The Making of an Economist II

by

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Individuals are not born as economists; they are molded through formal and informal training. This training shapes the way they approach problems, process information, and carry out research. That in turn influences the policies they favor and the role they play in society. The economics profession changes as cohorts with older-style training are replaced with cohorts with newer-style training. In many ways the replicator dynamics of graduate school play a larger role in determining economists' methodology and approach than all the myriad papers written about methodology. Arjo Klamer and I came to that belief in the early 1980s and it led us to publish our "Making of an Economist" (Colander and Klamer 1987) which in turn led to a much more thorough study of graduate economics education. (Hansen et al. 1991) Since that time I have been receiving numerous suggestions to update our earlier study.[1] This paper is the update.

The paper reports the findings of a survey and interviews with graduate students at seven top-ranking graduate economics programs: University of Chicago, Columbia University, Harvard University, Massachusetts Institute of Technology, Stanford University, Yale University, and Princeton University. It explores who current graduate students are and what they think about economics, the economy, and graduate school. In doing so it shows us a snapshot of current training that can be compared to our earlier snapshot, giving us a sense of how graduate students and graduate education have changed over the past 20 years.[2] To maintain comparability, I followed the same procedures that I followed last time, distributing an identical questionnaire, and following a similar interview procedure.[3]

Profile of Students

The profile of the typical graduate student in economics at highly selective institutions has not changed significantly since the last study. The average age is still 26 years. Students are predominantly male, although they are a somewhat smaller majority; the percentage of women in the survey increased from 18.9% to 28.5%.[4] A slight majority of the students did not go to graduate school directly after completing their undergraduate degrees, but instead had a variety of jobs, primarily as economic research assistants.

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[1] I did the study alone because Arjo has since moved to the University of Amsterdam in the Netherlands and is no longer involved in U.S. graduate economics education. Since our earlier book, *The Making of an Economist*, is out of print, I will make it available on the web at to come

[2] I have also looked at the changing views of students who were in the original study. These findings can be found in Colander (2002).

[3] More specific information about the survey and interview procedures is given in Appendix A. The survey can be found on the Middlebury College Economic Working Papers website: to come.

[4] This is in line with the 29.8 percentage of Ph. D.s awarded to women in the profession in 2003. (Blau 2004: 4)

The majority of the respondents (62%) are foreign. That percentage differed significantly by school; for example, 14% of the Chicago respondents were U.S. students, while 78% of the Stanford and MIT respondents were U.S. citizens.[5] The majority of the students are white. (68% of those who answered this question were white; 18% Asian, 10% Hispanic, and 4% other; 21% chose not to answer this question.) The majority of the students (69%) said they were nonreligious and 65% said they were involved in a long-term relationship. Most came from upper middle class families, many from academic backgrounds.

The large majority (81%) had majored in economics as undergraduates; 21% had majored in mathematics; 22% had other majors. (A number of students had double majors.) U.S. students and foreign students who had done their undergraduate work in the United States were much more likely to have majored in math, reflecting the higher math content in foreign undergraduate economics programs. Even with this higher percentage of U.S. students who were math majors, in the interviews it was generally believed (by both U.S. and foreign students) that foreign students had the stronger math background, at least as it related to economics.

At these top schools, financial issues were not stressful for most students; 90% had fellowships in their first year. Only 9% found financial issues very stressful. Some students even stated that they were able to save during their studies. What students identified as most stressful was finding a dissertation topic: 29% found this very stressful and 33% found it stressful. Relations with faculty were generally not stressful. Those relations did, however, become more stressful over time, with 4% of first-year students finding relationships with faculty very stressful but 16% of fifth-year students finding those relationships very stressful.

Almost half of the students (47%) were involved in writing a scholarly paper. Most students beyond their third year were working; 65% of students beyond their third year were working as TAs and about 38% beyond the third year were working as research assistants. (Some were doing both.)

Economists are often thought of as conservative, but that was not the case in the previous study nor in this study; in this study 47% of the students classified themselves as liberal, 24% as moderate, 16% as conservative, and 6% as radical. (Six percent stated that politics were unimportant to them.) This compares to the last study when 47% considered themselves liberal, 22% moderate, 15% conservative and 12% radicals. Thus, the biggest decline is in radicals, a change that I suspect parallels the change in the student population at large. The students' views were slightly more liberal than those of their

[5] In the interviews the students suggested that Americans were more likely to have filled out the questionnaire, so the percentage of foreign students at these schools is likely greater than the percentage of respondents. For example, the students at MIT reported a 50/50 split between U.S. and foreign students, but 78% of the respondents at MIT were U.S. citizens. I would estimate that about 70-75% of the students at these top graduate schools are foreign, which is a higher percentage than the 52% found by Aslanbeigui and Montecinos (1998) for the period 1995-1996. This suggests that the percentage of foreign graduate students has continued to increase, although the surveyed schools are different.

parents, 40% of whom they classified as liberal, 36% as moderate, 16% as conservative, and 3% as radical.

The large majority of students (80%) felt that their political views did not change in graduate schools, although that changed by year with 10% of first-year students reporting a change in their views, but 32% of fourth- and higher-year students reporting a change in their views. Insight into the students' changing political views can be gleaned from the political views by year. 10% of first year students considered themselves conservative; by the fourth and fifth year, this number had risen to 23%. There was also a large drop by year in students who considered themselves radical; that percentage fell from 13% of first-year students to only 1% of fourth-year and higher students. This is consistent with the view that economic training makes students more conservative and eliminates radicals.

Interests of Students

The majority of the students were positive about their graduate school experience, although students in the first and second year often were concerned by the lack of relevance of what they were learning. A typical comment of upper-level students was, "The first two years were miserable. Now it is kind of fun and exciting, but I'm not sure the pain was worth it." First-year students were more likely to question the relevance of economics. One wrote, "I'm not convinced I'm doing anything that matters outside the ivory tower of academia." Despite these feelings the concern was slightly less than it was in the previous study, and there seemed to be less cynicism than in the previous study. Only 7% said they would not have undertaken the program if they could do it over; 16% said they were unsure.

In terms of future jobs the majority of students planned on an academic career; only 7% said they did not plan to pursue an academic career. The majority of the students (59%) expected to be at a major university in 15 years, 18% at a major research institution, 18% at an institution involved in policy-making, and 9% at a good liberal arts school. This involved some changes from the previous study, when only 41% expected to be at a major university, 32% expected to be at a policy-making institute, and 16% expected to be at a good liberal arts school. Since graduate training is definitely geared toward training students for academic careers in major universities, this suggests a more effective selection process than before.

Although approximately the same percentage of students (50% compared to 53% in the previous study) listed desire to engage in policy formulation as very important, in this study the students do not see this policy interest as incompatible with their academic careers. My interpretation of this result is that the policy role they see themselves playing is more in keeping with the role that the majority of academic economists actually play. That role is not that of a person directly involved in making policy within a political arena, but instead as a person engaged in policy formation via providing expert and empirical support rather than direct policy implementation. One student put it this way: "Although a direct link to policy formation is not always present, economists serve a crucial role in providing clarification of issues both technically and in policy debates."

Most students (68%) did not consider political reasons to be important in their decision to do graduate work in economics; only 11% saw it as very important.

In the interviews, the push by the faculty toward major research universities was clear. One student stated, “There is definitely a perception among the graduate students that you’re better off not advertising that you’re not interested in a research university.” Another said, “I mentioned to one of my advisors last year that I might be interested in policy research, which I really am interested in, and she was definitely dismissive.” Creating researchers for major universities is clearly the role that these schools see for themselves.

There were some changes in the interest of students in various fields since the earlier study. Economic development, labor, and public finance increased in importance while macro theory, political economy, money and banking, international trade, industrial organization, and history of thought decreased in importance. In most areas interest did not vary significantly by year, but it decreased somewhat by year for both macro and money and banking. The largest change by year occurred in the interest in the history of thought, where interest fell and students progressed, with 19% of first-year students interested in history of thought, 16% of second-year students, and then about 3% of third-year and higher students being interested in the history of thought. Women were more interested in labor and less interested in theory, macro, and history of economic thought.

In the interviews, macro received highly negative marks across schools. A typical comment was the following: “The general perspective of the micro students is that the macro courses are pretty worthless, and we don’t see why we have to do it, because we don’t see what is taught as a plausible description of the economy. It’s not that macroeconomic questions are inherently uninteresting; it is just that the models presented in the courses are not up to the job of explaining what is happening. There’s just a lot of math, and we can’t see the purpose of it.” The students did point out, however, that foreign students were more likely to study macro than were U.S. students.

Perceived Importance of Alternative Skills

Perhaps the most discussed finding in our earlier study concerned what students felt put them on the fast track. In the earlier study having a broad knowledge of the economics literature was seen as very important by only 10% of the students, and having a thorough knowledge of the economy was seen as very important by only 3% of the students. In table 1 I report the results from the earlier study compared with the results from this study.

Table 1: Perceptions of Success

	Very Important		Moderately Important		Unimportant		Don't know	
	new	previous	new	previous	new	previous	new	previous

Being smart in the sense that they are good at problem solving	51.10%	65.00%	38.33%	32.00%	7.05%	3.00%	1.76%	1.00%
Being interested in, and good at, empirical research	29.96%	16.00%	52.42%	60.00%	12.33%	23.00%	3.52%	1.00%
Excellence in mathematics	30.40%	57.00%	51.98%	41.00%	13.66%	2.00%	2.64%	0.00%
Being very knowledgeable about one particular field	35.24%	37.00%	42.29%	42.00%	14.54%	19.00%	6.61%	2.00%
Ability to make connections with prominent professors	33.04%	26.00%	40.09%	50.00%	18.50%	16.00%	6.61%	9.00%
A broad knowledge of the economics literature	10.57%	10.00%	44.49%	41.00%	35.24%	43.00%	8.37%	5.00%
A thorough knowledge of the economy	9.25%	3.00%	24.23%	22.00%	50.66%	68.00%	14.54%	7.00%

As you can see in Table 1, this time the view of the importance of literature remained much the same, but students believing that having a thorough knowledge of the economy was very important increased from 3% to 9%. Being interested in empirical research also increased significantly in importance with the percentage finding it very important increasing from 16% to 30%. The increased emphasis given to empirical work could also be seen in other parts of the survey. For example, a typical response to the question of their idea of a successful economist was “someone who affects policies by empirical studies.” Problem solving, the most important skill by far last time, went down somewhat in importance, from 65% to 51% finding it very important. Excellence in mathematics also went down significantly, from 57% to 30% finding it very important.

In many ways this table summarizes my perception of the changes that have occurred in the profession over the last fifteen years. Math is still important, but less importance is given to math for the sake of math, and more importance is given to empirical work, which means that knowledge of the economy is more important. Economics is still a field that gives its literature little importance, but it is a field that is much more consciously empirical than it was, and the students believe that their ability to do good empirical work is what separates them from the other social scientists.

Additional insight into the students’ views can be gained by considering the views by year. Interest in doing outside reading in mathematics, which overall was 35%, had a significant difference by year, with 53% of first-year students thinking readings in mathematic very important, but only 22% of fifth-year students seeing it as very important. The same sense of the declining importance of mathematics by year can be seen when we look at the answers to this question by year. Excellence in mathematics

was seen by 46% of the first-year students as very important in putting someone on the fast track; the number finding it very important falls to 18% by the fifth year.

A slightly different picture emerges when we consider views on the stress caused by mathematics by year and by gender. Students finding math stressful was greatest in first year students with 18% of the first-year students finding it very stressful. By the third year that had decreased to 5%, but then it increased in the fourth- and fifth-year students to about 10%. My interpretation of that finding is that while the core program is centered on math, the field courses are not, and in the third year students are choosing a dissertation so math is not their main concern. But then in the fourth and fifth year when they are actually writing the dissertation, some students again face the problem of solving the models, which brings the math stress, back. In terms of gender, 23% of women but only 7% of the men found mathematics highly stressful. It seems that the degree of mathematics is an important reason for the smaller number of women in economics. This is not necessarily that they cannot do it; in interviews the women showed a strong knowledge of mathematics; it was more a reflection that they were more stressed by it.

The breakdown by year provides a somewhat different picture of "having a thorough knowledge of the economy." Even though the total seeing it as very important rose from 3% to 9%, the importance of knowledge of the economy did not rise as students progressed through their education; instead it fell, with about 15% of first-and second-year students seeing it as very important to put them on the fast track, but less than 1% of the fourth- and fifth- year students seeing it as very important.

Foreign students were much more likely to see a thorough knowledge of the economy as very important, with 13% seeing it as very important and 2% of U.S. students seeing it as very important. My interpretation of this data is that foreign students are more likely to be going back home and working in policy positions, where a knowledge of the economy is important, whereas U.S. students are more likely to be going into academia, where they will specialize in a particular area of study and will not be using general knowledge of the economy. The decline in importance by year suggests that as the students get into writing their dissertation, their interests narrow from a general interest to an interest in their particular field.

Relevance of Graduate Training

One of the criticisms that has often been made of graduate economic education is its lack of relevance, and last time we began our paper with a discussion of the view that "Departments of economics are graduating a generation of idiot savants, brilliant at esoteric mathematics yet innocent of actual economic life." Some observers saw our previous survey as a confirmation of that view. That view is still around, but it is less widespread, and there was an increase in the general relevance that the students found for economics. For example, in the previous study 34% of the students strongly agreed that neoclassical economics is relevant for economic problems; this time the number increased to 44%. The number strongly agreeing that economists agree on fundamental issues also went up from 4% last time to 9% this time. Similarly, the increase in the

number of students seeing economics as the most scientific of the social sciences rose from 28% to 50%.

My interpretation of these changes is twofold. First, there is better information about graduate school, and the students coming in are better informed about what it is. That means that those who think what economists currently do is relevant are the ones going into economics. A second reason is that graduate school has changed. While graduate economics education is still highly mathematical, it is much more empirical; the math that is used is less real analysis and more applied mathematics that ties in with the empirical work, and hence is relevant for policy analysis. Finally, in many of these top programs, while the math is presented in the first two years, the core exams, and the class exams, do not require an in-depth knowledge of the math, but instead simply an ability to do a variation of a fairly well-defined problems. Given the strong math background of many of the students, math is no longer seen as a major obstacle; it is simply a tool to be used when appropriate. For example, one graduate student stated, “You learn the five tricks of the math as it applies to economics and that’s it for the math.”

Whatever their views, the students were well on their way to being acclimated to being economists. For example, a defining attribute of an economist is often thought to be his or her use of the concept of optimizing behavior, and the students fit this mold. In the study 74% of the students stated that they used the notion of individual optimization behavior very often; 23% saying they used it only infrequently.

Differences Among Schools

Another of the interesting findings in the earlier study was the distinctive characteristic of various schools. Table 2 reports the opinions of economics as a science by school in the previous student and in the current study.

Table 2: Opinions of economics as a science: comparison among schools

	Strongly agree		Agree somewhat		Disagree		No Clear opinion	
	Then	**Now**	Then	**Now**	Then	**Now**	Then	**Now**
Neoclassical economics relevant								
total	34%	**44%**	54%	**45%**	11%	**5%**	1%	**5%**
Chicago	69%	**63%**	28%	**25%**	3%	**7%**	0%	**5%**
Princeton		**29%**		**65%**		**3%**		**3%**
Harvard	20%	**55%**	56%	**43%**	22%	**0%**	2%	**3%**
Yale	33%	**40%**	60%	**47%**	8%	**7%**	0%	**7%**
MIT	31%	**26%**	56%	**74%**	22%	**0%**	2%	**0%**
Columbia	24%	**33%**	68%	**44%**	8%	**4%**	0%	**19%**
Stanford	34%	**29%**	60%	**46%**	6%	**21%**	0%	**4%**
Economists agree on the fundamental issues								
total	4%	**9%**	40%	**43%**	52%	**44%**	4%	**4%**
Chicago	3%	**8%**	47%	**53%**	44%	**37%**	6%	**2%**
Princeton		**6%**		**44%**		**47%**		**3%**
Harvard	2%	**13%**	27%	**55%**	68%	**29%**	2%	**3%**
Yale	13%	**14%**	33%	**21%**	47%	**50%**	7%	**14%**
MIT	4%	**9%**	31%	**43%**	60%	**39%**	4%	**9%**
Columbia	4%	**0%**	48%	**33%**	44%	**59%**	4%	**7%**
Stanford	2%	**13%**	51%	**22%**	43%	**65%**	4%	**0%**
We can draw a sharp line between positive and normative economics								
total	9%	**12%**	23%	**34%**	62%	**40%**	6%	**14%**
Chicago	22%	**14%**	38%	**38%**	34%	**38%**	6%	**10%**
Princeton		**13%**		**19%**		**52%**		**16%**
Harvard	9%	**11%**	4%	**47%**	84%	**32%**	2%	**11%**
Yale	7%	**7%**	33%	**20%**	60%	**53%**	0%	**20%**
MIT	7%	**13%**	16%	**22%**	73%	**48%**	4%	**17%**
Columbia	0%	**15%**	32%	**27%**	52%	**42%**	16%	**15%**
Stanford	9%	**4%**	30%	**52%**	55%	**26%**	6%	**17%**
Economics is the most scientific of the social sciences								
total	28%	**50%**	39%	**27%**	19%	**16%**	14%	**6%**
Chicago	47%	**69%**	28%	**25%**	9%	**10%**	16%	**7%**
Princeton		**56%**		**13%**		**22%**		**9%**
Harvard	9%	**54%**	43%	**23%**	30%	**15%**	18%	**8%**
Yale	13%	**33%**	47%	**53%**	40%	**0%**	0%	**13%**
MIT	27%	**43%**	36%	**26%**	24%	**22%**	13%	**9%**
Columbia	36%	**50%**	24%	**23%**	28%	**27%**	12%	**0%**
Stanford	27%	**35%**	31%	**48%**	23%	**17%**	19%	**0%**

The breakdown by schools shows significant convergence in views, with less difference among schools in this study compared to the previous. For example, in the previous study Chicago stood out as a major outlier. While Chicago is still an outlier, it is less so than before. For example, notice that in the previous study Chicago stood out on the high end as seeing neoclassical economics relevant, and Harvard stood out on the low end. This time the overall results of students strongly agreeing that neoclassical economics was relevant increased, but the number strongly agreeing at Chicago decreased, while the number strongly agreeing at Harvard increased significantly. Today, in terms of their

views of the relevance of neoclassical economics there is only a slight difference between Harvard and Chicago; they both see neoclassical economics as more relevant than do the other schools.[6]

Another question where a school stood out was in the question of whether economists agreed on fundamental issues. In answering this question Columbia had no student who strongly agreed. When I asked Columbia students about this they stated that the policy views of two major professors at Columbia were starkly opposed, and that this may well account for the result.

Turning now to the overall changes in the students' views on these questions, as you can see in Table 2, today economics is regarded as more relevant and more scientific, with slightly more agreement on fundamental issues, than was the case 20 years ago. Specifically, there was also a substantial increase in those students agreeing that economics is the most scientific of the social sciences, with an increase in the percentage of students strongly agreeing increasing from 28% to 50%. While Chicago was still an outlier here, again it was less so than in our previous study. Other schools have come to the position that Chicago was at earlier, and Chicago increased more. The most substantial change was in Harvard, where 54% now strongly agreed that economics is the most scientific social science whereas only 9% had believed that earlier.

I also asked students to compare their current views on various issues with the views that they believed they held before they came to graduate school. Table 3 reports those results. (To save space I report only "strongly agree.")

[6] This finding is subject to different interpretations. In the 1980s when we did the first study, the term "neoclassical economics" stood for mainstream economics and was contrasted with a substantial undercurrent of heterodox thought that existed at the time. Today, the term neoclassical is far less used, and mainstream economics has incorporated many elements that previously were considered heterodox in developments in fields such as behavioral economics and evolutionary game theory. Today, the term "neoclassical" is not a term that is generally used. For example, when I asked a Stanford student why Stanford students' views on neoclassical economics differed from those at other schools, he stated, "It would probably just be that the people didn't know what neoclassical economics was."

Table 3: Current vs. Earlier Perspectives on Economics

		Current Strongly Agree	Before Strongly Agree
Neoclassical economics is relevant for today	**total**	**44.09%**	**36.56%**
	Chicago	63.33%	44.26%
	Princeton	29.03%	30.30%
	Harvard	55.00%	47.50%
	Yale	40.00%	31.25%
	MIT	26.09%	30.43%
	Columbia	33.33%	28.57%
	Stanford	29.17%	26.92%
Economists agree on the fundamental issues	**total**	**8.76%**	**10.91%**
	Chicago	8.33%	16.39%
	Princeton	6.25%	9.09%
	Harvard	13.16%	13.89%
	Yale	14.29%	0.00%
	MIT	8.70%	13.04%
	Columbia	0.00%	7.41%
	Stanford	13.04%	4.17%
We can draw a sharp line between positive and normative economics	**total**	**11.68%**	**15.07%**
	Chicago	13.79%	15.25%
	Princeton	12.90%	18.75%
	Harvard	10.53%	10.26%
	Yale	6.67%	6.67%
	MIT	13.04%	21.74%
	Columbia	15.38%	19.23%
	Stanford	4.35%	12.00%
Learning neoclassical econ is learning a set of tools	**total**	**35.78%**	**25.66%**
	Chicago	32.20%	18.03%
	Princeton	34.38%	21.21%
	Harvard	33.33%	33.33%
	Yale	46.67%	31.25%
	MIT	22.73%	34.78%
	Columbia	48.15%	28.57%
	Stanford	41.67%	23.08%
Economics is the most scientific of the social sciences	**total**	**50.23%**	**45.54%**
	Chicago	69.39%	46.67%
	Princeton	56.25%	42.42%
	Harvard	53.85%	64.10%
	Yale	33.33%	37.50%
	MIT	43.48%	39.13%
	Columbia	50.00%	28.57%
	Stanford	34.78%	48.00%

In it you can see how students believed that their views had changed differed by school. Overall, most students saw themselves as believing that neoclassical economists had become more relevant; the percentage strongly agreeing increasing from 37% to 44%. However, Chicago showed the largest increase, jumping from 44% to 63%, while MIT actually declined. In terms of agreeing on fundamental issues we also see differences among the changes in beliefs among schools, with Chicago, MIT, and Columbia showing decreases in the view that economists agree on fundamental issues, and Yale and Stanford showing increases.

There were also changes in views that learning neoclassical economics is learning a set of tools, with all schools but MIT increasing, and Harvard remaining the same. In regard to seeing economics as the most scientific of the social sciences there were also differences. Harvard, Yale, and Stanford decreased, while Chicago, Princeton, Columbia, and MIT increased.

Differences in Political Orientation Among Schools

There were also some differences in political orientation among schools as, can be seen in Table 4.

Table 4: Political Views of Different Schools

		Chicago	Princeton	Harvard	Yale	MIT	Columbia	Stanford	Total
Indicate your political orientation:	Conservative	18.97%	19.35%	12.82%	0.00%	8.70%	14.29%	28.00%	16.13%
	Moderate	20.69%	22.58%	20.51%	30.77%	30.43%	25.00%	24.00%	23.50%
	Liberal	43.10%	38.71%	64.10%	61.54%	43.48%	50.00%	44.00%	48.39%
	Radical	3.45%	12.90%	2.56%	7.69%	13.04%	3.57%	0.00%	5.53%
	Politics are unimportant to me	13.79%	6.45%	0.00%	0.00%	4.35%	7.14%	4.00%	6.45%
Did your political views change in graduate school?	No	81.67%	81.25%	72.50%	62.50%	73.91%	75.00%	92.59%	78.32%
	Yes	18.33%	18.75%	27.50%	37.50%	26.09%	25.00%	7.41%	21.68%

What I found surprising here is that Chicago is not a major outlier; Stanford students saw themselves as more conservative than Chicago. Stanford students were also least likely to change their views. (Seven percent saw their views changing.) Yale students saw their views changing the most. (Thirty-seven percent saw their views changing.) In the survey I also asked those who did change their views in what direction their views changed. For most schools the change went both ways. One student captured what likely is happening when he stated, “I became more eclectic. Both conservatives and liberals have their favorite pipe dreams at odds with reasonable economics.” There were two exceptions. At Chicago, nine students reported becoming more conservative, and only one more liberal, while at Princeton six students reported becoming more liberal and only one more conservative. Since Princeton and Chicago reported roughly the same percentage of conservative students, it seems that Princeton brings in conservative students and turns them into liberals, while Chicago brings in liberal students and turns them into

conservatives.[7]

In the previous survey major differences among schools showed up in the opinions on the importance of economic assumptions and on opinions about policy issues. Table 5 shows the views on the importance of economic assumptions in the previous study and in this one.[8]

[7] When asked about this tendency of Chicago students toward a more conservative point of view, one student noted that one of the teachers in the first year stated, “I'm not here to teach you; I'm here to brainwash you.” He continued, “And that's been pretty much successful.”

[8] I report only Chicago Harvard, MIT and Stanford for the individual schools because those were the schools presented last time. The other schools showed no major differences from the total.

Table 5: Importance of economic assumptions

		Very important		Important in some cases		Unimportant		No Strong opinion	
		Then	**Now**	Then	**Now**	Then	**Now**	Then	**Now**
The neoclassical assumption of rational behavior									
	total	51%	**51%**	41%	**43%**	7%	**5%**	1%	**1%**
	Chicago	78%	**79%**	22%	**21%**	0%	**0%**	0%	**0%**
	Harvard	33%	**68%**	51%	**30%**	14%	**3%**	0%	**0%**
	MIT	44%	**9%**	44%	**87%**	9%	**4%**	0%	**0%**
	Stanford	58%	**54%**	36%	**38%**	6%	**4%**	0%	**4%**
Economic behavior according to									
	total	4%	**9%**	25%	**55%**	57%	**17%**	19%	**19%**
	Chicago	0%	**10%**	31%	**42%**	31%	**25%**	38%	**23%**
	Harvard	16%	**11%**	55%	**57%**	9%	**14%**	20%	**19%**
	MIT	18%	**9%**	69%	**78%**	2%	**0%**	11%	**13%**
	Stanford	4%	**8%**	64%	**69%**	4%	**8%**	28%	**15%**
The rational expectations hypothesis									
	total	17%	**25%**	53%	**58%**	25%	**13%**	5%	**4%**
	Chicago	59%	**43%**	38%	**48%**	0%	**7%**	3%	**2%**
	Harvard	14%	**41%**	45%	**57%**	38%	**3%**	2%	**0%**
	MIT	0%	**0%**	71%	**70%**	18%	**22%**	7%	**9%**
	Stanford	9%	**12%**	53%	**81%**	32%	**8%**	6%	**0%**
Imperfect competition									
	total	40%	**37%**	55%	**58%**	4%	**3%**	2%	**2%**
	Chicago	16%	**23%**	72%	**67%**	9%	**7%**	3%	**3%**
	Harvard	47%	**51%**	47%	**49%**	7%	**0%**	0%	**0%**
	MIT	51%	**39%**	44%	**61%**	0%	**0%**	2%	**0%**
	Stanford	38%	**46%**	60%	**50%**	2%	**0%**	0%	**4%**
Price rigidities									
	total	27%	**14%**	60%	**65%**	10%	**11%**	3%	**10%**
	Chicago	6%	**7%**	56%	**58%**	38%	**22%**	0%	**13%**
	Harvard	37%	**22%**	54%	**68%**	7%	**0%**	2%	**11%**
	MIT	38%	**17%**	56%	**70%**	4%	**9%**	0%	**4%**
	Stanford	26%	**12%**	65%	**54%**	4%	**19%**	4%	**15%**
Cost mark-up pricing									
	total	9%	**5%**	46%	**47%**	26%	**18%**	18%	**30%**
	Chicago	0%	**3%**	16%	**38%**	50%	**28%**	34%	**30%**
	Harvard	7%	**3%**	48%	**49%**	26%	**16%**	19%	**32%**
	MIT	9%	**0%**	62%	**70%**	18%	**13%**	9%	**17%**
	Stanford	11%	**12%**	41%	**28%**	33%	**24%**	15%	**36%**

Students seeing the rationality assumption as very important increased from 35% to 68% at Harvard, whereas at MIT the percentage fell from 44% to only 9%. (Most of those moved to seeing it as important in some cases.) Harvard students also showed a significant change in their view of rational expectations, with the number seeing it as

very important increasing from 14% to 41%, while Chicago fell from 59% to 43%, still larger than the average, but no longer the enormous outlier. MIT remained an outlier, with 0% seeing rational expectations as very important. Other nonreported schools' percentages seeing rational expectation as very important were Yale 27%, Columbia 12%, Stanford 12%, and Princeton 15%, making Harvard and Chicago the outliers.

The importance given to price rigidities went down in all schools, with all schools moving closer together. Imperfect competition stayed about the same in overall importance, but there was less difference between Chicago and other schools. Behavior according to convention increased in importance, with Chicago no longer an outlier.

The changes are even starker in terms of economic opinions about policy issues, which are reported in Table 6.

Table 6 Economic Opinions at Different Schools

		Agree		Agree with res.		Disagree		No Strong opinion	
		Then	**Now**	Then	**Now**	Then	**Now**	Then	**Now**
Fiscal policy can be an effective stabilizer	**total**	35%	**21%**	49%	**58%**	11%	**12%**	5%	**9%**
	Chicago	6%	**15%**	34%	**60%**	44%	**13%**	16%	**12%**
	Harvard	30%	**13%**	65%	**73%**	2%	**8%**	2%	**8%**
	Yale	60%	**20%**	33%	**67%**	7%	**7%**	0%	**7%**
	MIT	48%	**30%**	51%	**57%**	0%	**9%**	2%	**4%**
	Columbia	54%	**26%**	38%	**63%**	8%	**4%**	0%	**7%**
	Stanford	30%	**24%**	52%	**32%**	9%	**20%**	9%	**24%**
The Fed should maintain a constant growth rate of the money supply	Total	9%	**7%**	34%	**22%**	45%	**50%**	12%	**22%**
	Chicago	41%	**18%**	44%	**36%**	9%	**28%**	6%	**18%**
	Harvard	7%	**3%**	24%	**13%**	57%	**73%**	11%	**13%**
	Yale	0%	**0%**	21%	**13%**	64%	**73%**	14%	**13%**
	MIT	0%	**0%**	27%	**22%**	60%	**52%**	13%	**26%**
	Columbia	4%	**4%**	50%	**22%**	33%	**52%**	13%	**22%**
	Stanford	2%	**8%**	39%	**16%**	44%	**40%**	15%	**36%**
Income distribution in developed nations should be more equal	total	47%	**32%**	32%	**41%**	14%	**18%**	7%	**9%**
	Chicago	16%	**20%**	50%	**47%**	19%	**20%**	15%	**13%**
	Harvard	54%	**25%**	33%	**48%**	13%	**23%**	0%	**5%**
	Yale	60%	**57%**	20%	**29%**	20%	**14%**	7%	**0%**
	MIT	52%	**39%**	30%	**35%**	9%	**9%**	9%	**17%**
	Columbia	46%	**33%**	37%	**44%**	9%	**15%**	9%	**7%**
	Stanford	52%	**36%**	24%	**32%**	17%	**28%**	7%	**4%**
A minimum wage increases unemployment among young and unskilled	total	34%	**33%**	39%	**38%**	18%	**23%**	9%	**7%**
	Chicago	70%	**56%**	28%	**29%**	3%	**12%**	0%	**3%**
	Harvard	15%	**21%**	41%	**56%**	35%	**18%**	9%	**5%**
	Yale	33%	**33%**	27%	**53%**	13%	**13%**	27%	**0%**
	MIT	24%	**17%**	53%	**30%**	11%	**30%**	11%	**22%**
	Columbia	38%	**30%**	25%	**30%**	21%	**26%**	9%	**15%**
	Stanford	36%	**38%**	40%	**35%**	19%	**27%**	4%	**0%**
Tariffs and quotas reduce general economic welfare	total	36%	**51%**	49%	**39%**	9%	**7%**	6%	**3%**
	Chicago	66%	**62%**	34%	**25%**	0%	**13%**	0%	**0%**
	Harvard	20%	**53%**	56%	**45%**	11%	**0%**	13%	**3%**
	Yale	33%	**33%**	60%	**53%**	7%	**13%**	0%	**0%**
	MIT	38%	**48%**	42%	**43%**	13%	**0%**	4%	**9%**
	Columbia	38%	**30%**	54%	**48%**	8%	**15%**	0%	**7%**
	Stanford	32%	**54%**	51%	**35%**	9%	**4%**	9%	**8%**
Inflation is a monetary phenomenon	total	27%	**34%**	33%	**33%**	29%	**20%**	11%	**14%**
	Chicago	84%	**44%**	16%	**25%**	0%	**21%**	0%	**10%**
	Harvard	15%	**30%**	26%	**38%**	46%	**25%**	11%	**8%**
	Yale	13%	**40%**	40%	**20%**	33%	**20%**	13%	**20%**
	MIT	7%	**18%**	44%	**50%**	36%	**14%**	11%	**18%**
	Columbia	29%	**22%**	25%	**44%**	33%	**22%**	13%	**11%**
	Stanford	23%	**28%**	45%	**24%**	23%	**16%**	10%	**32%**
The market tends to discriminate against women	total	24%	**14%**	27%	**28%**	39%	**47%**	10%	**11%**
	Chicago	6%	**5%**	19%	**20%**	69%	**69%**	3%	**7%**
	Harvard	44%	**15%**	20%	**33%**	26%	**43%**	11%	**10%**
	Yale	27%	**7%**	53%	**27%**	13%	**53%**	7%	**13%**
	MIT	24%	**22%**	22%	**30%**	40%	**39%**	13%	**9%**
	Columbia	38%	**26%**	21%	**26%**	33%	**26%**	8%	**22%**
	Stanford	11%	**8%**	38%	**32%**	43%	**52%**	9%	**8%**

Overall, as can be seen in the total columns, there have been only slight movements in views. Fiscal policy is seen as less effective; fewer students see the market as discriminating against women, and fewer respondents believe that the distribution of income should be more equal. In terms of specific schools we see much greater movement, with far less variance of views than before. The percentage of students agreeing that fiscal policy can be effective stabilizing policy increased at Chicago from 6% to 15%, while the percentage at Harvard decreased from 30% to 12%. There was also a significant decrease in the percentage of students at Chicago who believed that the Fed should maintain a constant growth of the money supply (from 41% to 18%) whereas at most other schools this percentage increased. Yale and Harvard, however, remained as the schools with the strongest disagreement with that proposition. A similar convergence of views can be seen in the question about whether inflation is primarily a monetary phenomenon, with Yale and Chicago differing only slightly on their views on this issue. It seems that the Yale/Chicago divide on monetary policy has finally been put to rest.

Table 7 shows students' views of the importance of reading in math, sociology, and psychology by school.

Table 7: Importance of Reading in Different Fields by School

		Chicago	Princeton	Harvard	Yale	MIT	Columbia	Stanford	Total
Mathematics	very important	47.46%	45.45%	22.50%	31.25%	13.04%	35.71%	40.74%	35.84%
	important	33.90%	21.21%	35.00%	43.75%	26.09%	32.14%	29.63%	31.42%
	moderately important	11.86%	24.24%	27.50%	25.00%	34.78%	25.00%	25.93%	23.01%
	unimportant	6.78%	9.09%	15.00%	0.00%	26.09%	7.14%	3.70%	9.73%
Sociology	very important	8.47%	15.63%	30.00%	0.00%	21.74%	25.00%	18.52%	17.33%
	important	40.68%	40.63%	40.00%	43.75%	43.48%	25.00%	40.74%	39.11%
	moderately important	37.29%	31.25%	22.50%	50.00%	30.43%	32.14%	29.63%	32.44%
	unimportant	13.56%	12.50%	7.50%	6.25%	4.35%	17.86%	11.11%	11.11%
Psychology	very important	12.07%	28.13%	25.00%	6.25%	47.83%	21.43%	18.52%	21.88%
	important	22.41%	21.88%	30.00%	56.25%	39.13%	35.71%	22.22%	29.46%
	moderately important	32.76%	34.38%	37.50%	25.00%	8.70%	25.00%	44.44%	31.25%
	unimportant	32.76%	15.63%	7.50%	12.50%	4.35%	17.86%	14.81%	17.41%

Notice from Table 7 that MIT students saw reading in psychology as very important, but reading in math as not very important. Harvard students saw reading in sociology as very important, while Yale students did not.

Differences Among Schools on other Dimensions

The survey asked a variety of other questions, and here I will try to summarize some of the interesting results of differences by school.

Interest in Fields

Interest in fields differed among schools. Significant differences include great interest in micro at Chicago and Yale, the most interest in international trade at Columbia, the most interest in labor at MIT and Chicago, with the least interest at Yale and Columbia. MIT students had the most interest in urban economics; macro theory was of least interest at MIT, Stanford, and Harvard, and of most interest at Columbia. Public finance was of most interest at MIT and of least interest at Columbia, Harvard, and Yale. Money and banking was of least interest at Harvard and of greatest interest at Princeton. Law and economics was of least interest at Princeton and of most interest at Stanford. Columbia and Chicago had the greatest interest in comparative economic systems.

What Put Students on the Fast Track

The response to what skills put students on the fast track also differed by schools. "Interest in empirical work" was greatest at MIT and least important at Harvard. "Excellence in mathematics" was most important at Princeton and Stanford and least important at MIT, Columbia, and Yale. Columbia had the most students seeing a thorough knowledge of the economy as very important (25%) and a broad knowledge of the economics literature as very important (18%). MIT and Stanford had 0%, and Stanford 4% of their students seeing a broad knowledge of the economy as very important.

Use of Optimizing Assumption

Chicago students were still the most likely to use the notion of individual optimizing behavior with 85% saying they used it very often, although the differences were less than before. Columbia students used it the least with 56% saying they used it very often.

Where Students Want to be in 15 Years.

Students at Harvard and Yale were much more likely (75%) to want to be at a major university, whereas MIT and Columbia (39% and 46% respectively) were less likely to want to be at a major university and more likely to want to be at an institution involved in economic policy making. MIT also had the largest percentage wanting to be at a good liberal arts college, 17% compared to an average of 9%. Students at Chicago and Columbia were much more likely to want to be research assistants or teaching assistants than were students at other schools, which is most likely explained by the different support levels of these programs.[9]

[9] Columbia has recently changed its practice, reducing the number of admitted students and providing more long-term support for a larger number of those admitted. Chicago remains the one top school that accepts a large number of students without support, and reduces the number somewhat in core examinations, although in the interviews, and in discussions with faculty at Chicago, that weeding out is less than it is sometimes rumored to be. Chicago remains the largest program. Columbia, which was a large program, now has a much smaller program.

Stress

Chicago students found course work most stressful (42% found it very stressful[10]); this is not surprising since the core exams weed out students at Chicago much more than they do at other schools. Harvard students found it least stressful (20%). Chicago students also found their financial situation most stressful (18%); Harvard students found it least stressful (2%); Columbia students found the relationship with faculty most stressful (22%); Princeton students found it least stressful (0%); Most students did not find the mathematics very stressful; the most stress was felt at Stanford, Princeton, and Columbia, with Harvard, MIT, and Yale having almost no students finding the math very stressful. Chicago found maintaining a meaningful life outside of school most stressful (31%); MIT students found it least stressful (9%). Columbia students found conflict between course content and interest most stressful (26%); Harvard students found it least stressful (7%).

Opinions

Stanford students saw problem solving as most important (69% found it very important[11]); Columbia saw it as least important (32%). MIT students saw empirical research as most important (50%);. Harvard students saw it as least important (15%). Princeton students saw excellence in mathematics as most important (48%); MIT students saw it as least important (17%);.Columbia students saw having a broad knowledge of the economy as being most important (25%); Yale students saw it as least important (0%).

Areas of Interest

Chicago had the greatest interest in micro theory (53% had great interest[12]); MIT had the least (18%). MIT had the most interest in labor (45%); Yale had the least (7%). Columbia had the most interest in macro theory (50%); MIT had the least (14%); MIT had the most interest in public finance (45%); Columbia had the least (14%). Harvard and Chicago had the greatest interest in development (47%); Yale had the least (25%). Princeton had the greatest interest in money and banking (41%); Harvard had the least (7%). Stanford had the most interest in law and economics (26%); Princeton had the least (6%).

Reflections on the Survey Results

Since our earlier study in the 1980s, graduate study in economics has been scrutinized and subjected to self-examination and self-criticism by the COGEE Commission in a way that few disciplines have. (Krueger et al. 1991; Hansen,1991) However, almost none of the COGEE commission recommendations were adopted, and in large part graduate economics training was unaffected by the report. Despite the lack of change in graduate economics education, as I think this survey shows, economics has

[10] The percentages reported in this section are the percentages finding math very stressful.
[11] The percentages reported in this section are the percentages finding a skill as very important.
[12] The percentages reported in this section are the percentages finding a topic of great interest.

changed significantly since the 1980s, and graduate students today are happier with their training than they were.

One reason is that there has been a change in the way economics is done, and the view that economists have of themselves. Economics, today, is more consciously empirical than it was, and while it is more mathematical, the mathematics that it uses are more likely to be applied mathematics rather than pure mathematics. Institutional economics has made a comeback, albeit in a quite different form than before. Rigid behavioral assumptions have become less sacrosanct; behavioral economics and experimental economics have blossomed, and while they are not center mainstream, they are clearly at the edge of mainstream.

A major reason for the change is technological change; econometrics has become far more sophisticated, allowing students to pull more information out of data. Another reason is that methods of bringing theory to the data have increased as economists have become less rigid about their approaches to theory and to empirical work.[13] One student expressed it this way: "I think empirical work is becoming the dominant strand of microeconomics. We have the computing power, we have the data sets, we understand identification issues, and the combination of the three makes the analysis much more credible than in the past, and therefore more readily consumed by policy makers." Creativity in actually saying something, finding the killer "ap", or the perfect field or natural experiment, has gained in importance, and pure technique has faded in importance. As another student put it, "Mathematical ability is great, but creativity is much more important."

The methodological debates of the 1970s and 1980s, which pitted neoclassical economics against heterodox economics, have faded, and the perception of a rigid neoclassical economics has been replaced by an eclectic mainstream whose central theme is "What can you tell me that I don't already know?" The view of what has happened in graduate economics education was captured by a student in his responses to two questions. First, in response to a question of what he most disliked about graduate school, he stated, "Being made more cynical than most would think possible. It is like seeing the inside of a sausage factory." But in answer to the question of whether economists have a relevant role in society that same student answered, "Yes, they are the only careful, structured, empirical thinkers on most economic, political, and social issues."

Issues of Concern

Although the students are generally satisfied with economics, serious issues about graduate education in economics remain open. Many of these issues were noted by the COGEE commission. The first issue is in who is becoming an economist. An important reason for the more positive attitude of the students is not a change in what is done in graduate economics education, but a change in who is becoming an economist. The

[13] When I did the first study, because I was handing out a survey a well-known economist asked me whether I had given up economics. Since that time, a number of economists have begun using survey techniques (Blinder et al, 1998; Bewley 1999) although survey data is still questioned than is other type data. (Easterlin 2004)

selection process is much more efficient than before. In part that is because the information provided to incoming students is much better. In the early 1980s students went into graduate economics study thinking that it would be like undergraduate school; today almost all students know better. [14] This means that students have been prescreened to be comfortable with the mathematics in the program. Similarly, graduate schools know better what they are looking for, and select students who are comfortable in the approach that will be taught. The result is a better fit and a more satisfied student body. That prescreening, however, comes at a cost since it likely eliminates those parts of the applicant pool who rank high on creativity and vision, but who either find the mathematics sterile, or do not have the mathematical ability.[15] The Easterlins, Norths, Olsens, Streetens, Tullocks, and even the Friedmans are far less likely to be replicated.

Since the prescreening is necessary because of the structure of the core, a second issue is the structure of that core. The COGEE report argued that these core courses should teach "those things common to all economists" and be regarded as "the concern of the entire department." (Krueger et al. 1052) There is much ambiguity in the phrase "those things common." Most schools have interpreted "those things common" to mean a set of techniques, and the core teaches the students the common techniques. But there is another interpretation of "those things common" and that is that what is common is a reasoning process. It is not the techniques economists use but the way they approach problems. The economic method that is common to all economists is an imaginative combination of insights and reasoning that emphasizes intuition of how incentives matter and how institutions really work.

The two interpretations are, of course, somewhat connected; certainly statistical methods are common to both But the economic reasoning concept of commonality (1) relies on a less formal set of models than are often taught in the core courses of graduate school today, and (2) emphasizes the relationship of those models to real-world observations much more than does the "technique" interpretation of "those things common."

Robert Solow provides one justification for focusing on highly technical models in the core. He writes, "In economics I like a man to have mastered the fancy theory before I trust him with simple theory. The practical utility of economics comes not primarily from its high-powered frontier, but from fairly low-powered reasoning. But the moral is not that we can dispense with high-powered economics, if only because high-powered economics seems to be such an excellent school for the skillful use of low-powered economics." (Solow 1964: 7, 8) He may be correct, but if that is the justification, it is definitely worth exploring whether there are other screening devices that could serve the same purpose.

One school, Chicago, stood out in teaching a reasoning-based, rather than a technique-based, core micro. The core micro at Chicago was more applied; it focused on

[14] A former chair of a major department once told me that I have discouraged more students from going on in economics than any other person has; I take that as a compliment because it means that the students going on are more likely to be those who really want to go on.

[15] I discuss this issue in Colander (1994)

giving students a sense of economic reasoning rather than techniques. The students reveled in the difference. When I mentioned the possibility of their learning more standard micro, most students strongly objected. One student stated what seemed a common view: "In micro I really like the perspective that they have here; there are a lot of schools where they just go through Mas Colell chapter by chapter. I'd much prefer a course where you don't go through a single chapter of that book." That economic reasoning approach to micro was strongly missed at other schools. For example, one Princeton student stated, "We don't learn price theory in the first year, or get introduced to the models we use in the field courses. In applied courses we do a lot with price theory and I was frustrated that that's not part of the core anymore." Students at other schools made similar remarks. Were students to vote, they would strongly favor a core that focused on economic reasoning rather than economic technique, and which better tied in with upper-level field courses.

One of the reasons the core is not tied to field courses relates to another COGEE recommendation that has not been followed. COGEE argued that the core should be the concern of the entire department. It may well be desirable, but it seems that the departments have allocated control of the content to a subset of individuals, and that subset has allocated control of subparts of the core to each of the individuals of the subset. By that I mean that what students are held responsible for is what the teacher of that sub-course chooses to teach. Again and again in the interviews students remarked that what they learn depended on who was teaching that particular year. They said that if one fails the core exam, one has to retake the entire course, because the next year the content of that core would change so much. Thus, the impression I got was that what is called the core is generally an introduction into the approach and techniques taken by the professors who are teaching that semester.

Thus, the core is not what most outside observers would call a core; instead it is a hurdle for students to jump through, and what is common among economics graduate students is that they have the ability to jump over that hurdle. In the last study, we detected a strong objection among students to being made to jump over this hurdle. This time there is less concern about jumping over those hurdles, because departments have preselected better hurdlers, and because the core exams are structured so that even those who are not interesting in this type of hurdling can make it over. What I mean by this is that with few exceptions at these top schools, the mathematical backgrounds of the students are very strong; they can pass the exams that are set if they decide it is worth doing. Even those who question whether it is worth doing can still pass the exams because the exams are structured sufficiently closely to the problem sets so that a bright mathematically-oriented students who study those problems sets hard enough are able to pass even if they are not totally comfortable with the techniques. One Princeton student made a typical remark "The first year is pure theory. I frequently was doing stuff that I had no idea why I should care about it." Students are highly cognizant of how the exams are structured, and can devise strategies to pass the exam at the required level, even as they are unclear about what they are learning.[16] So the core courses do not pose an

[16] One of the interesting discussions I had with students concerned the greater anxiety of women students about the core exams. The male students in the interview could not understand the women's anxiety since

insurmountable hurdle, which leads to happier students. But the question remains whether the core courses are serving the role that most economists would want core courses to play.

A third issue concerns what subjects are in the core, specifically: with the evolution of thinking in macro, whether macro belongs in the core at all. When we did the last study, new classical economics was in it infancy, and while schools differed enormously in their views on both macro and macro policy, much of the core macro course concerned macro policy. This study shows that that is no longer the case. Most of the macro courses never discussed macro policy, and since micro students never take advanced field courses in macro, they are taught no macro policy. The students told me that the differences in policy views on macro that showed up in the survey did not reflect what they were taught about policy in macro, since they were taught almost nothing about macro, but reflected their undergraduate training. When asked about survey results showing that his school had changed its view on policy, one student stated, "I think that in the macro course we never talked about monetary or fiscal policy, although it might have been slipped in as a variable in one particular model, but that wasn't the focus, so it didn't come from the courses." Another stated, "Monetary and fiscal policy are not abstract enough to be a question that would be answered in a macro course."

In short, the macro that is taught to the students in the core has lost touch with both policy and empirical evidence, even though it was the problem of relating theory to empirical evidence that led to much of the change in macro.[17] That sense of macro is not being conveyed to students. Instead they are presented with dynamic optimal control theory and Euler equations.

Macroeconomists will be quick to point out that that this is not the case; much of the evolution in macro occurred precisely because macroeconomists were trying to bring the models to the data, and that there are enormous amounts of serious empirical work going on in macro on that issue; the debate about calibration techniques is an example. My point here is not to criticize or discuss the state of macro; my point concerns the perception of macro that students get from what they are presented in the core. Whereas in micro and econometrics, the students can accept learning esoteric techniques because they hear from upper-level students that in the field courses they may use those techniques; in macro that is not the case. As one Princeton student remarked, "I would still be hard pressed to tell what any of the tools I learned in macro were for. In micro and econometrics I also initially felt that, but by the second year, things I tried to do before I came here started to make more sense. I was able to construct the models better, and I was able to apply the tools; that was not the case in macro." In many ways macro theory today is advanced dynamic general equilibrium price theory, and, as such a strong

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the rational expectation was that everyone was going to pass. The women agreed, but said that they still felt uncomfortable because they did not really understand what was going on; the male students didn't understand either, but since they were confident they could pass the exam, were not concerned about it.

[17] At one school that had a department-written exam, I heard that a policy-oriented economist who was not teaching in the core wrote a question for the core macro exam about the likely effect on the economy of a change in interest rates. Almost all students taking the exam had no idea how to answer it. The question was discarded, and the department moved away from department-written exams.

argument can be made that it does not belong in the core; it should be seen as an advanced upper level course.[18] Eliminating macro from the core would free up resources to teach more econometrics and statistics, which would serve the same "hurdle" function that the core macro course does currently, but also provide students with more tools for bringing the models to the data.[19]

Another issue with the core concerns the breadth as opposed to the depth of the courses. The COGEE report called for a balancing of breadth and depth in the core. That clearly hasn't happened; the core focuses on depth, not breadth, except as provided by the division of the courses into subcomponents taught by different professors. The core courses provide little context for why those techniques that the students are learning are important, or why they have developed. The core courses almost never survey the field, nor do they attempt to put the ongoing debates in context. They make almost no attempt to provide a knowledge of the field that would translate beyond the particular professor's approach. It follows that students have little sense of background to the debates or the techniques and do not understand why they developed, and what use they are. Instead, the students are thrown into the particular approach, and a particular technique, and told to learn it. What the professors are doing is often interesting, and exciting, so the students are generally comfortable with the course as long as they know that they will be able to pass the exams. Since the core exams are generally repetitions of the core course exams, and are graded by the same professors who taught the course, not by the department or by an outside group of examiners, the students can pass the exams without much trouble, which is why they can accept the situation.[20]

This breadth issue is of special interest to me as an employer of graduates of these schools. Liberal arts schools, such as mine, need macro economists who have some knowledge of macro institutions macro policy and some sense of the history of macro.[21] Job candidates who have studied macro in top schools often have almost no training in such issues.

Conclusion

Despite the problems with the core, the students were generally more positive on economics than they had been. All the problems and stress that go along with getting a Ph. D. are still there, but, in my view, this time, that stress reflected the normal level of

[18] What does, it seems to me, belong in the core is a course that is centered around macro policy issues, not macro theory and the problems of relating that theory to the empirical evidence; that, I suspect, would be to large a change to even entertain.

[19] Specifically, its place in the core can be replaced by additional training in the various time series, cointegration, VAR, and nonparametric econometric techniques that may be useful in bringing the macro models to the data, or at least bringing the data to policy. In my view, exciting developments are occurring in Europe in general to specific econometrics, yet almost none of the students I interviewed had any knowledge of these developments.

[20] I gave my alternative proposals for structuring and grading the core in Colander and Brenner (ed) (1992). They involve outside examiners, or a general exam, given by the department, based on a reading list, but without specific lectures, which students would have to pass as part of their training.

[21] Stock and Hansen (2004) discuss the training of economists from the perspective of employers, strongly arguing that graduate training does not fit the nature of the policy jobs that many economists take.

concern, not the deeper concern that I detected in the students in our previous study. This change can be seen in the failure of the recent "Post Autistic" French economics student revolution to make any waves in the United States.[22] Most students in the United States were unaware of that revolt, and those who were aware of it, felt that it was not especially relevant to their concerns. The reason is that the U.S. students were reasonably happy with their education and with economics. U.S. students feel they are learning useful tools, and that they are entering into a profession that is respected, and has something to say.

I am known as a critic of graduate education in economics, and, I suspect that by reading my view of the core that view will be reinforced. But my critique in this study is quite different from my critique of twenty years ago. Then, my critique was not only of economics graduate education, but also of economics—its rigidity of assumptions, its lack of empirical grounding, and its failure to bring the models to the data in a serious way. That is not my critique this time; economics has changed, and, in my view, it is attempting to bring the models to the data in a much more meaningful way than it used to.

In what economists do and value, theory is no longer constrained by strict modeling assumptions and the need to make models fit a certain approach and in a certain way. Theory for the sake of theory has been reduced. But, as can happen as technology changes, the pedagogical institutional structure has not kept pace with the changing research technologies. So my critique of economics now is not about economics, but about pedagogy—specifically the structure of the core in graduate education. If, as the students strongly noted in the interviews, creativity and economic reasoning, not mathematics, is the core of economics, then it seems reasonable that the core courses should focus on creativity and economic reasoning and not technique.

[22] About the same time that I was doing this survey, French graduate education was going through a student revolt. (See Fullerton 2003.) The complaints of the French students were, in many ways, the same complaints of critics of US education in the 1980s—that it was unempirical, and that it lacked connection to the real world.

Appendix A

Methodology of the Questionnaire

The questionnaire was distributed in 2001-2002 in Princeton and the 2002-2003 school year at the other schools. The total number of respondents was 231 from an estimated population of 600-800, an approximate 33% response rate, normal for this type of survey. The survey was identical to our 1985 survey and took students anywhere from 15 minutes to more than an hour to complete. The distribution of respondents by year by school was Chicago 26%, Princeton 15%, Harvard 18%, Yale 7%, MIT 10%, Columbia 12%, and Stanford 12%. The distribution by year was first year 22%, second year 25%, third year 19%, fourth year 14%, and fifth year or more 20%

The academic coordinators at the various schools distributed the survey. It was placed in student mailboxes and students were asked to return it to a central return point. Students were reminded to varying degrees by e-mail from the academic coordinators to fill in the questionnaires, and the differing tenacity of the academic coordinator in reminding students likely accounts for some of the different number of respondents by school. As we stated in the previous study, there is a potential for bias in the surveys; technically-oriented students were probably less likely to answer questionnaires, as were foreign students.

Interviews were conducted with students who agreed to be interviewed and who gave their e-mail address on the questionnaire. They were contacted and a date was set up for the interview. No attempt to insure a random selection of students to interview was done, although in all interviews, I asked the students if they felt they were representative of the views of the larger student population. The interview process differed somewhat from last time, since I did all of the interviews this time, whereas in our earlier study Arjo Klamer did a number of them.

Bibliography

Aslanbeigui, Nahid and Veronica Montecinos. 1998. "Foreign Students in U.S. Doctoral Programs" *Journal of Economic Perspectives*. Vol. 12:3 Summer. 171-182.

Bewley, Truman. 1999. *Why Wages Don't Fall During a Recession*. Cambridge: Harvard University Press.

Blau, Francine. 2004. Report on the Committee on the Status of Women in the Economics Profession 2003. *Committee on the Status of Women in the Economics Profession Newsletter*, Winter.

Blinder, Alan, et al. 1998. *Asking About Prices*. New York: Russell Sage Foundation.

Colander, David. 1998. "The Sounds of Silence: The Profession's Response to the COGEE Report." *American Journal of Agricultural Economics*, August 80(3). 600-607.

_____. 2002 "The Aging of an Economist." *Journal of the History of Economic Thought*

Colander, David, and Reuven Brenner. 1992. *Educating Economists*. Ann Arbor: University of Michigan Press.

Colander, David, and Arjo Klamer. 1987. "The Making of an Economist." *Journal of Economic Perspectives*, Fall 1(2): 95-111.

Easterlin, Richard. "Economists and the Use of Subjective Testimony" in Richard Easterlin, *The Reluctant Economist.* Cambridge, England: Cambridge University Press.

Fullerton, Edward (ed). 2003. *Revolution or Evolution: Reflections on the Post-Autistic Movement*. London: Routledge Publishers.

Hansen, Lee. 1991. "Education and Training of Economics Doctorates: Major Findings of the American Economic Association's Commission on Graduate Education in Economics." *Journal of Economic Literature*, Sept. 29(3): 1054-87.

Klamer, Arjo and David Colander. 1990. *The Making of an Economist.* Boulder, CO: Westview Press.

Krueger, Anne, Kenneth Arrow, Olivier Blanchard, Alan Blinder, Claudia Goldin, Edward Leamer, Robert Lucas, John Panzar, Rudolph Penner, Paul Schultz, Joseph Stiglitz, and Lawrence Summers. 1991. "Report of the Commission on Graduate Education in Economics." *Journal of Economic Literature.*" Sept. 1991, 29(3) 1035-53.

Solow, Robert. 1964. *Capital Theory and the Rate of Return.* Amsterdam: North Holland.

Stock, Wendy, and W. Lee Hansen. 2004. “PhD. Program Learning and Job Demands: How Close the Match?” Working paper.