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Graduate Education in Economics After the COGEE Report: Has Anything Changed? (Gregory M. Perry, Oregon State University, presiding)

THE SOUNDS OF SILENCE: THE PROFESSION'S RESPONSE TO THE COGEE REPORT

DAVID COLANDER

Oscar Wilde described a fox hunt as the unspeakable in pursuit of the inedible. Perhaps here [in graduate economics education] we have the overeducated in pursuit of the unknowable.

—Robert Solow

When asked about the profession's response to the COGEE (Commission on Graduate Education in Economics) report, Anne Krueger, the chair of the commission, stated that if a pin dropped simultaneously with the issuance of the report, the dropping of the pin would sound like thunder. I agree; there has been essentially no response to the COGEE report. Despite the lack of response, I believe that there is something to say on the topic.

I begin with a discussion of the background of the COGEE report, why it came about, and what it had to say. Next, I consider the changes that have occurred in the profession over the last 10 years in relation to the COGEE report. I conclude with some personal observations on the issues the COGEE report raised.

The Background of the COGEE Report

The COGEE report was a reaction to a general feeling of dissatisfaction at varying levels of the economics profession. Those concerns were prevalent all through the 1970s and early 1980s and were articulated in Arjo Klamer's and my work on the profession. That joint work started in 1983 and in 1985 led to an article, "The Making of an Economist," that

was published in 1987 in the newly formed *Journal of Economic Perspectives*, which itself was a product of that same discontent.¹

In 1986, the ideas in our forthcoming article were discussed at a National Science Foundation (NSF) symposium, and it was felt that there was sufficient concern to create COGEE. Robert Eisner, then president of the AEA, set up the commission with the charge to "take stock of what is being done (in graduate education), what results we are getting. . . . In all of this. . . the concern is, of course, very largely with the direction of research and focus of resources."

The commission was to look more deeply at graduate education than Klamer and I had done. Although there was a general agreement that what we had reported was, in general, correct, our work was certainly not systematic. (We had financed our limited surveys ourselves with help from small grants from our schools.) COGEE was a much larger fact-finding effort and had substantial NSF funding. It was felt that a commission made up of leading economists, basing their assessment on a more systematically structured study than ours, would provide more insight into what was really going on and, if it were felt that change was necessary, would better articulate the needed changes. It was also felt that, if changes were necessary, the commission would carry more weight in bringing about changes. Thus, COGEE was appointed with representatives of the top graduate schools and one government economist.² Lee Hansen

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The author would like to thank Peter Matthews, Paul Wonnacott, and members of the COGEE Commission who responded to my questionnaire for help, comments, and suggestions.

¹ We later expanded the paper into a book (1990) with the same title.

² The members of the commission were Anne Krueger, Kenneth Arrow, Olivier Blanchard, Alan Blinder, Claudia Goldin, Edward Leamer, Robert Lucas, Jan Panzar, Rudolph Penner, Paul Schultz, Joseph Stiglitz, and Lawrence Summers.

oversaw the statistical work that underlaid the commission's work.

In its makeup, the commission was broadly sympathetic to reform, although there was a diversity of views represented, as necessarily had to be the case if the commission were to be seen as representative of the mainstream graduate position. To reduce political infighting, it was decided that the report would not be an official report of the AEA but instead one that reflected the views of the members and nothing more. Still, given the distinguished stature of the commission members, it was felt that it would make a difference.

Before the commission's report, I had predicted, in print, that it would find that all was generally well with the profession but that there were some areas for concern. I was partially right. Near its beginning, the report stated that "the current state of the profession is healthy." However, I was pleasantly surprised by the degree to which the commission considered the concerns of critics of the profession and the relatively (for a commission) strong recommendations it made.

The commission's recommendations, which were issued in 1990 and published in September 1991 (Krueger et al.), were the following:

1. Reasonable requirements in mathematics, statistics, and economics should be established.
2. Remedial courses should be offered to those who have deficiencies in economics, mathematics, or statistics.
3. Core courses should be taught in a way that can balance breadth and depth, with sufficient attention to applications and real-world linkages to encourage students themselves to start applying the concepts.
4. The core should be regarded as a departmental "public good" and its content be the concern of the entire department.
5. Field courses should attempt to include more empirical applications.
6. Greater attention should be given to writing and communication skills.
7. Efforts should be made to ease the transition from course work to dissertation.
8. More differentiation should exist among departments.

Response of the Profession to the COGEE Report

I will discuss the profession's response to the COGEE report in two separate parts: changes

at highly ranked schools and changes at lower-ranked schools.³ By highly ranked schools, I mean the 20 or so schools that think of themselves in the top 10. (There are a variety of rankings; each school focuses on whichever ranking that ranks it highly, so more than 10 schools see themselves in the top 10.) These top 10 are themselves divided into subgroups that can vary somewhat; one does not, however, see large movements in the rankings of schools. The existing rankings are reinforced by hiring practices. If a lower-ranked school seems to have hired an up-and-coming star, that star will receive offers from various top 10 schools. Usually, he or she will accept one of these offers, thereby preserving the initial ranking. (Graduate schools have no reserve clause in their contracts.)

For the most part, the hiring practices of top 10 schools are incestuous; most hiring by top-10 schools is from other top 10 schools. If you are not sending your graduates to other top-10 schools, you will soon be out of the top 10. Not only do the top 10 schools supply professors to other top 10 schools, they also supply the majority of professors to programs that teach in graduate programs in economics. Thus, what goes on at these schools is central to graduate education in economics.

Changes at Highly Ranked Schools

I will discuss changes at the highly ranked schools in reference to each recommendation.

1. To my knowledge, no school has changed its mathematical requirements in response to the commission's report. No school that I know of has lowered its requirements. If anything, mathematical requirements have been raised. (The majority of the commission members felt that at their school the level of mathematical sophistication needed by incoming graduate students had increased.)

Moreover, the underlying culture has continued to deemphasize reading the literature and studying economic issues outside a formal theorem-proof and technical model approach. History of thought and history of economics requirements have declined further. Moreover, graduate school culture lets students know that they should deemphasize these courses

³ This discussion is based on a survey of COGEE Commission members and informal discussions with friends in the profession. It is not based on hard evidence but is, I believe, correct in its essentials.

and focus on the “hardcore” core courses. For example, at one top 10 school that had a core economic history requirement, I was told that either the requirement was overlooked or students were told to minimize their studying in the course to free up time for their other core courses.

2. Most schools already offered remedial courses in mathematics, so there was little change here. Most of these courses are given in August, preceding the first semester. As Alan Blinder remarked, “We have always had ‘remedial’ math. (In fact it is pretty advanced.) We still do.” From informal discussion, I would say that the content of these remedial courses has changed to a larger focus on game theory and dynamics. This change in focus has been in reaction to changes in the math used in the core courses.

No school, to my knowledge, had a remedial program in economics before the COGEE report, and none has implemented one. This is the case, even though many new graduate students have taken few if any economics courses (some have taken none). It is still possible to do exceptionally well in the first two years in economics graduate programs without having taken undergraduate economics. For those students without an undergraduate degree in economics, this means that their economics training consists of the economic content of the core courses and what they have learned on their own. When I asked one COGEE member about this, I was told that most of the graduate students serve as teaching assistants in a principles course where they learn economics.

3. Most commission members felt that the emphasis on technique and intuitive application has remained roughly the same or even increased. Some graduate students told me that they are encouraged to think of applying the models they learn. They are told to work on a paper in their first year, but they find doing that difficult because they have not had any in-class training in how to do so. Core classes generally consist of developing theorems, proofs of those theorems, studying techniques used in technical model building, and studying techniques used in formal testing of those models.

Whereas the general focus on technique has remained constant, the techniques being learned are changing. Much more game theory is being taught and being made central to the core of the microcourses. This movement toward game theory makes the core more

closely applicable to real-world events because it allows a broader range of assumptions. This change, however, has not been in reaction to the COGEE report; it has been part of the continuing evolution of microeconomic thinking.

4. The teaching of the core has changed not to a “public good,” as recommended by the commission, but to a “subdivided private good.” By this I mean that instead of one individual teaching the core course, as was common in the past, core courses are now taught by combinations of two or three professors. Essentially, the core courses now consist of a collection of minicourses, each focusing on a separate area or modeling technique. These minicourses are separable; each professor sets the exam for his or her portion of the course. In one sense, this approach presents the students with more diversity, but in another it removes any chance that a student might get an overall vision of the subject matter of the course. It increases the focus on the training of techniques. The development of these minicourses has, in many ways, eliminated the micro/macro distinction, and one school, Stanford, has integrated the two while simultaneously developing departmental guidelines as to what will be taught in the subsections of the core.

To my knowledge, no integrative core courses, which provide an overview of the economics, are given at any top school. History-of-thought requirements and electives have been eliminated at most top schools, and older professors who took an integrative approach to teaching are generally assigned non-core courses to teach. Where such courses still exist, students are discouraged from focusing on them.

5. I have no direct knowledge of whether significant changes in field courses have been made. My impression is that there has been a slight movement toward more applications but that this change is due primarily to the changing of the core toward game theory.

6. Some commission members said that at their schools more emphasis is being given to writing in workshops. Some schools have developed a second-year field paper in which students present a paper. Alan Blinder summed up the view of many when he wrote, “We keep experimenting with various types of workshops, papers, etc., but nothing works terribly well, and on the whole, it is much the same.” So I would judge that attempts are being made to improve writing, but these at-

tempts have been ongoing and are not in response to the COGEE Report.

7. Here again I have little direct information, but, on the basis of a general discussion with graduate professors, I feel that attempts are being made to improve the transition from coursework to dissertation. One commission member stated that at his school there is more assignment of advisors if the graduate student fails to develop ideas on his or her own. At some schools workshops and luncheon seminars are required in the third year; these workshops are meant to focus attention of the student on developing a thesis topic. Recently, the Social Science Research Council has started a program, including summer workshops and fellowships, to encourage more focus on intuitive foundations.

8. Among top schools there has been no recognizable movement toward differentiation. If anything, the process has gone the other way. When Klamer and I did our initial study, there was a significant difference in top schools as reflected in differences in what students believed. These differences reflected the view of some major professor there who taught the core. With recent hires blending freshwater and saltwater schools and the division of the core courses into components, such differences in beliefs among schools are far less noticeable. This is (a) because there are fewer differences in the profession and (b) because even if there are differences, those differences will not be taught to the students because the core courses are divided among two or three professors focusing on the particular subarea of that course within which they work.

Changes at Other Schools

Graduate economics education involves much more than these elite schools. In fact, there are some 150 graduate programs in economics. I estimate that an additional 30 or so schools see themselves in the top 25, so essentially there are 50 schools in the top 25. Although I have not formally studied the issue, from informal discussion I would say that the reactions to the COGEE report discussed above generally carry over to these additional 30 schools. Their tenure criteria are generally modifications of higher-level schools, and most of the hiring of professors for these top 25 schools is done from the top 10 schools. They hire the "second tier" of the top 10

schools' students who are looking for graduate teaching jobs. Their students, along with other top 10 school students who choose a nonacademic option or who did not get offers for academic jobs in graduate programs, will find jobs at the Fed or in government, business, international organizations, or liberal arts colleges or will return to their home countries.⁴ Thus, the 50 schools in the top 25 make a relatively closed set.⁵ They hire from one another; they tend to cover the same issues and approach economics in the same way. The hiring process pushes strongly toward uniformity of approach.

The 100 or so additional programs have various *raison d'être*. Some are regional schools that provide professors and policy economists for particular areas. Some are so-called special approach schools, and others are simply programs that exist primarily on paper as a supplement to a masters program. These schools often teach economics in a somewhat different way than the top 25 schools. Some of these programs are distinctively different, some are clones of the higher-level schools, and others are eclectic. Almost none of their graduates are hired at top 25 schools, but many go on to teach at undergraduate schools and work in various aspects of business and government and nongovernment agencies. As was the case with top 25 schools, foreign students make up a majority of the student body at these schools.

Klamer's and my original study focused only on the top 10 programs; COGEE focused heavily on the first two of my groups: the 50 schools in the top 25.⁶ Thus, this third group has gone almost completely unstudied. I have, however, informally discussed the problems with professors at a number of these schools and have found them much more open to discussion of change than the faculties at top 25 schools. This is both because they are less

⁴ At these graduate schools, students are told that teaching at a graduate school is what it is all about. Other job alternatives are portrayed as less exciting and less prestigious. A few students who went into graduate school favoring nongraduate academic appointments remain steadfast, but the majority succumb to the pressure. It should also be noted that more than 50% of the students in graduate economic programs are foreign students. This is both because foreign students tend to be better prepared technically and are thus selected over U.S. students and because top U.S. students are choosing other alternatives.

⁵ There are exceptions. For example, Washington University still maintains an institutional focus, and the University of Massachusetts-Amherst maintains a radical focus.

⁶ Lee Hansen reported that the sampling methodology used was heavily weighted toward the top schools. All top schools were included; about one-fifth of the bottom half of the top 91 schools were included. No school ranked lower than 91 was included.

satisfied with their programs and because they often have a hard time placing their students in acceptable jobs. Thus, at this level there are ongoing demand-driven changes.

Some schools have narrowed their offerings and focused on individual areas where they have a comparative strength. For example, Rensselaer Polytech Institute has an interesting program that focuses on ecological and evolutionary economics, building on its strength as an engineering school. Doing this, it has been able to recruit a high-quality student body. The University of New Hampshire has focused on preparing students to teach at liberal arts programs and has an innovative teaching cognate that graduate students can choose. It requires history of thought and has broad-based overview courses that help give the broad-based vision professors at liberal arts colleges need.

The University of Kentucky and the University of Cincinnati have established seminars on teaching for graduate students that are taught by professors whose tenure decision will be based on teaching as well as on research. The University of Hawaii focuses on Pacific Rim issues. George Mason, Auburn, Notre Dame, the New School, California Riverside, and Utah maintain programs with a special emphasis on a particular approach to economics. Diversity exists at these schools. However, these schools have little influence on the top 25 and what happens in the profession. I know of no recent case where one of their graduates was hired by a top 25 school; thus, their ideas do not become integrated into the standard approach.

Two aspects of this diversity should be noted. First, the diversity has not increased and indeed may have decreased because there has been an increased focus on teaching mathematical techniques at many "nonmainstream" programs to increase the perceived rigor of their programs. Second, many of the changes that have occurred since the COGEE report were in response to university-wide pressures rather than to pressures from within the economics department. For example, the programs focusing on teaching at the University of Kentucky and the University of New Hampshire were started by the university, and economics departments chose to participate.

My Personal View of the Changes

The above discussion makes it quite clear that the changes that have occurred in graduate

education in response to the COGEE report have been minimal. Despite this lack of response, I detect less concern about the state of the graduate economics education than there was in the 1970s and 1980s. The reason for this is twofold.

First, the core of formal economics is changing, away from static perfectly competitive analysis and toward dynamic non-perfectly competitive analysis. Advances in areas such as nonlinear dynamics, evolutionary game theory, and time-series econometrics have broadened the intuitive applicability of the core that students are learning. These advances allow a broader set of assumptions to be made and thus allow the development of more potentially relevant formal models. In the development of formal theory, I detect a new excitement of discovery.

As discussed by Solow, most economists are not involved in developing formal theory; they are involved in technical model building and in relating the models they develop to data. Solow correctly points out that there is a major difference between the two. The first is pure theory, and the second is applied model building.

In discussing this applied technical theory, Solow argues that there is a tendency for these technical models to exceed the data available to test them. He writes,

In economics, model-builders' busywork is to refine their ideas to ask questions to which the available data cannot give the answer. Econometric theorists invent methods to estimate parameters about which the data have no information. . . . As the models become more refined, the signal-to-noise ratio in the data becomes very attenuated. Since no empirical verdict is forthcoming, the student goes back to the drawing board—and refines the idea even more (p. 57).

He concludes this discussion with the quotation at the beginning of the paper, significantly questioning the usefulness of much of the applied work that is done in economics. However, he ends his critical discussion of the state of economics by summing up, "But it sure beats the alternatives."⁷

Second, this advance in formal theory has been accompanied by a change in the student

⁷ I believe that Solow's summary captures critics, such as my view of the situation in the economics profession in the 1990s. Where we differ is in our judgment of whether the current situation beats the unspecified alternatives.

body—in who is becoming, and has become, an economist. As better information about what graduate education in economics is has spread through the profession, the selection process is distilling a higher proportion of students who are comfortable with a formal and highly technical approach. Individuals who do not feel comfortable with this technical approach are choosing not to apply, and the selection process is eliminating others who do apply.⁸ This selection process has already made a significant change in the structure of the profession from what it was 20 years ago.

The below-age-45 professors are now almost all highly technical economists who are comfortable with the existing situation. Given current selection procedures, in 20 years almost all criticism of the profession will come from without rather than within because potential critics will never enter the profession.⁹

In the eyes of most graduate school professors, this selection process is increasing the quality of students. For these professors, abilities and mind-sets are unidimensional and measurable by students' ability to excel in doing formal proofs of abstract theorems. Those who do not excel in doing formal proofs go on to do technical applied work, and the applied work we get from them is technically superior to previous applied work.

My view is different; I regard abilities and mind-sets as multidimensional. Moreover, I believe that often there is a low correlation between the mind-set needed to do good applied work in economics—pushing the frontiers of the application of economic theory—and the mind-set needed to push out the frontiers of formal economic theory.

Pushing the frontiers of formal economic theory requires what might be called a formalist deductivist mind-set. It is a highly disciplined mind-set that is most comfortable with theorem/proof understanding of issues. Formalists can often be creative, but it is a creativity in a perfectionist mold, as it wants every piece in order. Formalists usually have the ability to remove themselves for the real world; they can structure abstract proofs in abstract settings. It is a mind-set that is useful in a number of settings, including abstract mathematics and formal logic. Being a good

formalist requires a combination of abstract creativity and a precise mind. Gerard Debreu would be an example of a brilliant economic formalist.

Doing creative applied work requires a quite different mind-set, what I call a generalist inductivist mind-set. This mind-set is superb at observing the world around it and incorporating those observations in its understanding of the world. A generalist can see patterns in a real-world setting and can choose what is important and what is not. It often leads the person to see the forest while leaving the trees out of focus. Once a generalist's intuition sees an answer, he or she often has no patience for formally dotting i's or crossing t's. Creative applied work requires these generalist inductivist skills. A good generalist can push the informal frontiers of economics but cannot push the formal frontiers. Examples of economic generalists would be Douglass North or James Buchanan.

Technical applied work is the most difficult branch of economics. To do it well, one must be both a good generalist and a good formalist. Good technical applied work requires the commonsense intuition of a generalist and the highly disciplined perfectionism of a formalist. Few economists combine both. Ken Arrow, Amartya Sen, and Robert Solow come to mind as ones who do rank highly in both dimensions.

Most individuals rank much higher in one mind-set than the other. Individuals who have one mind-set can still work in the other but find it difficult to do creative work outside their own mind-set. It is like writing poetry in a language that is not one's own. One can do it, but the output is unlikely to be creative. For that reason, short, remedial courses in mathematics do nothing to solve the problem. In fact, they make it worse because they set the tone for the core courses and convey a ranking of students that puts generalist knowledge down.¹⁰

Solow's Mistake

It is because of this two-dimensional set of abilities that I see a problem with graduate economic education. Put simply, the selection

⁸ I have discussed this issue in more detail in Colander.

⁹ Looking at incoming graduate doctoral classes, one sees that many incoming students in top 25 schools are math rather than economics majors, and an increasing number have the equivalent of masters of arts or more in mathematics when entering.

¹⁰ Edward Leamer compared the current situation in graduate economics education to a school for the deaf (mathematically) that insists on oral language (mathematics) even though few students or even teachers can speak it.

process is eliminating individuals with generalist inductivist proclivities from the profession. In doing so, it has created precisely the problem Solow says exists in the profession. He seems to assume implicitly that all economists are as balanced in both dimensions as he is. They are not, and as the profession gravitates more and more toward formalist deductivists, the commonsense anchor on applied work has been removed because of the current nature of graduate economics education.

Let me be clear about how I see this process working. All students entering the top graduate schools in economics are extremely bright, sufficiently so that the formalist/generalist distinction I am making does not show up on math scores on GREs. Similarly, at the level of intelligence I am talking about, the generalist students entering graduate school can meet the requirements set in the core courses. They can do so because, although the qualifying core exams generally look impressive, they do not test the creative element of working in the formalist mode. That creative element would involve an exam structuring an approach to a new problem, not replicating a proof that was presented in class or repeating a variation of an exercise that was presented in class, which is what the core exams that I have seen do. This suspicion is strengthened by the fact that in all cases that I explored, the core exam is made up by the same individual who gave that portion of the course. Core exams are essentially another course exam; they do not test a deep understanding of the material.¹¹

Thus, at least from the feedback I have received, it is not that the core is too hard or too mathematical that is keeping generalists out of graduate school; it is that it is imposing costs that generalists are unwilling to bear. Their alternatives are too good because businesses find bright generalists highly attractive.

A Proposal

I am a realist; I do not expect graduate economics programs to change, so I see applied economists gravitating more and more to public policy schools and interdisciplinary pro-

grams. As the rigor and selectivity of these schools and programs increases, more and more of the demand for applied economists will come from them, not from graduate economic programs. Graduate economics doctoral programs not only will fail to grow, as they have failed to do in the past 20 years, but will shrink in size as well.

Despite the slight chance of the situation actually changing, let me nonetheless offer a proposal that I think could improve applied work in economics at little cost to the development of formal theory. The proposal is for one or more of the top schools to modify its graduate program so that that program is more attractive to generalist students. They could do this by changing the core exams in the following way: Instead of being prepared by the individuals teaching the course, the core exams would be prepared and graded by a group of individuals who work in the area where the student believes he or she would like to work.

For example, there might be two tracks, one for those planning to extend formal theory and another for those planning to find jobs in undergraduate teaching, business, or government. The core exam that tests students' ability to extend formal theory would be set by a group of top graduate economics professors (not those teaching the course). The core exam for others would be set by a combination of top business, government, and undergraduate professors. There are many variations of this proposal, but the key elements of it are that (a) the core exam is determined by someone other than the professor who teaches the course and (b) there are at least two different tracks that graduate students could follow.

The proposal would not be especially difficult to implement. (The British system has, until recently, been built around outside examiners, and field exams and dissertation defenses have often included outside examiners.) It would even be possible that the same core courses, taught in the same way as now, could be offered. However, an additional part would need to be added to each of the core courses to provide the training a generalist needs—an overview of the field. It would likely cover the debates that are currently going on, the recent history of those debates, and where the research that is currently being done fits into those debates. Unlike other sections of the core that are taught in minicourses, this part could be spread over the entire semester and have significant amounts of

¹¹ As one top mathematical economist who has taught at a true top 10 school told me, he could walk around campus and have students come up to him and recite fixed-point theorems. He felt that 20% really understood what was going in the theorem but that none of them had a clue about the implications of the idea for economics.

reading. That reading could possibly be specified by the group of professors who would serve as examiners for that part of the core exams.

This overview part of the core courses would become a central part of the generalist track's education and play a significant role in the generalist track core exam. The formalist track would be like current core exams, but much more demanding, because even higher standards could be required as generalists would not have to be provided with a crutch to get through the course. Students could choose to do one, or both, of these core qualifying exams, depending on what their desired employment is.

As I envision it, the formalist core exam would require the creative development and use of formalist tools, whereas the generalist core exam would be much more like the qualifying exams of 20 or 30 years ago. It would involve an understanding of the formal developments but would not require students to replicate formal theorems and proofs or to replicate technical models. Instead, it would require students to interpret and understand the literature in the field, the limitations of the theory, and the evolution of thinking in that field and to do technical work at the level that business economists, government economists, or most professors actually do.

Creating such a different track will not have

a significant cost to formal research. Most of the professors at top 20 schools that I have talked to agreed that, in reality, only about one-fourth of their students were of the caliber to have any chance of making a real contribution to formal theory. The other students are there primarily to fill up the classes.

This plan will not change the profession quickly. The selection process that determines the nature of the profession works much more slowly, but it will help address the current imbalance in the profession and perhaps, over time, lead to a healthier and stronger profession, one in which we have "the appropriately educated pushing the boundaries of what is knowable."

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