RESEARCH RANKING OF TOP TEN CANADIAN UNIVERSITIES IN ECONOMICS

by

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ABSTRACT

In this paper, I have provided a research ranking of ten top Canadian economics departments. The ranking is based on journal publications in a core set of 63 journals between1997 and 2007. The result shows that the top three departments in Canada are in the University of Toronto, University of British Columbia and University of Montreal. Comparisons of my results with rankings from other literature or rankings based on different criteria suggest that the relative positions of the top three Canadian universities have remained remarkably stable. There are only minor shifts in the relative positions of bottom-ranked universities. More deviations occur for the mid-ranked schools in the baseline ranking. While rankings remain quite stable the actual performance is changing with some moving up quickly and others moving down even amongst top departments. Moreover, it seems that higher ranked departments also have more evenly distributed research performance across all faculty members.

Keywords: research ranking; economics ranking; economics departments; departments ranking; Canadian economics

Subject Terms:

DEDICATION

To My parents, for all your love!

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1. INTRODUCTION

One of the most frequently discussed topics in the economics profession is the research rankings of economics departments. The general public as well as those in academia are always curious to know which economics departments are among the best.

Other than to satisfy the public curiosity, such rankings can also be a very useful tool for faculty, students, universities, governments and even business firms. Faculty members may use the ranking as key information needed to see where his or her department is currently standing. Students, especially those with graduate degree aspirations, can use the ranking as a reflection of the research environment quality of particular institutions as well as a proxy for their expected dissertation quality and job market prospects (Scott & Mitias, 1996). University administrators can use the ranking to evaluate department progress, or as a marketing tool for fund raising and student recruitment. Governments may use rankings as a general guideline to direct scarce research funds to different

universities or departments more efficiently. Business firms may also use the ranking in their hiring process, as a signal of an individual candidate's skill level.

Because of such popularity and usefulness, there has been extensive research literature on rankings of economics departments throughout the world. Many different methodologies have been applied in these studies.

In this section, I will first provide a general literature review of previous studies on ranking economics departments. I will then go on to discuss the objectives of this paper.

1.1 Literature Review of current studies on economics department rankings

In the 1980s, Graves, Marchand, and Thompson (1982; GMT henceforward) provided rankings of US economics departments based on page counts of journal publications between 1974 and 1978 by faculty members and PH.D graduates. Hirsch et al. (1984) provided similar rankings for 24 European economics departments for the period 1978 to 1983. Later Kirman and Dahl (1994) further extended and updated Hirsch's work by including more European Union research institutions and using more recent data from 1987 to 1991.

More recently, Scott and Mitias (1996, SM henceforward) ranked the economics departments of all major US universities (more than 300) based on aggregate journal publication pages of each department's faculty members on a selected set of 36 high quality journals from 1984 to 1993. Dusansky and Vernon (1998; DV henceforward) provided rankings of the top 50 US economics departments based on total publication page counts in eight "blue-ribbon journals"[1] from 1990 to 1994 adjusted for quality differences of the journals. In Asia, Jin and Hong (2008) evaluated the recent development of Asian universities by updating Jin and Yau's (1999) East Asian university rankings based on the page counts of articles published in 60 quality journals between 1990 and 2005.

Other than all the above models that use page counts of journal publications as the main indicator of research ability, there are also other types of measures used in recent literature. For example, Davis and Papanek (1984) ranked US economics departments based on number of citations attributed to

[1] The eight top-tier economics journals listed in DV paper (1998): American Economic Review, Econometrica, International Economic Review, Journal of Economic Theory, Journal of Political Economy, Quarterly Journal of Economics, Review of Economic Studies, and Review of Economics and Statistics.

faculty members. Neri and Rodgers (2006) used average research productivity during 1998 to 2002 and the variability of research productivity among faculty members as the main methodology to rank Australian economics departments. Smyth (1999) provided rankings of US economics departments based on reputation, which was assessed by a recent study of National Research Council (NRC) survey where a sample of scholars from economics field were asked to rate the doctoral program on “scholarly quality”.

In the recent work by Scott and Mitias (1996), the concept of “flow” and “stock” was first introduced in their rankings of US economics departments’ research ability. The flow of research approach gives all credit for published journal articles to the department to which the authors were affiliated at the time of publication. On the other hand, the stock of research approach simply counts a faculty’s past and current research, and then attributes all of it to his or her most currently affiliated department. Based on the above definitions, the flow measure seems to be more suitable when measuring the fluctuations of research productivity over a long period of time, while the stock measure is more appropriate if the objective is to measure a department’s current research reputation and human capital. In other words, the stock approach provides a

“proxy for future research output” (Kalaitzidakis, Mamuneas and Stengos, 1999) for the current institution while the flow is more about past “glories”. In this paper, I will use the stock measure for all the rankings since my interest is the current reputation of the economics departments.

Even though the research literature on ranking departments is extensive, most of them are mainly focusing on US universities only. Research works on economics departments’ rankings for Canadian universities remain quite scanty. In fact, the only recent study focused specifically on Canada is Lucas’s (1995) paper in which he assessed the average publication rates of each individual economist holding tenured or probationary appointment at Canadian universities in the 1989 to 1990 academic year, and then provided a ranking based on the aggregate of average publication rates for each economics department.

Other than Lucas’s (1995) study, I am only aware of three relevant papers which have included Canada in their departmental ranking studies. The first is the study conducted by Coupe (2003), in which he implemented various performance measures such as citations weighted journal ranking by Laband and Piette (1994) to assess each individual faculty’s research output and then

calculated the department rankings according to the faculty's most current affiliation. He presented rankings from different methodologies, compared the difference and provided a general ranking based on the average of these different methods. Another paper by Kalaitzidakis, Mamuneas and Stengos (2003; KMS henceforward) was about research productivity rankings of economics institutions all over the world. They provided detailed journal rankings for more than 100 journals based on citations adjusted by age, impact, self-citation and size. Then they conducted worldwide rankings of economics institutions based on the weighted page counts of journal articles published in the top 30 journals for the five-year period 1995 to 1999. The third relevant study is the "econphd .net rankings" (Roessler, 2004, EPHD hence forward), in which KMS's dataset was updated and extended by using more recent publication data over a wider time range between 1993 to 2003, and applying a slightly different scoring formula where page shares of co-authors are calculated differently. Moreover, EPHD used the stock approach to measure research output instead of the flow approach in KMS.

All three papers above have provided comprehensive rankings of economics institutions including Canadian economics departments. They could

be very good reference points when evaluating the research performance of top Canadian economics departments. In this paper, my ranking results are compared with EPHD and KMS results to evaluate the research ability fluctuations of the top Canadian economics departments over time.

1.2 Limitations of current studies on economics departments rankings

Even though the previous literature on economics departments' rankings provided great insight and different perspectives on how the rankings should be conducted, it is far from perfect. In fact, all the different models and methodologies mentioned above have various limitations which are controversial.

Some common drawbacks in most of the department rankings studies, especially the publication-based rankings, are the timeliness, size and the accuracy of datasets and ranking models.

Timeliness is a problem one should expect to encounter a lot in the literature. It usually occurs in the data collection process of the rankings studies. Since previous studies are all based on journal publications in earlier periods, it is very likely that those publications will be quite outdated now. For example, GMT's (1982) studies on US economics departments' rankings mentioned before

are based on journal publications between 1974 to 1978. Jin and Yau's (1996) rankings of East Asian economics departments used the publication data from 1990 to 1996. Coupe's (2003) worldwide rankings of economics departments only covered publication data from 1990 to 2000. If we were to investigate the current standings of economics departments, these data will clearly not be an accurate reflection of the current state in the profession.

Besides the timeliness problem, size of the journal set used for ranking is another frequently discussed issue when analysing different methods in the previous studies. One can easily see that most of those ranking models use only a limited number of journals as the basis for research output calculation. More specifically, only papers published in a small range of journals are counted towards a department's final research production. As a result, departments that are dissatisfied with their rankings may find a powerful excuse in the narrowness of the journal set. On the other hand, some ranking models use a very wide range of journals in their journal set. In this case, the research output of faculty members will be more appreciated since more of their publications will be counted. However, having a very large journal set would take enormous time and effort in the ranking process because the amount of the data involved will be

overwhelming. Moreover, it will also be more difficult to deal with the quality differences among the large set of journals. It can be argued that the effort is not worth it, as publications in journals outside of the top fifty should not be determining a significant share of research productivity.

Another often-heard critique of the ranking studies is the accuracy of datasets and ranking methodology. This includes the accuracy of faculty rosters, their corresponding publication information, weighting schemes and scoring formulas used in the methodology, etc. All these problems could create uncertainty and flaws in the ranking results. These issues will be discussed in the data and methodology section.

1.3 Objectives of this paper

The objective of this paper is to rectify some deficiencies in the previous ranking literature and provide up-to-date research rankings for the top Canadian economics departments. This is done by constructing a flexible dataset such that one can easily generate and replicate the research ability rankings based on various criteria such as alternate weighting schemes or journal set or even scoring formulas.

The rest of the paper is organized as follows. The “Data and Methodology” section will explain in more detail the data collection process and the methodology of my baseline ranking. I will also discuss some major issues and problems associated with my baseline method and dataset. The “Results” section will provide all the ranking results and some other results on trends over time and concentration of research productivity within leading departments. The analysis and the sensitivity tests of the results will also be presented in this section. The last section will conclude the paper.

2 DATA AND METHODOLOGY

2.1 Data

The primary source of individual publication data are individual CVs downloaded from individual or department websites. However, this should not be the sole source of data because some faculty members do not maintain a website. Moreover, even though the majority of faculties do have CVs on the websites, some are not updated, so this method is not fool-proof. In order to deal with this problem and improve accuracy of the data, I use the online version of EconLit as another source of publication data. The reason EconLit was selected was for its relative completeness compared with other databases. It is widely used by academics as a comprehensive database for economics literature. It contains more than 800 indexed journals and covers a considerably long period of time.

However, it should be noted that referring to EconLit does not always guarantee accuracy of data. In fact, EconLit also has its limitations and was criticized in various ranking literatures for its shortcomings and errors. For

example, Neri and Rodgers (2006) pointed out that articles with several authors are frequently referenced using the ‘et al’ convention in EconLit. I have also encountered this problem when searching the publication data facilities through EconLit. This could become quite troublesome since it is very likely to miss some publications simply because the authors’ names are not explicitly displayed. Moreover, EconLit does not standardize the names of the authors and departments. As a result, there could be spelling errors in names which create search problems. For example, it could return no search result for a faculty member even though he or she actually has publications, simply because the name does not match the recorded name in EconLit. All the above problems associated with EconLit can be reduced to a significant extent by careful inspection. As for the practice in this paper, I have conducted numerous internet searches for each faculty member and cross-checked the records on the EconLit with the information on individual CVs when available. This includes checking the accuracy and consistency of authors’ names, article titles, publication dates, the number of pages, and so on. Finally, if there is a published article by an individual displayed on EconLit but not on the CV, I will still count this article and attribute credit to the author. The same procedure applies when a published

paper is listed on the CV but not on the EconLit. By combining the search results from both sources (individual CVs and EconLit) I hope to improve completeness and accuracy of the publication data in my dataset.

2.2 Methodology

2.2.1 Overview of the methodology

The methodology used in this paper to rank the research productivity of economics departments in Canada is very similar to that of Econphd.net ranking (EPHD henceforward) by Roessler (2004)[2]. My baseline method differs only in the scope of the ranking, the method for determining the individual's departmental affiliation, and the time period considered . The EPHD ranking worked on a sample of more than 300 economics departments across North America while my ranking is focused on the ten top Canadian economics departments only. One major problem for rankings with larger scope is the difficulty in dealing with departmental affiliations. It becomes a formidable task to look up every author's most current department affiliation. The solution provided by the EPHD ranking to this problem is to use the affiliation listed first in the

[2] Details of the EPHD study can be found in http://www.econphd.net/rankings.htm

author's most recent article abstract in JEL[3]. However, using this method will cause an author's affiliation to be assigned incorrectly if he or she has not published any research work since moving to a new department or has listed another department first. Thus there may be serious time lags and other inaccuracies. In contrast, the much smaller scope in my ranking model allows me to track affiliations manually and thus makes it possible for me to determine each individual's current affiliation more accurately.

Finally, the EPHD ranking covers the eleven year period 1993 to 2003, and my rankings advance the clock by four years to cover the period 1997 to 2007. The reason I choose 2007 as the end year rather than a more recent year such as 2008 is that there is usually a time lag for a published article to be recorded in the EconLit database. Furthermore, there is often a lag in updating CVs. I have noticed when looking at individual CVs that many individuals have 2008 publications as forthcoming. So setting the end year too recent will not make a difference in the outcome of the rankings since the forthcoming articles will not be included in the dataset anyway.

[3] Journal of Economic Literature

Other than the differences discussed above, all other components of my baseline ranking methodology will be that of EPHD approach. For example, like EPHD, the stock approach is used so that all the rankings in this paper assign papers to authors and then affiliate authors to departments.. Moreover, the journal set and the scoring formula used to determine departments' research output in baseline ranking are the same as the EPHD ranking model. Details on these methodological issues follow.

2.2.2 Four steps of the ranking process in the methodology

There are four main steps in my ranking method. First, the rankings are based on page counts of journal articles published in 63 top quality journals over the period 1997 to 2007 by the faculty members in each of the ten "top" Canadian economics departments. The ten Canadian economics departments analyzed in my rankings are: *University of Toronto* (UOT henceforward); *University of British Columbia* (UBC); *Queen's University* (QUEEN); *University of Laval* (LAVAL); *University of Western Ontario* (UWO); *University of Montreal* (UOM); *York University* (YORK); *McGill University* (MCGILL); *University of Calgary* (UOC); and *Simon Fraser University*). These universities were selected

based on the ranking results from EPHD. The one exception was that I replaced the tenth ranked department in EPHD[4] with UOC. This was because UOC has been perceived to be moving up in recent years with the appointments of some highly productive researchers such as Professors Scott Taylor and Curtis Eaton.

Departmental affiliations are primarily based on department websites at each university. Here I am only interested in full-time (non-retired) tenure track faculty with economics being their home department as of September 2007. Adjunct faculty members are not included because their affiliations usually differ from the schools to which they are adjunct. Graduate students are excluded because their affiliations are not permanent. The faculty rosters obtained were then confirmed by the respective department to assure accuracy of faculty information and reduce the uncertainties brought by faculty relocations.

The sixty-three economics journals included in my baseline journal set are exactly those of EPHD paper. These 63 journals selected in EPHD were chosen based on the journals rankings from KMS (2003). The rankings were adjusted for impact, age, self-citations as well as size of the journal[5]. The list of these 63

[4] University of Quebec is ranked 10th in EPHD ranking

[5] Table 1 column 5 of the journal ranking in P22-23 of KMS paper(2003)

journals provides a rich group of research outlets for all large economic fields and "accounts for more than 90% of all citations" (KMS, 2003). Furthermore, as previously mentioned, a major advantage in choosing this particular set is that by maintaining consistency with EPHD we can look at progress in department's research output going back to 1993 and across the two studies. In any case I will discuss and examine robustness of my rankings to the journal set below.

The second step is to collect and compile the publication information from CVs and EconLit for all individuals affiliated to the ten departments. The publication information includes: article titles; names of all the authors; publication time; number of co-authors; number of affiliations; the journal in which the article is published; and the number of pages of the article. Notice that only refereed publications are considered in my rankings. Book reviews and book chapters are excluded because they normally undergo very little peer review or might be just a collection of previously published articles. Conference papers are excluded because they are "likely to be submitted to a refereed journal later" (Neri & Rodgers, 2006, p. 77). Errata, corrigenda, comments and all other similar articles are excluded because they are usually supplements of a journal article published already and therefore do not contain any research work themselves.

Furthermore, affiliations corresponding to research centres that do not offer a permanent home base will not be counted. If an author includes such research centres as joint affiliations for his or her publications, all the weights will be attributed to his or her primary affiliation. Finally, any research output produced at non-academic centres such as the World Bank, the IMF and central banks will not be considered here. The decision not to include those research centres and non-academic centres is because the primary objective of my paper is to evaluate research activities carried out at academic institutions. Including research centres that do not offer a permanent home base and non-academic centres will not constitute a reasonable comparison since they normally have different job obligations compared with academic institutes. Academics usually have teaching duties and therefore will not be able to be fully engaged in research works. On the other hand, there could be cases where a researcher might only be affiliated with a research centre but not really employed there so that he or she is not actually doing any research work for that research centre. The final list obtained which contains the full faculty roster and the corresponding publication information will then be used in the next step to compute the total research output of each university.

The third step assigns scores to the ten departments based on page counts of journal publications by affiliated department members in the selected journal set, during 1997-2007. There are several important issues regarding the scoring process, which need to be addressed and dealt with here before carrying out the actual calculation.

The first issue is how to account for the quality differences of the journals included in the journal set. There is a wide range of weighting schemes used in the literature to deal with journal quality differences. All these weighting schemes aim to assess the relative quality of different journals, so that we can assign a score to a CV. In general, there are two ways to measure relative quality of journals. One approach is to evaluate perceptions of journal quality through surveys involving reputable economists and scholars (for example, Axarlaglou & Theoharakis, 2003), and then obtain the relative quality based on the survey results. Another approach is to assign weights to the journals based on the citations counts of articles in them (for example, KMS). The citation counts are then used to determine weights by calculating impact factors. There is an extensive literature using various sophisticated mechanisms to compute impact factors based on citation counts (Liebowitz & Palmer, 1984; Laband & Piette,

1994). In this paper, I have decided to use the more objective impact factors rather than surveys because it is the most frequently used criterion to rank economics journals. More precisely, I have used the impact factors for the top 63 journals calculated by KMS (2003) to generate my baseline departments' rankings. One reason to choose KMS impact factors is that they are the most updated and comprehensive weighting schemes available for economics journals. Moreover, KMS impact factors are more accurate indicators of the journal quality because they not only take account of the size, age and self-citations of economics journals, but also adjust for factors such as prestige and impact, which are normally ignored in other papers.

Furthermore, I have decided to take the log of the KMS index before multiplying it with the page share. The KMS index runs from 0 to 100, with AER ranked 1st in KMS journal rankings and thus being standardized to 100. The lowest ranked journal in the journal set is the *Journal of Institutional and Theoretical Economics* (ranked 63th in KMS journal rankings, JITE henceforward). It has a KMS index of value 2.01. Without taking the log, one AER publication will be equivalent to approximately fifty JITE publications with the same size. This seems a bit too punitive for lower quality journals in the

journal set. By taking the logs of KMS index, the quality distribution of journals will be much less spread out. The ratio between AER and JITE will be reduced to about 1 to 7 (log100 / log 2.01) which seems more reasonable. In addition, this is also the approach used in EPHD rankings, as a result, the comparison of my baseline ranking results with EPHD ranking results will be meaningful. Again, the importance of this decision for my rankings will be explored in my work by trying alternatives.

The second issue is how to account for size differences across various journals. Pages in some journals might be larger and contain more characters per page than other journals. It is important to standardize the pages of all different journals so that they can be measured in a common unit both in terms of size and quality. Thankfully, the KMS impact factors that I have chosen above do adjust for both quality differences and page size differences between journals. As a result, I can simply multiply the total pages of an article by the KMS impact factor of the specific journal where the article is published in order to adjust for size and quality differences between journals. The result generated here is generally referred to as “adjusted pages” in the ranking literature. Notice that different kinds of impact factors will generate different adjusted pages. However,

the purpose is all the same, that is to convert page counts of articles in different journals to a common unit such as the equivalent-pages in a pre-determined standard journal, so that they can be compared. In this paper, using the KMS impacts factors, the publication numbers are AER-equivalent page counts. So any articles published in the selected journal set by the faculty members will now be represented as AER equivalent pages in terms of quality and size. These are determined for each faculty member and are used later to compute the score for their total research output.

The third issue is the weighting of co-authored papers and papers with authors who have multiple affiliations. It is quite common to see published journal articles written by more than one author. How should we calculate the page share of each author in this case? The conventional practice in most of the ranking literature is to attribute 1/n of the total pages of a paper to each of the n authors, which means each co-author is apportioned an equal share of the paper. There is debate, however, in which some suggest that each author should get more than 1/n of the paper, and they assign $1/n^{1/2}$ of the total pages to each of the n authors in their ranking models. In this paper, I have decided to compute the page share a little bit differently by following the approach in the EPHD

ranking model in which page share is equal to pages*2/(1+n) where n is still the total number of authors. Under this weighting scheme, if n = 1, the author gets full credit for the paper. However, when n > 1, each author is allocated more than 1/n of the total pages, which means each author receives more partial credit than the conventional approach. Since all these three mechanisms to assign page shares to co-authors are subject to constant debate and could make sense under different contexts, my baseline case will be EPHD's 2/(1+n) but I will present and compare the ranking results based on a wide range of discounts to test the robustness of my baseline ranking results.

Other than the problem of multiple authors for an article discussed above, there are also occasions where an author indicates affiliations[6] to more than one department. Suppose there are m affiliations listed by an author (m>1), in this case, each affiliation will be allocated 1/m of the total pages.

Combining all the adjustments for the above issues together, my scoring formula for each entry (an article by a faculty member in a department) in my baseline rankings is as follows:

[6] Qualified affiliation only as have mentioned above (i.e. academic institutions only)

*Score = [TP * 2/(1+n) * 1/m * log (KMS)] / 100*

TP: total pages of the article

KMS: KMS impact factor of the journal in which the article is published

n: the total number of authors of the article (including the faculty member himself or herself)

m: the total number of affiliations listed by the faculty member

In the formula, the total page share of an entry is indicated by the term “TP * 2/(1+n) * 1/m”. This page share has adjusted for number of authors (n) and affiliations (m). Therefore, the term could also be interpreted as the total number of pages of a journal article that an author will receive credit for. The result of “TP * 2/(1+n) * 1/m * log (KMS)” is then normalized by dividing by 100 to keep numbers of manageable size. To summarize, a 50 pages article published in the AER by a single author affiliated with one department will have a score of 1.

Once the scoring formula is specified, the score for a given publication is assigned. Scores for all papers published by an individual during the period are totalled to determine a score for the individual. Individuals are affiliated to a department and scores for a department are then determined by summing across

all department members. Finally, the last step in my ranking process is to rank the ten economics departments based on their total scores. The results of my baseline department rankings are presented in Table 1 in the Results section below.

Other than computing the total scores based on journal article publications to reflect the volume of each department's research output, I have also decided to investigate the distribution of research productivities across department members for each department. More specifically, I am interested to know whether a department's high ranking is due to the presence of a few extremely productive scholars or whether it is due to the consistent, although not necessarily stellar, performance across all faculty members. This might be quite helpful for the potential graduate students who are considering which department to apply to, see Scott & Mitias (1996). The students who wish to specialize in a particular area might prefer the departments that have most of the research output concentrated on few "superstars", as long as the superstars are also specialized in his or her area of interest. The students looking for more general training might prefer the departments with less "superstars" but more uniform productivity.

In order to quantify such differences between the ten economics departments, I have followed the study of Scott and Mitias (1996) to generate the Herfindahl indices for each of the ten Canadian economics departments. Herfindahl index is a tool used to measure the “concentration” phenomenon quantitatively. It enables the researchers to estimate whether all the faculty members in a department are actively involved in research or whether the research activity is concentrated on just a few “superstars”. Because of such functionality, most scholars also call it “concentration index”. The Herfindahl index is calculated according to the following formula:

$$H = [(X_1^2 + X_2^2 + X_3^2 + \ldots + X_n^2) / T^2] * n$$

H: Herfindahl index

X_i: the score (or AER-equivalent page share adjusted for quality and size) of the i^{th} faculty member

T: the department’s total score

n: the number of faculty members in the department

Notice that the lower bound of the Herfindahl index is 1, in this case, the department’s total research output is equally distributed among all faculty

members. The upper bound is n, meaning that all the department's journal publications are produced by one faculty member only. Therefore, the higher the Herfindahl index, the more likely a department's high ranking is due to the performance of a few superstars. The Herfindahl indices for all ten economics departments will be presented together with the baseline ranking results in table 8 of the Results section.

2.2.3 Major concerns regarding the methodology and my response to them

Even though the baseline rankings above are like those in EPHD and seem to have provided a sensible research ranking of departments, the ranking methodology is not uncontroversial and so the sensitivity of the ranking results is an open question. In general, most of the concerns are focused on two major issues: the selection of journal set and the weighting scheme employed. In the next two paragraphs, I will provide some detailed discussions regarding these two issues and how I have responded them in my ranking model.

The first major concern is about the selection of the journal set. As I have mentioned at the beginning of the methodology section, the journal set in my baseline rankings consists of 63 top-rated economics journals which cover a

wide range of research fields in economics and account for more than 90% of all the citations received by economics journals. This is a rather inclusive journal set as compared with most other ranking models in the literature. Some scholars might perceive this as problematic due to the quality differences between the journals. More specifically, these scholars might argue that the larger the journal set, the more likely there will be disagreement over the relative quality between different journals. They prefer to use a much smaller journal set that contains only the most prestigious economics journals. For example, Dusansky and Vernon (1998) looked at the top 8 journals only, Kalaitzidakis, Mamuneas and Stengos (1999) had a journal set of top ten journals. They believe that with a smaller journal set, it will be much less likely to create debate over quality gaps since there is considerable agreement on the top-rated journals such as AER, Econometrica and Journal of Political Economy, etc. Therefore, publications in these high-end journals might be a better indicator of a department's research ability. Moreover, those top journals account for a large proportion of citations, for example, the citations received by the top 9 economics journals[7] are already

[7] AER, Econometrica, Journal of Political Economy, Journal of Economic Theory, Quarterly Journal of Economics, Journal of Econometrics, Econometric Theory, Review of Economic Studies, Journal of Business and Economic Statistics

more than 60% of all the citations received in the profession (KMS, 2003). An implication is that excluding other journals should not alter the overall ranking results much since the impact factors for other journals are so small that they would not make much differences in the calculation of total scores.

Meanwhile, there are also some scholars who argue that a huge journal set should be used so that more research works can receive credits. An example would be Coupe's (2003) paper in which he computed one of the rankings based on a journal set consists of more than 700 journals. The rationale behind that argument is that any research publication involves some amount of effort and therefore should not be ignored. Using a small journal set will penalize publications in lower quality journals since these publications will be very likely to receive zero credit simply because the lower quality journals are not included in the smaller journal set.

The second subject of debate is the weighting scheme employed in the rankings. This is understandable since different people may have different preferences over the methodology by which to obtain the journal rankings and the weighting of those journals' relative quality. The fact that I have chosen the

KMS impact factors as the weighting scheme in my baseline rankings does not necessarily mean others have to choose the same. In fact, there are extensive studies on various economics journal rankings and their corresponding weighting schemes, such as the LP index mentioned in the literature review part of the introduction. They all have their own set of criteria and mechanisms to rank journals and rate relative qualities. It would be ideal to apply all these different weighting schemes in my rankings and compare the results. However, the amount of work involved would be well beyond the scope of this paper.

Although there is much disagreement over the journal set selection and the weighting schemes, I think all these disagreements and arguments have their own merit and could be reasonable under different context. I have been well aware of them during my research and have made a lot of effort to deal with them when constructing my dataset. As mentioned in the introduction, the baseline dataset that I have built can easily be adjusted to allow ranking using alternate weighting schemes or journal sets or even scoring formula. Therefore, one can apply various approaches to generate the rankings based on their own preference.

In order to respond to the concerns over the size of journal set, I have re-ranked the ten departments based on top-30, top-10 and top-5 journal sets to see whether the size of journal set has any effect on the ranking results. In addition, I have also considered alternative scoring formulas by eliminating the log (as in KMS) and using different weighting schemes for co-authorship and affiliations. Finally, I have also compared my baseline rankings results with the results from EPHD and KMS to capture the trends over time. All these practices are quite useful for testing the sensitivity of my baseline rankings results and in adding more depth and scope to my analysis of the results.

3 THE RESULTS

Table 1 presents the baseline research rankings for the top ten economics departments in Canada. The ranking is based on journal publications in the top-63 economics journals adjusted for quality. According to the scores in Table 1, the economics departments at UOT and UBC are ranked one and two in Canada with scores of 53.06 and 46.52 respectively[8], respectively. In other words, these two economics departments have the highest aggregate research output. It could also be observed from the table that there is a large gap between the second (UBC) and third place (UOM) in the ranking, UBC's score (46.52) is more than 150% of the score of UOM (28.48). Then the gap seems to be milder between the four universities ranked from third to the sixth (UOM, Queens, SFU, McGill). Finally, the last four universities (UWO, Laval, Calgary, York) all scored significantly lower (less than 50%) of the top three universities in the ranking. So overall, there are three clusters based on the scores in the baseline ranking: UOT and UBC are clearly the top-tier elite cluster with dominant performance in

[8] All the scores are rounded to the second decimal

terms of aggregate research output. A second cluster is comprised of UOM, Queens, SFU and McGill. The economics departments in these four universities have moderate journal article production both in terms of quantity and quality, and their total scores are very close to each other, meaning that the research output of these four universities are quite comparable to each other. The final cluster includes all the remaining four universities: UWO, Laval, UOC and York. They all have many fewer journal article publications and the quality level is also lower. The large productivity disparity across the departments might be the cumulative outcome of several factors such as differences in resources, quality of human capital, incentive structures and so on. In general, the scores presented in Table 1 should give us a good insight into the current aggregate research output of these top ten Canadian economics departments.

Table 2 shows these baseline ranking results together with the results from EPHD ranking and KMS ranking. Both EPHD and KMS rankings are based on quality-adjusted publications and faculty rosters from earlier periods[9]. The purpose here is to compare the research performance of these ten economics

[9] EPHD is based on journal publications between 1993 and 2003 and faculty rosters taken in 2003 (but with lags). KMS is based on journal publications between 1995 and 1999, and the faculty roster was taken in 1999.

departments for different periods and observe the changes that have occurred across these periods. In addition to the direction of the changes, one might also be interested in the magnitude of those changes. Therefore, I have also quantified the changes of research output across time by computing the percentage change of each university's aggregate score in the baseline ranking compared with EPHD ranking. These are comparable because my baseline ranking and EPHD ranking both use exactly the same scoring formula and cover a period length of 11 years but only differ in the period covered. The comparison is presented in column 6 of table 2. From column 4 and 5 of the table, we can see that while there are some relatively large changes for some universities, the rankings do not change radically over these three studies. The two schools that have improved most recently (compare my results with EPHD or the KMS rankings) are SFU and McGill. The improvements from the previous rankings are likely due to the inflow of highly productive researchers such as Arthur Robson at SFU and Russell Davidson at McGill. In contrast, the rankings results seem to fall noticeably at York and UWO. The main reason could be the exit of valuable researchers and the lack of publication at the high quality research outlets such as the top-5 economics journals. For example, in my current dataset for the

baseline rankings, York only contributes 0.1% of the total publications by the ten universities in the top-5 economics journals during the period 1997 to 2007. This small share of high quality publications makes York's aggregate score low when adjusted for quality. Results from column 6 further illustrate our findings. Notice here that we should not just look at the ranking changes and ignore the percentage changes of aggregate research output over time. It is quite possible for some schools to have only minor changes in terms of ranking but substantial changes in aggregate research output. For example, UBC's ranking only falls by one position in the baseline ranking compared with EPHD ranking, however, its total research production has dropped by 24.49%, which is the second largest drop in the ranking. Meanwhile, UOC's total research output has increased by over 79% even though its ranking has only improved by one position from the EPHD ranking results. Therefore, one should always combine the results in column 4 and 6 in order to interpret the trend more completely and objectively.

Based on the information from tables 1 and 2, I have also looked at trends in research activity in the East versus the West over time. The ten economics departments are divided into two groups. Group 1 consists of LAVAL, UOM, McGill, Queens, UOT, UWO and YORK, and group 2 includes UOC, UBC and

SFU. These two groups of universities are from the east and west of Canada. I have summed up the aggregate research output of the two groups respectively based on my baseline ranking results and then compared with the sum computed based on EPHD ranking. The purpose of such comparison is to test whether the public perception that "there has been a shift of scholarly activity from east to west among Canadian economics departments" is credible. After careful calculation, it seems that the relative research output of group 1 compared with group 2 has increased over time[10]. Therefore, the public claim is probably not quite the case; the scholarly activity is probably flowing from west to east in Canada.

Table 3 tests the sensitivity of the baseline ranking results by considering alternative journal sets. More specifically, different results are generated by using the same ranking methodology with different subsets of journals. In table 3, column 1 is the baseline ranking based on the top-63 economics journals, column 2,3 and 4 are the ranking results based on top-30, top-10 and top-5

[10] The aggregate research output of group 1 is 152.1 and the output of group 2 is 81.6 based on EPHD ranking results.

The aggregate research output of group 1 is 165.9, and the output of group 2 is 81.4 based on my baseline ranking results

economics journals respectively. The purpose is to compare these ranking results and see whether they are sensitive to different journal set sizes. Based on the comparisons in table 3, it seems that the rankings of the top 3 departments (UOT, UBC and UOM) are unchanged irrespective of the journal set size selected. This should not be surprising to us since these three departments have been traditionally the strongest in Canada and have emphasized publications in high quality journals continuously for the past decades. In fact, according to the records in my baseline dataset, these three economics departments account for more than 68% of all the publications in the top-5 economics journals during the period 1997 to 2007 by the ten top Canadian economics departments considered here.

Another interesting pattern observed from table 3 is that the bottom end of the rankings also remain remarkably stable, while the majority of changes occur among the mid-ranked schools. This is especially true as we reduce the journal set size to smaller numbers such as top-10 and top-5 journals. This feature probably indicates that the aggregate production in bottom-ranked schools is quite low regardless of the journal set size. Moreover, it also reflects the different research strategies employed by the mid-ranked schools. Some might

concentrate more on producing high quality research work in the few top journals only (such as McGill), while others (such as Queens and SFU) might emphasize more on the diversity of research and therefore do not focus too much on publications in a small set of top journals only.

Furthermore, if we look at the ranking result in table 3 for York University, it's quite obvious to see that its total score is reduced enormously as we reduce the size of journal set. This is also true for the relative score of York compared with the top-ranked universities such as UOT. When the ranking is based on publications in top-63 journals, UOT's total score is around 5.5 times the score of York. However, when the journal set size is changed to top-5 journals, UOT's score becomes almost 272 times of York's score. This would clearly be too punitive for York University and should not be taken as an accurate measure of reality. The occurrence of such phenomenon probably implies that restricting the journal set to a very small number may not be a good idea.

Finally, I have also noticed from the statistics in the dataset that the high-ranked departments are also the main contributors of top quality journal publications. This percentage of contribution to total output becomes even more

skewed in favour of the high-ranked departments as we look at the publications in the top-10 and top-5 economics journals. For example, the top 3 departments in the baseline rankings (UOT, UBC and UOM) account for 51.8% of the total publications in the top-63 journals, the percentage increases to 53.3% as we reduce the journal set to top-30 journals, and it further increases to 61% and 68.3% when the journal set is restricted to top-10 and top-5 journals. This finding implies that a major reason for a department to do well in the baseline rankings is probably emphasizing the quality of research output and to focus more publications in top quality journals.

Generally speaking, altering the journal set size while holding other components of the methodology unchanged does not have much impact on the final ranking results. No considerable variability is observed for the top and bottom of the ranking, the changes in the rankings of mid-ranked schools are all within a small number of steps up or down. The overall structure of the baseline ranking remains intact regardless of the different journal set sizes selected.

Table 4 and table 5 further check the robustness of the baseline ranking results by replicating the ranking based on different scoring formulas. Each table

here will stress a different factor of the ranking methodology. In table 4, the scoring formula is modified by removing the log in the baseline scoring formula. Many other ranking literatures have applied similar practice in the calculation process of their ranking results (for example, KMS, 2003; Coupe, 2003). Without the log in the scoring formula, the quality distribution of the economics journals included in the journal set will be more spread out while their relative positions still remain the same. As a result, an author will be penalized more for publishing in lower quality journals since the relative quality of a lower quality journal compare with a top quality journal has been decreased significantly[11]. This is of course similar to reducing the set of journals in that the weight on low ranked journals is reduced either way (to zero if it is removed). The new scoring formula now becomes:

*Score = [TP * 2/(1+n) * 1/m * (KMS)] / 100*

TP: total pages of the article

KMS: KMS impact factor of the journal in which the article is published

[11] For example, the quality index (KMS) of AER is 100, and for JITE is 2.01. With log, one page in AER is equivalent to around 7 pages in JITE (log100/log2.01), without log, one page in AER will be equivalent to around 50 pages in JITE (100/2.01). Clearly the relative quality of JITE compared with AER has decreased enormously when taking off the log in the scoring formula.

n: the total number of authors of the article (including the faculty member himself or herself)

m: the total number of affiliations listed by the faculty member

New departmental rankings are calculated based on this scoring formula and compared with the baseline rankings. In table 4, column 1 is the baseline ranking, column 2 shows the ranking results calculated from the new scoring formula based on top-63 journals, column 3, 4 and 5 use the same new scoring formula as column 2 but are based on top-30, top-10 and top-5 journals respectively. After comparing all the results in table 4, it seems that the new rankings results are almost the same as the baseline ranking results regardless of the scoring formula used and the size of the journal set. This implies that the effect of a more spread out journal quality distribution after taking off the log is not sufficient to overcome the differences in the total research output between the ten departments. It is probably due to the fact that high-ranked departments also have higher proportions of their research works published in the top-rated journals as have observed from my baseline ranking data. Therefore, they benefit

much more from high research output quality and are penalized less for lower quality publications when taking off the log in the scoring formula.

In table 5, the new scoring formulas will differ from the baseline scoring formula in the weighting schemes implemented for co-authors. Three new scoring formulas are used, each with a different way to calculate page shares for co-authors. Column 1 of table 5 shows the baseline rankings results, column 2 presents the results when each co-author of an article gets 1/n page share where n is the total number of authors for that article, this is also the conventional way to compute page shares of co-authors in most ranking literatures. Column 3 implements another commonly used method to calculate page shares where each co-author is accredited $1/n^{1/2}$ of the total pages. Column 4 shows the result when there is no adjustment at all for co-authors. In this case, the number of co-authors for a publication will not matter anymore and this is the extreme case of no discounting for co-authorship. In column 5, 6 and 7, I have presented the ranking results when the log is excluded from the scoring formula under the three weighting schemes applied in column 2, 3 and 4. The mathematical expressions of the corresponding scoring formulas for column 2, 3, 4, 5, 6 and 7 rankings are:

*Score = [TP * 1/n * 1/m * log (KMS)] / 100* *(column 2)*

*Score = [TP * 1/(n^1/2) * 1/m * log (KMS)] / 100* *(column 3)*

*Score = [TP * 1/m * log (KMS)] / 100* *(column 4)*

*Score = [TP * 1/n * 1/m * (KMS)] / 100* *(column 5)*

*Score = [TP * 1/(n^1/2) * 1/m * (KMS)] / 100* *(column 6)*

*Score = [TP * 1/m * (KMS)] / 100* *(column 7)*

TP: total pages

n: Number of authors

m: Number of affiliations

KMS: KMS impact factor for the journal in which the article is published

Comparing the new rankings results in column 2, 3, 4, 5, 6 and 7 with the baseline ranking results in column 1, we can see that the ranking positions of all the ten universities remain almost unchanged regardless of the scoring formula used to assign page shares to co-authors. This could either be because the weighting scheme of co-authors does not have much impact on the aggregate research output count of a department, or it does affect the research output

calculation but the scales of the effect are almost the same for every department. The latter should be a more realistic interpretation based on the production patterns of the ten departments. More specifically, I have noticed from the records in my baseline dataset that, for all the ten economics departments evaluated, very large proportions of the journal publications are written by more than one author. As a result, the alternative ways to count page shares for co-authors should have significant impact on the total score of a department. However, since all the ten departments have similar proportions of their journal articles published by multiple authors, the scale of the impact from different weighting schemes for co-authors could be very close to each other. Consequently, the relative ranking positions of the departments could remain almost unchanged.

If we replicate the rankings in column 2, 3, 4, 5, 6 and 7 of table 5 based on smaller journal sets such as the top-5 journals, it can be observed that there will be some minor changes of the ranking results. These changes mainly occur on the mid-ranked departments while the results in the top and bottom of the rankings remain remarkably stable. A similar phenomenon has been observed and discussed in table 3. So I will not further explain the cause here since the

arguments will be exactly the same. Table 6 will present the results of the replicated rankings.

Until now, I have not considered the size differences between departments. It should be noticed that, since all the rankings above are based on the aggregate research output of the departments, the rankings results will be automatically biased in favour of larger departments. This is because larger departments that have more faculty members will be more likely to publish a lot and score high in our rankings above for total research output simply because of their size. An easy solution provided in many other ranking literatures to correct for this size bias is to compute the average scores of each department and construct a new ranking based on the average scores calculated (for example, Neri & Rodgers, 2006). This is equivalent to rank the departments on their average research productivity. In addition, there are also some researchers who deal with this problem by restricting the number of people involved in the calculation of aggregate scores such as taking the top 15 or top 20 best performing faculty members only, and then rank the departments based on the total scores calculated under such restriction (for example, Scott & Mitias, 1996). In this paper, I will take the most popular approach by calculating the average

scores of each department. Table 7 will present the averages and the departmental rankings based on the average scores. Column 1 shows the baseline ranking results and column 2 presents the average productivity ranking.

From the results in table 7, we can see that most of the changes occurred are minor (within one rank) The one exception is UOT, which drops three positions from number one in the baseline ranking to number four in the average productivity ranking. This is because UOT is a very large department. From the record on the dataset, UOT has a list of 64 faculty members in September 2007, which is almost twice the size of most other departments. The large faculty roster makes UOT's average scores more susceptible to the size problem discussed above. The fact that UOT's average rank is lower than its aggregate rank (baseline ranking) implies that size is having negative impact on the average rankings of UOT, and UOT's high aggregate research output is more likely caused by its large faculty size rather than high average productivity of individual faculty members.

Even though the departmental rankings based on average research productivity provides a simple solution to the size difference between

departments, one should not rely too much on it in this paper, because the main purpose of all the rankings in this paper as has mentioned in the methodology part is to provide a “stock measure” of each department’s total research output, which can also be perceived as the current reputation of the departments. As a result, we may not want to rule out that being big is good in itself. Imagine the perspective of a graduate student applicant comparing two departments.

In table 8, the Herfindahl indices for all the ten economics departments are calculated. Column 1 shows the baseline ranking results and column 2 presents the Herfindahl indices and the corresponding ranking by concentration. As I have mentioned in the data and methodology section, the Herfindahl index measures whether a department’s research output is concentrated on a few highly productive star researchers or more evenly distributed across all faculty members. The higher the index, the more likely that the department’s high score is due to the performance of few “superstars”. From the results in table 8, we can see that the school with the highest Herfindahl index is McGill, which means that most of McGill’s journal publications are published by few highly productive scholars. This is consistent with my baseline dataset records in which more than 73% of McGill’s total research output is from their top six researchers. UOT also

has a very high Herfindahl index, which is also consistent with the finding from the dataset records that more than 57% of UOT's total research output is concentrated on their top ten researchers. Another interesting pattern in the table is that: the schools that ranked higher in the baseline rankings such as UBC and UOM normally have lower Herfindahl index, while the schools ranked lower in the baseline rankings such as York and Laval usually have high Herfindahl index. This is probably an indication that the departments with better aggregate research outputs are also the ones that have more evenly distributed productions across faculty members. For example, notice that four of the top five research departments are in the bottom five on research concentration (UOT being the one exception). In other words, research activity is usually wide-spread in good research departments.

Table 1 Baseline Ranking for aggregate research output

University	Baseline Ranking (Top-63 journals, 1997-2007)	
	Score	**Rank**
UOT	53.06	1
UBC	46.52	2
UOM	28.48	3
QUEENS	27.43	4
SFU	23.38	5
MCGILL	19.47	6
UWO	14.55	7
LAVAL	13.10	8
UOC	11.50	9
YORK	9.82	10

Notes:

Baseline Ranking:

Score = [TP * 2/(n+1) * 1/m * log (KMS)] / 100

TP: Total pages

n: number of authors

m: number of affiliations

KMS: KMS impact factor for the journal

Table 2 Comparison of Baseline ranking results with EPHD and KMS ranking results

University	Baseline Ranking (Top-63 journals) Column 1		EPHD Ranking (Top-63 journals) Column 2		KMS ranking Column 3
	Score	Rank	Score	Rank	Rank
UOT	53.06	1	42.5	2	1
UBC	46.52	2	61.6	1	3
UOM	28.48	3	27.4	4	2
QUEENS	27.43	4	28.3	3	4
SFU	23.38	5	13.6	6	9
MCGILL	19.47	6	11.9	9	8
UWO	14.55	7	16.5	5	5
LAVAL	13.10	8	12.3	8	7
UOC	11.50	9	6.4	10	10
YORK	9.82	10	13.2	7	6

University	Rank Change (Compare with EPHD) Column 4	Rank Change (Compare with KMS) Column 5	% Change (Compare with EPHD) Column 6
UOT	+1	0	24.84%
UBC	-1	+1	-24.49%
UOM	+1	-1	3.94%
QUEENS	-1	0	-3.08%
SFU	+1	+4	71.92%
MCGILL	+3	+2	63.65%
UWO	-2	0	-11.81%
LAVAL	0	-1	6.53%
UOC	+1	-1	79.72%
YORK	-3	-4	-25.58%

Notes:

EPHD: the ranking results from ECONphd.net article, based on journal publications on the top-63 journals between 1993-2003.

KMS: the ranking results from Kalaitzidakis, Mamuneasand Stengos paper (2003), based on journal publications on the top-30 journals between 1995-1999.

Table 3 Baseline rankings based on different journal sets

University	Baseline Ranking (Top-63 journals) Column 1			Baseline Ranking (Top-30 journals) Column 2		
	Score	Rank		Score	Rank	Rank Change
UOT	53.06	1		45.67	1	0
UBC	46.52	2		39.78	2	0
UOM	28.48	3		23.34	3	0
QUEENS	27.43	4		23.18	4	0
SFU	23.38	5		18.51	5	0
MCGILL	19.47	6		15.39	6	0
UWO	14.55	7		12.50	7	0
LAVAL	13.10	8		10.57	8	0
UOC	11.50	9		6.89	10	-1
YORK	9.82	10		8.21	9	+1

University	Baseline Ranking (Top-10 journals) Column 3			Baseline Ranking (Top-5 journals) Column 4		
	Score	Rank	Rank Change	Score	Rank	Rank Change
UOT	27.28	1	0	14.50	1	0
UBC	23.10	2	0	13.06	2	0
UOM	12.84	3	0	7.31	3	0
QUEENS	11.37	4	0	3.41	5	-1
SFU	7.17	6	-1	2.86	6	-1
MCGILL	8.83	5	+1	3.45	4	+2
UWO	4.75	7	0	2.02	8	-1
LAVAL	3.90	8	0	2.39	7	+1
UOC	2.83	9	0	2.01	9	0
YORK	1.57	10	0	0.05	10	0

Notes:

Baseline Ranking:

Score = [TP * 2/(n+1) * 1/m * log (KMS)] / 100

TP: Total pages

n: number of authors

m: number of affiliations

KMS: KMS impact factor for the journal

Table 4 Baseline ranking without taking log based on different journal sets

University	Baseline Ranking (Top-63 journals) Column 1		Ranking (no log) (Top-63 journals) Column 2		
	Score	Rank	Score	Rank	Rank Change
UOT	53.06	1	1284.57	1	0
UBC	46.52	2	1115.69	2	0
UOM	28.48	3	637.23	3	0
QUEENS	27.43	4	573.74	4	0
SFU	23.38	5	451.26	5	0
MCGILL	19.47	6	437.37	6	0
UWO	14.55	7	294.42	7	0
LAVAL	13.10	8	269.20	8	0
UOC	11.50	9	190.33	9	0
YORK	9.82	10	163.07	10	0

University	Ranking (no log) (Top-30 journals) Column 3			Ranking (no log) (Top-10 journals) Column 4		
	Score	Rank	Rank Change	Score	Rank	Rank Change
UOT	1232.95	1	0	954.78	1	0
UBC	1066.74	2	0	815.76	2	0
UOM	596.91	3	0	416.36	3	0
QUEENS	544.14	4	0	362.59	4	0
SFU	416.83	5	0	243.02	6	-1
MCGILL	407.94	6	0	310.69	5	+1
UWO	279.91	7	0	163.55	7	0
LAVAL	250.70	8	0	143.79	8	0
UOC	157.43	9	0	101.63	9	0
YORK	151.10	10	0	46.17	10	0

Table 4 (continued)

University	Ranking (no log) (Top-5 journals) Column 5		
	Score	**Rank**	**Rank Change**
UOT	605.27	1	0
UBC	537.44	2	0
UOM	258.73	3	0
QUEENS	141.69	4	0
SFU	114.44	6	-1
MCGILL	144.40	5	+1
UWO	90.70	8	-1
LAVAL	100.08	7	+1
UOC	79.23	9	0
YORK	2.67	10	0

Notes:

Ranking (no log):

Score = [TP * 2/(n+1) * 1/m * (KMS)] / 100
TP: Total pages
n: number of authors
m: number of affiliations
KMS: KMS impact factor for the journal

Table 5 Baseline ranking with different scoring formulas

University	Baseline Ranking (Top-63 journals) Column 1		Ranking (1/n, with log) (Top-63 journals) Column 2		
	Score	Rank	Score	Rank	Rank Change
UOT	53.06	1	44.18	1	0
UBC	46.52	2	38.61	2	0
UOM	28.48	3	23.88	3	0
QUEENS	27.43	4	22.78	4	0
SFU	23.38	5	19.82	5	0
MCGILL	19.47	6	16.06	6	0
UWO	14.55	7	11.90	7	0
LAVAL	13.10	8	10.15	8	0
UOC	11.50	9	9.14	9	0
YORK	9.82	10	8.64	10	0

University	Ranking (1/n^1/2, with log) (Top-63 journals) Column 3			Ranking (not adjust for n, with log) (Top-63 journals) Column 4		
	Score	Rank	Rank Change	Score	Rank	Rank Change
UOT	55.75	1	0	73.27	1	0
UBC	48.87	2	0	64.30	2	0
UOM	30.12	3	0	40.05	3	0
QUEENS	28.83	4	0	37.98	4	0
SFU	24.61	5	0	32.19	5	0
MCGILL	20.51	6	0	27.25	6	0
UWO	15.36	7	0	20.61	8	-1
LAVAL	14.23	8	0	20.92	7	+1
UOC	12.22	9	0	16.89	9	0
YORK	10.19	10	0	12.53	10	0

Table 5 (continued)

University	Ranking (1/n, no log) (Top-63 journals) Column 5			Ranking (1/n^1/2, no log) (Top-63 journals) Column 6		
	Score	**Rank**	**Rank Change**	**Score**	**Rank**	**Rank Change**
UOT	1355.10	1	0	1355.10	1	0
UBC	1170.04	2	0	1170.04	2	0
UOM	674.29	3	0	674.29	3	0
QUEENS	601.13	4	0	601.13	4	0
SFU	475.91	5	0	475.91	5	0
MCGILL	460.83	6	0	460.83	6	0
UWO	312.64	7	0	312.64	7	0
LAVAL	294.21	8	0	294.21	8	0
UOC	203.58	9	0	203.58	9	0
YORK	169.99	10	0	169.99	10	0

University	Ranking (not adjust for n, no log) (Top-63 journals) Column 7		
	Score	**Rank**	**Rank Change**
UOT	1814.22	1	0
UBC	1528.93	2	0
UOM	899.03	3	0
QUEENS	784.48	4	0
SFU	626.20	5	0
MCGILL	616.60	6	0
UWO	429.28	8	-1
LAVAL	441.90	7	+1
UOC	288.75	9	0
YORK	213.77	10	0

Notes:

Column 2:
Score = [TP * 1/n * 1/m * log (KMS)] / 100

Column 3:
Score = [TP * 1/(n^1/2) * 1/m * log (KMS)] / 100

Column 4:
Score = [TP * 1/m * log (KMS)] / 100

Column 5:
Score = [TP * 1/n * 1/m * (KMS)] / 100

Column 6:
Score = [TP * 1/(n^1/2) * 1/m * (KMS)] / 100

Column 7:
Score = [TP * 1/m * (KMS)] / 100

TP: Total pages
n: number of authors
m: number of affiliations
KMS: KMS impact factor for the journal

Table 6 Baseline ranking with different scoring formulas and journal sets

University	Baseline Ranking (Top-63 journals) Column 1		Ranking (1/n, with log) (Top-5 journals) Column 2		
	Score	Rank	Score	Rank	Rank Change
UOT	53.06	1	11.70	1	0
UBC	46.52	2	11.03	2	0
UOM	28.48	3	6.04	3	0
QUEENS	27.43	4	2.93	5	-1
SFU	23.38	5	2.48	6	-1
MCGILL	19.47	6	2.99	4	+2
UWO	14.55	7	1.57	8	-1
LAVAL	13.10	8	1.68	7	+1
UOC	11.50	9	1.53	9	0
YORK	9.82	10	0.04	10	0

University	Ranking (1/n^1/2, with log) (Top-5 journals) Column 3			Ranking (not adjust for n, with log) (Top-5 journals) Column 4		
	Score	Rank	Rank Change	Score	Rank	Rank Change
UOT	15.38	1	0	21.03	1	0
UBC	13.64	2	0	17.51	2	0
UOM	7.82	3	0	10.76	3	0
QUEENS	3.53	5	-1	4.39	4	0
SFU	3.01	6	-1	3.89	7	-2
MCGILL	3.56	4	+2	4.38	5	+1
UWO	2.18	8	-1	3.17	8	-1
LAVAL	2.66	7	+1	4.27	6	+2
UOC	2.14	9	0	3.05	9	0
YORK	0.06	10	0	0.08	10	0

Table 6 (continued)

University	Ranking (1/n, no log) (Top-5 journals) Column 5			Ranking (1/n^1/2, no log) (Top-5 journals) Column 6		
	Score	**Rank**	**Rank Change**	**Score**	**Rank**	**Rank Change**
UOT	488.37	1	0	641.47	1	0
UBC	455.22	2	0	561.26	2	0
UOM	215.01	3	0	276.03	3	0
QUEENS	122.34	5	-1	146.39	5	-1
SFU	97.39	6	-1	120.79	6	-1
MCGILL	123.36	4	+2	149.50	4	+2
UWO	70.78	7	0	98.03	8	-1
LAVAL	70.70	8	0	111.08	7	+1
UOC	60.00	9	0	85.08	9	0
YORK	2.00	10	0	2.83	10	0

University	Ranking (not adjust for n, no log) (Top-5 journals) Column 7		
	Score	**Rank**	**Rank Change**
UOT	874.80	1	0
UBC	719.88	2	0
UOM	376.50	3	0
QUEENS	180.40	5	-1
SFU	158.76	7	-2
MCGILL	186.47	4	+2
UWO	141.82	8	-1
LAVAL	176.30	6	+2
UOC	123.03	9	0
YORK	4.00	10	0

Notes:

Column 2:
Score = [TP * 1/n * 1/m * log (KMS)] / 100

Column 3:
Score = [TP * 1/(n^1/2) * 1/m * log (KMS)] / 100

Column 4:
Score = [TP * 1/m * log (KMS)] / 100

Column 5:
Score = [TP * 1/n * 1/m * (KMS)] / 100

Column 6:
Score = [TP * 1/(n^1/2) * 1/m * (KMS)] / 100

Column 7:
Score = [TP * 1/m * (KMS)] / 100

TP: Total pages
n: number of authors
m: number of affiliations
KMS: KMS impact factor for the journal

Table 7 Average research output ranking

University	Baseline Ranking (Top-63 journals) Column 1		Average Ranking (Top-63 journals) Column 2		
	Score	Rank	Average Score	Rank	Rank Change
UOT	53.06	1	0.83	4	-3
UBC	46.52	2	1.37	1	+1
UOM	28.48	3	1.19	2	+1
QUEENS	27.43	4	0.95	3	+1
SFU	23.38	5	0.63	5	0
MCGILL	19.47	6	0.59	6	0
UWO	14.55	7	0.49	8	-1
LAVAL	13.10	8	0.50	7	+1
UOC	11.50	9	0.38	9	0
YORK	9.82	10	0.31	10	0

Table 8 Ranking based on degree of "concentration phenomenon" (Herfindahl index)

University	Baseline Ranking (Top-63 journals) Column 1		Herfindahl Index (Top-63 journals) Column 2	
	Score	**Rank**	**H**	**Rank**
UOT	53.06	1	3.52	2
UBC	46.52	2	2.12	8
UOM	28.48	3	2.01	9
QUEENS	27.43	4	1.65	10
SFU	23.38	5	2.30	6
MCGILL	19.47	6	4.57	1
UWO	14.55	7	2.92	4
LAVAL	13.10	8	2.37	5
UOC	11.50	9	2.20	7
YORK	9.82	10	3.02	3

Notes:

Herfindahl Index: $H = [(X1^2 + X2^2 + X3^2 + \ldots + Xn^2) / T^2] * n$

H: Herfindahl index

X_i: the score (or AER-equivalent page share adjusted for quality and size) of the ith faculty member

T: the department's total score

n: the number of faculty members in the department

4 CONCLUSION

This paper ranks the ten top Canadian economics departments on the basis of total research output. The total research output is measured by the quality and size adjusted aggregate page counts of articles published in a core set of 63 top economics journals for the period 1997 to 2007. The baseline ranking methodology is an update and extension of the previous study in EPHD paper.

The paper has also ranked the ten Canadian economics departments based on the degree of “concentration” in the research output distribution among their faculty members by calculating the Herfindahl index of each department. In addition, I have also looked at trends in research output over time and found that while ordinal rankings had not changed much there are rather dramatic changes in research productivity over time at even the best departments in Canada.

For the robustness of the results, I have looked at the inclusion of different journals, various kinds of scoring formula and weighting schemes.

Furthermore, the baseline ranking results are compared with results from other ranking studies, such as EPHD and KMS, to evaluate the trend of changes of research productivity over time. In addition, the average research productivity of the ten departments are also calculated.

All the rankings in this paper are based on affiliations at present (September 2007) rather than at the time of publication. Hence, the rankings measure the “stock” instead of the “flow” of publications. As a result, all the ranking results in this paper reflect the current reputation of the departments rather than the past performance.

Several main findings derived from the rankings are summarized as follows. First, the aggregate research productivity rankings of the economics departments at the top and the bottom are fairly stable regardless of the ranking methodologies used, but rankings for the mid-ranked departments seem to be more sensitive. In general, changing the components of the ranking methodology such as journal set size, scoring formula and weighting schemes does not alter the ranking results dramatically. Second, the average research productivity ranking results are more or less consistent with the aggregate rankings, meaning

that the departments scored high in aggregate research output also seem to have high average research output, vice versa. The only exception here is UOT. Third, the research outputs seem to be more evenly distributed among the faculty members of the better departments. Again, the only exception is UOT. Finally, it seems that publications in high quality journals play a very important role in the overall performance of a department. This is especially true for mid-ranked departments where the difference between their scores is very small and the competition is extremely fierce.

Based on the above findings and the data in my baseline dataset, there is some advice that I would like to give to the department chairs regarding the possible ways to improve their rankings. For all the ten departments especially the top and mid-ranked departments, the priority is probably to improve the incentive structure and quality of the research environment so that faculty members are encouraged to participate in research work more actively. For the departments ranked low in the baseline ranking, much more effort will be required. For example, it might be desirable if they could attract reputable scholars with demonstrated top-level publication records.

Although the baseline rankings results are quite robust and the large dataset constructed have rectified many deficiencies in previous literature, they are still far from perfect. There is still a lot of room for improvement and extensions. For example, one could further extend the paper by involving more universities. Moreover, new ranking methodologies such as the “flow” measure based on affiliations at the time of publication, the citation-based rankings or surveys, could be employed to generate new departmental rankings. One could compare these new rankings with the baseline rankings in this paper to check robustness further and to see whether there are any correlations in between. These are all possible future research options to be explored.

APPENDIX

The top sixty three economics journals in KMS journal ranking

Rank	Journal	Weight
1	American Economic Review	100
2	Econometrica	96.78
3	Journal of Political Economy	65.19
4	Journal of Economic Theory	58.76
5	Quarterly Journal of Economics	58.11
6	Journal of Econometrics	54.91
7	Econometric Theory	45.85
8	Review of Economic Studies	45.15
9	Journal of Business and Economic Statistics	38.41
10	Journal of Monetary Economics	36.41
11	Games and Economic Behavior	35.49
12	Journal of Economic Perspectives	34.26
13	Review of Economics and Statistics	28.02
14	European Economic Review	23.76
15	International Economic Review	23.04
16	Economic Theory	22.43
17	Journal of Human Resources	21.34
18	Economic Journal	20.71
19	Journal of Public Economics	19.77
20	Journal of Economic Literature	18.78
21	Economics Letters	18.73
22	Journal of Applied Econometrics	16.59
23	Journal of Economic Dynamics and Control	14.54
24	Journal of Labor Economics	12.76
25	Iournal of Environmental Economics and Managemen	11.85
26	Rand Journal of Economics	11.44
27	Scandinavian Journal of Economics	10.66
28	Journal of Financial Economics	9.89
29	Oxford Bulletin of Economics and Statistics	8.35
30	Journal of International Economics	7.84
31	Journal of Mathematical Economics	7.64

Rank	Journal	Weight
32	Journal of Economic Behavior and Organization	7.05
33	Social Choice and Welfare	6.89
34	American Journal of Agricultural Economics	6.19
35	International Journal of Game Theory	6.09
36	Economic Inquiry	6.03
37	World Bank Economic Review	5.68
38	Journal of Risk and Uncertainty	5.58
39	Journal of Development Economics	5.5
40	Land Economics	5.14
41	International Monetary Fund Staff Papers	5.12
42	an Journal of Economics—Revue Canadienne d'Econ	5.09
43	Public Choice	4.95
44	Theory and Decision	4.9
45	Economica	4.56
46	Journal of Urban Economics	4.37
47	International Journal of Industrial Organization	4.26
48	Journal of Law Economics and Organization	4.05
49	Journal of Law and Economics	3.9
50	National Tax Journal	3.87
51	Journal of Industrial Economics	3.85
52	Journal of Economic History	3.78
53	Oxford Economic Papers	3.71
54	Journal of Comparative Economics	3.36
55	World Development	3.22
56	Southern Economic Journal	3.09
57	Explorations In Economic History	2.97
58	Economic Record	2.93
59	Journal of Banking and Finance	2.62
60	Contemporary Economic Policy	2.42
61	Journal of Population Economics	2.41
62	Journal of Financial and Quantitative Analysis	2.09
63	Journal of Institutional and Theoretical Economics	2.01

Note: The weight assigned to each journal has already been adjusted for Size, Quality and Age.

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