Publish or perish: the publication history of the Department of Economics, University of Copenhagen, 1963-2013

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This paper addresses two issues. It documents the changes in the publication strategy of the members of the Department of Economics, University of Copenhagen over the last 50 years, away from a broad domestic audience to the international community of peers and scholars. From having been only occasionally present in the world of science the Department has increased its impact from the end of the 1980s. Exploiting data on the impact of journal articles the paper also makes a tentative estimate of a spectacular increase in research labour productivity.
JEL classification: A 11, B 1.

1. Introduction: Economics and the language of persuasion and reform

Economics in its modern form was born as a protest and reform movement at odds with the political elites in the 18th century. When economists enjoyed some success in redirecting economic policies away from mercantilism and protectionism in the 19th century economics moved closer to the circles of political power. Economics differed from the natural sciences in that its results used to be published in the vernacular or local language rather than the *lingua franca* of its time,

1. Department of Economics, University of Copenhagen. This paper is based on my Emeritus lecture. Anne Bach Stensgaard has diligently worked as my research assistant. I would like to thank Christian Schultz, Paul Sharp and Jean-Robert Tyran for useful comments on an earlier draft.

be it Latin as in the past or English at present. When Newton and Linnaeus[2] published in Latin, pioneering liberals such as Henry Martyn published in English, Salustio Bandini in Italian, Pierre Boisguilbert in French and Anders Chydenius wrote in Swedish.[3]

Why was that? The natural sciences and theoretical sciences such as mathematics and physics searched for universal and general truths, independent of time and nation. Natural scientists have always addressed the *learned*, other scientists scattered over Europe and later in the entire world, while economists wanted to convince and persuade a wider audience, the general public, to engage social forces and the elites in their own nation. In that process economists discovered some general principles which later formed the basis of economics as a science. However, their concern was initially practical and political and confined to a domestic policy agenda. In the 18th century a diverse crowd of pamphleteers, civil servants, university professors and independent intellectuals, even prelates and stock market jobbers, attacked the prevailing mercantilist doctrines and as a result of this process ground breaking economic ideas like the concept of *opportunity cost* and *comparative advantage* were born.

The attachment to the vernacular language remained strong throughout the 19th century and well into the 20th century when economists came to occupy positions in government and in the civil service. Economists were now closer to the economic policy making processes. Even when the professionalization of economics increased and the subject became more abstract and formalized and similar to the natural sciences in its search for general principles, most leading economists remained active in domestic economic policy debates. On the Scandinavian scene names like Ohlin,[4] Wicksell and Zeuthen come to mind, but they also published internationally, of course.

2. Linnaeus was not at all an original thinker outside his field of science and his mercantilist economic ideas were typically aimed at a domestic audience and also published in Swedish.
3. Martyn was the first to formulate the opportunity cost notion precisely in *Considerations on East-India Trade* (1701) although Samuel Fortrey stumbled on it in *England's Interest and Improvement* (1673). Chydenius published *Den Nationnale Vinsten* 1765, translated to English as *The National Gain* (Helsinki 1994). It was in Eli Hecksher's words '... an almost classically clear and simple exposition of the fundamentals of economic liberalism'. Salustio Bandini was like Chydenius a prelate and his subject was the neglected part of coastal Tuscany called La Maremma which, in his view, suffered from restrictions imposed on the grain trade by the Medici rulers in Florence. His *Discorso sopra la Maremma di Siena* was circulated privately from the end of the 1730s but not published until after his death. Pierre Boisguilbert *Le detail de la France ou la France ruinée sous la regne de Louis XIV*, published in 1696 was so explosive that it was published in Cologne rather than in France for fear of censorship.
4. Little known today is Bertil Ohlin's 'proto-Keynesian' and forceful pamphlet against the austerity policies of the 1920s written and published during his tenure at the University of Copenhagen, *Set produktionen igang*, Copenhagen, H. Aschehoug & Co., 1927.

A typical Copenhagen professor of economics in the early 1960s had a long, often distinguished, career in the civil service or in the Central bank before entering the university profession.[5] However all this changed in the last third of the 20th century. Economists talked increasingly to their peers, colleagues at other universities, and the preferred means of communication became the peer-reviewed article in an English language journal rather than the memo sent to the Minister of Finance. Today some members of the Department will typically sit on or chair advisory councils or committees but only for limited periods and as a part- time assignment. Although there are an increasing number of economists in the civil service, the career paths within Academia and public administration are now almost entirely separated. Within Academia career prospects have become determined by purely scientific pursuits, that is the number and quality of publications in internationally recognized journals. However, various members of the staff of the Department have had an almost unbroken presence in the Council of Economic Advisors (Det Økonomisk Råd) since its start in the early 1960s and members are heard in the public debates in the media. There is no denying, however, that there is a conflict between the often time consuming participation in public debates and the time needed to pursue research and teaching in an increasingly competitive academic world.

The transition from a domestically oriented Department to a Department seeking recognition in the international community of scholars was late but surprisingly fast in the case of the Department of Economics in Copenhagen, and part of a general trend in continental Europe. The other major departments in Denmark, most notably the University of Aarhus, have experienced or begun a similar process. The first aim of this article is to trace and explain this transition as it is manifested in the publication record of the Department including the dramatic shift in the preferred language used for communication and dissemination. The second aim is to present some tentative estimates of changes in research labour productivity following that transition.

The article is organized as follows. Section 2 presents the data used. In section 3 the shift from Danish to English as the major language used in publications is documented and explained. A number of questions are addressed. Is the diversity of subjects discussed in articles affected when academics face an international rather than a domestic audience? Is the international peer pressure imposing a bias on the nature of subjects discussed? What role did the demonstration effect from 'role model' departments in Scandinavia and elsewhere play in the transition? Section 4 presents a new method to measure research labour productivity and applies that method to trace the spectacular increase in productivity over the

5. See Niels Kærgård: 'Vækst, specialisering og formalisering, 1960-1979 og årene efter' in *Københavns Universitet 1479-1979*, Vol VI.2, Copenhagen 2001 for a documentation of economics professors' career paths in the nineteen sixties and seventies.

last 25 years. In section 5 the very uneven impact of individual articles is discussed and some tentative implications for publication strategy in a world of increasing competition for publication slots in the top journals are discussed. Section 6 concludes.

2. Data

We will look at the changing orientation of the Department of Economics through its *external* publication record. We have succeeded in documenting the publication activity and employment of tenured staff back to 1963 by consulting the yearly reports from the University (Københavns Universitets Årbog) and the Department's own yearly reports. Between 1993 and 2006 the reports are available on the web and further back in printed form. Publications after 2006 are now recorded in the so called CURIS-system which is accessible to the public. We have excluded internal publications, i.e. PhD dissertations, working papers, and teaching memos, in order to avoid double-counting. The argument is here that, say, a working paper sooner or later will be published externally and will then be recorded. Teaching memos and dissertations are also not recorded unless they are published as textbooks by an external publishing house. Chapters from PhD dissertations are typically published in journals in due time and will eventually be recorded. The number of publications is consistently normalized controlling for the number of authors external to the department. For example, an article which is co-authored by two external authors is recorded as 1/3 of an article, but a paper written by two internal academics is counted as one publication. Impact factors or weights given to articles in computing academic labour productivity, see section 4, are taken from three different sources: (i) Thomson-Reuter ISI Web of Knowledge,(ii) RePEc (Research Papers in Economics) database managed by the Research division of the Federal Bank of St. Louis , and (iii) the so called 'ambitious economist' ranking compiled by K. M. Engemann and Howard J. Wall.[6] The three sources are similar in that they all use fairly recent end years, 2012, 2013 and 2008 respectively , in estimating the impact and they adjust citation impact by the prestige of the source of citation but differ in the extent of 'inclusivness'. RePEc is the most inclusive and included almost 1500 economics journals at the time of the estimation (April 2013). ISI Web of knowledge includes about 300 economics journals and derives impact factors for 277 journals in 2012. The 'ambitious economist' include only a about 70 journals and calculates impact factors by focussing on citations in seven leading economics journals, defined below. It is worth stressing that impact factors are estimated for journals and not for single papers. The

6. K.M. Engemann and H.J. Wall, A Journal Ranking for the Ambitious Economist, *Federal Reserve Bank of St. Louis Review*, 91(3) 2009, pp.123-39.

impact factor of a journal, as used in this article, is derived from the number and quality or prestige of citations that all articles published in the journal accumulate. A journal which is much cited in other journals will typically have high prestige. There is a potential source of uncertainty in estimating the impact factors of journals since the variance of citations of articles in a given journal is very large. Even top journals occasionally publish (close to) zero citation articles. Often cited articles can be published in journals with an impact factor at about 25 or 10 percent of top journal impact. Half of the academics at the Department of Economics in Copenhagen who had articles in the top 6 journals (see Appendix 1 for a listing) had her/his most cited journal article published in a non-top six journal.

Despite this it is possible to rank and single out a number of top journals and to separate them from journals with much lower impact score, but the precise ranking of adjacent journals is very uncertain.[7]

We regret that we have not been able to record newspaper articles, op-ed notes etc. which could cast some light on the public impact of the Department, but the record is not consistent and complete enough to generate reliable and comprehensive time-series.

3. Overcoming the constraints of a small domestic audience.

Adam Smith argued that perfection in a profession is generated by specialization (division of labour) and that that specialization was only limited by the 'extent of the market'. Although Smith talked about manufacturing, the same mechanisms are applicable to the sciences. We can see the ongoing specialization of economics or any other science unfolding before our eyes. In the not so distant past a typical economist could publish a single-authored paper using standard econometrics for a test. Today, journal articles are increasingly becoming co-authored exploiting the combined 'perfection by specialization' of several authors. In the early 1970's 75 per cent of articles in top journals were single-authored as against a little less than 25 per cent in 2011/12.[8]

For a small language area specialization is constrained by 'the extent of the market'. The vernacular language 'market' becomes too small for a meaningful dialogue with qualified fellow researchers. Language choice will therefore be determined by the desire for increased exposure to the larger international community of scholars, which today implies the adoption of English as the *lingua franca*. That explains the flight from the vernacular language as we will soon reveal. Im-

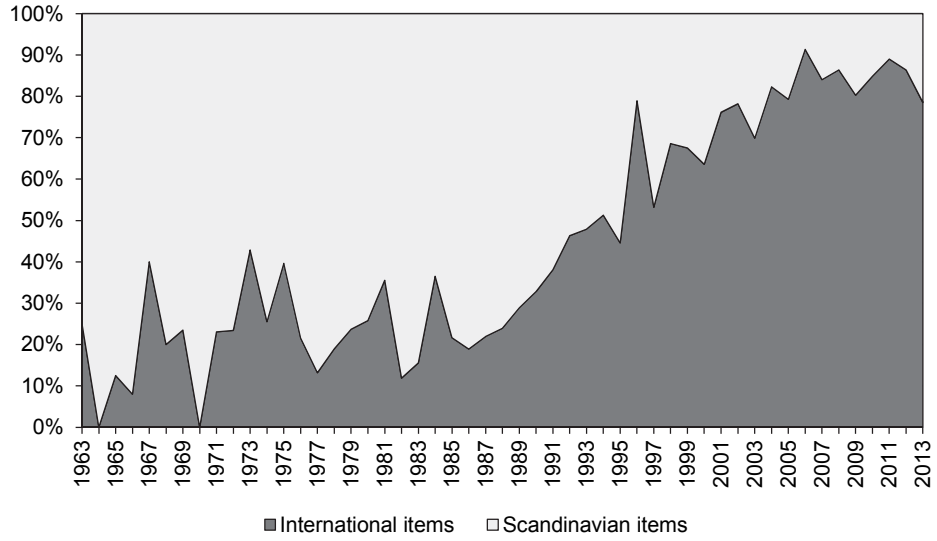
7. See D.I. Stern, Uncertainty Measures for Economics Journal Impact Factor, *Journal of Economic Literature*, 2013,51.1,173-189.
8. D. Card and S. DellaVigna, Nine Facts about Top Journals in Economics, *Journal of Economic Literature*, 2013,51.1, pp.144-161.

pressionistic evidence suggests that the drift towards English as the *lingua franca* started earlier and became more radical in small language areas, say the Scandinavian nations, compared to relatively larger languages, say, French, German and Italian. Support for this conjecture is the rankings of economics departments made regularly by Tilburg University, see https://econtop.uvt.nl . This ranking is based on publications in English language journals only and it turns out that small language areas in Europe are over-represented in the top 100 ranked economics departments given the size of the population. Sweden and Denmark combined have more top 100 departments (5) than Germany although the German population is 5.5 times the population of Sweden and Denmark. Likewise Netherlands universities have more top 100 departments than Italy and France combined despite a population around 13 per cent of that of the France and Italy.[9] German and French were in fact competing with English as the dominant scientific language well into the 20th century, which might explain the lagged response of language shift in these nations.

The Copenhagen Department of Economics used to have some presence in international journals from its start, although rarely in the top layer. But the problem outlined above about the search for a large enough audience of research fellows comes to the forefront in the 1980s, which witnessed profound changes as revealed by the choice of language in publications. In Figure 1 below we look at all externally published items (journal articles, monographs and contributions to edited books), see section 2 for details. The pattern that emerges is one of complete change over a very short period. Until the mid-1980s about 80 per cent of the publications were in a Scandinavian language and in that category around 95 per cent were in Danish. In the first decade of the 21st century the Scandinavian publications had been reduced to about 20 per cent while the remaining publications are 'International', which with a handful of exceptions means English language publications. Looking at the major means of communication, that is journal articles, the dominance of English is even more evident. In the first decade of the 21st century about 90 percent of journal articles were in English.

9. The numbers are based on rankings derived from publications between 2008 to 2012.

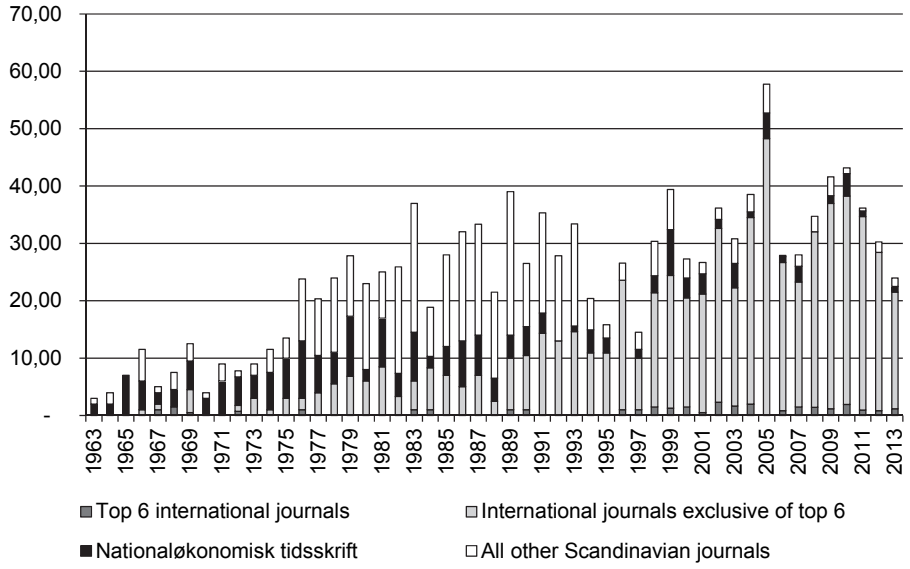
Figure 1. International and Scandinavian items published, 1963-2013. Shares of total, per cent



Notes: Journal articles, contributions to edited books and monographs, controlled for by co-authorship. See section 2 for sources.

Over the period covered in this essay the composition of published items has been stationary, although varying quite a lot from year to year, with journal articles being the most important item, accounting for about 70 per cent with monographs accounting for less than 10 per cent and contributions to edited books around 20 per cent. The drift towards English as the *lingua franca* is revealed by the changing composition of journal publications. In the sixties and seventies *Nationaløkonomisk Tidskrift* was the mayor outlet but was gradually losing its dominance permanently to international journals and temporarily to other Scandinavian language journals in the 1980s. However, international journals gained almost total dominance by the end of the 20th century, as is demonstrated by Figure 2. The category 'All other Scandinavian journals' which rose to a short spell of importance in the late seventies and eighties is a diverse lot and its appeal reflected the heated economic policy and ideological debates in the period. Another interesting phenomenom, indicated by Figure 2, is the publications in the top 6 international journals. Top 6 include, in alpabetical order, *American Review of Economics, Econometrica, Economic Journal, Journal of Political Economy, Review of Economic Studies and Quarterly Journal of Economics*. Top journal publications were occasional and rare before the mid-1990s but has become a small but permanent item since.

Figure 2. Number of journal articles in different categories, 1963-2013

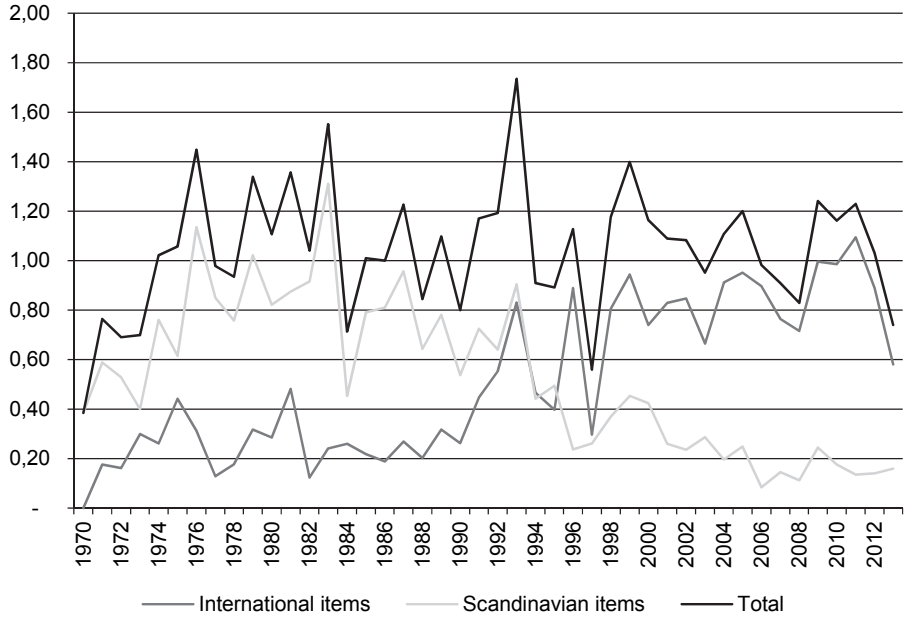


Notes: Top 6 journals defined in Appendix 1, see section 2 for sources. Articles controlled for co-authorship.

The spectacular increase in international journal articles is linked to an increase in the number of tenured academics but stems mainly from the changing composition of the journals chosen for publication. Figure 3 indicates that there has not been an increase in the total number of items published per academic after the mid 1970s. From Figure 2 it seems, however, as if the increase in the number of international journal articles has not been sustained in recent years which is true also if expressed in international journal articles per academic, see Figure 3. But numbers are controlled for by external co-authorship and the recorded increasing co-authorship will depress numbers as defined in this paper. It turns out that of the about 40 refereed articles to which Department members contributed in 2013 only three were single-authored and co-authors were external in more than half the cases. In 1996, as a contrast, only 20 percent of refereed journal articles had a co-author external to the Department. It is not obvious that co-authored articles relieve the effort for individual participating authors. The increase in co-authorships reflect, apart from gains from division of labour, the mounting demands from referees and editors which allocate scarce publicatioon slots.

Figure 3 also reveals that there has been a dramatic switch from Scandinavian to International (= English language) items starting in the mid-1980s. Why did his happen and why was it sustained?

Figure 3 Total, Scandinavian language and international items published 1970-2013 per academic (full, associate and assistant professor).



Note: Journal articles, monographs and contributions to books, controlled for by co-authorship. See section 2 for sources.

An intuitively appealing explanation is that we have two equilibrium regimes. The first is one in which vernacular language publications are encouraged. The service to the domestic economic policy environment is given prominence in this regime. In a sense this represents the traditional role of economics as outlined in section 1. The second regime is one in which publications in peer-reviewed international journals are an explicitly or implicitly stated condition for getting tenure and the international community of scholars is considered the principal reference group. It is noteworthy that the change between the two regimes takes place over a relatively short period, a little more than 10 years. The first regime is under pressure from the logic of scientific development in the direction of increasing perfection through specialization but also from the practice in other sciences, particularly 'hard' sciences which have professed a principle of maximum exposure to the larger international community of scholars for a long time. The demonstration effect from neighbouring Scandinavian departments in Stockholm and Oslo

should not be neglected.[10] Younger recruits had also experienced spells at top universities in Britain and the US and had been exposed to the academic culture prevailing at these institutions. Gradually a new academic ethos prevailed. Although the precise standards required for getting tenure was not formalized initially it became implicitly understood that publications in recognized, not necessarily top 5, journals was a requirement for a successful carfeer path. A process of selection and self-selection was begun in which potential candiadates opted for other career paths or orther universities which had not yet begun a similar transition.

Not surprisingly the new ethos was promulgated by the mathematical general equilibrium economists around Karl Vind and Birgit Grodal in the 1970s and 1980s. Theoretical economics has some obvious similarities with the natural sciences in its search for general principles. To publish in Danish was not a meaningful option, of course, for this research group using a highly formalised style of exposition and having a very small domestic audience. This group was instrumental in imposing an academic culture similar to that thriving at the best US and British universities on other groups at the Department. The mathematical economists found an ally in a left-leaning group interested in (formalised) Marxian economics, economic growth and economic history. At the end of the 1980's there was a rift between 'traditionalists' lead by the then Head of Department Professor Anders Ølgaard and 'modernists', the latter advocating an adherence to international exposure and to the principle of publishing in leading international journals. New more rigorous recruitment criteria were implicit in the 'modernist' programme. Ølgaard described the conflict accurately in his autobiography: 'Birgit (Grodal) was especially focussed on the research front and international contacts. I (i.e. Anders Ølgaard) was mainly preoccupied by our presence in the domestic economic debate ...'[11] The 'modernists' tried to unseat the incumbent Head of Department (Anders Ølgaard) in 1991 by proposing Professor Niels Thygesen as a candidate but failed. The academic staff was divided in two parts of about equal size but Ølgaard won because of support from the student representatives.[12]

When a new modernizing head of department, Troels Østergaard Sørensen, had finally been installed in 1993 the transition to English as the principal lan-

10. The Institute of International Economics at Stockholm University remained the leading Scandinavian institution judging from top publications in the 2000 to 2013 period. See A. Björklund, Nationalekonomisk toppforskning I Sverige – omfattning, lokalisering ocg inriktning, *Ekonomisk Debatt*, 2014, 5,6-19.
11. Anders Ølgaard, *Den syngende vismand*, Nyt juridisk forlag, Copenhagen 2008, p.353. My translation is from the Danish original which reads: 'Birgit var især interesseret i forskningsfronten og dermed i internationale kontakter. Jeg var mere optaget af, at vi markerede os i den hjemlige økonomiske debat ...'.
12. Ølgaard, op.cit, pp 358-9.

guage had already begun and there was a shift in impact of published articles later in the 1990s.The new academic culture now became institutionalized and explicit. In 2001, for example, an economic incentive program was introduced, the purpose of which was to encourage publications in a broad category of journals with high to medium impact scores, as well as the very top, see Appendix 1 for the list. Most importantly the academic culture was changing in the sense that career prospects became more transparent, since they were expected to be based on research performance as measured by publications in internationally recognized journals. The incentive program, which is still in operation, did not cause the transition, because it was already underway when the incentive programme was introduced. However, the incentive programme might have contributed to sustaining the transition and to narrow down the choice set of publications since it defined a list of preferred journals and incentives differed according to impact of journal. The effect of the incentive programme has been to widen the pay differences between full professors and associate professors since the former have been more successful in their publication performance. The size of the incentives might also have mattered since a single authored article in a top journal added almost 10 per cent to the base salary of a full professor.

But international 'peer pressure' or' role model imitation' also played a role in the transition. In a Scandinavian context the Institute of International Economics at Stockholm University and the Institute of Economics at Oslo University had early on a more pronounced presences in the top journals and were more appropriate 'role models' in the sense that they indicated a realistic path to improvement in publication performance. Another factor which sustained the modernization was the increased *active* participation in international scientific congresses and workshops. As a rule funding was granted by the Department provided the scholar had got a paper accepted for presentation. This was a shift away from a previous seemingly more generous but potentially counter-productive policy in which active participation was not a requirement for funding. The presence of the international community of scholars was also manifested by a sharp increase in invited speakers at seminars from the mid 1990s as well as a generous policy supporting the organization of workshops with invited speakers.

In retrospect it is worth pointing out that 'traditionalists' feared that too much focus on international publications would lead to a neglect of applied and empirical economics. It is correct that in the 1970s and 1980s top international journals were heavily biased in favour of pure theory. However that bias has been completely reversed since then. In 1973 and 1983 about 55 per cent of articles published in the *American Economic Review*, *Journal of Political Economy* and *Quarterly Journal of Economics* were pure theory but that category fell to about 20 per cent in 2011, while empirical and applied economics increased by almost 20 percentage

points to 64 percent in the same period.[13] The *Quarterly Journal of Economics*, which has the highest proportion of applied articles among the top journals, is also the journal with the best citation record. In recent decades theory articles also tend to get fewer citations and a predominatly theory-inclined journal such as *Econometrica* has a higher fraction of poorly cited articles and a lower median citation score for articles.

By and large the transition to a Department geared towards the international community of scholars has not meant a loss of diversity. As an indication we have listed all publications with more than 150 Google scholar citations ranked by number of citations in Table 1 below. The general impression is that the suspicion of a drift towards academic isolation and concern for topics without relevance seems unfounded. The theme of publications range from pure theory to applied economics, macro and monetary policy, welfare and tax reform and development economics, econometrics and economic history.

Table 1. Most cited publications from Department of Economics, as registered February 2015. Ranked by number of citations, in parenthesis.

Maximum likelihood estimation and inference on cointegration – with applications to the demand for money, *Oxford Bulletin of Economics and Statistics, 1990 (10619)*
Aid and growth regressions, *Journal of Development Economics*, 2001, (1028)
European monetary integration: From the European monetary system to economic and monetary union, monograph, Longman, London 1992.(829)
An omnibus test for univariate and multivariate normality, *Oxford Bulletin of Economics and Statistics*, 2008 (845)
On the empirics of foreign aid and growth*, Economic Journal*, 2004, (690)
The life cycle model of consumption and saving, *Journal of Economic Perspectives*, 2001 (429)
On the causal links between FDI and growth in developing countries, *World Economy* 2006 (321)
Unwilling or unable to cheat? Evidence from a tax audit experiment in Denmark, *Econometrica* 2011 (287)
Welfare reform in European countries: a micro-simulation analysis, *Economic Journal*, 2007 (280)
Monetary and fiscal policy interaction in a micro-funded model of a monetary union, *Journal of International Economics*, 2005 (261)
Fiscal transparency, political parties, and debt in OECD countries, *European Economic Review*, 2006 (276)
Worker flows and job flows in Danish Manufacturing, 1980-91, *Economic Journal* 1998 (214)

13. D.S. Hamermesh, Six Decades of Top Economics Publishing: Who and How? *Journal of Economic Literature,* 2013, 51.1, 162-172.

Grain markets in Europe 1500-1900, Integration and deregulation, monograph, Cambridge University Press 1999 (213)
Reputational cheap talk*, Rand Journal of Economics*, 2006 (205)
Achieving compliance when legal sanctions are non-deterrent, *Scandinavian Journal of Economics*, 2006 (198)
Introducing advanced macroeconomics : growth and business cycles, monograph , McGraw-Hill, 2010 (193)
On the optimality of the Nordic system of dual income taxation, *Journal of Public Economics*, 1997, (192)
Clubs and the market, *Econometrica,* 1999 (152)

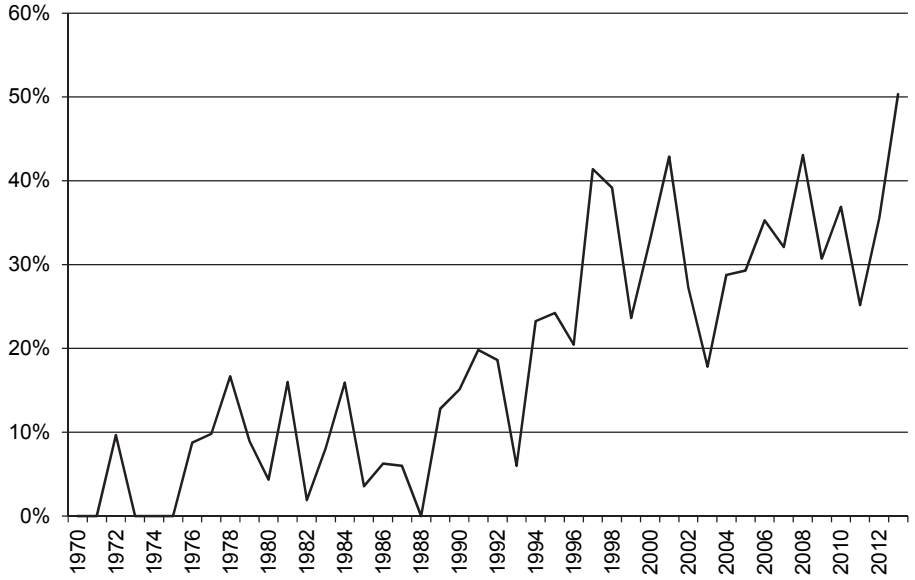
Source and notes: Google Scholar. Selection principles: The most cited, but just one, publication (journal article or monograph) per present or past member of the Department has been entered. Only publications published after 1990 with more than 150 Google Scholar citations, and published during author's tenure at the department have been registered.

4. Measuring academic research labour productivity.

Measuring labour productivity in the public sector is difficult and the university sector is no exception. We will restrict the productivity measurement to research labour and leave out the important aspect of teaching. A further limitation is that we only include journal articles and not monographs and contributions to edited books when estimating research output for reasons explained below.

As can be seen above in Figure 3 there is no obvious increase in the number of research items published per academic since the mid 1970s. But that does not exclude productivity changes because the items published are not homogenous. A first glance of the change in journal article quality that has occurred is given by Figure 4 below. It depicts the share of journal articles published in a broad category of esteemed journals. This category includes the top 6 mentioned above and an additional 50 journals including top field journals, see Appendix 1 for details. The share increased from less than 10 percent to 35 percent on average, and there seems to be positive trend after 1995 perhaps driven by the exceptionally high share in 2013 at 50 per cent. Whether that observation is an outlier or not only future can tell.

Figure 4. Broad top journal articles as a share of total published articles, 1970-2013. Per cent



Note: Broad top journals are journals used in the Department's incentive programme. Inclusion in the list is based on journal impact.

But that is still an imprecise way of measuring output. We have articles and they differ in quality. We need to aggregate different items, apple-juice and champagne, into a *total* output measure. This is a familiar problem in national income estimates and there we use prices to generate an estimate of total output. We need, in other words, an equivalent to prices to get an aggregate output measure. That equivalent is here taken to be the impact factor given to the journal in which articles are published. There is a problem deriving the impact of an article from the journal it is published in since the standard deviation of citations for articles in a given journal is very large, as mentioned in section 2. However, the impact factor is still a reasonably good measure of the 'intrinsic' quality or value of an article. The reason is that there is a strong positive correlation between journal impact factor and the quality control as revealed by the rejection rate of the journal, i.e. the share of submissions which are rejected. For the top journals the rejection rate has increased from some 85 per cent to 94 per cent since 1990 and for the *Quarterly Journal of Economics* it is 96 per cent.[14] There is, however, a potential bias in using fixed *end year* impact factors as weights, as we do. You can argue that

14. Card and DellaVigna, op. cit.

each generation of economists would aim at publishing in what was considered as the leading journals at the time of publishing. Over time the relative impact and absolute impact of journals might change. What once used to be respectable journals might have declined in importance and impact over time. If so, using *end year* impact factors will inflate the productivity estimate. However, looking at the journals favoured by Department members over the years we are confident that the bias is marginal.

There are no comparable impact factors available for monographs and contributions to edited books, which explains why we have not included these items in the research output estimate. Furthermore it has not been possible to include journals from allied fields because the impact numbers are not comparable. This leads to an underestimation of the true productivity increase because over the last 10 to 15 years members of the Department have published in the top journals in other fields for example political science. It is worth mentioning that books published by international publishing houses by Department members attract, on average, citations comparable to articles in the top 5 journals. Most of these monographs have been published over the last 20 years so if anything the exclusion of monographs will also understate the performance of the department. In principle it would be desirable to include monographs in the accounting of research labour productivity but it presupposes some standard of impact weights for books. Not all publishers use a proper referee system, for example. Articles published in edited books, with the exception of Handbook articles, usually get poor citation scores and therefore the exclusion is less of a problem.

The research output in a given year is then calculated as

$$\sum_{i=1,j=1}^{N_i,N_j} a_i e_i w_{ij}$$

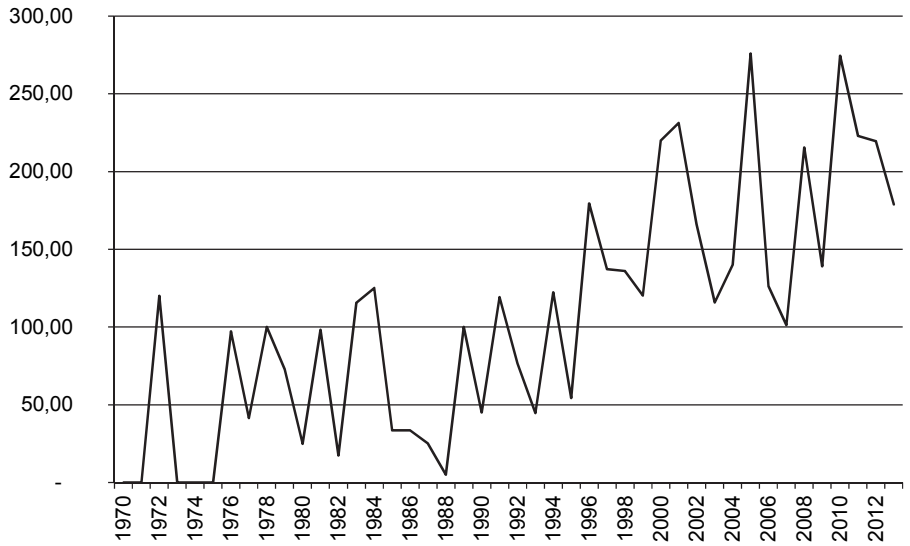
Where a means article, e is a factor controlling for co-authorship $0 < e \leq 1$ of the article i and w is the weight, or so called impact factor of the journal j in which the i_{th} article is published. j is a positive number for journals which pass a threshold level of citations, and $j = 0$ if not. Research output is in other words the weighted sum of all articles published a given year controlling for co-authorship e of the the i_{th} article and weighted by the impact factor of the journal j in which the i_{th} article is published.

To arrive at research labour productivity we divide research output with the number of professors L (full, associate and assistant) the given year, that is

$$\frac{\sum_{i=1,j=1}^{N_i,N_j} a_i e_i w_{ij}}{L}$$

w varies a lot across journals. A number of well-respected journals typically have impact factors which are 5 to 25 percent of the impact factor of the top 5 journals, that is the top 6 minus Economic Journal.

Figure 5a. Research labour productivity 1970-2013. Index 1989= 100



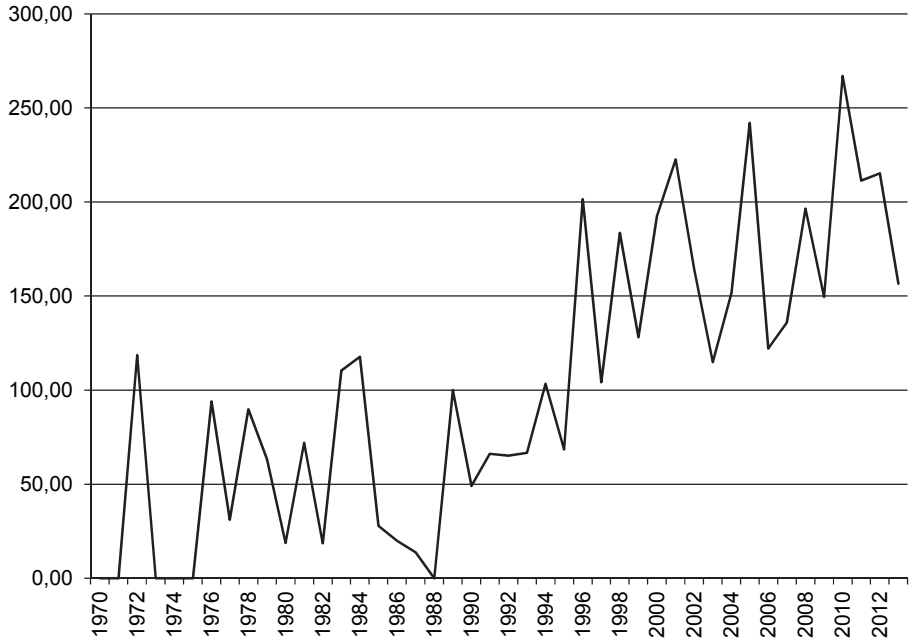
Note: Recursive impact factor from RePEc, april 2013.For a handfull of journals impact factors from April 2014 have been used.

The picture reveals an impressive development. Up until the mid 1990s the productivity level is stationary and then it jumps to a higher level and an occular inspection seems to suggest that there is a positive trend. Calculating the average research labour productivity in the two regimes 1970 to 1995 and from 1996 to 2013 respectively we find that there has been a remarkable shift by a factor of 3.0.[15]

A more established source generating rankings of journals and impact factors are provided by Thompson-Reuther ISI Web of knowledge. It is less inclusive that RePEc, which presents its impact factors as experimental, and ISI provides impact numbers, so-called 'Article influence score' for about 280 economics journals.

15. We have chosen 1995 as an appropriate 'regime change' year since the productivity index (1989= 100) does not fall below 100 a single year after 1995.

Figure 5b. Research labour producitivity 1970 – 2013. Index 1989= 100



Note: We have used 'Article influence score' from Thomson-Reuter ISI Web of knowledge with end year 2012.

This figure reveals an almost identical pattern and an estimate of the increase in research labour productivity by a factor of 3.3 between the first and more recent periods, just slightly higher than that generated by the RePEc data.

The high volatility in the curves are due to year to year changes in both nominator and denominator, see Appendix 2. A decline (increase) in the number of academics combined with an increase (decrease) in papers published will generate large fluctuations. For example, the decline in 2013 looks dramatic but weighted output is just about 15 per cent below the 1996-2013 average of 29 units and that fall is occurring at the same time as there is an increase in staff of almost 15 per cent from the year before.

The link between output a given year and number of academics that same year is of course only used for expostional reasons. The output in , say, year 2013, is linked to the number of academics in the previous years because of the time passing between submittance and publication.

We have also used a less inclusive list of publications where weights were generated by journal citations in seven top journals from publications in about 70 broad top journals only. The rationale here is that an ambitious economist should strive to be cited in the top journals. The seven top journals are the six defined

above plus *Review of Economics and Statistics*. Whether that particular addition to the top list is the choice of the typical 'ambitious economist' is an open question, of course and will depend on the author's field of expertise. The complete list is overlapping remarkably well with the category Broad top journals in Appendix 1. The results in terms of recorded research labour productivity are broadly similar when it comes to identify the timing of the labour productivity spurt although the implied productivity shift is slightly lower, just below a multiple of 3, which is still still a significantly large number. The intuition is here that the selection bias inherent in the restricted list excludes a number of journals with positive impact present in the RePEc as well as the ISI Web of knowledge ranking.[16]

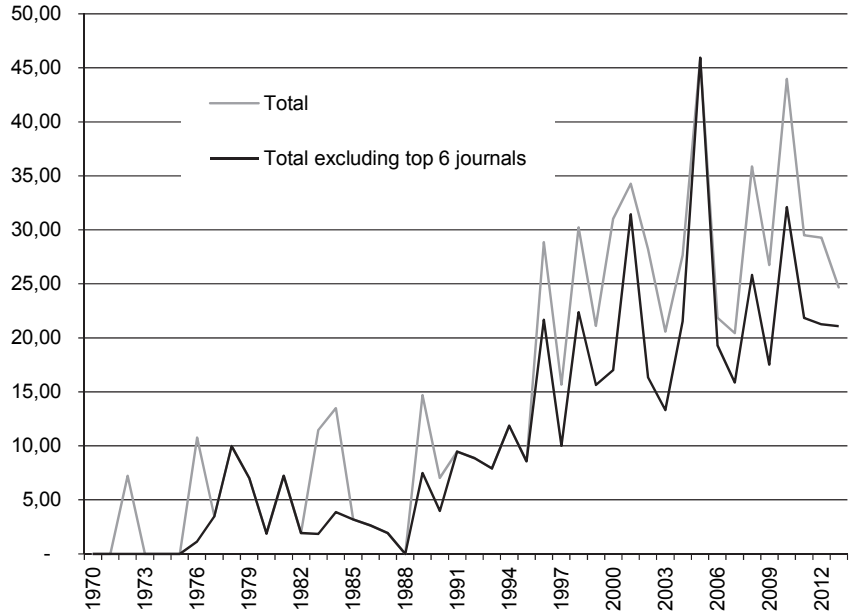
Top journal publications matter of course and Figure 6 is identifying the impact of top 6 publications. The grey upper curve is measuring the total research output, that is the sum of co-author controlled number of articles times their impact factor as weights or

$$\sum_{i=1,j=1}^{N_i,N_j} a_i e_i w_{ij}$$

The solid black curve is the total weighted output minus the output generated by the top 6 articles. The difference between the curves is thus the impact of top 6 publications. On average top 6 publications account for abourt 20 percent of the total output since 1996. Using the other two sourcesof impact factors does not reveal significant differences. The 'ambitious economist' listing generates a higher relative importance of top 6 journal articles as a share of total output. Figure 6 also reveals that the combination of increasing research labour productivity and the increase in academic staff has led to an increase in weighted journal article output by a factor of 4.8 comparing the 1970-1995 period, averaging 6 units per year, with the 1996-2013 period averaging 29 units per year.

16. See K.M. Engemann and H.J. Wall, A Journal Ranking for the Ambitious Economist, *Federal Reserve Bank of St. Louis Review*, 91(3) 2009, pp.123-39.

Figure 6. Total weighted research output and total less the contribution of top journal articles. ISI Web of Science, 2012 end year edition

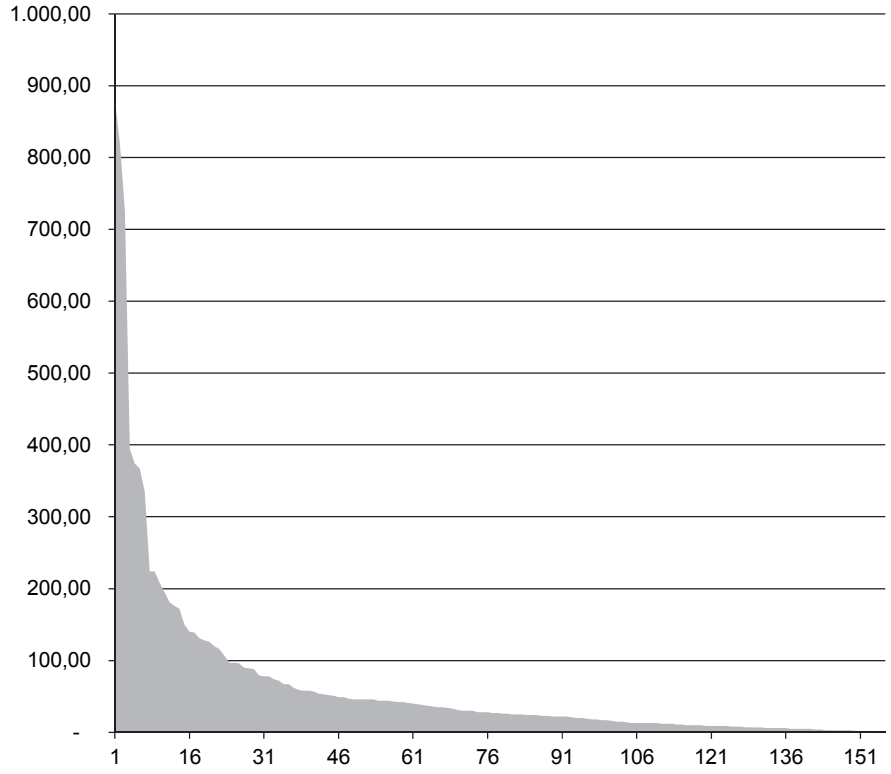


Source: We have used 'Article influence score' from Thomson-Reuter ISI Web of knowledge with end year 2012. See also Appendix 2.

5. Lost in translation

Publishing in the *lingua franca* will give the author the potential access to a large audience also for rather specialized articles which will increase feedback and possibly the quality of research. Has that potential been fully exploited? The short answer is: Yes, to some extent. However, it turns out that a great many items published get about the same attention as if published in a vernacular language – and sadly - if not published at all. The distribution of citations, here measured by Google Scholar, which is the most inclusive database for citations, is extremly skewed. In Figure 7 below we have counted Google Scholar citations as of April 2013 of all items (N =156) published in 1998-2002.

Figure 7. Numbers of citations received by each of 156 items published in 1998-2002



Source and notes: Google Scholar as of April 2013. Number of citations on the vertical axis and on the horizontal axis each publication is recorded from highest to lowest citation score.

It turns out that 10 per cent of the items published accounted for more than 50 per cent of the recorded citations and 20 per cent of published items accounted for 70 per cent of the citations. At the other end of the distribution 50 per cent of the items published attracted a mere 10 percent of the citations. A large number of articles attract less than 5 citations.

Nobel Prize laureate Tryggve Haavelmo is reputed to have said to his research students that they should publish only the very best of their contributions.[17] In modern Academia, however, that advice does not seem to be adhered to. Few others than likely Nobel laureates can afford or dare to follow that advice, perhaps.

17. Verbal communication with professor Karl Ove Moene, Oslo University, ca. 1980 confirmed by email in April 2013. Karl Ove Moene was a student of Haavelmo.

But Haavelmo's advice is still worth considering. A little more patience and time should be awarded to young researchers so that they can aim at publishing in a broad category of high quality journals, including the top field journals, rather than rushing to publish prematurely in journals which share the destiny of Festschrift- contributions, a well-known graveyard for senior faculty contributions, of being ignored or rarely cited.[18] The new generation of researchers face an uphill battle, however, since the number of papers published by top 5 journals (top 6 minus Economic Journal) have actually fallen over the last decades. That fall is compensated for by the fact that the number of authors per paper has increased but the rejection rate will probably climb higher from already very high levels. Furthermore almost 40 per cent of the articles in top 5 journals are published in just one, the *American Economic Review*, which, one could argue, is an unhealthy concentration of editorial power. However the number of new journals aiming at high quality standards has also increased in recent years and more realistically this is where space can be found for the publishing of high quality research. There is also an argument for widening the group of broad top journals because the ranking of journals in the interval, say, between 35 and 65 is often arbitrary due to the high variance of citations received by articles.

6. Conclusion

The transformation of the research and publication profile of the Department of Economics is remarkable but not unique in Europe and it follows the pattern of some of the Scandinavian, especially the Stockholm-based, departments.[19] On the European continent similar transitions are now visible. Despite this increasing competition from 'latecomers' from nations such as Germany, France and Italy, the Copenhagen Department has managed to keep or improve its Tilburg Ranking, which is around 15 in Europe, and around 10 in continental Europe.[20] The rankings of adjacent departments depend on the journals included in the ranking and should therefore be treated with some caution. However it is worth noting that the Department has gained permanent presence in the top six category of

18. The present author has to admit that only one of his festschrift contributions ('Market Integration and Convergence in the World Wheat Market 1800-2000', in T.J. Hatton et als (eds) *The New Comparative Economic History, Essays in Honor of Jeffrey G. Williamson,* Cambridge, MIT Press, 2007, 87-114. With Giovanni Federico) has had a modestly successful citation score: 51 as of March 2014, but that others have (close to) zero citations.
19. See Assar Lindbeck's autobiography *Ekonomi är att välja,* Stockholm, Bonnier 2012 pp. 175-196 for a discussion of the modernization of the Institute of international Economics which is part of the Stockholm University.
20. Based on publications in the period 2008 to 2012.

journals which is remarkable since the number of articles published by these journals has stagnated.

Has the improved international recognition of the research from Copenhagen scholars been traded for by a diminishing impact on the domestic economic policy scene? We cannot really answer that question with the data we have been able to collect and analyse, but the issue is worth looking into. A plausible conjecture, which can be tested, is that the share of time academics spend on communication with a broader public has declined, but since the number of academics at the Department has increased, the domestic impact of the Department has not necessarily declined.

Broad top journal publications as used in Department of Economics' incentive programme 2001-2013.

Top five
American Economic Review
Econometrica
Journal of Political Economy
Quarterly Journal of Economics
Review of Economic Studies

Note: Top six as referred to in the text is top five plus Economic Journal and top seven is top six plus Review of Economics and Statistics.

Other broad top journal publications
American Journal of Agricultural Economics
Berkeley Electronic Press Journal of Economic Analysis &Policy (Frontiers and Advances)
Berkeley Electronic Press Journal of Economic Theory (Frontiers and Advances)
Berkeley Electronic Press Journal of Macroeconomics (Frontiers and Advances)
Economica
Economic Journal
Economics Letters
Economic Theory
Econometric Theory
European Review of Economic History
Experimental Economics
European Economic Review
Games and Economic Behaviour
International Economic Review
International Journal of Game Theory
Journal of Applied Econometrics
Journal of Business and Economic Statistics
Journal of Development Economics
Journal of Econometrics
Journal of Economic Behavior and Organization
Journal of Economic Dynamics and Control
Journal of Economic Growth
Journal of Economic History
Journal of Economic Literature
Journal of Economic Perspectives

Journal of Economic Theory
Journal of Environmental Economics and Management
Journal of European Economic Association
Journal of Finance
Journal of Financial Economics
Journal of Health Economics
Journal of Human Resources
Journal of Industrial Economics
Journal of International Economics
Journal of Law and Economics
Journal of Mathematical Economics
Journal of Money, Credit and Banking
Journal of Monetary Economics
Journal of Labour Economics
Journal of Public Economics
Journal of Public Economic Theory
Journal of Risk and Uncertainty
Journal of Urban Economics
Oxford Bulletin of Economics and Statistics
Rand Journal of Economics
Review of Economic Design
Review of Economic Dynamics
Review of Economics and Statistics
Scandinavian Journal of Economics
Theoretical Economics
World Development

Academics and total weighted journal output 1970-2013

Year	Academics (full, associate and assistant professors)	Impact weighted output, ISI Web of science. 2012 edition
1970	13,00	0,00
1971	17,00	0,00
1972	17,00	7,22
1973	20,00	0,00
1974	23,00	0,00
1975	26,00	0,00
1976	32,00	10,77
1977	31,00	3,46
1978	31,00	9,97
1979	31,00	7,02
1980	28,00	1,88
1981	28,00	7,22
1982	29,00	1,94
1983	29,00	11,47
1984	32,00	13,49
1985	32,00	3,18
1986	37,00	2,64
1987	39,00	1,93
1988	42,00	0,00
1989	41,00	14,67
1990	40,00	7,04
1991	40,00	9,47
1992	38,00	8,86
1993	33,00	7,89
1994	32,00	11,85
1995	35,00	8,58
1996	40,00	28,86
1997	42,00	15,66
1998	46,00	30,24
1999	46,00	21,10
2000	45,00	31,05
2001	43,00	34,27
2002	48,00	28,21
2003	50,00	20,56
2004	51,00	27,63
2005	53,00	45,93
2006	50,00	21,87

2007	42,00	20,44
2008	51,00	35,88
2009	50,00	26,76
2010	46,00	43,96
2011	39,00	29,50
2012	38,00	29,27
2013	44,00	24,66