

Are Finance, Management, and Marketing Autonomous Fields of Scientific Research? An Analysis Based on Journal Citations

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ARE FINANCE, MANAGEMENT, AND MARKETING AUTONOMOUS FIELDS OF SCIENTIFIC RESEARCH? AN ANALYSIS BASED ON JOURNAL CITATIONS

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ABSTRACT

Although there is considerable consensus that Finance, Management, and Marketing are ‘science’, some debate remains with regard to whether these three areas comprise autonomous, organized and settled scientific research fields. In this paper we aim to explore this issue by analyzing the occurrence of citations in the top-ranked journals in the areas of Finance, Management, and Marketing. We put forward a modified version of the ‘network cluster’ as proposed by Klamer and Van Dalen (2002) and conclude that Finance is a ‘Relatively autonomous, organized and settled field of research’ whereas Management and (to a larger extent) Marketing are relatively non-autonomous and hybrid fields of research’. Complementary analysis based on sub-discipline rankings using the recursive methodology of Liebowitz and Palmer (1984) confirms the above conclusions.

Keywords: Citations; Science; Autonomy

JEL-Codes: C89; A12

1. Introduction

Philosopher Karl Popper's widely accepted definition of science maintains that a statement is scientific only if it is open to the logical possibility of being found false. This definition means that we evaluate scientific statements by testing them, by comparing them to the world around us. A statement is nonscientific if it takes no risk of being found false; that is, if there is no way of testing the statement against observable facts or events. Popper (1972) called this distinction the "line of demarcation".

Most economists see their discipline as scientific in Popper's sense of the word (Klaes, 2004). Economic theory makes statements about how facts fit together, and there are constantly new sets of facts arising that allow one to test the theory to see whether the facts are as they have been predicted therein. However, this process is more difficult for economists than it is for most physical scientists. Unlike physical scientists, economists can almost never use controlled experiments to gather facts with which to test theories. Rather they must use whatever facts the world gives them and rely on statistical procedures to draw conclusions.

Although statistical procedures allow economists to hold some variables constant so as to determine the effect of other variables, just as a controlled experiment does, they are subject to serious limitations. If there are variables that the theory deems important, but which cannot be measured or can only be measured imperfectly, statistical procedures may yield misleading results. Or the procedures may fail if the theory is uncertain as to exactly which of the many possible variables that may be involved must be controlled for. One positive aspect of a properly controlled experiment is that there is no need to list all the factors that are being controlled for. The procedure is such that only one factor, or a small and known group of factors, is different between the control and experimental groups. Given these difficulties, it is not surprising that controversy on whether a theory is supported or rejected by the facts can last for many years in economics.¹

In this line of reasoning we can consider Finance, Management, and Marketing as 'sciences'. The key issue here is whether these three 'sciences' comprise autonomous scientific fields of research, namely by assessing their dependence on the area of Economic research.

¹ There is a minority of economists, however, who do not see economics as scientific in Popper's sense. A group of economists called the Austrian school, for example, has argued that economics starts with assumptions and that economic theory is the logically deduced results of those assumptions. If the theory does not fit the facts, one cannot conclude that the theory is wrong, but only that it is inappropriate to apply the theory in that particular situation because the initial conditions do not agree with the theory's assumptions.

In this paper we aim to explore this issue by analyzing the occurrence of citations in the top-ranked journals in the fields of Finance, Management, and Marketing.

The paper is structured as follows. The next section presents some considerations on journal rankings, paper citations and the quality of scientific research. Then, in Section 3, the methodology used and the results of our investigation are explained. Finally, the main points of the study are listed in the Conclusions.

2. Citations in top-ranking journals and the autonomy of scientific fields of research

Research is disseminated in many varied forms, whether it be through books, journals, word-of-mouth or the Internet. However, journal articles are the only publications that are subject to the widely accepted thorough peer-review process. Therefore, most academics would agree, despite the imperfections of this process, that it provides the ‘fairest’ measure of quality. It can be argued that publishing a book can enhance an academic’s reputation. However, the heterogeneous nature of books and publishers makes it an extremely difficult task to derive an objective quality measure. Therefore, virtually all studies since the 1980s have ranked economics departments on the basis of refereed journal articles (Macri and Sinha, 2006).

Additionally, citations are often found to be the best quantifiable measure of journal quality and importance (Alexander Jr. and Mabry, 1994) and are frequently used to establish an accurate ranking of journals (Bush et al., 1974; Gerrity and Mckenzie, 1978; Hamelman and Mazze, 1976; Liehowitz and Palmer, 1984; Mabry and Sharplin, 1985; Schwert, 1993; Macri and Sinha, 2006). Rankings of journals (both in economics and finance) rely primarily on one of two different methods: opinion surveys or the frequency of journal citations in research. However, perceptions gleaned from surveys are much less tangible and may be easily influenced by the design of survey instruments. One potential problem is that the survey may fail to include relevant journals that have significant bearing on the discipline. The citations approach, which involves analyzing the frequency of journal citations found in published research, is a more objective technique for determining journal quality as most scholars perceive it – the contribution of information and ideas to current published research (Parks, 2002).

As Alexander Jr. and Mabry (1994) correctly state, knowing the relative importance of journals is valuable in many ways: as input in personnel decisions involving selection, compensation, promotion, and tenure; as information for authors who must decide which journals are the best sources of useful, relevant literature and which are the best (most

influential) outlets for their research results; as information for individuals, departments, and libraries that must allocate scarce resources to reading and/or buying journals; and as data for editors of journals to use in assessing their own performance and making the necessary adjustments to achieve their goals. However, it should be noted that the relative importance of journals in a given area, more specifically, the characteristics and relative patterns of citation might be a valuable tool to assess the degree of autonomy/dependence of that particular field of research.

According to some authors (e.g., Parks, 2002; Klamer and Van Dalen, 2002), academic publishing is apparently ‘gripped’ in a path-dependent equilibrium with scientists converging in clusters of concurring scientists. Klamer and Van Dalen (2002: 294) note that “The super star SSCI [Social Science Citation Index] journal has an impact factor of 11.3, which means that the average article in this journal receives 11.3 citations (including self-citations) in the first two years following the publication date. The most visible characteristic of the distribution of journals is however the almost rectangular shape. For 80 per cent of all journals, influence on the scientific community is small if not negligible. The median impact factor for the social sciences journals is 0.5 (which includes self-citations of authors) whereas the top-10 per cent journal has an impact factor of 1.65.”

In Van Raan’s (2000) view, modern science displays a ‘fractal-like structure’, that is, each research cluster generates its own publications and forms a mutual citation society and as time goes by this cluster generates a more refined cluster, which again generates ‘offspring’. Following this line of reasoning, one would expect that those who write in the *Journal of Finance* cite other articles in the same journal (journal self-citation rates are generally high). So even if these articles are not cited elsewhere, their citations add to the total (provided they are included in the SSCI). Klamer and Van Dalen (2002) argue that the ‘inflation of citations’ observed in recent years (Macri and Sinha, 2006) indicates a rapid expansion in the number of clusters in the world of the sciences. These authors put forward a set of interesting network models designed for understanding ‘science’: (a) Lone wolves (no interaction); (b) The Science Ideal (full interaction); (c) Technology leader sets the standard (of language, methods, issues); (d) Learning from neighbors; (e) Minimal network structure with a core.

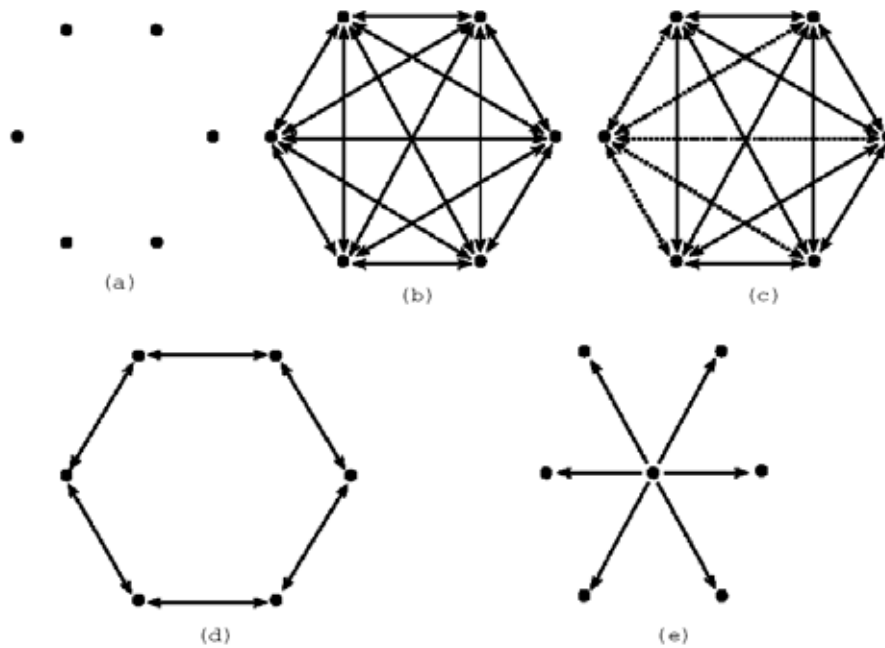


Figure 1: Network interaction structures

Source: KLAMER and VAN DALEN (2002: 306)

Model (c), in which a leader sets the standard, adds some plausibility to modeling the world of scientific publication. It is worth remembering, as Frey and Eichenberger (1997) note, how US universities and journals set standards for the rest of the economic community. The star model (e) comes close to how each discipline operates, with a set of core journals to which minor, more specialized journals are connected (see Stigler 1994; Stigler et al. 1995; Van Dalen and Henkens 1999). Note however how communication in this model generally moves in one direction. The intellectual triad between journals is generally such that core journals export knowledge to specialized journals and not the other way around. Klammer and Van Dalen (2002) provide an explanation as to why this happens: core journals generally reach a large number of readers and practitioners, whereas specialized journals reach more targeted and smaller audiences and, because of their size, the price of specialized journals are generally higher than core journals.

We propose a modified version of the ‘network clusters’ (c) - Technology leader sets the standard - in order to understand the degree of autonomy and scientific organization of particular fields of research, namely Finance, Management and Marketing. Each node is a top-ranked journal in the particular area. The direction and thickness of the arrows reflect, respectively, the direction of citation and the relative frequency of citations.

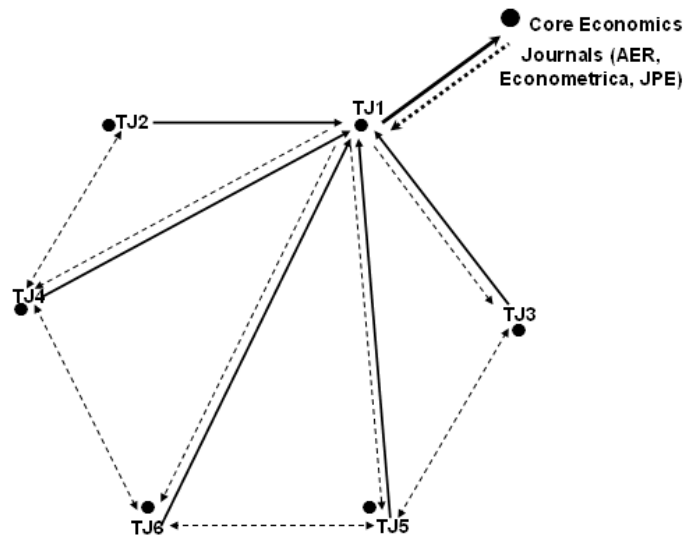


Figure 2: Relatively autonomous, organized and settled field of research

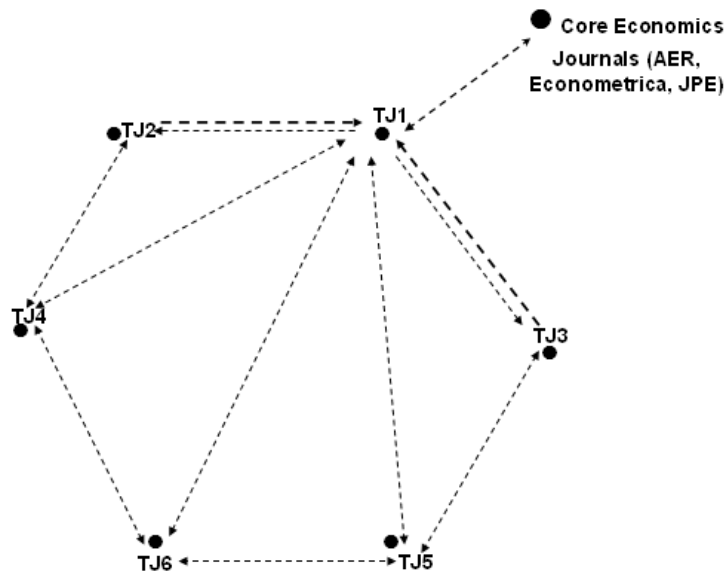


Figure 3: Relatively non-autonomous, hybrid, and recent field of research

In the case of a ‘Relatively autonomous, organized and settled field of research’, a narrow set of top journals in a given area (e.g., Finance, Management, or Marketing) do cite each other but the most important one (top of the top, TJ1) is cited to a greater extent (bold arrows). The latter in turn tends to cite top Economics journals (American Economic Journal, Econometrica, Journal of Political Economy, Quarterly Economic Journal) to a reasonable extent, which can be considered ‘the fundamentals’.

In contrast, ‘Relatively non-autonomous, hybrid, and recent field of research’ displays a more diffuse pattern. Among top journals the reciprocal citations are rather weak and there is no

well-defined body of ‘fundamental theoretical knowledge base’, that is, the citation of a given area’s top journal or of top Economics journals is negligible.

Following this line of reasoning, we aim to assess which network patterns emerge in the case of Finance, Management and Marketing. The following section details the procedures undertaken to achieve this.

3. Methodology and results

The data was obtained from the ISI Web of Knowledge database (portal.isiknowledge.com). ISI collects bibliographic information on thousands of journals among which 102 are classified as Management and Finance. Its access is limited to subscribers.

First, a list of the 2005 15 most cited journals was extracted from the ISI Web of Knowledge in the area of Management and Finance (Table 1). The top journal according to the number of citations is the Journal of Finance, with 8235 citations. This journal has an impact factor of 2.549, which means that the average article in this journal receives 2.5 citations (including self-citations) in the first two years following publication date. Note however that the Academy of Management Review and Journal of Marketing are those which have the highest impact factor.

Table 1: ISI Web of Knowledge 2005 most cited journals in the area of Management and Finance

ISI Ranking	Abbreviated Journal Title	ISSN	2005 Total Citations	Impact Factor
1	J FINANC	0022-1082	8235	2.549
2	ACAD MANAGE J	0001-4273	6944	2.200
3	ACAD MANAGE REV	0363-7425	6387	4.254
4	STRATEGIC MANAGE J	0143-2095	6137	1.897
5	ADMIN SCI QUART	0001-8392	5906	2.719
6	J FINANC ECON	0304-405X	5404	2.385
7	J MARKETING	0022-2429	5307	4.132
8	J MARKETING RES	0022-2437	4495	2.611
9	HARVARD BUS REV	0017-8012	4475	1.404
10	J CONSUM RES	0093-5301	4356	2.161
11	ORGAN SCI	1047-7039	3142	1.989
12	J MONETARY ECON	0304-3932	2670	1.661
13	J MANAGE	0149-2063	2562	1.535
14	REV FINANC STUD	0893-9454	1984	1.893
15	J INT BUS STUD	0047-2506	1788	1.250

In a second stage, the articles from the 2005 top ISI-ranked journal (Journal of Finance, JF) were listed and their references downloaded. With this citation data, the journals were ranked and the second-ranked journal (Journal of Economical Finance, JEF) was downloaded.

Following computations, the procedure was repeated with the third-ranked publication (Review of Financial Studies, RES). Core economics journals were then excluded (American Economic Review - AER; Econometrica - Econ; Journal of Political Economy – JPE, and Quarterly Journal of Economics - QJE) and the procedure was repeated for the 7th-ranked (Journal of Business) and 8th-ranked journals (Journal of Finance and Quantitative Analyses, JFQA). Table 2 summarizes the results.

From the data, it was quite interesting to find that the second ISI-ranked journal is cited just 6 times in 14334 cited works.

Table 2: Most cited journals (starting with Journal of Finance) in the area of FINANCE, 2005

Origin \ cited	JF	JFE	RFS	J BUS	JFQA	Ec Core*	Total
J FINANC	21.5%	12.0%	4.3%	2.1%	1.2%	12.5%	53.5%
J FINANC ECON	20.0%	14.2%	4.2%	2.3%	1.7%	10.6%	52.8%
REV FINANC STUD	21.2%	9.4%	7.0%	1.6%	1.3%	11.9%	52.4%
J BUS	18.8%	10.4%	4.4%	3.1%	1.5%	10.8%	49.0%
J FINANC QUANT ANAL	23.9%	16.6%	5.4%	2.4%	3.1%	6.9%	58.4%
<i>Average</i>	<i>21.0%</i>	<i>12.1%</i>	<i>4.5%</i>	<i>2.1%</i>	<i>1.4%</i>	<i>10.1%</i>	<i>51.2%</i>

* Econ Core - American Economic Review - AER; Econometrica - Econ; Journal of Political Economy – JPE, and Quarterly Journal of Economics - QJE

As can be seen in Table 2, on average, half of the total citations in the area of Finance come from a narrow set of top journals. Additionally, a large proportion of the citations refer to the Journal of Finance – for example, almost one-quarter (23.9%) of the references found in the Journal of Finance and Quantitative Analysis cite the Journal of Finance, far above the percentage of self-citation in the former journal (3.1%). What is particularly interesting here are the citations to Core Economics Journals. On average, ten per cent of these citations to/in [C1]top journals refer to the American Economic Review, Econometrica, Journal of Political Economy, and Quarterly Journal of Economics.

From the results mentioned above, and based on our theoretical proposal to determine the degree of autonomy and scientific organization of particular fields of research (the modified version of the ‘network clusters’ (c) - Technology leader sets the standard), it is possible to conclude that Finance is a ‘Relatively autonomous, organized and settled field of research’ (cf. Figure 2).

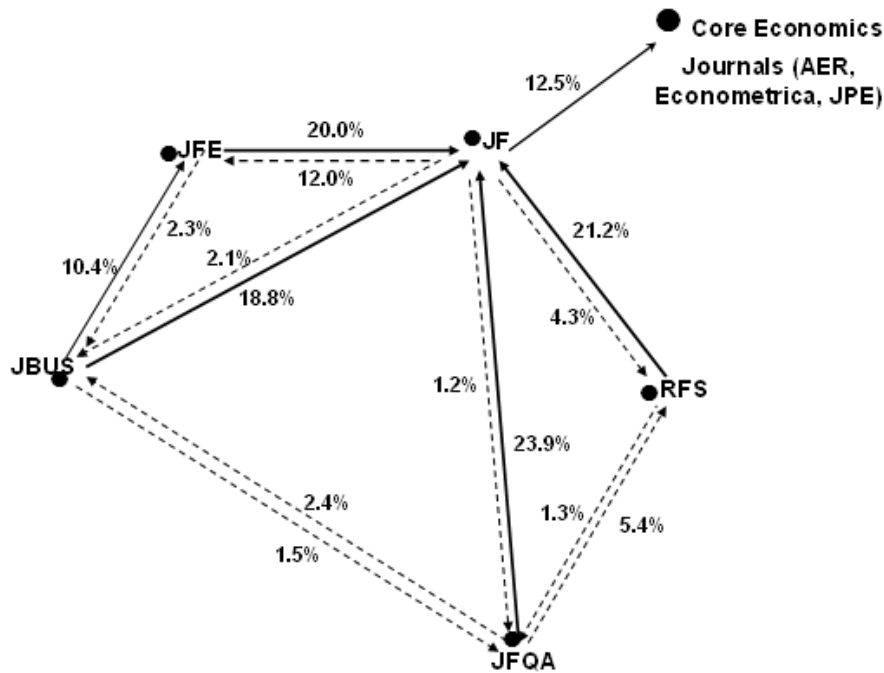


Figure 4: FINANCE as a ‘Relatively autonomous, organized and settled field of research’

In a third stage, the procedure is repeated with the second ISI-ranked journal (Academy Management Journal). Results are summarized in Table 3. It should be noted that “Management” journals do not cite Finance or Marketing journals. Moreover, citations are much more dispersed than in the Finance-related field – in management, on average, less than 30% of the total citations in top-ranked journals originate within this group of journals. Here the top of the top is not so clear-cut. In fact, the Academy of Management Review and Organization Science cite the Administrative Science Quarterly (2nd in the ranking) to a larger extent.

Table 3: Most cited journals (starting with Academy Management Journal) in the area of MANAGEMENT, 2005

Origin \ cited	AMJ	ASQ	AMR	SMJ	J M	OS	Ec Core	Total
ACAD MANAGE J	9.50%	7.94%	5.28%	5.66%	2.38%	2.34%	1.59%	34.68%
ADMIN SCI QUART	6.04%	10.54%	4.71%	1.43%	1.02%	3.28%	1.64%	28.66%
ACAD MANAGE REV	4.48%	4.80%	4.80%	3.44%	1.69%	1.62%	1.75%	22.58%
STRATEGIC MANAGE J	6.10%	3.18%	2.93%	12.92%	2.26%	2.98%	2.73%	33.10%
J MANAGE	7.16%	4.04%	4.77%	5.46%	4.66%	2.00%	0.77%	28.86%
ORGAN SCI	4.43%	6.53%	3.23%	2.21%	1.91%	4.50%	1.43%	24.24%
<i>Average</i>	<i>5.64%</i>	<i>5.30%</i>	<i>4.18%</i>	<i>3.64%</i>	<i>2.40%</i>	<i>2.95%</i>	<i>1.65%</i>	<i>28.69%</i>

Given these results, from a theoretical point of view, Management appears here as a relatively non-autonomous, hybrid, and recent field of research, as can be seen in Figure 5.

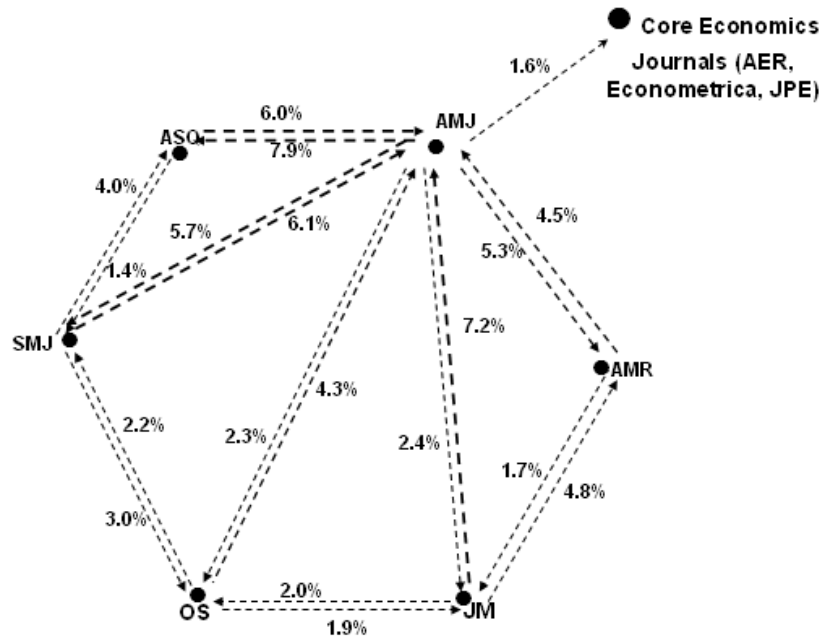


Figure 5: MANAGEMENT as a ‘Relatively non-autonomous, hybrid, and recent field of research’

Finally, the procedure is once more applied to the seventh ISI-ranked journal (Journal of Marketing). Table 4 summarizes the results. Data shows that similarly to the case of Management but in contrast to Finance there is no clear ‘leader’, since, for instance, the Journal of Consumer Research cites the Journal of Marketing Research (2nd-ranked journal) more extensively. Moreover, only less than 20% of citations (on average) come from these four ‘top’ journals.

Table 4: Most cited journals (starting with Academy Management Journal) in the area of MARKETING, 2005

Origin \ cited	MS	JMR	JM	JCR	Ec Core	Total
MARKET SCI	18.37%	7.48%	2.64%	0.72%	4.98%	15.82%
J MARKETING RES	10.25%	8.49%	8.49%	3.81%	0.60%	21.38%
J MARKETING	4.28%	2.92%	16.55%	1.66%	0.33%	21.45%
J CONSUM RES	2.63%	7.17%	4.65%	22.27%	4.39%	38.48%
Average	5.72%	5.86%	5.26%	2.06%	2.58%	19.55%

Similarly to Management, but presenting an even more dispersed and hybrid pattern, Marketing displays a network which reflects a non-autonomous, hybrid, and recent field of research (Figure 6).

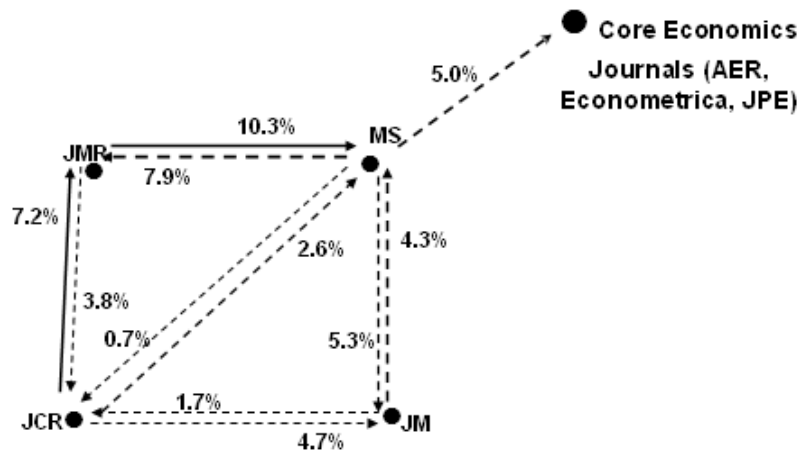


Figure 6: MARKETING as a ‘Relatively non-autonomous, hybrid, and recent field of research’

Based on the citation data, sub-discipline rankings were constructed using the recursive methodology of Liebowitz and Palmer (1984), which computes the average relative impact of each paper published. This methodology, relying extensively on Moore’s (1972) seminal work, has developed into the standard for the quality evaluation of journals (e.g., Laband and Piette, 1994 and Kalaitzidakis et al., 2003).

Given that I_m is the average impact of journal m and $K_{m,n}$ the percentage of citations from articles in other journals in journal m (where N is the total number of journals), then the average journal impact, I_m , is computed by the next expression where parameter ξ is a scale factor that normalizes the top-ranking journal’s impact to 100.

$$I_m = \frac{\sum_{n=1}^N K_{m,n} \cdot I_n}{\xi}$$

Applying this procedure to our data, a ranking of the journals in the 3 sub-areas considered was obtained, and is presented in Table 5.

Table 5: Relative impact of the most cited journals (Finance, Management and Marketing)

FINANCE		MANAGEMENT		MARKETING	
Journal title	Impact	Journal title	Impact	Journal title	Impact
J FINANC	100.00	ACAD MANAGE J	100.00	MARKET SCI	100.00
J FINANC ECON	69.91	ADMIN SCI QUART	96.47	J MARKET RES	84.05
REV FINANC STUD	32.04	ACAD MANAGE REV	80.70	J MARKETING	83.55
J BUS	16.66	STRATEGIC MANAGE J	70.42	J CONSUM RES	34.36
J FINANC QUANT ANAL	11.59	J MANAGE	63.91		
		ORGAN SCI	45.71		

To illustrate the degree of independence among these 3 sub-areas and their dependence on other scientific areas, namely Economics, Psychology and Sociology, we computed an extended sub-field area ranking with 25 journals where the weight factors are the impact indexes computed in Table 5 (see Table 6).

Table 6: Importance of journals from other scientific fields to the areas of Finance, Management and Marketing

FINANCE			MANAGEMENT			MARKETING		
Journal title	Fields	Index	Journal title	Fields	Index	Journal title	Fields	Index
J FINANC		100.00	ACAD MANAGE J		100.00	J CONSUM RES		100.00
J F E		69.91	ADMIN SCI QUART		96.47	J MARKETING RES		84.05
REV FINANC STUD		32.04	ACAD MANAG REV		80.70	J MARKETING		83.55
AM ECON REV	Econ	28.23	STRAT MANAGE J		70.41	MARKET SCI		34.36
ECONOMETRICA	Econ	25.17	J MANAGE		63.91	J PERS SOC PSYCHOL	Psychol	77.84
J POLIT ECON	Econ	24.87	J APPL PSYCHOL	Psychol	47.78	MANAGE SCI	Manag	31.38
Q J ECON	Econ	19.50	AM J SOCIOL	Sociol	46.06	STRAT MANAGE J	Manag	22.64
J BUS		18.60	ORGAN SCI		45.70	J RETAILING		19.96
J FINANC Q ANAL		11.59	AM SOCIOL REV	Sociol	35.06	INT J RES MARK		19.90
J POLITICAL EC	Econ	7.90	MANAGE SCI		29.75	ECONOMETRICA	Econ	18.75
J ACCOUNT ECON	Account	7.15	ADM SCI Q		26.77	J ACAD MARKET SCI		17.77
REV ECON STUD	Econ	7.06	J PERS SOC PSYC	Psychol	26.61	J CONSUM PSYCHOL	Psychol	17.09
J MONETARY ECON	Econ	7.06	RES ORG BEHAV	Psychol	26.53	PSYCHOL BULL	Psychol	16.28
J BANK FINANC		6.76	ORG BEHAV HUM	Psychol	16.23	HARVARD BUS REV	Manag	15.82
J ECON THEORY	Econ	6.21	AM ECON REV	Econ	15.27	J BUS	Finance	15.58
J LAW ECON	Econ	5.30	HARVARD BUS REV		13.80	AM ECON REV	Econ	13.43
RAND J ECON	Econ	4.83	PERS PSYCHOL	Psychol	13.54	ADV CONSUM RES		12.95
J ACCOUNTING RES	Account	4.63	J INT BUS STUD		12.81	MARKET LETT		11.88
FINANC MANAGE		4.19	HUM RELAT	Psychol	12.76	AM PSYCHOL	Psychol	11.74
J ECON PERSPECT	Econ	3.80	J ORGAN BEHAV	Sociology	11.51	J ADVERTISING		10.21
REV ECON STAT	Econ	3.66	PSYCHOL BULL	Psychol	11.49	ACAD MANAGE REV	Econ	9.04
FINANCIAL ANAL J		3.60	J MARKETING	Mark	11.37	J APPL PSYCHOL	Psychol	8.50
ACCOUNT REV	Account	3.44	STRATEGIC MAN		11.21	J ADVERTISING RES		6.22
J FINANC INTERMED		3.30	J MANAGE STUD		10.44	ACAD MANAGE J	Econ	6.14
J ECONOMETRICS	Econ	3.02	J LAW ECON	Econ	10.10	ADMIN SCI QUART	Manag	5.49

Table 6 shows that the Finance field of research draws on Economics-related journals substantially, whereas in Management, Psychology and Sociology-related journals are clearly relevant. In the case of Marketing, a more hybrid and disperse picture arises, which corroborates the network analysis performed earlier.

Table 7 presents a summary of the computations determining the degree of (in)dependence among the scientific fields of Finance, Management, and Marketing.

Table 7: Relative importance of other scientific fields in Finance, Management and Marketing

Fields \ contributes	Finance	Management	Marketing	Econ.	Psychol.	Sociol.	Accounting
Finance	60.70%	0.00%	0.00%	35.60%	0.00%	0.00%	3.70%
Management	0.00%	61.00%	6.74%	3.00%	18.31%	10.95%	0.00%
Marketing	2.32%	11.23%	59.78%	7.06%	19.60%	0.00%	0.00%

4. Conclusions

Although the idea that Finance, Management, and Marketing are ‘sciences’ is relatively consensual, some debate exists with regard to their autonomy as scientific fields of research, namely their (in)dependence (from)on the area of Economic research. In this paper, we have explored this issue by analyzing the occurrence of citations in the top-ranked journals in the three areas mentioned.

Based on Klamer and Van Dalen’s (2002) theoretical framework of science as ‘network clusters’ we propose a modified version of the ‘Technology leader sets the standard network’ in order to determine the degree of autonomy and scientific organization of these fields of research. In these networks, each node is a top-ranked journal in the particular area, and the direction and thickness of the arrows reflect, respectively, the direction of citation and the relative frequency of citations.

From this line of reasoning, it is possible to conclude that Finance is a ‘Relatively autonomous, organized and settled field of research’, whereas Management and (to a larger extent) Marketing are ‘Relatively non-autonomous and hybrid fields of research’. Complementary analysis based on sub-discipline rankings using the recursive methodology of Liebowitz and Palmer (1984) confirms the results obtained.

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