World-Leading Research and its Measurement

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Abstract

Journalists and others have asked me whether the favourable RAE 2008 results for UK economics are believable. This is a fair question. It also opens up a broader and more important one: how can we design a bibliometric method to assess the quality (rather than merely quantity) of a nation's science? To try to address this, I examine objective data on the world's most influential economics articles. I find that the United Kingdom performed reasonably well over the 2001-2008 period. Of 450 genuinely world-leading journal articles, the UK produced 10% of them -- and was the source of the most-cited article in each of the Journal of Econometrics, the International Economic Review, the Journal of Public Economics, and the Rand Journal of Economics, and of the second most-cited article in the Journal of Health Economics. Interestingly, more than a quarter of these world-leading UK articles came from outside the best-known half-dozen departments. Thus the modern emphasis on 'top' departments and the idea that funding should be concentrated in a few places may be mistaken. Pluralism may help to foster iconoclastic ideas.

World-Leading Research and its Measurement
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"4* – Quality that is world-leading in terms of originality, significance and rigour…comparable to the best work in the field or sub-field whether conducted in the UK or elsewhere. Such work … has become, or is likely to become, a primary point of reference in its field or sub-field."

1. Introduction

Is the UK outstanding at economics? The results of the RAE 2008 exercise would suggest so. Our discipline was ranked as the United Kingdom's best subject. The major departments in this country had strikingly large proportions of their work assessed as 4*, namely, as world-leading.

Yet a number of journalists and others have asked me if this result is believable or is instead a result of grade inflation. A related concern, voiced by various UK academics, is whether RAE scores truly measure those iconoclastic papers that make a difference or instead simply capture professional soundness[1]. A third issue, and the one of most general significance, is how in an objective way a Research Assessment Exercise can best measure the world-class research coming from a country. Do we -- adjusting for this nation's size -- really compete effectively with the United States[2], for example, in the production of new ideas?

When the problem is how to judge the quality of a country or a university department, it is likely that self-interest and subconscious biases will play a role. My instinct is that as academics we suffer from -- and here I include myself -- the following biases:

(i)   we tend to overestimate the importance of our own department;

(ii)   we tend to overestimate the importance of our own sub-field of economics;

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[1] I have been particularly influenced by Bruce Charlton's and Peter Andras's (2008) long-held view that we should evaluate whether the UK is producing revolutionary science and not merely normal, solid science. Bruce Charlton has pointed out to me that some non-revolutionary papers acquire high numbers of citations. He is plainly right. However, high citations numbers are presumably a necessary if not a sufficient condition, and I therefore feel the later exercise is potentially useful.

(iii)   we tend to be badly informed about how influential the articles can be from a range of journals (it has become common, in my 30-year professional lifetime, to hear people focus on a tiny number of journal 'labels' per se, and even sometimes to speak as though a publication in a place like the American Economic Review is an end in itself rather than mattering for its content or its contribution to human welfare);

(iv)   we tend to be poorly informed about the latest flow of research and excessively influenced by out-of-date stock variables (such as, for example, the long-standing reputation of another department, or of a particular economist).

I try here to devise a method of evaluation that I hope disinterested observers could agree upon ex ante, namely, before they see the data on how they and their own department do.

The proposed method is a simple one to implement. By its nature, any findings from it can be checked by others. This seems important.

I collect data on the world's most-cited articles over the period of the RAE, namely, from 2001-2008. I then calculate the proportion of articles from the UK. My attempted aim is to make operational the kind of 4* concept encapsulated in the quote at the beginning of the paper. [Anticipating what is to come, for a journal such as the American Economic Review, for example, the later suggested method ultimately means that I take the 3% most-cited AER articles from all countries and then, from within that already highly select group, work out the percentage of these influential articles that originated from a university in the United Kingdom.] [3]

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[2] Throughout the paper, I will, in the background, try to bear in mind relative population sizes, and in particular that the UK is less than one tenth the size of North America + Continental Europe + Japan.

[3] As one reader put it, this is a highly 'non-linear' method. It puts a large weight on the very best articles in a scholarly discipline. But I presume that something of this type is required if we are trying to design a criterion for the upper 4* grade in a system, such as RAE 2008, where there are three categories of international excellence. It also recognizes the admittedly inegalitarian skewness in intellectual productivity -- a phenomenon sometimes known as Lotka's Law -- whereby a rather small proportion of articles or people produce the majority of the work of lasting impact. I include self-citations

The paper's findings seem relevant to the concerns of Machin and Oswald (2000), Neary et al (2003), Dreze and Estevan (2006) and Cardoso et al (2008). The exercise may be worth replicating for European research as a whole.

2. The Method

I use data from the ISI Web of Science. This is produced by Thomson. It is probably the most widely used source of citations data. Google Scholar and Scopus are possible alternatives. It would be interesting to check the later calculations on such data, although it would be surprising to me if the conclusions changed.

Citations[4] are taken here as a proxy for the objective quality of an article (measured with the benefit of hindsight).

The later calculations reveal that this country has produced some of the most-cited articles in the world in a number of important economics field journals. It has also been the source of some of the most influential articles in the AER, Review of Economic Studies, and Econometrica. But it did not do well in certain other journals, especially the Quarterly Journal of Economics and Journal of Political Economy. On balance, I conclude that for its size the UK comes out fairly strongly on objective criteria.

I take the journals listed by the Helpman Committee in the recent ESRC Benchmarking Report on Economics in the United Kingdom. There is little dispute that these are important journals. There are 22 of them. They are

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because they make no difference in the case of highly-cited papers such as those covered in this analysis.

[4] See work such as Hamermesh et al (1982), Oppenheim (1995), Hamermesh and Schmidt (2003), and Goodall (2006, 2009), in which citations are treated as real signals. A particularly early and innovative paper, which remains unpublished, is Smart and Waldfogel (1996). Some defence against possible peer review bias is provided by Oswald and Jalles (2007). However, citations are not free of error, and in the long run it may not be sensible to see citations as unambiguously valuable (the more that citations are emphasized, as in this article I would accept, the more that their signalling value will be eroded). Hudson (2007) identifies some serendipitous influences on citations totals.

divided into 9 general journals and 13 field journals. It would certainly be possible to object that a few significant journals are missing from these (the Journal of Financial Economics and the Journal of Economic History[5], for example), but I adopt this list because it is the one chosen by Helpman and thus for this particular study helps avoid suggestions that I was consciously or unconsciously biased in my selection.

For each journal, I searched on articles published between January 2001 and December 2008. Thus I included an extra year of publications after the official end of the RAE period (though this has no material effect on citations numbers). I used the rank-by-citations facility of the Web of Science to order these from the most-cited downwards. I then searched as carefully as possible by hand through the articles for the UK-based ones[6]. The problem with not doing this by hand is that any mechanical search on England will throw up articles that are not truly from England – such as those authored by Americans with an honorary affiliation to the CEPR in London. [7]

It is perhaps worth emphasising that there is evidence that early citations numbers to an article are a good indicator of long-run citations numbers. See, for example, Adams (2005). In other words, if an article acquires few citations early on it is extremely unusual -- of course there are occasional exceptions -- for it ever to acquire a high number.

The key data are set out in Table 1. It tells us the influential recent articles from UK economics and, in particular, where they lie in a world-ranking of influence.

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[5] I wanted to have an economic history journal, because I think that sub-field is particularly important. But over the period even the Journal of Economic History is comparatively little-cited. The marginal cites on the 10th most-cited paper in JEH is 11. So I decided, reluctantly, that I could not quite justify including this with the Helpman list. In passing, two high-impact journals, the Journal of Economic Literature and Journal of Economic Perspectives, are also omitted from the Helpman list -- presumably because they are collections of review articles. Two other omitted journals are the newish but increasingly important ones of the Journal of Economic Geography and Games and Economic Behaviour.

[6] This is a tricky thing to do completely accurately (occasionally the addresses of authors can be hard to work out) and I am not a specialist bibliometrician. It is possible that some errors of counting remain, but I hope they are slight enough not to lead to incorrect conclusions.

To try to adjust for the fact that some journals attract a particularly large quantity of good articles, I allow different journals to have different numbers of articles in the key table -- 50 for the American Economic Review, 10 for the Economic Journal, and so on. These cut-offs were chosen to try to be fair to the different journals. I attempted approximately to equalize the numbers of citations of the marginal excluded article.

To give a sense of how selective the mechanism is, we are choosing in the case of the AER just the top 50 articles out of 1500 published articles over the period, namely, one article in thirty. This is an extraordinarily tough standard to set but it is designed to get at the principle of "4*… a primary reference in its field".

My method differs from, but I hope is complementary to, the work of Vasilakos et al (2007).

To read Table 1, the procedure is the following[8]. Take the numbers in the top row as an example. These tell us that if we look at the 50 most-cited articles published by all countries in the American Economic Review over the 2001-2008 period then the UK was the source of four of these out of the fifty. The UK ones were the 12th most-cited article, the 32nd, 35th, and 38th. Moreover, these four articles came, respectively, from Warwick and LSE on the first, LSE on the second, Cambridge on the third, and LSE on the fourth. It can be seen from the table that the UK attained the top slot in the Rand Journal, the International Economic Review, Journal of Econometrics, and Journal of Public Economics; 2nd in the Journal of Health Economics; 3rd in the Journal of Development Economics; and 4th in the Journal of International Economics, the Journal of Monetary Economics, and the Journal of Urban Economics.

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[7] At the time of writing, I am concerned that this error may have been made by Evidence Ltd in their work for the Helpman Report (2008), but the company has not yet provided me with enough information to judge.

[8] Neil Shephard has suggested to me that ideally the individual papers should be normalized by their year of publication (because a publication in 2001 has had longer to build up cites than one published in 2006). He is right, of course. The reason I do not do so here, and why I use a form of simple averaging, is that I am trying to assess UK economics rather than individual researchers' work.

This is a substantial achievement for the United Kingdom. Nevertheless, although I do not report the full data, the UK numbers are far behind those for the (obviously much larger) United States.

These citations totals were collected in December of 2008. They will, of course, increase through time.

Two UK articles seem to deserve special mention. They are Im et al in the 2003 Journal of Econometrics and Brazier et al in the Journal of Health Economics in 2002. Remarkably, both have already acquired over 300 cites (when measured in December 2008). The first of these is from Cambridge+Edinburgh and the second is from Sheffield. I take off my hat -- as we say in England -- to these authors.

3. Institutions' Contributions to the UK World-Leading Papers

It seems of interest to look at which institutions contributed these 45 important articles[9]:

Web of Science Data

LSE	11 articles
Oxford	11
Warwick	6
Cambridge	4
UCL	4
Edinburgh	2
LBS	2
Nottingham	2
Strathclyde	2

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[9] Hashem Pesaran has made the point to me that ideally we need to know where the important research was done -- rather than simply where the author is when credited in the journal. I would like to be able to do this. But it is not possible, at least for me, to adjust the data in this way.

and, interestingly, and somewhat to my surprise, 12 other universities or centres contributed one (or to one) article each. These universities are: York, Essex, Cardiff, QMW, Kent, St Andrews, Lancaster, the Insititute for Fiscal Studies, Sheffield, Leicester, Royal Holloway, and UEA. In other words, research excellence, even on this rare and rarified criterion, of having had major influence on the profession, is found widely across the country. It should be noted that my measure here assigns full weight to a jointly authored article, so that a tri-authored Article Y by economists from Universities A, B, C would see each of those universities credited above.

4. Two Further Checks

A Repec test

It was suggested to me that another data source for doing this kind of calculation[10] is IDEAS through www.Repec.org. This counts the number of cites in working papers and not just in published journals.

Hence I did the following. On the Repec site, there is a list of papers called Top Recent Research Items by Number of Citations. A recent research paper is defined as "a research item whose last version was published less than five years ago, and whose first version was published less than ten years before the last version."

This is a particularly highly selected group of papers. Only the top 82 economics papers in the world are listed. [It is worth noting that the list constantly changes on the Repec site as the data are updated.]

In so far as can be judged from this necessarily small sample, do we see broadly the same patterns as in ISI Web of Science data? It turns out that we do.

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10 Thanks go to Richard Blundell for this suggestion.

Of the 82 papers, ranked by their number of citations in the IDEAS Repec database, the UK-source items are in the following positions in the world ranking:

2nd most-cited recent paper in the world (*Cambridge+Edinburgh*)
13th (*Warwick*)
19th (*LBS*)
33rd (*Oxford*)
44th (*UCL*)
69th (*LSE*)
73rd (*Warwick*)
75th (*Oxford*)

and, overall, this is again consistent with a rough rule of thumb of 10% of influential papers coming from the UK. Of the 82 in the world, 8 were wholly or partly from universities in the United Kingdom.

The potentially special case of Econometrica

It was suggested to me that the journal Econometrica is unusual, among all economics journals, because it produces important papers that are technical and have a relatively slow build-up in, but eventually an unusually long-lived number of, citations. I looked at this in the historical data and there seems some mild evidence for it when Econometrica is compared to journals like the Economic Journal but not in any clear way with respect to journals like the American Economic Review. Although I therefore think the case for treating Econometrica differently is relatively weak, as one additional experiment I extended the number of papers treated to 100 in the case of Econometrica (rather than to 50 as in the table). This means allowing Econometrica articles to be included all the way down to a -- lenient -- marginal cut-off number of cites of 20.

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If Econometrica is allowed this latitude, little happens to the conclusions of the paper. The 10%-UK-articles rule of thumb is only slightly affected. The ranking of UK departments remains the same, although UCL, Cambridge and the University of York come up fractionally, because they obtain extra articles. LSE continues to top the table (and has three extra articles). A number of other departments get one more. But, overall, there is not much change in the substantive results.

5. Can We Compare Against Other Disciplines?

This paper proposes a methodology that could be applied in most other disciplines. Someone who -- unlike me -- can identify the top 20 journals in mathematics, or anthropology, or chemistry, and can use the ISI Web of Science to do a citation count, can do this same exercise for those other scholarly disciplines. In my judgment, that comparison would be interesting, and would allow a sharp test of which parts of UK research are truly highly-ranked in the world.

The closest I can come to the spirit of this across disciplines is the following calculation. New work by Bruce Weinberg (2009) ranks the quality of disciplines in the UK in an interesting way. Weinberg uses the Highly Cited Researcher database produced by ISI, available at www.isihighlycited.com. He shows that of the world's most highly cited economists[11] approximately 4% come from the UK. The Highly Cited Researcher database covers data from 1970 to today, so in a sense is an out-of-date snapshot of the health of UK academia. Weinberg's interesting Table 3 shows that the best UK subjects, when judged by the largest % of world-ranked researchers, are Pharmacology (18% of the world's most-cited researchers), Plant and Animal Science (13%), Neuroscience (12%), and Clinical Medicine (11%). No other subject gets above 9%.

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[11] In fact the ISI database classifies Economics+Business together, and it appears from the Highly Cited Researcher data that the lack of top business researchers in the UK is what really pulls down our average to the 4%. On its own, my calculations suggest that (purely) UK economics would rank at about 7%.

If (i) we assume that the <u>current</u> quality of economics is represented by my earlier number of 10% of the world's highly cited articles, and (ii) assume that in the long run there is a one-to-one relation between the proportion of highly cited articles and the proportion of highly cited researchers, then we might conjecture that UK economics has improved and is now closer to a steady-steady in which this country will have 10% of the world's top researchers. If so, and it is certainly possible to think of objections to my two assumptions, then Economics could be seen as one of the best and most highly ranked subjects in the United Kingdom. Unless these four subjects have all declined in quality, however, Economics would still not be the top discipline in the country, even if everything else remained the same.[12]

6. <u>Other European Countries</u>

Table 2, as an extension suggested to me by Jacques Dreze, re-does the exercise for the rest of the European nations. I have compressed the data into one table, but the identities of the countries can be read from Table 2.

It can be seen that the non-UK part of Europe contributes 56 out of the whole set of 450 world-leading papers[13].

7. <u>On Open-mindedness</u>

In doing this analysis, I have discovered that some people are powerfully influenced by their prior beliefs. They tend to extrapolate from how a university department is doing in their particular sub-field to how (they imagine) that department must be doing on average across all sub-fields. They are, unsurprisingly, attracted to assessment schemes that favour their own universities and their particular interests.

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[12] Bruce Charlton's early intuition in discussions with me was, interestingly, that medicine and allied subjects are the UK's top disciplines.

[13] Here the performance on top-ranked AER papers seems particularly creditable, although, as with some of the UK work, it should perhaps also be recorded that these few papers were quite heavily co-authored with Americans.

As an example, early on in this work I explained my proposed method to an experienced American applied economist (whose name I have suppressed from my acknowledgments). After some minutes, he nodded, and said "Yes Andrew, this method makes good sense. It is a natural way to do the calculation in a scientifically objective way". He then wanted to know the results. After a minute or two of looking at them, he said "oh no, I now think there must be a problem with the method, because University X should be higher in this league table". What I learned from him and others is that even experienced empirical researchers will agree to a method in advance and yet -- against the spirit of science -- want to change their mind unless the data come out in accord with their original views. This is very human but makes it hard to get people to listen to actual data. My conjecture is that he thought University X should do better because that department is strong in the kind of work my American friend himself does; but it is not possible to say for sure.

Some economists will look at this paper's data and prefer to stick to their prior intuitions about their country, department and university. But, bearing in mind the four biases discussed at the start of the paper, I hope most will be attracted to the idea that assessments should be made, at least in part, by using objective evidence of this kind.

8. Conclusions

I examine objective data, for the Research Assessment Exercise period of 2001-2008, on the world's most influential economics articles. The aim of the paper is to design a practical way to measure the quality of university research. I propose a way to capture the concept of exceptional 4* world-leading work. The method -- a bibliometric one[14] -- can be applied to other disciplines.

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[14] In passing, my own instinct is that a research assessment exercise such as the next so-called Research Excellence Framework (REF) in the United Kingdom should not rely in a mechanical way upon bibliometrics. It should have some element of peer review (or at least peer overview).

Following the Helpman report for the ESRC, I concentrate on 22 well-known economics journals. This is not because I view these as the only journals that matter. But it helps reduce possible objections that I chose the journals to obtain some desired result.

On balance, I conclude that in economics the United Kingdom comes out moderately well on my criterion. It produces 10% of the really important work. However, the UK remains far behind the USA.

Among a set of 450 genuinely world-leading articles -- these are the most-cited papers produced in the world over the period -- I find that the UK has been the source of 45 of them. In particular, the UK has been the home of the single most-cited article in the Journal of Econometrics, the International Economic Review, the Journal of Public Economics, and the Rand Journal of Economics, and of the second most-cited article in the Journal of Health Economics. A UK departmental ranking on this objective criterion looks somewhat similar to that generated by RAE 2008 data. A further check using instead Repec data leads to results consistent with the main conclusions. Allowing special treatment for Econometrica (although the case for doing so is unclear to me from the data) also leaves the key results unaffected. As an additional exercise, the rest of Europe is studied in Table 2. The total number of influential articles from these countries is 56.

As Table 1 reveals, one quarter of these objectively important UK articles emanate wholly or partly from departments of economics not normally considered to be in the top half-dozen in the country. I had not anticipated this result. It suggests to me that outstanding work -- a set of genuinely world-leading articles -- comes from a wide range of sources (literally speaking, 21 different universities in Table 1) and thus by implication that it might be a mistake to concentrate funding narrowly[15] on a tiny number of universities.

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[15] Any economist, however, would argue that it is the marginal productivity of research funding that matters. Public discussion, by contrast, is almost always about average productivities.

Perhaps economists, whose discipline has long espoused competition and opposed monopolies, should not be surprised at the idea that pluralism can encourage iconoclasm. Perhaps economists should take a lead in UK academia in arguing against a growing modern concern with 'top' departments[16], 'top' journals, and other monopoly-creating devices.

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[16] See also Frey (2003), Starbuck (2005), Ellison (2007), Macdonald and Kam (2007), Oswald (2007), and Wu (2007). I would argue, although may be biased, that this paper's bibliometric approach is a way of coping with the serious problem -- pointed out in different ways by Starbuck (2005) and Oswald (2007) -- for national scientific evaluation that the elite journals publish many 'poor' articles, that is, ones that go on to have no impact. The paper does this by concentrating on within-journal rankings of influential articles.

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TABLE 1

How Did UK Economics Do Over the Period 2001-8 if Judged Against the Most-Cited Articles Produced Around the World?

Notes to reading this table: the top row means that if we look at the 50 most-cited articles published by all countries in the American Economic Review over the 01-08 period then the UK was the source of the 12th most-cited, and of those ranked 32nd, the 35th, and the 38th. Moreover, these four articles came, respectively, from Warwick and LSE on the first, LSE on the second, Cambridge on the third, and LSE on the fourth.

Different journals are assigned different values of X, because some journals here are intrinsically more cited than others. The lower cut-off levels of cites are reported in square brackets in the first column. Hence the number 55 after AER means that the 50th most-cited paper in the American Economic Review attained 55 cites. The Journal of the European Economic Association has only recently started publishing papers so cannot be compared to others on cites.

The citations totals were collected in December of 2008.

Journal [lower cut-off marginal # cites]	Criterion: Appearing among the X most-cited articles in that journal where X here is the top:	Were there any UK papers within these top X articles?	Their positions in the world rank of these most-cited X	Which UK institutions were the source of these highly-ranked papers?
AER *[55]*	50	Yes	12th; 32nd; 35th; 38th	Warwick+LSE; LSE; Cambridge; LSE
EJ *[41]*	10	Yes	5; 10	LSE+Oxford; Nottingham
REStud *[35]*	20	Yes	9; 11; 12; 13	UCL+Oxford+Cambridge; LBS; LSE; Cambridge
Econometrica *[32]*	50	Yes	11; 17; 19; 29; 36	Oxford; York; UCL; Warwick; Oxford
IER *[29]*	10	Yes	1	Warwick+Cardiff+Oxford
REStats *[39]*	20	Yes	13	Warwick
JEEA *[8]*	10	No		
JPE *[30]*	50	Yes	45	Essex
QJE *[45]*	50	Yes	40	UCL
JEconometrics *[39]*	20	Yes	1; 6; 10; 14; 15; 19	Cambridge+Edinburgh; Edinburgh+QMW; Kent+StAndrews; Lancaster+Strathclyde; IFS; Oxford
JPubEcon *[35]*	10	Yes	1; 5	Warwick; LSE
JDevEcon *[30]*	10	Yes	3; 7	Nottingham; Oxford
JHealthEcon *[36]*	10	Yes	2; 9	Sheffield; Leicester
JMonetaryEcon *[51]*	10	Yes	4; 7	Royal Holloway; Oxford
JIntEcon *[27]*	10	Yes	4; 5; 10	Warwick; LSE; LBS
JFinance *[51]*	50	Yes	41	Oxford
Rand Journal *[44]*	10	Yes	1; 6; 10	Oxford; LSE; Oxford
JUrbanEcon *[22]*	10	Yes	4; 7; 10	UCL+LSE; LSE; LSE
JOLE *[28]*	10	No		
JEnvEcon&Man *[36]*	10	Yes	3; 7	Strathclyde; UEA
JLaw&Econ *[22]*	10	No		
JET *[34]*	10	No		
Total # world-leading papers from the UK			*45*	

TABLE 2

How Did the Rest of European Economics Do Over the Period 2001-8 if Judged Against the Most-Cited Articles Produced Around the World?

Notes to reading this table: As before

Journal [lower cut-off marginal # cites]	Criterion: Appearing among the X most-cited articles in that journal where X here is the top:	Were there any (non-UK) European papers within these top X articles?	Their positions in the world rank of these most-cited X	Which countries were the source of these highly-ranked papers?
AER *[55]*	50	Yes	2nd; 3rd; 5th; 33rd; 34th; 35th; 47th	Switzerland; Germany; Germany; France; Spain; Italy; Spain
EJ *[41]*	10	Yes	4	Netherlands
REStud *[35]*	20	Yes	5; 15; 19	France; Spain; France
Econometrica *[32]*	50	Yes	17; 18; 19; 21; 26; 27; 32; 34; 43	France; Spain; France+Germany; Denmark; France; Germany; Netherlands; Denmark; France
IER *[29]*	10	Yes	2	Italy+Belgium
REStats *[39]*	20	No		
JEEA *[8]*	10	Yes	1; 2; 7; 9; 10	Spain; Sweden; Sweden+Ireland; Spain; Italy+Switzerland
JPE *[30]*	50	Yes	10; 24	Sweden+Belgium+Italy; Italy
QJE *[45]*	50	Yes	21; 26; 40; 50	France; Italy; France; Italy
JEconometrics *[39]*	20	Yes	4; 20	Netherlands; France+Belgium
JPubEcon *[35]*	10	Yes	2; 10	Italy; Switzerland+Denmark
JDevEcon *[30]*	10	Yes	1; 2; 3	Denmark; Norway; France
JHealthEcon *[36]*	10	Yes	8; 10	Sweden; Germany
JMonetaryEcon *[51]*	10	No		
JIntEcon *[27]*	10	Yes	1; 4; 7; 9	Ireland; Germany; Italy+Spain+Germany; Spain
JFinance *[51]*	50	Yes	3; 10; 19; 25; 41	Netherlands; France; Spain; Finland; Finland
Rand Journal *[44]*	10	Yes	9	France
JUrbanEcon *[22]*	10	No		
JOLE *[28]*	10	Yes	1	France
JEnvEcon&Man *[36]*	10	No		
JLaw&Econ *[22]*	10	Yes	2	Austria
JET *[34]*	10	Yes	3; 5; 6	Italy; France; Spain
Total # world-leading papers from rest of Europe			*56*	