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the language of science

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The Big Deal – A Quest

**Dr Frans Lettenstrom
Director, Library Sales
Saloniki – November 2011**

- Original reports of data/theory
- Assert priority
- Correspondence between scientists
- Paper making technology (China 105)
- Movable-type printing (China 1040)
- "Gutenberg" printing technology (Korea <1403)
- Silver & gold from America (1492-)
- The two first scientific journals (1665)
 - Philosophical Transactions (London)
 - Journal des Savants (Paris)

PHILOSOPHICAL
TRANSACTIONS:
GIVING SOME
ACCOMPT
OF THE PRESENT
Undertakings, Studies, and Labours
OF THE
INGENIOUS
IN MANY
CONSIDERABLE PARTS
OF THE
WORLD.

Vol I.

For Anno 1665, and 1666.

In the SAVOY,
Printed by T. N. for John Martyn at the Bell, a little with-
out Temple-Bar, and James Allestry in Duck-Lane,
Printers to the Royal Society.

Presented by the Author May. 30th 1667.

First Scientific Journal



- 6th March 1665
*Philosophical
Transactions of the
Royal Society*
Ed. Henry Oldenburg
Secretary of the Royal
Society
- First true scholarly
journal
- Published for profit at
Oldenburg's expense

Inventing the Journal: Oldenburg's Letters

- [We must be] very careful of **registering** as well the **person** and **time** of our new inventions, and the **place** where they are made, by the honor of your interest in them, but in such a manner as to be of use to posterity. [Oldenburg, 24 November 1664]
- all Ingenious men will be thereby **incouraged to impart their knowledge** and discoveries. [Oldenburg, 3 December 1664]
- [I should not] neglect the opportunity of having some of my **Memorabilia** **registered** in the **Library** of the **Royal Society**, that is like to be the **lasting** **repository**. [Boyle, 1665]
- [P]lease to be diligent in ordering the **Memorabilia** of the **Royal Society** to be **registered** in the **Library** of the **Royal Society**, by the **order** of the **members** of the same. [R.Soc. Order in Council 1/3/1665]

LE
JOURNAL
DES
SCAVANS

Du Lundy V. Janvier M. DC. LXV.

Par le Sieur DE HEDOVILLE.



A PARIS,

Chez JEAN CVSSON, rue S. Jacques, à l'Ima-
ge de S. Jean Baptiste.

M. DC. LXV.

AVEC PRIVILEGE DV ROY.

(1)

Numb. 1.

PHILOSOPHICAL
TRANSACTIONS.

Munday, March 6. 1662.

The Contents.

*An Introduction to this Treat. An Account of the Improvement of
Optick Glasses at Rome. Of the Observation made in England,
of a Spot in one of the Belts of the Planet Jupiter. Of the motion of
the late Comet predicted. The Heads of many New Observations
and Experiments, in order to an Experimental History of Cold;
together with some Thermometrical Discourses and Experiments.
A Relation of a very odd Mousstrous Calf. Of a peculiar Lead-
Ore in Germany, very useful for Essays. Of an Hungarian Bo-
lus, of the same effect with the Bolus Armenus. Of the New Ame-
rican Whale-fishing about the Bermudas. A Narrative concerning
the success of the Pendulum-watches at Sea for the Longi-
tudes; and the Grant of a Patent thereupon. A Catalogue of the
Philosophical Books published by Monsieur de Fermat, Counsellour at
Tholouse, lately dead.*

The Introduction.



Hereas there is nothing more necessary for promoting
the improvement of Philosophical Matters, than the
communicating to such, as apply their Studies and
Endeavours that way, such things as are discove-
red or put in practise by others; it is therefore
thought fit to employ the *Press*, as the most proper way to
gratifie those, whose engagement in such Studies, and delight
in the advancement of Learning and profitable Discoveries,
doth entitle them to the knowledge of what this Kingdom, or
other parts of the World, do, from time to time, afford, as well

A

of

Scientific Journals

- Acceleration around 1760
- Since then: doubling every 15-20 years
- (Springer 1842. Politics, agriculture, mathematics)
- 1880: articles often 200-300 pages
- 1920: research split up in many short articles
- Now over 180.000 journals/report series
- Approx 20.000 peer reviewed
- 1.8M peer reviewed articles/year, by 2.000 publishers, read by over 15M scientists
- (50.000 scientific books/year, by 1.000 publishers)
- 1969 – Internet
- 1989 – WWW
- 1991 – arXiv at LANL
- (SpringerLINK 1997) (all books=ebooks 2006)

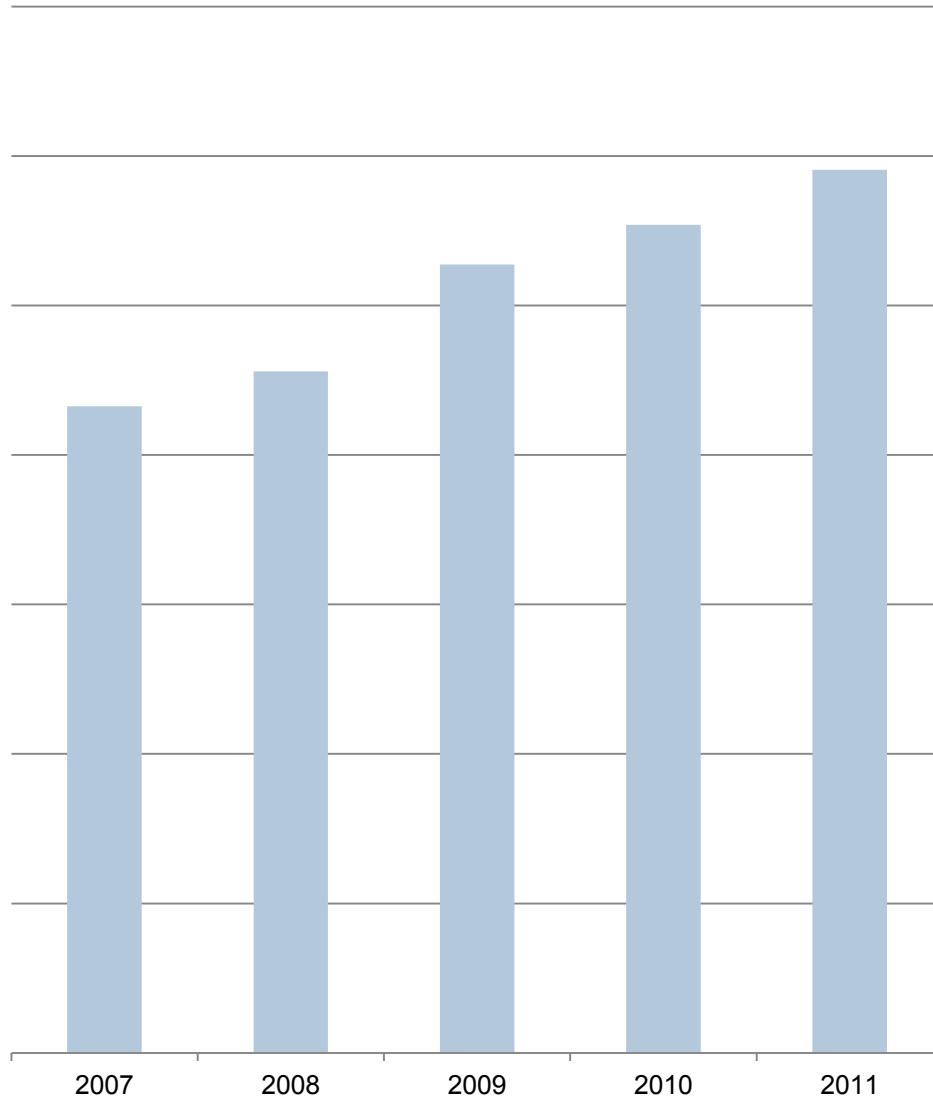
The Serials Crisis in 1990's

- Price increases of over 10% per year
- Number of articles increasing
- Number of journals increasing
- Library budgets constant
- Not sustainable!

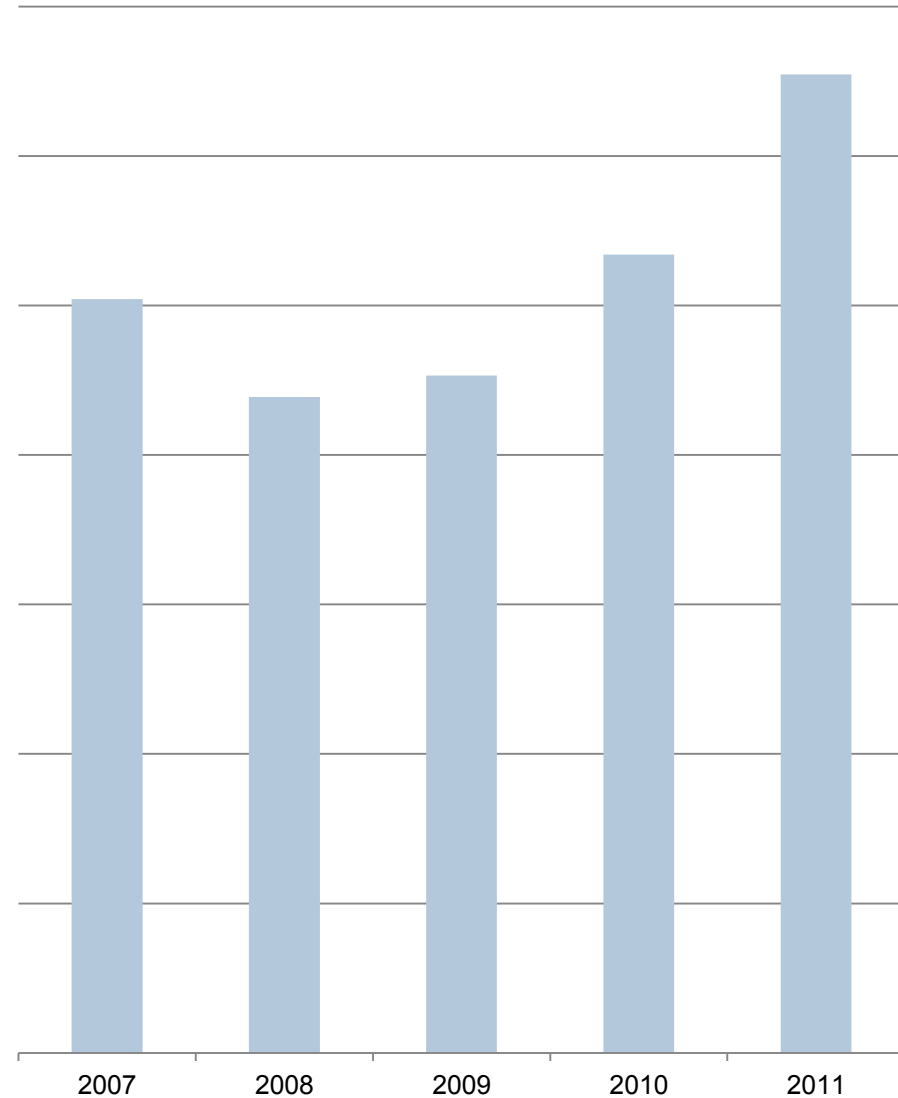
- 1996 - Academic Press (Pieter Bolman, Jan Velterop)
- (Temporary) solution to the serials crisis
- Online journals – lower yearly increase
- Massive growth in number of available journals to patrons
- Average 400% growth in number of new titles
- Cost per read article page decreased by 80%
- But library budgets must keep up with inflation!

Heal-Link usage statistics

JOURNALS

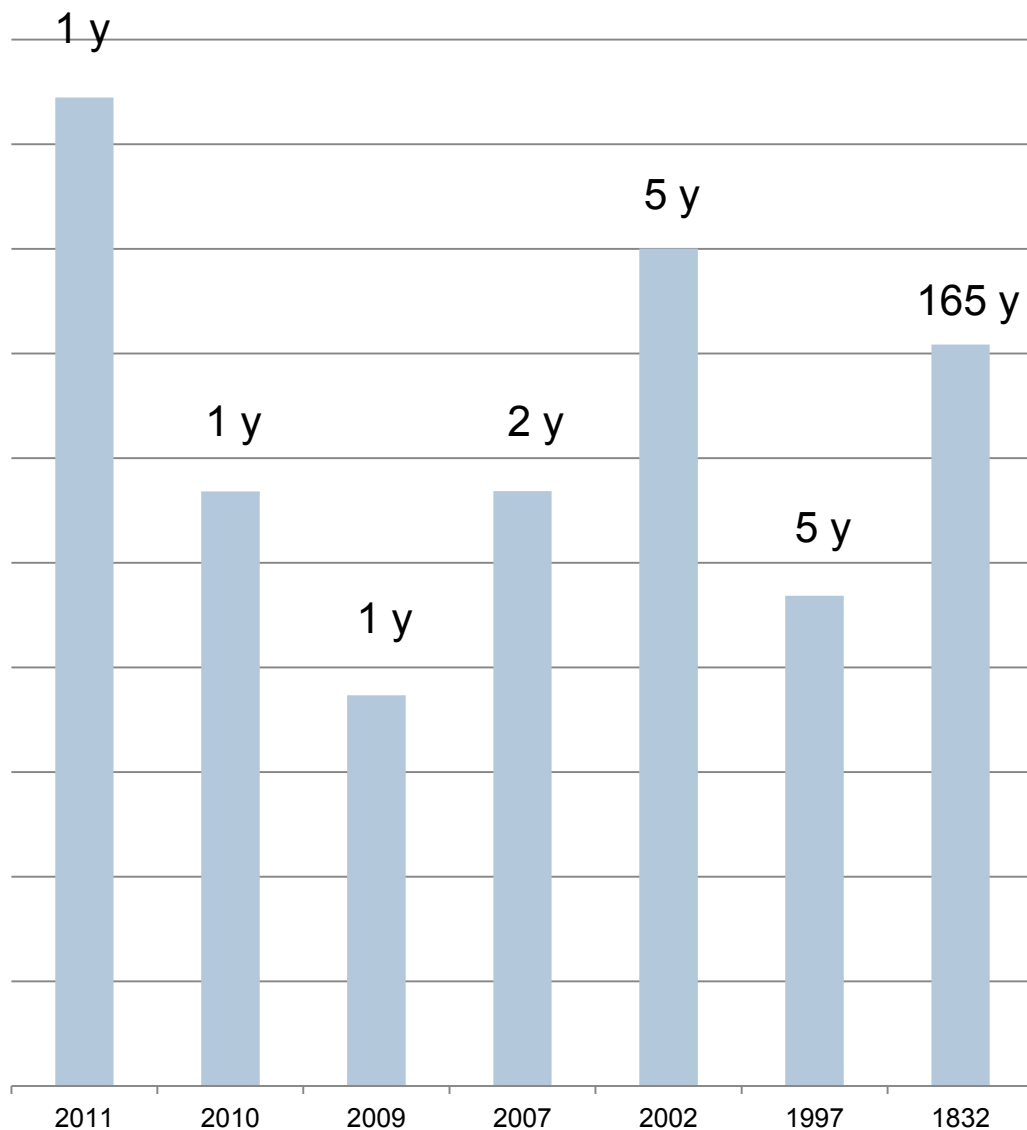


EBOOKS

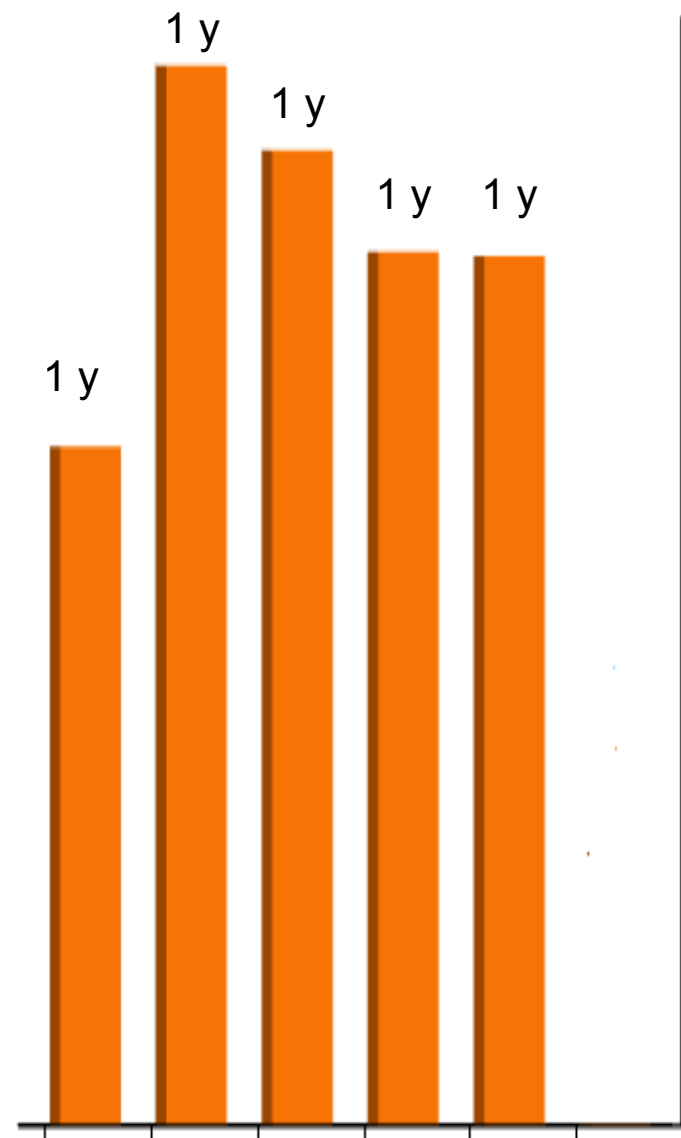


Heal-Link usage statistics

JOURNALS BY YEARS



EBOOKS BY YEARS

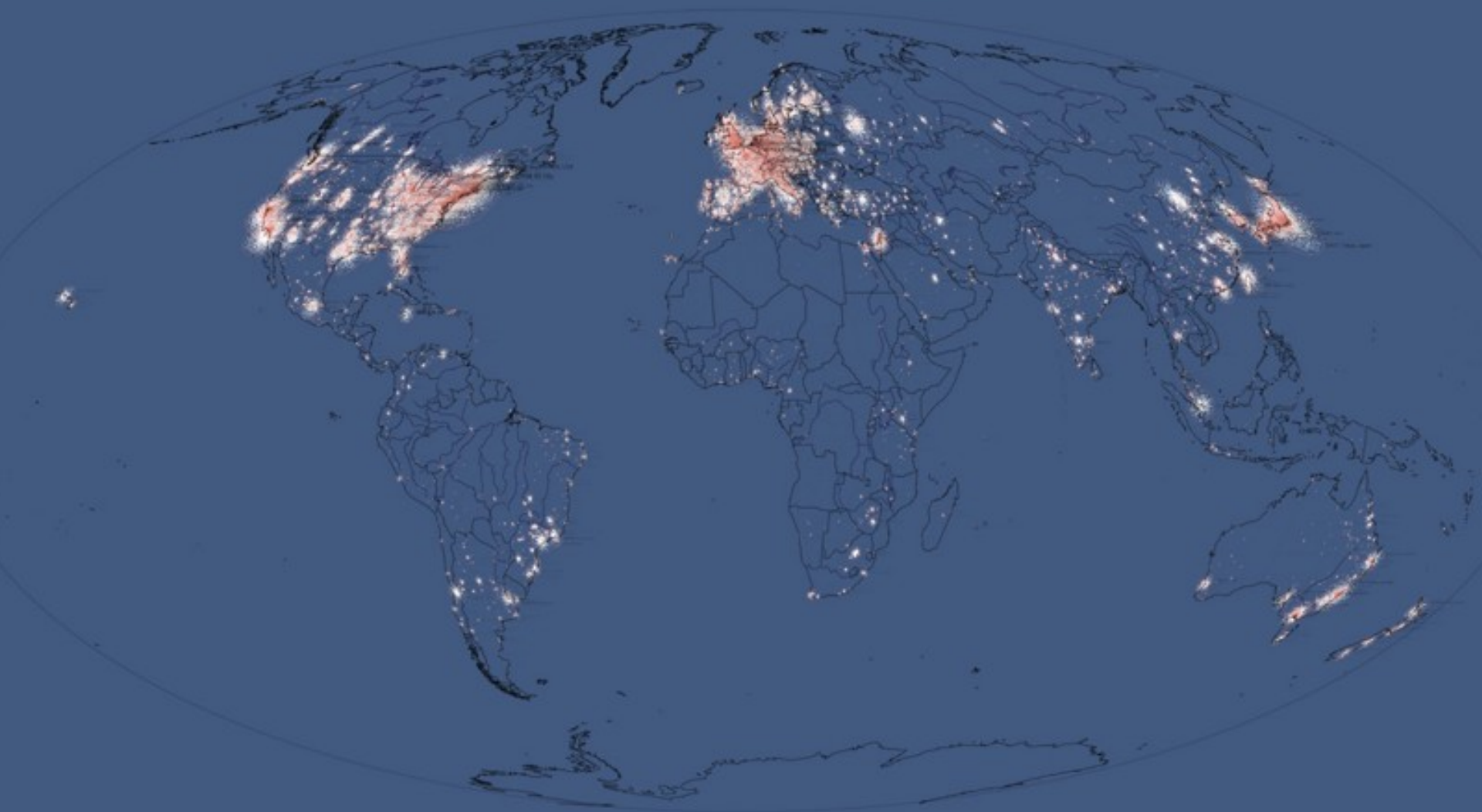


There is a direct relationship between the number of articles downloaded by a researcher or institution and the number of articles published.

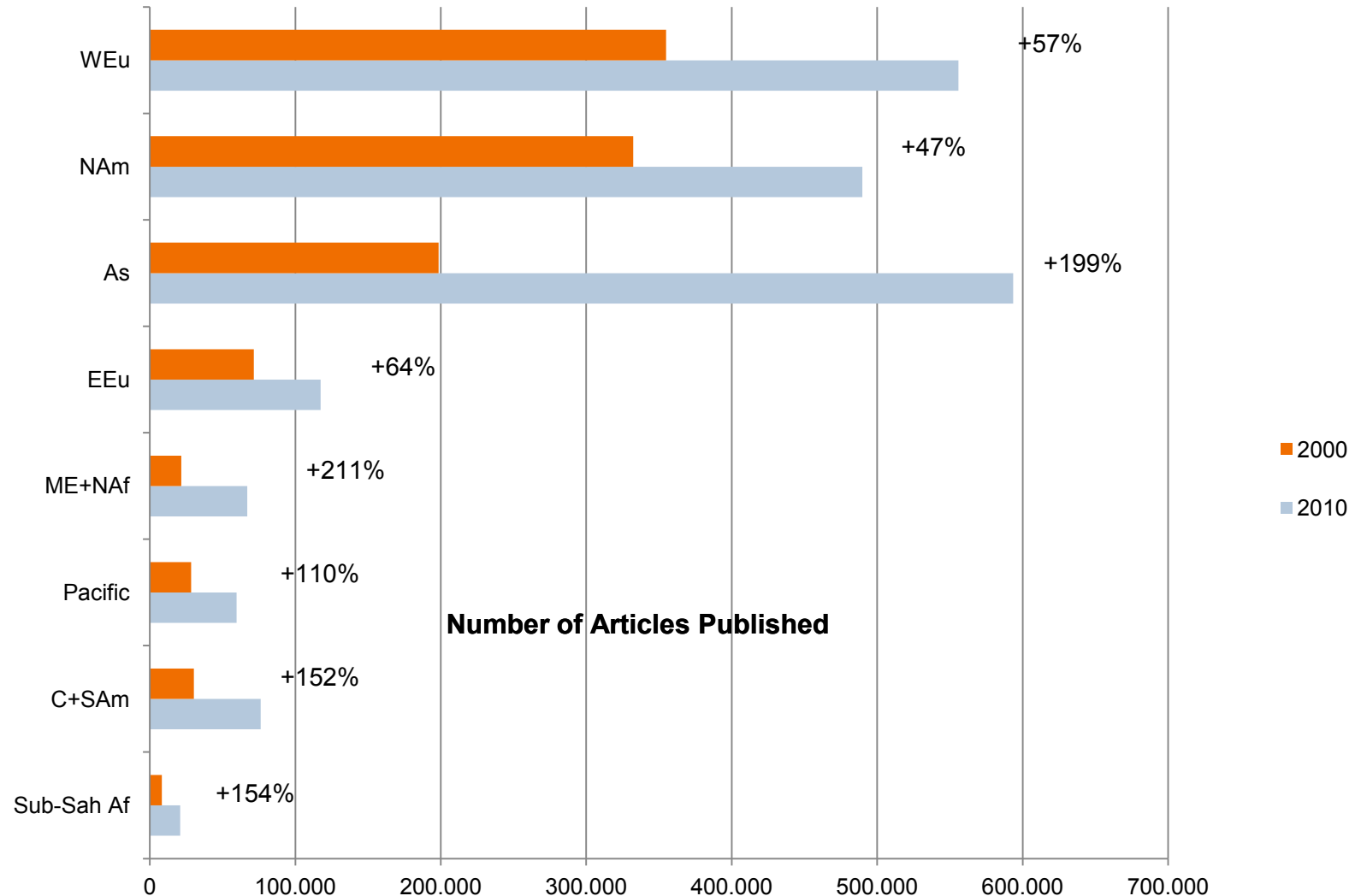
I.e. access to high-quality content leads to more and better research output.

Low amount of content available = low amount of papers being produced.

GEOGRAPHIC MAP: WHERE SCIENCE GETS DONE

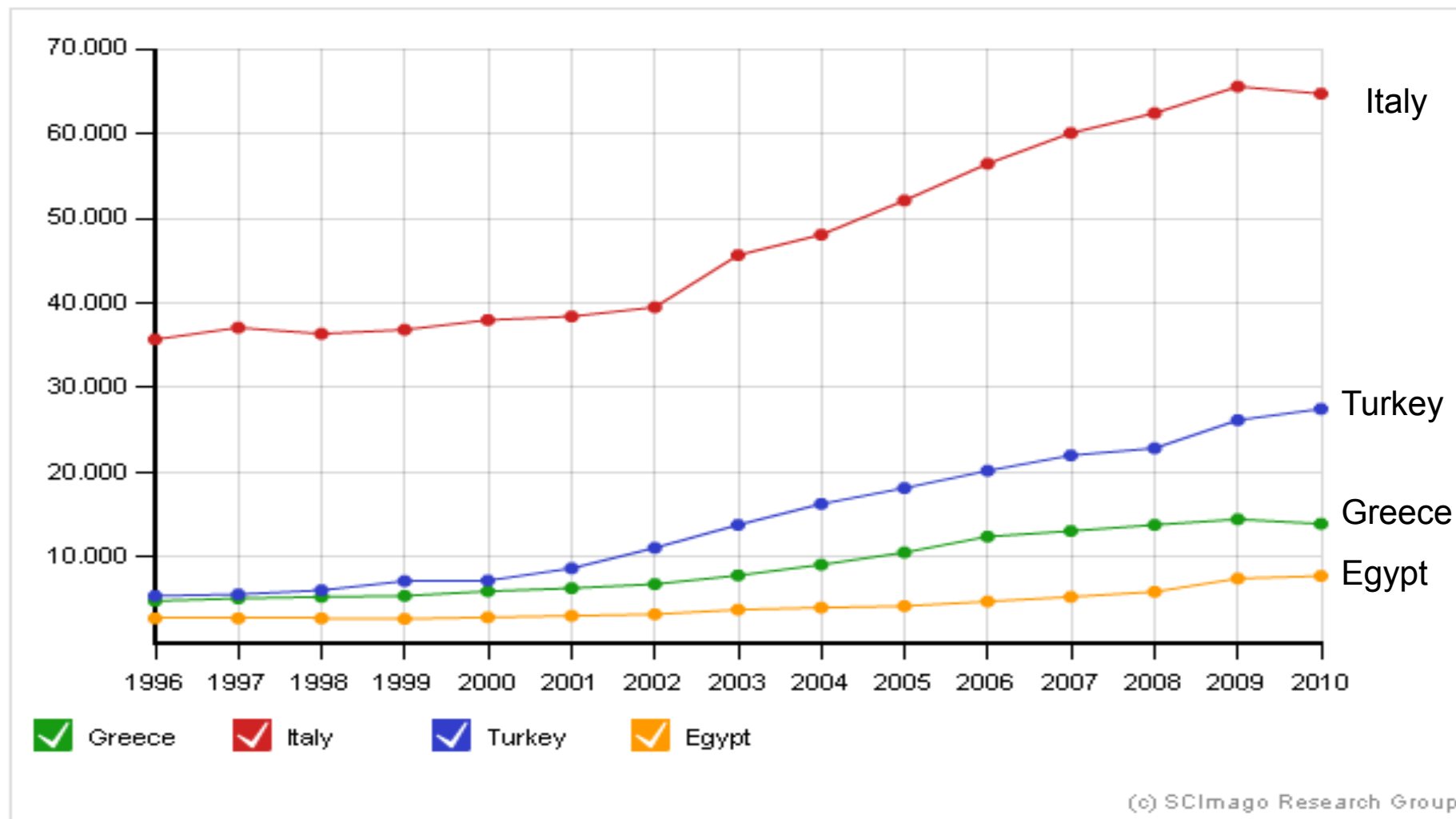


Scientific Output by Region



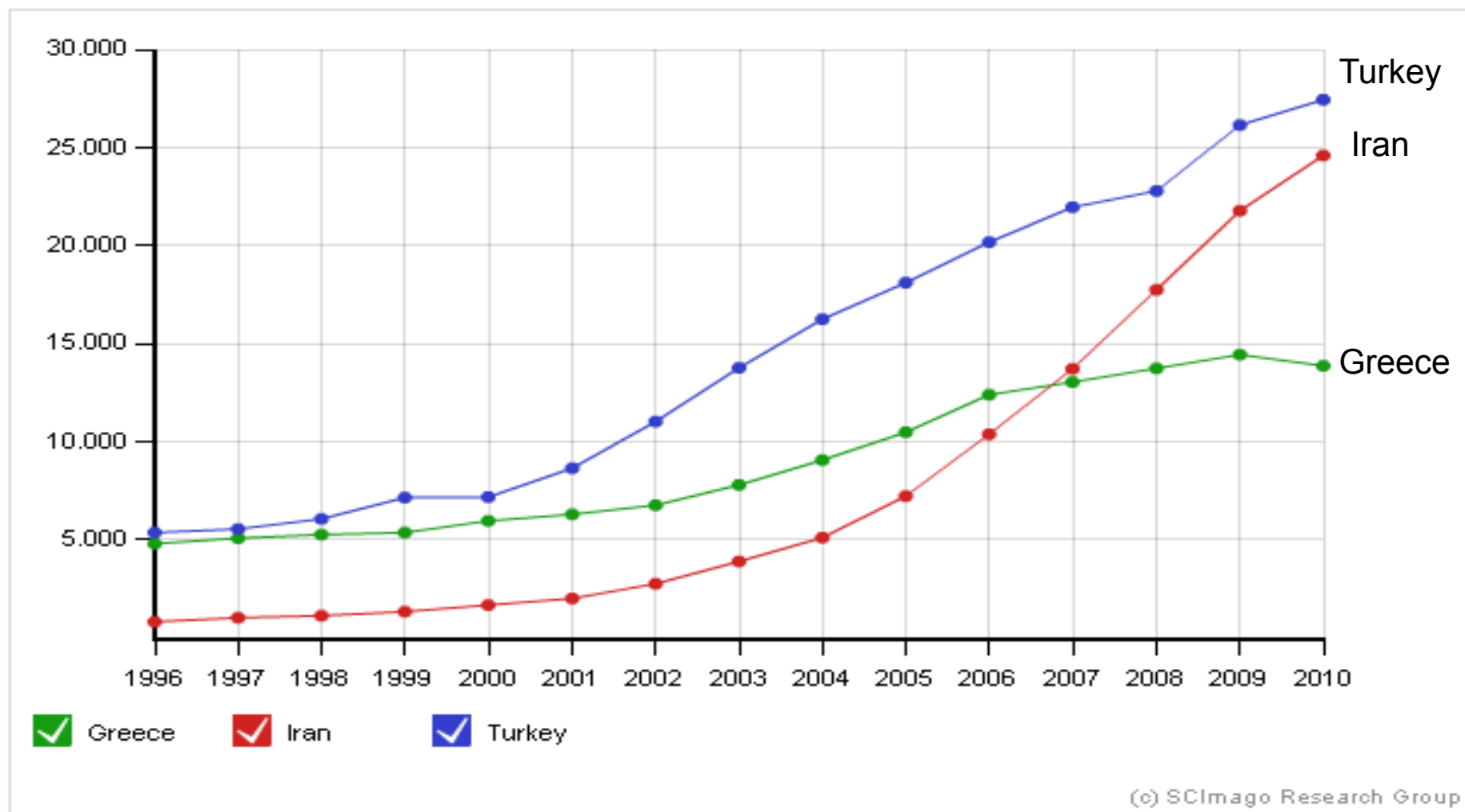
Greece and some neighbours

Documents Citable Documents Cites Self Cites Cites per Document (Cites-Self cites) per Document
H Index % cited documents International collaboration

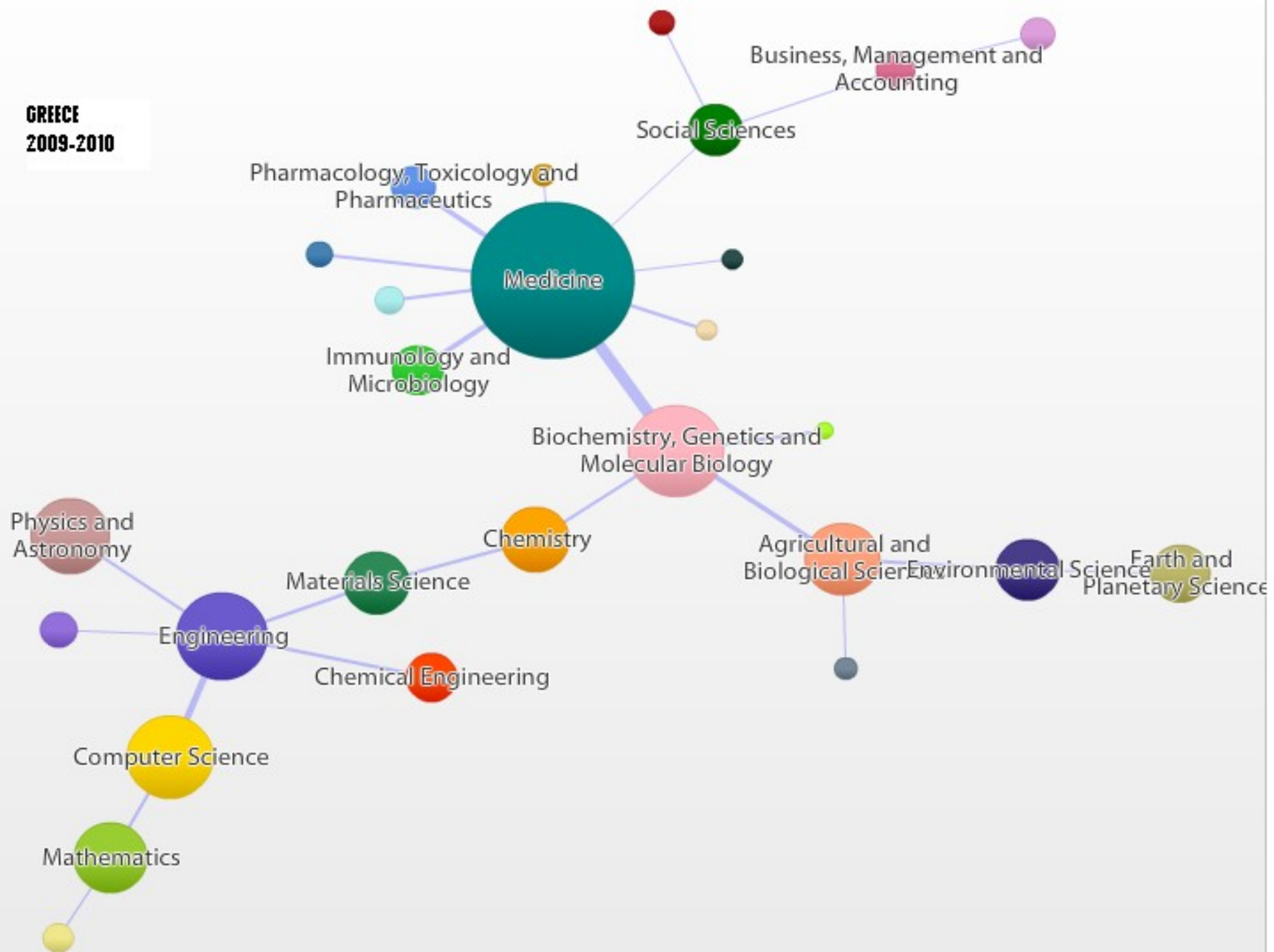


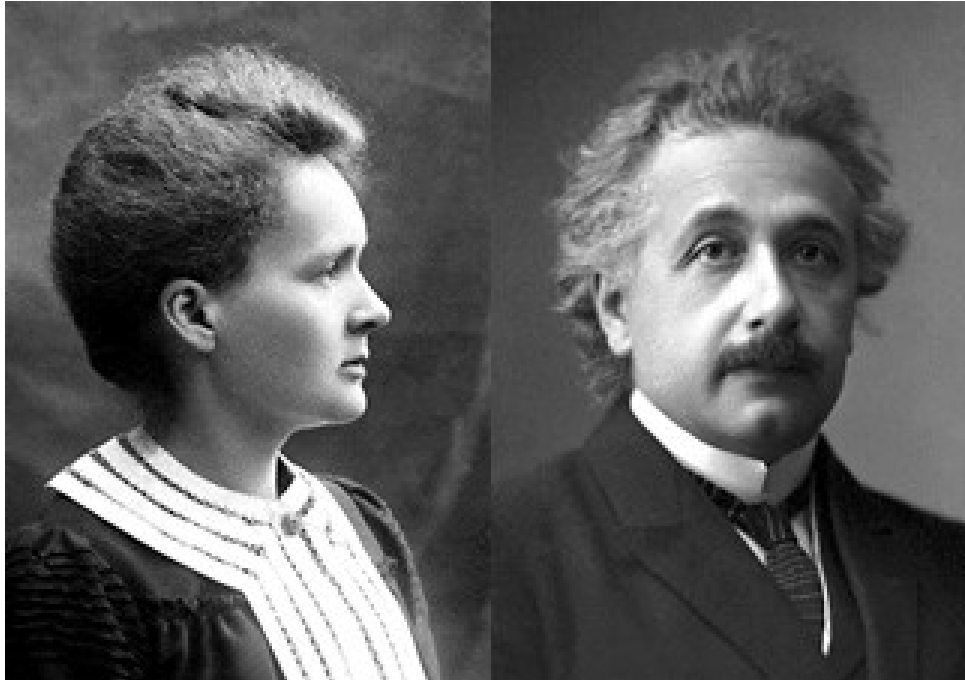
Greece vs Iran

Documents Citable Documents Cites Self Cites Cites per Document (Cites-Self cites) per Document
H Index % cited documents International collaboration



GREECE
2009-2010

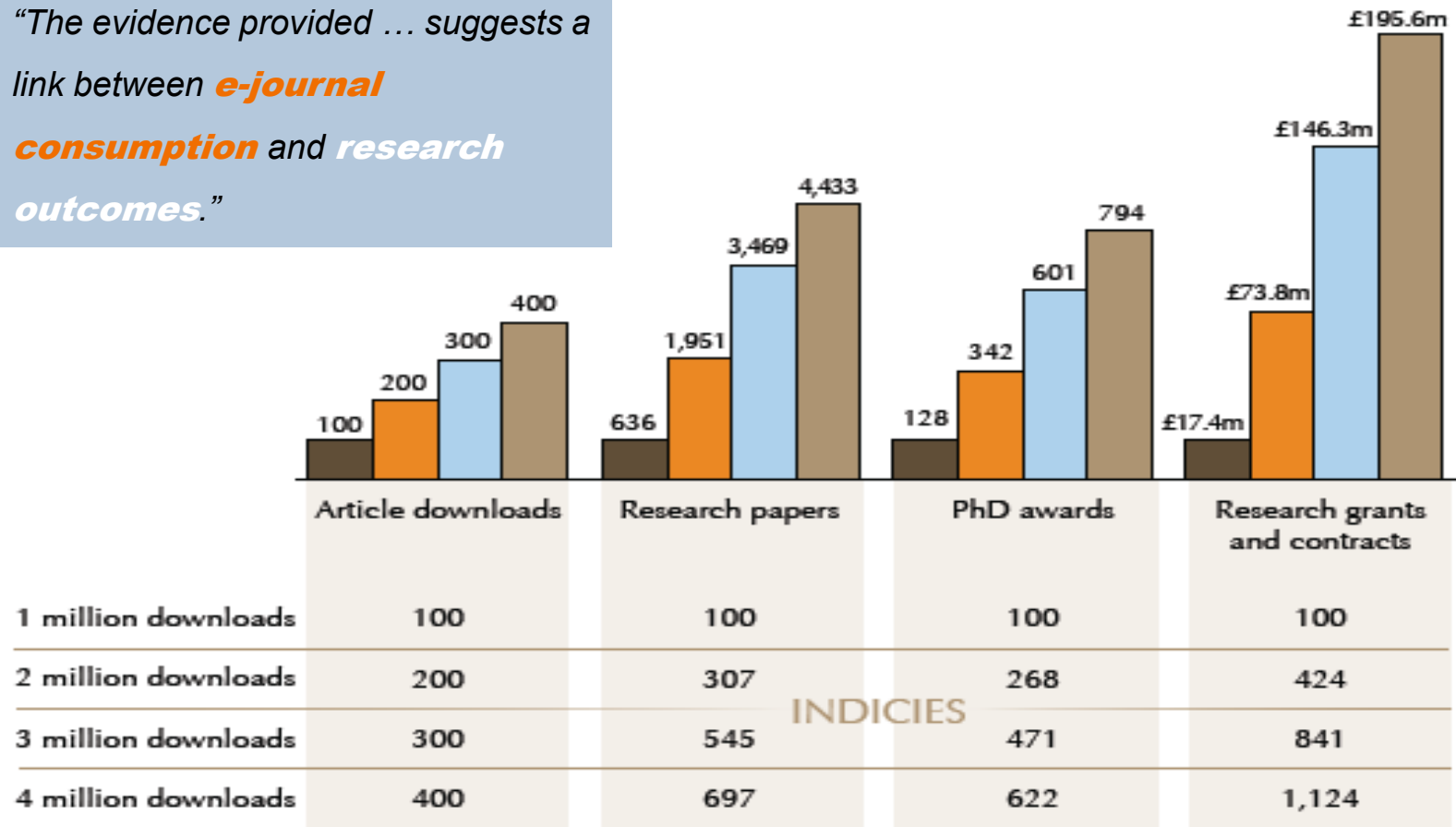




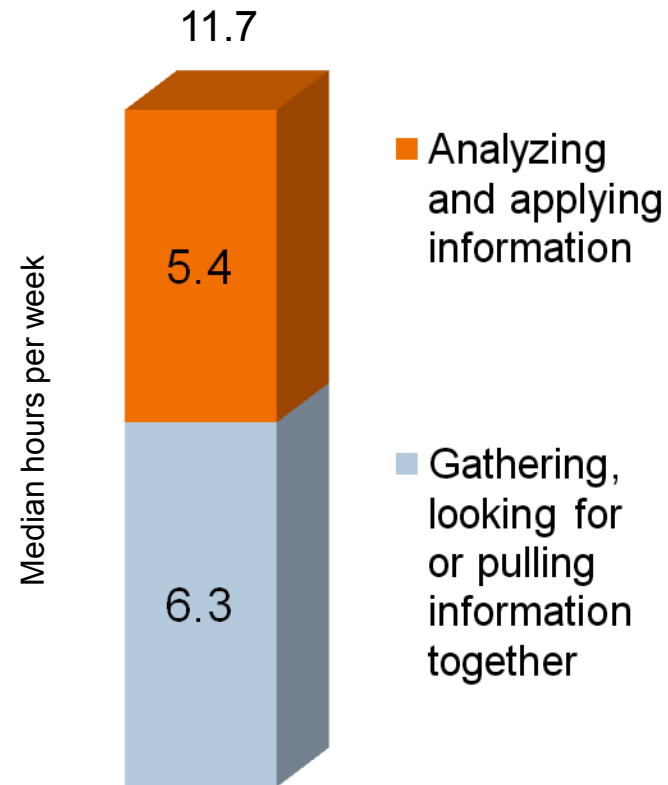
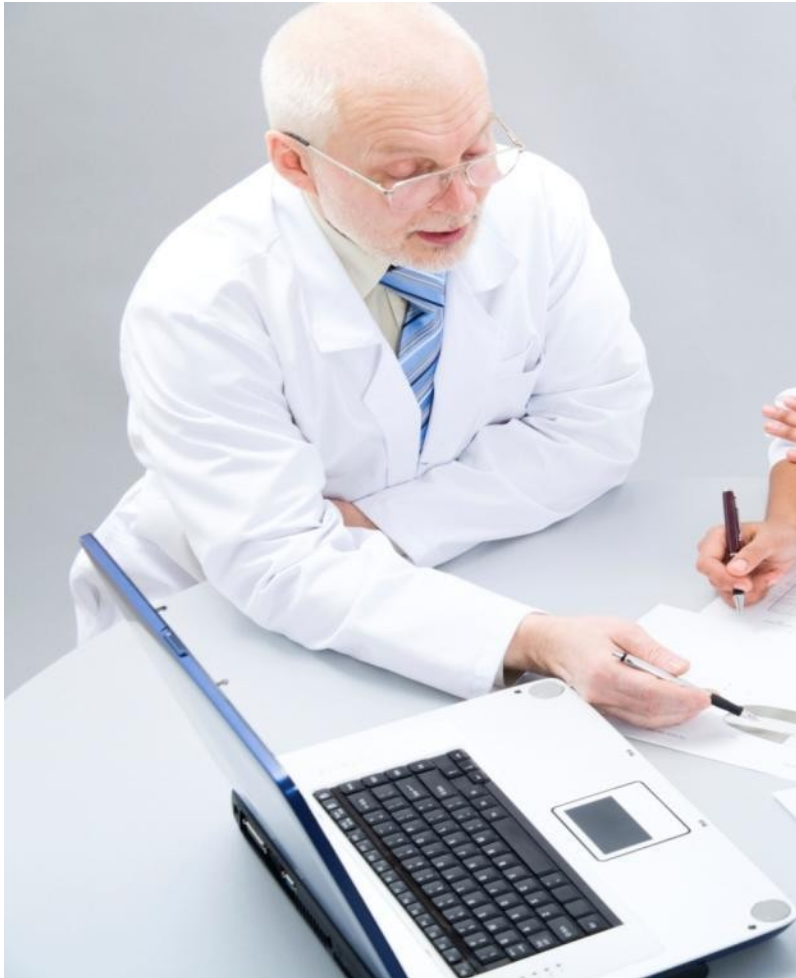
ARCHIVES:
Historical books &
articles are important.

UK study: Journal use and expenditure strongly correlate with research outcomes

*“The evidence provided ... suggests a link between **e-journal consumption** and **research outcomes**.”*

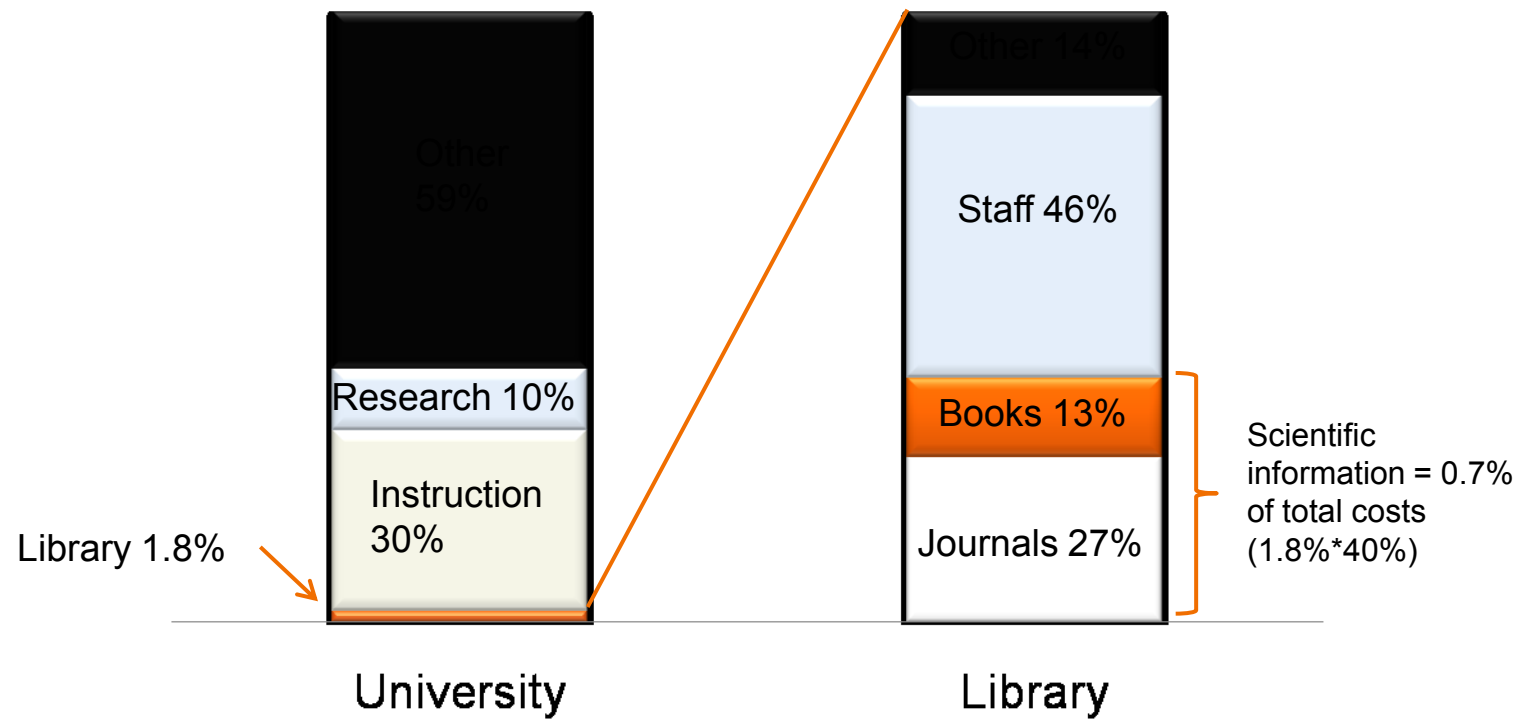


Scientists spend almost 12 hours per week on information tasks

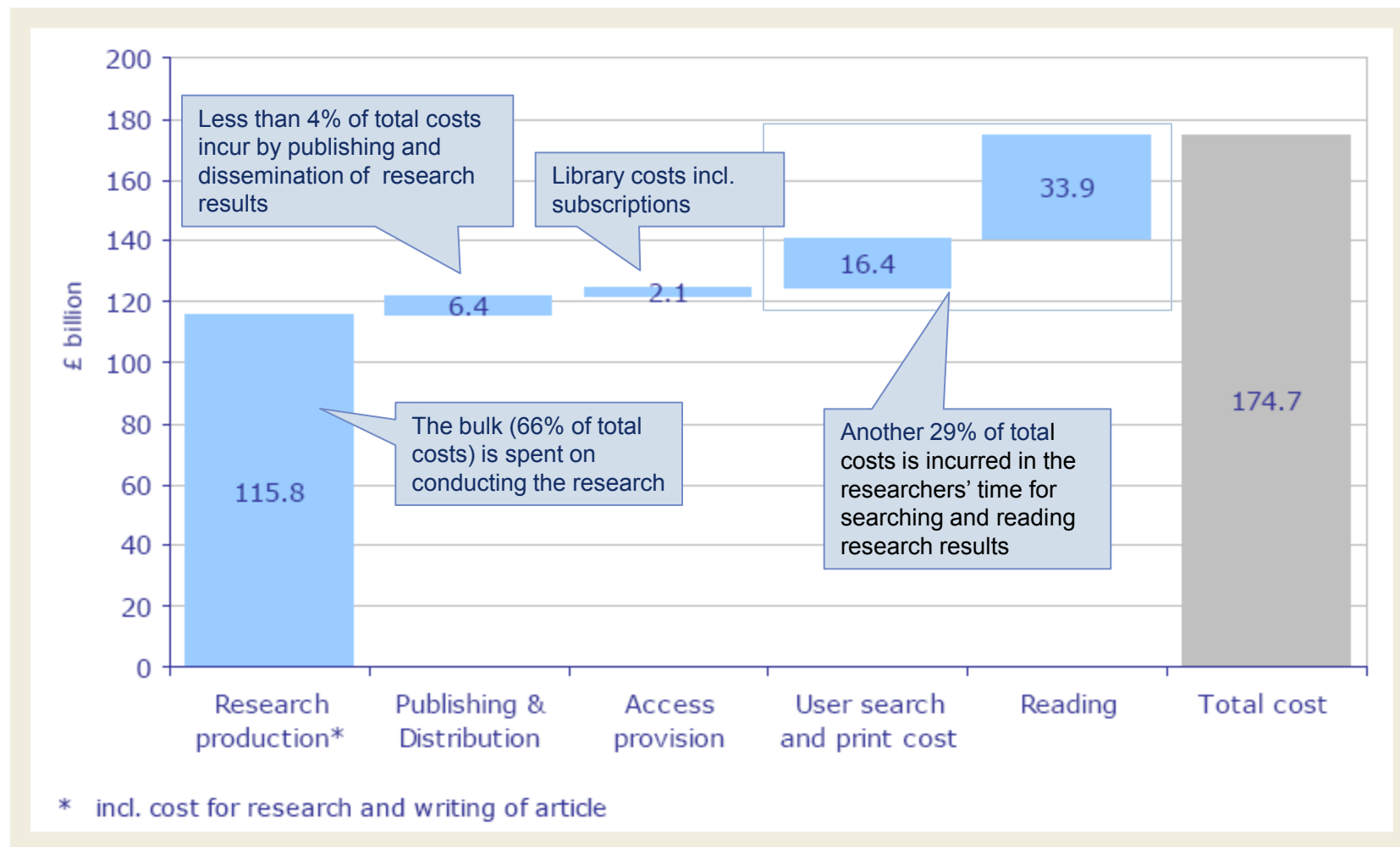


University budgets: Less than 1% is spent on scientific information

US University and Library Spend 2008



Costs of the global research system: publishing accounts for less than 4% of total costs



The Return of Investment (ROI) of Academic Libraries



The Lib-Value Project: Background

- Institute of Museum and Library Services-funded grant headed by Professor Carol Tenopir
- Phase 1: Pilot project with the University of Illinois at Urbana-Champaign in the US to develop a quantitative measure of the library's return on investment (ROI) by tying faculty's use of library materials to the generation of grant income
- Phase 2: Extension of Phase 1 to nine Universities worldwide
- Phase 3: Research on additional areas where libraries provide value: teaching / learning, research, and the social, professional, and public engagement functions of the library (to be completed 2012)



Results of Faculty Survey (Phase 2)

- Survey respondents report that they spend at least 3.5 hours per week finding and accessing articles, and at least 9.8 hours reading articles
- Nearly all faculty state that is "important," "very important," or "essential" to cite references to journal articles or books in their grant proposals
- Most respondents access at least half of the articles and books they cite in grant proposals, reports, and publications from their institutional library e-resource collections



ROI of Academic Libraries (Phase 2)

- For every Dollar invested in the library, the universities received a ROI of up to 16 Dollar in research grant income; with exception of two Universities the ROI was positive
- If the portion of the library budget that is just related to e-collections is used, the ROI rates range from 6 to 155
- In two North American universities, regression analysis using 10 years of data shows that an increase in the library budget is correlated with an increase in grant funding

Scientific research and the publishing of this research:

- raises the national profile and that of its educational institutions,
- encourages international collaboration,
- boosts innovation and business,
- keeps you ahead of the competition,
- stops the „Brain-Drain“

Publishing choices

Three levels –

- *(books / journals / protocols)*
- *(print / electronic)*
- *(traditional / open access)*



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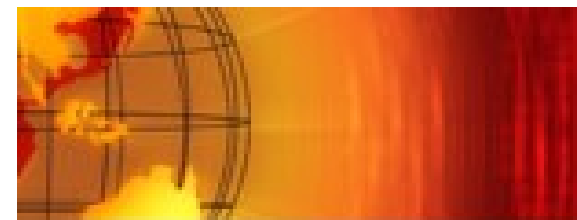
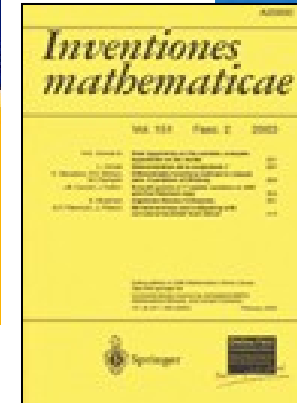
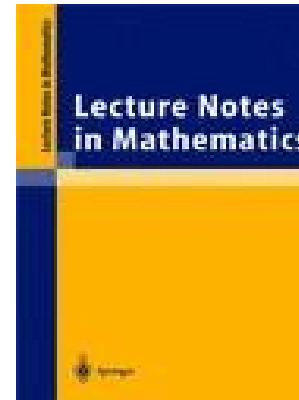
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- Large part of library budgets tied into big package deals
- Budgets being cut
- Meanwhile science budgets increase
- Number of journals go up
- Number of articles go up
- Number of scientists go up
- Cancellations!

- Cancellations means scientists read fewer high quality articles
- Less input means less publication of high quality science
- Research is a motor in modern economies
- If a research infrastructure is destroyed/halted, it takes a long time to recover

'Science' is still growing...



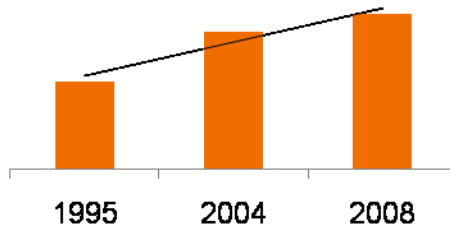
**R&D
Expenditures**



Article Output

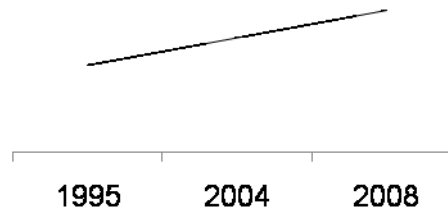
Higher education expenditure
on Research & Development

CAGR: 4.5%



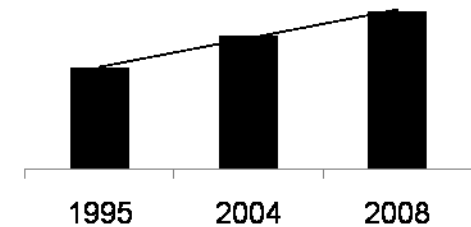
Total researchers in full-time
equivalent

CAGR: 3.9%



Journal Article Output

CAGR: 3.5%



- Number of journals still goes up
- Number of articles per journal still goes up
- Number of scientists still increase
- 0.7% of university budgets used for scientific information
- less than 4% of scientific research is publishing/dissemination

Solutions:

- either top-slicing for a National Infrastructure of high quality research information...
- or massive Open Access publishing paid by research grants...

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The Irish Times - Thursday, February 17, 2011

Science funding remains central to recovery

There is no backtracking on commitments made on funding. The commitment of the governments has always been gold standard, writes **DICK AHLSTROM**, Science Editor

In this se

Thank you!

Σας ευχαριστούμε!



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