

*Business Research in the Nordic Countries: An Analysis of Research Output across Countries, Disciplines, and Institutions**

Jukka Sihvonen, Sami Vähämaa

Abstract

This paper examines the state of business research in the Nordic countries over the period 2005–2015. Using publication data from the leading peer-reviewed business and economics journals, we analyze Nordic research output across countries, disciplines, and academic institutions. Our results indicate that the Nordic countries have been very productive in business research. Despite the small number of contributing institutions, the Nordic universities account for approximately 5 percent of the total research output published in the leading journals. We also document a distinct upward trend in the share of Nordic output over the sample period. The most prolific country is Sweden, followed by Denmark, Norway, and Finland. The top-ranked Nordic institu-

Jukka Sihvonen is an Assistant Professor of Accounting and Finance at the University of Vaasa, Finland. Address: University of Vaasa, Department of Accounting and Finance, P.O. Box 700, FI-65101 Vaasa, Finland; Tel.: +358 29 449 8506; E-mail address: jusi@uva.fi

Sami Vähämaa is a Professor of Accounting and Finance at the University of Vaasa, Finland. Address: University of Vaasa, Department of Accounting and Finance, P.O. Box 700, FI-65101 Vaasa, Finland; Tel.: +358 29 449 8455; E-mail address: sami@uva.fi

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tions in terms of research output are Copenhagen Business School, Aalto University, and Stockholm School of Economics, although substantial discipline-specific differences are also observed.

Keywords: Business research; research output; journal publications; Nordic business schools; university rankings

1. Introduction

The purpose of this paper is to examine the state of business research in the Nordic countries. Specifically, we aim to analyze research output in the Nordic countries across countries, business disciplines, and academic institutions by utilizing publication data from the leading peer-reviewed business and economics journals. Moreover, we also assess the development trends in research productivity in different countries and different business disciplines over the period 2005–2015. Finally, we provide overall and discipline-specific rankings of the Nordic academic institutions based on the number of peer-reviewed journal articles. As far as we know, our paper is the first systematic assessment of business research productivity in the Nordic countries.

Why are we interested in research productivity? The central task of academic institutions is to create new knowledge through research activities and to disseminate this knowledge to the society through publications, teaching, and miscellaneous other types of outreach functions. In general, research productivity and especially success in publishing in the leading peer-reviewed journals reflect and create the reputations and prestige of academic institutions (Baden-Fuller et al., 2000). Assessments of research productivity are commonly utilized for decision-making purposes by various internal and external stakeholders of universities such as faculty members, current and prospective students, administrators, governments, policy makers, and funding agencies. As noted by Kalaitzidakis et al. (1999), Polonsky and Ringer (2009), and Chan et al. (2013), information

regarding research productivity may influence personnel and recruitment decisions, student enrollment, resource allocation, and the level of funding. In many countries, significant political attempts have recently been made to enhance the quality and quantity of research, for instance, by establishing a direct linkage between research output and the level of government funding of public universities. Given the various uses of research output assessments, we believe that the empirical analysis presented in this paper may offer important insights for the various stakeholders of Nordic academic institutions.

Our paper complements a growing body of literature on research output of different geographical regions, countries, and academic institutions. Despite the extensive prior literature, surprisingly little is so far known about business research productivity in the Nordic countries. The only exception we are aware of is Engwall (1996), who examines the research output share of the Nordic countries in 15 peer-reviewed business journals during the period 1981–1992. Engwall (1996) concludes that Nordic scholars are an important minority within business research and contribute approximately 1 percent of the authorships in the leading business journals. The Nordic countries and some Nordic universities have also sporadically appeared in previous studies which have examined research productivity in different business disciplines either globally (e.g., Chan et al., 2006; Xu et al., 2008; Polonsky and Ringer, 2009; Elbeck and Vander Schee, 2014; Xu et al., 2014) or with a regional focus on European countries (e.g., Kalaitzidakis et al., 1999; Baden-Fuller et al., 2000; Chan et al., 2004; Chan et al., 2006).

The main findings of the existing studies regarding the Nordic countries and academic in-

¹ Following the prior literature, we use the terms “research output” and “research productivity” synonymously to refer to the amount of peer-reviewed journal articles.

stitutions are summarized in Appendix 1. As can be seen from the appendix, previous studies have documented distinct differences in the relative performance of the Nordic countries across business disciplines. Finland, for instance, is the most productive Nordic country in terms of accounting (Carmona et al., 1999; Chan et al., 2006) and finance research (Chan et al., 2011), while being the least productive country in economics (Kalaitzidakis et al., 1999), international business (Chan et al., 2006), and marketing research (Polonsky et al., 2006; Polonsky and Ringer, 2009). Regarding the research output of individual academic institutions, it can be observed from Appendix 1 that three Nordic institutions which seem to rank near the top regardless of the discipline are, in alphabetical order, BI Norwegian Business School, Copenhagen Business School, and Stockholm School of Economics. In this paper, we aim to contribute to the research productivity literature by providing a comprehensive, systematic assessment of business research output in the Nordic countries across countries, disciplines, and academic institutions.

Our descriptive analysis of research productivity in the Nordic countries is based on the number of peer-reviewed articles published in the leading business and economics journals over the period 2005–2015. We utilize the Chartered Association of Business Schools' Academic Journal Guide 2015 (hereafter ABS-AJG) to identify the leading journals in different business disciplines. Specifically, we collect data on author affiliations for all articles that are published during the sample period in journals included in ABS-AJG categories 4*, 4, and 3.² The journals included in these three categories are considered to publish well executed, top quality research, and are generally highly regarded among the academic community. During the sample period, the leading business and economics journals published altogether 135,513

articles with 18,966 different academic and non-academic institutions.³

The results of our empirical analysis demonstrate that the Nordic countries have been very productive in business research over the last ten years. Although Nordic universities account for less than one percent of the institutions which have produced publications in the leading peer-reviewed journals, their share of the total research output in these journals is 4.9 percent, corresponding to 6644 individual articles. The Nordic scholars are relatively most productive in management and marketing research with an output share of 5.7 percent, while being least productive in finance research with an output share of 3.4 percent. We also document a distinct upward trend in the share of Nordic research output over the sample period.

Our analysis further shows that the most prolific Nordic country in business research is Sweden followed by Denmark, Norway, and Finland.⁴ However, there are vast differences in the relative performance of the countries across the different disciplines and also in the development trends across countries. Sweden has the highest research output among the Nordic countries in the leading accounting, economics, and management journals, while Denmark is most productive country in finance research and Finland in terms of marketing research. The most distinct country-level weaknesses that can be observed from our analysis are the much lower output of Norway in accounting research and Finland in economics research. Regarding the development trends across countries and disciplines, our findings demonstrate that Finnish institutions have made significant progress in recent years with a threefold increase in the number of published articles from 2005 to 2014. Across the different disciplines, the most notable improvements in the output share of the Nordic countries have oc-

2 We collect publication data for accounting, economics, finance, management, and marketing journals and exclude some subject areas covered by the ABS-AJG which are not among the core business disciplines taught at business schools and universities. The included subject areas are discussed in Section 2.

3 The total number of institutions in our sample somewhat exaggerates the actual number of contributing institutions because of duplicate names, name changes, name misspellings, and university mergers.

4 We exclude Iceland from our analysis because of the very small number of publications in the leading business and economics journals.

curred in finance, management, and marketing research.

The top-10 Nordic universities and business schools in terms of research output across the disciplines are Copenhagen Business School, Aalto University, Stockholm School of Economics, Aarhus University, Hanken School of Economics, BI Norwegian Business School, Norwegian School of Economics, Lund University, Uppsala University, and the University of Gothenburg. Nonetheless, we document substantial discipline-specific differences in the output of the top institutions. Finally, our analysis demonstrates that research productivity in the Nordic countries is highly concentrated with the top-5, top-15, and top-30 universities producing approximately 30%, 70%, and 90% of the total Nordic research output in the leading journals.

The remainder of the paper is organized as follows. Section 2 describes the data and methods used in the empirical analysis. Section 3 reports our findings on business research productivity in the Nordic countries. Finally, the last section summarizes the findings and concludes the paper.

2. Data and methods

We provide a descriptive analysis of research productivity in the Nordic countries based on the number of articles published in the leading peer-reviewed business and economics journals over the period 2005–2015. For this purpose, we collect data on authors' affiliations for each article published in the journals which are ranked in categories 4*, 4, and 3 in the Chartered Association of Business Schools' Academic Journal Guide 2015 (ABS-AJG).⁵ The journals included in these three ABS-AJG categories are very selective in what they publish and are generally highly regarded among

⁵ It should be noted that our descriptive analysis is based on the location of the affiliation and not on the nationality of the authors. Given the internationalization of the academic community, a considerable amount of the Nordic research output is likely to be produced by non-Nordic nationals. On the other hand, our analysis ignores the research output of the Nordic scholars who are affiliated with non-Nordic institutions.

the academic community. Nevertheless, we acknowledge that the decision to classify the journals ranked in the three highest ABS-AJG categories as the "leading" journals unavoidably entails a subjective element to our study, and therefore, we also present supplementary analysis based on the number of articles published in the journals ranked in ABS-AJG categories 4* and 4.⁶ The publication data was collected in September 2015 and include the articles which were published by the beginning of September 2015 as well as all forthcoming articles which were electronically available at the time of the data collection.⁷ Following the prior literature (e.g., Chan et al., 2004; Chan et al., 2006; Xu et al., 2014), we include only articles, research notes, and comments, and exclude editorials, book reviews, replies, and errata from the analysis.

We focus on the core business disciplines and include the journals in the following ten ABS-AJG subject areas in our empirical analysis: (1) Accounting, (2) Economics, Econometrics and Statistics, (3) Entrepreneurship and Small Business Management, (4) Finance, (5) General Management, Ethics and Social Responsibility, (6) Human Resource Management and Employment Studies, (7) International Business and Area Studies, (8) Marketing, (9) Organisation Studies, and (10) Strategy. Furthermore, in order to make the analysis more tractable over time and across disciplines, we combine subject areas 3, 5, 6, 7, 9, and 10, and categorize the journals in these six subject areas more broadly as management journals.⁸ Consequently, the five individual disciplines examined in this study are accounting, economics, finance, management, and marketing.

⁶ We use the ABS-AJG to identify the leading peer-reviewed business and economics journals because of its widespread use in journal quality evaluation in Europe. The main alternatives for the ABS-AJG are the journal citation reports and impact factors published by Thomson Reuters, the Financial Times list of the top-45 business journals, Australian Business Dean's Council's (ABDC) Journal Quality List, and the national journal lists used in the Nordic countries.

⁷ Our data includes forthcoming articles as of September 2015 mainly for the journals published by Elsevier, Wiley, and Springer.

⁸ As can be seen from Table 1, four out of the six management subject areas have less than ten journals, and consequently, the number of published articles would be very small for analyzing research output across academic institutions and the development trends in productivity over time.

Table 1 presents the ABS-AJG subject areas and reports the numbers of journals which are included in the analysis in different subject areas and in the different ABS-AJG rating categories. Our sample covers articles published in 233 different peer-reviewed journals. As can be seen from Table 1, the number of journals varies substantially across the disciplines and across rating categories. Most of the journals are ranked in ABS-AJG category 3, and journals in the subject area of Economics, Econometrics and Statistics comprise about 40 percent of the total sample. Given the disparities in the numbers of journals across disciplines, our analysis is likely to favor productivity in economics research and disadvantage countries and institutions which are relatively more prolific in

accounting and marketing research.⁹ During the sample period, the 233 journals in ABS-AJG categories 4*, 4, and 3 published altogether 135,513 articles with 18,966 different academic and non-academic institutions.

Following the standard approach in the literature (see e.g., Kalaitzidakis et al., 1999; Chan et al., 2006; Polonsky and Ringer, 2009; Xu et. al, 2014), we use two metrics to assess research output. First, we use the total number of appearances which equally credits the individual countries and institutional affiliations of all authors of an article. For example, if an article has three authors from two different countries and three different institutions, both countries and all three institutions are credited with one article. The second research

Table 1. The number of journals by disciplines and ABS-AJG categories.

DISCIPLINE	ABS-4*	ABS-4	ABS-3	TOTAL NO. OF JOURNALS
(1) Accounting	4	2	19	25
(2) Economics, Econometrics and Statistics	6	17	68	91
(3) Finance	3	5	27	35
(4) Management	7	16	39	62
Entrepreneurship and Small Business Management	0	3	5	
General Management, Ethics and Social Responsibility	4	3	10	
Human Resource Management and Employment Studies	0	5	10	
International Business and Area Studies	1	1	7	
Organization Studies	1	4	4	
Strategy	1	0	3	
(5) Marketing	5	3	12	20
Total no. of journals	25	43	165	233

The table reports the numbers of journals included in the analysis in different subject areas and different ABS-AJG rating categories. The total number of journals in the ten included ABS-AJG subject areas is 237. We have excluded the following four journals in ABS-AJG category 3 due to lack of complete electronic coverage: British Tax Review (accounting), Financial Accountability and Management (accounting), Review of Asset Pricing Studies (finance), Review of Corporate Finance Studies (finance).

⁹ Due to the imbalance in the number of journals and the number of published articles, we analyze research output separately for each individual discipline and we also provide rankings of the Nordic academic institutions both with and without articles published in economics journals.

output metric used in our analysis is the weighted number of articles. This metric adjusts the number of published articles to account for multiple authors as well as authors with multiple affiliations by distributing articles proportionally among all authors and institutions. Specifically, for articles with n different co-authors, each author's country and institution are credited with $1/n$ articles. If an author is affiliated with m different institutions, each affiliation is credited with $1/m$ of the article share that was allocated to the specific author. For instance, if an article is co-authored by author i from institution x and author j who is co-affiliated with institutions y and z , institution x is credited

with 0.5 articles and institutions y and z are both credited with 0.25 articles.

3. Results

3.1. Research output across countries and business disciplines

Table 2 reports a summary of the Nordic business research output in the leading peer-reviewed journals by disciplines and by countries. During the sample period, the business and economics journals in ABS-AJG categories 4*, 4, and 3 published altogether 135,513 articles with authorships

Table 2. Summary of research output in ABS-AJG categories 4*, 4, and 3.

PANEL A: DISCIPLINES				
	TOTAL NUMBER OF ARTICLES PUBLISHED	TOTAL NUMBER OF NORDIC APPEARANCES	TOTAL WEIGHTED NUMBER OF NORDIC ARTICLES	PERCENTAGE OF ARTICLES
All business disciplines	135513	6644	4503	4.9 %
Accounting	7500	298	234	4.0 %
Economics	64639	3207	2067	5.0 %
Finance	20446	690	462	3.4 %
Management	33152	1887	1322	5.7 %
Marketing	9776	562	418	5.7 %
PANEL B: COUNTRIES				
	NO. OF INSTITUTIONS WITH ABS-AJG PUBLICATIONS	TOTAL NUMBER OF APPEARANCES	TOTAL WEIGHTED NUMBER OF ARTICLES	PERCENTAGE OF NORDIC ARTICLES
Denmark	9	1932	1185	26%
Finland	27	1250	879	20%
Norway	26	1472	931	21%
Sweden	28	2302	1509	34%

The table reports a summary of the Nordic research output over the period 2005-2015 in journals which are ranked in ABS-AJG categories 4*, 4, and 3. In Panel A, the total number of Nordic appearances indicates the number of articles in which at least one author is affiliated with a Nordic academic institution and the total weighted number of Nordic articles adjusts the number of articles to account for multiple authors as well as authors with multiple affiliations by distributing articles proportionally among all authors and institutions. In Panel B, the total number of appearances indicates the number of articles in which at least one author is affiliated with an institution from country j and the total weighted number of articles equals the number of appearances of country j per article and institution divided by the total number of unique appearances per article.

from 18,966 different academic and nonacademic institutions. Among these institutions, we are able to identify 90 Nordic academic institutions with at least one authorship in the top-ranked journals.¹⁰ In general, our analysis demonstrates that the Nordic countries have been very successful in business research over the last ten years. Despite having only 90 contributing academic institutions, the Nordic countries produce 4.9 percent of the total research output in the top-ranked ABS-AJG journals, corresponding to 6644 individual articles.

Regarding the output across disciplines, it can be observed from Panel A of Table 2 that Nordic scholars have been relatively most productive in management and marketing research and least productive in finance research. Specifically, the ratio of Nordic appearances to the total number of published articles reaches almost 6 percent in management and marketing journals, while being only 3.4 percent in finance. Based on the relative amount of appearances to the weighted number of articles in Panel A, it can be further noted that multiple authorships and affiliations are most common in economics and least common in accounting.

Given that economics journals comprise about 40 percent of the journals included in the sample, it is not surprising that the overwhelming majority of the published articles appear in the area of economics. The share of economics in the total sample as well as in the Nordic subset is approximately 48 percent, while the second highest output share in management is only 24 percent. The dominant share of economics articles in our sample creates an imbalance which obviously benefits countries and institutions that are particularly productive in economics research.

Panel B of Table 2 provides a summary of business research output at the country level. As can be observed from the table, Sweden is by far the most

prolific country with a 34 percent share of the total research output in the Nordic countries. Despite having only 9 contributing academic institutions, Denmark is the second most productive country with about 26 percent share of the output, while Norway and Finland both produce approximately 20 percent of the Nordic publications.¹¹ The ratio of the number of appearances to the weighted number of articles suggests that there are interesting country-level differences in the prevalence of co-authorships and co-affiliations, with Danish articles, on average, having the highest number and Finnish articles having the lowest number of authorships and co-affiliations.

3.2. Development trends in business research output

Table 3 reports publication patterns in the Nordic countries over time and across countries and disciplines. Overall, Panel A of Table 3 shows a distinct upward trend in research productivity in all four countries over the sample period. Both the number of appearances and the weighted number of articles have doubled from 2005 to 2014 with an annual increase rate of almost 10 percent. Among the Nordic countries, Finland has made the most notable improvement in research output with a threefold increase in the number of published articles over the last ten years.

In order to compare the Nordic business research performance relative to rest of the world, Figure 1 plots the total number of articles published in the top-ranked ABS-AJG journals and the total number of Nordic appearances by year. Although the leading journals have generally increased the number of published articles, the growth rate of the Nordic research output has considerably outpaced the global growth trend. Specifically, Figure 1 indicates that the Nordic share of scientific output has increased from about 4 percent in 2005 to almost 6 percent in 2014.

¹⁰ 54 individual Nordic academic institutions have at least ten appearances in the top-ranked journals over the last ten years. Our supplementary analysis based on publications in ABS-AJG categories 4* and 4 shows that 63 individual institutions have at least one appearance in the journals ranked in the two highest ABS-AJG categories, and only 27 institutions have at least ten appearances in these journals.

¹¹ Appendix 2 presents a summary of Nordic research output in ABS-AJG categories 4* and 4. This supplementary analysis indicates that Sweden has produced 31 percent, Denmark 28 percent, Norway 22 percent, and Finland 18 percent of the Nordic business research output in the two highest ABS-AJG categories.

Table 3. Nordic business research output by disciplines and countries.

YEAR	PANEL A: ALL DISCIPLINES				TOTAL NO.OF APPEARANCES	TOTAL WEIGHTED NO. OF ARTICLES	FINLAND		NORWAY		SWEDEN		TOTAL	
	TOTAL NO.OF APPEARANCES	TOTAL WEIGHTED NO. OF ARTICLES	TOTAL NO.OF APPEARANCES	TOTAL WEIGHTED NO. OF ARTICLES			TOTAL NO.OF APPEARANCES	TOTAL WEIGHTED NO. OF ARTICLES	TOTAL NO.OF APPEARANCES	TOTAL WEIGHTED NO. OF ARTICLES	TOTAL NO.OF APPEARANCES	TOTAL WEIGHTED NO. OF ARTICLES	TOTAL NO.OF APPEARANCES	TOTAL WEIGHTED NO. OF ARTICLES
2005-2015	1932	1185	1250	879	1472	931	2302	1509	6956	4503				
2005	138	89	60	42	90	59	146	104	434	295				
2006	114	75	81	58	99	67	160	114	454	315				
2007	118	75	91	68	116	75	179	125	504	343				
2008	125	76	113	82	110	76	205	139	553	372				
2009	158	94	97	71	133	83	202	126	590	374				
2010	191	125	104	77	145	94	182	125	622	421				
2011	173	112	123	93	152	97	254	168	702	470				
2012	216	131	118	85	136	83	230	155	700	454				
2013	245	149	159	111	168	100	251	153	823	512				
2014	285	162	183	120	190	116	302	190	960	588				
2015	169	97	121	73	133	80	191	108	614	360				

Table 3. Continued.

YEAR	PANEL B: ACCOUNTING													
	DENMARK			FINLAND			NORWAY			SWEDEN			TOTAL	
	TOTAL NO.OF APPEARANCES	TOTAL WEIGHTED NO. OF ARTICLES	TOTAL NO.OF APPEARANCES	TOTAL WEIGHTED NO. OF ARTICLES	TOTAL NO.OF APPEARANCES	TOTAL WEIGHTED NO. OF ARTICLES	TOTAL NO.OF APPEARANCES	TOTAL WEIGHTED NO. OF ARTICLES	TOTAL NO.OF APPEARANCES	TOTAL WEIGHTED NO. OF ARTICLES	TOTAL NO.OF APPEARANCES	TOTAL WEIGHTED NO. OF ARTICLES	TOTAL NO.OF APPEARANCES	TOTAL WEIGHTED NO. OF ARTICLES
2005-2015	83	58	83	71	50	29	99	75	315	234				
2005	6	4	5	5	2	1	6	5	19	14				
2006	6	5	5	5	2	2	4	3	17	15				
2007	6	4	6	6	5	4	10	8	27	22				
2008	2	2	7	7	4	3	8	8	21	19				
2009	13	8	8	7	2	1	10	7	33	23				
2010	18	12	11	9	4	3	10	7	43	31				
2011	7	6	3	3	8	5	15	11	33	24				
2012	2	1	8	7	3	1	7	6	20	15				
2013	6	4	15	13	8	4	10	7	39	28				
2014	10	7	10	8	10	4	9	7	39	26				
2015	7	4	5	3	2	1	10	8	24	15				

Table 3. Continued.

PANEL C: ECONOMICS, ECONOMETRICS AND STATISTICS												
YEAR	DENMARK		FINLAND		NORWAY		SWEDEN		TOTAL		TOTAL NO. OF WEIGHTED APPEARANCES	TOTAL NO. OF ARTICLES
	TOTAL NO. OF APPEARANCES	TOTAL WEIGHTED NO. OF ARTICLES	TOTAL NO. OF APPEARANCES	TOTAL WEIGHTED NO. OF ARTICLES	TOTAL NO. OF APPEARANCES	TOTAL WEIGHTED NO. OF ARTICLES	TOTAL NO. OF APPEARANCES	TOTAL WEIGHTED NO. OF ARTICLES	TOTAL NO. OF APPEARANCES	TOTAL WEIGHTED NO. OF ARTICLES		
2005-2015	970	580	333	220	819	523	1187	743	3309	2067		
2005	77	48	21	14	61	42	88	65	247	169		
2006	75	46	29	19	59	42	80	56	243	162		
2007	59	39	35	27	67	45	94	63	255	174		
2008	76	43	40	25	67	45	127	83	310	196		
2009	78	43	24	15	73	45	111	65	286	168		
2010	91	57	30	19	78	50	96	61	295	186		
2011	81	51	35	23	77	48	116	69	309	191		
2012	105	64	26	17	80	48	123	80	334	209		
2013	112	67	32	21	87	53	117	65	348	206		
2014	129	74	40	27	104	65	143	90	416	255		
2015	87	50	21	15	66	40	92	47	266	152		

Table 3. Continued.

PANEL D: FINANCE														
YEAR	DENMARK			FINLAND			NORWAY			SWEDEN			TOTAL	
	TOTAL NO. OF APPEARANCES	TOTAL WEIGHTED NO. OF ARTICLES	TOTAL NO. OF APPEARANCES	TOTAL WEIGHTED NO. OF ARTICLES	TOTAL NO. OF APPEARANCES	TOTAL WEIGHTED NO. OF ARTICLES	TOTAL NO. OF APPEARANCES	TOTAL WEIGHTED NO. OF ARTICLES	TOTAL NO. OF APPEARANCES	TOTAL WEIGHTED NO. OF ARTICLES	TOTAL NO. OF APPEARANCES	TOTAL WEIGHTED NO. OF ARTICLES	TOTAL NO. OF APPEARANCES	TOTAL WEIGHTED NO. OF ARTICLES
2005-2015	222	138	157	113	143	91	188	120	710	462				
2005	19	13	6	4	7	3	12	6	44	26				
2006	12	9	13	11	12	9	14	12	51	41				
2007	19	12	8	7	13	7	20	13	60	39				
2008	12	9	18	14	8	6	12	7	50	35				
2009	13	6	8	6	15	10	17	8	53	30				
2010	19	16	10	9	12	7	11	8	52	39				
2011	20	12	27	20	13	9	19	12	79	53				
2012	19	11	15	9	11	5	5	4	50	28				
2013	39	22	19	13	16	10	27	19	101	65				
2014	33	18	20	15	20	14	31	18	104	65				
2015	17	11	13	7	16	10	20	13	66	41				

Table 3. Continued.

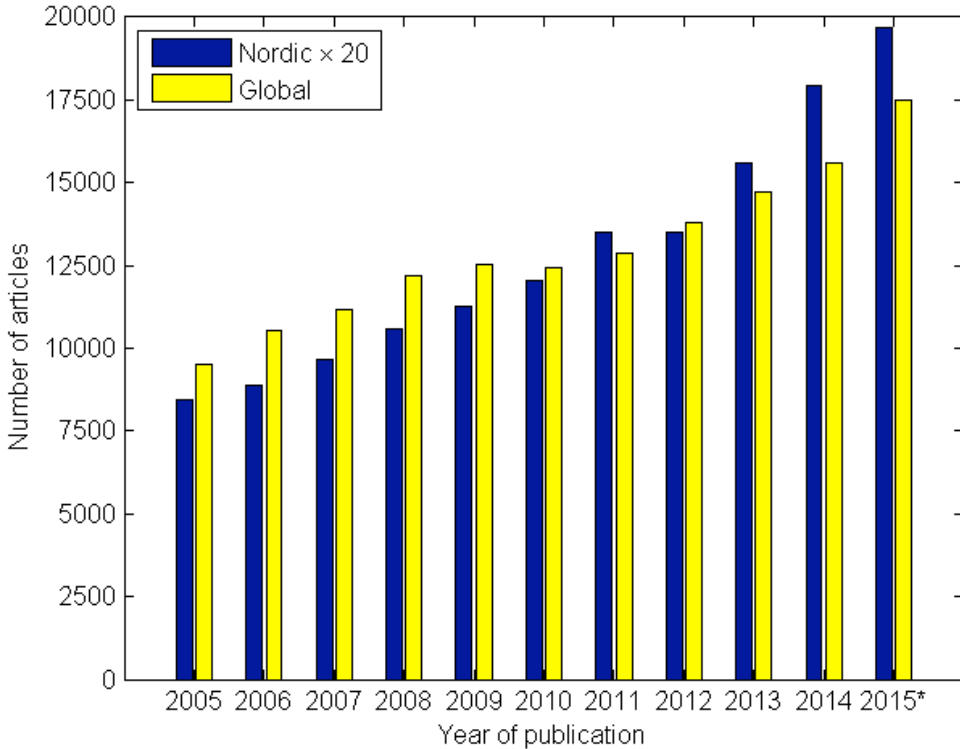
PANEL E: MANAGEMENT														
YEAR	DENMARK			FINLAND			NORWAY			SWEDEN			TOTAL	
	TOTAL APPEARANCES	TOTAL WEIGHTED NO. OF ARTICLES	TOTAL NO. OF APPEARANCES	TOTAL WEIGHTED NO. OF ARTICLES	TOTAL NO. OF APPEARANCES	TOTAL WEIGHTED NO. OF ARTICLES	TOTAL NO. OF APPEARANCES	TOTAL WEIGHTED NO. OF ARTICLES	TOTAL NO. OF APPEARANCES	TOTAL WEIGHTED NO. OF ARTICLES	TOTAL NO. OF APPEARANCES	TOTAL WEIGHTED NO. OF ARTICLES	TOTAL APPEARANCES	TOTAL WEIGHTED NO. OF ARTICLES
2005-2015	536	331	487	330	330	209	659	452	2012	1322				
2005	26	18	26	15	15	10	32	22	99	67				
2006	15	10	27	16	16	11	48	34	106	72				
2007	30	17	29	23	23	14	41	32	123	81				
2008	31	19	40	19	19	13	47	35	137	97				
2009	44	29	45	29	29	17	53	37	171	115				
2010	49	31	39	37	37	25	54	41	179	127				
2011	57	40	45	44	44	29	87	63	233	167				
2012	66	39	51	30	30	20	80	55	227	152				
2013	75	47	61	35	35	22	70	43	241	151				
2014	95	52	73	43	43	25	99	63	310	184				
2015	48	27	51	39	39	24	48	28	186	108				

Table 3. Continued.

PANEL F: MARKETING														
YEAR	DENMARK			FINLAND			NORWAY			SWEDEN			TOTAL	
	TOTAL NO. OF APPEARANCES	TOTAL WEIGHTED NO. OF ARTICLES	TOTAL NO. OF APPEARANCES	TOTAL WEIGHTED NO. OF ARTICLES	TOTAL NO. OF APPEARANCES	TOTAL WEIGHTED NO. OF ARTICLES	TOTAL NO. OF APPEARANCES	TOTAL WEIGHTED NO. OF ARTICLES	TOTAL NO. OF APPEARANCES	TOTAL WEIGHTED NO. OF ARTICLES	TOTAL NO. OF APPEARANCES	TOTAL WEIGHTED NO. OF ARTICLES	TOTAL NO. OF APPEARANCES	TOTAL WEIGHTED NO. OF ARTICLES
2005-2015	121	77	190	144	130	79	169	118	610	418				
2005	10	7	2	2	5	3	8	7	25	19				
2006	6	4	7	6	10	5	14	10	37	25				
2007	4	2	13	11	8	5	14	10	39	28				
2008	4	3	8	7	12	8	11	7	35	25				
2009	10	8	12	10	14	11	11	10	47	38				
2010	14	9	14	11	14	9	11	8	53	37				
2011	8	4	13	12	10	6	17	13	48	34				
2012	24	16	18	14	12	8	15	10	69	49				
2013	13	7	32	25	22	11	27	18	94	61				
2014	18	11	40	27	13	7	20	12	91	58				
2015	10	5	31	20	10	6	21	13	72	44				

The table reports Nordic publication patterns over time and across countries and disciplines in journals which are ranked in ABS-AJG categories 4*, 4, and 3. The total number of appearances gives equal credit to the individual countries and institutional affiliations of all authors of an article. The weighted number of articles adjusts the number of published articles to account for multiple authors as well as authors with multiple affiliations by distributing articles proportionally among all authors and institutions.

Figure 1. The amount of Nordic articles relative to the total amount of articles.



The figure plots the total number of articles published in the top-ranked ABS-AJG journals (Global) and the total number of Nordic appearances (Nordic x 20) by year. The total number of Nordic appearances is re-scaled by multiplying by 20, and thus, equal length of the bars would indicate that the Nordic share of the total output equals 5 percent. The publication data was collected in September 2015 and include the articles which were published by the beginning of September 2015 as well as all forthcoming articles which were electronically available. In the figure, the numbers of published articles for year 2015 have been scaled to correspond to annual publication numbers.

Panels B-F of Table 3 present the discipline-level developments in research output across the Nordic countries. First, it can be observed from Panel B that the number of published accounting articles is rather low in the Nordic countries. On average, each country has produced less than ten articles per year in the leading accounting journals. In terms of weighted number of articles, Sweden and Finland are the most prolific countries with 75 and 71 publications, respectively. However, the amounts of publications vary considerably from year to year with a minimum of one weighted article for Denmark in 2012 to a maximum of 13 articles for Finland in 2013. In comparison to the other Nor-

dic countries, Norway is acutely underperforming in accounting research with Norwegian scholars, on average, producing only three weighted articles per year. Consistent with our findings, Carmona et al. (1999) and Chan et al. (2006) have previously ranked Norway as the least productive Nordic country, which indicates persistency in Norway's weak competitiveness in accounting research. Our supplementary analysis presented in Appendix 2 indicates that the Nordic countries have produced only 35 weighted articles in ABS-AJG categories 4* and 4 over the last ten years, with Denmark and Finland being the most prolific countries with 14 and 9 publications, respectively.

As already noted above, a vast proportion of the published articles appear in the area of economics. Although there is an upward trend also in Nordic economics research output, the annual growth rate of about 6 percent is considerably lower than in other disciplines. As can be seen from Panel C of Table 3, Sweden is by far the most productive country in economics with 743 weighted articles, followed almost in tandem by Denmark and Norway with 580 and 523 articles, respectively. Interestingly, Denmark has made significant progress over the past few years especially in terms of the number of appearances. Panel C further shows that Finland is severely lagging behind the other Nordic countries in economics research with only 220 weighted articles. Even more worryingly, the growth rate of Finnish economics output is considerably lower than in other countries. The supplementary analysis based on the number of publications in ABS-AJG categories 4* and 4 further demonstrates the underperformance of Finland in economics research (see Appendix 2). Our findings regarding the relative performance of the Nordic countries are very similar to Kalaitzidakis et al. (1999), who document that Sweden is the most productive and Finland the least productive Nordic country in economics research over the period 1991–1996.

Panel D of Table 3 presents the trends in finance research output. In contrast to accounting and economics, publication patterns in finance research do not display any systematic differences across countries. During the sample period, Denmark has been the most productive country with 138 weighted articles, followed closely by Sweden, Finland, and Norway with 120 to 91 articles. Furthermore, it can be noted from Panel D that the Nordic countries also display a very similar upward trend in finance research productivity over the sample period with an annual growth rate of about 16 percent. This implies that large disparities in country-level output are unlikely also in the near-term future. The supplementary results based on the number of journal articles in ABS-AJG categories 4* and 4 are broadly consistent with our main analysis. As can be seen from

Appendix 2, Sweden, Denmark, and Norway have produced almost equal amount of weighted articles in the two highest ABS-AJG categories (29, 27, and 26, respectively), and Finland is only slightly behind the other three countries with 22 weighted articles.

Management publication patterns in Panel E of Table 3 demonstrate a distinct general improvement in Nordic research productivity from 2005 to 2014. The average annual growth rate in the number of published articles is approximately 14 percent. Panel E shows that Sweden is the most prolific country in terms of management research with a total amount of 452 weighted articles. Denmark and Finland have performed equally well by producing 331 and 330 weighted articles, respectively, while Norway with 209 articles is well behind the other Nordic countries. Moreover, Panel E indicates that the growth rate of Norwegian output in management research is somewhat stagnating relative to the other countries. The supplementary results in Appendix 2 support our main analysis; Sweden has produced 129, Finland 107, Denmark 103, and Norway 75 weighted journal articles in the two highest ABS-AJG categories.

Finally, Panel F of Table 3 reports the Nordic research output in the leading marketing journals. The Nordic countries have made significant progress in marketing research over the sample period with an average annual growth rate of 17.5 percent in the number of publications. As can be seen from the table, Finland is the dominant Nordic country in terms of marketing research with 144 weighted articles. However, the Finnish performance can be largely explained by the exceptional surge in the number of publications over the past few years. Sweden is the second most prolific country in marketing research and, in fact, produced more peer-reviewed articles than Finland during the period 2005–2012. Although Norway and Denmark are somewhat underperforming in comparison to Finland and Sweden, they still show comparable annual growth rates in the number of publications after ignoring the Finnish output surge after year 2012. Interestingly, in contrast to the other four disciplines, the supplementary

analysis based on publications in ABS-AJG categories 4* and 4 contradicts the results of our main analysis.¹² Appendix 2 shows that Norway is by far the most prolific country with a 48 percent share of the Nordic marketing research output in the two highest ABS-AJG categories, while Sweden and Finland are the least productive countries with almost equal output shares of about 14 percent. Hence, the supplementary analysis indicates that the high overall research output of Finland and Sweden documented in Panel F of Table 3 is driven by publications in ABS-AJG category 3. Our findings regarding marketing research output can be contrasted with Polonsky et al. (2006), who have previously documented that Denmark is the most productive and Finland the least productive Nordic country in marketing research over the period 1999–2003.

3.3. Research output across academic institutions

As the final step of our analysis, we compare research output across Nordic academic institutions.¹³ Table 4 reports the rankings of the top-15 academic institutions in the Nordic countries based on the total number of appearances in the

top-ranked ABS-AJG journals. In addition, we also report the total number of weighted articles which normalizes the articles with multiple authors and affiliations into generic, single-authored articles. The last two columns of Table 4 present the percentage of articles produced by each institution as well as the cumulative percentage produced by the top-15 institutions.

Panel A of Table 4 provides the overall ranking of the most prolific institutions. As can be seen from Panel A, the top-three Nordic institutions are Aarhus University, Copenhagen Business School, and the University of Copenhagen, which are all located in Denmark. Over the period 2005-2015, these three institutions have produced 22 percent of the total Nordic output in the leading business and economics journals. The remainder of the top-10 institutions comprises five Swedish universities together with Aalto University from Finland and Norwegian School of Economics. It can be also noted from Panel A that research productivity in the Nordic countries is highly concentrated with the top-5, top-10, and top-15 producing approximately 32 %, 54 %, and 69 % of the total Nordic research output in the leading journals.¹⁴ The concentration of research productivity is illustrated in

¹² The results of our supplementary analysis should be approached somewhat cautiously given the very small sample of only 38 weighted journal articles (see Appendix 2).

¹³ Adler and Harzing (2009) provide a critical perspective on university rankings that are based purely on research output.

¹⁴ The Nordic research output in ABS-AJG categories 4* and 4 is even more concentrated with the top-5, top-10, and top-15 institutions producing approximately 42 %, 67 %, and 81 % of the total Nordic output, respectively.

Table 4. Top-15 most prolific Nordic institutions by discipline.

PANEL A: ALL DISCIPLINES					
RANK	INSTITUTION (N = 90)	TOTAL NO. OF APPEARANCES	TOTAL WEIGHTED NO. OF ARTICLES	PERCENTAGE OF NORDIC ARTICLES	CUMULATIVE PERCENTAGE
1	Aarhus University	591	356	7.9 %	8%
2	Copenhagen Business School	589	336	7.5 %	15%
3	University of Copenhagen	488	282	6.3 %	22%
4	Aalto University	412	236	5.2 %	27%
5	Stockholm School of Economics	406	222	4.9 %	32%
6	Stockholm University	378	217	4.8 %	37%
7	University of Gothenburg	351	204	4.5 %	41%
8	Norwegian School of Economics	334	176	3.9 %	45%
9	Lund University	327	207	4.6 %	50%
10	Uppsala University	318	187	4.2 %	54%
11	BI Norwegian Business School	316	176	3.9 %	58%
12	University of Oslo	295	165	3.7 %	61%
13	University of Southern Denmark	249	125	2.8 %	64%
14	Hanken School of Economics	209	115	2.5 %	67%
15	University of Helsinki	200	125	2.8 %	69%

PANEL B: ACCOUNTING					
RANK	INSTITUTION	TOTAL NO. OF APPEARANCES	TOTAL WEIGHTED NO. OF ARTICLES	PERCENTAGE OF NORDIC ARTICLES	CUMULATIVE PERCENTAGE
1	Copenhagen Business School	47	34	14.7 %	15%
2	Norwegian School of Economics	27	13	5.8 %	20%
3	Aalto University	25	16	7.0 %	27%
4	Stockholm School of Economics	24	16	7.0 %	34%
4	Aarhus University	24	12	5.3 %	39%
6	University of Turku	21	12	5.3 %	45%
7	University of Oulu	18	13	5.4 %	50%
8	University of Gothenburg	16	11	4.6 %	55%
8	University of Tampere	16	11	4.7 %	60%
10	Örebro University	14	11	4.8 %	65%
11	Lund University	13	9	4.0 %	69%
11	Stockholm University	13	8	3.5 %	72%
13	University of Southern Denmark	10	7	3.1 %	75%
13	University of Vaasa	10	6	2.7 %	78%
15	BI Norwegian Business School	8	4	1.9 %	80%

Table 4. Continued.

PANEL C: ECONOMICS					
RANK	INSTITUTION	TOTAL NO. OF APPEARANCES	TOTAL WEIGHTED NO. OF ARTICLES	PERCENTAGE OF NORDIC ARTICLES	CUMULATIVE PERCENTAGE
1	University of Copenhagen	410	229	11.1 %	11%
2	Aarhus University	341	194	9.4 %	20%
3	Stockholm University	263	141	6.8 %	27%
4	University of Gothenburg	247	131	6.3 %	34%
5	University of Oslo	234	131	6.3 %	40%
6	Stockholm School of Economics	193	102	4.9 %	45%
7	Norwegian School of Economics	175	96	4.6 %	50%
8	Lund University	157	98	4.8 %	54%
9	Uppsala University	153	90	4.4 %	59%
10	University of Helsinki	144	89	4.3 %	63%
11	University of Southern Denmark	123	57	2.8 %	66%
12	Norwegian Uni. of Science and Techn.	116	73	3.6 %	69%
12	University of Bergen	116	60	2.9 %	72%
14	Copenhagen Business School	97	47	2.3 %	74%
15	Umeå University	88	55	2.6 %	77%

PANEL D: FINANCE					
RANK	INSTITUTION	TOTAL NO. OF APPEARANCES	TOTAL WEIGHTED NO. OF ARTICLES	PERCENTAGE OF NORDIC ARTICLES	CUMULATIVE PERCENTAGE
1	Aarhus University	106	66	14.2 %	14%
2	Copenhagen Business School	73	39	8.5 %	23%
3	Stockholm School of Economics	71	34	7.3 %	30%
4	Lund University	47	34	7.4 %	38%
5	Aalto University	43	27	5.9 %	43%
6	Hanken School of Economics	41	27	5.9 %	49%
7	Norwegian School of Economics	40	22	4.8 %	54%
7	BI Norwegian Business School	40	19	4.1 %	58%
9	University of Copenhagen	38	22	4.8 %	63%
10	Stockholm University	32	23	4.9 %	68%
11	University of Vaasa	28	18	3.8 %	72%
12	University of Oslo	22	13	2.8 %	75%
13	University of Agder	18	12	2.7 %	77%
13	University of Turku	18	9	1.9 %	79%
15	University of Southern Denmark	17	9	1.8 %	81%

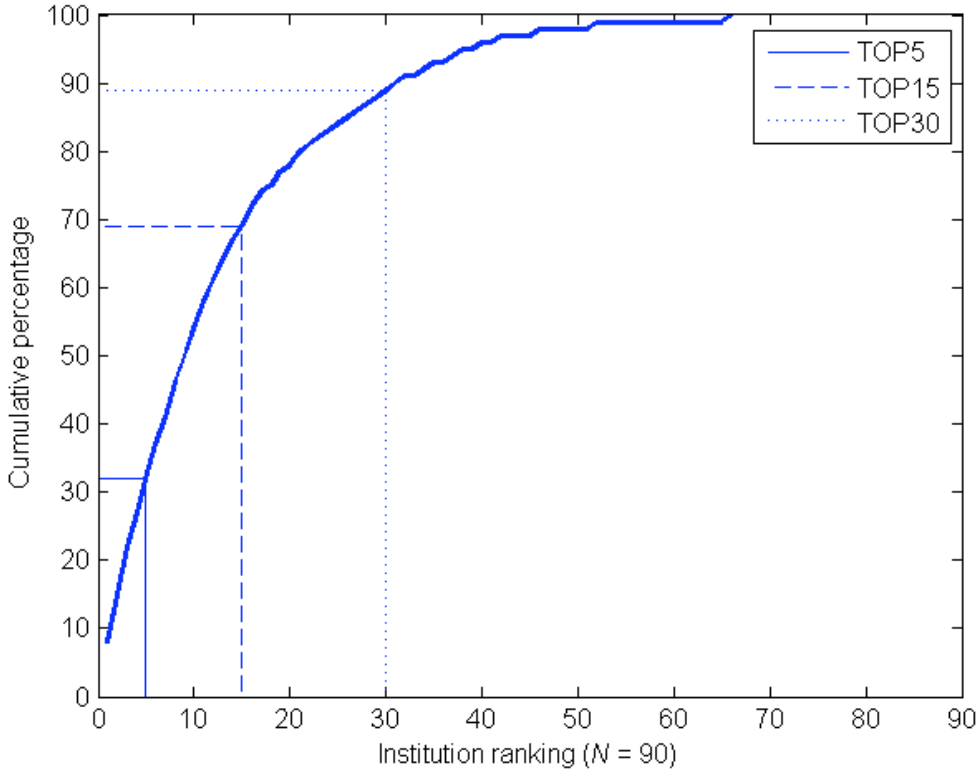
Table 4. Continued.

PANEL E: MANAGEMENT					
RANK	INSTITUTION	TOTAL NO. OF APPEARANCES	TOTAL WEIGHTED NO. OF ARTICLES	PERCENTAGE OF NORDIC ARTICLES	CUMULATIVE PERCENTAGE
1	Copenhagen Business School	333	193	14.6 %	15%
2	Aalto University	202	105	7.9 %	23%
3	BI Norwegian Business School	131	79	6.0 %	28%
4	Uppsala University	117	71	5.4 %	34%
5	Hanken School of Economics	99	47	3.6 %	37%
6	Jönköping University	94	46	3.5 %	41%
7	Lund University	93	56	4.2 %	45%
8	Aarhus University	85	60	4.5 %	50%
9	Stockholm School of Economics	78	41	3.1 %	53%
10	University of Gothenburg	69	53	4.0 %	57%
11	Norwegian School of Economics	63	29	2.2 %	59%
12	Stockholm University	58	38	2.9 %	62%
13	University of Southern Denmark	54	25	1.9 %	64%
14	University of Turku	51	31	2.4 %	66%
15	University of Vaasa	50	28	2.1 %	68%

PANEL F: MARKETING					
RANK	INSTITUTION	TOTAL NO. OF APPEARANCES	TOTAL WEIGHTED NO. OF ARTICLES	PERCENTAGE OF NORDIC ARTICLES	CUMULATIVE PERCENTAGE
1	Aalto University	71	45	10.8 %	11%
1	BI Norwegian Business School	71	38	9.0 %	20%
3	University of Southern Denmark	45	27	6.5 %	26%
4	Stockholm School of Economics	40	30	7.1 %	33%
4	Hanken School of Economics	40	27	6.4 %	40%
6	Copenhagen Business School	39	23	5.4 %	45%
7	Aarhus University	35	24	5.6 %	51%
8	Norwegian School of Economics	29	15	3.7 %	55%
9	Uppsala University	26	14	3.2 %	58%
10	University of Turku	22	13	3.2 %	61%
11	University of Oulu	21	14	3.3 %	64%
12	Lappeenranta University of Technology	19	14	3.3 %	68%
12	University of Vaasa	19	9	2.2 %	70%
14	Lund University	17	10	2.3 %	72%
15	Linköping University	15	9	2.1 %	74%

The table reports the rankings of the top-15 academic institutions in the Nordic countries based on the total number of appearances in the top-ranked ABS-AJG journals. The table also reports the total number of weighted articles, the percentage of weighted articles produced by each institution, and the cumulative percentage of weighted articles produced by the top-15 institutions.

Figure 2. Cumulative percentage of the weighted number of articles for Nordic institutions.



The figure plots the cumulative percentage of the weighted number of Nordic articles against the ranking order of the contributing Nordic institutions.

Figure 2, which plots the cumulative percentage of Nordic research output against the ranking order of the contributing institutions. As can be seen from the figure, the top-30 institutions have produced 90 percent of the Nordic research output.

Next, we present the top-15 rankings for each discipline in Panels B-F of Table 4. In accounting, the most productive institution by far is Copenhagen Business School, followed by Norwegian School of Economics and Aalto University. These three institutions produce over one quarter of the accounting research output in the Nordic countries, while the top-15 institutions together

account for 80 percent of the published articles.¹⁵ Consistent with the country-level results reported in Panel B of Table 3, the list of the top accounting institutions is dominated by Finland and Sweden with both countries being represented by five universities. Interestingly, a comparison of Tables 4 and 5 indicates that Norwegian School of Economics has produced almost half of the relatively scarce accounting output in Norway. Our ranking in Panel B is surprisingly similar to Chan et al. (2006), who examine accounting research pro-

¹⁵ Our supplementary analysis shows that only 15 individual academic institutions have at least one appearance in the accounting journals ranked in ABS-AJG categories 4* and 4 (i.e., the top-15 institutions account for 100 percent of the Nordic articles). The top-ranked Copenhagen Business School alone has produced 25 percent of the accounting articles in the two highest ABS-AJG categories.

ductivity over the period 1991–2002. Out of the top-10 institutions in Chan et al. (2006), nine are ranked among the top-15 in our list, with the only exception being the University of Jyväskylä.

The ranking of institutions based on the amount of economics articles is presented in Panel C of Table 4. The two most prolific institutions are the University of Copenhagen and Aarhus University, which together have produced 20 percent of the research output in the Nordic countries.¹⁶ These two top-ranked Danish universities are followed by Stockholm University, the University of Gothenburg, and the University of Oslo with almost equal output shares of about 6 percent. Overall, the economics ranking is dominated by large, broad-focused institutions such as the University of Copenhagen, the University of Oslo, and the University of Helsinki, which are seldom ranked high in the core business disciplines. A comparison of our ranking with Kalaitzidakis et al. (1999) suggests that research productivity in economics is also highly persistent. The top-10 institutions in Panel C for the period 2005–2015 comprise the exact same ten institutions as in Kalaitzidakis et al. (1999) for the period 1991–1996. The most noteworthy difference is the performance of Aarhus University which has improved its position from the tenth place in Kalaitzidakis et al. (1999) to the second-ranked institution in our analysis.

Panel D of Table 4 reports the rankings in terms of finance research output. Panel D indicates that Nordic finance publications are highly concentrated among the top-15 institutions which together produce 81 percent of the research output.¹⁷ Aarhus University is the single most productive institution with a 14.2 percent share of the Nordic publications, while the remaining top-ranked institutions each contribute output shares varying from 8.5 to 1.8 percent.¹⁸ Similar to

16 The University of Copenhagen and Aarhus University are the two most prolific institutions also based on the amount of publications in ABS-AJG categories 4* and 4. Together, they account for about 27 percent of the economics research output in the Nordic countries.

17 Finance research output in ABS-AJG categories 4* and 4 is even more concentrated with the top-15 institutions producing 97 percent of the published articles.

18 The top-ranked institution based on articles in ABS-AJG categories 4* and 4 is Stockholm School of Economics with a 23 percent share of the Nordic publications.

the persistence observed in accounting and economics research, we again find almost the same composition of the most productive institutions as previously document in Chan et al. (2004) for the period 1990–1999. The only institution absent in our finance ranking is the Chalmers University of Technology which was ranked sixth in Chan et al. (2004). In addition to the significant progress of Aarhus University over the recent years, another notable detail is the decline of the University of Vaasa from the top-ranked institution in Chan et al. (2004) to the 11th position in Panel D.

The top-ranked management institutions are presented in Panel E of Table 4. As can be seen from Panel E, the top-15 ranking includes six Swedish and four Finnish institutions which is consistent with the cross-country differences in management research output observed in Table 3. The top-three institutions are Copenhagen Business School, Aalto University, and BI Norwegian Business School, which jointly produce 28 percent of the Nordic articles in the leading management journals. Although Copenhagen Business School single-handedly contributes almost 15 percent of the Nordic output, research productivity in management appears less concentrated than in other business disciplines with the top-15 institutions having a combined output share of 68 percent.¹⁹

Finally, Panel F of Table 4 provides the ranking of the Nordic institutions in marketing research. Aalto University and BI Norwegian Business School tie the first place with 71 published articles, although Aalto University performs slightly better on the basis of the weighted number of articles. Over the sample period, these two institutions together have produced 20 percent of the Nordic output.²⁰ Consistent with the country-level com-

19 Our supplementary analysis based on publications in ABS-AJG categories 4* and 4 supports this finding; the top-15 institutions account for 79 percent of the articles. The top-three institutions Copenhagen Business School, Aalto University, and Hanken School of Economics jointly produce 35 percent of the Nordic output in the two highest ABS-AJG categories.

20 BI Norwegian Business School is by far the most prolific institution based on publications in ABS-AJG categories 4* and 4 with a 27 percent share of the Nordic marketing research output. Our supplementary analysis further shows that only 21 Nordic institutions have at least one appearance in the two highest ABS-AJG categories.

parisons in Table 3, Finland reigns the top-15 ranking in marketing with altogether six academic institutions. Our research output ranking in Panel F can be contrasted with the citation-based analysis in Elbeck and Vander Schee (2014), who rank BI Norwegian Business School, Uppsala University, and Copenhagen Business School as the top-3 Nordic institutions in marketing.

Given the substantial differences in publishing patterns and especially in the number published articles across the different disciplines, we present two discipline-balanced university rankings in Table 5. Specifically, for each academic institution, we take the median of the institution's rankings across all five disciplines in order to balance the weight given to each individual discipline. Panel A of Table 5 reports the median rankings of institutions across all disciplines, while Panel B focuses on the core business disciplines by excluding the articles published in economics journals.²¹ As a supplement to our main analysis, Appendix 3 presents corresponding university rankings based on publications in ABS-AJG categories 4* and 4.

Regardless of including economics or not, the top-8 Nordic academic institutions in business research are Copenhagen Business School, Aalto University, Stockholm School of Economics, Aarhus University, Hanken School of Economics, BI Norwegian Business School, Norwegian School of Economics, and Lund University. The top-15 ranking in Panel A comprises five Swedish, four Finnish, four Danish, and two Norwegian institutions. The only notable effect of excluding economics in Panel B is the replacement of the University of Copenhagen by the University of Oulu as the 15th ranked institution, after which the top-15 list includes five institutions from both Finland and Sweden.

The rankings presented in Table 5 are surprisingly similar to the ranking of institutions in Baden-Fuller et al. (2000) for the period 1995–1998.

Out of the top-12 Nordic academic institutions in Baden-Fuller et al. (2000), 11 are included among the top-15 institutions in Table 5 with the only exception being the absence of the Chalmers University of Technology. The new Nordic institutions which enter our research output rankings are the University of Gothenburg, Stockholm University, University of Turku, University of Copenhagen, and the University of Oulu.

A comparison between Table 5 and the supplementary analysis reported in Appendix 3 indicates that the exclusion of publications in ABS-AJG category 3 does not lead to substantive differences in the institution rankings. The following 13 universities and business schools appear among the top-15 Nordic business research institutions in all four ranking lists (in alphabetical order): Aalto University, Aarhus University, BI Norwegian Business School, Copenhagen Business School, Hanken School of Economics, Lund University, Norwegian School of Economics, Stockholm School of Economics, Stockholm University, University of Gothenburg, University of Southern Denmark, University of Vaasa, and Uppsala University. The most notable difference between Table 5 and Appendix 3 is the improved ranking of Norwegian institutions after the exclusion of journal articles in ABS-AJG category 3. In the supplementary analysis, Norwegian School of Economics and BI Norwegian Business School are ranked higher than in our main analysis, and moreover, the University of Agder, the University of Oslo, and the University of Stavanger enter the top-15 rankings as new institutions. The institutions which drop out from the rankings after the exclusion of the articles published in ABS-AJG category 3 are the University of Copenhagen, the University of Oulu, and the University of Turku.

4. Conclusions

This paper examines the state of business research in the Nordic countries. Specifically, we provide a descriptive analysis of research output based on the number of articles published in the leading

²¹ Economics journals comprise about 40 percent of the top-ranked ABS-AJG journals and have published almost 50 percent of the articles included in our sample. The dominant share of economics articles creates an imbalance which benefits institutions which are particularly prolific in economics research.

Table 5. Top-15 Nordic institutions in business research.

PANEL A: MEDIAN RANKING ACROSS DISCIPLINES			
RANK	INSTITUTION (N = 90)	MEDIAN RANKING OF APPEARANCES	MEDIAN RANKING OF WEIGHTED ARTICLES
1	Copenhagen Business School	2	2
2	Aalto University	3	3
3	Stockholm School of Economics	4	4
3	Aarhus University	4	6
5	Hanken School of Economics	6	7
6	BI Norwegian Business School	7	7
6	Norwegian School of Economics	7	9
8	Lund University	8	9
9	Uppsala University	9	13
10	University of Gothenburg	10	15
11	Stockholm University	11	12
12	University of Turku	13	13
12	University of Vaasa	13	14
12	University of Southern Denmark	13	15
15	University of Copenhagen	19	14

PANEL B: MEDIAN RANKING ACROSS DISCIPLINES, EXCLUDING ECONOMICS			
RANK	INSTITUTION (N = 90)	MEDIAN RANKING OF APPEARANCES	MEDIAN RANKING OF WEIGHTED ARTICLES
1	Copenhagen Business School	2	2
2	Aalto University	3	3
3	Stockholm School of Economics	4	4
4	BI Norwegian Business School	5	7
5	Aarhus University	6	6
5	Hanken School of Economics	6	7
7	Norwegian School of Economics	8	9
8	Lund University	9	9
9	Stockholm University	12	12
9	University of Turku	12	13
11	Uppsala University	13	13
11	University of Vaasa	13	14
11	University of Southern Denmark	13	15
14	University of Gothenburg	15	15
15	University of Oulu	17	16

The table reports two alternative discipline-balanced rankings of the Nordic academic institutions based on the number of articles published in the top-ranked ABS-AJG journals. In Panel A, the institutions are ranked based on the median of the institution's rankings across all five disciplines. In Panel B, articles published in economics journals are excluded and the institutions are ranked based on the median of the rankings in the four core business disciplines.

accounting, economics, finance, management, and marketing journals. Our empirical analysis demonstrates that the Nordic countries have been very productive in business research over the period 2005–2015. Despite having only 90 contributing academic institutions, the Nordic countries have produced about 5 percent of the articles published in the leading peer-reviewed business and economics journals. Moreover, we document that the output share of the Nordic countries exhibits a distinct upward trend during the last ten years.

Among the Nordic countries, Sweden is by far the most prolific country with a 34 percent share of the total Nordic research output, while Finland has made the most notable improvement in productivity with a threefold increase in the number of published articles over the last ten years. Our analysis further indicates that the Nordic scholars are relatively most productive in management and marketing research and least productive in finance research. Among the individual countries, Sweden has the highest research output in accounting, economics, and management journals, while Denmark is the most productive country in finance research and Finland in terms of marketing research. The most distinct country-level weaknesses that emerge from our analysis are the underperformance of Norway in accounting research and Finland in economics research.

Our descriptive analysis suggests that the top-10 Nordic academic institutions in terms of research output are Copenhagen Business School, Aalto University, Stockholm School of Economics, Aarhus University, Hanken School of Economics, BI Norwegian Business School, Norwegian School of Economics, Lund University, Uppsala University, and the University of Gothenburg. Nonetheless, we also document substantial discipline-specific differences in the research output of the top institutions, especially between the publication amounts in the four core business disciplines and economics. Interestingly, our rankings are surprisingly similar to those presented in the prior studies, implying considerable persistence in institutional-level research productivity. Finally, our results demonstrate that research productivity in

the Nordic countries is highly concentrated with the top-5, top-15, and top-30 universities producing approximately 30%, 70%, and 90% of the total Nordic research output in the leading journals.

The empirical findings reported in this paper offer several important insights for the internal and external stakeholders of the Nordic academia. First, our results can be utilized for decision-making purposes in education and science policy. Most importantly, the positive outcome regarding the current state of business research may provide valuable input for the evaluation of the recent and ongoing political efforts and university reforms in the Nordic countries. Moreover, academic institutions may find our results useful in self-assessment and for positioning themselves relative to other Nordic universities. Information regarding institution-level research performance can also be used by universities for marketing purposes and reputation-building. From the perspective of university administrators and political authorities, our findings may also help in setting realistic research objectives on the institutional as well as national levels.

Our findings and the limitations of our descriptive analysis suggest a number of avenues for future research. First, it is important to acknowledge that the selection of the leading peer-reviewed journals entails a subjective element to our analysis, and the use of a different set of journals could lead to different results. Moreover, our analysis focuses only on the core business disciplines and excludes many subject areas covered by the ABS-AJG. Obvious extensions of our analysis would be to use different journal selection criteria and to examine a wider set of disciplines. A central caveat in our research output analysis and in productivity-based comparisons in general is the focus on quantity over quality (for a discussion, see Adler and Harzing, 2009). It can be argued that the number of citations is a more appropriate measure of scientific relevance than research output measured by the number of published articles. Hence, future studies could examine the performance of the Nordic countries and academic institutions based on citation counts.

Our analysis is descriptive and we do not attempt to explain the observed differences in research output across countries and institutions nor the development trends over time. Future studies should examine whether and how observable productivity inputs and institution-specific characteristics are reflected in research output. Furthermore, it would be important to analyze institution-level developments in research productivity over time and to assess whether some specific events such as science policy reforms affect the country-level trajectories of research output. Finally, future research could focus on the productivity of individual authors and their influence on the overall performance of academic institutions.

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Appendix 1. A summary of the prior literature.

DISCIPLINE	AUTHORS	TIME PERIOD ANALYZED	COUNTRY RANKING AND/OR TOP NORDIC INSTITUTIONS
Business studies (at large)	Baden-Fuller, Ravazzolo & Schweizer (2000)	1995–1998	Top-12 institutions: 1. Stockholm School of Economics 2. BI Norwegian Business School 3. Copenhagen Business School 4. Aalto University School of Business 4. University of Southern Denmark 6. Aarhus University 6. Lund University 6. University of Vaasa 9. Chalmers University of Technology 9. Hanken School of Economics 9. Norwegian School of Economics 9. Uppsala University
Accounting	Carmona, Gutierrez & Camara (1999)	1992–1997	Countries: 1. Finland 2. Sweden 3. Denmark 4. Norway
Accounting	Chan, Chen & Cheng (2006)	1991–2002	Countries: 1. Finland 2. Denmark 3. Sweden 4. Norway

Appendix 1. Continued.

DISCIPLINE	AUTHORS	TIME PERIOD ANALYZED	COUNTRY RANKING AND/OR TOP INSTITUTIONS
Accounting	Chan, Chen & Cheng (2006)	1991–2002	Top-10 institutions: 1. Copenhagen Business School 2. Aalto University School of Business 3. University of Vaasa 4. Norwegian School of Economics 5. Turku School of Economics 6. Stockholm School of Economics 6. University of Southern Denmark 8. Stockholm University 9. University of Gothenburg 10. University of Jyväskylä
Economics	Kalaitzidakis, Mamuneas & Stengos (1999)	1991–1996	Countries: 1. Sweden 2. Norway 3. Denmark 4. Finland Top-10 institutions: 1. Stockholm University 2. University of Copenhagen 3. University of Oslo 4. Stockholm School of Economics 5. Uppsala University 6. Lund University 7. University of Helsinki 8. Norwegian School of Economics 9. University of Gothenburg 10. Aarhus University

Appendix 1. Continued.

DISCIPLINE	AUTHORS	TIME PERIOD ANALYZED	COUNTRY RANKING AND/OR TOP INSTITUTIONS
Finance	Chan, Chen & Chang (2011)	1990–2008	Countries: 1. Finland 2. Denmark 3. Sweden 4. Norway
Finance	Chan, Chen & Steiner (2004)	1990–1999	Top-10 institutions: 1. University of Vaasa 2. BI Norwegian Business School 3. Stockholm School of Economics 4. Aalto University School of Business 5. Hanken School of Economics 6. Chalmers University of Technology 7. Aarhus University 8. University of Southern Denmark 9. Copenhagen Business School 10. Stockholm University
International Business	Chan, Fung & Leung (2006)	1995–2004	Countries: 1. Sweden 2. Denmark 3. Norway 4. Finland Top-4 institutions: 1. Copenhagen Business School 2. Uppsala University 3. Stockholm School of Economics 4. BI Norwegian Business School

Appendix 1. Continued.

DISCIPLINE	AUTHORS	TIME PERIOD ANALYZED	COUNTRY RANKING AND/OR TOP INSTITUTIONS
International Business	Xu, Poon & Chan (2014)	1995–2011	Top-3 institutions: 1. Uppsala University 2. Copenhagen Business School 3. Stockholm School of Economics
International Business	Xu, Yalcinkaya & Seggie (2008)	1996–2006	Top-8 institutions: 1. Uppsala University 2. Copenhagen Business School 3. Aarhus University 4. KHT Royal Institute of Technology 5. Stockholm School of Economics 6. Hanken School of Economics 7. BI Norwegian Business School 8. University of Agder
International Marketing	Polonsky & Ringer (2009)	1999–2003	Countries: 1. Norway 2. Sweden 3. Denmark 4. Finland Top-3 institutions: 1. University of Tromsø 2. Umeå University 3. BI Norwegian Business School
Marketing	Elbeck & Vander Schee (2014)	2003–2012	Top-3 institutions: 1. BI Norwegian Business School 2. Uppsala University 3. Copenhagen Business School
Marketing	Polonsky, Garma & Mittelstaedt (2006)	1999–2003	Countries: 1. Denmark 2. Sweden 3. Norway 4. Finland

The table summarizes the main findings of the previous studies regarding research productivity in the Nordic countries. The following three modifications to the original results documented in the prior articles have been made in the summary: (i) we have used the current names of the academic institutions, (ii) we have combined the research output of merged universities if enabled by the original results, (iii) we have corrected the ranking of Aalto University School of Business in Chan, Chen & Cheng (2006) to account for the ranking error caused by the duplicate name of Helsinki School of Economics and Helsinki School of Economics and Business Administration.

Appendix 2. Nordic business research output by disciplines and countries (ABS-AJG categories 4* and 4).

DISCIPLINE	DENMARK		FINLAND		NORWAY		SWEDEN		TOTAL	
	TOTAL NO. OF APPEARANCES	TOTAL WEIGHTED NO. OF ARTICLES	TOTAL NO. OF APPEARANCES	TOTAL WEIGHTED NO. OF ARTICLES	TOTAL NO. OF APPEARANCES	TOTAL WEIGHTED NO. OF ARTICLES	TOTAL NO. OF APPEARANCES	TOTAL WEIGHTED NO. OF ARTICLES	TOTAL NO. OF APPEARANCES	TOTAL WEIGHTED NO. OF ARTICLES
All disciplines	484	258	282	169	359	206	513	287	1638	920
Accounting	21	14	14	9	11	5	10	7	56	35
Economics	204	104	45	26	147	80	216	116	612	327
Finance	51	27	31	22	45	26	57	29	184	106
Management	185	103	181	107	122	75	219	129	707	414
Marketing	23	9	11	5	34	18	11	6	79	38

The table reports Nordic publication patterns over time and across countries and disciplines in journals which are ranked in ABS-AJG categories 4* and 4. The total number of appearances gives equal credit to the individual countries and institutional affiliations of all authors of an article. The weighted number of articles adjusts the number of published articles to account for multiple authors as well as authors with multiple affiliations by distributing articles proportionally among all authors and institutions.

Appendix 3. Top-15 Nordic institutions in business research (ABS-AJG categories 4* and 4).

PANEL A: MEDIAN RANKING ACROSS ALL DISCIPLINES			
RANK	INSTITUTION (N = 63)	MEDIAN RANKING OF APPEARANCES	MEDIAN RANKING OF WEIGHTED ARTICLES
1	Copenhagen Business School	2	2
2	Norwegian School of Economics	3	3
3	Aarhus University	4	3
3	Aalto University	4	4
3	BI Norwegian Business School	4	5
6	Stockholm School of Economics	7	9
7	Stockholm University	8	8
8	Hanken School of Economics	9	7
9	Uppsala University	10	9
9	University of Southern Denmark	10	12
11	University of Gothenburg	12	10
12	University of Oslo	13	9
12	University of Helsinki	13	10
12	Lund University	13	12
12	University of Vaasa	13	15
12	University of Agder	13	17

PANEL B: MEDIAN RANKING ACROSS ALL DISCIPLINES, EXCLUDING ECONOMICS			
RANK	INSTITUTION (N = 63)	MEDIAN RANKING OF APPEARANCES	MEDIAN RANKING OF WEIGHTED ARTICLES
1	Copenhagen Business School	2	2
2	Norwegian School of Economics	3	3
3	Aalto University	4	4
3	BI Norwegian Business School	4	4
5	Aarhus University	5	5
6	Hanken School of Economics	8	7
6	Stockholm School of Economics	8	9
8	University of Southern Denmark	9	9
9	Stockholm University	12	10
9	Uppsala University	12	11
9	University of Vaasa	12	14
9	University of Agder	12	16
13	University of Gothenburg	13	10
13	University of Stavanger	13	16
15	University of Oslo	14	12
15	Lund University	14	14

The table reports two alternative discipline-balanced rankings of the Nordic academic institutions based on the number of articles published in the journals which are ranked in ABS-AJG categories 4* and 4. In Panel A, the institutions are ranked based on the median of the institution's rankings across all five disciplines. In Panel B, articles published in economics journals are excluded and the institutions are ranked based on the median of the rankings in the four core business disciplines.