

APPLYING FOR ADMISSION TO ECONOMICS PHD PROGRAMS

The (revised) former econphd•net guide

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1. DEMAND FOR ECON PHDS

Who wants economists and which economists do they want? There are 3,000 universities and colleges in the U.S., many of which hire economics PhDs from time to time. There are several thousand more international universities that do the same. In addition, some public service institutions as well as commercial research and consulting businesses employ PhD economists. To meet this demand, American programs award about 300 to 400 economics PhDs in a given year. Their graduates compete primarily for positions as assistant professors, either in a research university, like Harvard, or a teaching-oriented college.

1.1. *Academia*

Because publications are the road to fame, PhDs generally prefer to join a renowned research university; however, there are only a few such openings each year. If you guess that they'll go to graduates from the top schools you're (usually) right, but there are many more top-school PhDs than "good" academic jobs. In fact, almost one quarter of all U.S. PhDs comes from one of the schools that might be described as forming the top ten. (I'm referring to Berkeley, Chicago, Harvard, MIT, NYU, Northwestern, U Penn, Princeton, Stanford, and Yale.) Given the oversupply of prestigious degrees, it's reasonable to target such programs if you plan to make a mark.

A few of the very best PhDs from top-30 (or even top-50) and non-U.S. schools manage to get hired by prestigious departments. Programs rank their graduates internally, and the position on that list becomes a key factor in anyone's placement. Hence, there is something to be said for entering a rising, underrated program with strong training and a pool in which you can comparatively excel. Still, the fact remains that the vast majority of new hires at good departments comes from similar or better places. Liberal arts colleges also like to recruit from well-known programs, because this is the kind of thing students and parents consider when they decide to enroll. Faculty at the top-ranked colleges (Amherst, Swarthmore, Wellesley, Williams, etc.) hails from the most prestigious universities.

1.2. *Private and Public Sector*

For those interested in private industry and government employers that routinely hire PhDs (mainly economic consulting firms, central banks, the World Bank and the IMF), graduating from a program of high repute is also important. Consulting firms (such as Analysis Group, Brattle, Charles River Associates, Cornerstone, or NERA) can bill clients more easily for hours by a junior consultant with impressive qualifications. Jobs at the Fed and international organizations are sufficiently popular that they can be very selective.

These aren't the only non-academic places where PhDs can find work (others include transfer pricing and management consulting firms, not-for-profit think tanks and regulatory authorities). However, the economics PhD is not geared to applied pursuits and doesn't give you much of an edge over master's graduates in the general job market. If your goal is a business or government career, you should ask yourself whether the PhD is really something you need.

2. ADMISSION PROCESS

How difficult is admission to a good program? The top ten U.S. programs enroll about 300 new students each year; nonetheless, competition for these places is fierce. Economics is one of the more popular fields of graduate study, for one thing. Going by evidence such as GRE scores, economics applicants are on average also among the brightest; only physics, math, and computer science applicants beat them by a margin.

2.1. *Standardized Test Scores across Disciplines*

The table below compiles data on average GRE scores in each graduate field and the number of applicants scoring in the top 3%. Economics ranks 4th by the first measure and 8th by the second (biology, psychology and literature attract far more applicants each year ...). (The raw scores are dated and reflect the old paper-based GRE, with three sections and a maximum of 800 points on each. Although the testing medium and scale have changed since then, I would not expect a dramatic shift in the discipline ranks.)

In order to compare disciplines, one needs to take into account both the average quality of applicants as well as the number of strong applicants competing for places in PhD programs. That's why we look at average scores as well as how many are scoring above a certain threshold. To some extent, there will be more places in more popular disciplines, but probably not so much so that average quality is equalized. Thus, both matter. The following list is based on the average of the "quality" and "competitiveness" ranks. By this measure, the PhD fields in order of difficulty of entry are:

Computer Science, Physics, Mathematics
Economics
Electrical Engineering, Biology, Chemistry, Chemical Engineering
English, Philosophy
Mechanical Engineering
Psychology
Earth Sciences, Material Science, Political Science, History
Civil Engineering
Industrial Engineering
Anthropology / Archaeology, Art History
Theology, Sociology
Communication

(Some professionally oriented fields— architecture, business, education, medicine, public administration – are excluded since they may have distinctive tests and requirements.) Based on this, getting into the best PhD programs appears to be an easier feat in economics than in computer science, physics, and math, but it's tougher than just about

everywhere else. In fact, this method probably overestimates competitiveness in the hard sciences relative to economics. U.S. programs aren't nearly so dominant in these areas: this, combined with more scattered pockets of specialized expertise, creates a larger pool of leading institutions to which the global pool of applicants is matched.

GRE Score Concentrations in 28 Fields of PhD Study										
<i>Field</i>	<i>Quality of the Pool</i>					<i>Competitiveness Indicators</i>				
	MEAN SCORE BY SECTION			MEAN OVERALL		# PEAK SCORES (TOP 3%)			RANKS	
	V	Q	A	Tot	Rnk	V	Q	A	Md	Mn
BIOLOGY	514	618	602	1734	14	484	441	741	2	1
CHEMISTRY	502	665	612	1779	10	104	276	280	7	9
COMPUTER SCIENCE	515	712	635	1862	3	237	810	450	3	2
EARTH SCIENCES	528	626	607	1761	11	86	47	109	16	16
MATHEMATICS	517	714	646	1877	2	147	480	386	4	6
PHYSICS	536	719	644	1899	1	189	515	376	5	5
CHEMICAL ENGINEERING	506	712	627	1845	5	45	202	109	13	14
CIVIL ENGINEERING	469	691	584	1744	13	17	112	50	20	18
ELECTRICAL ENGINEERING	489	720	612	1821	7	117	780	240	9	4
INDUSTRIAL ENGINEERING	458	699	588	1745	12	10	64	30	23	23
MATERIAL SCIENCE	510	709	621	1840	6	13	73	32	22	22
MECHANICAL ENGINEERING	494	714	606	1814	8	53	248	90	15	12
ANTHROPOL. / ARCHAEOLOG.	546	545	584	1675	20	138	11	75	17	17
ECONOMICS	526	698	633	1857	4	152	328	256	8	8
POLITICAL SCIENCE	535	564	598	1697	17	250	35	162	11	11
PSYCHOLOGY	489	533	561	1583	24	537	87	539	1	3
SOCIOLOGY	507	540	566	1613	23	45	10	48	21	21
ART HISTORY	549	549	583	1681	19	107	7	51	19	19
ENGLISH LANG. / LIT.	573	538	591	1702	15	691	35	284	6	7
HISTORY	558	546	591	1695	18	356	19	189	10	10
PHILOSOPHY	585	597	621	1803	9	201	22	127	12	15
RELIGION / THEOLOGY	550	564	587	1701	16	29	3	17	27	27
ARCHITECTURE	491	606	555	1652	21	18	25	11	26	26
BUSINESS	479	598	562	1639	22	13	44	20	25	24
COMMUNICATION	486	521	542	1549	26	37	6	23	24	25
EDUCATION	467	515	532	1514	27	66	16	69	18	20
MEDICINE	470	556	556	1582	25	107	82	176	14	13
PUBLIC ADMINISTRATION	460	493	507	1460	28	3	1	8	28	28

Explanations: Mean score by section – V = verbal, Q = quantitative, A = analytical, all on an 800 scale.

Mean overall – Tot = total GRE score, on a 2400 scale; Rnk = rank by total. Peak scores – number of scores in the top 3% of each section accruing to the field. Ranks – Md = ranking by the median of peak score numbers across sections; Mn – ranking by the mean of peak score numbers across sections.

Bold-faced ranks reflect above-average “quality” / “competitiveness.”

Source: data reported in ETS Powerprep 2002 software.

(Fairly diverse fields, in content and selectivity, appear under the heading “business.” Out of these, finance gets much stronger applicants than others. On the whole, the considerably smaller size of business PhD programs, compared to economics, can make them very difficult targets, too.)

Admission to good PhD programs in economics is very competitive – equally or more so than the scuffle for the most prestigious jobs out in “the real world.” Even some schools outside the top ten accept fewer than 1 in 10 applicants, from a group of “overachievers” who have excellent grades and scores. They plan to enroll a smaller number than they admit – which means that only some of those 1 in 10 get fellowship offers ... If economics and math-intensive research are not your passions, the contest is not worth taking up. A suitable alternative may be business PhD programs, which are still a bit easier to get into (and through!), and provide more generous stipend packages, as well as a less saturated job market with higher pay.

2.2. *Selection Criteria*

What does it take to get in? Official admission literature from the schools will always say that many factors are given consideration, and this is really true. In the end, the whole picture either looks like a fit with the particular department, or it doesn't. On the other hand, certain weak spots are at once disqualifying. A popular program sees and expects very high undergraduate GPAs (still better graduate GPAs if applicable) at well-known institutions (ideally 3.7 / 4.0 or better, unless you come from a non-U.S. school or system that is understood to have tougher standards). It also expects a quantitative GRE score well above the 90th percentile (perfect scores are not out of the ordinary) and a decent analytical score. The verbal section is much less important, but a score below 500 looks off-putting, especially on an international application. Anything short of these benchmarks lands your application on the reject pile, unless you have some very intriguing other credentials (and usually in spite of it).

Pedigree matters - students from renowned U.S. undergraduate programs and state universities with top-ranked economics departments are popular with the adcoms. A concrete advantage these students have is access to well-known letter writers. But it is far from impossible to get into a good school without a gilt-edge degree, and the basic credentials (math background, grades ...) speak louder anyway.

International admits are typically (though not without exception) chosen from the best institutions of their home countries. Professors know the major universities outside the U.S.; they understand that a Korean coming from Seoul National University is like an American coming from Berkeley. The department's past experience also plays a key role in evaluating non-U.S. degrees. Some universities have a tradition of placing students in particular PhD programs every year because the adcoms have learnt by trial and error

that they come well-prepared and succeed. In other cases, the adcom may be averse to admitting someone from the same school that sent a weak student last year. The same happens at the even cruder level of nationality. How does understanding this help you? Look up the current graduate students in a department, take note where they're from, and you'll get a sense of the adcom's little biases. Say you are from China and there seem to be very few Chinese students in the department: it's probably a tough place to get into.

2.3. *Math Background*

You will need a number of math-related credits from your undergraduate studies. Graduate study in economics follows a theorem-proof approach and uses rigorous notation, so the adcoms pay a lot of attention to how comfortable you look to be with pure mathematics. Two or three terms of calculus, and often linear algebra, are deemed minimum preparation; similarly a semester of mathematical statistics. First-year graduate courses draw heavily on real analysis. Background in real analysis is highly valued and indeed almost expected of a strong applicant. Real analysis is usually the first "rigorous" mathematics course, where you have to work through all proofs and write some yourself. The course is supremely effective preparation for initial graduate courses.

If you really want to delight the adcoms, take metric spaces and functional analysis, too. When they see these and measure theory, perhaps even topology, they're going to pay very close attention to you. Courses in differential equations are useful too, but if you have to choose in your final undergraduate years, the proof-based classes will always do more for you. Economics up to intermediate micro- and macroeconomics is also preferred, but perhaps not as essential. In all these, you should have earned good grades. Having taken too few math courses in college, or having performed poorly in them, rules you out of a top school. Apart from such coursework requirements, a formal major in economics is not necessary. In fact, the committee will view a math or physics major favorably, but anything – English, social work, Islamic studies – is fine as long as you demonstrate a strong aptitude for math.

2.4. *GRE*

Plan to send your applications by mid-November. You need your final GRE score by end of October or early November: this means, start practicing for the GRE no later than early September. Whatever ETS claims, smart practice can raise your score significantly. You might get the best results from taking two sample tests in a row, about once a week. (Tests are available from prep books and the software ETS sends you after registration.) This builds up stress resilience and won't make you as hostile to the GRE as

looking at it every day, over a two-week period, would. Review math, but don't memorize word lists – increasing the verbal score doesn't help your application.

Take the GRE by October, so that you have a chance to retake in November (you are allowed to test once per calendar month). Don't try to improve a result that's already good enough (quantitative part is around the 95th percentile or better) – ETS will report all scores to the departments, and if you do worse the second time around, it discredits your initial, satisfactory performance.

2.5. *Recommendation Letters*

Letters of recommendation carry much weight. Contrary to popular belief, they do not need to come from famous professors. They must, however, come from academic economists (or perhaps mathematicians) – not your boss at work, nor your old philosophy instructor ... If a non-economist can endorse you in a uniquely meaningful way, perhaps submit this letter as an extra. Of course, a distinguished referee can't hurt, but getting an enthusiastic, specific letter from someone who knows you well is more important. Because lukewarm letters are very damaging, be sure to ask referees in advance whether they can support you whole-heartedly; a good way to breach the topic is to ask their advice on the type of program you should apply for. You can provide a background sheet with your grades, scores, and other credentials to professors and refresh their memory about things you've done in class, in order to get the detailed letter you need.

Phone calls from professors on your behalf will not necessarily help (and neither would personal e-mails to people on the committee, showing off your insightful opinions on their work); in fact, they can invite a negative reaction. More likely than not, people will find "helpful" outsiders disturbing and lecturing students presumptuous; professors often get contacted and won't let it influence the decision. Of course, if your backer is or has been at the department you are targeting, that's a different thing ...

Keep in mind how many students are applying and that professors cannot give individual attention at this stage. If anything, resentment at being busied with networking attempts may work against you. The situation is different at less established, more narrowly focused departments. Writing to professors makes good sense here, since you'd want to ascertain that they have resources in your area of interest and perhaps identify a potential supervisor. In some European systems it is even a necessary step in the application process - more on that later.

2.6. *Research Experience*

A popular myth is that the admission committee rolls out the red carpet for applicants who have published a paper. In fact, the opposite can be true. Top-school professors think nothing of low-quality journals; those publications are rarely up to the mark of good graduate-level research. Moreover, a poor-quality publication becomes part of your permanent record as a writer. Your advisors intend to work hard to make you an attractive candidate for the academic placement market and might prefer to start out on a blank page ...

Of course, if you have a paper in a good journal, you're gold. But top general-interest or field journals are virtually inaccessible to students. That said, there's nothing wrong at all with sending a well-crafted technical paper as evidence that you can do serious research. If you submit anything, it ought to be a rigorous piece; non-quantitative work won't impress the committee.

2.7. *Statement of Purpose*

Some applicants obsess about the Statement of Purpose, but it has a smaller impact in economics than in many other subjects. Overly enthusiastic homages to the discipline of economics or the department you're applying to should be avoided as they sound artificial and waste space. Don't forget that the professors who will read it are very intelligent people and won't appreciate your presuming otherwise. Nor do they care much about your sincere love for markets, your presidency of the toastmaster's club, or the good things you've done in your community, as long as you can read and construct proofs. They also know you're applying to other top schools and would happily go to any of them if you had the chance.

The best approach is a conservative one, stating your credentials and objectives in a clear and focused way, outlining a specific research idea (without sounding rigidly attached to it – a delicate balance needs to be struck here), and mentioning how the school's particular strengths fit into your plans. Look up the faculty's research interests and histories to determine this.

Work experience (except at a central bank or similar professional economics outfit) is wholly irrelevant for graduate admissions. No degree of accomplishment or seniority in the private sector means anything to the professors. If you try to turn such a background to advantage in the statement, it will hurt you. You will sound as if you have illusions about the nature and requirements of graduate study. Most applicants have little or no work experience, but those who have had a career (and made an informed decision to apply for the PhD) should make only passing reference to the fact and instead implicitly address the questions that a prolonged absence from academia raises in people's minds. Primarily, they would wonder whether your math background is

active knowledge, whether you can discipline yourself to study, whether your commitment is final and unencumbered by financial and family obligations.

Draft your statement of purpose by late October and revise it several times, in intervals, until it sounds genuine. If a sentence looks dry, tortuous, or pompous to you, it will also look that way to the reader.

3. ISSUES AND SOLUTIONS

3.1. *Grading Scales*

So graduate programs require high GPAs - but what if you don't have a GPA? The main alternative to letter grades are numerical grades on varying scales. Australia, for instance, uses a percentage scale, i.e. the best possible grade is 100. In converting numerical grades, I would use the following key, which the University of Michigan endorsed for Australian grades. (If the scale is, say, 15, just work it out proportionally.)

Percentage Band	Equivalent Letter Grade	Equivalent Grade Points
80-100	A	4.0
75-80	A-	3.7
70-75	B+	3.3
65-70	B	3.0
60-65	B-	2.7
55-60	C+	2.3
50-55	C	2.0
45-50	C-	1.7

To calculate your GPA, you need to convert every grade to U.S. grade points and take the weighted average, where the weights are credit hours. A credit hour corresponds to the number of lecture hours per week in a twelve-week term. (Hence, add up the total number of lecture hours for the class and divide by 12.)

Grades aren't the only way in which adcoms can compare you. It helps if you have an official class rank or percentile. Some universities award "honors" on graduation that directly imply a percentile - if so, explain this. If you have no official class rank, ask your referees to quantify your standing in the class as they perceive it. If you feel that your converted grades or your official class rank don't do you justice – say because your university, although not well known, is particularly competitive, it's ok to mention this in your application. Chances are, the adcom is already aware of it from previous

experience (otherwise, they probably won't pay attention to your claim unless it's substantiated by the letter writers).

3.2. *Chequered Histories and Transfers*

The following is a common story: I didn't take college seriously at first and got really bad grades, but I've come around since then and aced the rest (or my master's program). Will those early years come back to haunt me? You know there's a price to be paid, but it's not as high as forfeiting all chances of entering a good graduate school. The adcoms genuinely want to find good students, not deliver moral justice. Recent grades count for a lot, but it's important that these grades are in subjects that matter most to the adcoms: your math and advanced economics classes. If you've taken real analysis etc. at that dark point in your life, you probably need to enroll in metric spaces or measure theory now, or graduate micro theory perhaps, and excel.

Although the disparities in your record will be obvious to the adcom and really don't need that much comment, you can refer to them in your statement. But don't devote much space, except to emphasize that the problem is resolved – sympathy is not a factor in admissions. It may be a good idea to cite a grade-point average for the two most recent years, or for advanced math and economics classes only. It is quite feasible to enter a PhD program based on average credentials (or, at any rate, accept a less than ideal offer) and transfer after a successful first year. Since your grades in actual PhD coursework are considered to be an excellent indicator, even one term of high grades can greatly improve the picture, so it is possible to reapply immediately after the first term. Typically you will want a reference from someone in your current program, confirming that it makes sense for someone of your capacity and / or interests to study elsewhere. The new program normally expects you to repeat the first year there.

Now for the unfortunate case that the bad years were the most recent ones. The typical example is a master's program, or beginning of a PhD program, gone awry. Your past achievements count for little once this has happened. Even not very selective departments will be reluctant to consider, let alone fund, you. In some cases, a current professor may be willing to recommend you and emphasize attenuating reasons for your recent performance. Short of this, the PhD route may no longer be an option, unless you can study without funding (or do a master's before reapplying).

3.3. *First Stop: Master's*

Many successful international and domestic applicants have begun or completed a master's degree. Existing graduate transcripts are very helpful to the adcoms, since the content of the courses is similar everywhere, so this gives professors a good idea of what you really know and how you perform at a level of some rigor. (Research master's

degrees are also offered in some countries - they don't help as much.) It is generally assumed that master's level grades are inflated, so a graduate GPA ought to be rather better than 3.7. As long as you can show some solid grades in the program, it is in principle acceptable to apply to a PhD program early, and perhaps transfer out of the master's program without finishing it. You'll get another master's from your PhD program anyway.

PhD programs will generally not give credit for prior coursework; it serves only as a signal in the admission decision. You will start your PhD program from zero. But if your math background is somewhat deficient, you can strengthen your application by completing a full-length master's and taking the needed courses in the meantime. You'll likely get better recommendations if you stick around longer in your master's. (And let's not forget that you do benefit academically: students who have worked through the graduate textbooks before, perhaps TAed at that level, have a clear advantage in the first year of their PhD programs and may raise their stipends.)

Is it always good to get a master's before applying to PhD programs? It's becoming a reality for prospective applicants from unfancied undergraduate schools who are less than very well-prepared. If you don't have the right math credits, or your undergraduate GPA is mediocre, a master's program can solve your problems. It is much easier to get into terminal master's programs than into any PhD program. Unfortunately, terminal master's students in economics are generally not funded in the U.S., and tuition is not cheap. (Tuition-free master's programs still exist in Europe, along with lower-cost ones, which are also found in places like Canada, Australia and Singapore. But the general trend is to move the money into PhD programs.)

Where to get your master's? Most top schools don't offer a terminal master's in economics (NYU and Boston University, and recently Columbia, are the most prestigious U.S. schools that do have the degree.) What you want is a mix of reasonable cost, smaller size (so that you can actually interact with faculty), research-active faculty (that will teach rigorous classes and be effective as letter writers), and perhaps a campus located within a strong non-academic job market – in case your plans change.

From a cost angle, and also with a view to ideal preparation for the PhD, a master's in math or statistics could be preferable to a master's in economics. However, if you end up not getting the PhD afterwards (which is a very real possibility, given the high admission hurdles and dropout rates), the master's in economics is probably more valuable to you.

4. PROGRAMS

Which schools should you apply to, and when? Almost everybody tries one or two really prestigious programs (Chicago, Harvard, MIT, Princeton, and Stanford are known as the “Big Five”), more if very confident. Even if you think that admission there is unrealistic, you’ll feel better afterwards for having probed the limit. The rest depends on how competitive you expect your application to be, and how safe you want to play it. Normally, the final list will comprise five to ten departments and include two or three back-up choices where admission seems very likely.

But if you wouldn’t want the economics PhD unless from a very good school – because you have other options or you can afford to wait and reapply if necessary – it is perfectly reasonable to have no safeties at all. There is a tradeoff between number and quality of applications; they do take time (particularly if you wish to understand and address what is special about the programs you picked), and your recommenders will be better motivated writing to a small number of appropriate choices than lots of inferior or unreachable ones.

4.1. Ranking Departments

How do the schools stack up? The top ten are great in every major subdiscipline of economics. Other renowned programs are on par with them in some areas, but not in all. You’ll need to spend some time looking up the faculty’s research and identifying departments that have at least two or three well-published Associate Professors or Professors working on the topics you’ve earmarked for specialization.

Later, on the job market, it will make a big difference who supervised your thesis – besides name recognition, an established professor has the contacts and the influence to get you on shortlists. On the other hand, one should not overestimate one’s commitment to a research area before doing graduate coursework. You’ll discover that there’s more to various topics than you can now imagine, and your professors will sway your inclinations. Flexibility is therefore valuable at the point of entry – hopefully there’s consistent quality at some level.

Everyone’s consulting, and subjecting a good part of their judgements to, “the rankings.” Not to do it would be foolish, since rankings contain fairly objective information, which is hard to come by through our personal contacts. But which ranking to use? There are two major types: reputation (survey) rankings and publication / citation counts.

Economists know their colleagues and the work done at the leading departments; in reputation rankings they take all factors into account and provide a more or less

balanced assessment. Aggregated over a large and representative sample, these ratings mean a lot. US News & World Report publishes the best-known reputation rankings of graduate programs each year – but the NRC (National Research Council) studies, conducted every ten years, involve many more respondents (from a list of key faculty supplied by the schools’ dean’s offices). The US News ranking, which tries to survey two senior members in each program, garners a response rate of about one-half and basically has an adverse selection problem. The two key indices reported by the NRC are the “program effectiveness” and the “faculty quality” rating, each ranging from 0 to 5, where fives indicate universal agreement that the program is “extremely effective” and the faculty “distinguished.” The grades translate into: 5 – distinguished, 4 – strong, 3 – good, 2 – average, 1 – marginal, 0 – inadequate.

Publication rankings have some methodological issues: articles published in different journals are hard to compare objectively and page numbers may or may not correlate with quality. Also, some schools excel in research productivity (publication) rankings because they have a handful of individuals who write prolifically in specialized areas - depending on your interests, this may be important or unimportant to you. However, I have come to side with publication rankings for primarily two reasons.

(1) The reputation of departments in a professor's mind is really a proxy for publications, and an imperfect proxy at that, constrained by what fields the professor pays attention to, which recent moves she is aware of, etc. (2) It has been argued, and seems true by circumstantial evidence, that publication rankings are a leading indicator of future recognition. Partly, this may be because frontier research turns into mainstream stuff; more importantly, I think, professors correct their biases in response to publication rankings.

There are a good number of publication rankings around (such as those done by Kalaitzidakis, Mamuneas, and Stengos); some are even disaggregated to specific fields within economics. Sampling different rankings, and perhaps averaging them, yields information of poor quality and is, in my view, not worth anyone’s time. Resist the temptation.

4.2. *Non-U.S. Programs*

PhDs educated in the top U.S. departments tend to be the most sought-after and highly-prized on the market. This isn’t true for every subject, but it is for economics because American-style graduate programs, with their intense curricula and immersive research cultures, produce competent and productive academics. This is also recognized abroad, and the European schools that made inroads with programs modeled after American ones (such as the London School of Economics, the Toulouse School of Economics and Tilburg University) are now a model for ambitious departments elsewhere that tap into an applicant pool that includes far more talent than the best U.S. programs can absorb.

Much of what is said here about applications to U.S. programs applies to these international programs that have been refashioning themselves to offer similarly conducive conditions.

It's not a bad idea to apply to non-U.S. programs, for a couple of reasons. (1) They have fewer applicants, even when compared to U.S. programs of similar quality. (2) Some programs offer generous funding with most admissions. Elsewhere, applying for available funds may be more involved, but that narrows the pool of applicants; there are information rents to be earned. (3) Every year, some admitted students have their visas denied by U.S. consulates. "At-risk" applicants (this is especially frequent for Chinese, Latin Americans and Middle Easterners) may want an option outside the U.S.

Unfortunately, not every university system operates like the American system. All Canadian and Australian universities, and a few others besides, have very similar application processes to those in the U.S.; the marginal effort in applying to them is not large. (Note, however, that the Australian deadlines are entirely different.) Other good programs require a substantial investment in information search, personal contacts, filling up unfamiliar forms, and supplying extra write-ups and references. One should have a good reason for taking this upon oneself. Perhaps a specialty is particularly well represented in one of these places, or one is a marginal candidate where entry barriers are low and seeks the aforementioned information rents. Some regional specifics follow, although very sparse in some cases. There are no programs to speak of in Africa.

Canada Toronto is traditionally viewed as on par with U.S. top 30 schools, and recently UBC (the University of British Columbia) has had research output to rival that of top 30 departments. Next in line are Queen's University, the University of Montreal (not to be confused with the University of Quebec at Montreal), which are roughly like top 50 U.S. schools, and Western Ontario. Application procedures and deadlines are as in the U.S., and there is similar availability of funding (which admits are automatically considered for). Canadian programs also run like their U.S. counterparts, with equivalent coursework, requirements, and placement mechanisms.

Australia / New Zealand Australia is on the way to forming departments and programs that consistently meet U.S. standards (New Zealand is farther behind). Traditionally, the Australian National University was the region's flagship, but the University of Melbourne and the University of New South Wales are now equal competitors, after bringing in senior faculty from the U.S. and hiring to U.S. standards in the junior market for about a decade. Graduates from these programs can place fairly well with Australian universities. The University of Queensland and Monash University are very strong in particular fields (Queensland in micro theory and Monash in econometrics) and catching up in others. Australia's academic year begins in late February / early March and runs to December; the admission deadlines are in fall of the preceding year. The application process is similar to that of the U.S., although the GRE tends not to be required. The selection process (for funding in particular) places heavy emphasis on grades and is to

an extent controlled by university bureaucrats, rather than the department. Hence the system favors those with good GPAs, even if the coursework is deficient in content.

UK In the London School of Economics and University College, England has two fine American-style programs that bear comparison with U.S. top 20 schools. The application procedures are also similar. There are more good departments, but many of these (most prominently Oxford and Cambridge) separate funding from admission decisions, so that time-consuming applications to multiple bodies with various objectives are required in order to have a reasonable chance of support. Some of these foundations ask for separate essays and references. Funding is generally easier to obtain for European and Commonwealth citizens than for other foreigners. Among the more ambitious programs, e.g. Warwick and Essex, a positive trend is in the making to offer some department-sponsored scholarships. The best schools have two-year coursework sequences akin to those in the U.S. and are earning international recognition for the quality of the training.

Europe The centuries-old university systems of the continent still reflect different underlying philosophies. The German and French universities (and related systems such as the Belgian, Austrian, and Dutch) traditionally had no tuition charges, while scholarships were primarily offered to nationals through government offices (or to European citizens, through the European foundations). There were typically no admission cycles or even formal admission processes: rather, one would contact a desired supervisor and “compete” for an available PhD research topic (that may have funding attached to it). The departments are, in the German system, organized into professorships that function as separate institutes (with their own academic and other staff and budgets), working within a clearly demarcated specialty. One seeks affiliation with an institute (headed by a particular professor) and becomes a member of the department through membership in the institute. In the French system, a pattern has emerged in which departments host fairly autonomous research centers, and professors may be affiliated with several of these. This model is also becoming popular elsewhere in Europe and outside the U.S. Some of the centers train and fund graduate students. An outstanding success story of this system is the Toulouse, which must be counted among the world’s top sources of high-quality theory research.

Things are changing, and we now have a number of good programs in Holland (Tilburg and Erasmus in Rotterdam / Amsterdam), Italy (European University Institute in Florence, Bocconi in Milan), Spain (Carlos III in Madrid, Pompeu Fabra and Autònoma in Barcelona), France (Toulouse and Paris Schools of Economics), Sweden (Stockholm School of Economics), Germany (Bonn and Mannheim), and Austria (Vienna Graduate School of Economics). At such departments, English is the lingua franca, so despite appearances command of the local language is not necessary. These are U.S.-style programs, with the usual admission requirements, department-sponsored scholarships, and a standard coursework sequence. I am not familiar with the Israeli system and because few non-Israelis seem to consider them due to the security situation. But it

should be noted that Israel's economics departments have been remarkably productive; Tel Aviv University and Hebrew University have two of the most impressive faculties of mathematical economists and constantly host well-known professors from the U.S. (with Jewish backgrounds, mostly).

Asia Programs in Asia that cater to an English-speaking, international population are found in Hong Kong and Singapore. Although mostly populated by students of ethnic Chinese origin, they are certainly open to others and in fact offer some of the best scholarship opportunities anywhere. HKUST (the Hong Kong University of Science and Technology) comes closest to being a university of international stature. The National University of Singapore (NUS) is also widely known and well-funded. Programs at the better Japanese universities (Tokyo, Kyoto, Osaka) are not designed to accommodate non-Japanese PhD students. The only major Indian program, at the Delhi School of Economics (the Indian Statistical Institute doesn't systematically train PhDs), is of course conducted in English, but seems to attract little international enrollment - perhaps funding is too limited. For the typical applicant, Hong Kong and Singapore universities are possibly interesting options, since funding is quite generous, but many students regard the programs more as a jumping-off point to the U.S. than as their PhD training of choice.

Latin America I am not really acquainted with Latin American universities, so I cannot say much. The premier institutions of the region are ITAM (in Mexico) and Fundacao Getulio Vargas (in Brazil). Their publication output compares with that of top 100 U.S. departments.

4.3. *Business Schools*

Applying to economics-related programs at business schools is a popular diversification strategy. For a fact, business schools often pay significantly higher stipends to their students; they don't attach teaching responsibilities and they usually don't revise stipends on the basis of performance. Secondly, although business schools accept, on the whole, fewer PhD students than economics departments, their selection criteria are more subjective. Someone who lacks an important math credit or two, and would be disqualified by an econ adcom on that basis, may succeed with a b-school adcom that has less rigid expectations and is impressed with a compensating strength.

There is also the argument that the applicant pool to business schools is on average not as strong, since very well-trained students are often theory-inclined and shun the business programs. And finally someone might apply to business schools for the "right reasons": being interested in the applied economics of management and competition. (Of course, for someone whose primary interest is theoretical or empirical finance, business schools are natural first choices.)

The application process at business schools is decentralized; submissions are made to, and decisions taken by, a specialty, such as management & organization, business economics, finance, marketing, accounting, etc. One has to commit to a field at the time of application and invest some time and thought into presenting an informed research proposal in that field.

Different departments would appeal to different types of economists: business economics to those with somewhat theoretical leanings and interest in industrial organization / game theory, or perhaps empirical macro and public policy. Business economics programs often have an emphasis on micro or macro. Wharton and Haas, for example, are on the public policy end of the spectrum; Northwestern's MEDS is a game theory powerhouse. Management and organization is typically the least math-oriented department, given to survey, experimental, and other empirical studies. Decision science at business schools is usually a synonym for operations research, but in some places (notably Fuqua and INSEAD) it means choice theory. Under the umbrella of finance, technical general equilibrium research can take place, also time series econometrics. Columbia Business School has a combined finance and economics program.

An individual department typically admits a very small number of students – almost certainly fewer than ten, and perhaps as few as one. Because all are generously funded (at the major schools), few are expected to reject the offer. This makes the admission rates appear brutal, but of course the applicant pool divides into the specialties – if economics departments admitted people by field, the numbers wouldn't look so different.

Without a doubt, however, business PhD programs are becoming more popular and more competitive every year. They are not necessarily easier to get into, in terms of a percentage, but the gamble is less predictable, and this works in certain people's favor. Because the objective criteria have a smaller weight, the SOP (and any networking one is able to effect) deserves more attention. One should become familiar with the research done by the handful of department members who work in the targeted field: not at a general level, but specifically, by reading into their work, understanding the themes and current directions. The idea is to make a play for one or two of the faculty who are available to supervise by tailoring the proposal to their research program.

Some business economics programs – Harvard Business School and Stanford GSB – make their students take the first year sequence in the economics department. Kellogg and Chicago Booth also lean strongly toward pure microeconomics; they've hired faculties that wouldn't make a half-bad econ department by themselves. NYU Stern is strong in macro. But the majority of PhD programs in business schools end up being less rigorous, partially due to the chosen focus, and put their students through considerably more benign trials. Attrition is minimal. And for all that, placement prospects are typically bright, albeit in most cases restricted to business schools. (This is increasingly

no longer true for the top business schools, which train a number of economists; such PhD graduates from HBS, Kellogg, Booth, Stanford GSB are competitive in the economics job market these days.)

4.4. *A Rough Classification*

Below I have tried to categorize programs by prestige in the job market for Assistant Professors. (Application deadlines, typically from 2012, are given in parentheses. Multiple deadlines indicate multiple intakes.)

Top US Programs Graduates are typically placed in very good jobs, are routinely considered by the top universities and leading private / public sector employers.

Harvard University 12/3 (Harvard Business School 12/3, Kennedy School of Government 1/2)

Massachusetts Institute of Technology 12/15

Northwestern University 12/15 (Kellogg School of Management 12/31)

Princeton University 12/1

Stanford University 12/11 (Stanford Graduate School of Business 12/1)

University of California, Berkeley 12/4

University of Chicago 12/28 (Booth School of Business 1/1)

University of Pennsylvania 12/15 (Wharton School of Management 12/15)

Yale University 12/15

Excellent US Programs Graduates often place well, are on the radar of the top universities and leading private / public sector employers.

Boston University 1/2

Brown University 12/15

California Institute of Technology 12/15

Carnegie-Mellon University 1/15

Columbia University 12/15

Cornell University 1/15

Duke University 12/8

New York University 12/18 (Stern School of Business 1/10)

University of California, Los Angeles 12/1

University of California, San Diego 12/14

University of Michigan, Ann Arbor 12/15

University of Minnesota, Twin Cities 12/13

University of Rochester 1/2

University of Toronto 12/15

University of Wisconsin 12/5

Washington University St. Louis 1/15

Very Good US Programs Graduates sometimes obtain good placements, but except for some outstanding students are not normally considered by the best employers.

Boston College 1/2
Georgetown University 1/1
Johns Hopkins University 1/6
Michigan State University 12/14
Pennsylvania State University 1/15
Purdue University 2/15
University of Arizona 1/21
University of California, Davis 12/15
University of Illinois, Urbana-Champaign 1/1
University of Iowa 1/15
University of Maryland, College Park 1/15
University of Pittsburgh 1/15
University of Southern California 12/1
University of Texas, Austin 1/1

Good US Programs Graduates might land academic positions, but generally have difficulty competing for the popular jobs, usually end up in the private / public sector.

Arizona State University 1/15
Florida State University 2/15
George Mason University 2/1
Indiana University 1/15
Iowa State University 1/31
Ohio State University 11/30
Rice University 1/15
University at (SUNY) Buffalo 2/1
University of California, Irvine 1/15
University of California, Santa Barbara 11/30
University of California, Santa Cruz 1/15
University of Colorado, Boulder 12/1
University of North Carolina, Chapel Hill 1/8
University of Notre Dame 12/31
University of Virginia 1/15
University of Washington, Seattle 12/15
Vanderbilt University 1/15

Graduates of less prestigious US programs, not listed here, may have rather limited job options, but will usually find some kind of satisfactory employment.

Established European Programs These are well-run and well-funded programs that achieve strong placements for their students within Europe, and in some cases in the US. While the variance in placement outcomes is generally greater in European than in comparable US departments, individual students from these programs (particularly from the LSE, Oxford, and University College) may even get prestigious offers on the US job market.

European University Institute (Florence, Italy) 1/31
London School of Economics (UK) 1/7 (preferably apply early)
Oxford University (UK) 1/18, 3/8 (requires writing samples)
Paris School of Economics (Paris, France) 3/1, 5/27
Stockholm School of Economics (Stockholm, Sweden) 2/1
Tilburg University (Tilburg, Netherlands) 2/1
Tinbergen Institute (Amsterdam / Rotterdam, Netherlands) 2/1, 4/1
Toulouse School of Economics (Toulouse, France) 3/15
Rheinische Friedrich-Wilhelms-Universität Bonn (Bonn, Germany) 4/30
Universidad Carlos III de Madrid (Madrid, Spain) 1/31, 4/20
Universitat Autònoma Barcelona (Barcelona, Spain) 6/1 (rolling)
Universität Mannheim (Mannheim, Germany) 4/15
Universitat Pompeu Fabra (Barcelona, Spain) 4/12
Universität Zürich (Zurich, Switzerland) 1/31
Université Catholique de Louvain (Louvain, Belgium) rolling
Université Libre de Bruxelles (Brussels, Belgium) 3/31
University College London (UK) 1/13
University of Cambridge (Cambridge, UK) 12/12
University of Warwick (Warwick, UK) 2/15

Promising European Programs While these programs are newer and do not have a long track record of placement success, they have created a strong infrastructure with good funding for PhD students.

Goethe Universität Frankfurt (Frankfurt, Germany) 2/1, 5/1, 6/15
Humboldt Universität Berlin (Berlin, Germany) 3/31
Ludwig-Maximilians-Universität München (Munich, Germany) 4/30
Sciences Po (Paris, France) 2/1, 5/18
Università Bocconi (Milan, Italy) 2/1
Universität Wien (Vienna, Austria) 1/31, 4/30
University of Edinburgh (Edinburgh, UK) 1/31, 3/31, 6/15
University of Essex (Essex, UK) 3/27
University of Glasgow (Glasgow, UK) 4/17

5. APPLICATION OUTCOMES

5.1. *Results*

Some programs begin sending out acceptances in early February, but most of the action takes place in the last February week and the first week of March. Almost all schools notify admits by March 15; only waitlisted and rejected applicants will not hear until later. Generally, schools take care of their admits first – many immediately e-mail these applicants when a decision has been reached, though some schools may still send acceptances by post. Rejections almost always come by letter, and weeks later, but if you politely enquire about your status by e-mail, the graduate secretary will usually reply after decisions have been reached. The best way to find out whether decisions are out used to be to check the testmagic message board; information exchange tends to be particularly lively in the economics community.

You could be waitlisted for admission or for financial aid. It's hard to predict whether this will eventually result in an offer; sometimes it does and sometimes not. The schools initially take in a group of people of whom they expect a subset, not exceeding the enrollment target, to come. Programs that offer full funding to most or all applicants (such as Stanford) make a conservative round of initial offers, and extend more offers once they get a picture of who's accepting. Other programs (Chicago, for instance) manage enrollment by giving just a few of the admits money and passing any unclaimed financial aid on to the next best. Harvard makes awards conditional on the applicant's securing outside funding (ideally, things like NSF grants) to shoulder part of the cost.

Thus, some schools have waitlists and others haven't, and Harvard has something they call a waitlist, which is more like an ultimatum. Waitlists are frustrating. Some claim that you can tip the scales by writing to professors and reiterating your interest in the place, but in reality there's little you can do except ... wait. Getting waitlisted does not reflect uncertainty about your eligibility (in that case, they'd just reject you), it is a question of enrollment targets. All depends on which way the initial admits decide, and when.

Which offer to take? When you have several offers, you start looking for information in earnest. Fortunately, departments will be much more responsive to enquiries when you've been admitted, and it's easy to get in touch with current students. You'll be committing something between four and six years to the program, so the chemistry in such correspondence is a factor not to be discounted. You'll also want to check how many students fail to complete the degree and why (because they are asked to leave? fail the exams? enter better programs? take jobs?).

Some schools are notorious for taking in a lot more students than they plan to graduate, in order to have a large pool of budget-friendly TAs on hand. The implication is that many won't pass the qualifying exams or, most commonly, will not continue to get

funded at some point. Completion rates of about half are normalcy in many U.S. departments. Few publically report their numbers, but as a rule of thumb, programs with higher drop-out rates tend to offer fewer and / or less generous fellowships in the first year, for obvious reasons. Another key aspect to consider is the placement track record of the program. Most departments make this information available on their website or in brochures.

5.2. *Funding*

Economics departments give considerably lower fellowships than business schools or science departments. Worse yet, some people will be admitted without fellowships and a few end up paying tuition. But it is commonly understood (although the department may not be willing to explicitly guarantee it) that all students who stay on beyond the first one or two years are funded in some manner. Often teaching assistantships are part of it, but many programs also reward academic success with scholarship money.

Generally, the best and most competitive programs offer the most generous funding – MIT, Princeton, Harvard, Stanford, and Yale admits can expect to get a package of, perhaps, around \$ 30,000 per year (plus tuition waiver). Most other schools offer lower awards or awards tied to teaching duties, and the less prestigious the program, the less money tends to be available, and the more teaching is allocated. Some schools offer good first-year fellowships that will not be renewed subsequently (but can be replaced with a teaching or research assistantship).

The reason good programs don't normally tie their aid to teaching is that the first-year coursework will be too intense to be compatible with chores. A teaching assistantship in the first year should be regarded skeptically: they deliberately expose students to stress, compromised performance and threat of failure in order to keep staffing costs down. If financially manageable, it would be advisable to turn down a lucrative teaching assistantship in favor of a lower fellowship.

To a minor extent, and for the right reasons, it is possible to bargain for a higher award if you have only received a tuition waiver or a small fellowship (say, below \$ 10,000). This needs to be done with tact and with stress on the insufficiency of the funding to meet your basic needs, rather than by pointing out your other options. Money is always a sensitive issue, and departments don't want to "bid" for students. Weigh carefully whether the slim prospect of a significantly better deal justifies the risk of alienating some people you may soon be working with. Communicate your respect for the department and your correspondents before everything else. And if the financial side permits, you should finally base your choice on the quality of the education only.