

# Ranking Economics Departments Worldwide on the Basis of PhD Placement<sup>1</sup>

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**Abstract:** Four rankings of economics departments worldwide in terms of graduate education are constructed. The central methodological idea is that the value of a department is the sum of the values of its PhD graduates, as reflected in the values of their current employing departments. Scores are derived as solutions to linear simultaneous equations in the values. The sample includes the top fifty-eight departments, the composition of which is determined endogenously, invoking a criterion requiring more than three placements in the sample. Illuminating the current state and trends of economics PhD education, the conclusions should be of broad interest to PhD candidates, academics and policy makers.

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## 1. Introduction

A remarkable development in economic research is the emergence of a literature dealing exclusively with the evaluation of scientific performance. The multi-faceted need for some of these rankings is increasingly viewed as critical for the proper functioning of the academic sector.<sup>1</sup> While rankings in the past tended to rely on subjective methods such as opinion surveys<sup>2</sup>, this trend comprises studies based on objective methods. In economics, this trend was pioneered by the journal ranking method of Liebowitz and Palmer (1984), giving rise to several studies ranking journals and/or departments according to various standards.<sup>3</sup>

The aim of this paper is to propose a ranking of economics departments worldwide based not on a measure of their research productivity but on the worth of their PhD program, as reflected in their ability to place their PhD graduates at top-level economics departments or business schools. As such, it is the first ranking that places PhD students and graduate education in a key position, within the class of objective rankings.

The methodology is an adaptation of the Liebowitz-Palmer method consisting of replacing journal citations by faculty hires and gives rise to an objective ranking in terms of long-run placement. For an  $n$ -department sample, the idea is to derive an endogenous relative valuation of each department by specifying a system of  $n$  equations wherein the value of department  $i$  is a weighted average of the values of all other departments, with the  $j$ -th weight being the number of placements department  $i$  has made in department  $j$ . Thus the value of each placement is given by the score of the employing department, which is itself simultaneously determined in the underlying fixed-point relationship. The final score of a department is then simply the sum of all the values of its individual placements. We provide a simple theoretical foundation for this method that sheds light on its meaning and computation.

Within their respective contexts, faculty hires probably constitute a more reliable and stable indicator of influence than journal citations. Indeed, the latter should ideally be distinguished in terms of their primary or secondary nature vis-à-vis the contents of the citing article, while the latter tend to be of more uniform value for the recruiting department. This offsets the disadvantage of placements over citations in terms of statistical significance.

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<sup>1</sup> Universities in the U.K. periodically undergo government-mandated evaluations of academic departments in terms of aggregate research output, upon which a substantial portion of their research funding is contingent.

<sup>2</sup> A well-known example is a ranking of PhD programs in the U.S. by the National Research Council as a survey of department chairmen. Another is the popularized survey by U.S. News and World Report on a yearly basis.

<sup>3</sup> See Laband and Piette (1994), Combes and Linnemer (2003), Coupe (2003), Kalaitzidakis et al. (2003), and Lubrano et. al. (2003). Methodological studies include Ellison (2002) and Palacios-Huerta and Volij (2004).

The data was collected in April 2006 directly from the websites of the relevant departments. The size of the sample was determined by invoking a selection criterion that required strictly more than three PhD placements within the sample, at least one of which abroad. The resulting final list of placements thus consists of faculty members that held a position at any rank at one of the departments in the sample as of early 2006, irrespective of PhD cohorts. With some methodological assumptions, the contribution of business schools to the demand and supply sides of the economics PhD market is taken into consideration.

From the primary ranking, three other rankings are derived, based on truncations of the original data set either to the period 1990-2006 and/or to placements in economics departments only. The motivation for these changes is to provide a ranking that does not entail biases against new or improved economics departments for the former and to assess the contribution of business schools to the hiring side of the economics PhD market for the latter.

One of the primary aims of the present exercise is to provide an up-to-date objective source of guidance in the evaluation of PhD programs for potential recruiters, university administrators and benefactors as a more informative alternative to the established overall reputation of the institutions. To this end, our ranking is arguably the most relevant one.<sup>4</sup>

PhD education in economics emerges as a highly concentrated activity, with only ten countries as contributors and the score distribution being strongly skewed to the top. The well-known superiority of U.S. economics departments in terms of the general quality of PhD graduates is unambiguously confirmed by these rankings. Surprisingly, for PhD placement, the top ten U.S. places appear to cluster rather into three separate subgroups, with the dominance by Harvard and M.I.T. prominently confirmed. The participation of good U.S. business schools to the hiring side of the economics PhD market is substantial and growing, and tends to exacerbate the concentration of the rankings while leaving the ordinal ranking virtually unaffected at least for the top 20 places. By contrast, non-U.S. departments typically place very few graduates within business schools. While some newly formed departments in Europe have achieved scores comparable to those of existing leading departments there, U.S. departments that have undergone a major successful build-up in terms of faculty in the last 15 years experienced an increase in their score that falls quite short of reflecting their current faculty strengths. Further discussion and comparison with other rankings are given below.

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<sup>4</sup> For some other purposes, such as guidance for PhD applicants, a ranking based on value added would be more desirable. Such a goal would require some normalization by the value of incoming students, which is beyond our scope due to obvious data limitations. By measuring the value of outputs only, our rankings embed the quality of the recruiting strategy (of PhD students) employed by departments as one of the relevant dimensions.

## 2. Data and Methodology

### 2.1. Data gathering and sample selection

For each economics department in the sample and the business school of the same university, we collected data on faculty members holding a full-time appointment at any academic rank (assistant, associate or full professor in the U.S. and analogous ranks at non-U.S. universities) as of April 2006. For each individual, the information consisted of the date of PhD graduation, the granting university and the current affiliation, but not the history of employment.<sup>5</sup> Thus the term “placement” in this paper clearly differs from its customary use in academic life as the first long-term affiliation of a PhD graduate. Consideration was limited to individuals holding appointments at economics departments and business schools, and not at other departments.<sup>6</sup> Those with an economics appointment are included irrespective of their PhD discipline (some hold PhDs from business administration or mathematical sciences). Individuals with a business school appointment must hold an economics PhD to be included. Thus while business PhDs employed at business schools are excluded (unless they hold a joint appointment in economics), the contribution of these schools to the demand and supply sides of the economics PhD market is fully accounted for.<sup>7</sup>

A key decision is to determine the selection criteria for the sample of economics departments. It should be large enough to ensure that the study would not amount to an update of where exactly the usual top ten places stand today, and that it would include lesser-known places that have undergone serious improvements in recent times, as well as a selection of departments outside the U.S. to allow for international comparisons. On the other hand, the criteria must be demanding enough to include only departments that are making a recognized contribution to PhD education on a worldwide competitive basis.

***Inclusion Criterion:*** *To be included, an economics department must have placed strictly more than three of its PhD graduates as current faculty members, as of April 2006, in economics departments included in the sample (other than itself) or in business schools from the same set of universities, with the further requirement that at least one of these placements is in a department or a business school located in a different country.*

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<sup>5</sup> This information was collected directly from the departments’ websites whenever it was available and up to date. In some cases, we solicited information directly from departments or from national academic databases.

<sup>6</sup> This excludes economics PhDs employed at related departments, such as public policy or political science. As such people often hold a joint appointment in economics, this is probably not a major loss of precision. Including such people poses serious methodological problems in that it would require an endogenous evaluation of these departments as “economics departments” in view of our methodology, as will become clear below.

As business schools are not ranked as such, a key assumption is that a placement in a business school is assigned the value of the economics department of the same university. As rankings of economics departments and business schools tend to have a good correlation, this is a good approximation (it will be confirmed as such by our ranking at least for the top 20 places). Likewise, a placement from a department other than economics accrues value to the same university's economics department, which is justified since such an individual would typically have been associated to some degree with the latter's PhD program.

Invoking this criterion gives rise to a sample of 58 economics departments worldwide, which is just about the target size we had in mind as appropriate for this study. As there is no systematic way of uncovering these departments, our approach involved some trial and error.

While most reactions from colleagues about this criterion tended to argue that the threshold of more than three was too low, we felt it was desirable to err on the side of inclusion to include enough international universities to allow for meaningful and representative comparisons.<sup>8</sup> While this threshold was binding for only 3 departments, 22 others (roughly 40%) have placed at least 25 graduates each in the sample.

The additional requirement of placing at least one PhD graduate abroad is justified on two separate grounds. First, it seems like a reasonable criterion to justify a contribution to PhD education at a worldwide competitive level, as economics is probably the most internationally integrated of all disciplines. Second, and more importantly, this requirement emerged as critical to rule out the presence of some departments that have succeeded in placing more than three PhD graduates in economics departments within the same country or even city (including their own department) as part of a hiring process motivated primarily by concerns outside of the competitive realm. These considerations ended up being relevant in a few countries.<sup>9</sup> In the converse direction, the requirement of one foreign placement did not disqualify any well-established department that would have otherwise qualified. U.S. departments have not been subjected to this secondary requirement, the justification being that faculty hiring is well-known to be competitive in the U.S. Three U.S. departments in the sample fail the requirement: Duke U, Penn State U, and U Washington, which we interpret to mean that these do not satisfy the international dimension alluded to earlier.

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<sup>7</sup>As PhD programs in business schools tend to be small, we are capturing the bulk of economics-related activity.

<sup>8</sup> Another reason for this threshold is that it is convenient to use the same threshold for our second ranking based only on more recent placements. In this case, the same threshold is of course more demanding.

<sup>9</sup> Our sample would otherwise include U Complutense Madrid and U Barcelona, as they have placed business professors in the economics departments of Carlos III and Pompeu Fabra respectively, which include business administration. Similarly, the dual nature of Oxford and Cambridge, as unusual combinations of first rate research institutions and teaching colleges, might have led to more U.K. universities in the sample.

Another key dilemma we faced is to determine whether own hires, i.e. faculty members for whom the employing and the PhD-granting departments have constantly been the same, starting essentially at graduation,<sup>10</sup> ought to count in the present ranking.<sup>11</sup> This issue is particularly troublesome in light of the fact that many non-U.S. departments continue to hire their own graduates on a somewhat regular basis for two opposite reasons. The first is that the local candidate may simply be the best person they could get in a particular year. The second, rather unfortunate, reason is that even some of the best non-U.S. departments still have “old-fashioned” members who, periodically if not systematically, endeavor to restrict hiring to or at least favor their own graduates irrespective of quality considerations, and sometimes succeed in imposing their views on their colleagues. In view of the sustained coexistence of these two conflicting ways of managing the hiring process, the appropriate course of action was to select, on the basis of faculty members’ CVs, those who were probably hired according to international standards. To this end, we included all individuals whose CV is consistent with a positive tenure decision within six to nine years of PhD graduation at a top sixty economics department in the U.S.<sup>12</sup> This is obviously an approximate and partly subjective criterion.

## 2.2. Methodology for the Rankings

Our rankings are based on an adaptation of Liebowitz-Palmer’s method to PhD placements. Let  $q_{ij}$  be the number of PhD graduates from economics department  $i$  employed by economics department (or business school)  $j$  as of April 2006, where  $i$  and  $j$  belong to our sample of  $n$  departments, the selection of which was based on the Inclusion Criterion.

Let  $Q=[q_{ij}]_{n \times n}$  denote the placement matrix and  $\mathbf{q}=[q_i]_{n \times 1}$  be the vector whose  $i$ -th coordinate  $q_i = \sum_{j=1}^n q_{ij}$  is the total number of graduates in the sample from department  $i$ . The first step of the ranking procedure is to take the column vector  $\mathbf{q}$  and divide each of its entries by the column sum. This yields the first ranking, which is treated as a vector of weights in the next iteration. We multiply the number of placements of department  $i$  in department  $j$  by the latter’s weight. Again, we add these weighted numbers along each row and divide by their total to get the next vector of weights, normalized to sum up to 1. In symbols,

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<sup>10</sup> An applicant hired by his home department some years after PhD graduation is not considered an “own hire”. There were several such cases in our sample, even at some of the best U.S. departments, where these individuals tend to have better research records than their average colleague. On the other hand, “own hires” tend to be more often than not a signal of favoritism and weakness of the recipient’s research record outside the U.S.

<sup>11</sup> Indeed, according to the procedure at hand, every own hire, if counted, would end up contributing to the final score of the department some weighted amount of that same final score.

<sup>12</sup> While some readers may question the appropriateness of the references to U.S. practices as benchmarks for universities worldwide, we would defend this choice on account of the fact that it is the national system that has the most competitive and well-identified (though multi-layered) standards for the economics discipline.

$$v_{i,1} = \frac{q_i}{\sum_{i=1}^n q_i} \text{ and } v_{i,h} = \frac{\sum_{j=1}^n q_{ij} v_{j,h-1}}{\sum_{i=1}^n \sum_{j=1}^n q_{ij} v_{j,h-1}}.$$

The score of the  $i$ -th department and hence the score  $n$ -vector are given by

$$v_i = \frac{\sum_{j=1}^n q_{ij} v_j}{\sum_{i=1}^n \sum_{j=1}^n q_{ij} v_j} \text{ and } v = \frac{Qv}{\|Qv\|}$$

Thus  $v$  is the eigenvector corresponding to the largest (positive) eigenvalue, whose existence and uniqueness follow from the Perron–Frobenius theorem for positive irreducible<sup>13</sup> matrices (e.g. Seneta, 1981). While Liebowitz and Palmer report that this process converged quickly for their citation data, this result guarantees convergence for any such data set as long as the natural property of irreducibility is verified. This provides a simple and rigorous theoretical foundation for the procedure that fully clarifies when, how and why it actually works.

### 3. The Rankings

This methodology is applied to four different rankings using different parts of the data, all displayed in Table 1. The first ranking, R1, is based on the entire data set as described in Sections 2.1-2.2 (see Columns 1 and 3). The other three rankings are based on different subsets of the entire data set, as follows. The second ranking, R2, reflects placements within economics departments only for the entire period (Column 4 of Table 1). By the same Inclusion Criterion, 4 institutions from the original sample no longer qualify (as indicated by the mention “f.i.t.” or “failed the inclusion test”). The third ranking, R3, considers only graduates from 1990 onwards, with the original data truncated accordingly, and all other aspects of R1 preserved (Column 5). The same Inclusion Criterion eliminates 14 institutions from the original sample, reducing our sample to 44 departments for R3. The fourth ranking, R4, further restricts the data of R3 to placements in economics departments only (Column 6). Columns 7 and 8 give each institution’s total placements over the entire period in R1 and R2, respectively, i.e. including and excluding those in business schools. Column 9 gives each institution’s total placements in the top 10 US economics departments<sup>14</sup> (for the entire time period, but excluding business schools). Finally, Table 2 gives some concentration measures and correlations between the four rankings and the total number of placements.

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<sup>13</sup>  $Q$  is irreducible if there exists  $t > 0$  such that  $Q^t$  has no zero entries. That is, one can go from any department to any other by following some finite sequence of departments, each of which has hired at least one person from the previous. Intuitively, this property reflects the fact that the top world economics departments are sufficiently interconnected by the hiring process. This critical property for the method clearly holds in our setting.

<sup>14</sup> These are the top 12 in R1 minus LSE and Oxford, which indeed correspond to the classical US top 10.

**Table 1:** Rankings R1-R4

<b>R1</b>	<b>Economics Dept</b>	<b>R1 score</b>	<b>R2 score</b>	<b>R3 score</b>	<b>R4 score</b>	<b>total # grad</b>	<b># grad in econ</b>	<b># grad in US top 10</b>
1	MIT	100	93.11	100	100	255	158	74
2	Harvard U	97.70	100.00	85.36	87.96	252	160	58
3	Stanford U	37.10	38.29	43.69	59.34	166	119	35
4	Princeton U	33.39	37.56	34.91	43.84	131	102	38
5	U Chicago	31.90	35.69	38.09	65.09	154	114	30
6	Yale U	24.01	29.21	22.04	30.13	107	87	29
7	UC-Berkeley	18.58	30.01	17.05	28.95	115	98	20
8	Oxford U	13.55	12.09	7.10	3.97	45	38	6
9	U Minnesota	9.86	9.51	12.43	13.41	75	65	18
10	Northwestern U	9.67	12.68	14.97	29.83	101	85	18
11	LSE	7.03	10.53	9.85	21.33	60	50	8
12	U Pennsylvania	6.22	9.04	4.91	9.79	57	41	6
13	Carnegie Mellon U	6.21	1.90	0.14	0.41	31	18	4
14	U Rochester	5.69	5.84	3.67	4.81	52	40	6
15	UC-Los Angeles	5.53	3.91	8.64	8.65	36	28	3
16	U Wisconsin	4.85	3.46	2.35	3.29	56	47	5
17	U Michigan	3.67	7.34	6.02	6.26	35	29	1
18	Duke U <sup>(*)</sup>	3.60	2.01	6.59	f.i.t.	15	11	4
19	Cambridge U	3.12	5.21	0.78	0.85	25	22	3
20	Columbia U	2.93	4.01	3.33	f.i.t.	37	23	3
21	Cal Tech	2.68	3.04	f.i.t.	f.i.t.	12	12	4
22	UC-San Diego	1.98	1.58	3.01	0.99	20	16	1
23	Penn State U <sup>(*)</sup>	1.96	5.38	3.78	13.48	6	5	2
24	U Maryland	1.83	3.23	2.69	f.i.t.	13	9	3
25	Johns Hopkins U	1.63	3.40	f.i.t.	f.i.t.	19	16	3
26	Brown U	1.53	1.58	1.72	f.i.t.	13	10	2
27	U College London	1.44	1.35	3.28	5.81	8	8	2
28	New York U	1.39	1.00	2.75	4.51	20	14	3
29	U Toulouse	0.93	1.34	2.20	8.02	18.5	17	1

30	Stockholm School Econ	0.89	f.i.t.	0.80	f.i.t.	15	11	1
31	Purdue U	0.87	1.03	f.i.t.	f.i.t.	12	10	1
32	Cornell U	0.81	1.48	0.47	2.03	28	23	1
33	U Virginia	0.80	1.14	f.i.t.	f.i.t.	6	4	2
34	Boston U	0.76	1.23	1.96	4.94	13	11	1
35	The Hebrew U	0.68	f.i.t.	f.i.t.	f.i.t.	11	10	0
36	U Illinois-Urbana	0.61	1.13	f.i.t.	f.i.t.	12	11	2
37	Free U Brussels	0.57	f.i.t.	0.62	f.i.t.	6.5	6	1
38	Queen's U	0.50	0.30	0.65	0.33	18	14	0
39	U Aarhus	0.44	1.09	0.73	3.11	15	15	1
40	U Pittsburgh	0.39	0.64	0.85	1.87	7	7	1
41	EHESS-Paris	0.38	3.14	0.69	8.89	9	9	1
42	Pompeu Fabra U	0.34	0.58	0.85	3.02	6	6	0
43	U Iowa	0.29	0.23	0.27	f.i.t.	16	10	0
44	SUNY-Stony Brook	0.28	0.10	0.31	f.i.t.	8	6	0
45	U Western Ontario	0.24	0.48	f.i.t.	f.i.t.	11	10	1
46	U British Columbia	0.22	0.40	f.i.t.	0.05	10	9	0
47	U Paris I	0.22	1.75	0.60	4.86	25	25	0
48	ANU-Canberra	0.20	0.39	f.i.t.	f.i.t.	10	10	0
49	U Louvain/CORE	0.17	0.47	0.24	1.59	28	28	0
50	U Toronto	0.13	0.08	f.i.t.	f.i.t.	13	8	0
51	Rice U	0.12	0.12	f.i.t.	f.i.t.	4	4	0
52	U Washington <sup>(*)</sup>	0.12	0.31	f.i.t.	f.i.t.	5	4	0
53	Iowa State U	0.08	f.i.t.	f.i.t.	f.i.t.	8	6	0
54	European U Institute	0.07	0.13	0.31	1.82	13	13	0
55	U Paris 9	0.03	0.24	f.i.t.	f.i.t.	6	6	0
56	U Autonomia-Barcelona	0.02	0.06	0.07	0.60	11	11	0
57	UC-Davis	0.01	0.02	0.04	0.39	6	6	0
58	U Carlos III-Madrid	0.01	0.06	0.07	0.61	4	4	0

(\*) means the department fails the additional international placement criterion.

**Table 2:** Descriptive statistics for Table 1

	<b>R1</b>	<b>R2</b>	<b>R3</b>	<b>R4</b>
<b>HHI</b>	1215.51	1059.42	918.36	918.36
<b>2-largest market share</b>	43.91	39.42	41.11	32.14
<b>7-largest market share</b>	76.11	74.28	75.66	71.17
<b>Correlation (R<sub>i</sub>, total # grads)</b>	0.94	0.92	0.93	0.87

#### **4. Discussion of the results**

This section provides a general analysis of the rankings and draws conclusions of potential interest to educators, graduate students and policy makers. We begin with general observations that can be seen from a cursory inspection of the rankings. While the cardinal scores should not be taken at face value, they do allow for some precise comparisons. Economics PhD education emerges as a highly concentrated activity, with the top few departments scoring substantially higher than the others in all four rankings (see Table 2). Another reflection of the high concentration is the small number of countries appearing in the rankings: US, UK, Canada, France, Spain, Belgium, Australia, Denmark, Israel and Sweden.<sup>15</sup> The latter four countries are each represented only by one institution. The well-known overall superiority of U.S. departments in terms of the general quality of PhD graduates is strongly reflected in these rankings.<sup>16</sup> Hiring of economists by business schools is a significant component of overall placements. In view of the very low relative scores of the departments at the lower end of the rankings (with the top score normalized at 100%, departments in the bottom half each have a score of less than 1%), the fact that the Inclusion Criterion did indeed err on the side of inclusion is strongly confirmed. Including more departments by imposing less stringent placement requirements would result in a negligible gain in precision.<sup>17</sup>

We now elaborate on these conclusions. Table 2 and Column 9 give various standard measures of “industry concentration” for our rankings. These measures point to a modest decrease in the level of concentration from R1 to R2. In particular, the overwhelming dominance of Harvard and M.I.T. in R1 has shrunk in R2, although it still persists to a

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<sup>15</sup> While located in Italy, the European University Institute is a European-wide graduate school that functions according to international norms and programs.

<sup>16</sup> Indeed, most internationally-oriented non-U.S. departments that are strongly committed to competitive hiring attend the North-American ASSA meetings and tend to aim their recruitment effort at those selected graduates of good U.S. departments that appear promising in terms of their potential to move to, and remain in, their country of location. The rankings vindicate the well-founded nature of this broadly observed hiring strategy.

<sup>17</sup> All four rankings reflect a bias in favor of larger departments. While one might be tempted to normalize the scores by faculty size, we decided against such a step on account of the fact that faculty size and the concomitant diversity of scholarly expertise and availability for research mentoring are critical dimensions of PhD education.

remarkable extent. In the reverse direction, in the top league, Chicago, Stanford and Northwestern recorded notable gains. These changes are more pronounced for R2. The extremely steep rate of decline of the scores as one moves down the rankings suggests that, with few exceptions, only top departments manage to place PhD graduates in top departments on a regular basis. Yet, while the top 10 U.S. economics departments are often thought of as forming a closed clique in terms of hiring, Column 9 indicates that 20% of their faculty is composed of PhD graduates from outside the top 10, of which one third comes from non-U.S. universities. It seems fair to say that these numbers rather refute the insularity hypothesis.

As to the participation of business schools to the hiring side of the economics PhD market, comparing R1 and R3 on the one hand and R2 and R4 on the other, along with a look at the data, reveals a number of observations of interest. With hires by business schools forming a substantial part of overall hiring, this appears to be to a large extent part of a recent and growing trend (60% of the top 20 places recruited between 50% and 85% of their current business school hires after 1990). The rate of decline of the scores is higher when business schools are included, the M.I.T./Harvard prominence being strongly exacerbated, suggesting that business schools conduct even more selective hiring than economics departments. Despite the significance in a cardinal sense of the contribution by business schools, a remarkable observation is that this hardly affects the ordinal ranking of the economics departments: R1 and R2 on the one hand and R3 and R4 on the other reflect virtually the same ordinal ranking for the top 20 places. This ceases to hold as well for the bottom half of the places, a key reason being that the level of placement of non-U.S. economics departments in business schools is relatively minor (the only clear exceptions being LSE and Toronto).<sup>18</sup> Finally, the level of participation of business schools is highly correlated with rankings amongst such schools, i.e. better business schools tend to hire more economics PhDs.

The first step of the recursive version of the method, as described earlier, measures the total placements each department has made in the sample (see Columns 7-8 of Table 1). As such, it already incorporates a rough measure of quality of the PhD program since our sample comprises only the highest-scoring departments in terms of PhD placement. A somewhat surprising outcome is that the rankings implicit in Columns 7-8 and the corresponding actual

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<sup>18</sup> Possible explanations include the fact that non-U.S. departments in the sample have a lower tendency to specialize in business-relevant economics and U.S. business schools might be less accessible to applicants from outside the U.S. Furthermore, non-U.S. business schools hire fewer economists, which may be due to the absence of a research culture within most of them, the more traditional orientation of their teaching mission, and an overall lack of competitiveness (and thus of openness to innovation). Our methodology unfortunately excluded some independent business schools (i.e. not attached to universities), such as Insead or London Business School, which function along U.S. standards and often hire top-level economics PhDs.

rankings are remarkably similar, as reflected in the correlation coefficients in Table 2. While this stands in sharp contrast to the cases of journals and patents, this result simply reflects the fact that the best PhD programs are also those that produce the largest numbers of top-level PhDs, which is quite natural in view of the characteristics of this market. Indeed, the best programs receive more quality PhD applications, can thus afford larger faculties and provide a richer program with a more diversified set of courses and closer research supervision. This is no doubt facilitated by their being mostly well-endowed private schools. Naturally, this high correlation reflects a welcome sense of overall efficiency in terms of world welfare. It also follows from this correlation that a measure of average placement quality obtained by dividing scores by number of placements would not differ significantly from the total score.<sup>19</sup>

The share of non-US departments in the sample is remarkably constant over time at 36% (21 out of 58 departments in R1 and 16 out of 44 in R3). However, for economics-only placements, the share of non-U.S. departments increased from 35% to 38% from R2 to R4. While this gain is rather minor, it is nevertheless noteworthy that many of the non-US departments have made most of their non-local placements (those excluding own hires) in the last 15 years. In other words, their number of placements is only slightly lower in R4 than in R2. This indicates that a modest catching up trend is under way. The reason this observation does not have a significant impact on their overall score is simply that their placements are often limited to departments at the lower end of the ranking.

Several departments have entered the global market for PhD education in the last 15 years at a level that earned them a place in the present rankings. Some are drastically improved departments (Boston U, New York U, Free U Brussels and U Toulouse) while others are part of newly founded universities (Pompeu Fabra and Carlos III). The inclusion of R3 and R4 was partly motivated by the desire to assess the current standing of these departments without any bias in favor of older established departments. Although Boston U and New York U have had first-rate faculties for many years, their scores are surprisingly low. On the other hand, the performance of Free U Brussels, Toulouse, Pompeu Fabra and Carlos III is already on a par with the best departments in Continental Europe. This suggests that in the more competitive US market, successful entry into the top-level league is harder than in Europe, confirming the observation that the global reputation of a PhD program takes

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<sup>19</sup> A noteworthy exception is that Penn State University would emerge as #1. However, this is not the average value of all of a department's placements as our study considers only placements in the top 58 places, reflecting a bias in favor of lower-ranked departments as more of the lower tail of their placements has been truncated.

longer to establish outside academic circles and that a substantial lag exists between achieving a first-rate faculty and attracting top-level students and turning them into top economists.<sup>20</sup>

The National Research Council (N.R.C.), a branch of the U.S. National Science Foundation establishes a ranking of U.S. graduate programs for several academic disciplines including economics on a regular basis. Their most recent ranking, conducted in 1994, is based on a multi-criterion assessment relying on survey data, and is available in an interactive manner on the Internet.<sup>21</sup> Users may select amongst twenty different criteria and the weights on a scale of 1 to 5 that they ascribe to each of the selected criteria, and receive the corresponding ranking. One such ranking in particular, based exclusively on the criterion of “Educational Effectiveness”, which, of the N.R.C. criteria, is most closely related to PhD placement ability, is surprisingly close to ours (restricted to U.S. departments), with a few outliers that may be partly explained by contrasting the long run nature of our ranking with the fact that this NRC ranking refers specifically to the period 1984-1994.<sup>22</sup>

Our findings may also be usefully related to various rankings constructed on the basis of research output alone. Coupe (2003) develops a ranking of the top 100 most research-productive economists worldwide and reports a high level of concentration, with 25% of these scholars being PhDs from M.I.T., 14% from Harvard, 9% from Princeton, and 7% from each of Chicago and UC-Berkeley. While department rankings on the basis of faculty research productivity also produce outcomes that are lop-sided at the top, scores tend to fall at a much lower rate. This may be seen for instance in the recent ranking in [Combes and Linnemer (2003), Appendix B], which also shows that the gap in scores between the top U.S. and non-U.S. departments is less dramatic in research rankings than it is in our PhD program ranking.

A comparison with the research rankings of the top 50 U.S. departments by Dusansky and Vernon (1998) reveals larger discrepancies. A key reason is that research rankings are known to have pervasive variations across time periods, which in part reflects the high mobility of economics professors. Nevertheless, this research ranking can be invoked to confirm that newly reformed economics departments such as New-York U (#6), Boston U (#7), and U.C.-San-Diego (#9) have achieved a very high rank in terms of the quality of their faculty. Yet their standing is not nearly as high in our ranking. Similar comments apply to U

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<sup>20</sup> In the less competitive European market, a group of quality scholars, in many cases led by one visionary individual, may create or improve an existing department and bring it up to leading international, though perhaps not elite, standards. Recruiting highly qualified PhD students for such departments is facilitated by the imperfect international mobility of PhD students, which is itself due to a variety of reasons.

<sup>21</sup> See <http://www.phds.org/rankings/getWeights.php?d=28>.

<sup>22</sup> With the next N.R.C. ranking two years overdue now (and questionnaires not sent out yet), their last ranking is still quite relevant for our comparative purposes as our own data spans a longer period that includes theirs.

Texas-Austin (#11), which did not even make our top 58. A further confirmation is that these four departments are the top four places in the N.R.C. ranking based on the criterion of "Change in Quality", i.e. on a measure of the level of progress made in recent years (as of 1994). This is further evidence of the reputation lag that follows a drastic department build-up. Another likely contributing factor is the fact that the overall name of a university plays a major role in the ability of its departments to attract qualified graduate students.

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