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A ranking of supply chain management journals based on departmental lists

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The issue of journal rankings has been an issue of frequent debate, likely due to the effect rankings can have on academic careers. While many rankings have been done over the years, few, if any, take into account what really matters to academics' careers, how their own departments evaluate their research. This study collected department journal ranking lists from top international supply chain programmes. The resulting data, approximately 70% US and 30% international, presents a diverse perspective on the journals considered when analysing research productivity. A cluster analysis is performed and the results are compared with impact factors for select journals; we also discuss the differences highlighted between perceived rankings based on the departments' geographic location. The results show that the field still has some divisions.

Keywords: journal rankings; journal evaluation; supply chain management research

1. Introduction

The issue of journal rankings is quite popular among members of the academy. A literature search reveals a steady diet of journal ranking articles across a range of disciplines over the last 25 years. While some may argue that this is mere navel-gazing, research is the currency for most academics; therefore, the ability to substantiate the quality of published research is of great importance to most academics' careers. It is clearly much easier to validate the quality of research if rankings of research outlets exist. It is also easier for departments to evaluate their faculty for the purposes of promotion and tenure if journal rankings exist.

The genesis of this article stems from such a situation. Within the last four years, our university enrolled its first business Ph.D. students and merged two undergraduate majors, one focusing on logistics and the other on operations management (OM), into a single Department of Supply Chain Management (SCM). This necessitated the consolidation of two distinct faculties, motivating a review of our department procedures, and resulted in an evaluation of our journal lists.

Turning to the literature, we found numerous articles ranking journals in logistics, operations or purchasing. However, these did not fit our department's need for a combined ranking for all of the fields we consider as part of SCM. One option for creating a combined list was to merge existing rankings (e.g. Fry and Donohue 2013); however, the lack of a consistent methodology in the previous studies jeopardised the ability to equitably combine those rankings. Journal ranking are generally dominated by two competing methodologies, the opinion survey and citation analysis. Opinion surveys ask respondents to rate the quality and/or relevancy of various journals; two articles by Barman, Tersine, and Buckley (1991), Barman, Hanna, and LaForge (2001) are good examples of this method. The other dominant paradigm is some form of citation analysis, for example Linderman and Chandrasekaran (2010), where journals are ranked based on the frequency of citations in subsequent research. Further complicating the problem of combining rankings based on competing methodologies is the problem of combining journals from distinct fields where the number of potential contributors, number of potential outlets and the perceived importance of each outlet between fields is unequal.

Rather than try and devise a scheme to equitably combine rankings from distinct fields created by means of differing methodologies, we choose to ask top international business schools to share their SCM journal lists. Analysis of the collected lists allows us to identify what peer and aspirant departments see as the top journals in the field. This method and resultant data are distinctly different from previous journal ranking articles in two aspects. First, since the data reflects the journal lists at top institutions teaching SCM, it speaks directly to how faculty evaluations, promotion and tenure decisions are made. Second, the data are comprised of journal lists from various disciplines that collectively

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comprise SCM, and therefore provide a holistic view of the journals from the field. We analyse the data using cluster analysis to account for both the number of schools that list a journal and the ranking they give it. Our results identify nine journals as being highly valued across a broad spectrum of departments teaching logistics, operations, purchasing or other SCM content. We also were able to identify a number of niche journals, whose quality was found to be very high, but whose inclusion in departmental lists was more limited. We compared our results with published impact factor and citation half-life measures, identifying clear divisions within the field.

We begin our analysis with a review of prior studies ranking logistics, operations and purchasing journals. We then describe the methodology we followed to collect, code and analyse the journals lists. Results from our analysis are then presented and discussed. We conclude by discussing various trends we discovered and their likely impact on the continued evolution of SCM as a discipline.

2. Literature review

Given the importance of publishing high-quality research to academic careers, it is not surprising that a number of journal ranking articles have appeared over the years. Please see Table 1 for a selection of such articles. Below, we discuss the methodologies and results of these articles.

2.1 *Surveys*

Survey articles are straightforward; the researcher contacts a list of respondents and asks for their opinion regarding various journals. The strength of this method is that it is a gauge of which journals a researcher's colleagues perceive as being important. However, as with all perceptual measures, its weakness is a potential lack of objectivity. Additionally, respondents are generally presented a limited set of journals to evaluate and may fail to identify journals that are increasing in perceived quality.

The first journal ranking survey article published in business was authored by Coe and Weinstock (1984). In this article, department chairs were surveyed and asked to provide a 0–9 ranking of select journals. The chairs were also asked to estimate the acceptance rates at these journals. Interestingly, the respondents tended to overestimate acceptance rates. The first article to look specifically at OM journals appears to be Saladin (1985). He surveyed both academics and practitioners. The academics were asked which journals were most appropriate for OM research and which journals the respondent's school considered the most appropriate. Practitioners were surveyed and asked which research journals, if any, they read in an attempt to inject the issue of relevance into journal evaluation. Rutner and Fawcett (2005, 59) found that practitioners 'rated most of the top academic journals significantly lower than their academic counter-parts'. Journal rankings that include practitioners are in minority; Table 1 displays the academic respondents for those articles including practitioners.

Barman, Tersine, and Buckley (1991) noted that most previous journal rankings were not focused on OM journals. They surveyed Decision Science Institute members regarding 20 OM-focused journals. The respondents were asked to rate the relevancy of each journal as a OM research outlet and to rate the overall quality of each journal. Ten years after his initial study Barman, Hanna, and LaForge (2001) did a follow-up study. In 2001, members of the Production and Operations Management Society were surveyed. The results show a shift in survey pool demographics during the intervening period with the percentages of full, associate and assistant professors changing from 28, 27 and 44 in 1991 to 41, 29 and 28, respectively, in 2001. This may reflect a maturation of the field of OM. As can be seen in Table 1, the top journals found in 2001 differed to those in the earlier study.

Two other survey studies are notable for their scope. Soteriou, Hadjinicola, and Patsia (1999) limited the scope of their survey to European production and OM researchers. This study is significant, as it provides a non-US-centric perspective into academics' perception of journal quality. Second, Zsidisin et al. (2007) used a two-stage survey to create a list of 'purchasing and supply management' journals. This work is notable as rankings of purchasing journals appear to be quite rare.

2.2 *Citation analysis*

Citation analysis tabulates and analyses patterns of citations to determine the relative importance or impact of a particular article on a specified field. The advantage of this method is that it offers greater objectivity over the use of surveys. However, this objectivity is tempered by the selection of the articles and journals, as this selection may involve subjectivity. As with the survey method, citation analyses tend to limit the journals investigated as well as the number of journals counted for subsequent citation.

Table 1. Summary of previous journal ranking articles.

	Coe and Weinstock (1984)	Saladin (1985)	Barman, Tersine, and Buckley (1991)	Vokurka (1996)	Goh et al. (1997)	Soteriou, Hadjinicola, and Patsia (1999)	Barman, Hanna, and LaForge (2001)	Gibson and Hanna (2003)	Gorman and Kanet (2005)	Rutner and Fawcett (2005)	Zsidisin et al. (2007)	Menachof et al. (2009)	Fry and Donohue (2013)
AMJ	2						4						
AMR	6						10						
ASQ	1												
AOR									10				
CMR	8												
DSJ		3	2	2	1		3				9		7
EJOR			10		8	7							8
HBR	3		6	4	2	9	7	2			4	7	
IIE		4	4	6	9		8		5				6
IL								10					
ILR	7												
INF				9					7				
IJLM								5		4	5	3	
IJOPM					4	2							
IJPDLM								7		3	10	2	
IJPE			9			8							
IJPR			5	7	5	5							4
JOB	9												
JBL								1		1	2	1	
JC								9					
JOMkt										6			
JOM		2	3	5	3	1	5		8	8	1	4	2
JPSM											8		
JSCM								8		5	3		
JORS					10								
LTR									9				
LRP	10												
MS	4	1	1	1	6	3	1		4			8	1
M&SOM									3				10
NRL			8	10			6						
OR	5	5	7	3		6	2		2				3
PIMJ				8	7								
POMJ						4	9		6				5
SMR						10					6		
SMJ											7		
SCM												10	
SCMR								3		2		5	
TW								6					
TJ								4		7		6	
TRE										9		9	

TS									1	10			9
Field	MGT	OM	OM	OM	OM	OM	OM	LOG	OM	LOG	PURC	LOG	OM

Notes: Based on question 'What journals does your school consider to be the most appropriate for OM research (in order)?'.
Though the authors position this as a supply chain article, we have classified it as a logistics focused article given the sample pool.
Top journals based on 'research usefulness'.
Abbreviations: AMJ – Academy of Management Journal; AMR – Academy of Management Review; ASQ – Administrative Science Quarterly; AOR – Annals of Operations Research; CMR – California Management Review; DSJ – Decision Sciences; EJOR – European Journal of Operations Research; HBR – Harvard Business Review; IIE – IIE Transactions; IL – Inbound Logistics; ILR – Industrial & Labour Relations Review; INF – Interfaces; IJLM – International Journal of Logistics Management; IJOPM – International Journal of Operations and Production Management; IJPDLM – International Journal of Physical Distribution and Logistics Management; IJPE – International Journal of Production Economics; IJPR – International Journal of Production Research; JOB – Journal of Business; JBL – Journal of Business Logistics; JC – Journal of Commerce; JOMkt – Journal of Marketing; JOM – Journal of Operations Management; JPSM – Journal of Purchasing and Supply Management; JSCM – Journal of Supply Chain Management; JORS – Journal of the Operational Research Society; LTR – Logistics and Transportation Review; LRP – Long Range Planning; MS – Management Science; M&SOM – Manufacturing & Service Operations Management; NRL – Naval Research Logistics; OR – Operations Research; PIMJ – Production and Inventory Management Journal; POMJ – Production and Operations Management Journal; SMR – Sloan Management Review; SMJ – Strategic Management Journal; SCM – Supply Chain Management; SCMR – Supply Chain Management Review; TW – Traffic World; TJ – Transportation Journal; TRE – Transportation Research Part E and TS – Transportation Science.

Vokurka (1996) appears to have published the first OM-specific citation analysis of journals. He chose to analyse three years' worth of the OM articles in Decision Sciences, Journal of Operations Management and Management Science. His final ranking was an average of total citations, citations per article and citations per operation management works published. The last factor was to account for 'the variation between journals of the length of articles and words printed per journal page' (353). The following year, Goh et al. (1997) published a citation analysis of three journals (Journal of Operations Management, International Journal of Production Research and International Journal of Operations and Production Management) over five years. They created hurdles for consistency, trend, breadth and intensity and used these hurdles to create their final ranking.

Gorman and Kanet (2005) use a variation of citation analysis. They use the author affiliation index, which is based on the idea that researchers at the top schools will tend to publish in the top journals. In a follow-up, Gorman and Kanet (2007) noted that the results found were very similar to Olson's (2005) survey of researchers at the top 25 US business schools. It should be noted that Institute for Scientific Information added *Journal of Supply Chain Management*, *Journal of Business Logistics*, *International Journal of Physical Distribution and Logistics Management*, and *International Journal of Logistics Management* to their journal citation reports in 2010. Citation analyses run after this date would likely have different results than those in Table 1.

2.3 *Commentaries*

In addition to articles that rank journals, there have been a number of articles that discuss the issue of journal ranking. For instance, the journal *Omega* had a series of articles on this topic (Doyle and Arthurs 1995; Jones, Brinn, and Pendlebury 1996a, 1996b; Ormerod 1997; Doyle 1999; Jones 1999; Brinn, Jones, and Pendlebury 2000). Articles which debate the role of journal rankings and what influences them often have important points to make about this process.

Vastag and Montabon (2002) discussed a variety of issues involved in journal ranking. Among them, they examined the idea that a person's educational background is likely to influence their perception when ranking journals. They were able to empirically show that this relationship exists. This relationship is important since it speaks of the issue of bias and sample selection when conducting surveys for the purpose of ranking journals.

Citation analyses can also be affected by differences in background. Pilkington and Meredith (2009) created network of bibliographic co-citations that indicated that empiricists tend to reference a wider array of related journals than modellers, who tend to cite fewer journals. This clearly has implications for citation analyses in that one might expect more variance in rankings of more empirically focused journals.

Since both educational background and preferred research method can substantially affect journal rankings, the question becomes how to minimise subjectivity when ranking journals. This is especially important for the field of SCM, which has undergone much development and evolution in its relatively short academic history, but still must develop a means of establishing the quality of research contributions from a number of disparate yet related disciplines.

3. Methodology

Our research flows from the need to create a combined journal list for the various fields that collectively comprise SCM. While this would appear a fairly straightforward task, we could not identify a single article that covered logistics, operations and purchasing in a holistic manner. Exacerbating the issue is the unequal number of publication outlets for each area, the relative number of potential authors for each area and the weight/importance each should carry in a combined list.

3.1 *Sample and data collection*

Rather than follow either the survey or citation analysis methodologies, we chose to collect journal lists from the top international business schools. Collecting data in this manner had a number of benefits relative to either the citation analysis or survey methods in terms of speed, richness of data and, most importantly, relevance to academic careers. We believe that these data are more relevant to academicians since the collected journal lists are used to determine annual evaluations, promotion and tenure decisions. Additionally, since the lists represent the collective wisdom of the various departments, perceptual biases based on background or methodological preferences are minimised, enhancing the objectivity of our rankings.

We selected universities to contact based on the rankings by US News and World Report, BusinessWeek and the Financial Times for undergraduate/graduate business education. We augmented these lists with a SCM-specific ranking from SCM Review (Fawcett 2009), to ensure inclusion of schools that excel in SCM education but would not otherwise

be ranked by the other sources. From this composite list, we identified specific departments at each institution to contact. Unlike accounting or finance, SCM is a fairly young academic discipline combining previously distinct fields, so department identification was a painfully time-consuming task. In all, we identified 167 universities containing 174 departments covering 16 different countries.

Table 2 displays the top 10 department names teaching SCM topics. Of the 174 departments identified, only 56 were stand-alone SCM discipline-specific. The stand-alone departments were generally grouped under the banner of OM (23), SCM (8), Management Science (8) or Decision Science (5). The vast majority of departments teaching SCM content collocated SCM faculty with other disciplines. Table 3 lists the keywords used to identify departments teaching SCM content and the frequency that they occur. Given the close relationship between the disciplines, SCM faculty are often located in departments with Information Systems/Technology (60), Management (26) and Marketing (10) faculty.

Having identified the departments teaching SCM content at each school, we then identified the appropriate contact person within each department. For a majority of universities, the contact chosen was the department chair; however, when we were unable to identify a department chair, or when it was unclear which department housed SCM faculty, we designated the college's dean as the point of contact. During the 2010–2011 academic year, each contact person received a letter from our department chair requesting a copy of that school/department's journal quality list for logistics, operations, purchasing and/or SCM. The letter specified that the lists could be submitted electronically or by postal mail. This initial contact was followed, also by means of postal mail, with a second request to those who had not previously responded. Finally, a few weeks later we emailed a request to those who had not previously responded.

Of the 174 departments contacted, 98 (56.32%) responded to our request for information. Of the 98 departments who responded, 66 departments (37.93%) provided their department list while the remaining 32 departments stated that they did not have an official journal list. United States institutions comprise a majority of the respondent institutions; however, as shown in Table 4, we also received journal lists from universities located in the UK, Canada, France and Australia, among others.

There were two notable trends identified during data collection. First, the UK, France and Australia are among a growing number of countries to establish a single journal quality list for their universities. Despite this, several of the institutions located in these countries continued to maintain department lists distinct from the national ones. We, therefore, only code responses for institutions in those countries that responded to our request. Second, in keeping with previous research (Van Fleet, McWilliams, and Siegel 2000), many of the institutions reporting no department journal list are highly ranked. Out of 32 institutions, 17 institutions reporting no department list are within the top 100 International MBA programmes as ranked by the Financial Times; two others are in the top 20 SCM programmes as ranked by US News and World Report. Of the departments without an official list, three stated that they utilise the lists used in compiling MBA programme rankings for the Financial Times and BusinessWeek, two utilise the Harzing Journal Quality List as a reference, two utilise impact factors and two reported that research quality decisions are based on analysis of each manuscript.

In all, the 66 journal lists encompassed 318 different publication outlets for SCM research. Surprisingly, the data reveal the average list contains approximately 25 journals, the range varied from a low of 2 to a high of 121. As would be expected, the distribution is right-skewed with a median value of 16. While these numbers are outside our expectations, the data collected represent all research outlets that departments provide credit for and not all outlets receive equal weight. When looking only at the top-tier research outlets as ranked by each school, the number of outlets drops to an average of 6.68 journals. Closer inspection of the data reveals 13 lists contain in excess of 40 journals. Of the lists

Table 2. Top 10 department names.

Rank	Department name	Frequency
1	Operations Management	23
2	Management	17
3	Management Science	8
4	Supply Chain Management	8
5	Decision Science	5
6	Information Systems & Operations Management	5
7	Marketing & Logistics	5
8	Operations & Information Management	4
9	Information Systems & Decision Science	3
10	Operations & Technology Management	3
10 (tie)	Operations and Information Management	3

Table 3. Department names.

Department identifiers		Co-located disciplines	
Operations	81	Information Systems	60
Management	24	Management	26
Decision Science	22	Marketing	10
Management Science	19	Economics	3
Supply Chain Management	16	Statistics	3
Logistics	12	Entrepreneurship	2
Procurement	1	Risk	2
Transportation	1	Finance	2
Other/not specified	14	Innovation	2
		Aviation	1
		Other/not specified	11

Table 4. Geographic coverage and response rates.

Country	Identified departments	Respondents	Provided list	Percent responding (%)	Percent providing lists (%)
United States	128	74	47	57.81	36.72
United Kingdom	18	10	8	55.56	44.44
Canada	7	6	5	85.71	71.43
Spain	4	0	0	0.00	0.00
France	3	2	1	66.67	33.33
Australia	2	1	1	50.00	50.00
Singapore	2	1	1	50.00	50.00
China	2	0	0	0.00	0.00
Ireland	1	1	1	100.00	100.00
Italy	1	1	1	100.00	100.00
Netherlands	1	1	1	100.00	100.00
Switzerland	1	1	0	100.00	0.00
Other	4	0	0	0.00	0.00
Total	174	98	66	56.32	37.93

containing 40+ journals, three are national lists, six are ranked in the top 100 Financial Times MBA rankings, three are ranked in the top 100 for undergraduate education in the US and one is a top 15 SCM programme according to *Supply Chain Management Review*.

3.2 *Coding*

Not surprisingly, we found a great degree of diversity in the ranking schemes utilised by respondent schools. Schools differentiated journals by means of both the number of categories and the type of classification scheme employed. The number of categories employed to differentiate the quality of journals ranged from one to five with approximately 53% of respondents using one or two categories. Of departments having more than one category, three primary classification schemes are utilised: letter grade (60%), label (23%) and numeric (17%). The most popular means of differentiating classes, letter grades, was not consistent. For example, one school might use A+, A, A− and B+ while another school with four categories used A, AB, B and C. Label classification schemes selected category names with the intent to impart the desirability of various journal classes. Premier, star, elite, etc. were all utilised to identify the top journal categories at various institutions. Numeric classifications would seem to have the most uniformity; however, again there was some variation in the schemes as some schools used '1' as the top category while others inverted the scale.

The challenge in coding this widely varying data was to identify a means to standardise the ranking schemes. We adopted two approaches and analysed the data under both to establish a pattern of results. The first approach was initially proposed by Van Fleet, McWilliams, and Siegel (2000). Their approach, which we will refer to as 'class' through the remainder of the paper, identifies the maximum number of categories utilised by all respondents. It then assigns journals that appeared in the top category of each school's list with the same maximum score. In this case, top-ranked journals were coded as a five; a journal ranked in the second category of a school's list was coded as a four and so on.

This coding scheme could potentially inflate the value of a journal based on the number of categories utilised by an institution. Therefore, we also adopted a 'ratio' scheme of classification. Utilising the ratio scheme, we calculated the relative position of each journal relative to the maximum value it could achieve on each school's list. In this manner, a top-ranked journal would receive a score of 100%, whereas a second-tier journal would receive a score of 50, 67, 75 or 80% for classification schemes containing 2, 3, 4 and 5 classes, respectively. As a counter to the class scheme, the ratio scheme tends to depress the score of journals based on the number of classes utilised by each of the respondent institutions.

4. Results and discussion

4.1 *Data analysis*

Upon completion of the coding process, we tabulated the number of times a journal was listed on one of the department journal quality lists and computed the average quality for both the class and ratio classification schemes. Using this data, we ran a separate cluster analysis for each of the classification schemes based on the computed quality and frequency of occurrence scores. As with any cluster analysis problem, the question of how many clusters should be created must be addressed. The rule of thumb promoted by Lehmann (1979) suggests that the number of clusters should be between $n/30$ and $n/60$. Based on the 318 SCM journals collectively identified by our sample departments, the expected number of clusters should be between 5 and 10. We were able to verify that 5 clusters were optimal by means of Schwarz's Bayesian Criterion. Analysis by *k*-means clustering, our findings, displayed in Figures 1 and 2 and Table 5, show a remarkably consistent pattern of dispersion and cluster membership for both the class and ratio coding schemes.

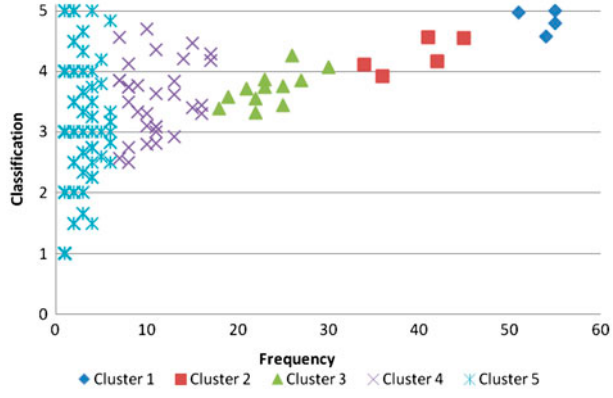

Figure 1. Cluster dispersion for the classification coding scheme.

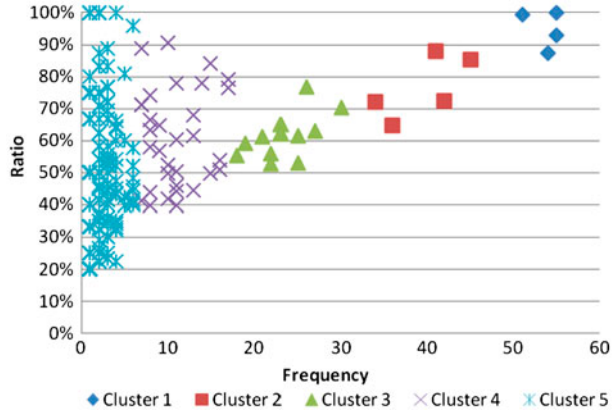

Figure 2. Cluster dispersion for the ratio coding scheme.

Table 5. Journal quality, cluster and rate of occurrence.

Journal	Ratio average	Class average	Count	Ratio cluster	Class cluster
Management Science	1.0000	5.0000	55	1	1
Operations Research	0.9951	4.9804	51	1	1
Journal of Operations Management	0.9282	4.8000	55	1	1
Production and Operations Management Journal	0.8750	4.5741	54	1	1
Manufacturing and Service Operations Management	0.8793	4.5610	41	2	2
Decision Sciences	0.8522	4.5556	45	2	2
European Journal of Operational Research	0.7238	4.1667	42	2	2
Naval Research Logistics	0.7206	4.1176	34	2	2
International Journal of Production Research	0.6481	3.9167	36	2	2
IIE Transactions	0.7673	4.2692	26	3	3
Journal of Business Logistics	0.7044	4.0667	30	3	3
Journal of the Operational Research Society	0.6493	3.8696	23	3	3
International Journal of Operations and Production Management	0.6290	3.8519	27	3	3
Omega	0.6225	3.7391	23	3	3
International Journal of Production Economics	0.6160	3.7600	25	3	3
Annals of Operations Research	0.6135	3.7143	21	3	3
Interfaces	0.5904	3.5789	19	3	3
Computers and Operations Research	0.5583	3.5455	22	3	3
International Journal of Logistics Management	0.5537	3.3889	18	3	3
Journal of Supply Chain Management	0.5307	3.4400	25	3	3
International Journal of Physical Distribution and Logistics Management	0.5273	3.3182	22	3	3
Journal of the American Statistical Association	0.9050	4.7000	10	4	4
Transportation Research Part B	0.8881	4.5714	7	4	4
Mathematical Programming	0.8400	4.4667	15	4	4
Mathematics of Operations Research	0.7902	4.2941	17	4	4
IEEE Transactions	0.7810	4.2143	14	4	4
Transportation Journal	0.7803	4.3636	11	4	4
Transportation Science	0.7637	4.1765	17	4	4
INFORMS Journal on Computing	0.7417	4.1250	8	4	4
Journal of Business Research	0.7119	3.8571	7	4	4
Transportation Research Part A	0.7119	3.8571	7	4	4
Transportation Research Part E	0.6795	3.8462	13	4	4
Journal of Forecasting	0.6646	3.7500	8	4	4
Journal of Applied Probability	0.6463	3.7778	9	4	4
Journal of Transportation Economics and Policy	0.6333	3.5000	8	4	4
Production, Planning and Control	0.6141	3.6154	13	4	4
Supply Chain Management: An International Journal	0.6030	3.6364	11	4	4
Journal of Quality Technology	0.5813	3.7500	8	4	4
Transportation	0.5685	3.3333	9	4	4
Operations Research Letters	0.5385	3.4375	16	4	4
Journal of Scheduling	0.5250	3.3000	10	4	4
Computers and Industrial Engineering	0.5083	3.3125	16	4	4
International Journal of Project Management	0.5030	3.0909	11	4	4
Production and Inventory Management Journal	0.4989	3.4000	15	4	4
Project Management Journal	0.4967	3.1000	10	4	4
Journal of Manufacturing Systems	0.4606	3.0909	11	4	4
International Journal of Quality and Reliability Management	0.4462	2.9231	13	4	4
International Journal of Logistics: Research and Applications	0.4409	2.8182	11	4	4
Journal of Manufacturing Technology Management	0.4396	2.7500	8	4	4
Journal of Purchasing and Supply Management	0.4183	2.8000	10	4	4
Transportation Research Part D	0.4119	2.5714	7	4	4
International Transactions in Operational Research	0.3979	2.5000	8	4	4
Quality Management Journal	0.3970	3.0000	11	4	4

To ensure that our clusters were significantly different, a one-way analysis of variance (ANOVA) was performed to test for differences across group means. Since our clusters were of widely differing sizes and the Levene statistic suggested that we had violated the assumption of homogeneity of variance across clusters, we utilised the Tamhane T2 test to test for differences between groups. The cluster means, standard error, F test and significance (p) for the ANOVA, as well as the Tamhane comparisons are shown in Tables 6 and 7.

Table 6. Cluster dimensions for the classification code scheme.

	Cluster 1 $n=4$	Cluster 2 $n=5$	Cluster 3 $n=12$	Cluster 4 $n=32$	Cluster 5 $n=265$	
Quality	(3,4,5)	(4,5)	(1,5)	(1,2,5)	(1,2,3,4)	
Cluster mean	4.8386	4.2635	3.7118	3.5602	3.0715	$F=7.315$
Standard error	0.0990	0.1274	0.0808	0.1068	0.0640	$p<0.001$
Count	(2,3,4,5)	(1,3,4,5)	(1,2,4,5)	(1,2,3,5)	(1,2,3,4)	
Cluster mean	53.7500	39.6000	23.4167	10.9063	1.8830	$F=1885.04$
Standard error	0.9465	2.0149	0.9806	0.5542	0.0794	$p<0.001$

Notes: Numbers in parentheses indicate the group number from which this cluster is significantly different at $p=0.05$ level according to the Tamhane T2 comparison test. F statistic and associated p-values are derived from one-way ANOVAs.

Table 7. Cluster dimensions for the ratio code scheme.

	Cluster 1 $n=4$	Cluster 2 $n=5$	Cluster 3 $n=12$	Cluster 4 $n=32$	Cluster 5 $n=265$	
Quality	(3,4,5)	(5)	(1,5)	(1,5)	(1,2,3,4)	
Cluster mean	0.9496	0.7648	0.6135	0.6059	0.5017	$F=9.088$
Standard error	0.0298	0.0436	0.0204	0.0268	0.0129	$p<0.001$
Count	(2,3,4,5)	(1,3,4,5)	(1,2,4,5)	(1,2,3,5)	(1,2,3,4)	
Cluster mean	53.7500	39.6000	23.4167	10.9063	1.8830	$F=1885.04$
Standard error	0.9465	2.0149	0.9806	0.5542	0.0794	$p<0.001$

Notes: Numbers in parentheses indicate the group number from which this cluster is significantly different at $p=0.05$ level according to the Tamhane T2 comparison test. F statistic and associated p-values are derived from one-way ANOVAs.

Table 8. Impact factor, quality ranks and citation age statistics for select journals.

Journal	Impact factor	Ratio rank	Class rank	Cluster	5-Year impact factor	Citation half-life	Immediacy index
Journal of Operations Management	4.400	3	3	1	7.130	8.0	0.351
Journal of Supply Chain Management	3.320	20	19	3	5.107	6.4	0.481
Transportation Research Part B	2.944	23	23	4	3.520	8.0	0.347
Transportation Research Part A	2.725	31	31	4	3.000	8.0	0.346
Transportation Research Part E	2.272	32	32	4	2.764	9.0	0.419
European Journal of Operational Research	2.038	7	7	2	2.524	8.1	0.311
Journal of Business Logistics	2.020	11	11	3	3.656	>10.0	0.000
Management Science	1.859	1	1	1	3.057	>10.0	0.374
International Journal of Physical Distribution and Logistics Management	1.826	21	21	3	3.228	8.6	0.341
Transportation Science	1.814	28	28	4	2.623	>10.0	0.182
Operations Research	1.786	2	2	1	2.484	>10.0	0.208
Manufacturing and Service Operations Management	1.712	5	5	2	2.561	6.5	0.244
Decision Sciences	1.484	6	6	2	2.993	>10.0	0.171
International Journal of Production Research	1.460	9	9	2	1.733	8.0	0.040
Production and Operations Management Journal	1.315	4	4	1	2.316	7.6	0.129
IIE Transactions	1.287	10	10	3	1.647	>10.0	0.182
Naval Research Logistics	0.692	8	8	2	1.240	>10.0	0.085
Transportation Journal	0.250	27	25	4	0.961	9.6	0.045

The five clusters break according to the Pareto principle, with the first 53 journals (16% of the total as identified by Clusters 1–4) accounting for more than 67% of the department listings. While each cluster is distinct from the others in terms of the number of times a member journal is identified on the department lists, only Cluster 5 is distinct from all of the other clusters based on the quality scores. With Cluster 5 being obviously inferior to Clusters 1–4, we will focus the discussion on the characteristics of Clusters 1–4.

4.2 Discussion

Analysis of the results reveals the four journals that comprise Cluster 1 to be highly valued both in terms of quality and frequency of listing: *Management Science*, *Operations Research*, *Journal of Operations Management*, and *Production and Operations Management Journal*. Both *Management Science* and *Operations Research* frequently appear in previous listings of top operations journals (see Table 1). Similarly, the *Journal of Operations Management* has frequently been ranked as a top journal for operations, logistics and purchasing in previously published journal quality articles. While not listed as a 'Top Five' journal in the articles listed in Table 1, the presence of *Production and Operations Management Journal* in this elite group is understandable due to its inclusion on the lists used by the *Financial Times* and *BusinessWeek* to determine intellectual strength for ranking academic programmes.

Somewhat surprising is the finding that the quality difference between Cluster 1 and Cluster 2 is negligible; the differential between the clusters appears based on the number of departments targeting the journals. While previous research would suggest that *Manufacturing and Service Operations Management* and *Decision Sciences* should be highly ranked, the appearance of *European Journal of Operational Research*, *Naval Research Logistics* and *International Journal of Production Research* suggests increased influence within the past few years. While both *European Journal of Operational Research* and *Naval Research Logistics* are fairly traditional OM journals, the emergence of *International Journal of Production Research* as a first-tier SCM research outlet may be due to the diversity of articles it publishes in terms of both content and geographic perspective. Investigating trends for the country of origin of articles published in *IJPR* since 1986, Fry et al. (2013) identified a clear trend toward more 'international' content. Whereas authors residing in the US and UK contributed about 65% of the articles published from 1986 to 1995, the percentage dropped to about 20% for the US and 6% for the UK between 2006 and 2010 with authors residing in Taiwan (11%), China (9%) and India (6%) now contributing nearly as much content.

Cluster 3 is comprised of 12 journals with moderately high-quality scores and fairly wide recognition. This cluster contains *International Journal of Operations and Production Management* and *International Journal of Production Economics*, two journals that are generally seen as strong but not elite in previous OM journal rankings. Cluster 3 also contains *Journal of Business Logistics*, *International Journal of Logistics Management*, *Journal of Supply Chain Management* and *International Journal of Physical Distribution and Logistics*; journals that are traditionally seen as elite in the areas of logistics and purchasing. A visual inspection of the department lists indicates an underlying cause for the relative downgrade, a cause suggested in both Tables 2 and 3. Most of the departments that identify themselves as logistics, transportation or supply chain management have these journals ranked highly; however, the vast majority of the departments teaching SCM material, as indicated by department name and the content of the previous clusters, lean toward operations.

Interestingly, the traditional elite logistics journals seem to be caught in a paradox; they are too well established to be disregarded on the journal lists of top business schools, but not valued highly enough by the majority OM community to rank well on broader lists. To illustrate this point, Cluster 4 contains *Transportation Research* (parts A, B and E which have quality ratio ratings of 0.88, 0.71 and 0.67, respectively), *Transportation Journal* (0.78) and *Transportation Science* (0.76). Each of these journals compare favourably in terms of quality to the *Journal of Business Logistics* (0.70) and the *Journal of Supply Chain Management* (0.53), two traditionally elite Cluster 3 logistics and purchasing journals. Whereas *JBL* and *JSCM* appear on nearly two times as many lists as the journals appearing in Cluster 4, they appear to be devalued relative to their contemporaries.

To explore this phenomenon further, we collected 2012 impact factor, citation half-life and immediacy index data for journals ranked in the top five in studies published since 2000, journals ranked in our top two clusters and other selected transportation journals. When ranked based on impact factor (see Table 8) there appears to be a clear disconnect between this proxy for journal importance and department rankings. A comparison of *JSCM* and *JBL* with *Management Science*, the top-ranked journal on most department lists, proves insightful. Not only do both the *Journal of Supply Chain Management* and the *Journal of Business Logistics* have superior 1-year and 5-year impact factors, *JSCM*'s content appears much timelier as indicated by both the citation half-life and immediacy index. While the median age of *Management Science* citations can be attributed, in large part, to the substantial library of classic studies previously published, articles published in *JSCM* are cited by research published in the following year more frequently. While 71% of the journals in Clusters 1–4 suggest an operations orientation, we expect the emergence of SCM as both a strategic imperative and field of study to increase the importance placed on logistics and purchasing journals, improving both their quality and count scores.

The emergence of additional outlets for SCM research could have significant implications for areas such as purchasing, whose literature remains in its relative infancy. Zsidisin et al. (2007) published the first ranking of purchasing research outlets; a review of that list reveals a majority of the outlets are elites focused on operations or

Table 9. Classification rank and percent of schools reporting based on geographic location.

Journal	North America class average	Europe class average	Asia-Pacific class average	North America percent included (%)	Europe percent included (%)	Asia-Pacific percent included (%)
Management Science	5.0000	5.0000	5.0000	84	100	100
Operations Research	4.9737	5.0000	5.0000	76	100	100
Journal of Operations Management	4.8095	4.8000	4.6667	84	100	100
Production and Operations Management Journal	4.7073	4.2000	4.0000	82	100	100
Manufacturing and Service Operations Management	4.7419	4.1429	3.6667	62	70	100
Decision Sciences	4.6571	4.0000	4.6667	70	70	100
European Journal of Operational Research	4.2188	4.0000	4.0000	64	80	67
Naval Research Logistics	4.2800	3.5000	4.0000	50	60	100
International Journal of Production Research	4.0000	3.8750	3.0000	52	80	67
IIE Transactions	4.3636	2.5000	5.0000	44	20	67
Journal of Business Logistics	4.4091	3.1667	3.0000	44	60	67
Journal of the Operational Research Society	3.9333	3.7143	4.0000	30	70	33
International Journal of Operations and Production Management	3.8889	3.7500	4.0000	36	80	33
Omega	3.8667	3.4286	4.0000	30	70	33
International Journal of Production Economics	3.7333	3.7500	4.0000	30	80	67
Annals of Operations Research	4.0769	3.2857	2.0000	26	70	33
Interfaces	3.8571	3.0000	2.0000	28	40	33
Computers and Operations Research	3.6250	3.2000	4.0000	32	50	33
International Journal of Logistics Management	3.7778	3.1250	2.0000	18	80	33
Journal of Supply Chain Management	3.8235	2.7143	2.0000	34	70	33
International Journal of Physical Distribution and Logistics Management	3.6667	3.0000	2.5000	24	80	67

logistics. Thus, purchasing research must compete for space with articles tailored to a particular journal's mission, diminishing the probability of publication. Although *IJPR* and *JSCM* have both consistently published purchasing articles, the only journal in Table 5 that primarily publishes purchasing research is the *Journal of Purchasing and Supply Management*, a journal currently ranked in Cluster 4. Given the importance of purchasing to the field of SCM, the emergence of additional high-quality research outlets could speed the progress of a literature stream that has been slow to develop.

Finally, based on the work of Soteriou, Hadjinicola, and Patsia (1999), we investigated the impact of geographic location on department perception of journal quality. As shown in Table 9, North American universities listed the journals in Cluster 1 between 76 and 84% of the time while universities located in Europe and the Asia-Pacific region did so unanimously. The top three journals in this cluster show a great deal of consistency in terms of perceived quality; however, North American universities appear to overweight the perceived quality of the *Production and Operations Management Journal* relative to departments located in Europe and Asia-Pacific. In Cluster 2, we see some difference in perceived quality based on geographic location for *M&SOM* and *IJPR*, with Asia-Pacific universities ranking these journals lower than North American or European universities. Similarly, Decision Sciences is ranked significantly lower by European departments relative to either departments in North America or Asia-Pacific. Cluster 3 is notable for having a wide divergence in percent of universities including the journals on their lists. European universities generally include a larger number of journals, perhaps due to the adoption of single journal quality lists in a number of European countries. A second interesting feature of Cluster 3 is that *International Journal of Operations and Production Management*, which Soteriou, Hadjinicola, and Patsia (1999) ranked second overall in terms of quality as perceived by European researchers, is now perceived less favourably in Europe than in other geographic regions. Finally, it is apparent that North American universities perceive SCM and logistics journals as having greater quality than departments located in Europe or Asia-Pacific regions. While adoption rates are not exceptionally high for these journals in North America, those universities that have included journals such *as JBL, IJLM, JSCM* and *IJPDLM* appear to have a much more favourable perception of their quality when compared to universities in other regions.

5. Conclusions

We began this project as a service contribution to our department; to provide information on how best to integrate distinct logistics, operations and purchasing journal lists into a single SCM list that all of our faculty could accept. Finding no published articles on a holistic ranking of SCM literature, we quickly realised the contribution this work could make to the SCM community. We decided to address the question in terms of how evaluations for tenure and promotion would be carried out by using department journal lists.

Collection and analysis of the journal lists provided a unique view of the relative importance of the journals in the field. While this method created a messy coding problem, not specifying a set of journals or a quality scale addressed several problems associated with previous journal quality articles. First, rather than asking faculty to judge a predetermined but incomplete list of journals, we were able to determine the set of journals considered by top schools during tenure and promotion decisions based on their own documentation. Second, since journal lists are generally developed by numerous members of the faculty and voted on by the department, we reduced individual bias by collecting the collective wisdom of each SCM department. Finally, we removed the perceptual bias caused by asking faculty to judge the quality of journals on an arbitrary scale when that perception would be coloured by the spectre of their own department journal lists. Thus, though our response rate was calculated on the basis of 66 department respondents, this actually represents the combined wisdom of a far larger segment of SCM faculty.

Using cluster analysis, we are able to identify four journals that are clearly elite and an additional five journals that are indistinguishable from the first four in terms of quality, but less recognised across the academy. We call these nine journals the first-tier journals, since they appear distinct from the members in the third and fourth clusters. A review of these first-tier journals reveals clear omissions when viewed from a logistics or purchasing perspective; one-hundred percent of the journals in the first tier and 71% of the 53 journals identified in Clusters 1–4 present an operations oriented. Interestingly, many of the journals identified in previous studies as elite in the logistics or purchasing literature appear undervalued, relative to lesser quality journals in their field. This has contributed to uneven theoretical development across operations, logistics and purchasing, and inhibited the dissemination of ideas, particularly in purchasing.

Failure to address the relative dominance of operations in SCM may hinder a broader view of a holistic system by limiting targets for research. This problem may be exaggerated by national journal lists, which are intended to provide greater clarity of requirements for tenure and improve fairness through consistency of standards across institutes of higher education. However, since national lists promote monolithic attitudes toward research, they may eliminate variety and potentially inhibit professional/real-world application. Perhaps one mitigating factor that will improve perceived quality of non-OM journals is the publication of impact factors for traditionally elite logistics and purchasing journals.

Reconsidering the relative quality of journals across the previous distinct literature presents a real opportunity to increase diversity in research topics and improve our understanding of the integrated supply chain. As the field transitions from distinct academic disciplines toward a holistic view of the supply chain, we expect significant changes to the clusters presented here. We find it likely that as academics and practitioners continue to wring higher levels of productivity from manufacturing systems, they will seek higher marginal benefit environments to apply advanced process improvement techniques. It is highly likely that these environments will extend beyond the walls of manufacturing into purchasing, service management, distribution and warehousing. As traditional OM academics explore these areas, it is likely that they will find a new appreciation for these journals and we will see significant increases in both their quality and recognition scores.

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