

9. Research

Analysis was mainly carried out using Elsevier's *SciVal*.
The number of publications is calculated by means of the full counting method.

9-1. Trends Across Kyushu University as a Whole Based on Field Classification of Journals

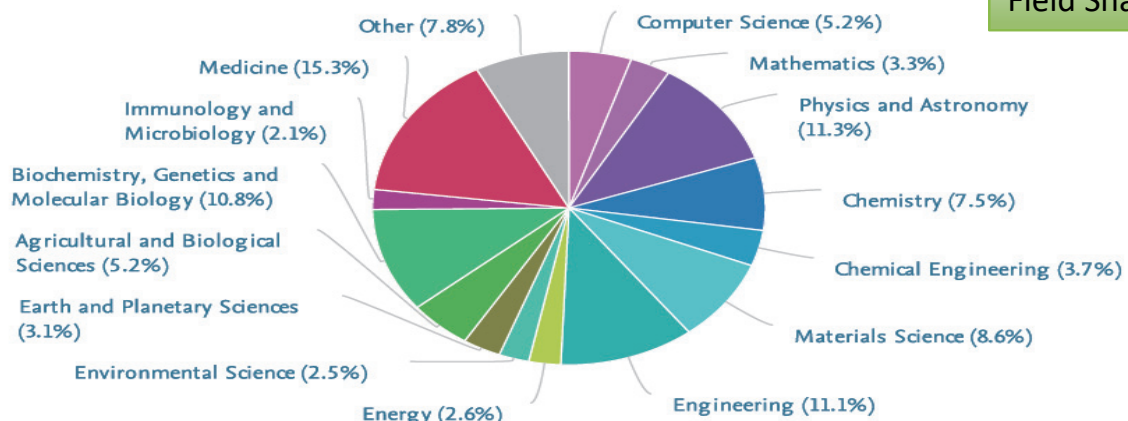
Kyushu University

★ 135th (QS ↗) | 351-400 (THE ↗) | 201-300 (ARWU ↗) | [Japan](#)
 2012 to >2017 | no subject area filter selected | [ASIC](#)

Overall research performance

Publications	Citations	Authors	Field-Weighted Citation Impact	Citations per Publication
26,825 ▲	162,919	16,915 ▲	1.13	6.1

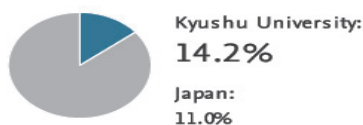
Field Shares



Performance indicators

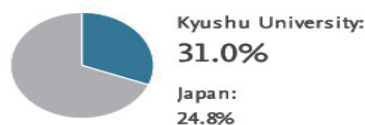
Outputs in Top Citation Percentiles

Publications in top 10% most cited worldwide



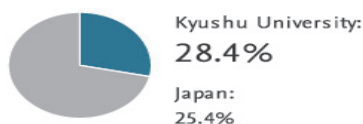
Publications in Top Journal Percentiles

Publications in top 10% journals by CiteScore Percentile



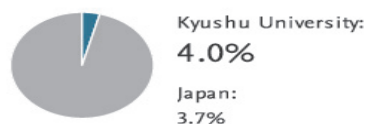
International Collaboration

Publications co-authored with Institutions in other countries



Academic-Corporate Collaboration

Publications with both academic and corporate affiliations



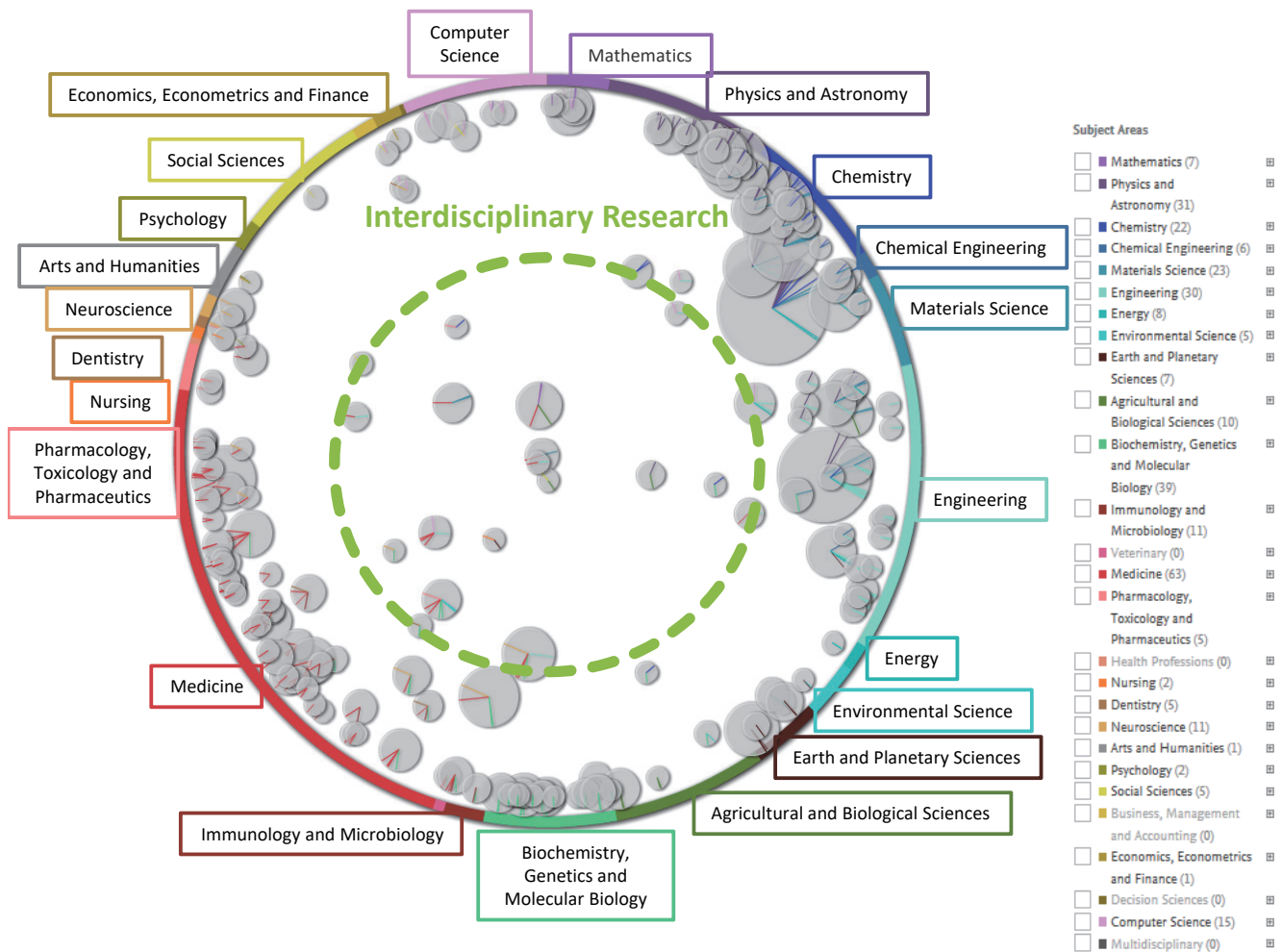
*Source: From Elsevier, *SciVal* (as of August 2017)

Science Mapping

— Analysis of University Strengths Based on Co-citation of Publications —

Kyushu University's competencies (*1) are concentrated in the fields of chemistry, engineering, biochemistry, and Medicine in particular, and that Kyushu University has a high share in many research domains in these fields. Also, our competencies (*1) are distributed close to the center of the circle, demonstrating that interdisciplinary research is being carried out, principally in such areas as Medicine and engineering.

Kyushu University's competencies: 191 (13 DC, 178 EC)



◆ Perspectives ◆

- Circle map circumference: Research fields used in Scopus (ASJC 27 major subject areas) are indicated by color.
- Size of competencies (small circles): Indicates the number of publications that make up the competency. The larger the circle, the greater the number of publications in that research domain.
- Lines within competencies: These use the Scopus field colors from the circle circumference to indicate the fields of the publications that make up the competency. They indicate the direction in which each field is located in the circumference.
- Competency position: They are arranged according to the share of each field in the publications that make up the competency. Interdisciplinary research is positioned toward the center.
- Types of competencies: Competencies that consist of a large number of publications and meet certain standards, such as being top for the number of citations or publication share, are classed as Distinctive Competencies (DC), while others are classed as Emerging Competencies (EC).

(*1) Competencies: Behavioral characteristics of high achievers

Research domains that account for a large percentage of publications at the organization under analysis when research domains are grouped together by means of the co-citation analysis (grouping together publications cited at the same time) of publications.

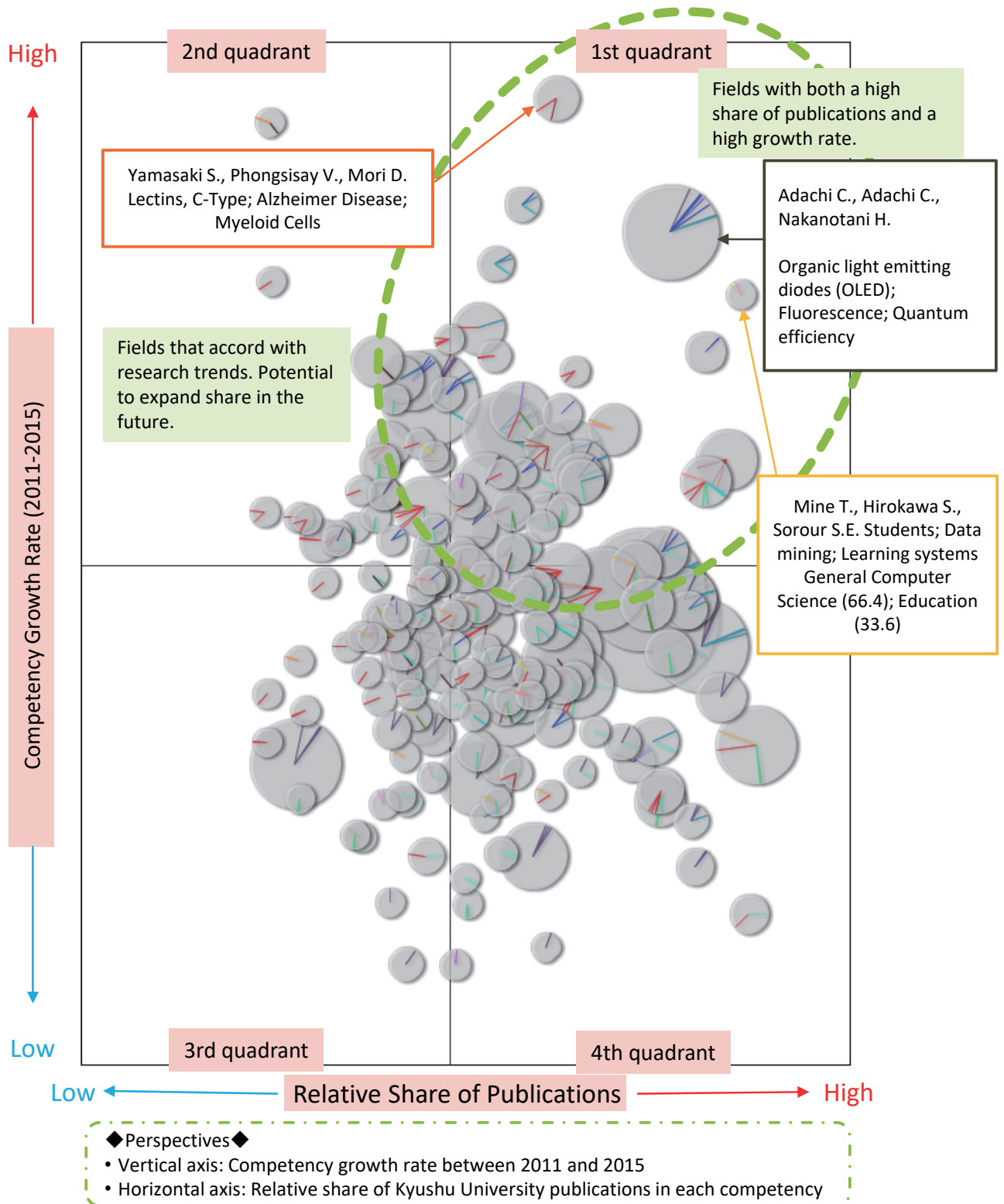
*Source: From Elsevier, *SciVal* (as of August 2017)

9-1. Trends Across Kyushu University as a Whole Based on Field Classification of Journals (continued)

Science Mapping

— Analysis of University Strengths Based on Co-citation of Publications — (continued)

The competencies in the first quadrant of the graph could be described as Kyushu University's star research domains, as they are fields in which it has both a high share of publications and a high growth rate. The competencies in the second quadrant are research domains that accord with research trends, in which there is potential for Kyushu University to expand its share in the future. The competencies in the fourth quadrant are stable, classic research domains in which Kyushu University has secured a high share.

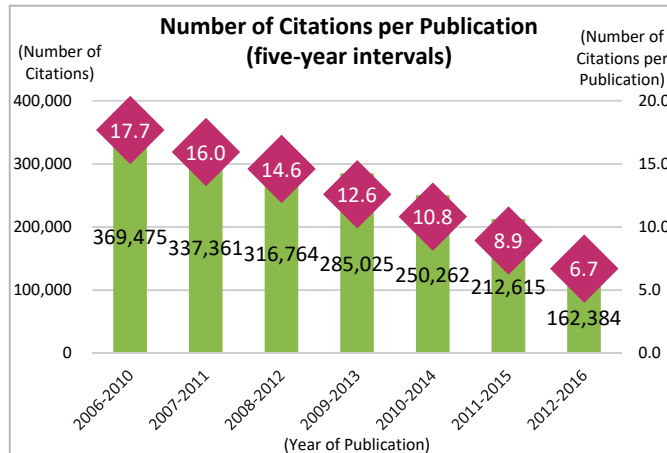
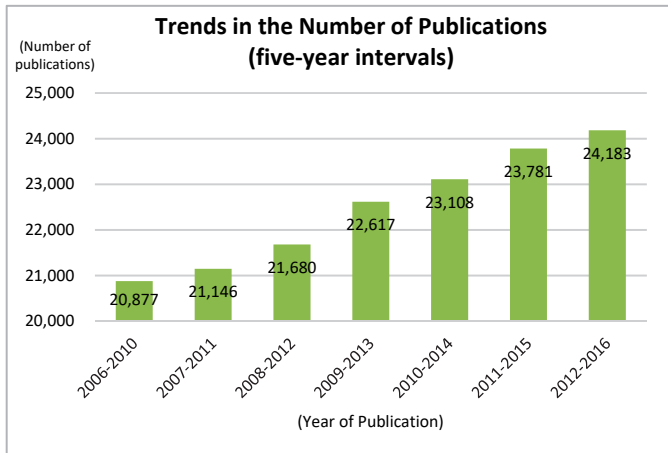


*Source: From Elsevier, *SciVal* (as of August 2017)

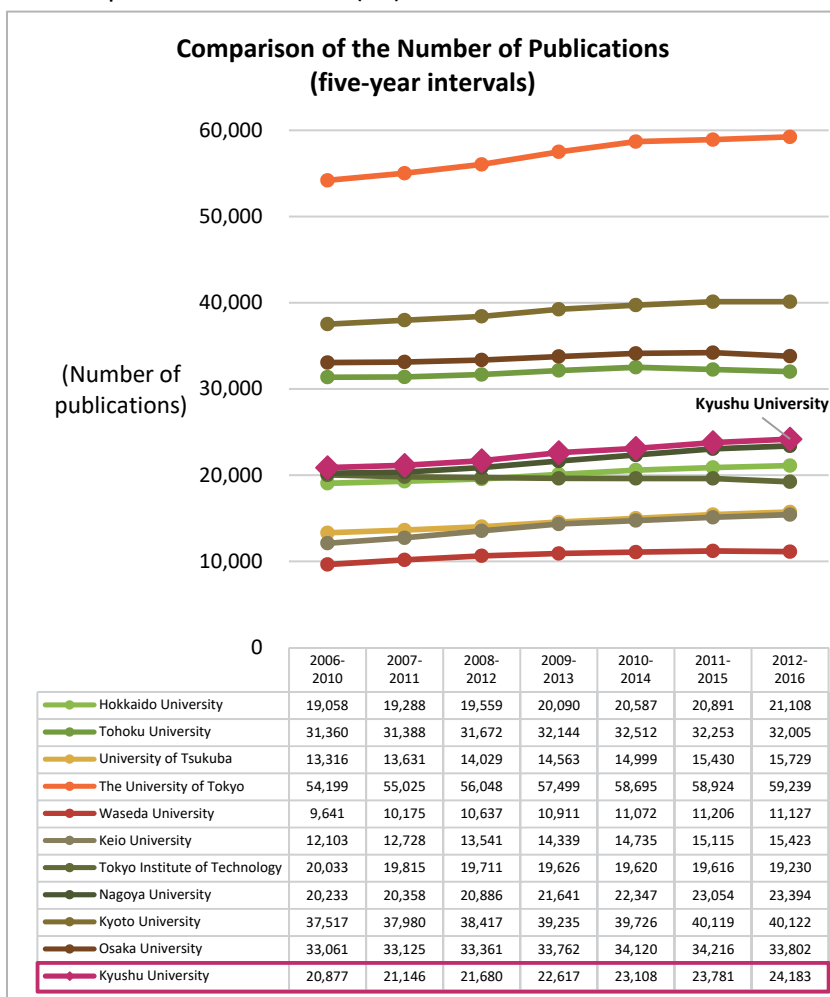
9-2. Comparisons of Publication Quantity and Quality

The number of publications is continuing to rise when observed on the basis of five-year intervals. Looking at the number of citations, there is a time lag between publication and citation in other publications, so there is a tendency for the number of citations to be lower in the most recent year of the period under analysis, but this downward trend is the same at other universities.

◆ Kyushu University ◆



◆ Comparison of the RU11(*1) ◆



Rate of Increase in the Number of Publications (2006-2010→2012-2016)

Rank	Universities	Rate of Increase
1	Keio University	27.4%
2	University of Tsukuba	18.1%
3	Kyushu University	15.8%
4	Nagoya University	15.6%
5	Waseda University	15.4%
6	Hokkaido University	10.8%
7	The University of Tokyo	9.3%
8	Kyoto University	6.9%
9	Osaka University	2.2%
10	Tohoku University	2.1%
11	Tokyo Institute of Technology	-4.0%

Kyushu University is 5th among the RU11 in terms of the number of publications at five-year intervals, but by rate of increase between 2006-2010 and 2012-2016, it was 3rd among the RU11, increasing by 15.8%.

(*1) Research University 11 (RU11)

A consortium of universities engaged in intensive global academic competition, placing great emphasis on research and the development of high-quality human resources through this. This consortium is composed of both national and private universities.

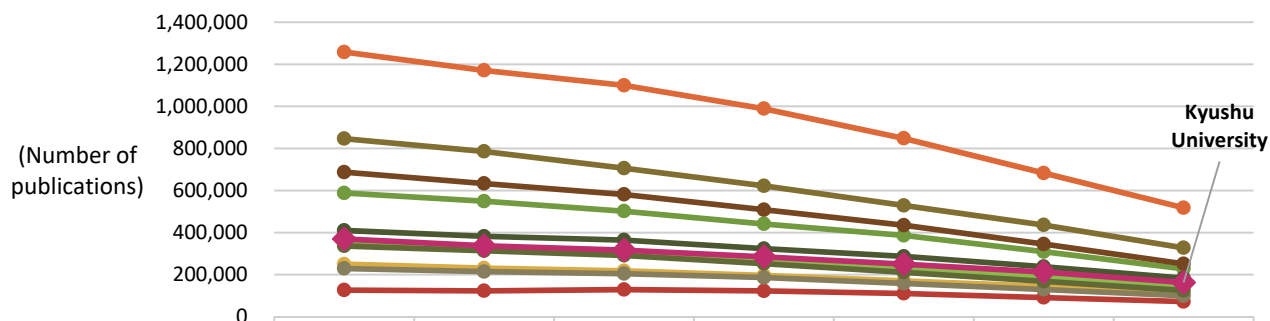
Hokkaido University, Tohoku University, University of Tsukuba, The University of Tokyo, Waseda University, Keio University, Tokyo Institute of Technology, Nagoya University, Kyoto University, Osaka University (in order from north to south)

*Source: From Elsevier, SciVal (as of August 2017)

9-2. Comparisons of Publication Quantity and Quality (continued)

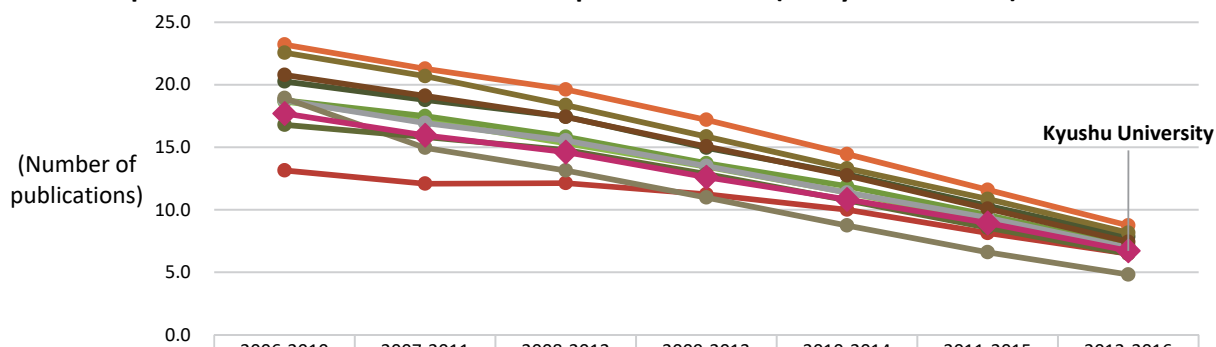
Comparing Kyushu University with the rest of the RU11(*1), while the number of publications at five-year intervals is not very high, Kyushu University is **third** in terms of the rate of increase and is demonstrating an upward trend. However, in comparisons of publication quality, in the form of the number of citations and the number of citations per publication, Kyushu University does not score highly.

Comparison of the Number of Citations (five-year intervals)



	2006-2010	2007-2011	2008-2012	2009-2013	2010-2014	2011-2015	2012-2016
Hokkaido University	355,615	330,654	299,708	270,080	234,591	189,132	137,728
Tohoku University	588,174	549,011	501,564	441,072	386,504	309,071	227,787
University of Tsukuba	249,649	230,886	218,037	196,557	170,649	144,451	109,774
The University of Tokyo	1,258,165	1,171,011	1,099,771	988,723	848,087	682,954	517,873
Waseda University	126,737	122,996	129,064	122,665	110,798	91,243	72,168
Keio University	229,127	214,316	204,555	186,195	158,330	129,495	99,609
Tokyo Institute of Technology	336,484	313,347	291,389	252,404	211,033	168,038	124,490
Nagoya University	409,936	382,272	364,318	323,617	286,740	237,866	183,610
Kyoto University	846,448	785,846	705,738	622,115	528,779	435,933	327,579
Osaka University	687,137	633,272	581,278	508,572	434,732	345,116	251,240
Kyushu University	369,475	337,361	316,764	285,025	250,262	212,615	162,384

Comparison of the Number of Citations per Publication (five-year intervals)



	2006-2010	2007-2011	2008-2012	2009-2013	2010-2014	2011-2015	2012-2016
Hokkaido University	18.7	17.1	15.3	13.4	11.4	9.1	6.5
Tohoku University	18.8	17.5	15.8	13.7	11.9	9.6	7.1
University of Tsukuba	18.7	16.9	15.5	13.5	11.4	9.4	7.0
The University of Tokyo	23.2	21.3	19.6	17.2	14.4	11.6	8.7
Waseda University	13.1	12.1	12.1	11.2	10.0	8.1	6.5
Keio University	18.9	15.0	13.1	11.0	8.7	6.6	4.8
Tokyo Institute of Technology	16.8	15.8	14.8	12.9	10.8	8.6	6.5
Nagoya University	20.3	18.8	17.4	15.0	12.8	10.3	7.8
Kyoto University	22.6	20.7	18.4	15.9	13.3	10.9	8.2
Osaka University	20.8	19.1	17.4	15.1	12.7	10.1	7.4
Kyushu University	17.7	16.0	14.6	12.6	10.8	8.9	6.7

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Hokkaido University, Tohoku University, University of Tsukuba, The University of Tokyo, Waseda University, Keio University, Tokyo Institute of Technology, Nagoya University, Kyoto University, Osaka University (in order from north to south)

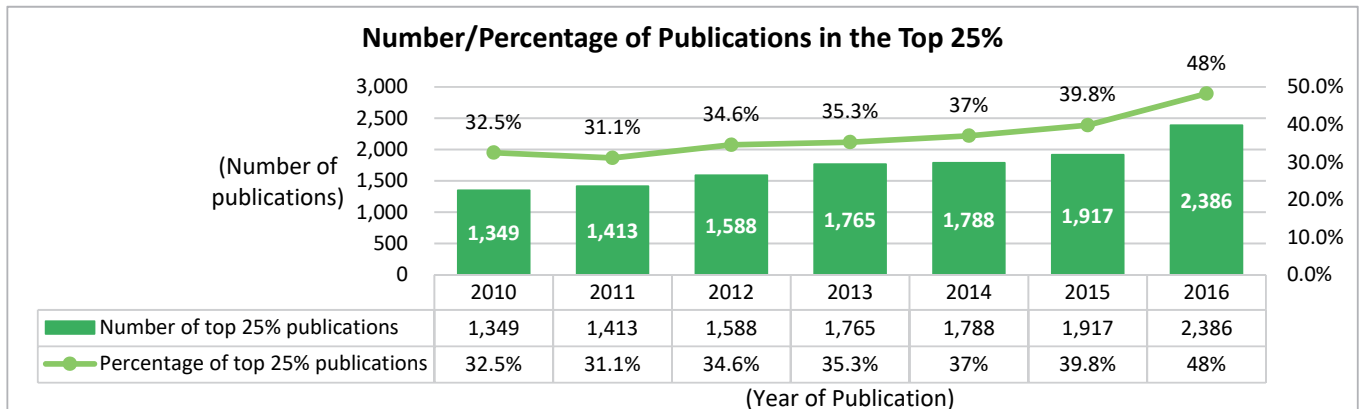
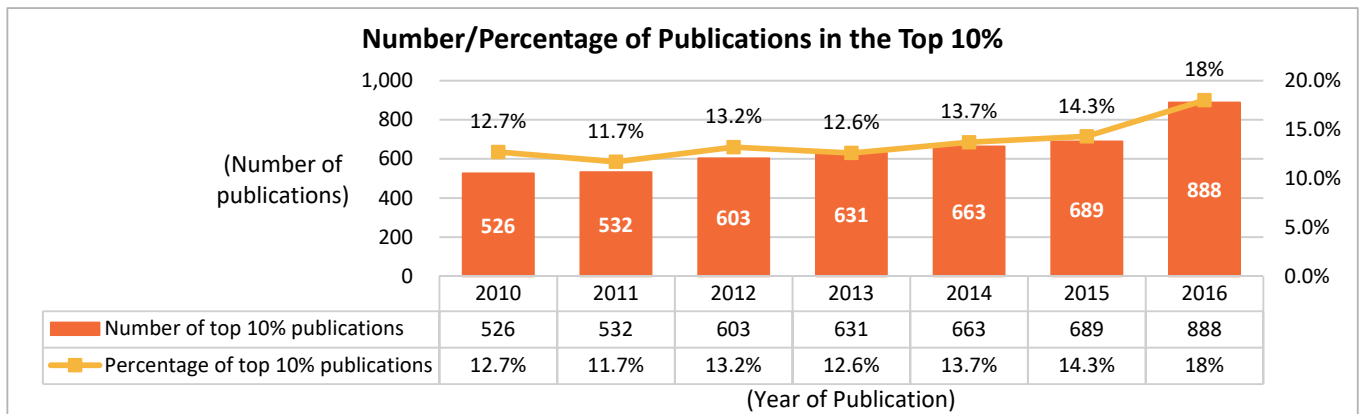
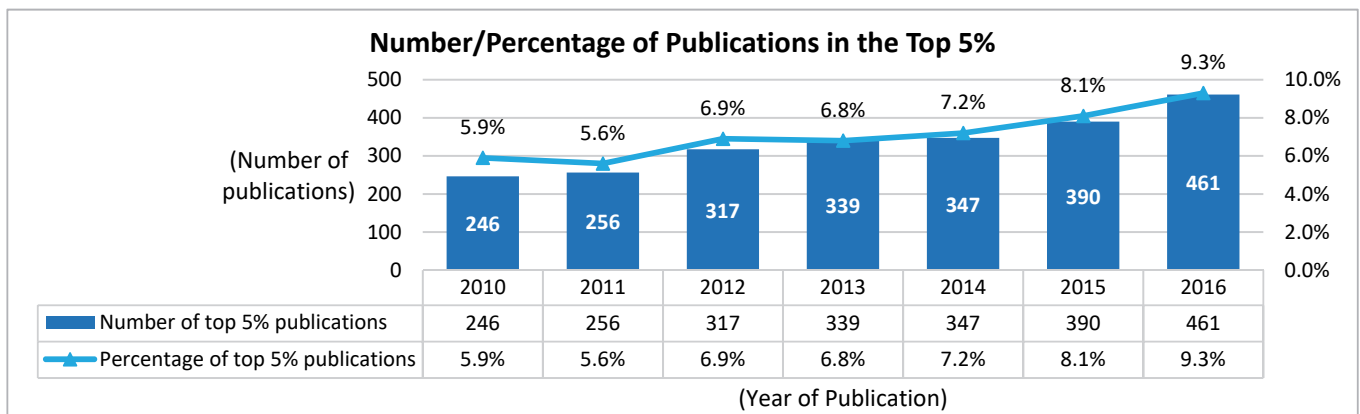
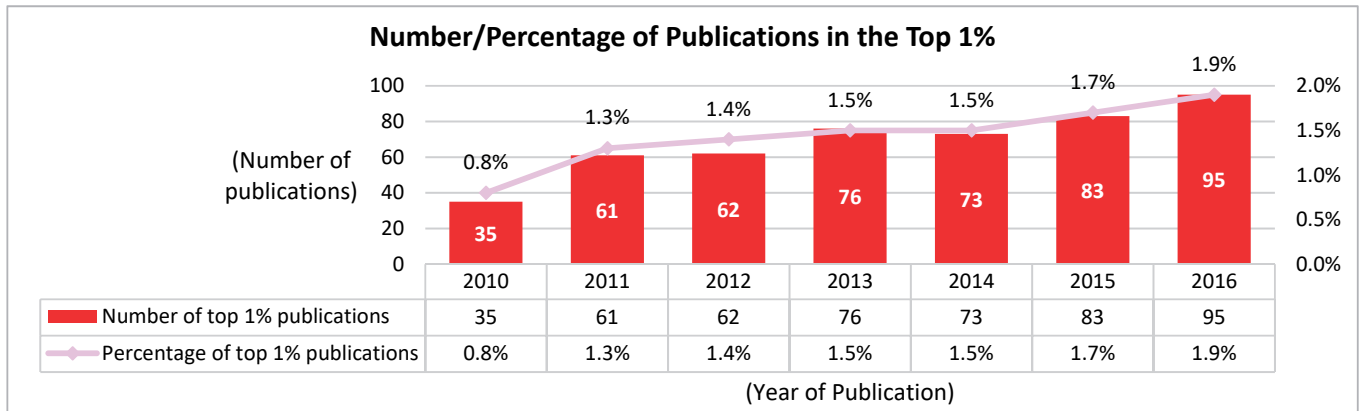
*Source: From Elsevier, *SciVal* (as of August 2017)

9-2. Comparisons of Publication Quantity and Quality (continued)

Trends in the Number and Percentage of Publications Carried in the World's Top Journals

*What is the number/percentage of publications in the top X%?

This is the number or percentage of publications among the world's top by number of citations. It indicates the number of publications in the top 1%, 5%, 10%, and 25% based on the number of citations in Scopus each year.

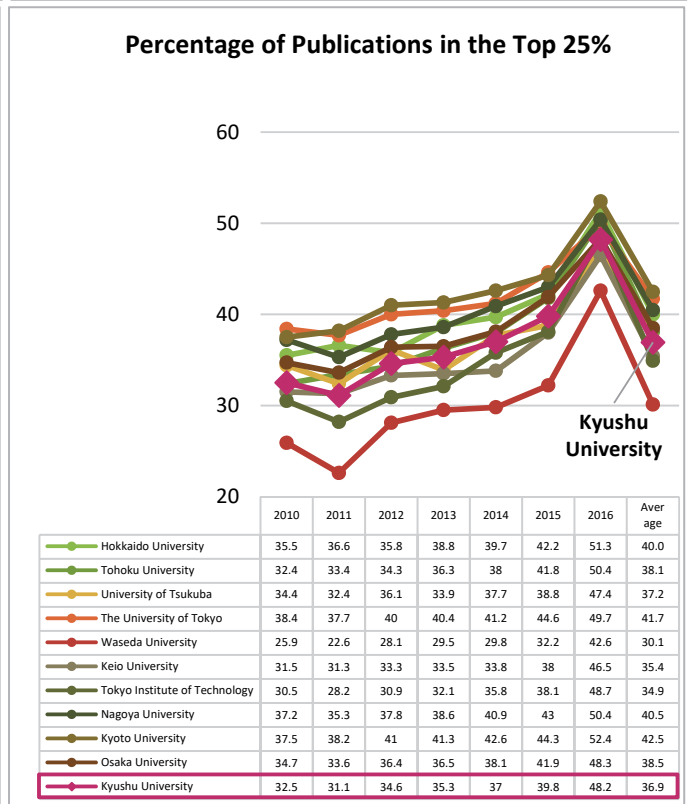
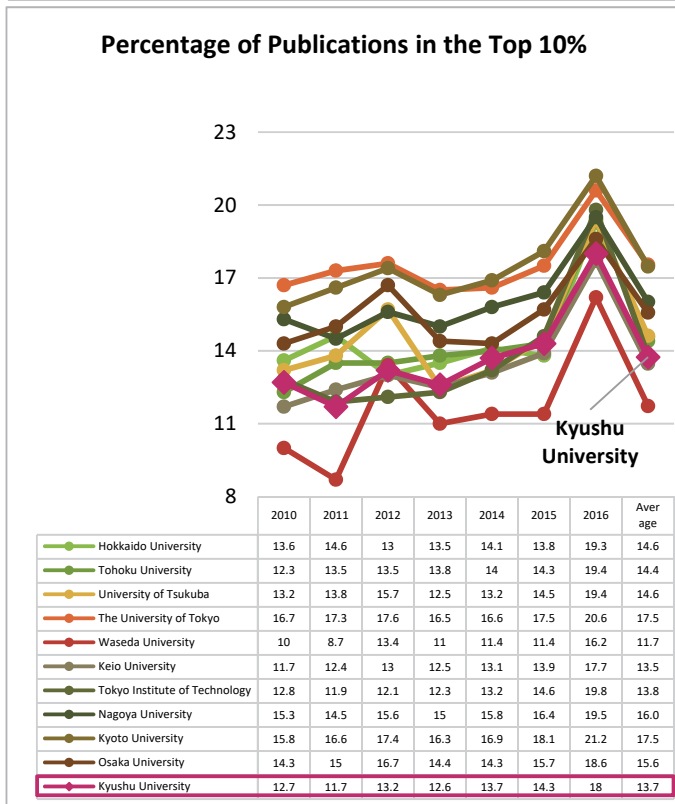
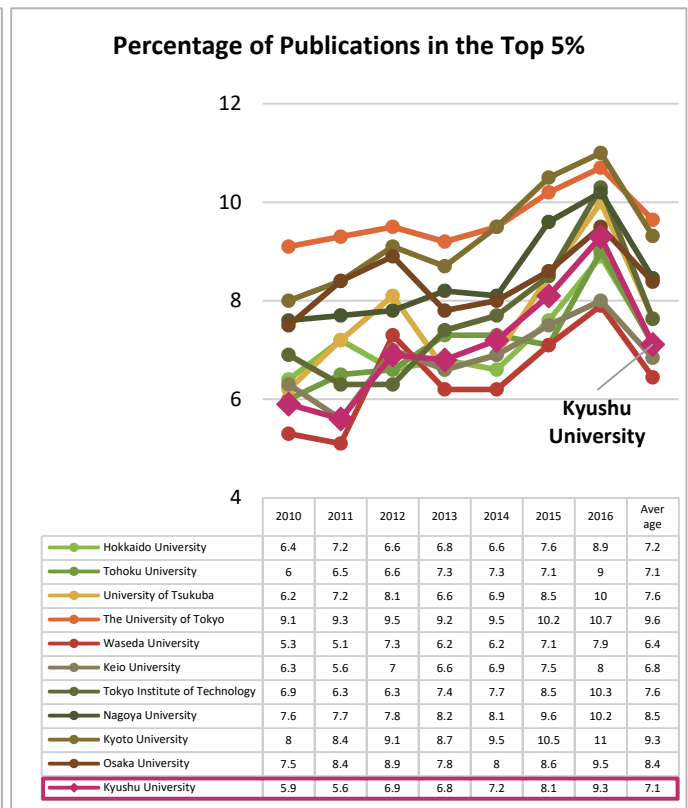
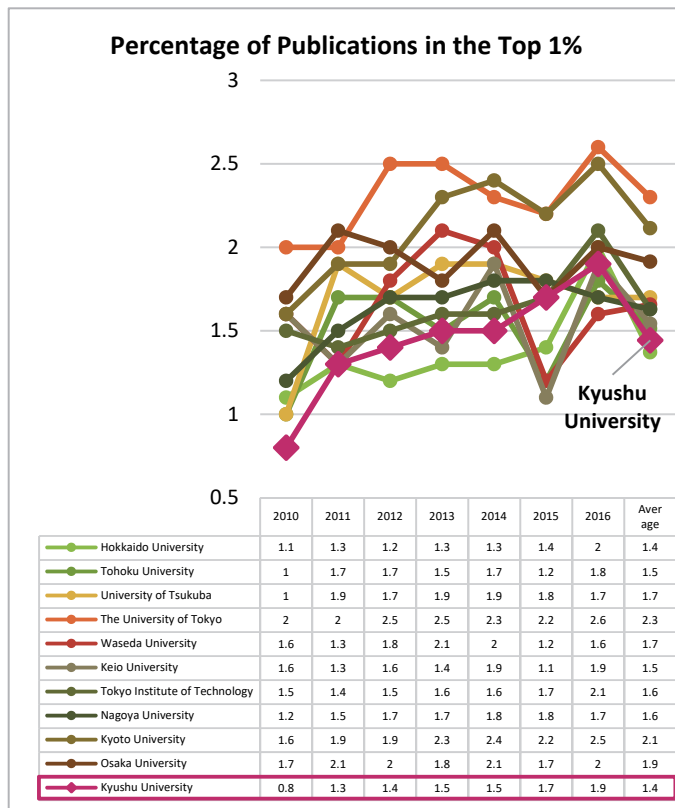


*Source: From Elsevier, *SciVal* (as of August 2017)

9-2. Comparisons of Publication Quantity and Quality (continued)

Trends in the Number and Percentage of Publications Carried in the World's Top Journals

◆ Comparison of the RU11(*1) ◆



(*1) Research University 11 (RU11)

A consortium of universities engaged in intensive global academic competition, placing great emphasis on research and the development of high quality human resources through this. This consortium is composed of both national and private universities.
 Hokkaido University, Tohoku University, University of Tsukuba, The University of Tokyo, Waseda University, Keio University, Tokyo Institute of Technology, Nagoya University, Kyoto University, Osaka University (in order from north to south).

*Source: From Elsevier, SciVal (as of August 2017)

9-2. Comparisons of Publication Quantity and Quality (continued)

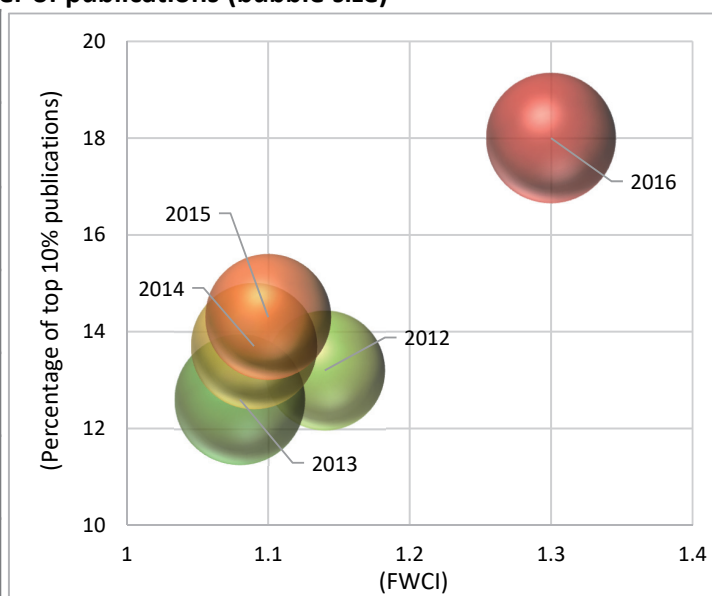
In the scatter diagram below, positioning further toward the top right indicates higher publication quality. The number of publications is on the increase and the percentage of publications in the top 10% is also growing, so figures indicating the quality of publications are rising year on year.

Comparing this university with the rest of the RU11(*1), while Kyushu University has a large number of publications, the percentage of publications in the top 10% is low, as is the FWCI score, so the figures indicating publication quality are not high.

◆Kyushu University◆ (2012-2016)

Kyushu University percentage of publications in the top 10% (vertical axis) × FWCI (*2) (horizontal axis) × Total number of publications (bubble size)

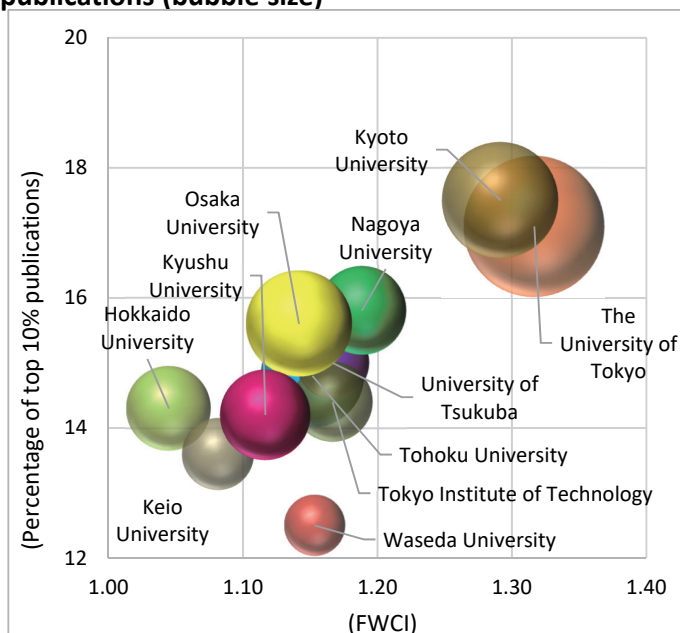
Year	Number of top 10% publications	FWCI	Number of publications
2012	13.2	1.14	4,585
2013	12.6	1.08	4,998
2014	13.7	1.09	4,835
2015	14.3	1.1	4,819
2016	18.0	1.3	4,946
Average	14.4	1.14	4,837



◆Comparison of the RU11(*1)◆ (2012-2016)

Percentage of publications in the top 10% (vertical axis) × FWCI (*2) (horizontal axis) × Total number of publications (bubble size)

University	Percentage of top 10% publications	FWCI	Number of publications
Hokkaido University	14.3	1.05	23,485
Tohoku University	14.8	1.15	35,145
University of Tsukuba	15.0	1.17	17,405
The University of Tokyo	17.1	1.32	64,965
Waseda University	12.5	1.15	12,207
Keio University	13.6	1.08	17,025
Tokyo Institute of Technology	14.4	1.17	20,972
Nagoya University	15.8	1.19	25,869
Kyoto University	17.5	1.29	44,230
Osaka University	15.6	1.14	37,007
Kyushu University	14.2	1.12	26,823



(*1) Research University 11 (RU11)

A consortium of universities engaged in intensive global academic competition, placing great emphasis on research and the development of high quality human resources through this. This consortium is composed of both national and private universities.

Hokkaido University, Tohoku University, University of Tsukuba, The University of Tokyo, Waseda University, Keio University, Tokyo Institute of Technology, Nagoya University, Kyoto University, Osaka University (in order from north to south)

(*2) FWCI (Field-weighted Citation Impact)

The number of citations received by the article in question, divided by the world average for the same type of article in the same field and same year of publication.

An FWCI of 1 or higher means that the average impact is higher than the world average.

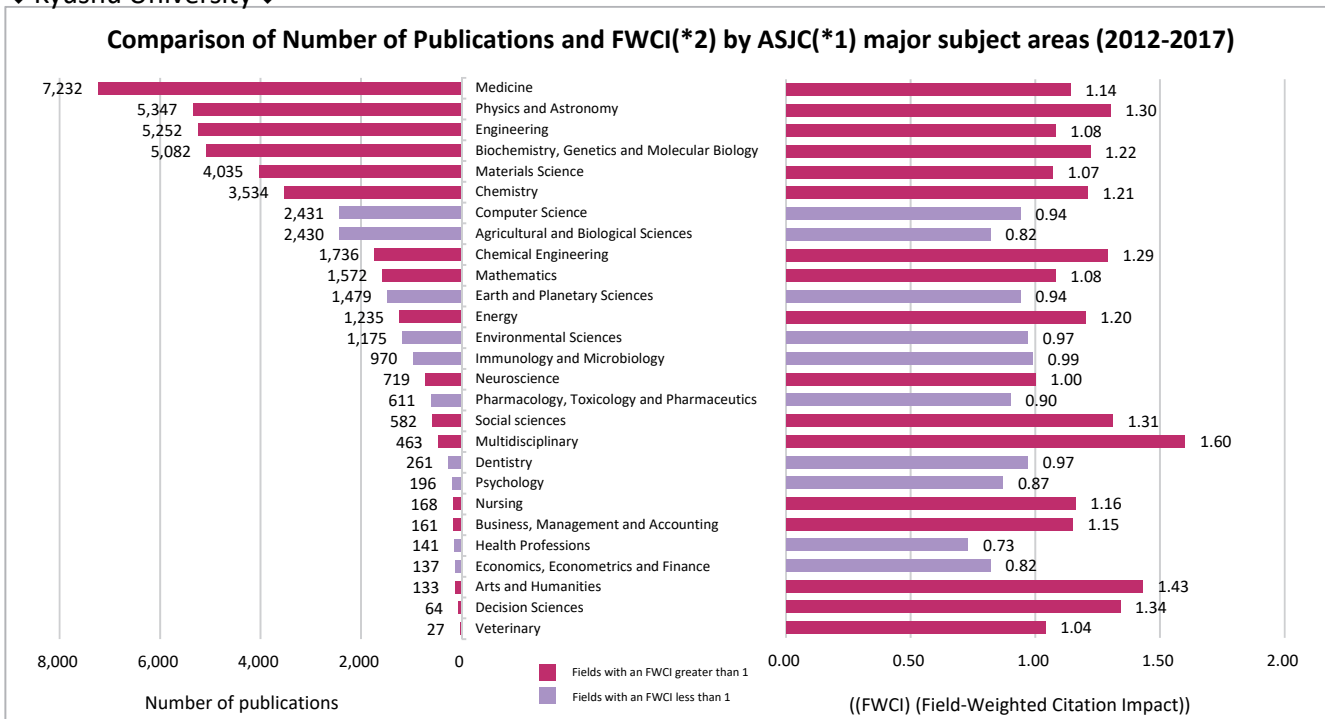
*Source: From Elsevier, *SciVal* (as of August 2017)

9-2. Comparisons of Publication Quantity and Quality (continued)

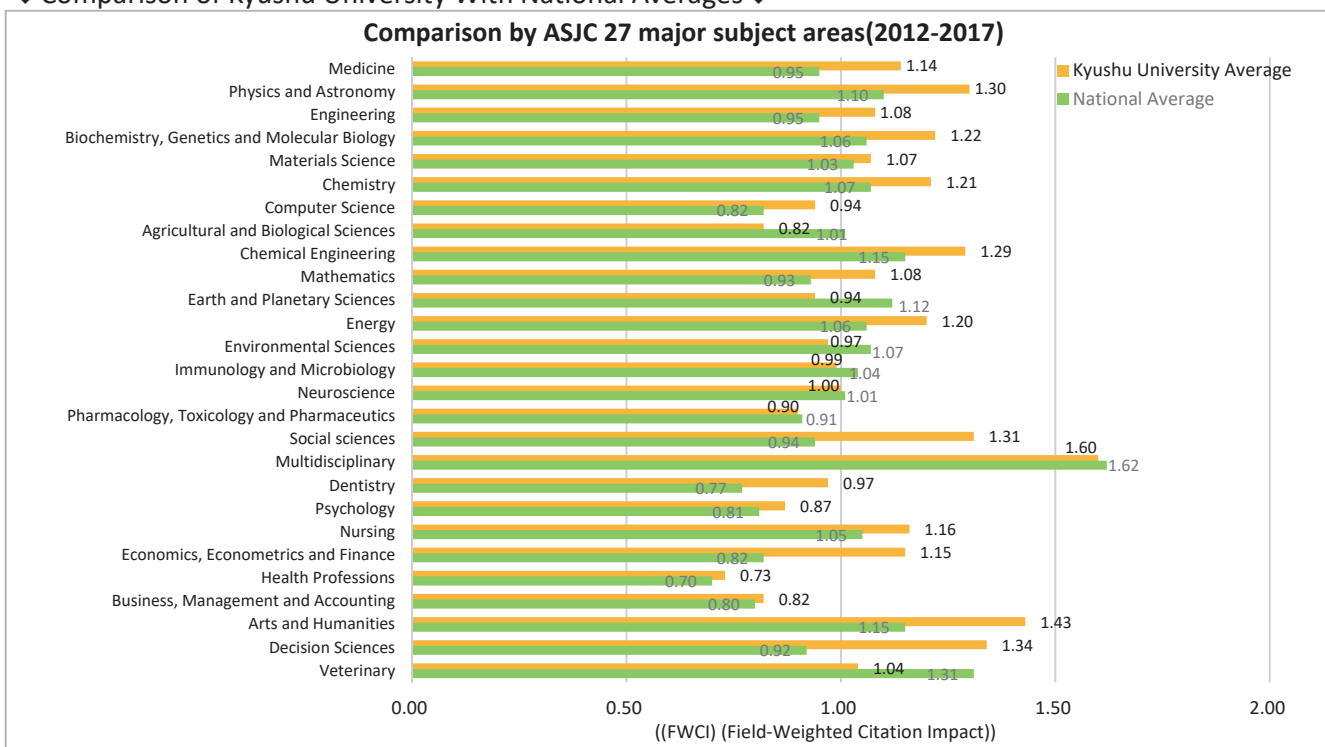
Comparison Between Kyushu University and the National Average (by ASJC 27 major subject areas (*1)) — Field-weighted Citation Impact (FWCI) (*2)

Kyushu University has an FWCI(*2) greater than the global average of 1 in 17 of the 27 major subject areas. The fields in which this university's FWCI score is particularly high compared with the national average are decision sciences (46% higher); economics, econometrics and finance (40% higher); and social sciences (39% higher). A larger number of publications and higher FWCI indicates greater depth of research capability (i.e. that it is one of the university's strengths). A smaller number of publications and high FWCI often indicates that there is a specific faculty member with advanced research ability. For example, this could include exceptional cases in which a specific faculty member belongs to a huge community of researchers.

◆ Kyushu University ◆



◆ Comparison of Kyushu University With National Averages ◆



(*1) ASJC 27 major subject areas

27 major subject areas and 334 minor subjects areas based on the All Scopus Science Journal Classification (ASJC) or research domains formulated independently.

(*2) FWCI (Field-weighted Citation Impact)

The number of citations received by the article in question, divided by the world average for the same type of article in the same field and same year of publication.

An FWCI of 1 or higher means that the average impact is higher than the world average.

*Source: From Elsevier, *SciVal* (as of August 2017)

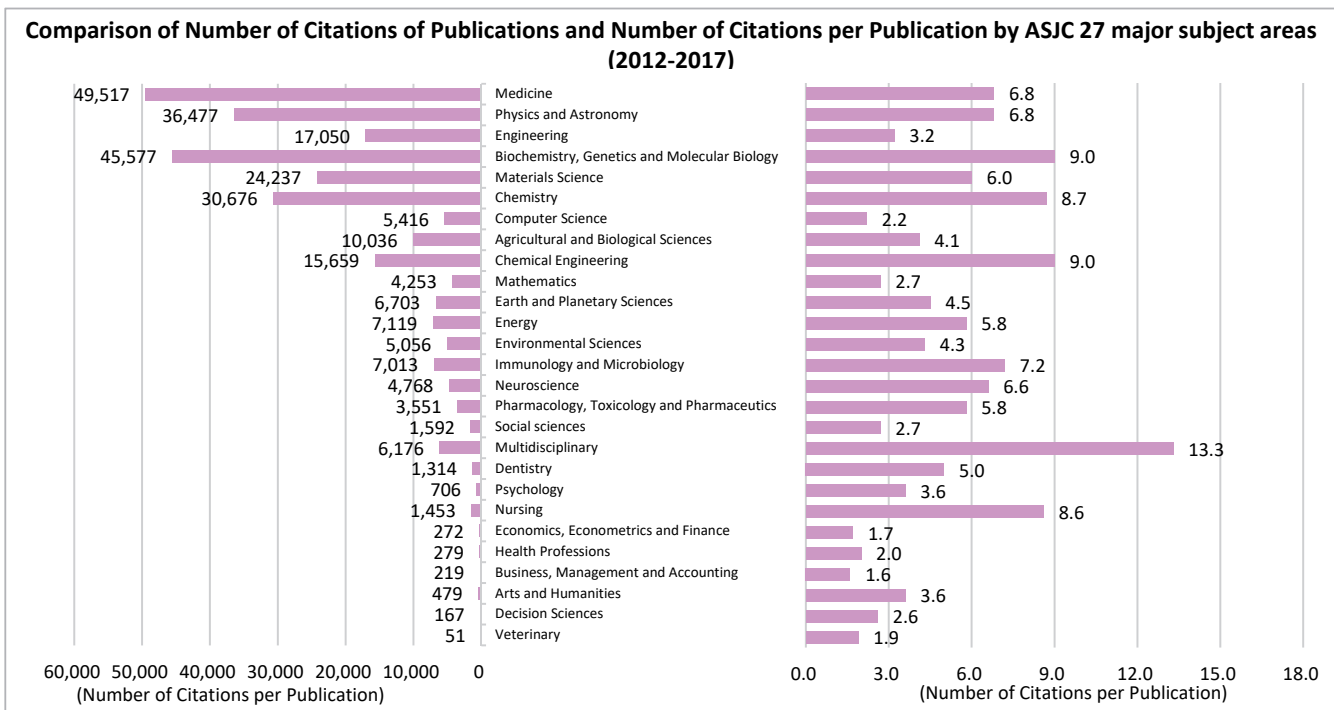
9-2. Comparisons of Publication Quantity and Quality (continued)

■ Comparison Between Kyushu University and the National Average (by ASJC 27 subject categories (*1))

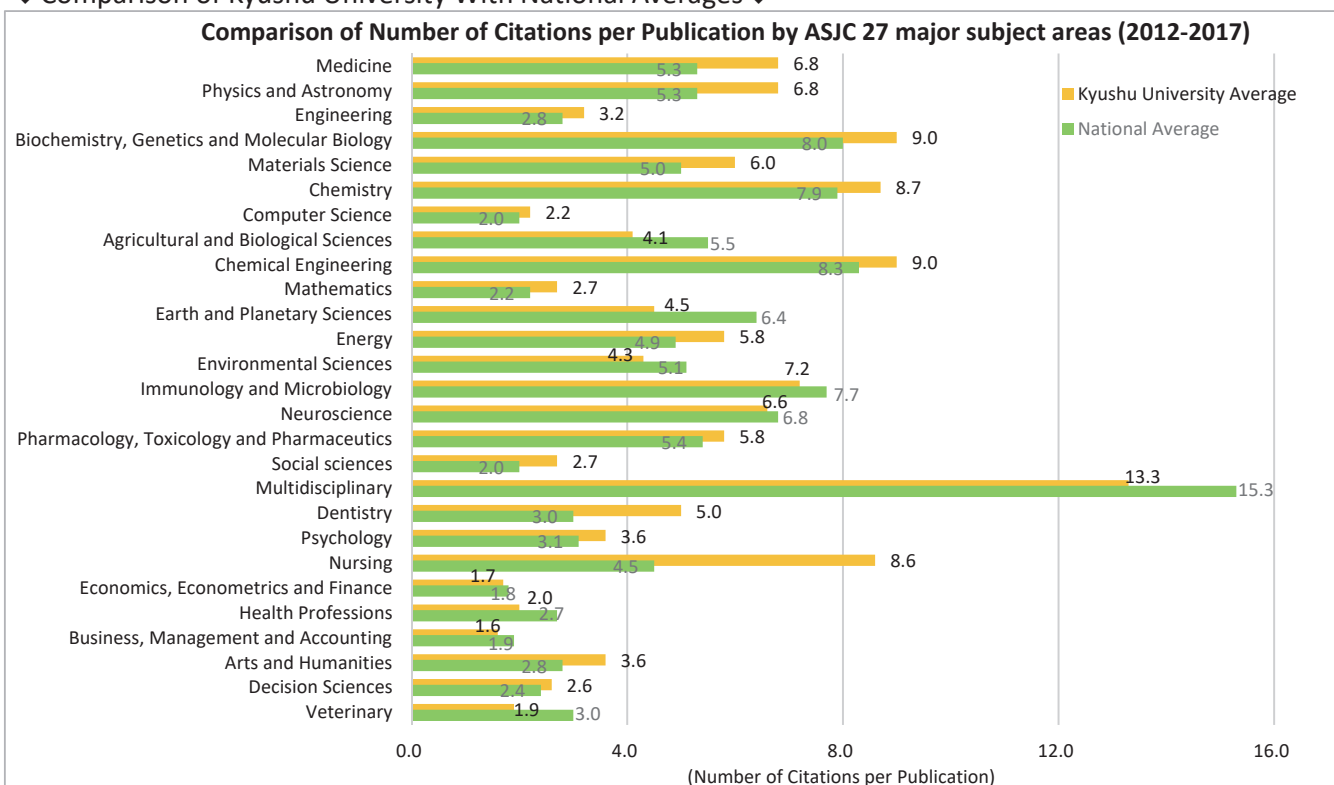
— Number of Citations per Publication

Kyushu University's number of citations per publication is higher than the national average in 13 of the 27 categories. The fields in which this university's percentage of citations is particularly high compared with the national average are nursing (91% higher); dentistry (67% higher); and social sciences (35% higher).

◆ Kyushu University ◆



◆ Comparison of Kyushu University With National Averages ◆



(*1) ASJC 27 major subject areas

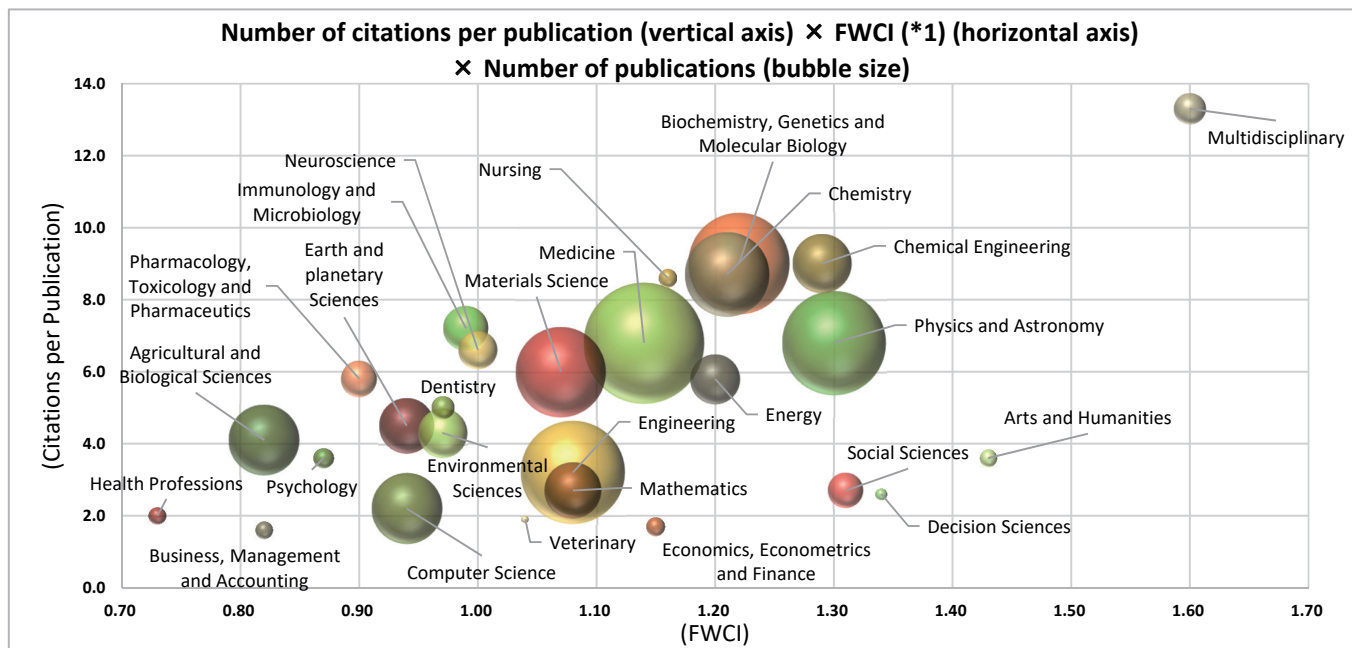
27 major subject areas and 334 minor subjects areas based on the All Scopus Science Journal Classification (ASJC) or research domains formulated independently.

*Source: From Elsevier, *SciVal* (as of August 2017)

9-2. Comparisons of Publication Quantity and Quality (continued)

■ Comparison of Research Fields of Kyushu University Publications (by ASJC 27 major subject areas (*1)) (2012-2017)

The further right and upward a field is positioned, the higher the FWCI(*2) and the number of citations per publication, indicating that it is a high-quality publication. The field of multidisciplinary research in particular is attracting attention, as it involves research that cuts across subject boundaries, integrates two or more academic fields.



■ Comparison of Research Fields of Kyushu University Publications (by ASJC 334 minor subject areas (*1)) (2012-2017)

Kyushu University has an FWCI(*2) greater than the global average of 1.0 in 167 of the 334 subjects. The top 10 subjects in which this university has a particularly high FWCI(*2) are listed below.

Rank	ASJC 27 major subject areas (*1)	ASJC 334 minor subject areas	FWCI
1	Health Professions	Medical Laboratory Technology	4.34
2	Nursing	Advanced and Specialized Nursing	4.07
3	Chemistry	Chemistry (miscellaneous)(*3)	3.67
4	Business, Management and Accounting	Tourism, Leisure and Hospitality Management	3.37
5	Engineering	Engineering (miscellaneous) (*4)	3.06
6	Decision Sciences	Management Science and Operations Research	2.88
7	Business, Management and Accounting	Business and International Management	2.85
8	Social Sciences	Transportation	2.56
9	Physics and Astronomy	Physics and Astronomy (miscellaneous) (*5)	2.4
10	Biochemistry, Genetics and Molecular Biology	Cell Biology	2.15

(*1) ASJC 27 major subject areas, ASJC 334 minor subject areas

27 major subject areas and 334 minor subjects areas based on the All Scopus Science Journal Classification (ASJC) or research domains formulated independently.

Translation assistance provided by the National Institution for Academic Degrees and Quality Enhancement of Higher Education. (Translation of major areas by Elsevier.)

(*2) FWCI (Field-weighted Citation Impact)

The number of citations received by the article in question, divided by the world average for the same type of article in the same field and same year of publication.

An FWCI of 1 or higher means that the average impact is higher than the world average.

(*3) Chemistry

Other than analytical chemistry, electrochemistry, inorganic chemistry, organic chemistry, physical and theoretical chemistry, and spectroscopy

(*4) Engineering

Other than aerospace engineering; automotive engineering; biomedical engineering; civil and structural engineering; computational mechanics; control and systems engineering; electrical and electronic engineering; industrial and manufacturing engineering; mechanical engineering; mechanics of materials; ocean engineering; safety, risk, reliability and quality; media technology; building and construction; and architecture

(*5) Physics and Astronomy

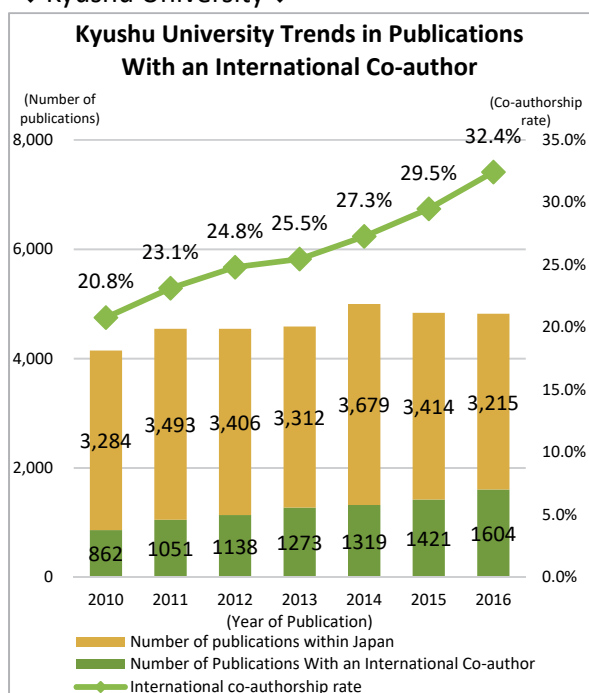
Other than acoustics and ultrasonics; astronomy and astrophysics; condensed matter physics; instrumentation; nuclear and high energy physics; atomic and molecular physics, and optics; radiation; statistical and nonlinear physics; and surfaces and interfaces

*Source: From Elsevier, *SciVal* (as of August 2017)

9-3. Publications With an International Co-author

At Kyushu University, the number of publications with an international co-author and the international co-authorship rate are both rising, but neither figure is high in the context of the RU11(*1).

◆ Kyushu University ◆



Number of Publications With an International Co-author (by Faculty) (2010-2016)

Rank	Faculty	Number of Internationally Co-authored Publications (Total)	International Co-authorship Rate (Average) (%)
1	Faculty of Science	1,406	45.6
2	Faculty of Engineering	1,283	20.2
3	Faculty of Agriculture	865	32.5
4	Faculty of Medical Sciences	783	12.2
5	Faculty of Information Science and Electrical Engineering	669	22.9
6	Faculty of Engineering Sciences	433	27.3
7	Faculty of Pharmaceutical Sciences	252	25.8
8	Faculty of Dental Science	175	19.1
9	Faculty of Mathematics	75	28.1
10	Faculty of Social and Cultural Studies	68	33.6
11	Faculty of Design	66	12.3
12	Faculty of Human-Environment Studies	45	22.0
13	Faculty of Economics	25	23.6
14	Faculty of Law	9	26.8
15	Faculty of Humanities	0	0.0
15	Faculty of Languages and Cultures	0	0.0

◆ Comparison of the RU11(*1) ◆ (2010-2016)

Number of Publications With an International Co-author

Rank	University	2010	2011	2012	2013	2014	2015	2016	Total Number
1	The University of Tokyo	3,155	3,201	3,480	3,584	3,871	3,858	3,874	25,023
2	Kyoto University	1,943	2,133	2,282	2,343	2,393	2,489	2,665	16,248
3	Tohoku University	1,760	1,787	1,912	1,981	2,047	1,904	2,009	13,400
4	Osaka University	1,478	1,643	1,702	1,745	1,788	1,852	1,850	12,058
5	Nagoya University	953	1,112	1,293	1,316	1,338	1,383	1,399	8,794
6	Kyushu University	862	1,051	1,138	1,273	1,319	1,421	1,604	8,668
7	Hokkaido University	965	992	1,002	1,136	1,144	1,184	1,295	7,718
8	Tokyo Institute of Technology	931	1,017	1,094	1,073	1,176	1,175	1,164	7,630
9	University of Tsukuba	664	739	890	872	858	945	1,075	6,043
10	Waseda University	522	615	721	634	681	690	703	4,566
11	Keio University	456	559	579	633	599	627	741	4,194

International Co-authorship Rate

Rank	University	2010	2011	2012	2013	2014	2015	2016	Average (%)
1	The University of Tokyo	27.8	28.2	29.5	29.9	31.7	33.3	33.2	30.5
2	Tohoku University	27.9	27.9	29.2	30.2	30.6	31.5	32.6	30.0
3	Waseda University	24.6	26.8	32.1	29.1	30.6	30.6	31.6	29.3
4	Kyoto University	25.8	26.7	29	28.6	29.4	31.4	33.4	29.2
5	Tokyo Institute of Technology	24	24.9	28.4	27.8	29.9	30.3	31.5	28.1
6	University of Tsukuba	24.1	25.1	28.9	28	27.7	29.6	33.1	28.1
7	Nagoya University	24.1	26	27.9	27.7	28.3	29.6	30.3	27.7
8	Hokkaido University	25.2	24.2	24.4	26.5	26.9	28.6	29.9	26.5
9	Kyushu University	20.8	23.1	24.8	25.5	27.3	29.5	32.4	26.2
10	Osaka University	22.4	24.2	25	24.5	26.2	27.7	29	25.6
11	Keio University	17.4	19.3	18.7	20	20.2	20.9	23.1	19.9

(*1) Research University 11 (RU11)

A consortium of universities engaged in intensive global academic competition, placing great emphasis on research and the development of high quality human resources through this. This consortium is composed of both national and private universities.

Hokkaido University, Tohoku University, University of Tsukuba, The University of Tokyo, Waseda University, Keio University, Tokyo Institute of Technology, Nagoya University, Kyoto University, Osaka University (in order from north to south)

*Source: From Elsevier, *SciVal* (as of August 2017)

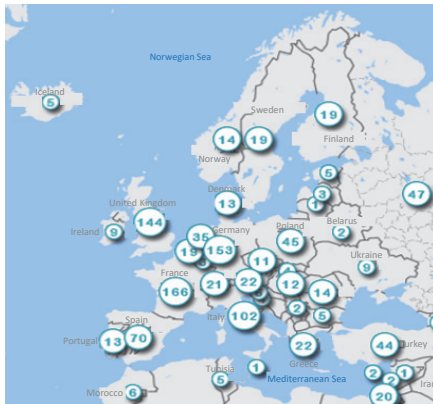
9-3. Publications With an International Co-author (continued)

[International Co-authorship With Institutions Worldwide (2012-2017)]

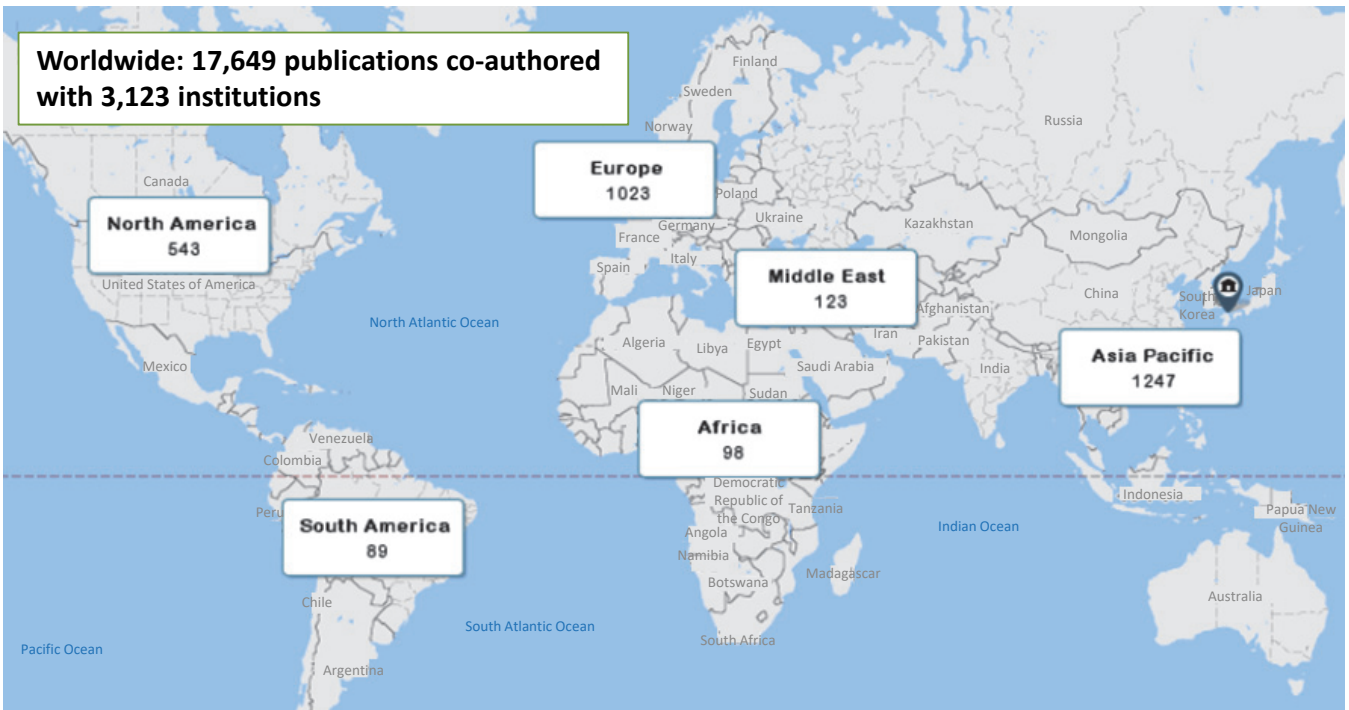
North America
2,617 publications co-authored
with 543 institutions



Europe
2,573 publications co-authored
with 1,023 institutions



Asia
15,718 publications co-authored
with 1,247 institutions



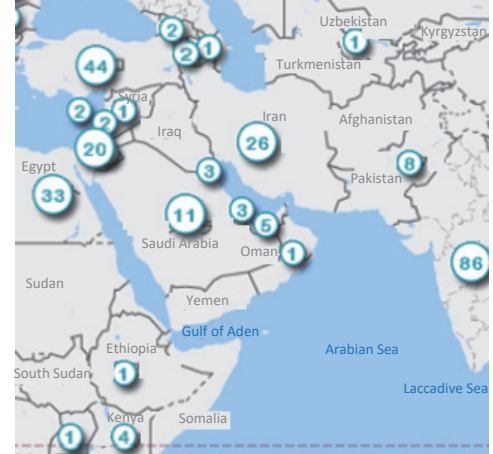
South America
585 publications co-authored
with 89 institutions



Africa
928 publications co-authored
with 98 institutions



Middle East
726 publications co-authored
with 123 institutions



• Figures on the maps represent the number of institutions.

*Source: From Elsevier, *SciVal* (as of August 2017)