

Measuring contextual citation impact of scientific journals

A new measure for a new era?

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Why a new indicator?

- **New insights → better indicators**
- **Show “relativity” of indicators**
- **Define a proper context of assessment**



New indicator =

A journal's raw impact per paper

**peer
reviewed
papers only**

Citation potential in its subject field

**A field's
frequency &
immediacy
of citation**

**Database
coverage**

**Journal
scope,
focus**



A journal's raw impact per paper (in 2008)

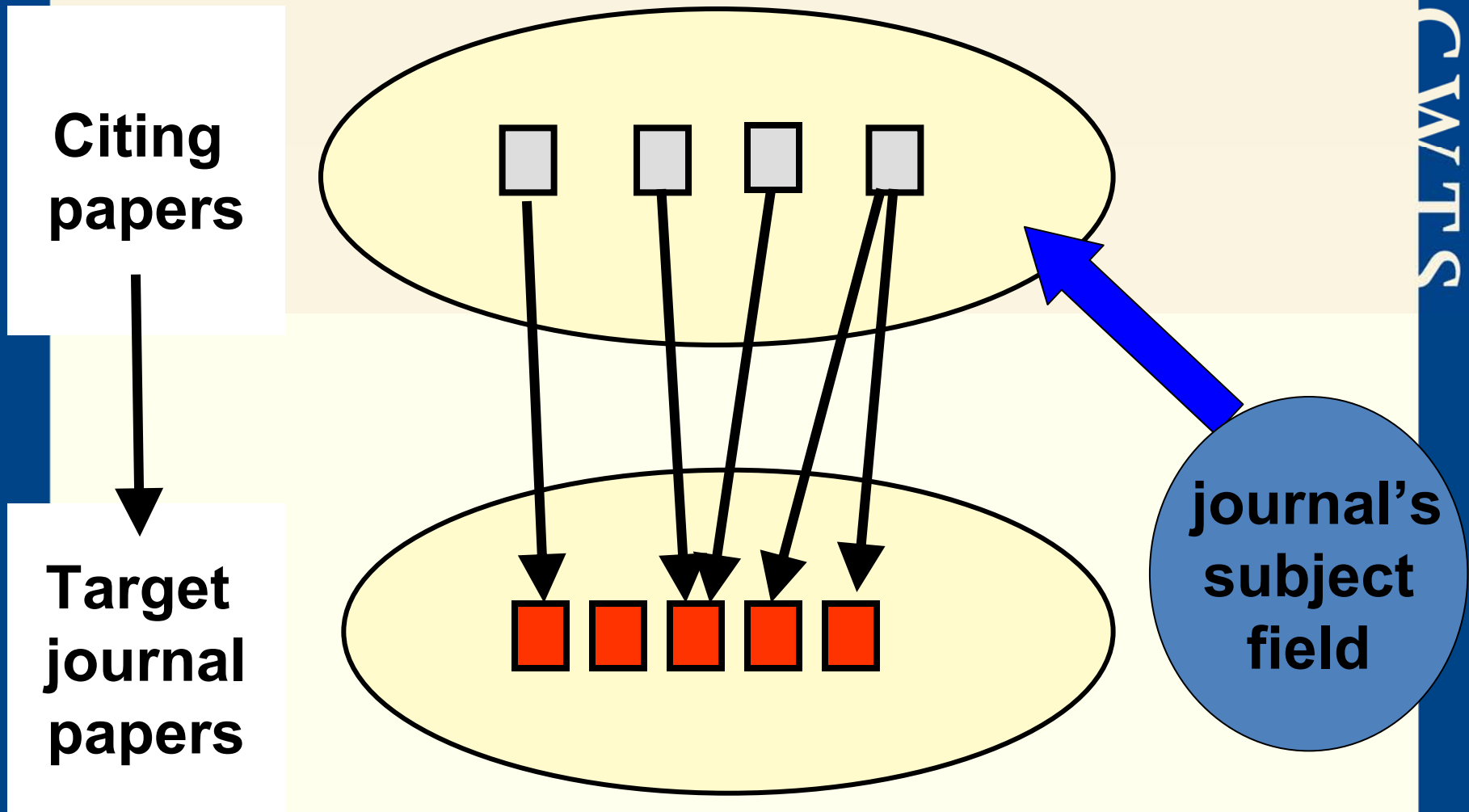
**# Citations in 2008 to papers
published in 2005-2007**

Papers published in 2005-2007

**Average citation rate in a particular year of
1-3 year old papers published in a journal**

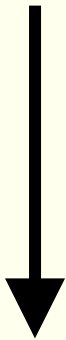


A journal's subject field = papers citing the journal

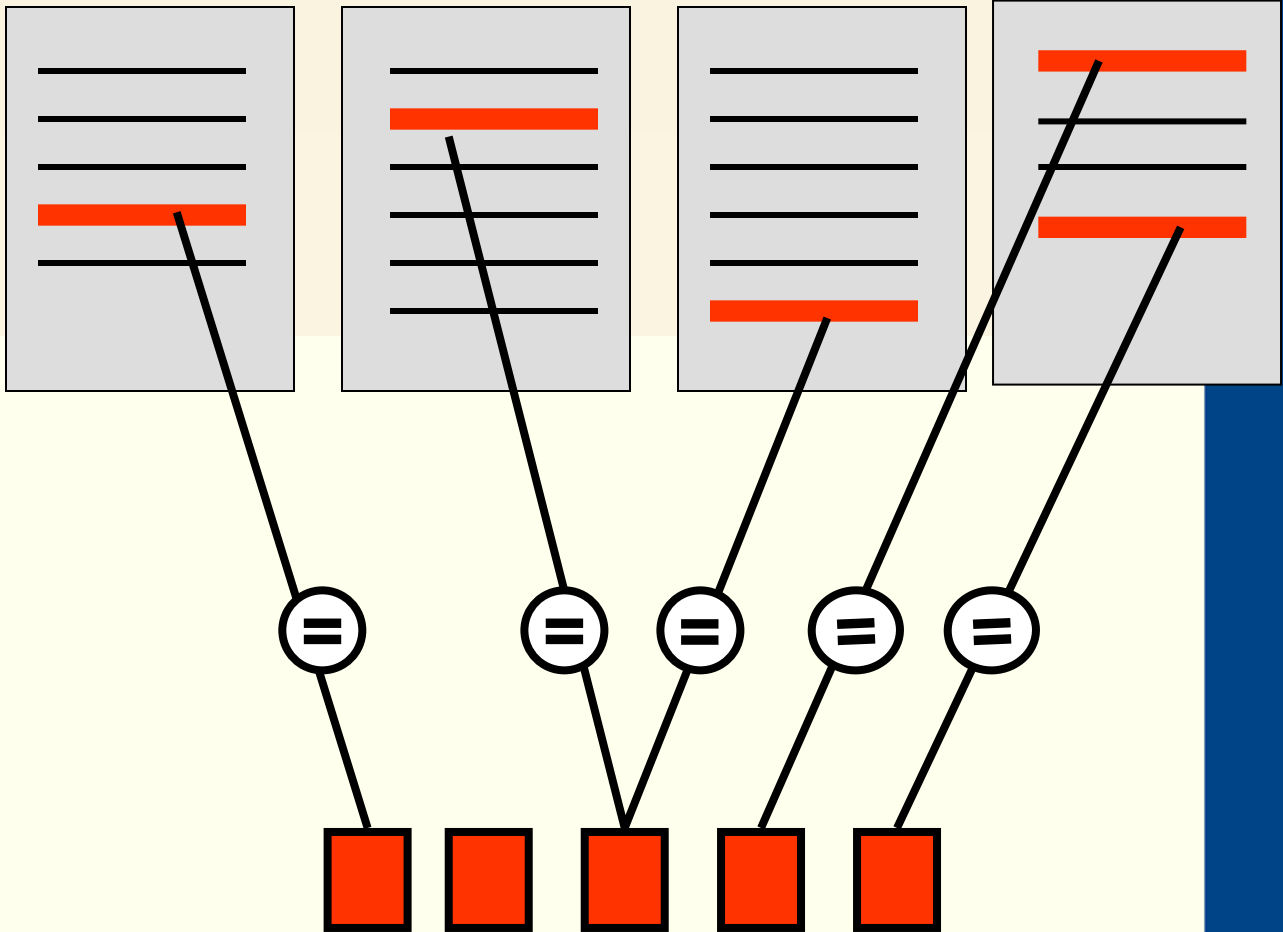


Citation potential ↔ length of citing papers' ref lists

**Citing
Papers
Reference
lists**



**Target
Journal
papers**



Citation potential: based on number of 1-3 yr old cited references

Citing paper
Citing year: 2008

CR1.....	2008
CR2.....	2007
CR3.....	2007
CR4.....	2007
CR5.....	2006
CR6.....	2005
CR7.....	2003
CR8.....	1999
CR9.....	1994
CR10.....	1983
CR11.....	1943

Citing paper contains five 1-3 yr old cited refs

A journal's raw impact per paper (RIP)

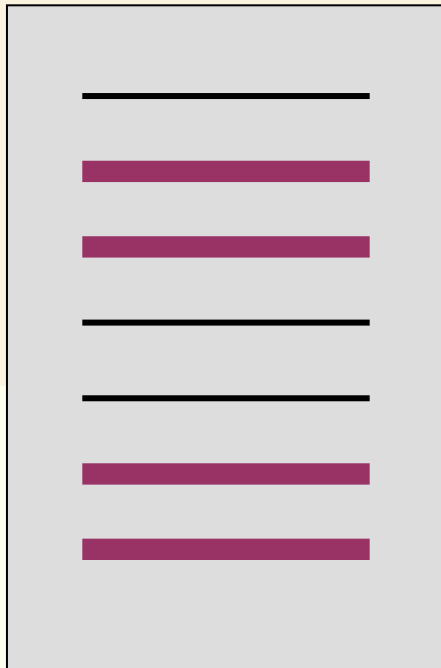
Database Citation Potential in a journal's subject field

Average number of citations
received by
1-3 year old papers
published in a target journal

Average number of
1-3 year old cited references
contained in papers
citing a target journal



Citing paper's Reference list



Published in a journal
processed for database



Published in other
sources (e.g., books)

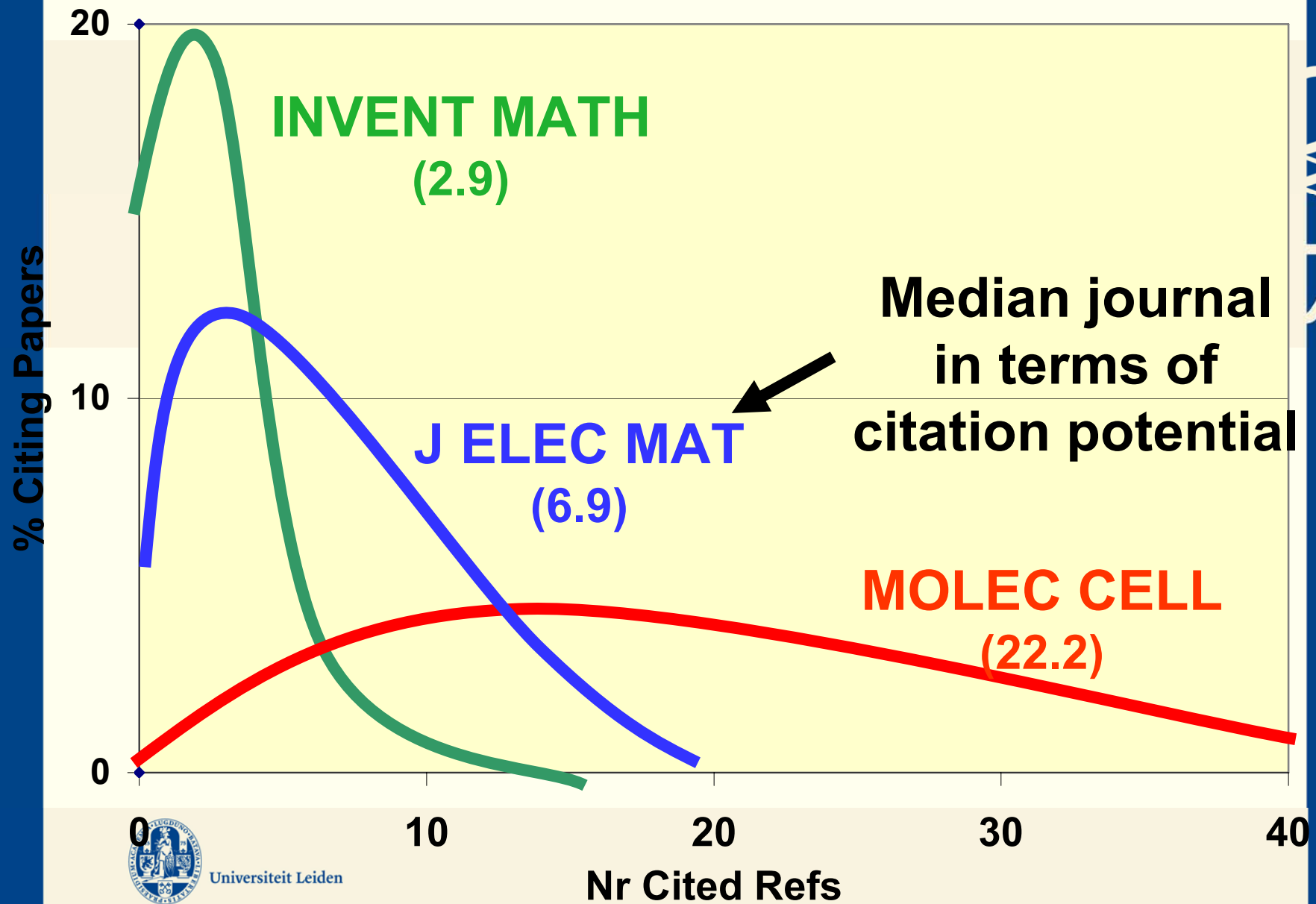
Citation Potential = 7

Database coverage = $4/7 = 57\%$

Database Citation Potential = 4



Database citation potential in three subject fields



Citation potential: examples

Journal	In journal's subject field	
	Database citation potential	<u>Relative</u> database citation potential
INVENT MATH	2.9	0.42 (=2.9/6.9)
J ELEC MATER	6.9 (=median)	1.00 (=6.9/6.9)
MOLEC CELL	22.2	3.23 (=22.2/6.9)

Source Normalized impact per Paper

(SNIP) =

**A journal's Raw Impact per Paper
(RIP)**

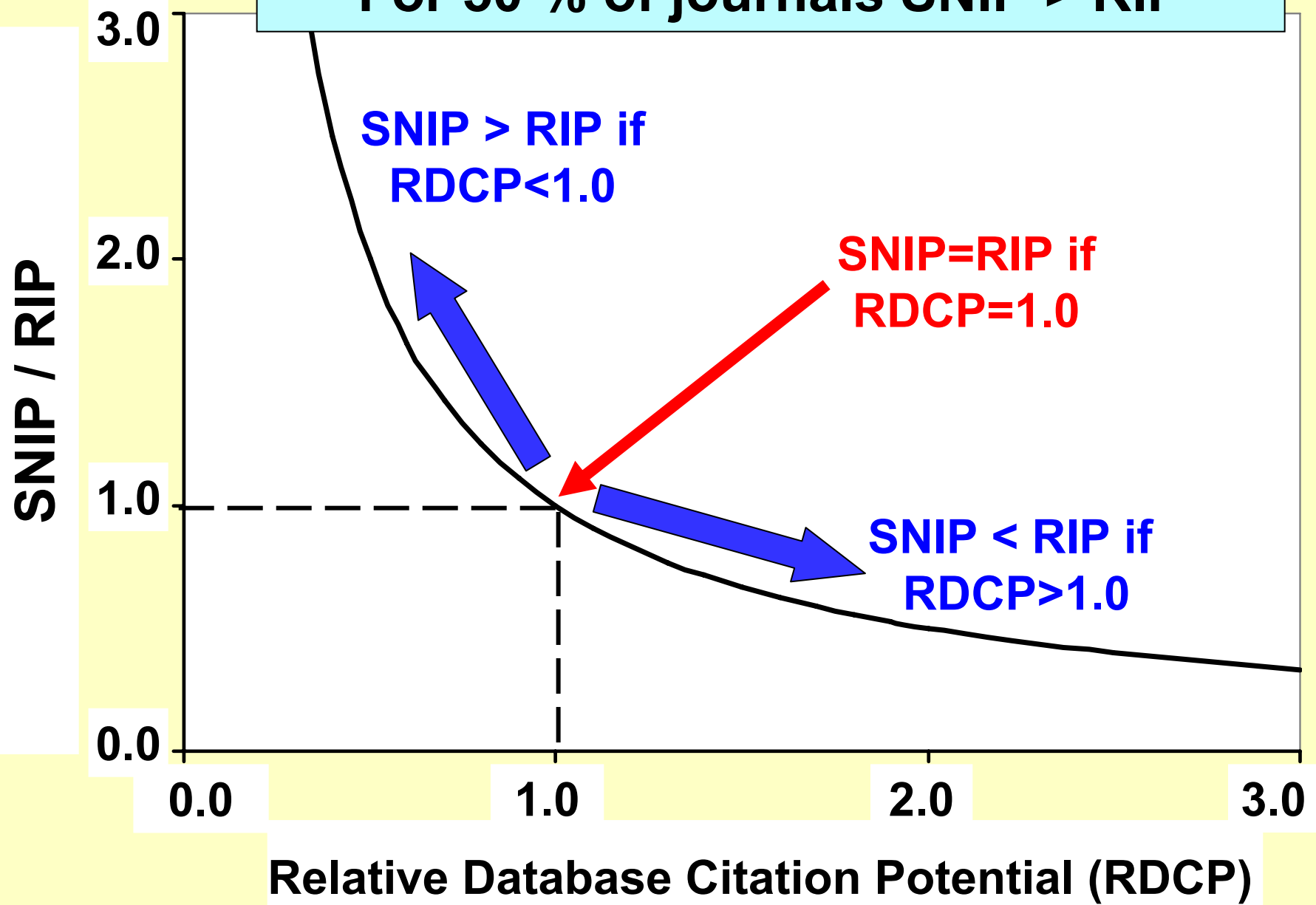
**Relative database citation potential
in its subject field**

Examples

<i>Journal</i>	<i>RIP</i>	<i>Cit Pot</i>	<u><i>SNIP</i></u> <i>(= RIP/</i> <i>Cit Pot)</i>
INVENT MATH	1.5	0.4	<u>3.8</u>
MOLEC CELL	13.0	3.2	<u>4.0</u>
J ELEC MATER	1.5	1.0	<u>1.5</u>



For 50 % of journals $SNIP > RIP$



Social Sci vs. Biol & Med Sci

<i>Journal</i>	<i>RIP</i>	<i>Cit Pot</i>	<u><i>SNIP</i></u>
J GERONTOL - A (Biol & Med Sci)	3.7	2.0	<u>1.8</u>
J GERONTOL - B (Psych & Soc Sci)	2.7	1.2	<u>2.3</u>



Atom & Molec Physics: General vs. topical

<i>Journal</i>	<i>RIP</i>	<i>Cit Pot</i>	<u><i>SNIP</i></u>
J MOLEC SPECTR	1.1	1.0	<u>1.1</u>
NANOPARTICLE RES	2.3	1.9	<u>1.2</u>



Applied mathematics: new vs. classical subfield

<i>Journal</i>	<i>RIP</i>	<i>Cit Pot</i>	<u><i>SNIP</i></u>
Int J Nonlinear Sci & Numer Simulat	4.2	2.0	<u>2.1</u>
Commun Partial Differential Equat	1.1	0.5	<u>2.1</u>

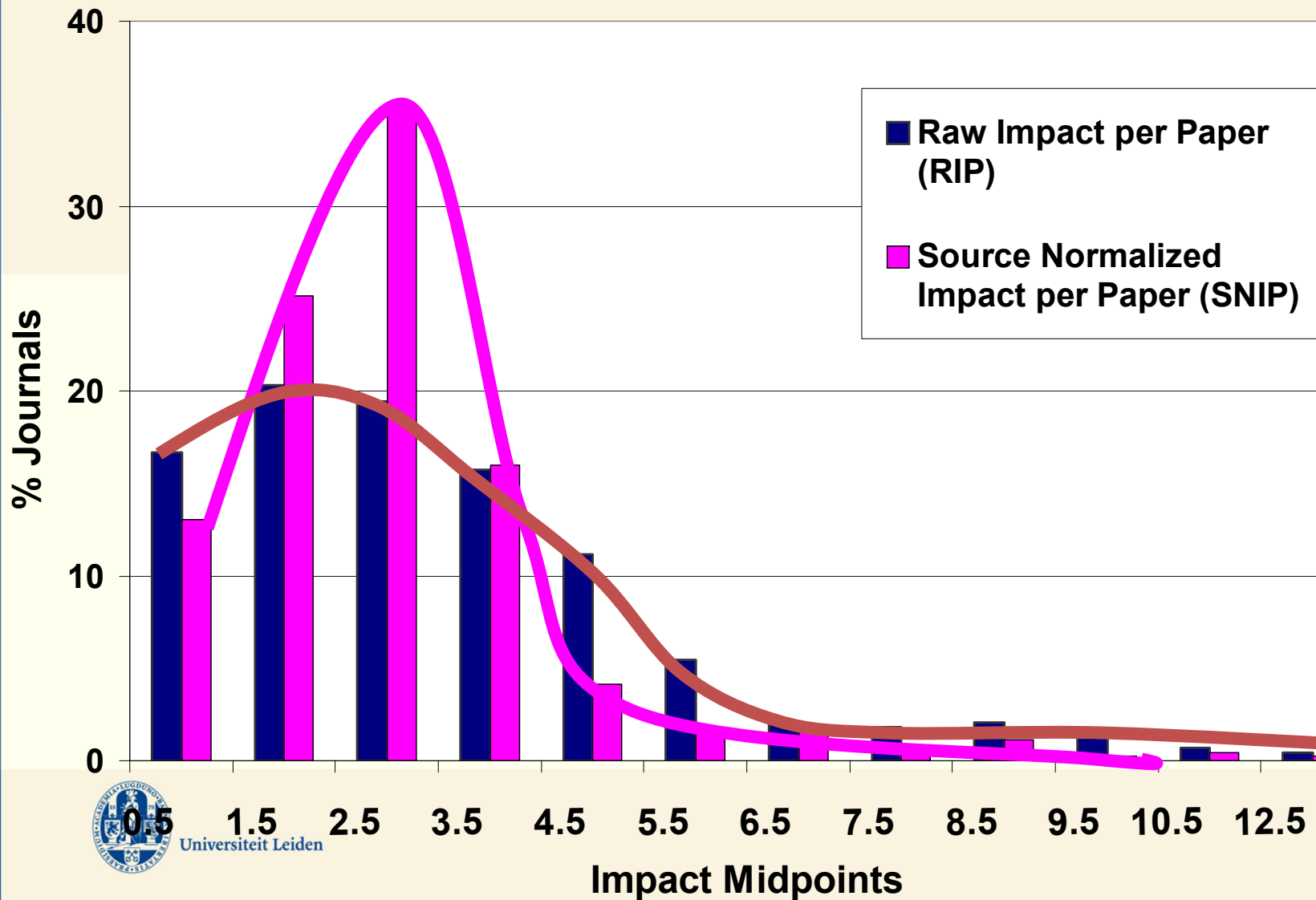


Multi-disciplinary journals

<i>Journal</i>	<i>RIP</i>	<i>Cit Pot</i>	<u><i>SNIP</i></u>
NATURE	19.0	2.5	<u>7.6</u>
SCIENCE	15.4	2.5	<u>6.3</u>



SNIP distribution across Scopus journals is more concentrated than that for RIP



Effects: General tendency

- Journals in **moderately covered** fields not disfavored (e.g., SSH, Applied Sci)
- **‘Topical’** journals less favored compared to **‘classical’** ones



Strong points of SNIP

- Takes into account a journal's **scope**
- **Cross-subject** comparability
- Less potential for **gaming**
- Accounts for differences between **and within** journal 'categories'

Availability

- **Scopus.com** launches SNIP and SCIMAGO's SJR indicator on 23 January 2010
- Indicators are **freely** available
- Numbers calculated by SCIMAGO and CWTS (**not** by ES/Scopus team)
- **Background data** available on SCIMAGO and CWTS websites