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ECONOMICS RESEARCH IN SPAIN DURING THE 1990'S: A LITERATURE

REVIEW

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Abstract

This paper is a review of the literature on the ranking of centers of excellence in economics according to the papers published in specialized journals that have an anonymous evaluation procedure. There are two objectives: (1) to examine the evolution during the 1990's of certain features of economic research, such as the gap that exists between the United States and the rest of the world, the dominant position of the United Kingdom within Europe, and the low productivity of economic scholars everywhere; and (2) to document the tremendous progress that Spanish research centers underwent during this period.

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I. INTRODUCTION

Traditionally, the ranking of university Economic Departments according to their research performance was a question that only concerned the United States or, intermittently, some European countries.¹ Later, several papers were published on Europe as a whole (Hirsh *et al.*, 1984, Kirman and Dahl, 1994); among those, the influential contribution of Kalaitzikakis *et al.* (1999), which deals with the 1991-96 period and was corrected and updated for 1997-2002 by Tombazos (2005), should be emphasized. However, the real jump took place when the European Economic Association, worried about poor governing and the reduced role given to research criteria in the financing of the majority of non-British European universities, held a competitive selection process in 1999 for the ranking of Economic Departments in Europe and its comparison with the best centers in the United States. Of the 8 proposals presented, the following 4 were selected: (i) Combes and Linnemer; (ii) Coupé; (iii) Kalaitzidakis, Mamuneas and Stengos, and (iv) Lubrano, Bauwens, Kirman and Protopopescu. After the usual anonymous evaluation process, the results were published in the December 2003 issue of the *Journal of the European Economic Association*. Other comparable studies, such as García-Castrillo *et al.* (2002) and the electronic publication Econphd (2004), have appeared around that time.

In this context, it is important to remember the Lisbon Declaration of 2000 in which the Council of Europe announced its intentions to become by 2010 “the most dynamic and competitive knowledge-based economy in the world.” As the first step in creating a European Area of Research, the European Commission and the member states proposed identifying the best research centers in Europe by means of Maps of Excellence, whose objective was to approach the question of “who does what in Europe”. Interestingly enough, the High Level Group of representatives of the European Union which was established for that purpose, soon

¹ For references to this literature, see Combes and Linnemer (2002) or García-Castrillo *et al.* (2002), and for recent work about the United States, see Scott and Mitias (1996), Dusansky and Vernon (1998), and Griliches and Einon (1998).

restricted this momentous project to a pilot experience in three timely areas: the life sciences, nanotechnology and, precisely, economics. In the sequel, we refer to the work carried out by the European Union Research Directorate General in our area as European Commission (2004)

In any survey of this literature it should be considered informative –and even obligatory– to place the research which has been carried out in a given country within an international context. Thus, this paper has two aims: (1) to briefly review the evolution during the 1990's of three characteristic features of economic research, namely, a) the existing gap between the United States and the rest of the world, b) the predominance of the United Kingdom within Europe, and c) the low productivity of economic scholars everywhere; and (2) to document the enormous progress experienced by Spanish research centers during this time.

Restricting ourselves to this period is justified by the abundance of information, the scarcity of Spanish research in periods prior to this time, and by the opportunity to include the results obtained by strongly research oriented Spanish universities, such as Pompeu Fabra and Carlos III, founded in the early 1990s. Although the paper is limited to quality research in the international context, it also reviews the literature dealing with the evolution of Spanish research in a national context.²

It should be kept in mind that research forms only a part of academic activity that also includes teaching, administration, advising and consulting, popular writing, and so on. In any case, research work appears in scientific publications, supervision of Doctoral Theses, research projects, research evaluation carried out by third parties, editing of scientific publications, and so on. The results of these efforts are transmitted in many ways, but in economics, as in other sciences, only those articles published in specialized journals undergo the rigorous anonymous peer evaluation process that is the essence of quality control in any scientific discipline. In line

² We are referring to García *et al.* (1999a), Bergantiños *et al.* (2002), Dolado *et al.* (2003) and Royuela *et al.* (2005). Sanz *et al.* (1999) refer only to the first part of the period studied here, whereas García *et al.* (1999b) and Pons and Tirado (1999) concentrate on publications in Spanish journals.

with the literature reviewed here, this is the setting this paper focuses on.³ Otherwise, as we will see below, the construction of indicators based on the publication of specialized articles is a task plagued with difficulties. Therefore, it is important to establish from the beginning that there is no single evaluation system that is completely satisfactory for all conceivable purposes.⁴ Consequently, it will be often necessary to review the robustness of the results obtained with a battery of imperfect indicators.

In a first approach, it is useful to examine the information compiled in large international databases on publications in academic journals that carry a certain weight. However, it is important to point out other dimensions that, in principle, can drastically alter any ranking based exclusively on the volume of published articles. We are referring, for example, to the ranking of institutions according to their annual flow of publications or of the stock of the same accumulated at the end of a given period, as well as the criteria to be followed for research carried out by sub-centers which are institutionally and physically close, the corrections which must be made for the number of co-authors of each article or the number of institutions each author is affiliated with, or the possibility of taking into account the size of each center.

The solution to the above problems, while difficult and potentially influential in the final ranking, is less controversial than the adjustments according to the quality of the articles which it is usually identified with the quality of the journals in which they are published. The key to this problem lies in two aspects. First, the weight granted to the small number of the “best” journals, recognized as such by a large majority of the profession, in comparison with the next tier of journals with international impact. Second, the awarding of a score or the exclusion of the “local” journals from a national level or a lower tier. In order to facilitate the interpretation of the results,

³ For a critical view of this option see, for example, Nederdof (1989) and Nederdof and van Raan (1993).

⁴ As stated by the committee members of the EEA in charge of selecting the 4 abovementioned papers, “*In principle, the ideal may be a single widely accepted index of every department’s research output. However, given the many legitimate areas of disagreement on how an index should be computed, this ideal seems unattainable for the present*” (Neary *et al.*, 2003, p. 1240).

the studies reviewed in this paper are informally ranked from greater to lesser degrees of “egalitarianism”. A methodology is considered more egalitarian the lower is the weight it assigns to the “best” journals, and the higher is the score it gives to “local” publications.

The main conclusions are the following:

1) Although the gap between the United States and Europe narrowed during the 1990’s, the United States is still responsible for more than half of the volume of worldwide production and approximately two thirds of the total number of pages, adjusted by differences in quality and other concepts, published by the top 200 Universities worldwide. The figures for Europe are 40% and 20%, respectively. Similarly, at the end of the last century, among the top 200, 100 and 20 Economic Departments in the world the proportion represented by the United States is 45-48%, 53-59%, and 95%, respectively. The figures for Europe are 31-36%, 30%, and 5%, respectively.

2) Within Europe, two facts deserve to be emphasized. First, the United Kingdom maintains a dominant position. It is responsible for 45% of the total volume of publications and, when journal quality and other factors are taken into account, 25% of the top 75 Departments in Europe and one third of the adjusted output belongs to this country. Second, among the success stories during the 1990’s, Spain shows the largest yearly growth rate in publications volume and becomes the fifth or sixth largest producer in Europe. After the adjustment for quality and other factors, Spain is responsible for 9.3% of the quality adjusted pages produced by the top 75 European centers, and jumps to the fourth European position after the United Kingdom, Holland, and France.

3) The distribution of the scientific publications in economics is everywhere very unequal. The researchers and research centers that regularly contribute something to the research output, however measured, constitute a minority in their respective countries. According to all available indicators, this phenomenon is even more pronounced in Spain than elsewhere. By way of

example, during 1971-2000 only 28% of academic economists in Spain (*versus* 42.8% in Europe) published at least once in a journal listed in *EconLit*. Of the authors that appear in that database in 1991-2000, only 16.5% in Spain (*versus* 21.1% in Europe) exceed some minimum standards of production.

4) When adjustments are made to take into account the quality of the papers and other factors, 5 of the most active Spanish centers in publication volume become part of the international big leagues. These are the UAB (*Universidad Autónoma de Barcelona*) plus the IAE (*Instituto de Análisis Económico*) –grouped as a single center– UPF, UCIII and UAL (*Universidad Pompeu Fabra, Universidad Carlos III, and Universidad de Alicante, respectively*) and CEMFI (*Centro de Estudios Monetarios y Financieros*). As the degree of egalitarianism in the methodology used drops and more recent periods are considered, these centers generally improve their relative positions on both a world and European scale. The first three finished out the 20th century in 48th to 80th place in the world and 9th to 14th in Europe, whereas the next two place around 100th to 140th on a world level and 30th to 50th in Europe.

5) In several broad fields of specialization these Spanish centers are very highly placed. According to Econphd (2004), in Econometrics the UCIII occupies the 10th place in the world and second in Europe; in Public Economics the UAB-IAE is placed 14th in the world and second in Europe, while in Macroeconomics the UPF is placed 24th in the world and sixth in Europe.

The rest of this paper is organized in four sections and an Appendix. Section II discusses the abovementioned methodological complications, emphasizing the weighting that journals receive according to their quality. Additional information and some clarifying examples are relegated to the Appendix. Section III presents evidence on a worldwide and European scale regarding the best research centers. Section IV reviews the Spanish situation for economics in general, as well as in broad research fields. The last section presents the conclusions.

II. A DISCUSSION OF ALTERNATIVE METHODOLOGIES

II. 1. Databases and Preliminary Problems

In economics, the databases of articles from the most important journals are the following: the SSCI (Social Science Citation Index), a product of the ISI (Institute of Scientific Information) in Philadelphia that includes information on citations, and *EconLit*, a publication of the American Economic Association. Both have significant drawbacks.

The SSCI includes only some 170 journals, mainly in English, in its Economics section.⁵ Nevertheless, other relevant outlets for economists are found in other thematic areas within the social sciences, such as Finance, Business, or even Psychology and Political Science and, in the case of journals with a mathematical or statistical orientation, in the SCI (Science Citation Index) within the natural sciences.

In 2001, *EconLit* covered 690 journals, including many from a national level in languages other than English.⁶ It has been said (Coupé, 2003, p. 1310) that “*one can claim with slight exaggeration, first, that if one is not in EconLit, one did not do academic research in economics, and second, that these journals together form the ‘economics literature’*”. Nevertheless, *EconLit* does not include 15 of the journals found in the ISI or journals specializing in Demographics, Business Economics, Applied Mathematics and Statistics (such as the *Annals of Statistics*, *Biometrika*, *Journal of the Royal Statistical Society (B)* and the *Journal of Time Series Analysis*, among others) where many economic researchers regularly publish.

We are interested in knowing which are the most productive Economic Departments in Spain, Europe and the world. Unfortunately, there is still no generally accepted single ranking based on the information contained in these datasets. The reason is that each of the studies

⁵ The only Spanish language journals in this group are *Desarrollo Económico* and *Trimestre Económico*, and from 2006, *Investigaciones Económicas*, *Revista de Economía Aplicada*, and *Revista Española de Economía* (currently, *Spanish Economic Review*).

⁶ The Spanish journals included are *Economía Industrial*, *Información Comercial Española* *Revista de Economía*, *Investigaciones Económicas*, *Moneda y Crédito*, *Revista de Economía Aplicada*, *Spanish Economic Review*, and *Top*.

cited in the Introduction have found different solutions to a set of methodological questions as to how to measure the output of an institution beyond the total number of publications of its members. Therefore, in order to determine up to what point different studies are comparable and to facilitate the interpretation of the results, this section reviews how each one of them solves these methodological problems.⁷

1. Flow or stock. Assume that we wish to rank Economic Departments according to their publications during a period of time, say 1990 to 2000. Where should an author's articles be accounted for? In the institution s/he is affiliated with at the time of publication (flow), or only in the institution where s/he is working in 2000 (stock)? In the first case, an author's publications are credited to the Department to which s/he belongs in the year of publication of each article. In the second case, *all* the publications of an author in this period of time are credited to the Department s/he belongs to at the end of that period. The second procedure better measures the potential research of each institution in the future as a function of the current location of the researchers who have published in the past, whereas the first procedure, by reflecting where the work was generated, provides a better measure of the historic evolution of that potential. Since the second method is much more costly, it is not surprising that, except for the studies of Combes and Linnemer (2003), Econphd (2004), and the European Commission (2004), all the rest list only the flow of publications from each institution.

In order to study the remaining problems, it is useful to utilize van Damme's (1996) well known formula for calculating the score, S_i , of researcher i in a given year:

$$S_i = \sum_{P_i} [\beta(P_i) w(P_i)] / \alpha(P_i). \quad (1)$$

⁷ The following pages closely follow the analogous discussion found in Neary *et al.* (2003).

For each publication P_i , $\beta(P_i)$ denotes the length; $w(P_i)$ is a weight that reflects the publication's quality, and $\alpha(P_i)$ is a correction coefficient for the existence of several co-authors (or an author belonging to several institutions).

2. The length of the article. Longer articles are not necessarily better. Moreover, as Villar (2003) points out, the more mathematical papers tend to be the shortest and some journals impose strict limitations on the number of pages per article whereas others do not. Nevertheless, there seems to be a general agreement as to the correlation between the length of an article and its importance. For this reason, except for the European Commission (2004) and Lubrano *et al.* (2003) who set $\beta(P_i) = 1$, the rest of the studies take into account the number of pages in each article. Many also consider the differences in the number of characters per page in each journal and convert each article into the number of pages of a paper in a reference journal.

3. The number of authors.⁸ Except for the European Commission (2004) and Lubrano *et al.* (2003), who set $\alpha(P_i)$ equal to one or the square root of the number of authors of P_i , respectively, the rest of the studies set $\alpha(P_i)$ equal to the number of authors of P_i . Using a wage equation in the United States, Sauer (1988) found that the monetary value of the publications follows this same rule.

4. The number of institutions to which the author is affiliated. If an author states that s/he belongs to m research centers in a given year, the score that the majority of the papers allocate to each one of them in this year is S_i/m , where S_i is determined in accordance with equation (1).

5. The existence of sub-centers. For various reasons, in some countries researchers belonging to one or many Departments are grouped into sub-centers. In Spain, this problem arises in the case of the UAB and the IAE, located in the same campus of Bellaterra. Although

⁸ According to Combes and Linnemer (2003), during the period of 1971–2000 nearly half of the publications in economics were joint efforts: 53.2% were written by individual authors, 38.5% by two authors and the rest by three or more authors.

they are separate institutions, it seems acceptable that both appear together, although ideally the score that each of them receives should be reported. Except for Combes and Linnemer (2003) and García Castrillo *et al.* (2002), the rest of the studies deal with the two institutions as a whole.

6. The size of the center. The aggregate score for all members of an institution measures its global strength but favours the larger Departments. An alternative is to classify each institution according to its per capita score that constitutes a (crude) measurement of productivity. In a world where there is great inequality in the distribution of individual publications within each institution, the per capita score is not as attractive as an indicator of the research activity of the institution as a whole. In any case, the most serious problem with this approach is that the number of members of an institution at any given moment in time is not an easy data to obtain. In these circumstances, it is tempting to identify this concept with the number of researchers at the center who have at least one publication, a method that favours those institutions whose publications are due to a small number of authors. Finally, the comparability of any indicator by size is complicated in two ways. First, there are centers dedicated exclusively to research where the large majority of its members publish regularly; on the other hand, in university Departments the rule is that a certain number of their members are dedicated almost exclusively to teaching and other tasks and, to a certain extent, have given up research work. Second, there are universities where researchers in Applied Economics, Business Economics or Econometrics are integrated in a single Economics Department whereas in others this is not the case. At any rate, except for Combes and Linnemer (2003), the rest of the studies provide only the total score of each center independently of its size. Therefore, this will be the classification criterion we will use in the rest of this paper.

II.2. The Ranking of Journals: Objective Criteria

As mentioned in the Introduction, the ranking of articles according to their quality is the most difficult problem to solve and the one that generates the greatest differences in the final Departmental rankings. In principle, the information about the times that each publication is cited could be an indicator of quality. Nevertheless, citations are subject to long and variable delays, they favour expository articles or literature reviews, they answer to different practices in different areas, and vary as well according to the age of the journal. Because of this, all of the studies identify the quality of an article with the quality of the journal in which it is published.

There are two alternatives for determining the quality of journals. This sub-section reviews the first one, which uses objective criteria based on the number of times an article is cited. In addition to the problems already mentioned, one limitation of this approach is that it can only be applied to the databases that have information on citations, that is, the ISI databases. Most users of such databases only consider the approximately 150 academic journals that appear in the Economics section of the SSCI. As already pointed out, this excludes other relevant journals found in other thematic areas of the SSCI as well as the SCI.

The next problem in this approach is how to utilize the citations to construct a weighting system for a given set of journals. To begin with, one may rely on the so-called *impact factors* that are regularly updated and published in the JCR (Journal Citation Reports) of the SSCI. These factors lead to a weighting for each journal based on the number of citations that the average article receives from all journals during a specific time period. Let C_{kj} be the number of citations made in journal j in the year T of the articles published in journal k in the years $T-1$ and $T-2$. Let A_k be the number of articles published during these years in journal k , so that $\gamma_{kj} = C_{kj}/A_k$ is the number of citations that an average article in journal k receives from journal j . The impact factor of the journal k is thus defined by

$$w_k = \sum_j \gamma_{kj} = \sum_j C_{kj}/A_k.$$

The imprudent use of impact factors for measuring the influence or quality of a journal has been widely criticized.⁹ One of the most obvious problems is its variability over time. To alleviate this, García-Castrillo *et al.* (2003), for example, consider (with some exceptions) the 55 journals with the greatest average of the impact factors during the six-year period of 1992–97. Given the exclusion of local journals and the large difference between the impact factors of the most cited journals and the rest¹⁰, this methodology is classified with a “low” degree of egalitarianism.

Another problem with this approach is that the citations should receive different weights depending on the prestige of the journal they come from. One way of taking this into account is to simultaneously determine all weights in a process where the weighting of journal k becomes

$$w_k = \sum_j \gamma_{kj} w_j.$$

This means solving the matricial equation

$$w = \Gamma w. \tag{2}$$

The weights w can be calculated as the greatest eigenvalue of the matrix Γ . This was first done in Liebowitz and Palmer (1984) for citations made in 1970 in 50 journals of articles published in 1965–69. Laband and Piette (1994) updated this exercise for citations made during 1980 and 1990 in 109 and 130 journals, respectively; in both cases the citations referred to articles published during the previous 5 years. These authors also adjusted the citations for the number of characters per page of each journal (see Table A2 in Laband and Piette, 1994).

Now, insofar as the journals differ in the intensity with which they cite, it has been argued that the citations coming from journals with a greater average number of them should carry less weight. Palacios-Huerta and Volij (2004) introduce an axiom to this effect according to which if the citations C_{kj} are multiplied by a factor $\lambda_j > 0$ so that the proportion $\lambda_j C_{kj} / \lambda_j C_j$

⁹ See, for example, Moed and van Leeuwen (1996), Moed (2002) and Amin and Mabe (2000). Among economists, impact factors are questioned in Lubrano *et al.* (2003) and García-Ferrer *et al.* (2006).

¹⁰ For example, if we consider the 166 journals included in the Economics section in the 2001 issue of the JCR and a value of 100 is given to the impact factor of the journal that appears in the first place, the one in fifth place barely exceeds a value of 26 and that in 50th place drops to a value of 10 (Villar, 2003, p. 102).

remains constant, where $C_j = \sum_k C_{kj}$ is the total number of citations in journal j , then the weighting assigned to journal k must also remain invariant. These authors prove that although the method used by Liebowitz and Palmer satisfies three appealing axioms, it lacks this last property. In fact, they also show that there is only one weighting system that satisfies the four axioms simultaneously: the *Invariant method*. In this system the measurement of the direct impact that an article in journal k has on journal j , which was measured by γ_{kj} in the above method, now becomes $\gamma_{kj}/(C_j/A_j)$, where (C_j/A_j) is the reference intensity of the articles in journal j ; that is, the measurement of the direct impact becomes the average number of citations of an article in k out of the average number of references by a typical article in j . Although by way of example Palacios-Huerta and Volij (2004) illustrate the considerable differences between the two systems in a group of 37 journals, there is still no application of the invariant method for ranking Economic Departments in a given geographical area.

On the other hand, both in Liebowitz and Palmer (1984) as well as in the invariant method self-citations are included, namely, the citations of the articles in a journal which come from other articles in this same journal. Kalaitzidakis *et al.* (2003) eliminate these self-citations, making the elements of the principal diagonal of matrix Γ equal to 1 in equation (2). Finally, they insist on the convenience of constructing the weighting of the journals using the information closest to the period during which the research centers are to be ranked. Thus, for the worldwide ranking of the economics centers during 1995–1999, these authors updated the weightings used by Laband and Piette (1994) using citations made in 159 SSCI journals during 1998 of articles published in 1994–1998. Finally, these authors select the top 30 journals that happen to receive 83.4% of the total number of citations adjusted for different concepts (see column 5 of Table 1 in Kalaitzidakis *et al.*, 2003).¹¹ According to Combes and Linnemer (2003, p. 1259), the articles in

¹¹ Table 2 in Kalaitzidakis *et al.* (2003) analyzes the effect of the different adjustments they make, and includes a comparison with the ranking of Laband and Piette (1994). The ranking of the best journals does not change greatly,

these 30 journals represent 13.8% of the total in *EconLit*. Furthermore, of the 22,000 economists appearing in *EconLit* from 1971–2000, more than 85% have never published in any of the 30 journals in question. For all of the above reasons this methodology, which will be referred to as Kalaitzidakis 1 (to distinguish it from other proposals by these authors that will be reviewed below), is classified as having a “low” degree of egalitarianism.¹²

Econphd (2004) looks at 63 journals, whose citations represent 95.6% of the total number of citations adjusted for all concepts in Kalaitzidakis *et al.* (2003).¹³ However, it takes the logarithm of the weightings in that paper, a procedure that greatly reduces the difference between the weightings of the best journals and the rest. Therefore, although the number of journals considered is relatively small and local journals are totally excluded, this method is classified as having a “high” degree of egalitarianism.

II.3. The Ranking of Journals: Subjective and Other Criteria

The second criterion for evaluating the quality of journals is their ranking by experts. Thus, for example, in one of the first European-wide analyses for the 1991–96 period, Kalaitzidakis *et al.* (1999) starts from the 10 journals that occupy the top places of Laband and Piette (1994, Table A2). The *Journal of Financial Economics*, the *Journal of Finance* and the *Rand Journal of Economics*, which occupy 2nd, 8th and 10th place respectively, are eliminated and substituted by the *Review of Economics and Statistics*, the *Economic Journal* and the *European Economic Review*, occupying the 23rd, 25th and 50th positions, respectively. The 10 journals selected represent 42.6% and 44.9% of the total of citations adjusted for all concepts in Laband and Piette (1984,

but its relative weighting does. Another important feature, which we will turn to later on, is the improvement that empirically oriented journals, such as the *Journal of Business and Economic Statistics* and the *Journal of Applied Econometrics* experience, and the appearance among the top 30 of *Economic Theory* and *Econometric Theory*, due, possibly, to the fact that the citations they receive come from other journals in top places.

¹² The 30 journals selected in this method are listed in the Appendix.

¹³ These are the first 64 journals from the list of Kalaitzidakis *et al.* (2003), once having eliminated the one that appears in 41st place, the *IMF Staff Papers*. The list of the additional 33 journals over those of Kalaitzidakis 1 is included in the Appendix.

Table A2) and Kalaitzidakis *et al.* (2003, Table 1), respectively. This certainly is an elitist criterion that will be classified as having a “very low” degree of egalitarianism and will be referred to as Kalitzidakis 2.¹⁴

Similarly, in an influential paper Dusansky and Vernon (1998) restrict themselves to the so-called blue ribbon journals, a set of 8 journals also chosen from the top 10 of Laband and Piette (1994).¹⁵ The journals in question represent 37.8% and 40.8% of the total number of citations adjusted for all concepts in Laband and Piette (1984, Table A2) and Kalaitzidakis *et al.* (2003 Table 1), respectively. Moreover, according to Combes and Linnemer (2003, p. 1259), of the more than 22,000 economists appearing in *EconLit* in 1971–2000, more than 90% have never published in these 8 journals that contain only 6.2% of all the articles in *EconLit*.

At the other extreme, Combes and Linnemer (2003) classify the 680 *EconLit* journals into 6 groups that contain 5 journals with 10 points; 16 with 6.7; 39 with 5; 68 with 3.3; 138 with 1.7 and the rest with 0.8 points. This methodology is an example in which there is not much difference between the best journals and the rest, and in which the local journals receive a positive score; for this reason, it will be classified as having a “very high” degree of egalitarianism.

Lubrano *et al.* (2003) adopted a mixed strategy: they started by entrusting to one of their members, Alan Kirman, the ranking of 505 journals that come from the 680 journals in *EconLit* after eliminating those with fewer than 10 articles in 10 years. In a second phase, they gathered information on the number of citations which 307 journals receive. Finally, they asked Professor Kirman to modify his original ranking in light of this information. The result is a grouping of all the journals in 6 classes that contain 6 journals with 10 points, 17 with 8 (except for one with 7),

¹⁴ It seems that Kalaitzidakis *et al.* (1999) made a mistake in establishing the weightings of these 10 journals. The journals with the weightings revised by Tombazos (2005) are listed in the Appendix under Kalaitzidakis 2.

¹⁵ In this case, the *Journal of Financial Economics*, the *Journal of Finance* and the *Journal of Monetary Economics*, which occupied places 2nd, 6th, and 8th, respectively, were eliminated and substituted by the *Review of Economic Studies*, the *International Economic Review* and the *Review of Economics and Statistics*, which occupy places 9th, 21st and 23rd, respectively. The resulting 8 journals and its weightings are listed in the Appendix under Dusansky and Vernon.

45 with 6, and the remaining 437 with 4, 2, or 1 point. This is another case of “very high” egalitarianism, which will be referred to as Lubrano 1. On the other hand, Lubrano *et al.* (2003) select the 68 journals with 6 or more points in an option, referred to as Lubrano 2, which will be rated as having a “high” degree of egalitarianism.¹⁶

Coupé (2003) opts for a ranking of journals based on the mean that these obtain according to 11 different criteria that vary from the most elite to the most egalitarian. It is difficult to know how to rate this solution, although taking into account the predominance of the methods that attribute some value to local journals, we will opt for rating it as having a “medium/high” degree of egalitarianism. This methodology will be referred to as Coupé 1, but two other alternatives from Coupé (2003) will also be used: Coupé 2, which takes into account the 71 journals included in the ranking by Laband and Piette (1994) and is rated with a “high” degree of egalitarianism, and Coupé 3, which considers the 10 journals in Kalaitzidakis 1 and is assigned a “very low” degree of egalitarianism.

Finally, we turn to the criterion used by the European Commission (2004), which simply scores the number of publications in *EconLit* without making any adjustments for the differences in quality of the journals in which they appear. Because it includes all local journals and weights all types of journals equally, this criterion is characterized by a “maximum” degree of egalitarianism.

II.4. A Final Assessment

¹⁶ In the same vein, we should mention the criterion in Dolado *et al.* (2003) that has been used internally in the Universidad Carlos III and whose results will be reviewed below. It classifies many of the *EconLit* journals and other local ones into 8 categories: 3 journals receive 30 points; 11 receive 20 points; 35 receive 15 points; 40 receive 8 points; the 44 top local journals receive 4 points, while those of a second or third tier receive 2 and 1 points, respectively; finally, other Spanish journals without external evaluation receive 0.5 points. This is a criterion that could be rated as having a “high” degree of egalitarianism.

The different methods are listed according to the information they provide on (i) flows or stocks, (ii) the period of time that the paper refers to, (iii) the number of journals with a positive score, and (iv) our subjective rating on the axis of egalitarianism–elitism.

| FLOW | STOCK |
|---|--|
| 1. Lubrano 1 (1990-2000) # Journals: 505 Egalitarianism: VERY HIGH | 8. European Commission (1990-1999) # Journals: 680, <i>EconLit</i> Egalitarianism: MAXIMUM |
| 2. Lubrano 2 (1990-2000) # Journals: 68 Egalitarianism: HIGH | 9. Combes y Linnemer (1996-2000) # Journals: 680, <i>EconLit</i> Egalitarianism: VERY HIGH |
| 3. Coupé 2 (1990-2000) # Journals: 71 Egalitarianism: HIGH | 10. Econphd (1993-2003) # Journals: 63 Egalitarianism: HIGH |
| 4. Coupé 1 (1990-2000) Egalitarianism: MEDIUM/HIGH | 11. Dusansky and Vernon, 19 in the U.S. # Journals: 8 Egalitarianism: VERY LOW |
| 5. García Castrillo (1992-1997) # Journals: 55 Egalitarianism: MEDIUM | |
| 6. Kalaitzidakis 1 (1995-99) # Journals: 30 Egalitarianism: LOW | |
| 7. Kalaitzidakis 2 (1991-96 and 1997-2002) = Coupé 3 (1990-2000) # Journals: 10 Egalitarianism: VERY LOW | |

To shed some light on the reasoning that has led to this rating, some additional information is offered in the Appendix (see Section B) on the weight that some important methods assign to certain international journals in relation to the very best ones.¹⁷ Naturally, the reader interested in judging the differences between the different methods for him/herself

¹⁷ Neary *et al.* (2003) present a very illustrative graph showing the weightings received by the 30 top journals selected in Kalaitzidakis *et al.* (2003) according to the 5 following methodologies: (i) Combes and Linnemer (2003) and (ii) Lubrano *et al.* (2003), which have been rated as having a very high degree of egalitarianism; (iii) the 8 journals selected by Dusansky and Vernon (1998) and (iv) the impact factor based on the number of citations in the JCR received in 1998 by articles published in the previous 10 years, which can be rated as having a very low degree of egalitarianism, and (v) the Kalaitzidakis 1 method which was rated as having low egalitarianism.

should consult directly the original papers and the ample information they provide in defence of their respective approach.¹⁸

According to Laband y Piette (1994, p. 641), “...*citations are the scientific community’s version of dollar voting by consumers for goods and services...however, the purchase decision may...be influenced by the buyer’s friendship or family relationship with the seller and/or the buyer’s hope that the seller will, in turn, patronize the buyer’s establishment...Economists who study industrial organization do not make any distinctions between ‘good’ or ‘bad’ sales...Sales are sales, period...We do not treat consumption of scientific literature any differently.*” Without needing to totally accept this initial position, we sympathize with the attempt to base the weightings that the journals receive on the objective information provided by citations. In fact, we have reviewed diverse alternatives to mitigate much of the criticism directed towards the naive use of the ISI impact factors, such as the weighting of citations by the importance of the journals in which they appear, the elimination of self-citations, or the need to take into account citation periods that are sufficiently long and as close as possible to the planned application.

Nonetheless, the interventionist pretensions of other authors wishing to ensure an academic value to the weightings that different journals should receive are understandable. However, we do not as yet have a carefully administrated opinion survey on this matter capable of generating sufficiently wide professional acceptance. On the contrary, the methodologies based on the expert opinions have introduced elements of an undeniably arbitrary nature that result in a lack of majority support.

On one hand, a legitimate and understandable zeal has led to elitist rankings that are open to two types of criticism. First, the choice of journals reveals a mix of generally accepted opinions in favour of the *American Economic Review*, *Econometrica* or the *Journal of Political Economy*, with other

¹⁸ For the correlation between the weighting systems that have been termed Kalaitzidakis 1, Lubrano 1, Combes and Linnemer and that of Dusansky and Vernon, see Combes and Linnemer (2003, Table 1).

much more controversial ones such as the inclusion or not of the *European Economic Review*, the substitution of the *Journal of Monetary Economics* for the *International Economic Review*, or the exclusion of important journals in certain fields, as in the case of the *Journal of Econometrics*, the *Journal of Public Economics* or the *Rand Journal of Economics*.¹⁹ Secondly, the 8 or 10 privileged journals represent a minimum percentage of the articles collected in large databases such as *EconLit* and, above all, a reduced percentage of the adjusted citations in Laband y Piette (1994, Table 2A) and Kalaitzidakis *et al.* (2003, Table 1).

On the other hand, with the intention of better representing worldwide output, other authors have abandoned the SSCI in favour of the more extensive list of journals in *EconLit*. In addition to the deficiencies of this database, these attempts have led to what is probably an excessive recognition of local journals. As noted by Neary *et al.* (2003, p. 1247), “*The egalitarian weighting schemes value ten or twelve articles in such local journals as equivalent to at least a single article in the American Economic Review...It seems unlikely that this weighting corresponds to those used by most European economists to rank their colleagues in other countries, or to the valuation that the profession worldwide places on contributions in different journals.*”

In light of this experience, what is an ideal methodology remains an open question. Personally, within the objective approach I would suggest: (i) Widening the citation universe by extending the set of journals in the thematic area of Economics of the SSCI to other journals in other areas of the SSCI or even the SCI.²⁰ (ii) Using the invariant model recommended by Palacios-Huerta y Volij (2004) that controls for the reference intensity, so that the length of the reference section does not matter, but eliminating the self-citations as is done in Kalaitzidakis 1.

¹⁹ A case of extreme arbitrariness, in our opinion, is the selection of 15 journals made by Kocher and Sutter (2001), whose detail is in the Appendix. The rankings of the centers using this method have not been considered in this paper.

²⁰ Invoking the interdisciplinary nature of Economics, García-Ferrer *et al.* (2005) consider 404 journals from the following thematic areas of the ISI: *Economics, Business, Finance, Planning and Development, Management, Mathematical Social Sciences, Transportation, and Statistics and Probability*. In my opinion, this is an excessively heterogeneous option. In any case, the authors do not apply the weighting they obtain for the ranking of the Economic Departments anywhere.

(iii) Selecting a sufficiently ample array of journals so as to represent a variety of fields and interests, and in any case, so as to capture an elevated percentage of the citations adjusted for all concepts as it is accomplished in Kalaitzidakis 1 and Econphd.²¹ Nevertheless, there is little question that there already exists a wide range of interesting methods that are worth testing in order to determine which features of recent economics research are robust, and which are not. This is the task undertaken in the following two sections.

III. THE WORLD AND EUROPE DURING THE 1990's

This Section has three aims. First, to document the evolution during the 1990's of the gap between the research in economics done in the U.S., Europe, and the rest of the world. Second, to review two issues within Europe: the dominant role of the United Kingdom and the take off of Spanish research during this decade. Third, to summarize the evidence on the high degree of concentration of the output produced by academics researchers everywhere, and specially within Spain.

III.1. The Worldwide Sphere

The 2000 Lisbon Declaration by the European Council refereed to in the Introduction, reveals a deep preoccupation in the European front about the distance that separates our Continent from the U.S. in every dimension relating to science, research, and development. From this perspective, it is useful to establish how has evolved the worldwide position of the U.S. in the field of economic research. First, we look at top Economics Departments in the world. Second, we consider quantitative indicators relating to the volume of publications as well as the number of standardized pages adjusted by a number of concepts, including the relative quality of professional journals, as reviewed in Section II.

²¹ For an alternate strategy, see Villar (2003, p. 113-14).

There are 4 papers ranking the academic Departments on a worldwide scale during the last decade of the past century: García Castrillo *et al.* (2002), who rank 1,000 institutions for the period from 1992-97; Coupé (2003) and Kalaitzidakis *et al.* (2003) who rank 200 Departments for the periods 1990-2000 and 1995-99, respectively, and Econphd (2004), which refers to 321 centers during the period 1993-2003. Table 1 presents the distribution by large geographic areas of the top 200 Departments in the aforementioned 4 cases.

It can be observed that the proportion represented by the Departments in the United States in the top 200 during the period drops from 61% to 45-48%. The European share increases from 25% to 31-36%, and the rest of the world goes from 25% to 31-36%. However, as we proceed towards the best, the dominant position of the U.S. strengthens even more so and falls at a declining rate over the period. Thus, among the top 100 Departments, the U.S. percentages drop from 65-70% to 53-59%, while Europe shows an increase from 15-19% to 30%, approximately. Finally, among the top 50, the United States goes from 80% to 70% and Europe from 8-12% to 14-20%.

To deal with the question of the relative position of the United States, Europe and the rest of the world among the top 20 Universities, Table 2 presents the results of the following 5 rankings: the three variants of Coupé, that of Kalaitzidakis 1 and that of Econphd. In the first column, Universities are ranked in accordance with the criterion referred to as Coupé 3 or Kalaitzidakis 2, that is, the elitist classification that only takes into account a version of the top 10 journals. Informally, the main result is that the robustness at the world's top leaves little room for doubt.²²

- Harvard, Chicago and MIT occupy the top 3 spots, while Northwestern and Stanford appear at least 3 times (of the 5 cited) in fourth and fifth position.

²² Only Lubrano *et al.* (2003) formally research the statistical robustness of their rankings, an approach that we will not be able to follow here.

- Princeton and Pennsylvania, as well as Yale, Berkeley and Columbia, appear at least 3 times in the 6th to 10th positions. The University of California at Los Angeles, New York University and the University of Michigan in Ann Arbor hold the 11th to 13th positions.

- The University of Rochester, the University of California at San Diego, LSE (London School of Economics), Cornell, the University of Wisconsin at Madison, the University of Texas at Austin and Boston University round out the top 20.

The alterations in this ranking due to methodological differences or to the period of time covered only affect the relative position of the Universities in the top 15 positions.²³ On the other hand, it must be pointed out that, although the Universities of Toronto, Tel Aviv, British Columbia or, most recently, Toulouse and Tilburg appear on occasion, only one non-U.S. University, the LSE, is consistently ranked in the top 20. However, there is no European research center in the top 10 positions.

Table 3 presents some quantitative evidence. The upper panel is based on the NSI (National Science Indicator), another product of the ISI which covers fewer journals than the SSCI (see Table 3.A) It summarizes the evolution in the volume of articles published by the United States, the 15 member states of the European Union, Japan and the world as a whole during the 1991–2001 period. The superiority of the United States at the beginning of this period is clear: in 1991, research in this country comprised 66.5% of the total, whereas that of the European 15 made up 21.7%. Nevertheless, during the 1990's the growth rate for the United States was negative (- 2.2%), while that of Europe was 6.2%, which narrowed the gap between the two areas considerably. Thus, in 2001 the United States and Europe comprised 53% and 39.5% respectively, of world research.

²³ Seventeen of these Universities, including the LSE, are also in the top 20 in the world according to García-Castrillo *et al.* (2002) for the period 1992-97. As to the ranking, the only differences worth mentioning are the improvements experienced by the University of Pennsylvania and the University of Wisconsin at Madison.

However, it is important to evaluate research excellence beyond the mere volume of publications, taking into account the quality of professional journals, as well as the complications concerning article length, the number of authors, the multiple affiliations of many authors, and the remainder of the methodological aspects analysed in Section II. For that purpose, Table 3.B presents the evidence on the number of pages adjusted by different concepts according to Kalaitzidakis 1, which is based on publications appearing in the period 1995-99 in the top 30 journals. Of the total number of pages published by the top 200 Universities worldwide, approximately two-thirds are attributable to U.S. institutions. The European percentage drops to little more than 20%.

It must be concluded that the gap between the U.S. and Europe remains quite formidable. Furthermore, the more stringent the criteria for excellence used in the comparison, the wider the gap becomes.

III.2. The European Sphere

In order to review the research performance of the different European countries, two types of evidence will be presented. First, the sheer volume of publications during the 1990's in relation to that of the world as a whole according to the NSI (see the left-hand side of Table 4). Second, the distribution by country in 1995-99 of the best 75 European Departments, as well as the number of adjusted pages they produce according to Kalaitzidakis 1 (right-hand side of Table 4).

Two facts deserve emphasizing. First, in the early 1990's the United Kingdom is responsible for nearly 10% of the world output and 45.2% of the European production (the last figure is not shown in Table 4). In 2001 the percentage that this country represents in the world increases to 14.4%. Nevertheless, due to the fact that other European countries advanced at a quick pace, the United Kingdom's contribution in Europe remains equal to 45.3% (see column 4 in Table 4). On the other hand, the 19 Departments of the United Kingdom, which represent

somewhat more than 25% of the top 75 in Europe, are responsible for one third of the total production.

Second, the best description of Spain's improvement in the volume of publications is contained in the following quotation from the European Commission (2004, Chapter III, p. 37): *“Spain is one of the largest producers of scientific publications in economics. Between 1991 and 2001, its presence in the ISI databases increased from 0.4% to 2.7%, thus achieving the greatest yearly growth rate (20.3%) of all European countries. EconLit shows some impressive increases as well (the EconLit information is not shown here): between 1991 and 1999, Spanish publications increased from 80 to 400, which represents an annual average increase of 23.4%. Spain's percentage contribution rose to 11.5%, the highest rate in Europe. Spain has gone from being the sixth lowest producer of literature in 1991 (according to EconLit) to being the sixth largest producer in 1999.”*

Spain (together with Belgium) also stands out because of its good performance in quality research: about 5% of the best 75 Departments generate more than 9% of the total output (see columns 5 and 6 in Table 4). Holland, a small country, is another success story: it provides close to 10% of the Departments and 14% of the adjusted pages. Other European countries, however, are less productive. France, Sweden and Denmark, for example, produce somewhat less than what would be expected by their contribution in percentage terms to the top 75 Departments, while Germany, Italy, Switzerland and Norway do much worse. Thus, Spain, which was the sixth country in volume of publications within Europe, is now clearly in fourth position behind the United Kingdom, Holland and France when adjusted pages from the best 75 centres are taken into account.²⁴

III.3. The Degree of Concentration

²⁴ The worldwide contribution of Spain to Kalaitzidakis 1 is 2.05% (slightly below the 2.7% of the world volume of publications in 1999 shown in the left-hand panel of Table 4).

It will be illuminating to close this Section with a brief discussion of one of the features of economic research that is highlighted in Villar's (2003) survey: no matter what geographical area we refer to, the productivity of academic economists (university faculty and scholars in research centers) is quite low. For our purposes, it suffices to provide a few glimpses of this phenomenon.²⁵

In Coupé's (2003) study of the publications in *EconLit* of academic economists around the world during 1994–98, it is found that 32,740 authors, or 59.5% out of a total of 55,000, wrote (alone or in collaboration) only one article. Similarly, according to a study by Combes and Linnemer (2003) covering 18 European countries during the years 1971–2000, only 42.8% of European academic economists published at least once in a journal listed in *EconLit*. Moreover, according to Lubrano *et al.* (2003), only 21.1% of the authors who did appear at least once in *EconLit* from 1990 to 2000 and one third of their Departments exceed some minimum standards of production.²⁶

The Spanish figures point out to a rather dismal average performance. According to Combes and Linnemer (2003), only 28% of academic economists published at least once in *EconLit* during 1971–1990. Of the authors that appear in that database in 1990–2000, only 16.5% exceed the minimum standards suggested by Lubrano *et al.* (2003). Similarly, only 12 of 48 Departments, or 25% of them, are over the corresponding minimum standards. In a study carried out on the production of 62 public and private Spanish Universities during 1994–2003, Royuela *et al.* (2005) concluded that 7 of them had never published a single article in *EconLit* and 11 had never appeared in the records of the SSCI–ISI. On average, a Spanish faculty member

²⁵ For a more detailed analysis, see Villar (2003) or Ruiz-Castillo (2006).

²⁶ The standard for a researcher is one article with a co-author published in the space of a decade in the *American Economic Review* or the equivalent in other journals. The standard for a Department is set equal to that of 10 researchers.

during this period published only one *EconLit* article every 13.5 years or one ISI article every 22 years.²⁷

In Villar (2003) countries are ranked in terms of a productivity indicator equal to the production index in relation to the size of the population for each country, in relation to the productivity of the United Kingdom measured in the same way. During the last third of the 20th century only the Scandinavian countries (except Finland), Belgium and Holland show productivity indices close to that of the United Kingdom. The productivity indices of the remaining 9 European countries are lower than 50% of that of the reference country. In particular, the productivity of the Spanish (or German) academic economists measured by production per capita is, approximately, five times lower than that of the United Kingdom. We have seen the rapid progress of the Spanish research production during the 1990's. Nonetheless, when the population is taken into account, at the close of the last century Spain occupies 12th place in the EU and its productivity index only reaches 25% of that of the United Kingdom.

The conclusion is clear: wherever we look at, the distribution of scientific publications in economics at the end of the 20th century is extremely unequal. Researchers and research centers that regularly contribute to the total volume of publications constitute a minority in their respective countries. According to all available indicators, this phenomenon is even more pronounced in Spain than in the rest of Europe.

It is important to emphasize that the phenomenon persists when we refer to the research of excellence, namely when the research output is measured, not by the simple volume of publications, but by the number of standardized pages after appropriate adjustments are made for the many issues reviewed in Section II. In order to illustrate the high degree of concentration of

²⁷ These statistics on the shortage of economic research production in Spain are accompanied by very low rates in the six-year research money prizes that have been awarded by the Ministry of Education since the end of the 1980's to all applicants who meet very low minimum standards. In 2003, for example, only 53% of the applicants in economics, compared to 78% in other disciplines, were successful (see García-Ferrer *et al.*, 2005, Table 2, as well as Royuela *et al.*, 2006, Appendix A.1)

this type of research in an international context, consider the distribution of the number of adjusted pages in Kalaitzidakis 1 among the top 200 Departments worldwide. The three top Departments are responsible for 12% of total output, while the top 10 and the top 20, which represent 5% and 10% of the top 200 in the world, are responsible for 28% and 42% of the total output, respectively. At the other tail of the distribution, the last 100 Universities among the top 200 in the world are responsible for only 15% of the total production. Similarly, in the distribution referred to the top 75 European centers it is found that the three top Departments are responsible for 14.5% of the total output, while the top 10 and the top 20, which represent 7.5% and 15% of the top 75 in Europe, are responsible for 36% and 57% of total output, respectively. The last 35 Universities among the top 75 of Europe obtain only 20% of the total output.

The analysis of the inequality across Spanish centers of the distribution of research output measured by either volume of publications or more sophisticated criteria, is left for the next Section.

IV. SPAIN

The previous Section documented a central feature of Economics research everywhere that is specially present in Spain: the low productivity of academic economists when output is measured by volume of publications. A reference was also made to the high degree of concentration of the research of excellence across the top Departments in Europe and the world. This Section is organized around the following three issues. First, the identification of centers of excellence within Spain. Second, the evolution of their standing in an international context as far as general Economics is concerned. Third, the position that the best Spanish centers occupy in Europe when the research output is classified by major fields.

IV.1. The Overall Situation Within Spain

We shall begin by summarising the most significant papers about the recent evolution of research in Spain. Dolado *et al.* (2003) study the period 1990-99 using the following 4 criteria. First, Kalaitzidakis 2, a criterion limited to the 10 general journals selected in Kalaitzidakis *et al.* (1999) that has been rated as having a “very low” degree of egalitarianism and has been used in the ranking of the top 20 centers worldwide in Table 2. Second, the 147 top journals in the ranking established by Kalaitzidakis *et al.* (2003) are taken. Since this criterion, referred to as Kalaitzidakis 3, does not include local journals and the most important ones have very high weighting, it is assigned a “low” degree of egalitarianism. Third, the criterion used internally in the UCIII that has been rated as having a “high” degree of egalitarianism (see note 16). Fourth, a criterion originally suggested by Bauwens (1998) and Lubrano *et al.* (2003) where the journals in *EconLit* are classified into 5 categories with weightings from 1 to 5. This methodology, referred to as Bauwens, is deemed to have a “very high” degree of egalitarianism. The ranking of Spanish centers according to these criteria is shown in the first 4 columns of Table 5. Lastly, the ranking according to the European Commission (2004) has been included in the last column of that Table. Since this methodology counts the articles in all the journals in *EconLit* without any adjustment for quality, it is assigned the highest degree of egalitarianism.²⁸

Two points will be emphasized. In the first place, it is enlightening to compare the ranking of the Spanish centres according to the two opposing criteria as far as the degree of egalitarianism is concerned: that of Kalaitzidakis 2 and that of the European Commission (2004). It can be observed that:

²⁸ Recall that the methodology of the European Commission is the only one of the 5 that adjudicates *all* of the publications of each researcher during the 1990’s to the institution where the researcher is *at the end of the period*. The remainder adjudicate each publication to the institution to which the author(s) declares himself affiliated at the moment the publication in question appears.

- UPF, the UAB and the IAE, treated as a single center²⁹, and UCIII hold the first 3 places in both classifications. That is, whether we only count a version of the blue ribbon journals or the gross volume of publications, during the 1990's these 3 centers clearly stand out from the rest.

- There are institutions of smaller size and/or oriented to journals with greater impact, which when the gross volume of publications is taken into account hold positions relatively far from the top, yet when the criterion of maximum elitism is utilized their relative position improves considerably. This is the case of the Universities of Alicante (UAL) and of Salamanca, which go from 9th and 19th positions according to the European Commission to 4th and 9th according to Kalaitzidakis 2, respectively. This happens as well to two private research centers that began their activities in the early 1990's: CEMFI (*Centro de Estudios Monetarios y Financieros*), created under the auspices of the Bank of Spain and financed by financial system institutions, and FEDEA (*Fundación de Estudios de Economía Aplicada*). These centers go from the 12th and 15th position to the 5th and 7th, respectively.

- Other institutions run the opposite course. This is the case of the University of Valencia, the Complutense of Madrid, the Pública of Navarra and, to a lesser extent, the Universities of País Vasco and Zaragoza, which hold 4th, 5th, 10th, 6th and 8th positions in column 5 of Table 5, and the 13th, 11th, 19th, 8th and 10th, respectively, in column 1 of said Table. These are Departments that are more oriented towards local journals, and/or those with less international impact.

- Finally, the Research Department of the Bank of Spain, a public research center, maintains the 7th and 6th positions in the two rankings.

²⁹ The Spanish papers usually separate the UAB from the IAE. However as the majority of the foreign publications consider them to be a single center since they both pertain to the same campus of Bellaterra, this paper maintains the latter criterion.

In the second place, if we limit ourselves to the 4 rankings of Dolado *et al.* (2003), that is, to the 4 first columns in Table 5, the resulting ranking is quite robust:

- The UAB-IAE, UPF and UCIII hold the first three positions. If the most elitist criteria are followed, UPF is in first place; otherwise, the tandem UAB-IAE is adjudicated the 1st position.

- The UAL clearly registers 4th in the ranking, while the CEMFI is 5th.

- The Research Department of the Bank of Spain and the University of País Vasco hold the 6th and 7th positions, while the Universities of Zaragoza, Valencia and Complutense of Madrid are in the 8th to 10th positions.³⁰

IV.2. The Spanish Centers Of Excellence In the International Scene

In Table 6, the position of the Spanish centers among the top 200 in the world and/or the top 75 in Europe during the 1990's is summarized in accordance with 11 methodologies or different periods of time.³¹ In light of the above results, it is not surprising that the Spanish centers that appear in Table 6 are confined to those situated in the first positions of the national ranking. Since the first part of the 1990's the presence of 3 Spanish institutions must be highlighted: the UAB and the IAE, as well as UPF and UCIII, both of whom, although established in 1990-1991, immediately began to achieve noteworthy positions. In Kalaitzidakis 2, which refers to the period 1995-99, the UAL also appears, and in Econphd, for the period 1993-2003, the CEMFI likewise is present. These 5 centers, which represent only 15% of the 34 with some publication in *EconLit* during 1991-2000 according to the European Commission (2004, Annex II), are responsible for 40% of the gross output in the country. All of which rules out, as pointed out by Royuela *et al.* (2005), the existence of a trade-off between quantity and quality: the

³⁰ In spite of using other criteria to adjust for quality, the rankings provided by Bergantiños *et al.* (2002), García *et al.* (1999a), and Royuela *et al.* (2005) are very similar to this one (see the details in Ruiz-Castillo, 2006).

³¹ Of all the methods discussed in Section II, only the results from Combes y Linnemer (2003) are excluded for reasons explained in Ruiz-Castillo (2006).

centers carrying out the greater part of quality research also distinguish themselves in gross output volume. What happens is that the publications of other Spanish centers appear for the most part in journals with less international impact.³²

Within the European scene, we first point out that if we place ourselves at the beginning of the period (García-Castrillo) and/or we simply consider the volume of articles published during the 1990's (European Commission), the UAB and the IAE, UPF and UCIII hold different rankings between the 20th and 40th positions among the best in Europe. Nevertheless, when the methodology utilized is refined (as in the 3 versions of Coupé and the two of Lubrano) these centers register an immediate improvement, surging up to between 10th and 30th positions; moreover, the UAL also appears between 35th and 55th and the CEMFI at 72nd. Finally, when we come to more recent periods (in Kalaitzidakis 1, Econphd y Tombazos) and/or consider criteria which are not very egalitarian (Kalaitzidakis 2), the first 3 centers achieve a position in the top 20, with some of them appearing in the top 10, while the UAL changes to the 30-40 segment and the CEMFI registers a position in the top 50.

In order to verify the changes produced when more recent periods are considered, it suffices to compare the rankings of Kalaitzidakis 2 and of Tombazos who, sharing the most elitist criteria, are differentiated exclusively by the period that they cover: UPF gains 5 places to reach the fifth spot in Europe; UCIII gains 14 positions reaching the 19th slot, and the UAL gains 10 positions reaching 30th. On the contrary, the UAB-IAE loses some ground, going from third in Europe during 1991-1996 down to 21st in 1997-2000, while the CEMFI holds steady at 49th.

On the other hand, comparing Lubrano 1 and 2, for example, it can be observed that as the degree of egalitarianism decreases because of the elimination of the local journals, or the increase of the relative weighting of the most important, the position of the Spanish Universities

³² Royuela *et al.* (2005), however, detect less distance between the levels of scientific production of the 10 top Spanish Universities and the remainder in 1999-2003 than that which existed in 1994-98.

experiences an ostensible improvement compared to the rest of the European Universities.³³ Nevertheless, UPF is clearly the one which most benefits when we reach a minimum degree of egalitarianism (compare Coupé 2 and Coupé 3, as well as Kalaitzidakis 1 and Tombazos).

As far as the worldwide rankings is concerned, two fundamental features are confirmed. First, the UAB-IAE, UPF, and UCIII hold positions 120th to 160th worldwide at the beginning of the 1990's, but advance to positions near 50th to 80th at the end of that period. Furthermore, in the ranking of Econphd the UAL and the CEMFI hold positions between 130th and 140th. Second, as the degree of egalitarianism decreases, the positions of the Spanish centers, especially UPF, improve. This can be seen clearly upon comparing the rankings of Coupé 2 and Coupé 3 and, except for UCIII and CEMFI, those of Econphd and Kalaitzidakis 1. Taking into account that what has been termed local journals are excluded in the 4 cases, it can be concluded that as greater relative weight is given to the top international journals, the position of the Spanish Departments in the world rankings improves at the expense of the centers from the U.S., Europe, and other parts of the world.

Finally, it has been noticed that the best Spanish centers are far from the top 20 in the world. But how well do they fair among the top European Universities during the last decade of the 20th century? This information is found in Table 7, where the top 21 Universities are ranked according to Kalaitzidakis 1 (recall that this method refers to the period 1995-99, considers the top 30 journals and has been rated as having a "low" degree of egalitarianism). Four other rankings are also collected: Coupé 1 and 3 (which coincide with that of Kalaitzidakis 2), Lubrano 2, and the most recent one of Econphd. Although the clarity and the robustness of the following conclusions are inferior to that obtained in the world ambit, the available information for the 1990's can be summarized as follows:

³³ The information in Combes and Linnemer (2003, Table A.1) regarding the journals *EconLit* to which the majority of output of each country is directed, clearly illustrates the elevated level of localism found in all of the European countries.

- LSE and Tilburg hold the top two spots, while University College London, Oxford, Toulouse and Cambridge are situated in the 3rd to 6th positions.

- Amsterdam, Warwick, UPF, the Catholic University of Louvain, the UAB-IAE, Essex, Erasmus, UCIII, York, the INSEE, the Stockholm School of Economics and the Universities of Stockholm, Bonn, Vienna and Copenhagen round out the 7th to 21st positions.

That is, informally combining several ordinal criteria of classification it can be concluded that 7 universities of the United Kingdom, 3 Dutch, 3 Spanish, 2 French and one each from Belgium, Austria, Germany and Denmark form the top 21 of Europe during the 1990's.

IV.3. The Rankings By Major Fields

There are two papers that study areas of specialization: Econphd (2004), which refers to the top Universities in the world during 1993-2003, and European Commission (2004) which is concerned only with the European sphere during 1991-2000.

Starting with Econphd (2004), bear in mind that this methodology is characterized by 4 traits: (i) It ranks Departments according to their stock of publications in 2003. (ii) Any meaningful study by areas must use more than the 10 or 30 journals considered, for example, by Kalaitzidakis 1 and 2, respectively. Thus, Econphd includes 63 journals (listed in the Appendix). (iii) The methodology in Econphd is rated as having a “high” degree of egalitarianism. (iv) The top Spanish Departments are very highly placed in this rating: UCIII holds the 9th and 46th positions in Europe and in the world, respectively, UPF the 14th and 66th, the UAB-IAE 20th and 79th, and the UAL 42nd and 132nd.

Econphd distinguishes among 6 fields that are described in Table 8. The first 3 – Microeconomic Theory, Macroeconomics and Econometrics– refer to the most basic aspects of Economics, while the remaining 3 –Public Economics, Industrial Organization and Labor Economics and related areas– are applied Economics fields. It is important to emphasize that the

6 areas cover 85% or more of the output of the 4 Spanish Economic Departments cited. With regard to distribution by areas, the three following facts must be highlighted. First, an important percentage of the research output of these 4 Departments is dedicated to Microeconomic Theory. Secondly, approximately one third of the output of UCIII, UPF and the UAB-IAE is dedicated to Econometrics, Macroeconomics and Public Economics, respectively. Third, the research production of UPF, the UAB-IAE and the UAL are concentrated, relatively speaking, in 2 or 3 areas; on the other hand, UCIII devotes a reduced percentage to Macroeconomics but registers respectable percentages in the rest of the areas.

The next question is how to translate this distribution of output of the Spanish centers into the European context. The information in this respect is found in Table 9, where it can be observed that:

- UCIII holds the second European position in Econometrics (and the 10th world-wide) and, furthermore, holds the 8th position in Europe in Public Economics and in Industrial Organization, 10th in Microeconomic Theory, and 13th in Labor and Demography.³⁴
- The UAB-IAE occupies the second position in Public Economics (and 14th in the world).
- UPF achieves sixth position, not only in Macroeconomics (where it holds the 24th position world-wide), but also in Microeconomic Theory (where it places 34th worldwide).
- In this last area, the University of País Vasco joins the top 4 Spanish Departments within the top 30 of Europe (or the top 83 worldwide).

³⁴ It is worthwhile pointing out the two reasons that explain the good classification of UCIII in Econphd (2004). In the first place, the output of this center is relatively spread out among various areas. Thus when the number of quality journals included goes up from 10 to 30 or 63, as in Econphd, its relative position considerably improves. Given the recent origin of the UCIII, this case is reinforced the closer we get to the present (see Table 6). Secondly, Econphd is based on Kalaitrizedakis *et al.* (2003) and, as we have seen in note 11, the relative situation of some key theoretical and applied Econometrics journals within the top 30 is more favourable in this methodology than in the rest. Econometrics, of course, is the area in which UCIII particularly stands out.

In summary, as it could be expected given the high level reached in Economics in general, in some specific areas the best Spanish Universities hold distinguished positions in Europe, and even in the world, and very noteworthy positions in the rest.

The European Commission (2004) distinguishes among 4 areas that coincide with 4 of the large categories from the *Journal of Economic Literature*: Quantitative Methods (C); Economic Development, Technological Change and Growth (O); Industrial Organization (L), and Work and Demographics (J). The major problem with the representativeness of the results obtained is that the publications of the top 4 Spanish Universities in the areas not covered by the study represent as much as 32.4% or 39.9% of the total output of UCIII and UAB-IAE, respectively, or 44.8% of UAL and 68.4% of UPF.

In any case, the most important conclusions from this study are the following:

- The distinguished position of UCIII is confirmed in Quantitative Methods that encompasses Econometrics, Game Theory and Mathematic Methods.
- In the area of Development, Technical Change and Growth, which does not exist in Econphd, UPF occupies a privileged position. In some ways, this fact is congruent with the position that this University holds in the area of Macroeconomics of Econphd.

VI. CONCLUSIONS

This paper has reviewed the literature regarding the rankings of the centres of excellence in Economics according to articles published in specialized journals that use an anonymous evaluation procedure. The main objective has been to place the research carried out in Spain during the 1990s from an international perspective.

It has been useful to organize the different rankings according to two criteria: (i) the gross volume of published papers, as in the European Commission (2004) study, and (ii) after taking into account a series of adjustments, which includes the identification of the quality of an article

with the impact of the journal in which it is published, as in the rest of the rankings reviewed in this paper.

The existing methodologies for weighting the journals according to quality combine in different degrees objective information from the citations that the journals receive with the subjective information that experts provide. Since, as of yet, there exists no generally accepted, fully satisfactory system of weightings exists, it is necessary to compare the results obtained from several alternative methods. To facilitate this task, the different methodologies have been classified according to their degree of egalitarianism. A methodology is more egalitarian the greater the weight assigned to local journals and the smaller the weight assigned to the top generalist journals relative to the remaining journals with some international impact.

As was mentioned in the Introduction, the most important conclusions regarding research in Economics in the international sphere can be summarized as follows.

1. At the end of the XX century, world scientific production is still dominated by the United States. Moreover, the more stringent the criteria of excellence used in the comparison, the wider the gap becomes (see Tables 1 to 3). In the words of highly qualified professional leaders, *“The studies thus paint a well-known but distressing picture of relatively inferior performance in Europe, reflecting the poor governance of most European universities and the limited role given to research criteria in their funding”* (Neary *et al.*, 2003, p. 1248).

2. Although some European countries grew very quickly during the 1990’s, among which Spain and The Neatherlands stand out, the United Kingdom maintains its predominance in Europe (see Table 4). Spain ends up the 20th century in fifth or sixth place in Europe for volume of publications according to *EconLit* or the ISI, respectively.

3. As in all the sciences, the distribution of scientific publications is very unequal regardless of the geographical area being investigated. This phenomenon is even more pronounced in Spain:

the enormous growth of Spanish publications in the databases of the ISI and *EconLit* is a result of the activity of a small percentage of researchers in a reduced number of centers.

4. Beyond the mere volume of research papers, when the quality of the journals in which they appear and other adjustment factors are taken into account, only 5 Spanish centers appear regularly in the international rankings. What is truly extraordinary are the achievements made in general economics as well as in some broad fields by the group composed of the UAB-IAE, UPF, and UCIII, together with the UAL and CEMFI (see Tables 6, 7 and 9). The bottom line is that, in the year 2000, Spain leaps up to the fourth position in Europe and the seventh worldwide as a producer of research of excellence measured by journal pages adjusted by quality and other factors.

The situation in Spain has been summarized as “a substantial process of improvement, accompanied by a notable polarization” (Villar, 2003, p. 99). What factors might explain this phenomenon? While this is not the place for an in-depth analysis, the elements that distinguish the Spanish Universities that form part of the international best from the rest are not difficult to determine.³⁵

Let us begin by recalling the important investment in human capital, which, from 1970 until today, has led several hundreds of Spanish economists to obtain their doctoral degrees in some of the top universities in the United States and the United Kingdom. Although some of the best reside outside of Spain, the majority of the beneficiaries of this professional training carry out their work in a large variety of Spanish organizations. The novelty lies in that, precisely in the Spanish Universities that stand out at the international level, those faculty members who have received their doctoral degrees abroad³⁶ have provided the impetus for a radical change of course. As an organization, the economic departments within the recently established universities, such

³⁵ For some considerations along the same lines see Villar (2003).

³⁶ This deals with what Pérez-Díaz (2005) calls the “cultural hybrids (natives socialized in a foreign setting)”.

as UPF and UCIII, as well as in older ones which are research oriented, such as the UAB and the UAL, are dedicated first and foremost to fomenting quality research.

The hiring policy in these centers has been structured along three key elements. First, by prohibiting the hiring of graduates from their own doctoral programs, the traditional endogamy characterizing the Spanish university system has been abolished. The recruitment of new faculty is carried out by means of a rigorous selection system open to interested candidates from any *other* institution. (The steps include: advertising job vacancies on the Internet; first round candidate selection by an *ad hoc* committee; interviews with those selected during international conferences; Seminar presentation and, upon hearing department members' opinions, an extension of work offers). Second, the academic staff hired in this way, whose performance is evaluated every two years, have a maximum period of 6 years to become tenured faculty members. The minimum standards for research and teaching excellence to achieve this status, as well as for further advance in the academic career, are clearly established beforehand. The decisions regarding promotion are adopted by a department vote after the discussion of a written proposal by an *ad hoc* committee that takes various factors into account (such as the quantity and the quality of work done, the candidate's research proposal, and letters of references from outside experts). Third, there are diverse internal systems of incentives to complement salary and/or to assign the teaching load. These systems, which are based on the research (and teaching) trajectory of each faculty member, are based on methods for weighting academic journals similar to those reviewed in this paper.

Although the earnings of the Spanish teaching and research staff have slightly decreased in real terms in the past 15 years, the increase of public resources for research from regular university budgets and through competitive selection processes in Spain and in Europe, has been advantageous for the Universities with which we are concerned here in two ways: (i) to finance travel expenditures, computer facilities, sabbaticals or stays of visiting foreign faculty, and (ii) as a

source of funding for Spanish and foreign students in international doctoral programs that are conducted in English.

Lastly, the international context cannot be overlooked. With the exception of the United Kingdom, the rest of the European university systems for Economics are organized in markets that are relatively closed to the outside, and dominated by national traditions where research does not necessarily hold a predominant place.³⁷ So, the combination of a rigorous merit system –that is innovative and attractive in the European context– with the availability of resources to fund certain strategic needs, is what has made possible the expansion of the human capital already in existence in this group of 4 Spanish Universities at the beginning of the 1990's with professionals from different parts of the world.³⁸ If to this we add the contribution of public and private research centers, such as the IAE and the CEMFI, respectively, focusing exclusively on quality research, we can understand how this reduced group of Spanish institutions has been able in record time to catapult Economic research up to the levels reached by other scientific disciplines in Spain with an important international tradition³⁹.

To conclude, we may ponder as to the soundness of this project, and the possibilities of staying at the levels reached or of taking advantage of the opportunities to decisively influence, at least in some areas, in the future of European and worldwide research. We should not fool ourselves. The results reviewed in this paper are the consequence of favourable circumstances. *Ceteris paribus*, when the rest of the European countries loosen the reins, establish a higher level of competition in their university systems and design their incentive systems so as to foment quality

³⁷ See, for example, Portes (1987) and Frey and Eichenberger (1993).

³⁸ In general, approximately a fourth of the faculty members in these 4 Universities are foreign.

³⁹ According to the electronic publication *Essential Science Indicators* (http://www.in-cites.com/research/2006/june_12_2006-4.html), professional publications in Economics and Business in Spain during 2001-05 represent 3.17% of the world total, very near to the Spanish average for 21 sciences. In particular, 8 disciplines are ahead –Space Sciences, Agrarian Sciences, Mathematics, Microbiology, Chemistry, Animal and Vegetal Biology, Ecology and Environmental Sciences and Physics– and the remaining 12 below –Biology and Biochemistry, Pharmacology, Material Sciences, Neurosciences and Behavioral Sciences, Molecular Biology, Computer Sciences, Immunology, Geosciences, Engineering, Clinical Medicine, Psychology and Psychiatry, and Social Sciences.

research, with the current real salaries in Spain it will be difficult for the most prestigious Spanish centers to maintain their current attractiveness.

On the other hand, once demonstrated that it is possible to compete in the world context from Spain, the increase of resources for boosting existing incentives and remunerating top researchers at the level demanded by the international market could constitute an interesting alternative within Spanish society. As in the United States, whose performance we wish to emulate, to put this option into practice it would be necessary to draw new resources proceeding both from the public university system and from large private foundations.

APPENDIX

A. Journals Included In Different Methodologies

Kalaitzidakis 1: *American Economic Review*, *Journal of Political Economy*, *Econometrica*, *Quarterly Journal of Economics*, *Journal of Econometrics*, *Journal of Economic Perspectives*, *Journal of Economic Theory*, *Journal of Monetary Economics*, *Review of Economic Studies*, *Review of Economics and Statistics*, *Economic Journal*, *European Economic Journal*, *Games and Economic Behavior*, *Journal of Business and Economic Statistics*, *Journal of Public Economics*, *Journal of Human Resources*, *Journal of Economic Literature*, *Econometric Theory*, *Journal of Labor Economics*, *International Economic Review*, *Economic Theory*, *Journal of Environmental Economics and Management*, *Rand Journal of Economics*, *Journal of Financial Economics*, *Economics Letters*, *Journal of Applied Econometrics*, *Oxford Bulletin of Economics and Statistics*, *Scandinavian Journal of Economics*, *Journal of Economics Dynamics and Control*, and *Journal of International Economics*.

Econphd: The following 33 journals were included in addition to the 30 mentioned in footnote 19: *Journal of Mathematical Economics*, *Journal of Economic Behavior and Organization*, *Social Choice and Welfare*, *American Journal of Agricultural Economics*, *International Journal of Game Theory*, *Economic Inquiry*, *World Bank Economic Review*, *Journal of Risk and Uncertainty*, *Journal of Development Economics*, *Land Economics*, *Canadian Journal of Economics*, *Public Choice*, *Theory and Decision*, *Economica*, *Journal of Urban Economics*, *International Journal of Industrial Organization*, *Journal of Law and Economic Organization*, *Journal of Law and Economics*, *National Tax Journal*, *Journal of Industrial Economics*, *Journal of Economic History*, *Oxford Economic Papers*, *Journal of Comparative Economics*, *World Development*, *Southern Economic Journal*, *Explorations in Economic History*, *Economic Record*, *Journal of Banking and Finance*, *Contemporary Economic Policy*, *Journal of Population Economics*, *Journal of Financial Quantitative Analysis*, *Journal of Institutional Theoretical Economics* and *Applied Economics*.

Kalaitzidakis 2: *American Economic Review* (10), *Econometrica* (6.26), *Journal of Political Economy* (5.2), *Quarterly Journal of Economics* (4.05), *Journal of Monetary Economics* (4.15), *Journal of Economic Theory* (3.24), *Review of Economic Studies* (4.06), *Review of Economics and Statistics* (1.95), *Economic Journal* (0.99) and *European Economic Review* (0.26).

Dusansky and Vernon: *American Economic Review* (10), *Econometrica* (5.1), *Review of Economic Studies* (3.8), *Journal of Political Economy* (3.6), *Quarterly Journal of Economics* (2.8), *Review of Economics and Statistics* (2.4), *Journal of Economic Theory* (2.3) and *International Economic Review* (0.9).

Kocher and Sutter: In addition to the 10 of Kalaitzidakis 2, the *Journal of Economic Theory*, the *Review of Economics and Statistics* and the *European Economic Review* are eliminated, while the following 8 are included: the *Journal of Financial Economics*, the *Rand Journal of Economics*, the *Journal of Economic Literature*, the *Brookings Papers on Economic Activity*, the *Journal of Law and Economics*, the *Journal of Human Resources*, the *Economic History Review* and *Economic Geography*.

B. Weightings That the “Best” Journals Receive In Relation To Other Journals With an International Impact According To Four Different Studies

(I) Combes and Linnemer (2003) consider more than 600 journals in *EconLit*. Degree of egalitarianism: VERY HIGH

• Any two articles in the following journals receive the 10 points assigned to the 5 best (*American Economic Review*, *Econometrica*, *Journal of Political Economy*, *Quarterly Journal of Economics* and *Review of Economic Studies*)

Canadian Journal of Economics
Economics Letters
Journal of Macroeconomics
Land Economics

Economic Theory
Journal of Health Economics
Journal of Population Economics
Social Choice and Welfare

• Any three articles in the following journals receive the 10 points assigned to the 5 best.

Applied Economics
Brookings Papers on Economic Activity

Industrial Relations
Journal of Economic Growth

Economica
Energy Economics
Experimental Economics
Demography
Mathematical Social Sciences

Kandklos
National Tax Journal
Oxford Economic Bulletin
Regional Science and Urban Economics
Urban Studies

- Any set of 6 articles in the following journals receives the 10 points assigned to the 5 best

Applied Economic Letters
Bulletin of Economic Research
Econometric Reviews
Economic Development and Cultural Change
Fiscal Studies
International Economic Journal

Journal of Economic Education
Journal of Economic Surveys
Journal of Income Distribution
Journal of Productivity Analysis
Macroeconomic Dynamics
World Bank Research Observer

- 12 articles in any local journal are equivalent to one journal of the 5 best.

(II) Lubrano *et al.* (2003) distinguish between two options according to whether the number of journals is 65 or 505. Degree of egalitarianism: HIGH or VERY HIGH, respectively. In both cases we have:

- Any two articles in the following journals, for example, receives 12 points > 10 points assigned to the 6 best (*American Economic Review*, *Econometrica*, *Journal of Economic Theory*, *Journal of Political Economy*, *Quarterly Journal of Economics* and *Review of Economic Studies*)

Brookings Papers on Economic Activity
Economica
Economic Theory
Economics Letters
Economic Journal
European Economic Review
Demography

Journal of Economic Dynamics and Control
Journal of Economic Growth
Journal of Health Economics
National Tax Journal
Oxford Economic Bulletin
Regional Science and Urban Economics
Social Choice and Welfare

- 10 articles in any local journals, such as *Investigaciones Económicas*, *Spanish Review of Economics*, *Economía Aplicada* or *Hacienda Pública Española*, are equivalent to one journal of the 6 best

(III) Econphd (2004) considers 63 journals. Degree of egalitarianism: HIGH

- Any two articles in the following journals receive the approximate number of points assigned to *American Economic Review* or *Econometrica*:

Economic Journal
Economic Theory
Economics Letters
European Economic Review
International Economic Review
Journal of Economic Dynamics and Control
Journal of Environmental Economics

Journal of Human Resources
Journal of Economic Literature
Journal of Labor Economics
Journal of Public Economics
Oxford Bulletin of Economics and Statistics
Rand
Scandinavian Journal of Economics

(IV) Kalaitzidakis 1 considers 30 journals. Degree of egalitarianism: LOW.

- Any set of 4/5 articles in the following journals receives the approximate number of points assigned to *American Economic Review* or *Econometrica*

Economic Journal
Economics Letters
Economic Theory
European Economic Review

International Economic Review
Journal of Human Resources
Journal of Economic Literature
Journal of Public Economics

- The sum of one article in each of the following 9 journals is approximately equivalent to the points assigned to *American Economic Review* or *Econometrica*:

Journal of Applied Econometrics
Journal of Economic Dynamics and Control
Journal of Environmental Economics
Journal of Financial Economics
Journal of International Economics

Journal of Labor Economics
Oxford Bulletin of Economics and Statistics
Rand Journal of Economics
Scandinavian Journal of Economics

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Table 1. The Gap Between the United States and Europe Among Top Economics Departments In the World According To Different Studies and Periods

| | G ^a -Castrillo | | Coupé 1 | | Kalaitzidakis 1 | | Econphd | |
|------------------------|---------------------------|-------------|-------------|-------------|-----------------|-------------|-------------|-------------|
| <u># Journals:</u> | 55 | | - | | 30 | | 63 | |
| <u>Egalitarianism:</u> | MEDIUM | | MEDIUM/HIGH | | LOW | | HIGH | |
| <u>Period:</u> | (1992-97) | | (1990-2000) | | (1995-99) | | (1993-2003) | |
| | # Dpts. | % | # Dpts. | % | # Dpts. | % | # Dpts. | % |
| United States | 122 | 61.0 | 103 | 51.5 | 97 | 48.5 | 87 | 44.5 |
| Europe | 50 | 25.0 | 55 | 27.5 | 62 | 31.0 | 73 | 36.5 |
| Rest | <u>28</u> | <u>14.0</u> | <u>42</u> | <u>21.0</u> | <u>41</u> | <u>20.5</u> | <u>40</u> | <u>20.0</u> |
| Total | 200 | 100.0 | 200 | 100.0 | 200 | 100.0 | 200 | 100.0 |
| <hr/> | | | | | | | | |
| United States | 70 | 70.0 | 65 | 65.0 | 53 | 53.0 | 59 | 59.0 |
| Europe | 15 | 15.0 | 19 | 19.0 | 31 | 31.0 | 28 | 28.0 |
| Rest | <u>15</u> | <u>15.0</u> | <u>16</u> | <u>16.0</u> | <u>16</u> | <u>16.0</u> | <u>23</u> | <u>23.0</u> |
| Total | 100 | 100.0 | 100 | 100.0 | 100 | 100.0 | 100 | 100.0 |
| <hr/> | | | | | | | | |
| United States | 40 | 80.0 | 41 | 82.0 | 35 | 70.0 | 35 | 70.0 |
| Europe | 4 | 8.0 | 6 | 12.0 | 7 | 14.0 | 10 | 20.0 |
| Rest | <u>6</u> | <u>12.0</u> | <u>3</u> | <u>6.0</u> | <u>8</u> | <u>16.0</u> | <u>5</u> | <u>10.0</u> |
| Total | 50 | 100.0 | 50 | 100.0 | 50 | 100.0 | 50 | 100.0 |
| <hr/> | | | | | | | | |

Table 2. The Top 20 Economics Departments In the World According To Different Studies and Periods, Ranked By the Coupé 3 Criterion (That Takes Into Account the 10 Best Journals Selected In Kalaitzidakis *et al.*, 1999, or Kalaitzidakis 2)

| | Coupé 3 | Coupé 2 | Coupé 1 | Kalaitzidakis 2 | Econphd |
|------------------------|----------------|----------------|----------------|------------------------|----------------|
| # Journals: | 10 | 71 | - | 10 | 63 |
| Egalitarianism: | VERY LOW | HIGH | HIGH/MEDIUM | VERY LOW | HIGH |
| Period: | 1990-2000 | 1990-2000 | 1990-2000 | 1995-99 | 1993-2003 |

| | | | | |
|-----------------------------------|----|----|----|----|
| 1. Harvard University | 1 | 1 | 1 | 1 |
| 2. University of Chicago | 2 | 2 | 2 | 2 |
| 3. MIT | 3 | 5 | 3 | 3 |
| 4. Northwestern University | 5 | 7 | 4 | 7 |
| 5. Stanford University | 4 | 4 | 8 | 6 |
| 6. Princeton University | 7 | 11 | 7 | 5 |
| 7. University of Pennsylvania | 6 | 3 | 5 | 8 |
| 8. Yale University | 9 | 8 | 6 | 9 |
| 9. U. of California, Berkeley | 8 | 6 | 9 | 4 |
| 10. Columbia University | 10 | 10 | 11 | 13 |
| 11. U. of California, Los Angeles | 13 | 12 | 14 | 11 |
| 12. New York University | 12 | 13 | 10 | 10 |
| 13. U. of Michigan, Ann Arbor | 11 | 9 | 13 | 15 |
| 14. University of Rochester | 14 | 20 | 17 | 16 |
| 15. U. of California, San Diego | 17 | 28 | 12 | 21 |
| 16. Boston University | 20 | 30 | 22 | 26 |
| 17. University of Toronto | 22 | 25 | 23 | 36 |
| 18. University of Tel Aviv | 28 | 42 | 26 | 30 |
| 19. London School of Economics | 23 | 15 | 20 | 12 |
| 20. Carnegie Mellon University | 25 | 32 | 30 | 40 |

| | | | | |
|----------------------------------|----|----|----|----|
| 21. U. of Wisconsin, Madison | 21 | 16 | 9 | 13 |
| 22. University of Texas, Austin | 19 | 21 | 16 | 19 |
| 23. Cornell University | 16 | 14 | 15 | 14 |
| 25. Duke University | 15 | 17 | 27 | 35 |
| 26. U. of Maryland, College Park | 24 | 19 | 31 | 17 |
| 30. Ohio State University | 18 | 18 | 38 | 23 |
| 34. U. of British Columbia | 29 | 27 | 29 | 20 |
| 41. University of Toulouse | 51 | 73 | 46 | 18 |
| 63. Tilbug University | 56 | 47 | 18 | 24 |

Table 3.A. Evolution Of the Articles Published During the 1990's In the United States, the European Union-15, Japan and the Rest of the World

| | 1991 | 1996 | 2001 | Growth Rate 1991-2001 In % |
|--|-------------|------------|------------|----------------------------------|
| Total Number of Articles In the World | 6,201 | 6,869 | 7,823 | 2.35 |
| Percentages In % | | | | |
| United States | 66.5 | 59.2 | 53.0 | - 2.23 |
| European Union-15 | 21.7 | 31.8 | 39.5 | 6.16 |
| Japan | 1.6 | 1.7 | 2.2 | 3.11 |
| Rest of the World | <u>10.2</u> | <u>7.3</u> | <u>5.3</u> | - |
| | 100.0 | 100.0 | 100.0 | |

Source: ISI, *Nacional Science Indicator*

Reference: Table 2.1, Chapter II, European Commission (2004)

Table 3.B. The Percentage Distribution By Large Areas of the Number of Adjusted Pages Published In the Best 30 Journals During 1995-99 In the First 200 Departments of the World

| | |
|--------------------------|-------|
| United States | 65.0 |
| European Union-15 | 21.2 |
| Rest of the World | 13.8 |
| Total | 100.0 |

Source: Table 3 in Kalaitzidakis *et al.*, (2003, p. 1357).

Table 4. Percentage Distribution Of the Articles Published During the 1990's In the European Countries, and Of the Top 75 Departments and The Number Of Adjusted Pages In the Best 30 Journals According To Kalaitzidakis 1

| Percentage Distribution Of the Articles Published | | | | | Kalaitzidakis 1 | | |
|---|-----------------------|-------------|-------------|----------------------------|-----------------------|---------------|----------------|
| | Relative To the World | | | | | Top 75 Depts. | Adjusted Pages |
| | 1991 | 2001 | Growth Rate | Relative To Europe In 2001 | | | |
| | % | % | % | % | | | |
| 1. United Kingdom* | 9.8 | 14.4 | 3.9 | 45.3 | 1. United Kingdom | 26.6 | 33.3 |
| 2. Germany | 2.1 | 4.4 | 7.9 | 13.8 | 2. Holland | 9.3 | 13.8 |
| 3. Holland | 2.0 | 3.9 | 6.8 | 12.3 | 3. France | 12.0 | 11.0 |
| 4. France | 1.8 | 3.6 | 7.3 | 11.3 | 4. Spain | 5.3 | 9.3 |
| 5. Italy | 1.2 | 2.8 | 8.9 | 8.8 | 5. Germany | 9.3 | 5.4 |
| 6. Spain | 0.4 | 2.7 | 20.3 | 8.5 | 6. Italy | 8.0 | 4.6 |
| 7. Belgium | 0.9 | 1.7 | 7.0 | 5.3 | 7. Sweden | 5.3 | 5.1 |
| 8. Sweden | 1.0 | 1.7 | 4.9 | 5.3 | 8. Belgium | 2.7 | 4.2 |
| 9. Denmark | 0.7 | 1.2 | 6.2 | 3.8 | 9. Switzerland | 5.3 | 2.8 |
| 10. Finland | 0.5 | 1.0 | 7.2 | 3.1 | 10. Denmark | 2.7 | 2.5 |
| 11. Austria | 0.6 | 0.7 | 0.9 | 2.2 | 11. Norway | 4.0 | 2.3 |
| 12. Greece | 0.4 | 0.6 | 5.6 | 1.9 | 12. Other countries** | 9.5 | 8.2 |
| 13. Ireland | 0.2 | 0.5 | 6.6 | 1.6 | TOTAL | 100.0 | 100.0 |
| 14. Portugal | 0.1 | 0.5 | 19.5 | 1.6 | | | |
| 15. Luxembourg | 0.1 | 0.0 | - 7.2 | 0.0 | | | |
| Europe | 21.7 | 31.8 | | 100.0 | | | |

Source: Left-hand Panel: ISI, *Nacional Science Indicator*. European Commission (2004, Chapter II, Table 2.1)

Right-hand Panel: Kalaitzidakis *et al.* (2003, Table 4)

* Countries appear in order of their percentage contribution to the world total in 2001

** Austria, Cyprus, Finland, Greece, Ireland, Portugal and Turkey, each one contributing one Department to the top 75 in Europe

Table 5. Top Research Centers In Spain During the 1990's According To Different Methodologies, Ordered According To Kalaitzidakis 2 (Which Takes Into Account the 10 Best Journals)

| | Kalaitzidakis 2 | Kalaitzidakis 3 | UCIII | Bauwens | European Commission |
|--------------------------------|------------------------|------------------------|--------------|----------------|----------------------------|
| # journals: | 10 | 147 | 281 | 265 | 680 |
| Egalitarianism: | VERY LOW | LOW | HIGH | VERY HIGH | MAXIMUM |
| 1. U. Pompeu Fabra | | 1 | 3 | 3 | 1 |
| 2. UAB-IAE | | 2 | 1 | 1 | 2 |
| 3. U. Carlos III | | 3 | 2 | 2 | 3 |
| 4. U. Alicante | | 4 | 4 | 4 | 9 |
| 5. CEMFI | | 5 | 8 | 10 | 12 |
| 6. Bank of Spain | | 6 | 7 | 7 | 7 |
| 7. FEDEA | | 12 | 17 | 15 | 15 |
| 8. U. País Vasco | | 7 | 5 | 5 | 6 |
| 9. U. Salamanca | | 15 | * | 19 | 19 |
| 10. U. Zaragoza | | 8 | 10 | 9 | 8 |
| 11. U. Complutense | | 11 | 9 | 8 | 5 |
| 13. U. Valencia | | 10 | 6 | 6 | 4 |
| * U. Cantabria | | 9 | 19 | * | 20 |
| * U. Pública de Navarra | | * | * | * | 10 |

* Situated above position 19

Source: First 4 columns, Dolado *et al.* (2003, Tables 2 and 3)

Column 5, European Commission (2004, Table A2.3, Annex II)

Table 6. The Position Of Spanish Centers Among the Top 75 European Departments (*In Brackets: Among the Top 200 Departments In the World*)

| | UAB - IAE | UPF | UCIII | UAL | CEMFI | UVAL |
|--|-----------|----------|----------|----------|-----------|-----------|
| 1. Europ. Commission (1990-1999) # Jour. = 680; Egalit.: VERY HIGH | 29 | 24 | 39 | ... | ... | ... |
| 2. G ^a Castrillo (1992-97)* # Jour. = 55; Egalit.: MEDIUM | 9 (75) | 22 (121) | 39 (166) | ... | ... | ... |
| 3. Coupé 1 (1990-2000) Egalitarianism: HIGH/MEDIUM | 15 (84) | 29 (121) | 31 (131) | ... | ... | ... |
| 4. Coupé 2 (1990-2000) # Jour. = 71; Egalit.: HIGH | 9 (66) | 13 (79) | 21 (104) | ... | ... | ... |
| 5. Coupé 3 = Kalaitz. 1 (1990 - 2000) # Jour. = 10; Egalit.: VERY LOW | 10 (61) | 8 (58) | 21 (192) | ... | ... | ... |
| 6. Kalaitzidakis 1 (1995-99) # Jour. = 30; Egalit.: LOW | 7 (50) | 11 (55) | 9 (52) | 30 (97) | ... | ... |
| 7. Econphd (1993-2003) # Jour. = 63; Egalit.: HIGH | 20 (79) | 14 (66) | 9 (46) | 42 (132) | ... (132) | ... (139) |
| 8. Lubrano 1 (1991 - 2000) # Jour. = 505; Egalit.: VERY HIGH | 19 | 31 | 32 | 56 | ... | ... |
| 9. Lubrano 2 (1991-2000) # Jour. = 68; Egalit.: HIGH | 10 | 21 | 24 | 37 | 72 | ... |
| 10. Kalaitzidakis 2 (1991-96)** # Jour. = 10 ; Egalit.: VERY LOW | 3 | 8 | 31 | 39 | 49 | ... |
| 11. Tombazos = Kalaitz. 2** (1997-2002) # Jour. = 10; Egalit.: VERY LOW | 21 | 5 | 19 | 30 | 49 | 53 |

* The UAB and the IAE appear separated in the original paper

** Corrected according to Tombazos (2005)

UAB = *Universidad Autónoma de Barcelona*

IAE = *Instituto de Análisis Económico*

UPF = *Universidad Pompeu Fabra*

UCIII = *Universidad Carlos III*

UAL = *Universidad de Alicante*

CEMFI = *Centro de Estudios Monetarios y Financieros*

UVAL = *Universidad de Valencia*

Table 7. The Top 20 European Departments According To Different Methodologies and Periods Of Time, Ordered According to Kalatzidakis 1 (Which Takes Into Account the 30 Best Journals)

| | Kalaitzidakis 1 | Coupé 1 | Coupé 3 | Coupé 3 | Lubrano 2 | Econphd |
|------------------------------------|------------------------|------------------|------------------|------------------|------------------|------------------|
| Period | 1995-99 | 1990-2000 | 1990-2000 | 1997-2002 | 1991-2000 | 1993-2003 |
| # Journals: | 30 | - | 10 | 10 | 68 | 63 |
| Egalitarianism: | LOW | MEDIUM | VERY LOW | VERY LOW | HIGH | HIGH |
| | | /HIGH | | | | |
| 1. Tilburg University | | 5 | 12 | 7 | 1 | 3 |
| 2. London School of Economics | | 1 | 1 | 1 | 2 | 1 |
| 3. University College London | | 4 | 3 | 3 | 12 | 10 |
| 4. Cambridge University | | 3 | 6 | 6 | 8 | 7 |
| 5. Oxford University | | 2 | 2 | 4 | 5 | 4 |
| 6. Toulouse University | | 11 | 4 | 2 | 4 | 2 |
| 7. UAB-IAE | | 15 | 10 | 21 | 10 | 20 |
| 8. University of Amsterdam | | 7 | 20 | 14 | 6 | 6 |
| 9. Carlos III University | | 32 | 22 | 19 | 24 | 9 |
| 10. University of Essex | | 12 | 15 | 17 | 11 | 11 |
| 11. Pompeu Fabra University | | 30 | 8 | 5 | 21 | 14 |
| 12. Catholic University of Louvain | | 9 | 9 | 15 | 3 | 19 |
| 13. Erasmus University | | 8 | 29 | 38 | 7 | 17 |
| 14. INSEE | | 19 | 7 | 18 | 17 | - |
| 15. Stockholm School of Economics | | 20 | 19 | 11 | 14 | 16 |
| 16. University of Warwick | | 6 | 16 | 12 | 9 | 5 |
| 17. University of Vienna | | 34 | 18 | 26 | 31 | 31 |
| 18. University of Bonn | | 17 | 11 | 9 | 18 | 22 |
| 19. University of Copenhagen | | 25 | 23 | 13 | 19 | 18 |
| 20. University of York | | 10 | 24 | 24 | 16 | 13 |
| <hr/> | | | | | | |
| 21. U. Southampton | | 18 | 14 | 10 | 32 | 28 |
| 22. Stockholm U. | | 13 | 5 | 8 | 13 | 12 |
| 23. Free University of Brussels | | 27 | 13 | 23 | 20 | 43 |
| 25. Université Paris I | | 23 | 21 | 25 | 25 | 26 |
| 37. Birbeck College | | 21 | 17 | 48 | 33 | 36 |
| 38. London Business School | | 14 | 26 | 52 | 26 | 34 |
| 42. U. Zurich | | 42 | 20 | 16 | - | 30 |
| 43. University of Nottingham | | 16 | 30 | 46 | 27 | 15 |
| 49. European Institute of Florence | | 28 | 31 | 28 | 44 | 8 |
| 51. DELTA | | - | - | 20 | 22 | 62 |

Table 8. Percentage Distribution Of Scientific Production By Broad Fields In the 1993-2003 Period In the Best Spanish Departments According to Econphd (2004)

| | UCIII | UPF | UAB-IAE | UAL |
|----------------------------|------------|-------------|-------------|------------|
| 1. Microeconomic Theory | 19.6 | 28.2 | 24.5 | 38.3 |
| 2. Macroeconomics | 8.5 | 33.7 | 9.4 | 9.7 |
| 3. Econometrics | 31.9 | 10.2 | - | 10.7 |
| 4. Public Economics | 12.3 | 6.1 | 33.2 | 21.9 |
| 5. Industrial Organization | 10.4 | 8.6 | 10.7 | - |
| 6. Labor Economics | 12.7 | - | 7.2 | 11.3 |
| 7. Other fields | <u>4.6</u> | <u>13.2</u> | <u>15.0</u> | <u>7.9</u> |
| 8. TOTAL | 100.0 | 100.0 | 100.0 | 100.0 |

Note: The two digit categories of the *Journal of Economic Literature* are in parenthesis

1. Mathematical Methods and Programming (C6); Game Theory and Bargaining Theory (C7); Experiment Design (C9); General Equilibrium and Disequilibrium (D5); Information, Knowledge and Uncertainty (D8).
2. Interterm Choice and Economic Growth (D9); General Aggregate Models (E1); Consumption, Saving, Production, Employment and Investment (E2); Prices and Cycles (E3); Money and Interest Rates (E4); Monetary Policy, Central Banking and Money and Credit Supply (E5); Macroeconomic Policy Training, Macroeconomic aspects of Public Finance and Macroeconomic Policy (E6); International Finance (F3); Macroeconomic aspects of Trade and International Finance (F4); Public Spending (H5); Budget, Deficit and Public Debt (H6); Local and State Governments (H7); Other Topics (H8)
3. Statistic and Econometric Methods: General Aspects (C1); Econometric Methods: Single Equation Models (C2); Econometric Methods: Simultaneous Equation Models (C3); Econometric Methods: Special Topics (C4); Econometric Modelling (C5); Data Gathering and Estimation Methods (C8).
4. Welfare Economics (D6); Collective Decision Making (D7); Structure and Size of the Public Sector (H1); Taxes, Subsidies and Income (H2); Fiscal Policy and Behavior of Market Agents (H3); Goods Provided by the Public Sector (H4); Basic Areas of Law (K1); Regulation and Commercial Law (K2); Other Substantive Areas of Law (K3); Legal Procedures and Systems and Illegal Behavior (K4).
5. Market Structure, Entrepreneurial Strategy and Market performance (L1); Objectives, Organization and Behavior of the Company (L2); Non-profit Organizations and Public Companies (L3); Policy of Defence of Competition (L4); Industrial Policy and Regulation (L5); Industrial Studies: Industry (L6), Primary Products and Construction (L7), Services (L8), Transport and Utilities (L9); Production and Organization (D2); Business Administration (M1); Technological Changes (O3)
6. Economic Demographics (J1); Time Allotment, Work and Job Determination (J2); Salaries, Compensations and Labor Costs (J3); Specific Labor Markets (J4); Labor Relations, Unions and Collective Bargaining (J5); Mobility, Unemployment and Job Vacancy (J6); Discrimination (J7); Work Standards (J8); Household Economy and Family Economy (D1); Distribution (D30); Health (I1); Education (I2); Cultural Economy (Z1)

Table 9. The Place Held By Spanish Departments By Broad Fields In 1993-2003 In Relation To the Best European Centers According to Econphd (2004). World Rankings Are In Parenthesis.

| MIICROECONOMICS | | MACROECONOMICS | | ECONOMETRICS | |
|--------------------------------------|-------------|-------------------------|--------------|-----------------------|--------------|
| 1. Tilburg U. | (11) | 1. LSE | (12) | 1. LSE | (2) |
| 2. U. Toulouse | (16) | 2. European Institute | (14) | 2. UCIII | (10) |
| 3. École Nat. Ponts and Chaussees | (22) | 3. U. Warwick | (15) | 3. European Institute | (14) |
| 4. LSE | (24) | 4. Tilburg U. | (21) | 4. U. Amsterdam | (15) |
| 5. UCL | (30) | 5. U. Amsterdam | (22) | 5. Erasmus U. | (23) |
| 6. UPF | (34) | 6. UPF | (24) | 6. U. Cambridge | (29) |
| 7. U. Essex | (35) | 7. U. Copenhagen | (28) | 7. U. Oxford | (31) |
| 8. U. Paris I | (36) | 8. Stockholm U. | (30) | 8. U. York | (32) |
| 9. U. Bonn | (35) | 9. U. Cambridge | (39) | 9. U. Helsinki | (35) |
| 10. UCIII | (41) | 10. Birbeck College | (44) | 10. Tilburg U. | (42) |
| <hr/> | | | | | |
| 13. UAB | (51) | 28. UCIII | (90) | 25. UPF | (77) |
| 22. UAL | (66) | 44. UAB | (120) | 26. CEMFI | (78) |
| 29. U. País Vasco | (83) | 76. UAL | (201) | 54. UAL | (139) |
| <hr/> | | | | | |
| PUBLIC ECONOMICS | | INDUSTRIAL ORGANIZATION | | LABOR ECONOMICS | |
| 1. U. Toulouse | (6) | 1. U. Toulouse | (5) | 1. LSE | (13) |
| 2. UAB | (14) | 2. U. Oxford | (10) | 2. U. Essex | (14) |
| 3. LSE | (15) | 3. LSE | (17) | 3. UCL | (20) |
| 4. U. Amsterdam | (24) | 4. UCL | (31) | 4. U. Warwick | (25) |
| 5. Tilburg U. | (25) | 5. U. C. Louvaine | (38) | 5. U. Oxford | (28) |
| 6. U. Warwick | (26) | 6. U. Warwick | (41) | 6. Tilburg U. | (29) |
| 7. Stockholm U. | (29) | 7. U. Cambridge | (43) | 7. Free U. Amsterdam | (38) |
| 8. UCIII | (33) | 8. UCIII | (50) | 8. Stockholm U. | (41) |
| 9. U. Bonn | (42) | 9. K. U. Leuven | (51) | 9. Uppsala U. | (42) |
| 10. U. Zurich | (47) | 10. U. Bonn | (53) | 10. U. Amsterdam | (43) |
| <hr/> | | | | | |
| 16. UAL | (51) | 27. UAB | (83) | 13. UCIII | (50) |
| 32. UPF | (66) | 29. UPF | (88) | 38. UAB | (139) |
| | | | | 50. UAL | (163) |