THE STATE OF CANADIAN MANAGEMENT RESEARCH: A QUESTION OF MEASUREMENT

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The aim of this study is to extend prior work on the methodological evaluation of the 'state of Canadian management research'. This study clearly demonstrates that university and/or researcher rankings, as measured by journal output, are significantly affected by the constructs used and may or may not reflect accurate portrayals of the research activity being conducted at a given institution.

Introduction

The aim of this study is to extend and explain the assumptive nature of statistical measurement of research productivity and the prior work on the *'state of Canadian management research'*. Specifically, to extend the work of Erkhut (2002); Bissonette, Runte, Lowe, Mullen, and Marshall (2001); and Grandy, Kelley, and O'Connell, (2000) which comprise the most recent work on Canadian management research output. We will also demonstrate the challenges associated with the assumptions made in studies of these types and the concomitant challenges this poses for interpretation and measurement.

Used to measure career success (Benner and Sandstrom, 2000), determine recipients of research funds or grants, and as a measure of university financial performance (Purglove and Simpson, 2001), research output measures significantly impact academics and their affiliated institutions. It is important, therefore, that rankings established by these previous studies be understood. Specifically, it is important that users of this information understand the variables shaping the particular studies and the actual meanings of stated results. This study clearly demonstrates that university and/or researcher rankings are significantly affected by the constructs used and that research output rankings may not be as relevant as they first appear and may take on entirely new meanings once the variables have been examined in more depth.

Universities and The Research Context

The genesis of universities as centers of research activity is a function of two distinct milestones over the last two centuries. The first event in 1809 was the then novel approach adopted by Wilhelm von Humbold, the founder of the University of Berlin. He has been acknowledged as the conceptual originator of the modern university's role (Denning, 1997), and was instrumental in inculcating a belief that an academic's true profession went beyond that of merely teaching and that academics were also responsible for furthering their disciplines through research. The second major milestone was the post World War II publication in the United States of "Science the Endless-Frontier" by Vannevar Bush (Denning, 1997; Likins, 1992; Nelson and Romer,

1996). Vannevar Bush's social contract formulation of the role of universities contended that universities should contribute directly to social good through the progression of science - that is to say engaging in research activities. It was the anticipation of the fruits of university research activities in terms of realizable and practical progress. Thus, modern governments became major sources of research funding and support for universities. However, with this also came an expectation of results.

Research Output Mechanisms

Kelemen and Bansal (2002) note that there are two main venues for the publication output of management research - scholarly journals or practitioner publications. Scholarly peer reviewed journals, oriented to an academic audience, have developed as the primary mechanism for the transfer of research with practitioner journals considered as only a belated secondary mechanism. This is reflected in the continuing academic-practitioner relationship gaps that continue to exist. These gaps have been recognized in a number of fields including; information systems (Te'eni et al., 2001), human resources (Clark, 1993), management (Amabile et al., 2001; Rynes, McNatt, and Bretz, 1999; Rynes, Bartunek, and Daft, 2001), marketing (Razzaque, 1998), organizational science (Mohrman et al., 2001), and others (Hamilton and Blake, 1982; Rogers, 1995; Scandura and Williams, 2000).

The Publish Motives

The reasons for publishing research results may be typified as either personal in nature, career oriented, or institutionally oriented. Within an institutional setting there are several factors at work that influence the balance and expectations for teaching and research. Therefore, Universities may use a combination of teaching evaluation and publication as a performance measure. Research and publication may be used as a measure to differentiate between faculty members for purposes of pay (Johnson and Podsakoff, 1994), promotion and/or for tenure decisions (Gordon and Purvis, 1996; Tahai and Meyer, 1999; Weinstock and Coe, 1969).

Consequently, publication rates are often used to measure the total 'research output' (performance) of universities and schools (Armstrong and Sperry, 1994) or to make comparisons between departments or faculties (Erkhut, 2002). Publication aggregates can act both as a reputation building exercise amongst the academic community, or may be presented to government in competition for funding or other resources (Purglove and Simpson, 2001). It may also be used for marketing endeavors aimed at the general public, and it may also be used to further enhance reputations, or rankings may also be used by governments themselves to determine where to allocate funds (Zhou et al., 1991). Therefore, universities may develop a "publish or perish" culture where there is, as observed by Benner and Sandstrom, (2000), a prevalent norm or expectation that publishing is the primary method of improving career success. It is also seen as a mechanism for receiving research funding or grants. Institutionally, Purglove and Simpson (2001) note that research activities form a critical component of measuring university financial performance in the aggregate. So the *must publish* mentality may be considered a cultural mechanism that is reinforced and perpetuated on an ongoing basis through the merit and compensation systems in academia.

The Journal as Output

The study of academic journals, specifically the publication of articles including rate, amount and citations, and other criterion is widespread. These studies have attempted to rank institutions (Erkhut, 2002), to compare national research outputs (Li and Tsui, 2002), determine trends in various fields of studies (Tahai and Meyer, 1999), as educational tools (Grandy et al., 2000), to determine trends within a specific journal (Stone et al., 1995), or to rank journals themselves (Coe and Weinstock, 1984; Salancik, 1986; Sharplin and Mobry, 1985). Recently Bharati and Tarasewich (2002) conducted research on the impact of new journals for developing fields of study such as e-commerce (Colford, 2002). Historically many of these studies are solely quantitative in method (Weinstock and Coe, 1969; Salancik, 1986; Stone-Romero, 1995) or are attempts to validate new quantitative methods for measurement of rates, amounts, citations, proportions and weighting systems (Johnson and Podsakoff, 1994; Korhonen,et al., 2001; Tahai and Meyer, 1999). More recently, Zhou et al. (2001) produced an integrative system for journal ranking using both qualitative and quantitative measures and Korhonen et al. (2001) developed a separate method for the valuation of research at universities without using journals.

A Question of Measurement

Regardless of the ongoing debate about how best to use academic journal data as source measures of research output, research trends or for rankings of individual researchers, schools, universities or the journals themselves, their use remains prevalent. For the purposes of this study, we will focus our attention on the results of three studies (Erkhut, 2002; Grandy et al., 2000; Bissonette, Runte, Lowe, Mullen, and Marshall, 2001) which comprise the recent work on Canadian management research using publishing in journals as a measure of performance. We will show that the assumptions made for the collection, analysis, and reporting of aggregate research performance in the field of Canadian management research are problematic and easily lead to highly contrasting conclusions.

Methodology

The University of Alberta's Citation Study (2002) represents the single largest consolidated database of information concerning Canadian management research and it provides the best contemporary vehicle for the analysis of publication research output by management scholars in Canada. Within this database the top 30 researchers' cumulative output was 1024 journal articles, representing approximately 22 percent of the journal articles listed in the citation study. The decision to choose the top 30 researchers (research 'stars'), while arbitrary, offered a solid basis for capturing statistical effects given that so few researchers represented a relatively large proportion of the cited management research articles. A consolidated database was subsequently compiled using this data. In addition to the data recorded within the study, additional information was sourced concerning the university/school affiliation of the author at time of publishing. This information was most often obtained by accessing the full text version of the paper in question. Many journals provide author notes or cite university affiliations directly. For journals that did not provide this information, this dilemma was solved by visiting authors' web sites and viewing curriculum *vitaes*. In many cases, triangulation was achieved through multiple sources, e.g. journal and CV. Researchers used both electronic and library databases to code the

articles. Interrater reliability was assessed by randomly selecting 2.5 percent of the 1024 articles. An interrater agreement score of 90 percent was achieved. Lastly, the data was combined, cleaned, and formatted for analysis.

Results

The Erkut (2002) study ranked the top nine Canadian universities in terms of paper credits on an annual basis from 1990 up to and including 1999 (see Appendix A). When comparing the results of our ranking to those of other rankings presented by Erkut (2002) some interesting observations can be made. Illustratively we will use the example of University of British Columbia (UBC).

According to the Erkut (2002) study, UBC is consistently ranked first overall in paper credits assigned to their management faculty. However, when only the top 30 'stars' are considered, UBC does not even appear in the rankings (see Appendix B). There are three plausible explanations for UBC ranking first in terms of overall research performance but not ranking at all when the location of top 30 publishing authors is considered. Firstly, that UBC is a research focused versus a teaching focused institution, therefore encouraging an above average number of annual publications from all members of staff. This could imply that while all teaching staff at UBC publish more than the national average, the institution is not home to any of the 'star' authors. Secondly, that UBC, instead of encouraging teaching staff to increase their rate of publishing articles in peer reviewed journals, in fact hired people who had an above average publishing record before joining UBC. Finally, UBC may have lost their more prolific researchers between 1999 and 2000 and this inability to retain top talent is the reason why in 2000 none of the top 30 author's publications were credited to UBC. The ranking of other institutions i.e., Cornell University, could also be used to illustrate the above findings.

The second interesting observation occurs when author credits for publication are assigned based upon the institution at which they were employed when they conducted the research. In the Erkut study, assignment was dictated by the place of employment of the researcher in 2000. When this is changed and assignment is determined by the location of the researcher at the time of the research, the results change significantly. Given this new criteria, UBC is ranked at 8th place (see Appendix C). Based on rankings of assigned citations, eight of twenty institutions actually lose rankings (i.e. they drop) in comparison to the Citation Study. Similarly, ten of twenty institutions gain in the rankings. Only two institutional rankings of do not experience change. This further demonstrates the problematic associated with attempting to rank institutions – it depends almost solely on the methodological approach.

Finally, by identifying authors who are management researchers and publish management articles in peer reviewed journals but who are not part of a university's business faculty, our study was able to recognize authors who were not included in previous studies (see Appendix D). One limitation of this approach was that a different data set to that used in the Erkut study (2002) was applied. Although the data was based on the top 30 researchers, as defined by Erkut, the criteria was the location of authors in 2000 and their research published in 15 journals regardless of which department the researcher was affiliated with. Under these guidelines UBC is ranked 6th . This change in ranking clearly illustrates the fact that altering the criteria used, in this case the

inclusion or exclusion of authors from non-business faculties, again changes an institution's ranking in regards to number of articles published.

Discussion

The Erkut study (2000) provided a snapshot of management research, identifying the 30 most prolific researchers and their affiliated universities. The method employed matched the research (publication) with the university where the researcher was employed at the time the study was completed. Our research paired the researcher with the university with which they were affiliated when the research was carried out. This dynamic perspective revealed that research, as measured by publication, was frequently attributed to another university that accrued the benefit of the publication but was not actually involved in the research. The Erkut study ranked universities based on total number of publications by the top 30 'star' researchers using a static window of ten years. Consequently, it failed to take into account the movement of researchers between universities during the time span reviewed. Our results demonstrate that there is sufficient movement across and between the universities/schools in Canada by management researchers and that measuring performance in a 'snap-shot' fashion can produce perhaps somewhat misleading results.

These findings have grave implications as university funding is increasingly being linked directly to research. Studies of this nature create "rankings" that may or may not reflect accurate portrayals of the research activity being conducted at a given institution – yet may still be used by others such as the public or government. Consequently, an 'artificial' picture may influence resources available for the conduct of research. Therefore, in order to fully understand any ranking, assumptions made, method used and criteria assessed must be carefully reviewed and fully understood.

Limitations and Future Research

One of the limitations of the current study was the dependence on the University of Alberta citation database. Although a significant and important body of information, the current study's dependence on the use of this database artificially constrained the scope of the current study. A second limitation was the definitional and operational differences between the three available studies on Canadian management research. In particular, the definition of "management research" in terms of faculty of origin (psychology vs. management) and the subject coding structure used. Third, source data itself is limited in that it does not completely capture research output. For example, all three of the studies used focus solely on journal publications. This would not capture research output as measured by conference papers, scholarly books, or book chapters. Fourth, as noted by Erkut (2002), the data is restricted to a single decade. Given the research and publication process and timelines (two to three years for top tier journals), the results of this study are historical in nature and, subsequently, already several years out of date. Finally, none of the studies actually deal with original source data. All information gathered came from secondary or tertiary sources. Thus, it can be expected that errors and omissions are cumulative in nature and may also affect the results.

Despite the limitations just noted, the current study may serve as a significant catalyst for future research in the area of Canadian Management research productivity. More questions were identified than answered. Some important questions that have arisen from the study are as follows:

1) Does the size of a given management department significantly impact the volume of research output? This has significant implications for future graduate students and funding decisions.
2) Are the most prolific researchers publishing in the 'best' journals? Quality vs. quantity, although problematic by definition, is an issue that should be considered.
3) Do students actively seek "star" researchers when choosing graduate schools? Similarly, if the "star" leaves the institution, does the student follow?
4) As identified by the current study, the definition of "management research" used significantly affects rankings. Investigation into what is classified as management research and how best to categorize it is needed.
5) The current study identified the fact that movement of individuals between schools can significantly affect rankings regardless of method. This reflects the dynamic nature of research, which is not necessarily captured using conventional methods. Study into the volume and frequency of movement would shed additional light on the factors influencing research activities in Canadian universities.

Given the relatively small world of Canadian management research, in comparison to the United States for example, and the thus greater impact that rankings may have on institutions and faculties within them, it is important that we take a closer look at our productivity and performance measures. The question of measures and measurements is important and an obviously fertile area for future research.

Appendix A

University of Alberta – Top 30 Schools based on Paper Credits *

University of British Columbia	286.78
University of Toronto	208.69
McMaster University	201.05
HEC University of Montreal	195.07
York University	192.62
University of Alberta	133.52
Concordia University	133.05
University du Quebec a Montreal	121.35
McGill University	112.26
Queens University	90.52
Universite Laval	90.02
University of Western Ontario	88.05
Saint Mary's University	81.45
University of Calgary	79.25
Simon Fraser University	78.03
University of Guelph	68.45
University of New Brunswick at Fredericton	64.83
University of Waterloo	63.33
University of Manitoba	56.63
University of Ottawa	54.12
University of Windsor	48.33
Wilfred Laurier University	47.87
Carleton University	41.95
University of Saskatchewan	39.83
University of Victoria	32.92
University of Lethbridge	32.83
Brock University	28.37
Dalhousie University	27.83
Memorial University of Newfoundland	26.25
University de Sherbrooke	18.3

*Paper Credits - Authors from multiple-author papers were given partial credits depending on the number of authors.

School Ranking Comparison - Criteria: Number of articles authored or co-authored

Appendix B

Appendix C

Appendix D

University of Alberta Data (2002) Criteria: Location of author at year 2000 Business schools only	Number of Articles	Rank	Saint Mary's Study (2002) Criteria: Location of author when article published Location of top 30 researchers as identified in the University of Alberta study	Number of Articles	Rank	Saint Mary's University Data Presented at ASB 2000 Criteria: Location of author at year 2000 Research published in 15 journals regardless of which department the researcher was affiliated with Based on top 30 researchers	Number of Articles	Rank
HEC University of Montreal	218	1	HEC University of Montreal	196	1	University of Toronto	26	1
York University	120	2	York University	120	2	University of Western Ontario	15	2
McMaster University	114	3	McMaster University	113	3	Concordia University	14	3
University of Toronto	84	4	University of Toronto	81	4	McGill University	13	4
University of Alberta	57	5	McGill University	72	5	Queens University	13	4
University of New Brunswick (Fredericton)	53	6	University of Alberta	57	6	HEC University of Montreal	13	4
University of Winnipeg	51	7	University of New Brunswick (Fredericton)	53	7	Saint Marys University	11	5
McGill University	48	8	University of British Columbia	51	8	University of British Columbia	10	6
Concordia University	48	8	University of Guelph	49	9	University of Waterloo	9	7
Queens University	47	9	Concordia University	48	10	Laval University	8	8
University of Manitoba	32	10	Queens University	47	11	York University	6	9
University of Calgary	28	11	University of Manitoba	32	12	UPQ	5	10
University of Windsor	27	12	University of Calgary	28	13	University of Alberta	5	10
Saint Marys University	27	12	University of Windsor	28	13	University of New Brunswick (Fredericton)	4	11
Memorial University	25	13	Memorial University	25	14	University of Manitoba	4	11
University of PEI	23	14	Royal Military College of Canada	22	15	University of Calgary	4	11
University of Guelph	22	15	New York University	2	16	McMaster University	4	11
University of British Columbia	*	*	University of PEI	1	17	Memorial University	*	*
University of Western Ontario	*	*	Cornell University	1	17	University of PEI	*	*
Laval University	*	*	University of Western Ontario	*	*	University of Guelph	*	*
UPQ	*	*	Saint Marys University	*	*	University of Winnipeg	*	*
University of Waterloo	*	*	University of Waterloo	*	*	University of Windsor	*	*
Royal Military College of Canada	*	*	Laval University	*	*	Royal Military College of Canada	*	*
Cornell University	*	*	UPQ	*	*	Cornell University	*	*
New York University	*	*	University of Winnipeg	*	*	New York University	*	*

* This school did not earn a ranking in   This study

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