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# Dissertation Guidelines for Economics PhD candidates

*"Those who do not imitate anything, produce nothing."* Salvador Dali

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One of many hazards faced by economics PhD students is that writing a dissertation may draw them into an obsolete and ineffective writing style. Years ago, publishing long research monographs and or even one's dissertation as a book was not uncommon. But today's competitive job market demands quick communication and publication (a 20 minute presentation, a 25 page "job market" paper). In this market, one format dominates all others: that of a refereed journal paper. Papers are the currency of the economics profession, and generally more and shorter is better. PhD students need to start accumulating this currency right out of the gate. The journal format has become ubiquitous: to see this, visit the web site of any major economics department. You will see dissertations titles along the lines of "Three essays on the demise of development economics" or "Essays on the gains from trade." Dissertations increasingly consist of 2-3 essays in standard journal paper format. The best of these 20-30 chapters becomes one's "job market paper." Hence the form in which one communicates dissertation research is almost never the dissertation itself. The sad fact (or not so sad if you have read many) is that beyond your mentor and committee almost no one will ever read dissertation in its original format. They will however, read papers based on your dissertation.

In light of these job market realities economics PhD students face two daunting challenges. First they must learn how to imitate standard journal style perfectly. This style is uniform, rigid and perhaps unlike any writing style you have ever encountered. Imitation and proficiency in this style requires intense concentration and attention to detail. Imitation seems to be the anti-thesis of creativity and free expression. But a clear and concisely written journal article, like good Bordeaux, stands up for years. Examples include Robert Solow growth theory paper (1956) or Ramsey's 1927 paper on optimal savings or Nash's (short) game theory from the early 1950s. These papers read as well today as they did then: perhaps better with age.

The second challenge facing PhD student is find 2-3 ideas for papers on a related theme along with some data to test them. This style guide will give you some hints on both of these tasks, though it will not make either task easy. Writing a good paper is very difficult, and it always takes much longer than you thing, particularly an empirical paper. But then if it were easy, journal papers would not be worth much. So here we are. For a dissertation student, the three essay approach can actually be advantage: think of it as a form of diversification. If two or three ideas fly, you are likely home free (given the obligatory review of the literature). You pick an area, and sketch out a simple model (for now a textbook or someone else's model will do). Now thing of how one could prove this model is write or wrong (hopefully you have two models, or two possible outcomes so there is an empirical hypothesis to test). In development economics this hypothesis is likely to have testable implications at household level, the village or provincial level and at the national level (cross country comparisons). There may be time series implications as well, or both as with the currently fashionable panel format. Of course, data

availability is a crucial question, and even when data is available your particular question may not lend itself to an easy answer.

**Imitating Journal Style**

The economics journal paper style is above all efficient, concise and to the point. This style fits and reflects the technical, quantitative slant of most economic research. Once the key universal parameters of this writing style are upheld, there is a still room for creativity. Below I summarize some of these stylistic elements. Please do read other guidelines of this sort: for example John Cochrane's excellent admonitions . One can read hints and guidelines, but there is no substitute for reading journal papers, many of them. As you read each paper carefully deconstruct the structure of paper to better appreciate the common elements of this style. How many sentences before you know what the author's key contribution is compared to previous papers? How long before you know organization of the paper and what the paper's key results are? Remarkably quickly is the answer: almost every journal paper starts with a complete synopsis of their plot and key conclusions to extent that reading conclusions, or indeed to the rest of the paper. You have in advance, the complete lay of the land, a road map or where you are going and where you end up. Actually reading the paper becomes like traversing familiar terrain. This is the only efficient way to read: one could read the paper several times to the same effect, but that would not be efficient.

Papers start with an abstract, and that's where you should start too. Write down a brief summary of the main contribution of your paper or dissertation—even though it is not written yet. Try to see where you headed before you leave the station. Follow the abstract by an introduction which expands on your summary. Now and at the end, all of your important conclusions and policy implications should be right up front. Nothing important should appear initially in your conclusions. Of course key conclusions might need context that does not fit in the 100-150 word abstract, but that is the purpose of a 4-6 paragraph introduction (2-3 pages at most—a sort of executive summary). By the third paragraph all the mystery of what your paper or dissertation accomplishes (or well accomplish) should be removed. All that is left for the rest of the paper is document your initial bold claims.

Be concise and get to the point quickly in every paragraph and sentence. Sentences should be short, crisp and to the point. Your paper is more likely to be accepted if it has a familiar look and feel. Original ideas and results are welcome: original writing styles typically are not. Similar, familiar formats make it easier to communicate, and more costly to deviate. Those who flaunt convention may pay the ultimate price: their work may be ignored as in not cited. Like Microsoft software, adherence to writing conventions creates a sort of network externality: the more a particular style is followed, the less time it takes to read (and write) a research paper.

Unless yours is a 28 page Nobel Prize winning thesis like John Nash's *Non-Cooperative Games*, you should plan to write papers for refereed journals.[1] Nash wrote in his equations by

[1] Nash certainly understood the value of journal articles. By the time he finished his dissertation in May of 1950 he had already submitted two papers to journals—one of which he cites in his thesis. Practically his only other reference: John Von Neumann and Oscar Morgenstern's *Theory of Games and Economic Behavior*. Later that same

hand, but with today's fancy equation editors and word processors drafts of working papers look more and more like journal articles (see any recent NBER working paper for example). Even the venerable and verbose PhD dissertation can, and should, read like two or three journal papers strung together.

The best way to discover paper writing conventions is to carefully "deconstruct" a number of articles from leading journals. This style guide assumes you have done this and are ready to read a list of dos and don'ts. If one looks hard enough, one can still find papers written in deviant formats: old WordPerfect tables with boxes around each entry (no vertical lines in Tables), long discursive literature reviews, wandering subscripts which don't know their place, etc. But there is no reason to repeat the mistakes of others. After reading though this guide, go back and look at a few journal articles once more, looking particularly for ones that present your particular type of statistical results (logit, panel regression, GMM, cointegration analysis, etc.).

***1. Start your paper and the writing process with a short title and a succinct but longer 300-500 word abstract*** both or which summarize your paper's subject, motivation and key results (this is not easy with just a title—though it can be done). How will the world be different once the results of your paper are known? Later this long abstract can be split in the real 100-150 word abstract and you introduction. Right now it gives you priorities for cutting down your apper and only mentioning papers/results that support the sweeping assertions of your abstract. This is what readers will be looking for, and you what to give them want they want, and only that.

Keep the abstract and introduction at front the front of your paper, and in front of you while you write (for now, ignore Fordham's GSAS rules to put the abstract at the back—this may be OK in some disciplines but not Economics). Some like to save their findings for the end, like a mystery novel, but Economist always everything new in the abstract or in the first or second paragraph of the introduction. Knowing what you claim to have found creates and incentive to read your paper, which is generally desireable. Read the first few pages of any journal paper closely, several times, and you will notice that all introductions to economics papers have the same organizational structure, and all generally manage to accomplish the following in the first 2-3 paragraphs or, in more complex paper, 2-3 pages maximum:

i) Briefly explain the purpose and motivation of the paper (e.g. what controversy, problem, policy dilemma does this paper address).

ii) Mention previous articles, preferably journal articles, that are the closest antecedents related or relevant to your issue, question or methodological approach. In this context, quality trumps quantity. Focus on the 2-4 most relevant papers, put others in footnotes or mention in specific contexts in the body of the paper.

iii) Summarize the content, organization and strategy of the paper sections to follow in

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year Nash got his thesis published almost verbatim in the *Annals of Mathematic* under the same wonderfully short title. Though one is unlikely to match Nash's brevity and insight, publishing three short articles by the time one hits the job market is certainly a good strategy and even easier than in Nash's day, given the amazing number of economics journals now hunting for publishable material (including *Economic Letter*s and *Applied Economics Letters* both of which publish short papers within a year).

just a few sentences often located in the the last paragraph of the introductory section, and certainly within 2 journal pages or four double spaced pages.

Many authors also summarize their key findings, conclusions and policy implications in the introduction and/or the abstract but if you like suspense and surprises and think your introduction is provocative enough, you can leave these to the concluding paragraphs. Most papers do not have a Table of Contents, but most dissertations do. Always number pages and equations whether you have a Table of Contents or not (most equation editors/word processors do this automatically if you tell them to).

***2. Diagrams relating to a 2x2 case of your model or charts to display data*** are always a good idea—but if find yourself with more than 4-6 of each you probably have too many (put them in a sequel paper or a companion appendix). Label all the axes with descriptive titles designed to make figures and tables as self-sufficient as possible. Avoid legends and use text boxes (no borders) and arrows where possible. Always include the data source as a note and define all units in the table or figure. Most macroeconomic variables are best presented as a share of GDP or GNP, others as an index. Avoid more than one digit to the right of the decimal point when possible (this is why we use indices with the base year, say 1995 = 100). A chart should have a y axis with whole digits, 5% of GDP for example or 90, 100, 110 etc. for an index. Color charts are nice and fashionable for pdf files and a few journals that publish in color, but make sure the same chart works in black and white as well. Again, charts color or not should be relatively self-sufficient—almost all the information you need to understand interpret a chart should be in the titles and notes to the chart itself. The reader should not have to read back and forth between the picture and the text to understand the content and main point of most Tables and diagrams.

3. ***Tables reporting regression results or other statistics*** should have three to four horizontal but no vertical lines. Unless you include your data in an appendix, you may want to start with some summary statistics for you key variables. The best way to understand the dependent variable in your analysis is to see it or its mean and variance. For regression equations, the dependent variable is included in the sub-title and/or identified for each column/equation. Generally regression equations are reported down a column so that one can read across row of comparable coefficients. Row descriptors should be as descriptive as space permits. Never use acronyms, unless they are very standard (CPI, GDP etc.). Include footnotes describing the units and perhaps even the source of each variable (see the Tables attached). Here are Word and Excel templates for standard regression tables, though you can easily make some of your own. If you use the Excel spreadsheet, copy the table itself and then "paste special" as a windows metafile—this gives you more flexibility in formatting the table to fit the page, though if you change the table in Excel it will not automatically update in your Word document (you have to copy and "paste special" and use one of the "metafile" formats again—don't paste as an excel or html object—you will have lots of trouble formatting your Table or Figure to the page). Whichever template you use, it is a good idea to paste copies of the regressions your putting into the table on some nearby page or worksheet or near the Table itself, so that it is easier to retrace your steps or reproduce your results at some later. Include at most 2-3 significant digits—including more digits, especially to the right of the decimal point suggests more accuracy that you probably have or need. Recall that t-statistics become interesting when they are greater than

2.0, so 2.1 or .80 says all you need to say. If you report only standard errors (as many older journals prefer) you may want to use the * for 10% significance, ** for 5% and *** for 1% significance levels, if you needed. If find your regression coefficients are numbers like .000062 rescale your data to the coefficient is .62 (multiplying by a constant should not change your t-statistics at all). Use natural logs wherever possible, as these coefficients can be interpreted as elasticities and are generally better behaved—but one does not (generally) take logs of variables that are already a percent of something (GDP for example).

***4. Include data tables summarizing key characteristics of your data in the text and full lists of key data in an Appendix.*** Most major journals including the American Economic Review require that data used in regressions be posted and made available online. Careful documentation of data sources and care in preserving intermediate calculations is therefore a must. If you are preparing data for statistical analysis I suggest a master data table, perhaps also in a spreadsheet, that maps all of your short 2-3 letter variable names into definitions of those variables, data sources used (including the file used for any intermediate calculations or editing). If you plan to publish your research (or you need to make revisions) it is a good idea to keep a backup of every file used to create your data files, on a CD, mailed to a special email and on at least two computer disks (one might be a zip disk, a USB flashdrive or even your IPOD).

***5. Equations should always be written as part of complete sentences,*** look carefully at any journal article or text containing equations. You will see that equations are rarely presented in lists, rather they are presented in sentences, complete with commas, prepositions and always, always ending with a period. Try to avoid defining variables in lists. Using an equals sign "=" when defining notation as in "$\beta$ = the rate of time preference" is never done. If you must list variable definitions, use "$\equiv$" or a colon ":" in place the word (preferred) word define (use "$\equiv$" for identities as well). Generally it is best to write out exactly what you are trying to say in words, as in "$\beta$ is the rate of time preference." Avoid using variable names with more than one letter (e.g. MC or MPL) as strictly speaking two adjacent letters or symbols in an equation implies multiplication (that is xy generally means x times y). As in the Levine and Renelt (1992) you can occasionally report a regression with coefficients with variable abbreviations, or use familiar acronyms such as GDP or M2 as variable names, but keep this to a minimum.

Be sure to make sub and superscripts using the appropriate MS Word commands or using an equation editor such as Mathtype or you can write your paper in Scientific Word (a front end for Latex). Messy equations communicate carelessness or a lack of competence or both—be careful to make sure equations are exactly right, and then make them look just like the ones on most journal pages. Luckily, international and development economists have a standard guide for symbols provided in the Notation Guide and Glossary of Obstfeld and Rogoff's (1996) *International Economics* text. Feel free to deviate from the guide. Development economists for example, tend to use e instead of s for the nominal exchange rate so the real exchange rate $q = ep^*/p$ where $p^*$ and p are foreign and domestic price levels respectively. The next page contains a section with equations from a recent paper I coauthored with Bill Gruben. Note equations are written in sentences so they end with a period (as equation 2.3 does below) if the equation is not followed by variable definitions such as "where $\delta$ is the discount rate and $\beta$ is the…" and so on, (see also the equation transparencies from Obstfeld and Rogoff (1996) chapter 1 – note the

commas and periods so that equations can extend for several lines, contain conditions such as $0 < \alpha < 1$ and then end with a period).

**Appendix A: pages from Gruben and McLeod (2004) "Dollarization and Inflation Convergence:"**

To demonstrate the benefits and risks of currency competition, this we explore a situation in which two currencies provide similar (but not identical) "transactions services" to households. The model is basically a small country version of Diba and Cazonieri (1992).[2] Households derive utility from consumption $c_t$ and they enjoy the transaction services $v(m_t,n_t)$ provided by domestic and foreign real money balances $m_t$ and $n_t$,

$$U = \sum_{t=0}^{\infty} \beta^t [c_t + v(m_t, n_t, \sigma)] \qquad (2.1)$$

where $\beta = 1/(1+\delta)$ and $\delta$ is the discount rate, identical at home and abroad. Making utility linear in c and separable in consumption and transactions services fixes both the home and foreign real interest rate at $r_t = \delta$ and omits income effects on money demand. Transactions services $v(\bullet)$ can be provided by real balances $m_t$ or $n_t$ with the degree of substitutability between the two currencies measured by $\sigma$. The nature of $\sigma$ and the particular properties of $v(\bullet)$ are spelled out in more detail for a particular functional form below. Households maximize (2.1) subject to the budget constraint,

$$\begin{aligned} c_t + n_t + m_t + b_t - \bar{d}_t^* / e_t \leq \\ y_t - \tau_t + m_t(1+\pi_t)^{-1} + n_t(1+\pi_t^*)^{-1} + (1+r_{t-1})b_{t-1} - (1+r_{t-1}^*)\varphi_t d_{t-1}^* / e_t \end{aligned} \qquad (2.2)$$

where $(1+\pi_t) = p_t/p_{t-1}$ and $(1+\pi_t^*) = p_t^* / p_{t-1}^*$. The identical consumption good costs p at home and p* abroad yielding a home currency price of foreign exchange of $e = p/p^*$. Note that up to a

[2] In particular, we use the functional form of the money demand the recommend, though Sturzenegger(1992) and Obstfeld and Rogoff (1996) employ similar "transactions cost" driven functional form for money demand.

point, house holds can borrow abroad (perhaps because $\delta^* < \delta$ and $r^* < r$) but transactions fees and capital controls increase the cost of borrowing abroad as $\varphi_t < 1$. A high $\varphi_t$ may also reflect the risks of future taxes or restrictions on dollar borrowing. Since dollars ($n_t$) can either be held or used to pay down private foreign the debt, as the real opportunity cost of holding foreign currency is $(1 + r^*)\varphi$. Capital controls also effect $\sigma$, the degree of substitutability between home and foreign currency. The limited ability of households to borrow abroad adds a current account dimension to the model which we ignore for now.

Completing the fiscal story is the government budget constraint,

$$g_t + (1 + r_{t-1})\, b_{t-1} = \tau_t + s_t - \kappa(\pi) + b_t. \qquad (2.3)$$