

Research Performance Evaluations



Teerasak Markpin

20 September 2012



Thai-Journal Citation Index Centre (TCI Centre)

King Mongkut's University of Technology Thonburi

Publications Produced by Thai Universities between 2001-2007 in SCI-Expanded Database

No.	University	Articles
1	Mahidol University (MU)	4,511
2	Chulalongkorn University (CU)	3,879
3	Chiang Mai University (CMU)	1,943
4	Prince of Songkla University (PSU)	1,261
5	Khon Kaen University (KKU)	1,096
6	Kasetsart University (KU)	1,057
7	Asian Institute of Technology (AIT)	845
8	King Mongkut's University of Technology Thonburi (KMUTT)	795
9	Thammasat University (TU)	559
10	Suranaree University of Technology (SUT)	341
11	Srinakharinwirot University (SWU)	252
12	Naresuan University (NU)	235
13	Burapha University (BUU)	206
14	Silpakorn University (SU)	182
15	King Mongkut's Institute of Technology Ladkrabang (KMITL)	168

Publications Produced by Thai Universities between 2001-2007 in SCI-Expanded Database (cont.)

No.	University	Articles
16	Mahanakorn University of Technology (MUT)	119
17	Ramkhamhaeng University (RU)	92
18	Rangsit University (RSU)	81
19	Walailak University (WU)	80
20	King Mongkut's University of Technology North Bangkok (KMUTNB)	54

หมายเหตุ ข้อมูล ณ วันที่ 20 สิงหาคม 2551

Articles/staffs of Thai Universities between 2002-2007 in SCI-Expanded Database

No.	University	2002	2003	2004	2005	2006	2007	Avg.
1	MU	0.16	0.21	0.23	0.26	0.25	0.32	0.24
2	KMUTT	0.14	0.19	0.22	0.25	0.29	0.31	0.23
3	CU	0.13	0.17	0.19	0.23	0.27	0.30	0.21
4	SUT	0.11	0.15	0.29	0.25	0.23	0.23	0.21
5	CMU	0.09	0.12	0.11	0.15	0.17	0.22	0.14
6	PSU	0.09	0.09	0.08	0.11	0.14	0.15	0.11
7	KKU	0.06	0.07	0.06	0.09	0.10	0.13	0.09
8	KU	0.05	0.06	0.05	0.09	0.08	0.08	0.07
9	TU	0.04	0.06	0.07	0.07	0.07	0.12	0.07
10	WU	0.04	0.06	0.05	0.08	0.09	0.06	0.06
10	BUU	0.05	0.05	0.04	0.05	0.05	0.04	0.05
12	NU	0.02	0.04	0.02	0.03	0.05	0.06	0.04
13	SU	0.02	0.02	0.03	0.03	0.05	0.05	0.03
14	UBU	0.02	0.01	0.03	0.03	0.03	0.07	0.03
15	SWU	0.02	0.03	0.02	0.03	0.04	0.04	0.03

Articles/staffs of Thai Universities between 2002-2007 in SCI-Expanded Database (cont.)

No.	University	2002	2003	2004	2005	2006	2007	Avg.
16	KMITL	0.03	0.03	0.02	0.02	0.03	0.06	0.03
17	MJU	0	0.01	0.03	0.03	0.02	0.03	0.02
18	MSU	0	0.01	0.01	0.02	0.03	0.04	0.02
19	RU	0.02	0.01	0.01	0.01	0.02	0.02	0.02
20	MFU	0	0	0	0.03	0.04	0.02	0.01
21	KMUTNB	0.01<	0.01	0.01	0.02	0.02	0.02	0.01
22	NIDA	0	0	0	0	0.03	0.02	0.01

หมายเหตุ

- ข้อมูล ณ วันที่ 20 สิงหาคม 2551
- ข้อมูลจำนวนบุคลากรในมหาวิทยาลัยของรัฐและเอกชน โดย สกอ.

<http://www.mua.go.th/personal.php>

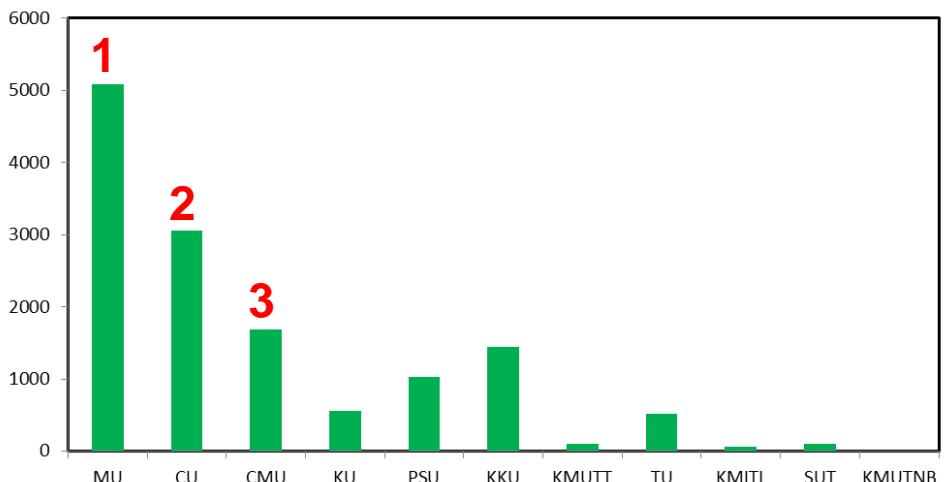
Publications Produced by Thai Universities between 2007-2012 in SCOPUS Database

No.	University	Articles
1	Mahidol University (MU)	7,082
2	Chulalongkorn University (CU)	6,219
3	Chiang Mai University (CMU)	3,558
4	Kasetsart University (KU)	2,879
5	Prince of Songkla University (PSU)	2,807
6	Khon Kaen University (KKU)	2,552
7	King Mongkut's University of Technology Thonburi (KMUTT)	1,575
8	Thammasat University (TU)	1,354
9	King Mongkut's Institute of Technology Ladkrabang (KMITL)	941
10	Suranaree University of Technology (SUT)	835
11	King Mongkut's University of Technology North Bangkok (KMUTNB)	369

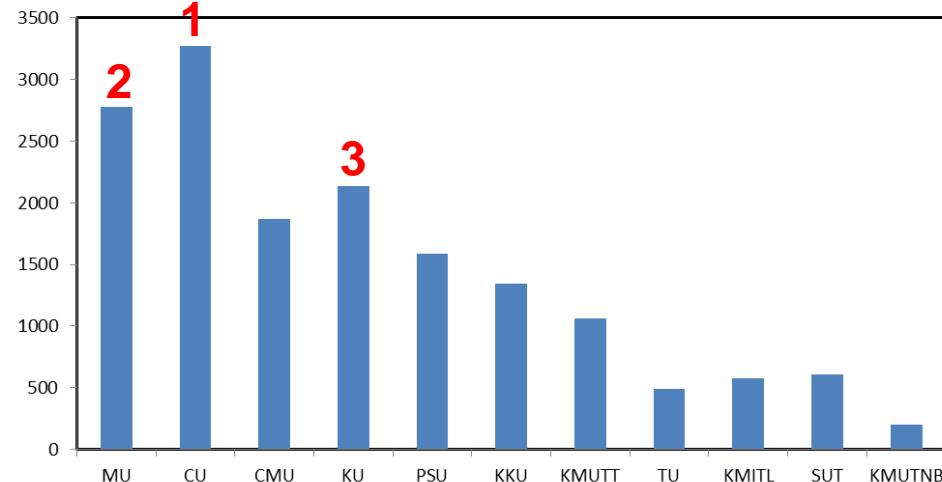
หมายเหตุ ข้อมูล ณ วันที่ 27 กรกฎาคม 2555

Publications Produced by Thai Universities between 2007-2012 in SCOPUS Database by Subject

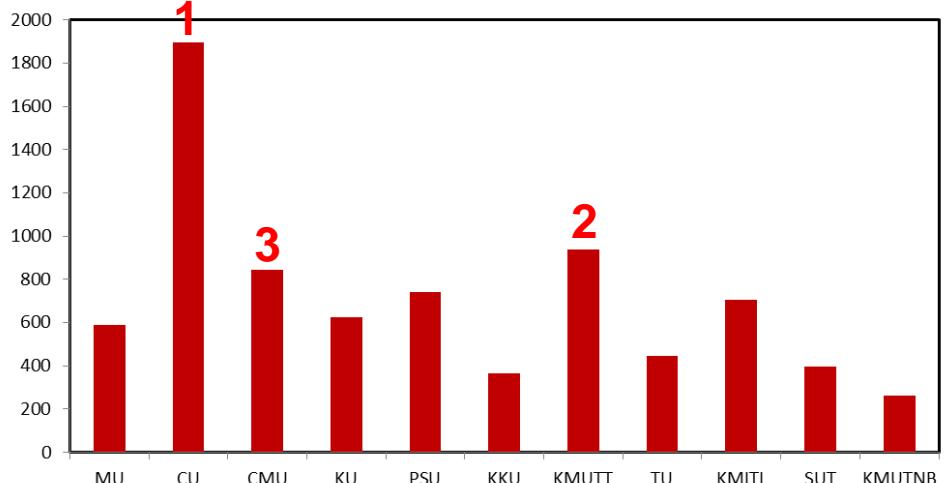
Life Sciences & Biomedicine



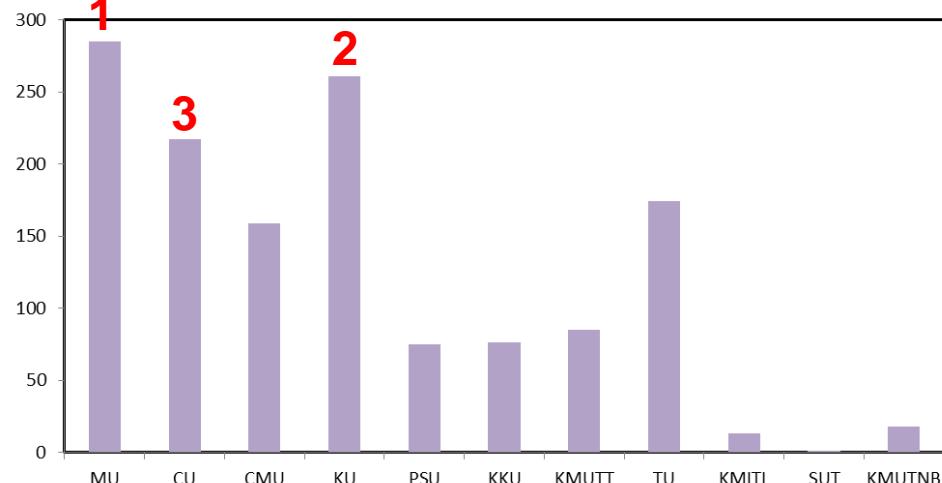
Natural Sciences



Technology



Social Sciences



ISI Impact Factor

- **Journal Impact Factor** หรือ **Impact Factor** หมายถึงจำนวนครั้งโดยเฉลี่ยที่บหความของวารสารนั้นจะได้รับการอ้างอิงในแต่ละปี (*A measure of the frequency with which the “average article” in a journal has been cited in a particular year or period*)
- คิดค้นขึ้นโดย **Eugene Garfield** และ **Irving H. Sher** แห่งสถาบัน **Institute for Scientific Information (ISI)** หรือปัจจุบันคือ **Thompson ISI** ในปี ค.ศ. 1960s
- **ISI** ผลิตฐานข้อมูลชื่อ **Journal Citation Reports (JCR)** เพื่อรายงานค่า Journal Impact Factor ของวารสารในสาขาวิชาศาสตร์และเทคโนโลยีมากกว่า 6,000 รายการจากทั่วโลก

ISI Indexes

- **Journal Impact Factor** เป็นดัชนีที่บ่งบอกปริมาณการอ้างอิงของบทความในวารสารต่อนหนึ่งบทความในช่วงเวลาหนึ่งๆ
- **Journal Immediacy Index** เป็นดัชนีที่บ่งบอกความเร็วที่บทความในวารสารถูกนำไปอ้างอิงในปีที่มีการตีพิมพ์
- **Journal Cited Half-Life** เป็นดัชนีที่บ่งบอกระยะเวลาที่บทความในวารสารหนึ่งๆ ยังคงสามารถถูกนำมาใช้อ้างอิง

วารสาร A	2548	2549	2550
จำนวนบทความที่ตีพิมพ์	35	40	45
จำนวนครั้งที่ถูกอ้างอิงทั้งหมด	100		
- บทความในปี 48 ถูกอ้างอิงในปี 50	30	ครั้ง	
- บทความในปี 49 ถูกอ้างอิงในปี 50	20	ครั้ง	
- บทความในปี 50 ถูกอ้างอิงในปี 50	10	ครั้ง	
ค่า JIF ในปี 50	= $\frac{20 + 30}{40 + 35} = \frac{50}{75} = 0.666$		
ค่า JII ในปี 50	= $\frac{10}{45} = 0.222$		

ISI Journal Citation Reports

ISI Web of KNOWLEDGESM ISI Journal Citation Reports L
H

ISI JOURNAL CITATION reports® Powered by ISI Web of KnowledgeSM

 HOME  HELP 2002 JCR Science Edition

SUBJECT CATEGORY SELECTION

Select one or [more subject categories](#) from the list to filter journals.

MECHANICS
MEDICAL ETHICS
MEDICAL INFORMATICS
MEDICAL LABORATORY TECHNOLOGY
MEDICINE, GENERAL & INTERNAL
MEDICINE, LEGAL
MEDICINE, RESEARCH & EXPERIMENTAL
METALLURGY & METALLURGICAL ENGINEERING
METEOROLOGY & ATMOSPHERIC SCIENCES

Sort journals by:

ISI Journal Citation Reports (...continuous)

ISI Web of KNOWLEDGE SM		ISI Journal Citation Reports		GO	Log out Home											
ISI JOURNAL CITATION reports [®]		Powered by ISI Web of Knowledge _{SM}		2002 JCR Science Edition												
HOME	HELP								JOURNAL TITLE CHANGES							
JOURNAL SUMMARY LIST																
MEDICINE, GENERAL & INTERNAL																
Selection:		<input type="button" value="Impact Factor"/>		<input type="button" value="Sort Again"/>												
Sorted by:																
Journals 1 - 20 (of 107)			[1 2 3 4 5 6]		► ►		Page 1 of 6									
<input type="button" value="MARK ALL"/>		<input type="button" value="UPDATE MARKED LIST"/>														
<i>Ranking is based on your journal and sort selections.</i>																
Mark	Rank	Abbreviated Journal Title <i>(linked to full journal information)</i>	ISSN	2002 Total Cites	Impact Factor	Immediacy Index	2002 Articles	Cited Half-life								
<input type="checkbox"/>	1	NEW ENGL J MED	0028-4793	143124	31.736	8.138	378	7.2								
<input type="checkbox"/>	2	JAMA-J AM MED ASSOC	0098-7484	75539	16.586	5.679	383	6.5								
<input type="checkbox"/>	3	LANCET	0140-6736	118123	15.397	5.299	522	6.9								

Some words for JIF and its users!!

- *We never predicted that people would turn this (JIF) into an evaluation tool for giving grants and funding. (Eugene Garfield; 2005).*
- *Journal impact factors are not for the assessment of single papers, certainly not for the assessments of researchers and research programs. (European Association of Science; 2007).*
- *The quality of an article will never change once published, but the impact factors of a journal changes every year (Sombatsompop; 2009)*

Always remember that:

1. Journal impact factors are used only for quantitative assessment of journal citations or visibilities.
2. Also not sure for **quality**. This is because;
 - 2.1 *JIF values do not differentiate positive and negative citations.*
 - 2.2 *Citations in high impact factor journals may come from low quality articles (in low impact factor journals).*
 - 2.3 *one citation in each journal does not contribute to the same degree of the impact factor value.*
3. It is very (very) wrong to use the JIF values for evaluations of researchers and institutions, research funding decisions, academic promotions, and activity prioritizations.
4. Getting accepted for publication is based on **quality** of manuscript, not on the JIF.

Conventional variations/limitations of JIF

- There is no normalization for reference practices and traditions in the different fields and disciplines.

Subject Variation and No.of Authors/paper

Figure 2a. Subject Variation in Impact Factors

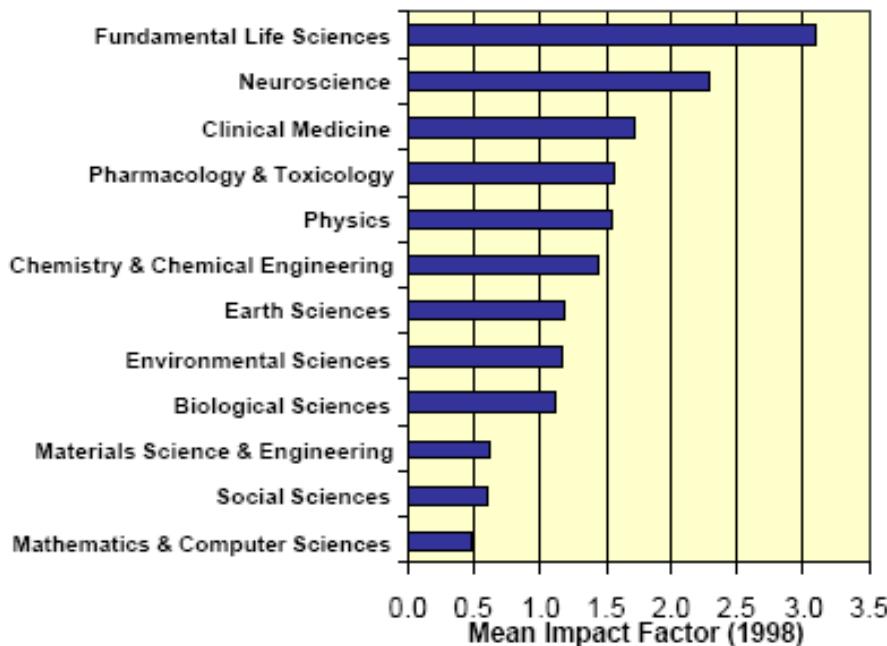
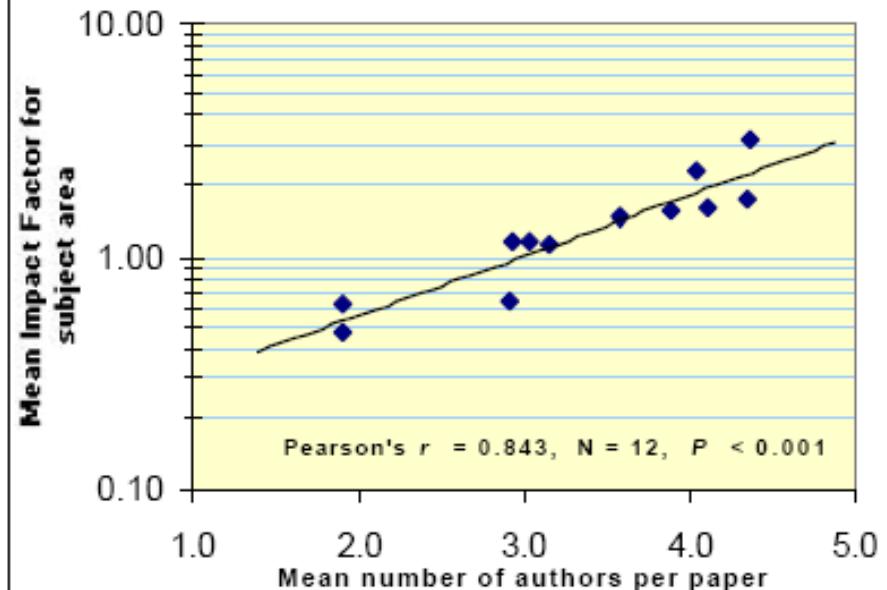


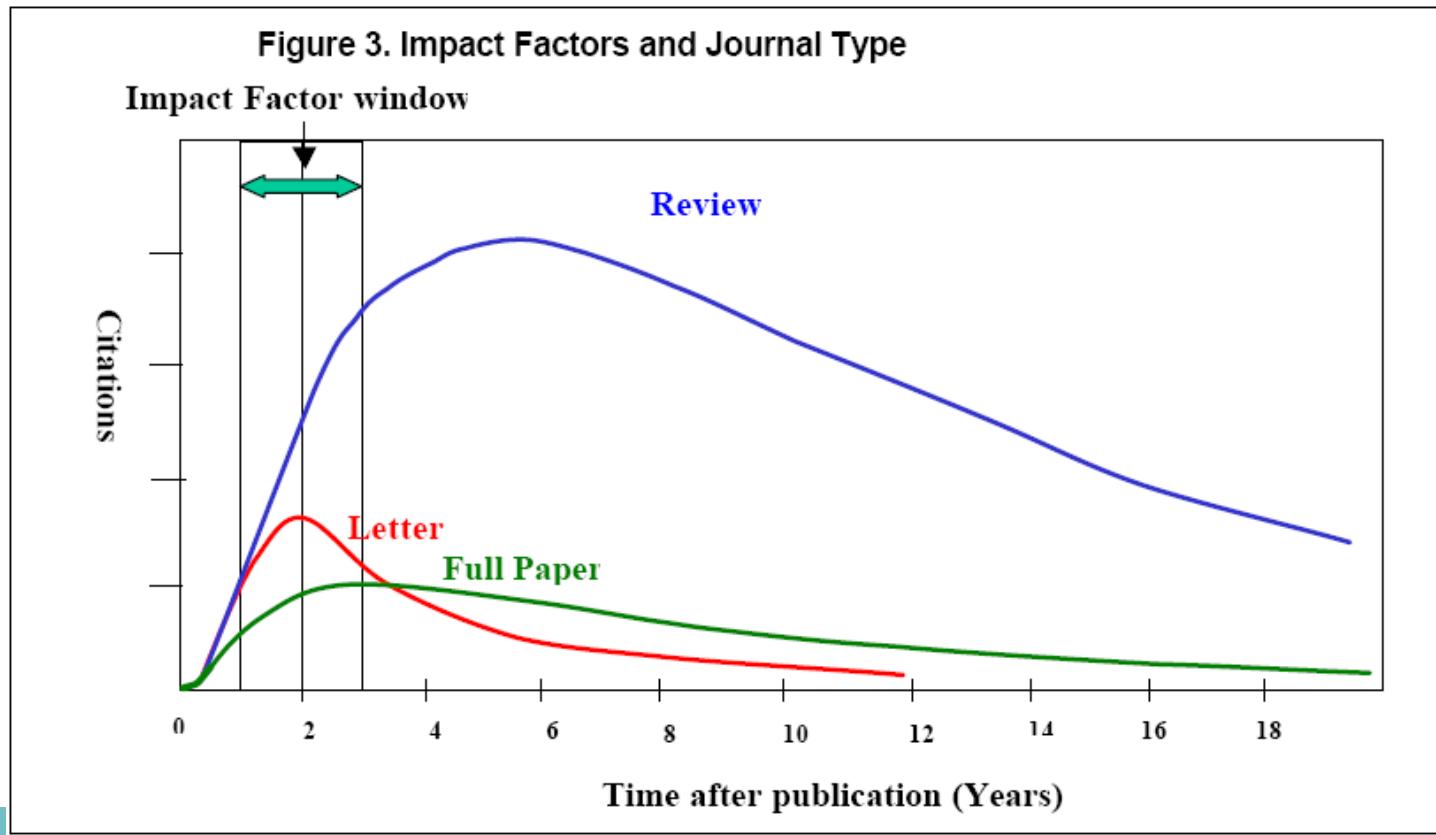
Figure 2b. Impact Factors and number of Authors per paper



Conventional variations/limitations of JIF (cont.)

- There is a bias in favor of journals with lengthy papers, e.g. review journals, original research articles and notes.

Article types in journals



Conventional variations/limitations of JIF (cont.)

- Most impact factors are over-estimated, especially the journals *Science* and *Nature*.

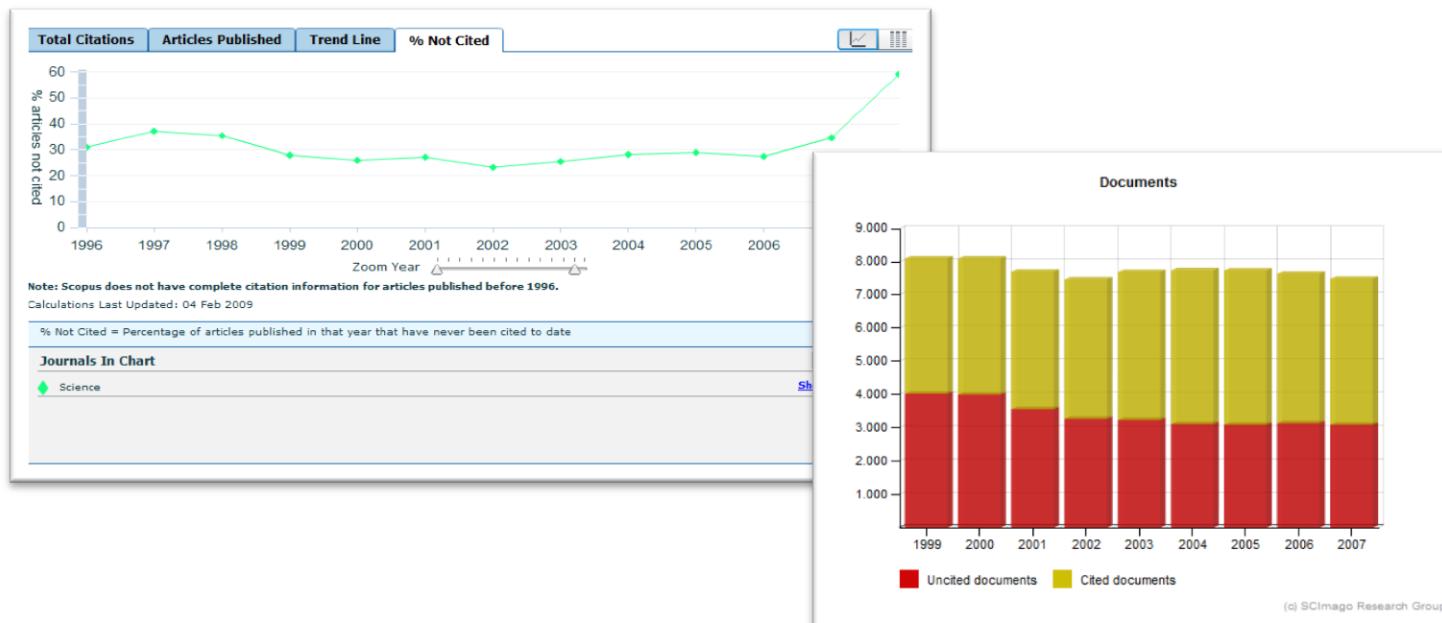
Over-estimation of JIF

- Over-estimation of **numerator**: The citations are counted from all items (citable and non-citable).
- Under-estimation of **denominator**: The citable items are referred to research articles and reviews, **but not** such items as editorials, letters to the editor, news items, meeting abstracts and corrections.
- Therefore, the impact factors are greatly over-estimated.

Conventional variations/limitations of JIF (cont.)

- Only some articles in a journal are responsible for most of citations. (Polderman, President of EASE; 2007)

Even Science...



Narongrit

 Somboon Maraporn
 Teerasak Markpin 18

Conventional variations/limitations of JIF (cont.)

Article-count impact factor (ACIF)

ACIF index = the ratio of the number of articles that were cited in the current year to the source items published in that journal during the previous two years.

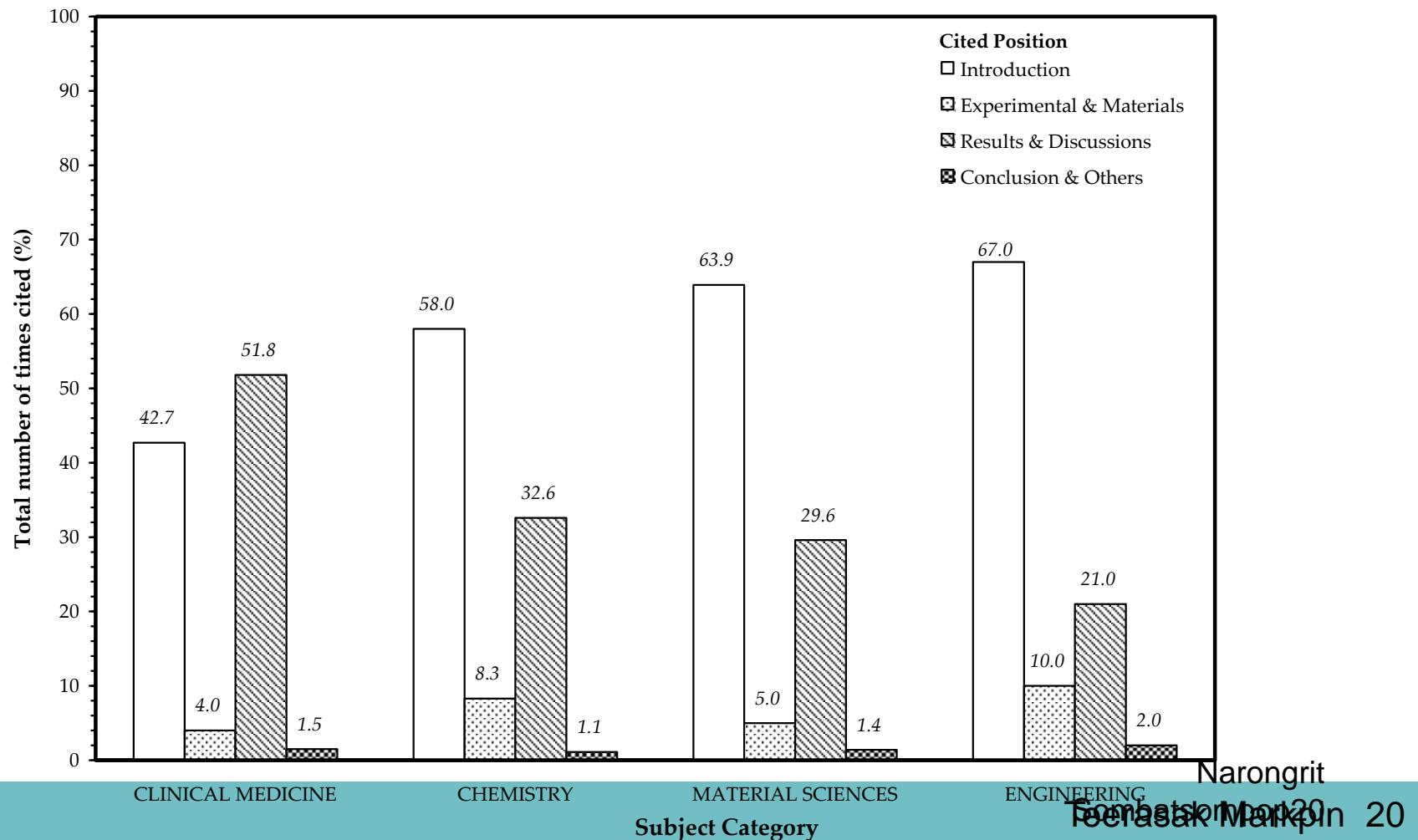
(**Sombatsompop et al; Scientometrics, 75:251-261 (2008)**

Category	Journal Title	JIF	ACIF
Polymer Science	J Polym Sci Pol Chem	2.773	0.786
	J Polym Sci Pol Phys	2.773	0.659
Metallurgical Engineering	Oxid Met	1.568	0.653
	J Alloy Compd	1.562	0.547
Ceramics	J Sol-Gel Sci Techn	1.150	0.556
	J Electroceram	1.124	0.858

Conventional variations/limitations of JIF (cont.)

- The concept of citable documents is not considered.

Citation numbers and positions of articles in SCI database
Sombatsompop et al in Scientometrics 65:293. (2005)



Conventional variations/limitations of JIF (cont.)

- Impact Factor Fluctuation VS Journal Size

Effect of Journal Size

Figure 4a. Impact Factor Fluctuation vs Journal Size

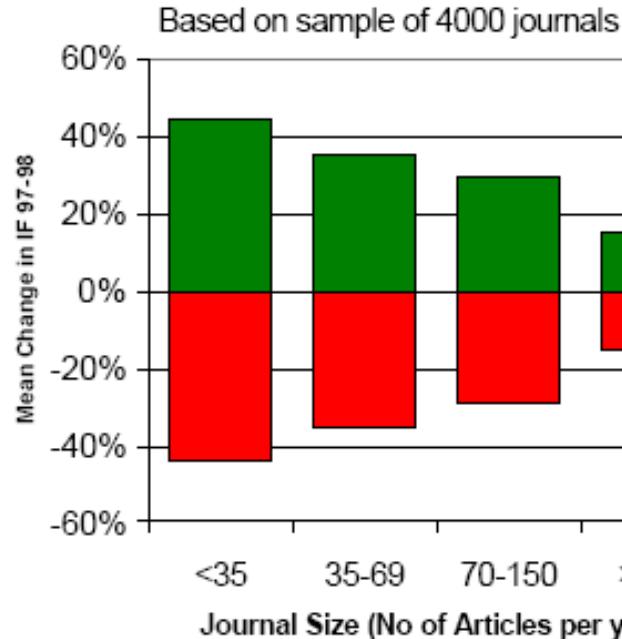
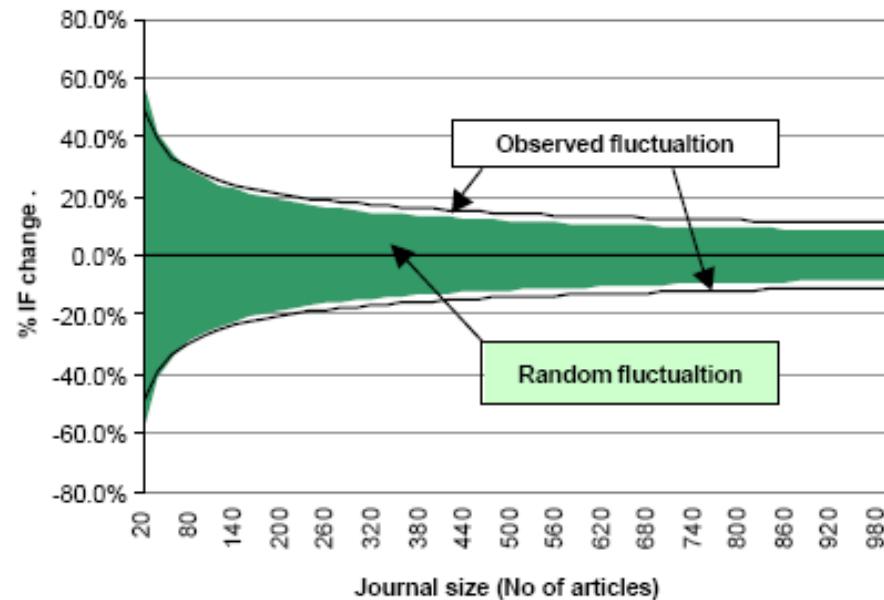


Figure 4b. Impact Factor Fluctuation vs Journal Size



Proper uses of the impact factors

- JIF can be used as **one of the criteria for journal selection** for publication of research work of individuals and universities. [*The higher the JIF values the greater the visibilities of the published articles*].

How to select a journal for publication?

1. Highly visible among your peers (indexed in many international databases and available on-lines)
2. Most relevant to the content of your manuscript. (How to tell?)
3. High total citations
4. High impact factors or h-index

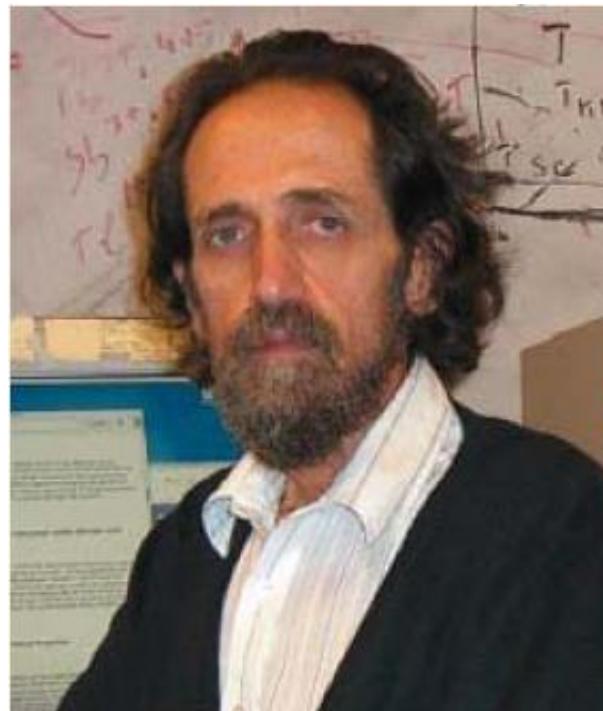
Proper uses of the impact factors (cont.)

- If you **really** need to use the JIF for assessment of research articles and researchers, the **cross-citation count** of the article (of the researcher) during the past 2 years should be equal or greater than **the JIF value**.
- **Best!!** Not to use the JIF for any assessments!!

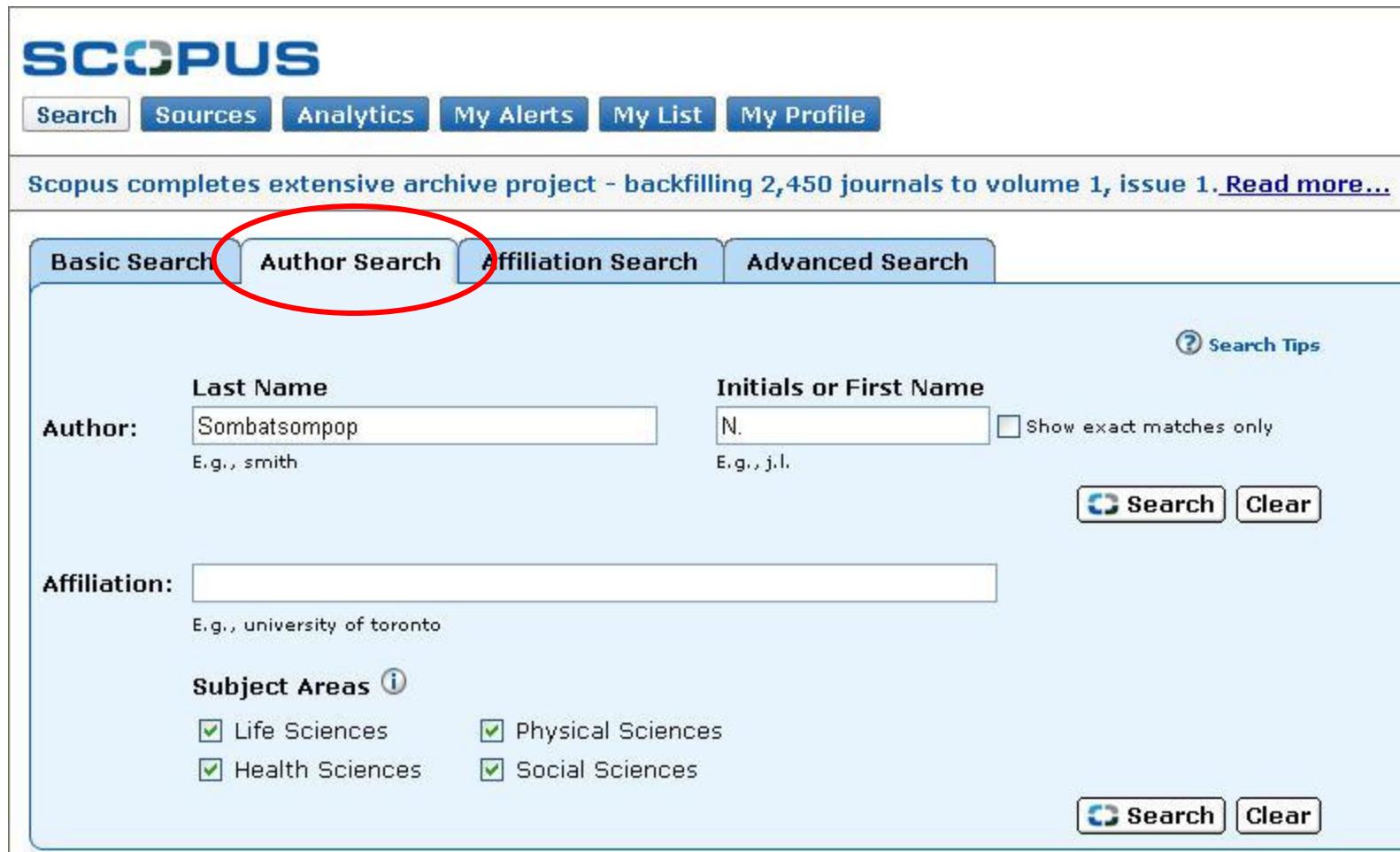
[Do not use one metric to measure many things!!]

h-index

- The h-index was suggested by **Professor Jorge E. Hirsch**, a physicist at University of California, San Diego.



h-index from SCOPUS



The screenshot shows the Scopus search interface. At the top, there is a navigation bar with links: Search, Sources, Analytics, My Alerts, My List, and My Profile. Below this, a banner announces "Scopus completes extensive archive project - backfilling 2,450 journals to volume 1, issue 1. [Read more...](#)". The main search area has four tabs: Basic Search, Author Search (which is circled in red), Affiliation Search, and Advanced Search. The Author search section contains fields for "Last Name" (Author: Sombatsompop) and "Initials or First Name" (N.). There is also a checkbox for "Show exact matches only". Below these fields are "Search" and "Clear" buttons. The "Affiliation" field is empty, with an example "E.g., university of toronto". Under "Subject Areas", there are four checked options: Life Sciences, Physical Sciences, Health Sciences, and Social Sciences. Below these are "Search" and "Clear" buttons.

h-index from SCOPUS (cont.)

Citation Overview Citations received since 1996

This is a citation overview for a set of 104 documents.

Overview options [Close](#)

Exclude from citation overview: Self citations of all authors

Sort Documents Date Range

Citations descending [Update Overview](#)

1996 to 2008

Citations from Sombatsompop's papers
Published from 1996 only (104)

Sort papers from highest cited to lowest cited from 1996 to current year

Citations														>2008		total			
104 Cited Documents save to list		Total	<1996	1996	1997	1998	1999	2000	2001	2002	2003	2004	2005	2006	2007	2008	subtotal	>2008	total
1	<input type="checkbox"/>	1997 Flow analysis of natural rubber ...	0	1	7	26	43	40	39	51	33	44	87	78	91	64	604	0	604
2	<input type="checkbox"/>	1999 Investigation of swelling behavi...			1	6	6	6	6	4	3	2	1	1		1	37	37	
3	<input type="checkbox"/>	2000 A modified method for calculatin...			1	2	2	1	1	3	5		4	2	1	1	23	23	
4	<input type="checkbox"/>	2001 dust content o...										4		7	5	4	20	20	
5	<input type="checkbox"/>	2002 static hydrocar...				2	2	2	3	4				7	5	4	20	20	
6	<input type="checkbox"/>	2003 Measurement of thermal conductiv...				1	2	2	2	1	1	2	2	2	3	1	20	20	
7	<input type="checkbox"/>	2004 Dynamic mechanical properties an...										1	6	5	2	4	19	19	
8	<input type="checkbox"/>	1997 Flow analysis of natural rubber ...				3	4	4	4			1			1		18	18	
9	<input type="checkbox"/>	2004 Fly ash particles and precipitat...										1	1	5	6	4	17	17	
10	<input type="checkbox"/>	2001 Rheology, morphology, and mechan...							1	4	4	1	1	2	4		16	16	

Article Rank Number

No. of Citations

h-index from SCOPUS (cont.)

104 documents written since 1996
 Sorted by highest cited to lowest cited

104 Cited Documents save to list		<1996	Citations													>2008	total	
Total	1		1996	1997	1998	1999	2000	2001	2002	2003	2004	2005	2006	2007	2008	subtotal		
1	<input type="checkbox"/> 1997 Flow analysis of natural rubber ...	0	1	7	26	43	40	39	51	33	44	87	78	91	64	604	0	604
2	<input type="checkbox"/> 1998 Investigation of swelling behav...			1	6	6	6	6	4	3	2	1	1	1	1	37	37	
3	<input type="checkbox"/> 2004 A modified method for calculatin...				2	2	1	1	3	5		4	2	1	1	23	23	
4	<input type="checkbox"/> 2003 Effect of wood sawdust content o...										4	5	4	6	1	20	20	
5	<input type="checkbox"/> 1997 Penetration of aromatic hydrocar...				2	2	2	3	4			3	2	1	1	20	20	
6	<input type="checkbox"/> 1997 Measurement of thermal conductiv...				1	2	2	2	1	1	2	2	3	1	2	19	19	
7	<input type="checkbox"/> 2003 Dynamic mechanical properties an...										1	6	5	2	4	18	18	
8	<input type="checkbox"/> 1997 Flow analysis of natur...													1		17	17	
9	<input type="checkbox"/> 2001 Fly ash particles and p...											1	5	6	4	16	16	
10	<input type="checkbox"/> 2004 Effect of moisture con...															16	16	
11	<input type="checkbox"/> 2002 Effect of moisture con...															16	16	
12	<input type="checkbox"/> 2005 Influence of type and concentrat...															15	15	
13	<input type="checkbox"/> 1998 Dynamic mechanical properties of...				3	4	1	4	1			2				15	15	
14	<input type="checkbox"/> 1998 Analysis of cure characteristics...				1	2	1	1	2			1	5	1	1	15	15	
15	<input type="checkbox"/> 2005 Influence of type and concentrat...												4	6	4	14	14	
16	<input type="checkbox"/> 2002 Rheology, cure characteristics, ...												3	6	3		12	
17	<input type="checkbox"/> 2001 Flow visualization and extrudate...									4	1	2	2	2	1		12	
18	<input type="checkbox"/> 2005 Making an equality of ISI impact...											2	4	3	2	11	11	

H-index looks for a balance between
 Quantity vs Quality
 No. of papers vs Citations

A scientist has index 14 if 14 of his 104 papers since 1996 have
 at least 14 citations each and the other 90 (104-14) papers have
 no more than 14 citations each.

Meaning of *h-index (scopus)* for Sombatsompop

A scientist has index 14 if 14 of his 104 papers have at least 14 citations each, and the other 90 (104-14) papers have no more 14 citations each

Rough assessment for h-index (by Hirsch, Physicists)

- 10-12: normal staff in research universities.
- 15–20 : A fellowship in the American Physical Society
- 18 : Full professorship
- 45 or higher: Membership in the United States National Academy of Sciences

Drawbacks of h-index

- It is not fair for scientists with a short career, regardless of the importance of their discoveries.
- The h-index never decreases as a result of no time limit of citation window. This is difficult to monitor author's history and progression, whether an author is still active in publication or not. [Citations will go on although the author stops working and/or publishing].
- Citations of the articles above the h-index have no effect on the change in h-index.
- The exact times of citations of the articles attributed to the h-index are not considered. For instance, Two scientists may have the same *h*-index, say, $h=15$, but one has total citations from the 15 papers of 400 times, and the other has 300 times. Clearly scientific output of the former is more valuable. This causes an initiation of ***g*-index**.

g-index

- To give more weight to highly cited papers,
Leo Egghe (2006) proposed the g-index:
 - Given a set of articles ranked in decreasing order of the number of citations they received, the g-index is the (unique) largest number such that the top g articles received together at least g^2 citations.

g-index

- Examples

$h\text{-index} = 13 \rightarrow$

$g\text{-index} = 19 \rightarrow$

TC	r	Σ_{TC}	r^2
47	1	47	1
42	2	89	4
37	3	126	9
36	4	162	16
21	5	183	25
18	6	201	36
17	7	218	49
16	8	234	64
16	9	250	81
16	10	266	100
15	11	281	121
13	12	294	144
13	13	307	169
13	14	320	196
13	15	333	225
12	16	345	256
12	17	357	289
12	18	369	324
12	19	381	361
11	20	392	400

Drawbacks of h-index (cont.)

- *h*-index does not account for types of articles (review, original and letters).
- *h*-index does not consider the significance of citations.
- *h*-index does not account for the number of authors.
- *h*-index is affected by limitations in citation databases.

Ways to obtain the h-index

- Google Scholar (max), Scopus and Web of Knowledge (smallest) [Each database gives different values of h-index].
- Web of Knowledge has strong coverage of journal publications, but poor coverage of high impact conferences.
- Scopus has better coverage of conferences, but poor coverage of pre-1992 publications and contains some citations from non-refereed articles.
- Google Scholar has the best coverage of conferences and most journals with a coverage of pre-1990 publications, but contains a large amount of non-refereed articles.

Recommendations for use of h-index

- Using h-index as one of the tools.
- H-index will be more accurate for comparing the similar working years (age) of researchers.
- Citation window must be selected (say the past 5 or 10 years, esp for comparative assessments).
- Only used for comparison within the same sub-field.
- h-index of a researcher will be more accurate if the author correspondence of the articles and self-citations are taken into account.

One main advantage of ***h-index*** over JIF

*- ***h-index*** can be used to assess impact of articles, journals, researchers, outputs & distributions of departments and faculties (schools), universities and countries,*

whereas

*- **JIF** are used only for comparison of journal citations (visibilities) and journal selections.*

University Ranking



Times Higher Education (THE)
World University Rankings 2010-2011



QS.com Asian University
Rankings



Academic Ranking of World Universities
By Institute of Higher Education of
Shanghai Jiao Tong University, China



2010 Performance Ranking of Scientific Paper
for World Universities



Dimensions of “evaluations”

1. **Accreditation** : A confirmation of a collective ability to perform at a certain level of a given set of tasks in teaching, research and services.
2. **Benchmarking** : It is a standard reflecting the best practice in a given domain and environment.
3. **Rating** : [group tables] : Referred to as quality assurance banding for institutions.
4. **Ranking** [league tables] : This is to assess and display a comparative standing of institutions.

Complexities in Evaluation

The evaluation is greatly dependent on level, data size, type and characteristics, database used, data retrieval method, duration, purpose, discipline, and the indicators used.

- Level: International – regional – national – local – institutional – faculty (field) – department (subfield) – individual.
- Data size: A whole picture - a specific purpose (teaching, research, or service etc).
- Data type: Inputs, processes, outputs and outcomes

Complexities in Evaluation (cont.)

- Data characteristics: Policy, Academic, Industrial and Social outputs.
- Database: International (field based, SCOPUS, WoS, PubMed etc), and regional and/or national (if any?)
- Data retrieval methods: journal category VS key-words
- Best researchers may not be in the best institutions.
- Duration: Regularity - annually and as-required.
- Purposes: funding allocations, promotions and awards, univ. selections.
- Discipline: conventional, specific and/or niche
- Indicators used**

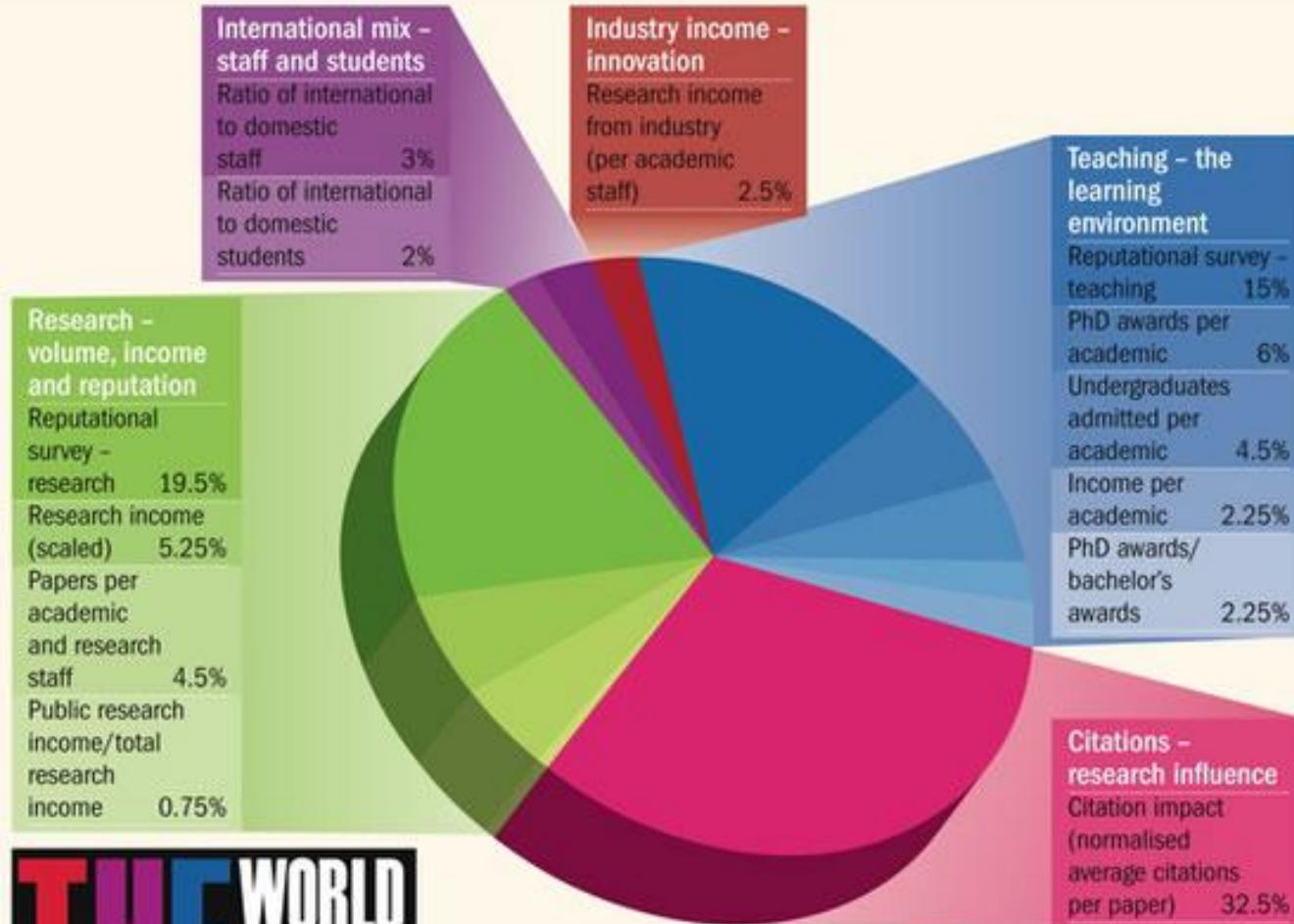
Indicators

1. **Policy and Inputs:** International staff and students, inbound and outbound students. Student/faculty ratio.
2. Reputation impacts: Peer and/or employer reviews
3. **Academic outputs and impacts:** Publications, publication/staff, journal impact factors, Citations, citation/publication, citation/staff, H-index, SNIP, etc.
4. Industrial impacts and outcomes: patents, royalty, industry-university publications, numbers of new employees, more taxes paid, etc.
5. **Social impacts:** impact on humans, changing behaviour and life, better.
6. Environmental impacts: cleaner and colder world

World-Recognized University Ranking Systems

Times Higher Education (THE) World University Rankings 2010-2011

WEIGHTING SCHEME FOR RANKINGS SCORES



Teaching

- the learning environment (worth 30 per cent of the final ranking score)

Research

- volume, income and reputation (worth 30 per cent)

Citations

- research influence (worth 32.5 per cent)

Industry income

- innovation (worth just 2.5 per cent)

International mix

- staff and students (worth 5 per cent)



Criteria

Criteria	THE – QS World University Rankings		QS.com Asian University Rankings In association with Chosun Ilbo	
	Indicator	Weight	Indicator	Weight
Research Quality	Global Academic Peer Review	40%	Asian Academic Peer Review (academics with knowledge of research in Asian institutions)	30%
	Citations per Faculty	20%	Papers per Faculty	15%
			Citations per Paper	15%
Teaching Quality	Student Faculty Ratio	20%	Student Faculty Ratio	20%
Graduate Employability	Global Employer Review	10%	Asian Employer Review (employers with experience of recruiting from Asian institutions)	10%
Internationalisation	International Faculty	5%	International Faculty	2.5%
	International Students	5%	International Students	2.5%
			Inbound Exchange Students	2.5%
			Outbound Exchange Students	2.5%

Academic Ranking of World Universities, ARWU

นิติบัตรสารที่ดี
Citation Index Centre



By Institute of Higher Education of
Shanghai Jiao Tong University, China

Indicators and Weights for ARWU

*ไม่รวมมหาวิทยาลัยไทยติดอันดับในฐานข้อมูลนี้

Criteria	Indicator	Code	Weight
Quality of Education	Alumni of an institution winning Nobel Prizes and Fields Medals	Alumni	10%
Quality of Faculty	Staff of an institution winning Nobel Prizes and Fields Medals	Award	20%
	Highly cited researchers in 21 broad subject categories	HiCi	20%
Research Output	Papers published in Nature and Science*	N&S	20%
	Papers indexed in Science Citation Index-expanded and Social Science Citation Index	PUB	20%
Per Capita Performance	Per capita academic performance of an institution	PCP	10%
Total			100%

* For institutions specialized in humanities and social sciences such as London School of Economics, N&S is not considered, and the weight of N&S is relocated to other indicators.

2010 Performance Ranking of Scientific Paper for World Universities



The Criteria, Indicator and Their Respective Weightings used for the Overall Performance based Ranking

Criteria	2010 Overall Performance Indicators	Weighting
Research productivity	Number of articles of the last 11 years (1999-2009)	10
	Number of articles of the current year (2009)	10
Research impact	Number of citations of the last 11 years (1999-2009)	10
	Number of citations of the last 2 years (2008-2009)	10
	Average number of citations of the last 11 years (1999-2009)	10
Research excellence	<i>h</i> -index of the last 2 years (2008-2009)	20
	Number of Highly Cited Papers (1999-2009)	15
	Number of articles of the current year in high-impact journals (2009)	15

Indicator

- **Output** : Number of scientific papers published in scholarly journals
- **International Collaboration (IC%)** : This indicator shows the ability of institutions to create international research links through the output ratio that has been produced in collaboration with foreign institutions
- **Normalized Impact (IN)** : Normalized Impact values show the ratio between the average scientific impact of an institution and the world average impact of publications of the same time frame, document type and subject area.
- **High Quality Publications (Q1%)** : Ratio of publications an institution publishes in the world most influential scholarly journals. Journals considered for this indicator are those ranked in the first quartile (25%) in their categories as ordered by SCImago Journal Rank SJR indicator.

Comparison of World University Ranking 2010

University	THE	QS	ARWU	HEEACT	SCIMAGO
Harvard University	1	2	1	1	1
California Institute of Technology	2	9	6	31	66
Massachusetts Institute of Technology	3	5	4	7	31
Stanford University	4	13	3	2	14
Princeton University	5	10	7	39	136
University of Cambridge	6	1	5	16	22
University of Oxford	7	6	10	10	27
University of California Berkeley	8	28	2	6	24
Imperial College London	9	7	26	21	35
Yale University	10	3	11	18	40

Comparison of Asian University Ranking 2010

University	THE	QS	ARWU*	HEEACT*	SCIMAGO
University of Hong Kong	1	1	27-43	25	32
University of Tokyo	2	5	1	1	2
Pohang University of Science and Technology	3	14	44-68	47	78
National University of Singapore	4	3	10-18	8	10
Peking University	5	12	19-26	14	11
Hong Kong University of Science and Technology	6	2	27-43	46	61
University of Science and Technology of China	7	25	27-43	28	1**
Kyoto University	8	8	2	2	5
Tsinghua University	9	16	-	13	3
Korea Advanced Institute of Science and Technology	10	13	27-43	35	53

Comparison of Thai University in World Ranking 2010

University	THE	QS	ARWU	HEEACT	SCIMAGO
Mahidol University	306	228	-	500	539
Chulalongkorn University	341	180	-	-	527
Chiangmai university	-	401-450	-	-	981
Thammasat University	-	451-500	-	-	2220
Prince of Songkla University	-	501-550	-	-	1298
Khon Kaen University	-	551-600	-	-	1462
Kasetsart University	-	551-600	-	-	1416
Siriraj Hospital	-	-	-	-	1316
KMUTT	-	-	-	-	1763
KMITL	-	-	-	-	1780
Asian Institute of Technology	-	-	-	-	1917
Suranaree University of Technology	-	-	-	-	2562
Silpakorn University	-	-	-	-	2806
Mahasarakham University	-	-	-	-	2807

Comparison ASEAN University in World Ranking 2010

University	Country	THE	QS	ARWU	HEEACT	SCIMAGO
University of Indonesia	Indonesia	-	236	-	-	2241
Gadjah Mada University	Indonesia	-	321	-	-	-
Bandung Institute of Technology	Indonesia	-	401-450	-	-	2421
University of Malaya	Malaysia	-	207	-	-	739
National University of Malaysia	Malaysia	-	263	-	-	897
Science University of Malaysia	Malaysia	-	309	-	-	714
Ateneo de Manila University	Philippines	-	307	-	-	-
University of the Philippines	Phillipines	-	314	-	-	2296
De La Salle University	Phillipines	-	451-500	-	-	-
National University of Singapore	Singapore	34	31	101-150	84	46
Nanyang Technological University	Singapore	174	74	301-400	245	84
Mahidol University	Thailand	306	228	-	500	539
Chulalongkorn University	Thailand	341	180	-	-	527
Chiang Mai University	Thailand	-	401-450	-	-	981



ตัวชี้วัดที่ใช้

1. Equivalent International Journal publication / Faculty Member
2. **Journal Impact Factor** / Faculty Member
3. Equivalent International Journal publication / Discipline
4. **Journal Impact Factor** / Discipline

โครงการประเมินคุณภาพผลงานวิจัยเชิงวิชาการ ด้านวิทยาศาสตร์และเทคโนโลยีของสถาบันอุดมศึกษาในประเทศไทย ปี 2552 โดย สกอ.

การกำหนดน้ำหนักบทความที่ตีพิมพ์

1. วารสารวิชาการนานาชาติ ที่อยู่ในฐานข้อมูล SCI ของ ISI ให้ค่าน้ำหนักเท่ากับ 1
2. วารสารวิชาการนานาชาติ ที่ไม่อยู่ในฐานข้อมูลของ ISI และมีคุณสมบัติตามเกณฑ์ของคณะกรรมการเกี่ยวกับการส่งเสริมและพัฒนางานวิจัย ของ สกอ. ให้ค่าน้ำหนักเท่ากับ 0.75
3. วารสารวิชาการระดับชาติ ที่ผ่านเกณฑ์ของคณะกรรมการเกี่ยวกับการส่งเสริมและพัฒนางานวิจัย ของ สกอ. ให้ค่าน้ำหนักเท่ากับ 0.50
4. วารสารวิชาการระดับสถาบัน หรือตีพิมพ์ต่อเนื่อง มี Impact Factor เฉลี่ยขึ้นหลัง 3 ปี (จากฐานข้อมูล TCI ปี 2548-2550) ไม่ต่ำกว่า 0.01 ให้ค่าน้ำหนักเท่ากับ 0.25
5. วารสารวิชาการที่ตีพิมพ์ต่อเนื่อง มี Impact Factor เฉลี่ยขึ้นหลัง 3 ปี (จากฐานข้อมูล TCI ปี 2548-2550) ไม่ต่ำกว่า 0.01 และไม่เท่ากับ 0 ให้ค่าน้ำหนักเท่ากับ 0.125

สาขาวิศวกรรมศาสตร์

สาขาวิชา

หน่วยงานที่ได้ Rating 5

Electrical Engineering	ภาควิชาวิศวกรรมไฟฟ้า คณะวิศวกรรมศาสตร์ จุฬาลงกรณ์มหาวิทยาลัย	
Mechanical Engineering	ภาควิชาวิศวกรรมเครื่องกล สถาบันเทคโนโลยีนานาชาติสิรินธร มหาวิทยาลัยธรรมศาสตร์	
Civil Engineering	ภาควิชาวิศวกรรมศาสตร์และเทคโนโลยีโยธา สถาบันเทคโนโลยีนานาชาติสิรินธร มหาวิทยาลัยธรรมศาสตร์	
Industrial Engineering	ภาควิชาวิศวกรรมระบบการผลิต สถาบันเทคโนโลยีนานาชาติสิรินธร มหาวิทยาลัยธรรมศาสตร์	
Chemical Engineering	ภาควิชาวิศวกรรมเคมี คณะวิศวกรรมศาสตร์ จุฬาลงกรณ์มหาวิทยาลัย	

สาขาวิชาเทคโนโลยี

สาขาวิชา	หน่วยงานที่ได้ Rating 5
Energy Technology / Management Technology / สถาปัตยกรรมศาสตร์และสิ่งแวดล้อมสร้างสรรค์	สาขาวิชาเทคโนโลยีพลังงาน คณะพลังงานสิ่งแวดล้อม และวัสดุ มหาวิทยาลัยเทคโนโลยีพระจอมเกล้าธนบุรี
Environmental Technology / Environmental Engineering	สาขาวิชาเทคโนโลยีสิ่งแวดล้อม คณะพลังงานสิ่งแวดล้อม และวัสดุ มหาวิทยาลัยเทคโนโลยีพระจอมเกล้าธนบุรี
Information and Communication Technology / Computer Engineering	ภาควิชาเทคโนโลยีสารสนเทศ คอมพิวเตอร์และการสื่อสาร สถาบันเทคโนโลยีนานาชาติสิรินธร มหาวิทยาลัยธรรมศาสตร์
Material Science and Technology และ Mining, Materials and Multidisciplinary Engineering	ภาควิชาวิศวกรรมคอมพิวเตอร์ คณะวิศวกรรมศาสตร์ มหาวิทยาลัยเทคโนโลยีพระจอมเกล้าธนบุรี
Biotechnology	สถาบันชีววิทยาศาสตร์โมเลกุล มหาวิทยาลัยมหิดล ภาควิชาเทคโนโลยีชีวภาพอุตสาหกรรม คณะอุตสาหกรรมเกษตร มหาวิทยาลัยสงขลานครินทร์ ภาควิชาเทคโนโลยีชีวภาพ คณะวิทยาศาสตร์ มหาวิทยาลัยมหิดล

สาขาวิชาเกษตรศาสตร์

สาขาวิชา	หน่วยงานที่ได้ Rating 5
Agriculture	<p>--- ไม่มีหน่วยงานได้ผลประเมิน Rating 5 ---</p>
	<p>ภาควิชาเทคโนโลยีอาหาร คณะอุตสาหกรรมเกษตร มหาวิทยาลัยสงขลานครินทร์</p>
Food Science and Technology	<p>ภาควิชาวิทยาศาสตร์และเทคโนโลยีการอาหาร คณะ อุตสาหกรรมเกษตร มหาวิทยาลัยเกษตรศาสตร์</p>
	<p>ภาควิชาเทคโนโลยีอาหาร สำนัก เทคโนโลยีการเกษตร มหาวิทยาลัยเทคโนโลยีสุรนารี</p>
Fishery และ Animal Science / Veterinary Science	<p>ภาควิชาสัตวศาสตร์ คณะเกษตรศาสตร์ มหาวิทยาลัยขอนแก่น</p> <p>คณะประมง มหาวิทยาลัยเกษตรศาสตร์</p>



Thank You