead of a one dollar increase in income giving a 0.00123456 increase in predicted Y), holding other included X variables constant. (Of course, you might well end up reporting this number as 1.23 instead of 1.23456)

### Do use the SE as a guide 1.23456789 +/- 0.203040506 → 1.2 +/- 0.2

If you prefer a more logical approach in reporting your results, we recommend that you follow a modified version of a common practice in the hard sciences of letting the SE be your guide. The basic idea behind this often-used approach is that the SE is a measure of the precision of the estimated coefficient. Thus, the SE is used to determine how many decimal places are reported.

To use the SE as a guide, scientists employ the following simple procedure: They find the first non-zero digit in the SE. If it is greater than one, this is the decimal place to which they will

report the coefficient. They round the SE to this decimal place and report the estimated coefficient rounded to as many decimal places as the SE. This is the rule applied in the underlined example above. Here is another example: 0.00456789 +/- 0.0089→0.005 +/- 0.009. The first non-zero digit in the SE is 8, so we round the SE to 0.009 and then we report the coefficient rounded to that decimal place, 0.005.

If the first non-zero digit in the SE is a one, then you apply the same rules to the next decimal place in the SE: 12345.6789 +/- 12.3456789 → 12346 +/- 12. The first non-zero digit in the SE is 1, so we go to the next digit, 2, and round the SE to 12. Then we use the SE as our guide to rounding the coefficient. Note that this rule means that 12345.6789 +/- 1234.56789 should be reported as 12300 +/- 1200. (When you need to round up from 1 to 2, keep the next digit, e.g., if the SE is 0.196, report the SE as 0.20.)

Here's my modification to the scientists' rule of thumb: add one additional decimal place to the results you report beyond what the above rule would give you. Thus, 12345.6789 +/- 12.3456789 → 12345.7 +/- 12.3 and 12345.6789 +/- 1234.56789 → 12346 +/- 123. I make this modification to deal with a disadvantage of the scientific rule: it is hard to compute accurate t-statistics when there are only a limited number of decimal places. Here's an example: Suppose the true values of the estimated SE and the estimated coefficient are 0.344 and 0.663 respectively; then the true t-statistic for the null that the parameter value is 0 is about 1.93. If one were to follow the scientific rule stated above, the estimated SE and the estimated coefficient would be reported as 0.3 and 0.7 respectively. This would lead to a t-stat of about 2.33. Reporting an additional decimal place gives you values of 0.34 and 0.66, which would lead to a t-stat of 1.94.

To be sure, there is no consensus on the matter of significant figures in the economics profession. One thing that is quite clear is that reporting ten or fifteen decimal places is silly and embarrassing. Avoid this. Some rounding must be applied to computer output. While applying "pleasing to the eye," the common practice in the social sciences, is better than nothing, you can do better by considering the likely size of the error in the results.

## 7.3   The Bottom Line

When writing up your empirical results focus only 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!

## 7.4   Miscellaneous

- You will mightily resist this advice. If you can't follow it, at least do not put anything before the main result that a reader does not need to know in order to understand the main result.

- Give the stylized facts in the data that drive your result, not just estimates and $p$ values. For a good example, look at Fama and French's 1996 "Multifactor explanations." In the old style we would need one number: the GRS test. Fama and French show us the expected returns of each portfolio, they show us the beta of each portfolio, and they convince us that the pattern of expected returns matches the pattern of betas. This is the most successful factor model of the last 15 years ...even though the GRS test is a disaster! They were successful because they showed us the stylized facts in the data. Explain the economic significance of your results.

- Explain the economic magnitude of the central numbers, not just their statistical significance. Especially in large panel data sets even the tiniest of effects is "statistically significant." (And when people show up with the usual 2.10 t statistic in large panel data sets, the effect is truly tiny!)

- Of course, every important number should include a standard error.

- Follow the main result with graphs and tables that give intuition, showing how the main result is a robust feature of compelling stylized facts in the data. Follow that with limited responses to potential criticisms and robustness checks. Most of those should end up in your web appendix.

**Tables**

Each table should have a self-contained caption so that a skimming reader can understand the fact presented without having to go searching through the text for things like the definitions of Greek letters. Don't go nuts here; some captions are longer than the paper. In my opinion, you can leave out details of variable construction and similar items. "Book/market ratio" is fine; you don't have to tell me that you got book values in June from Compustat. The goal is to allow a skimming reader to understand the table, not to substitute for the detailed documentation that must be in the paper somewhere.

The caption of a regression table should have the regression equation and the name of the variables, especially the left hand variable.

No number should appear in a table that is not discussed in the text. You don't have to mention each number separately; "Row 1 of Table 3 shows a u-shaped pattern" is OK. "Table 5 shows summary statistics" (period) is not OK. If it's not worth writing about in the text, it's not worth putting in the table.

Use the correct number of significant digits, not whatever the program spits out. 4.56783 with a standard error of 0.6789 should be 4.6 with a standard error of 0.7. Two to three significant digits are plenty for almost all economics and finance applications.

Use sensible units. Percentages are good. If you can report a number as 2.3 rather than 0.0000023, that's usually easier to understand.

**Figures**

Good figures really make a paper come alive, and they communicate patterns in the data much better than big tables of numbers. Bad or poorly chosen figures waste a lot of space. Again, give a self-contained caption, including a verbal definition of each symbol on the graphs. Label the axes. Use sensible units. Don't use dotted line types that are invisible when reproduced. Don't use dashes for very volatile series.

## 7.5 Some Suggestions for Points to Cover in the Results Section and Measurement Issues

- Try to stick to about 3-5 single space pages.

- Interpret coefficients on key variables only presented

- Interpret your results: Explicitly mention the estimated coefficient of the crucial explanatory variable in your analysis and comment on what it means.

- Note both statistical significance & point estimates, interpret magnitude of estimated effect

- Note whether difference between naïve and alternative estimates bigger or smaller

- Are any other coefficients strange/large/unexpected?

- Provide units: When discussing numbers, such as estimated coefficients or predicted Y values, remember to present the units of the numbers.

- If you are testing a hypothesis, present the null hypothesis, compute the test statistic, and report the P-value. State whether you reject or do not reject the null.

- If you are estimating a parameter, report the estimated SE and a 95% confidence interval.

- Discuss any potential remaining biases/shortcomings

- Suggest ways to check these

- Present and interpret results from various other result runs

- Compare your results to others in the literature. Do they support or contradict the relevant economic theory?

- At the end of the empirical section of your paper, you should be able to draw a conclusion, even if it is a negative one. For example, you may find that there is no relationship between divorce and schooling in your data; this is still worth reporting.

- Remember this: No study is absolutely perfect, but if you have done a thorough job in your empirical section, you should be able to reach some answer to your research question. This conclusion will then be inserted into your introductory paragraph in a slightly different form.

# 8 Discussing Your Results

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 2 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 result, 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. 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 results, you can add a short conclusion summarizing what you have done. Then go back and write an introduction that provides a road-map 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. Make necessary corrections and then submit.

## 8.1 Some Suggestions for Points to Cover in the Discussion Section

- Try to stick to about 2 single space pages.

- What are the ambiguities of your results?

- What are different possible interpretations?

- What are strongest arguments for one or the other?

- What directions for future work suggested by your results?

# 9 Conclusions

Really, a conclusions section should not be necessary. If you did a good job of explaining your contribution in understandable prose in the introduction, and then documenting those claims in the body of the paper, (writing in good triangular style), then saying it all over again is pointless. It is true that some people skip to the conclusion to look for the main result, but that's because they are used to authors who don't explain it well enough in the introduction.

Thus, conclusions should be short and sweet. Do not restate all of your findings. One statement in the abstract, one in the introduction and once more in the body of the text should be enough! You can include a short paragraph or two acknowledging limitations, suggesting implications beyond those in the paper. Keep it short though. And don't speculate; the reader wants to know your facts not your opinions.

After writing the conclusion, you should then go to the beginning of the paper and write/rewrite the Introduction with a brief overview of the results and their implications. It should be a snap.

"And then I turn it in?" No, not quite yet. The last thing you should do is **PROOFREAD** your paper. Even after spell checking the paper with your word processor, you should take the time to read it one last time before turning it in. Fix typographical errors, improve wording, and make sure the numbers make sense.

## 9.1 Some Suggestions for Points to Cover in the Conclusion Section

- Try to stick to about 1 single space pages.

- "Policy brief" of your study:

    - What were main findings
    - Why important
    - What does this imply for policy

# 10  Placing Citations in Your Paper and References

When deriving a theory or fact 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 the year of publication. The way this information is formatted depends on (1) whether you wish to draw attention to the source and (2) whether you have referred to the author(s) previously in your paper.

## Loud Reference

If you wish to acknowledge the source of an idea explicitly, cite the name of the author(s) in the body of your sentence and place the publication date in parentheses. The first time you cite the name of the author(s), provide both first and last names:

Vincent P. Crawford and Hans Haller (1990).

Thereafter, refer to the author(s) by last name only:

Crawford (1998)

Thus, a first-time reference:

Sender-receiver games, introduced by Jerry Green and Nancy Stokey (1980) and Vincent P. Crawford and Joel Sobel (1982), provide the simplest stylized environment in which communication is essential.

A reference to authors previously mentioned:  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.

## Soft Reference

To evoke a source that substantiates a claim you make, cite the name of the author(s), as well as the date, in parentheses. As above, the first time you cite the author(s), provide both first and last names:

(Vincent P. Crawford and Hans Haller, 1990; Matthew Rabin and Joel Sobel, 1996)

Thereafter, refer to the author(s) by last name only:

(Crawford and Sobel, 1982; Crawford, 1998)

- Authors are listed in order of publication date.

- Separate sources with a semi-colon.

Thus, in an article that has already cited Andreas Blume:

Such "babbling equilibria" are proper (Roger B. Myerson, 1978; Blume, 1994), and even strategic stability (Elon Kohlberg and Jean-Francois Mertens, 1986) does not rule out uninformative equilibria in general.

## Listing Your References

When readers want to know more about a source – what its title is, where it was published, when it appeared – they will look at your list of REFERENCES at the end of your paper. The bibliographical information there makes it possible for readers themselves to track down the source.

Note that the word REFERENCES is capitalized – because AER Style demands that it be so. 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 count.

## Three Types of Sources

The information contained in a REFERENCES entry and the way in which this information is formatted depend largely on the type of source it is. 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," the 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, which are available from the individuals who wrote them or the institution that sponsored them, are of various kinds: the mimeograph (a photocopied paper or report), the unpublished doctoral dissertation, the working paper, and so on. Other unpublished sources include course lectures, websites, and e-mail messages.

See below for sample entries according to these three types of sources.

## 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.

- Alphabetical listing. Sources are listed in alphabetical order, according to the last name of the author (or the last name of the primary author, if there's more than one). If the source has no author – for example, U.S. Bureau of the Census – it should be listed alphabetically according to its initial letter.

- Formatting author(s)' names. Authors' last names are always listed before their first names. The punctuation separating individual authors' names changes depending on the number of authors.

One author: Davis, Donald R.

Two authors: Kohlberg, Elon and Mertens, Jean-Francois.

Three authors: Kandori, Michihiro; Mailath, George J. and Rob, Rafael.

Four authors: Berg, Joyce E.; Daley, Lane; Dickhaut, John and O'Brien, John.

Note the semicolon (;) used to divide some, but not all, of the names in the three- and four -author examples.

- Repeat authors. Sometimes your REFERENCES will contain more than one source by the same author or authors. In this case, do not spell out the author's or authors' name(s) 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 Venables, Anthony J. "Integration and the Competitiveness of Peripheral Industry," in Christopher Bliss and Jorge Braga de Macedo, eds., Unity with diversity in the European economy, Cambridge: Cambridge University Press, 1990, pp. 56– 77.

___. "Globalization and the Inequality of Nations." Quarterly Journal of Economics, November 1995, 110 (4), pp. 857–80.

Note that the second source above was written by exactly the same authors as the first source. If the second source had been written by Krugman and, say, Young, their names would have to have been spelled out. If the second source had been a book written during the same year (1990) as the first source, the first source would be listed as 1990a, the second as 1990b.

- Inclusive page numbers. Page numbers are inclusive – that is, they refer to the pages on which the entire source may be found, not just the page or two from which you drew a fact or theory. 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 Entries

When formatting your REFERENCES section, use the following sample entries as models. If you don't find the type of source you're looking for, pick up a copy of the American Economic Review in the Lamont Reference Room and try to find a model there, or emulate the closest approximation you can find.

### Article Published in a Journal
An entry for a journal article will contain the following information, formatted as you see:

**Author.** "Title of the Article." Name of the Journal, Month Year, Issue Numeral (Issue Number), pp. X–Z.

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

- No author:

**Economist.** "The Economist Survey of China." November 28, 1992, 325 (7787), pp. 1–22.

- One author:

  **Davis, Donald R.** "Intra-Industry Trade: A Heckscher-Ohlin-Ricardo Approach." Journal of International Economics, November 1995, 39 (3–4), pp. 201–26.

- Two authors:

  **Kohlberg, Elon and Mertens, Jean-Francois.** "On the Strategic Stability of Equilibrium." Econometrica, September 1986, 54 (5), pp. 1003– 37.

- Three authors:

  **Kandori, Michihiro; Mailath, George J. and Rob, Rafael.** "Learning, Mutation, and Long-Run Equilibria in Games." Econometrica, January 1993, 61 (1), pp. 29–56.

- Four authors:

  **Berg, Joyce E.; Daley, Lane; Dickhaut, John and O'Brien, John.** "Controlling Preferences for Lotteries on Units of Experimental Exchange." Quarterly Journal of Economics, May 1986, 101 (2), pp. 281–306.

**Books**
In its most basic form, a book will contain the following information, formatted as you see:

**Author.** The title of the book. City of Publication: Name of the Press, Year of Publication.

Note the boldfaced author name and the italicized title. Only the initial letter of the title is capitalized. The second line is indented, as are all lines after the first one.

- Reference works:

  **U.S. Bureau of the Census, Department of Commerce.** U.S. census of manufactures. Washington, DC: U.S. Government Printing Office, 1992.

  **National Science Foundation/Division of Science Resource Studies.** Research and development in industry. Washington, DC: U.S. Government Printing Office, 1992.

Even the period after Studies is in boldface.

- By a single author:

  **Rosenberg, Nathan.** Perspectives on technology. New York: Cambridge University Press, 1976.

  **Helpman, Elhanan and Krugman, Paul R.** Market structure and foreign trade. Cambridge, MA: MIT Press, 1985.

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.** "Linguistic Hybridization and the Special Case' of Pidgins and Creoles," in Dell Hymes, ed., Pidginization and creolization of languages. Cambridge: Cambridge University Press, 1971, pp. 91–116.

    **Krugman, Paul R. and Venables, Anthony J.** "Integration and the Competitiveness of Peripheral Industry," in Christopher Bliss and Jorge Braga de Macedo, eds., Unity with diversity in the European economy. Cambridge: Cambridge University Press, 1990, pp. 56– 77.

    **Maskus, Keith.** "Comparing International Trade Data and Product and National Characteristics Data for the Analysis of Trade Models," in Peter Hooper and J. David Richardson, eds., International economic transactions: Issues in measurement and empirical research. NBER Studies in Income and Wealth, Vol. 55. Chicago: University of Chicago Press, 1991, pp. 17–56.

The name of the essay is in quotation marks. Note the capitalization scheme. An editor is "ed.," editors are "eds." Inclusive page numbers help the reader easily locate the essay.

### Unpublished Sources

- Unpublished Ph.D. dissertation:

  - **Clausing, Kimberly A.** "Essays in International Economic Integration." Ph.D. dissertation, Harvard University, 1996.

- Working paper or discussion paper:

  - **Kramarz, Francis.** "When Repeated Cheap Talk Generates a Common Language." Working paper, Institut National de la Statistique et des Etudes Economiques (INSEE), 1992.
  - **Sopher, Barry and Zapater, Iñigo.** "Communication and Coordination in Signalling Games: An Experimental Study." Working paper, Rutgers University, 1994.
  - **Wei, Shang-Jin.** "How Reluctant Are Nations in Global Integration?" National Bureau of Economic Research (Cambridge, MA) Working Paper No. 5531, April 1996.
  - **Green, Jerry and Stokey, Nancy.** "A Two-Person Game of Information Transmission." Harvard Institute of Economic Research Discussion Paper No. 751, Harvard University, 1980.

- Mimeograph (i.e., photocopied material)

  - Fujita, Masahisa; Krugman, Paul R. and Venables, Anthony J. "Agricultural Transport Costs." Mimeo, MIT, December 14, 1996.

- Class lecture or speech:

  - **Foote, Christopher L.** "Introduction to Economic Theory." Lecture in Economics 970, Harvard University, 12 February 1999.

- Website:

  - **U.S. Census Bureau.** <http://www.census.gov/> cited 21 February 1999.

- E-mail message:

  - **Neugeboren, Robert.** neugebor@fas.harvard.edu "Economic Models." Personal e-mail, 16 January 1999.

# 11   Appendices

Appendices are a great tool. Take that delicious section that has so many insightful comments on the literature, the general version of the model, the 57 robustness exercises that you did, and dump them in to an appendix. This is a good way to get them out of the paper. Eventually you'll dump them out of the appendix too. Seriously, careful authors, referees and critics often want to document that the main result is robust to various other ways of doing things. You have to do that, but once you've verified that it does not make that much difference and you've found the one best way of doing things in your main result, it isn't worth space in the paper to present all the checks and variations. Appendices are a great way to solve this problem, and you can just summarize all the things you did in the paper. You can put the appendix on your and the journal's website. ("Bond risk premia" with Monika Piazzesi is an example of a web-appendix gone wild.)

# 12   Some Formatting Rules

## 12.1   General

All margins should be one inch.

Use a standard type face in 11 or 12 point font.

Indent your paragraphs.

Double space the text; single space footnotes, endnotes and long quotations.

Single space within each reference entry and double space between reference entries.

Do not attach a cover page. Your first page should cover your title, your name, an abstract and date.

## 12.2   Graphs and Charts

Graphs and charts should have numbers (such as Figure 1 or Table 1) and titles. The source of the data should be indicated at the bottom of the graph or chart. You should include them in an appendix to the paper, right after your section called "References". It is easier to read a working paper if the tabular and graphical material is grouped together.

You can include graphs if you feel illustrating your argument graphically will serve your purpose. Graphs may be neatly hand drawn or you may use a drawing tool included in your word processing software.

## 12.3 Proofreading and Revision

Check for typos, spelling errors, missing pages, incorrect table or figure numbers, missing references, and the like. These are the cockroaches of writing. Exterminate them.

Use the spell-check feature of your word processing software, but do not use it as your sole proofreading measure! Carefully read your draft to correct awkward and/or repetitive phrases, and to reorganize your sentences and paragraphs to improve the flow of the paper and eliminate redundancies. After a careful revision, I recommend that you have another person read the paper, too. Keep in mind that the Writing Center[4] offers assistance, but you must complete a draft in a timely manner to make use of these services.

# 13 Further References

*Several books can help you in writing a research paper.*

*For specific information on economics papers and research, consult the following books:*

- Andreano, Ralph L., Evan Ira Farber, Sabron Reynolds. 1967. The Student Economist's Handbook. Cambridge, Schenkman. call#: Z 7164 .E2 A63

- McCloskey, Donald N. 1987. The Writing of Economics. New York, Macmillan Publishing Co. call#: PE 1479 .E35 M33 1987

- Officer, Lawrence H., Daniel H. Saks, Judith A. Saks. 1980. So You Have to Write an Economics Term Paper. East Lansing, Michigan, Graduate School of Business Administration Division of Research.

*For general help on writing, including organization and style, consult the following books:*

- Strunk, William Jr., and E. B. White. 1979. The Elements of Style. New York, Macmillan. call#: PE 1408 .S772 1979

- Turabian, Kate L. 1987. A Manual for Writers of Term Papers, Theses, and Dissertations. 5th edition. Chicago, University of Chicago Press. Call#: LB 2369 .T8 1987

*There are three additional books that will both entertain and tell you a lot about how economists think and write. These books are not directed towards that actual writing of a research paper, but they will certainly provide you with a helpful perspective on the whole process.*

- McCloskey, Donald N. 1985. The Rhetoric of Economics. Madison, University of Wisconsin Press. call#: HB 71 .M38 1985

- McCloskey, Donald N. 1990. If You're So Smart: The Narrative of Economic Expertise. Chicago, University of Chicago Press. call#: HB 199 .M385 1990

- McCloskey, Donald N. 1994. Rhetoric and Persuasion in Economics. New York: Cambridge University Press. call#: HB 71 .M378 1994

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[4]Improving your writing skills is an important goal of this course. The Economics Department has produced a guide to writing that you should consult before writing your first paper (HUhttp://isites.harvard.edu/fs/docs/icb.topic141255.files/Writing_Economics.pdfUH ). I also encourage you to take advantage of the services provided by the Harvard Writing Center on the Garden Level of the Barker Center (http://www.fas.harvard.edu/~wricntr/).

- Thomson, William. A Guide for the Young Economist (M.I.T. Press, 2001)

- Thomson, William., "The Young Person's Guide to Writing Economic Theory," Journal of Economic Literature 37 (March 1999): 157-83.