6 Final Notes

6.1 How to Write a Theory Paper

1. A highbrow theory paper—go talk to Jerry or Drew—don't listen to me.

2. A lowbrow or applied theory paper.

    - You must start with an interesting real world puzzle.

    - You must have a compelling idea that answers this puzzle, which needs to be both novel and at least plausibly true.

    - You must write a parsimonious model that makes your point clearly.

- Ideally, you would want your model to have other testable implications that could be used to confirm your theory.

- You might want to discuss a little bit of the evidence yourself.

6.1.1 A few hints on how to write a paper of this form

1. Do not include a literature summary—weave references elegantly into the text.

2. Make the paragraph sentence of the opening paragraph your question, if possible—it might even be an appropriate title for the paper. This will keep you focused.

3. Keep your abstract below 100 words.

4. Keep your introduction below four pages.

5. Get to your explanation of the puzzle by the third paragraph.

6. If you can't convince your mother that you are working on an interesting problem, it is a good bet that you won't be able to convince a journal editor either (at least in applied theory).

7. After your introduction, you can either have a two-three page section explaining the puzzle or not. This requires some facts, and you would want to use this to weave in the literature. Again, it should be heavy on facts.

8. After this, you will want to get to the model. Be very precise about setting up the model. Make sure that everyone can understand what you did. But do not put your calculations in the text, unless you are really sure that a particular first order condition gives huge amounts of insight.

9. Better to write everything in proposition/proof format. Even comparative statics, i.e. the equilibrium level of x is falling with y and rising with z if the following conditions hold

10. A good figure is worth a lot

11. Do not include every calculation in the paper. Just because you did it, does not mean that anyone else wants to read it. In many cases, extra work is helpful because it helps guarantee the generality of results. Often just citing the work in a footnote is fine.

12. In the model, focus on explaining variation across time and space as well as explaining your core puzzle. If you are trying to explain a behavior—why do we see it in some places and not others, etc.

13. Do include a discussion section after the model. This would be a good time to argue how the model fits the available evidence well.

14. Keep your conclusion to a page or less.

15. Economists care a lot about being cited—the easiest way to make an enemy is to fail to cite someone who thinks that he or she has done important work in your area.

6.2 A Brief Aside on Empirical Papers

My understanding is that they come in really four flavors:

1. Stylized-facts paper

2. Estimating a single parameter—usually an elasticity of some x on some z

3. Structural empirical work—writing down a formal model and using the moments of the data to fit the exact model you are writing

4. Puzzle-driven paper—i.e. why are poor countries poor or why has income risen, or something like that, that lists a set of hypotheses and then essentially tries to figure out a decomposition of the form:

$$Y_i = \sum \beta_j X_{j,i}$$

or

$$Y_i - Y_k = \sum \beta_j (X_{j,i} - X_{j,k})$$

Essentially the goal is to have a set of factors and measure the difference in the factors between the places, time periods, people, etc., and then multiply those differences by the estimated parameters that tells you the effect of this.

Of these, stylized-facts paper are often enormously useful but hard to write well and even harder to publish. Leave this to a later stage in your career.

Surely the most straightforward task is to estimate a single elasticity.

The quality of the paper hinges on the degree to which we care about the elasticity and the degree to which people believe your estimation strategy—i.e. the degree to which your instruments are orthogonal to the error term.

Remember: exogeneity and orthogonality are not, not the same thing.

One final suggestion—in all cases, it is best to have a sensible model that justifies whatever regression you are writing.

6.2.1 A parameter-estimate paper

In the case of a parameter-estimate paper (which includes papers like: Does public insurance crowd out private insurance? Is competition good for schools? Is segregation bad for minorities? Etc.) the structure can be quite simple:

1. Introduction—again the paragraph sentence of the first paragraph should be the question

2. "Theory" or discussion section—in some particularly straightforward cases, this can be dropped—in other cases, you need 2 pages to set up a horserace—make it clear that the theoretical case is ambiguous and that you are trying to figure out what is true. In cases where we think we know the sign (punishment deters crime) but we care about the magnitude—this section is really unnecessary.

Alternatively, you can even write down a little model here. But if the section is more than 4 pages you are screwing up

3. Data and Discussion of the Instrument/Natural Experiment. Where is your exogenous source of variation coming from? This is going to take about 3 pages, I would guess.

4. Main results—4-6 pages.

5. Extensions and Robustness checks: 2-4 pages—remember, not every specification you run needs to be in the paper. You can describe things that don't appear in tables—you can put things in footnotes. Keep it short.

6. Conclusion—1 page for you to wax philosophic on how important your results actually are

6.2.2 A broad question paper

These come in two flavors: discrete and continuous.

A continuous paper starts with a correlation—$cov(x, y)$ is big: why?

Examples are—why is there more crime in cities, why does fertility fall with income across countries, why does pollution first rise and then fall with income, etc.

A discrete paper starts with a discrete fact—why do whites earn more money than minorities? Why does the US have a less generous welfare system than Europe?

In either case

1. The introduction can be as much as four pages– the opening paragraph should set up the fact. The next three paragraphs should explain between two and

four major theories—if you have more minor theories then dispatch them in footnotes. Then use the rest of the introduction to explain what you found.

2. Section II needs to clearly explain each one of the three theories. In this case (as opposed to the previous paper) the theories can be complementary—cities can have less crime both because of a greater density of victims and because of lower probabilities of arrest due to anonymity.

   I would say no formal modelling is needed, but you should have gone through the discipline of writing down a model for each one of the theories to make sure your own thinking is clear, i.e. what is needed to get each theory to work.

3. Then in Section III you need to set up the methodology, either the discrete formula

$$Y_i - Y_k = \sum \beta_j (X_{j,i} - X_{j,k})$$

or the continuous formula, which is essentially:

$$y = f(z_1(x), z_2(x), z_3(x)))$$

so

$$\frac{dy}{dx} = \frac{\partial f}{\partial z_1}\frac{\partial z_1}{\partial x} + \frac{\partial f}{\partial z_2}\frac{\partial z_2}{\partial x} + \frac{\partial f}{\partial z_3}\frac{\partial z_3}{\partial x}$$

or if you prefer elasticities:

$$\frac{x}{y}\frac{df}{dx} = \frac{z_2}{y}\frac{\partial f}{\partial z_2}\frac{x}{z_2}\frac{\partial z_2}{\partial x} + \frac{z_2}{y}\frac{\partial f}{\partial z_2}\frac{x}{z_2}\frac{\partial z_2}{\partial x} + \frac{z_3}{y}\frac{\partial f}{\partial z_3}\frac{x}{z_3}\frac{\partial z_3}{\partial x}$$

Or statistically—assume all variables are mean zero, standard deviation one (just normalize):

$$\begin{aligned} y &= \alpha_1 z_1 + \alpha_2 z_2 + \alpha_3 z_3 + \varepsilon \\ z_i &= \beta_i x + \mu_i \end{aligned}$$

The estimated regression coefficient from a univariate regression of y on x will be $\sum \alpha_i \beta_i$ so then the game is to estimate the α_i and β_i

4. Now you need to estimate this stuff.

The beta terms are straightforward– these are just correlations.

The hard part is the alpha terms—sometimes you need to estimate these and sometimes you can just take them from the existing literature.

5. Conclude—again no more than 1 page.