Dr. Andrey Kovatchev
Regional Director- Middle and Eastern Europe
a.kovatchev@elsevier.com

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University Nish
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Elsevier team

- Dr. Andrey Kovatchev
  - Regional Director Middle and Eastern Europe

    A.Kovatchev@Elsevier.com
- Sandra Grijzenhout
  - Product Sales Manager Databases (Scopus, Engineering Village, embase.com)

    S.Grijzenhout@Elsevier.com

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Agenda

- About Elsevier
- Scientometrics – measuring science
- Scientific output - comparison Middle and Eastern Europe

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Elsevier

History:

- **Original Elsevier Company** – founded 1580, when Louis Elsevier began selling books to university scholars in Leiden (NL) (authors: including Galileo, Erasmus and Descartes)
- **Modern Elsevier Company** – founded in 1880
  - In the 1950s and 60s Elsevier took its first steps toward becoming a global company
  - In the 1980s Elsevier Science become part of **Reed Elsevier Group plc** (35 000 employees), the Anglo-Dutch media company (LexisNexis, Harcourt...)

Today:

- 2 000 journals
- 2 200 book p.a.
- 7 000 employees at 100 locations worldwide
- Provider of the worldwide largest e-full text (ScienceDirect) and abstract and indexing (Scopus) databases
- several subject e-databases

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Worldwide Scientific Publishers positioning (Top 10)

	2004 Market share %*
• Elsevier	25.0
• Springer	7.7
• Blackwell	5.3
• Wiley	4.6
• Taylor & Francis	3.0
• Am Chem Soc	3.0
• AIP	2.8
• Wolters Kluwer	2.7
• IEEE	1.9
• Am Phys Soc	1.7

Elsevier published 25% of all the peer reviewed journal papers published in 2004 in all subject areas.

*Data: Market share analyse May 2005, ISI based, Executive summary

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The 3 ‘S’s

SCIENCE DIRECT®

- With >7.4 million full text articles world’s largest full text database
- Nearby Only Elsevier content (Journals, Books)

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- Elsevier’s web Search Engine for scientific information on the internet
- Freely available
- Integrated in Scopus

SCOPUS

- World’s largest bibliographic database (no full texts)
- Navigates through 28 million abstracts of 15,000 titles from 4,000 publishers (not only Elsevier)
- New: Scopus Citation Tracker

Key facts

- 1900 Elsevier journals
  - Academic Press
  - Harcourt Health Science
  - Cell Press
  - *New*: 33 Urban & Fischer journals
- 24 Subject areas
- Backfiles for all subjects, going back to Vol.1, issue 1 (Oldest backfile goes back to 1823)
- Total full-text articles on SD >7.4 million

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Where to find journals

Address http://www.sciencedirect.com/ Go Links

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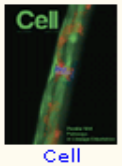

Cell


Research in Organizational Behavior

Hot Topics

- Infants not surprised to see adults talking to robots
- "Doctor knows best" in prescription of HRT for menopause

Subject Areas in ScienceDirect

- Agricultural and Biological Sciences
- Arts and Humanities
- Biochemistry, Genetics and Molecular Biology
- Business, Management and Accounting
- Chemical Engineering
- Chemistry
- Computer Science
- Decision Sciences
- Earth and Planetary Sciences
- Economics, Econometrics and Finance
- Energy
- Engineering
- Environmental Science
- Immunology and Microbiology
- Materials Science
- Mathematics
- Medicine and Dentistry
- Neuroscience
- Nursing and Health Professions

1,800 Els. Journals

- Academic Press
- Harcourt Health
- Cell Press
- *New: Urban Fischer*

Scientometrics

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Why Sciencometrics

- Measuring Science
  - Better Use of Research Funds
  - Provides Quantitative Data that Controlling Agencies (Ministries, Research Agencies) can easily understand
  - Alternative to existing static measurement **at journal level**
  - Needs for a real time analysis on individual author and article level –Scopus Citation tracker

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Citations in Science – Hirsch Index (h-index)

- The number of papers published by a scientist provides a measure of their productivity, it says nothing about the quality of their work.
- The number of citations received by a scientist is a better indicator of quality, but co-authoring a handful of articles that are cited widely could "inflate" the reputation of a scientist.
- The Hirsch Index provide a balance between the number of publications and citations and is rapidly becoming viewed as an alternative to the impact factor. H-index can be calculate easily using the Citation Tracker
- h-index: the highest number of papers a scientist has that have at least that number of citations

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An index to quantify an individual's scientific research output

J. E. Hirsch
Department of Physics, University of California, San Diego
La Jolla, CA 92093-0319

I propose the index h, defined as the number of papers with citation number higher or equal to h, as a useful index to characterize the scientific output of a researcher.

PACS numbers:

For the few scientists that earn a Nobel prize, the impact and relevance of their research work is unquestionable. Among the rest of us, how does one quantify the cumulative impact and relevance of an individual's scientific research output? In a world of not unlimited resources such quantification (even if potentially distasteful) is often needed for evaluation and comparison purposes, eg for university faculty recruitment and advancement, award of grants, etc.

The publication record of an individual and the citation record are clearly data that contain useful information. That information includes the number (N_p) of papers published over n years, the number of citations ($h = 75$), D.J. Scalapino ($h = 75$), G. Parisi ($h = 73$), S.G. Louie ($h = 70$), R. Jackiw ($h = 69$), F. Wilczek ($h = 68$), C. Vafa ($h = 66$), M.B. Maple ($h = 66$), D.J. Gross ($h = 66$), M.S. Dresselhaus ($h = 62$), S.W. Hawking ($h = 62$).

I argue that h is preferable to other single-number criteria commonly used to evaluate scientific output of a researcher, as follows:

(0) Total number of papers (N_p): Advantage: measures productivity. Disadvantage: does not measure importance nor impact of papers.

(1) Total number of citations ($N_{c,tot}$): Advantage: measures total impact. Disadvantage: hard to find; may

Sciencometrics

- Users need to compare themselves with peers or their research group with another working in the same field
- ***Scopus Citation Tracker*** is the exclusively service for simultaneously presentation of the number of papers an author has published and citation count per year for each paper and the total for the author in one Citation Overview

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Other database reviews

- Google Scholar
  - Very fast search speed (+)
  - Free (+)
  - Voluminous output (-)
  - No information about STM research (-)
  - No source lists of content (-)
  - Limitations in accuracy and timeliness (-)
  - inadequate search tool for citation data (-)
    - (no accurate data on publication names, no explain how citations rates are calculated)

  Lack of authority control for basic data elements such as author names and publication titles limits the GS ability to sustain an serious scientific and technical research tool.

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Scientific output - Comparison Middle and Eastern Europe

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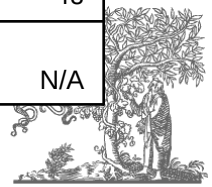
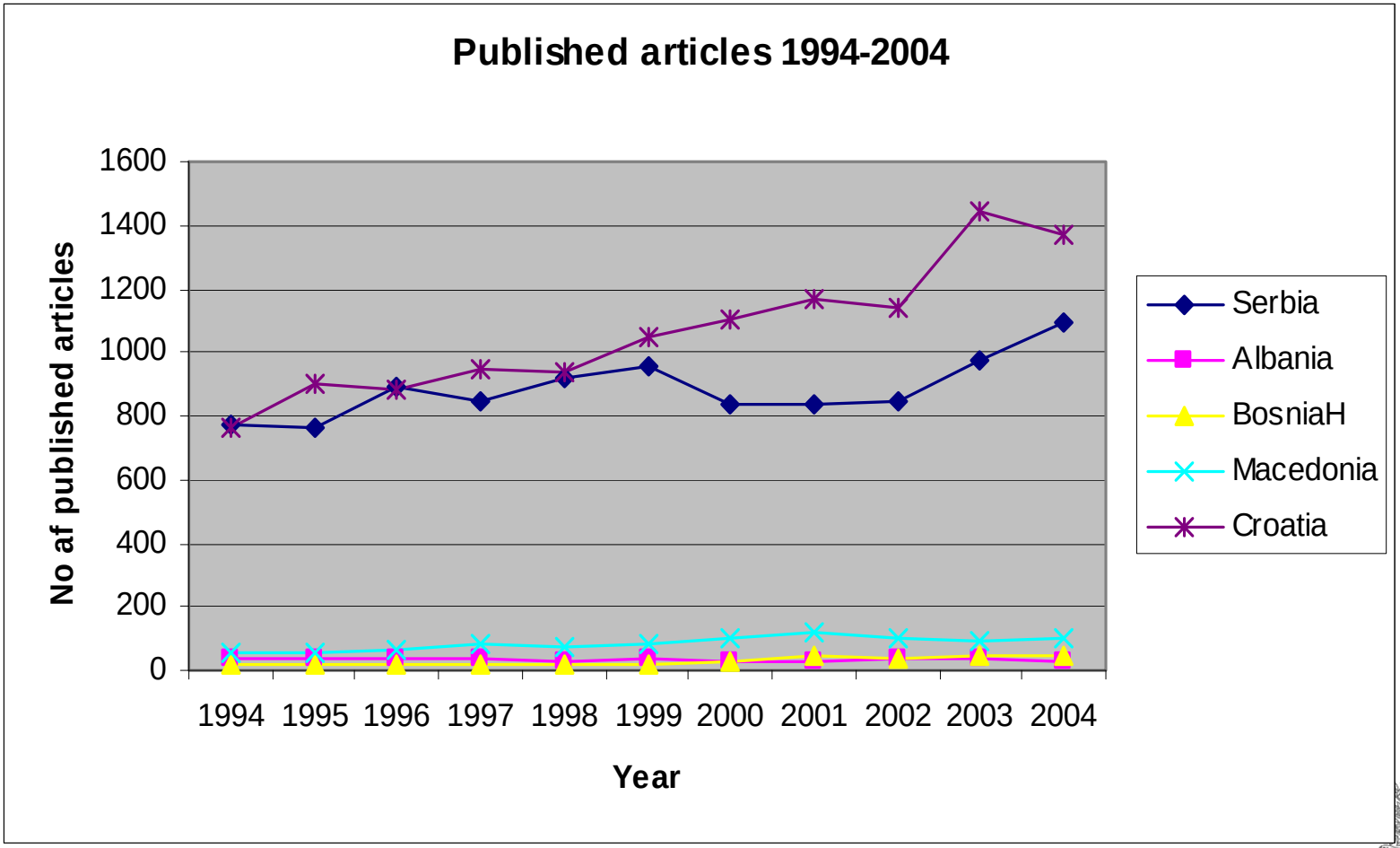
Macroeconomic data and data on Higher education and research

Country	Serbia Montenegro	Croatia	B&H	Macedonia	Albania
Population x Mio	10.83	4.50	4.03	2.05	3.50
GDP x Mio	$ 26,591	$ 37,873	$ 9,497	$ 4,913	N/A
GDP / capita (ppp)	$ 5,204	$ 12,364	$ 5,827	$ 7,749	$ 4,500
GDP real growth rate	4.6%	3.4%	5.4%	3.8%	6%*
Inflation	15.4%	3.0%	1.0%	1.2%	3.0%
R&D spending as a % of GDP	**0.8 % * (only Serbia)**	**1.1%**	**N/A**	**0.22%**	**N/A**
R&D spending x Mio (ppp)	N/A	$ 520	N/A	$ 34	N/A
R&D spending per capita (ppp)	N/A	$ 116	N/A	$ 17	N/A
Researchers per mio pop.	1,002	1,905	N/A	N/A	N/A
Researchers	10,855	8,572	N/A	2,865	N/A
R&D spending per researcher (ppp)	N/A	$ 60,663	N/A	N/A	N/A
Article output	1,480	1,670	43	90	48
Articles per 100 Researchers	13.6	19.5	N/A	N/A	N/A



Article growth in Eastern Europe (Non-EU members)



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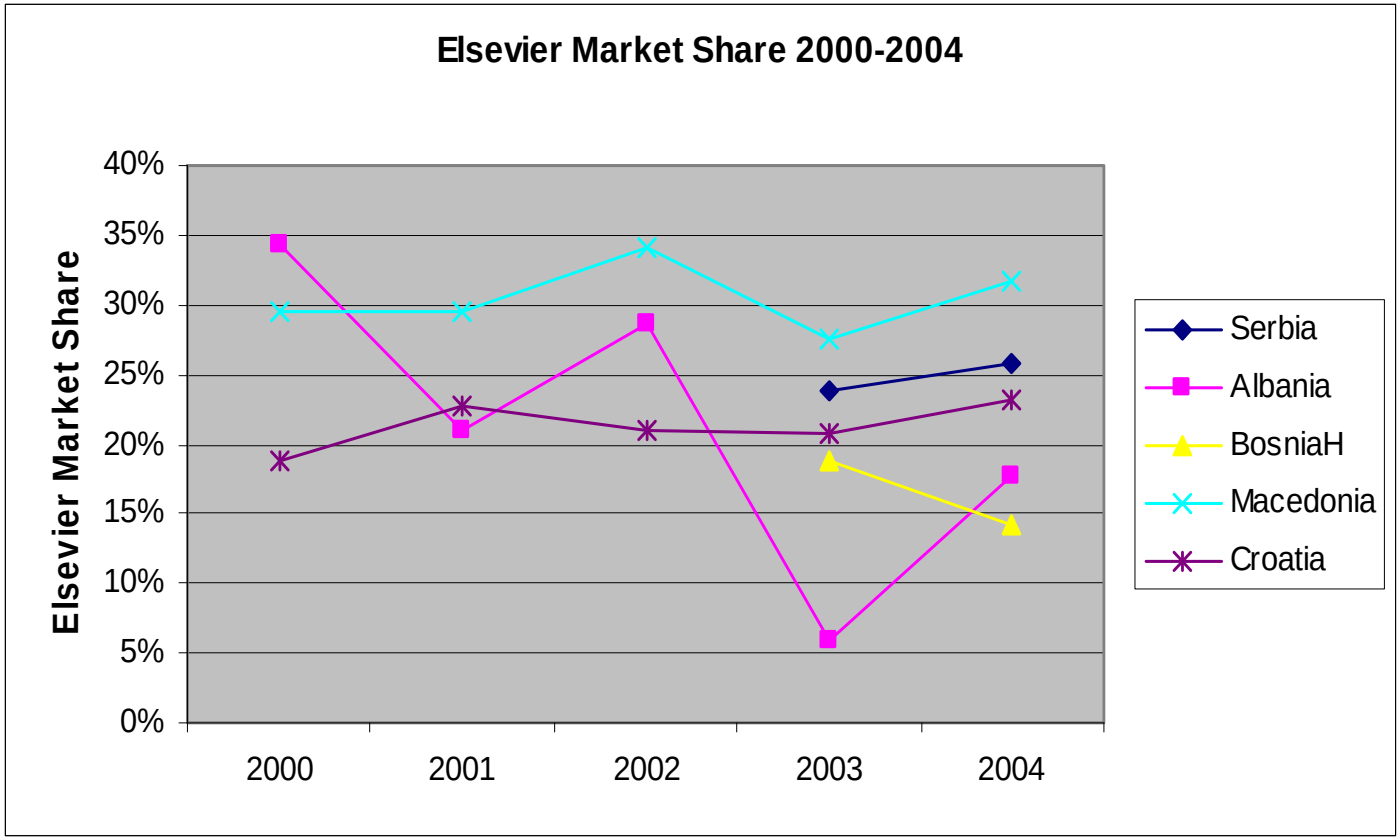
Articles published in Elsevier (Non-EU members)



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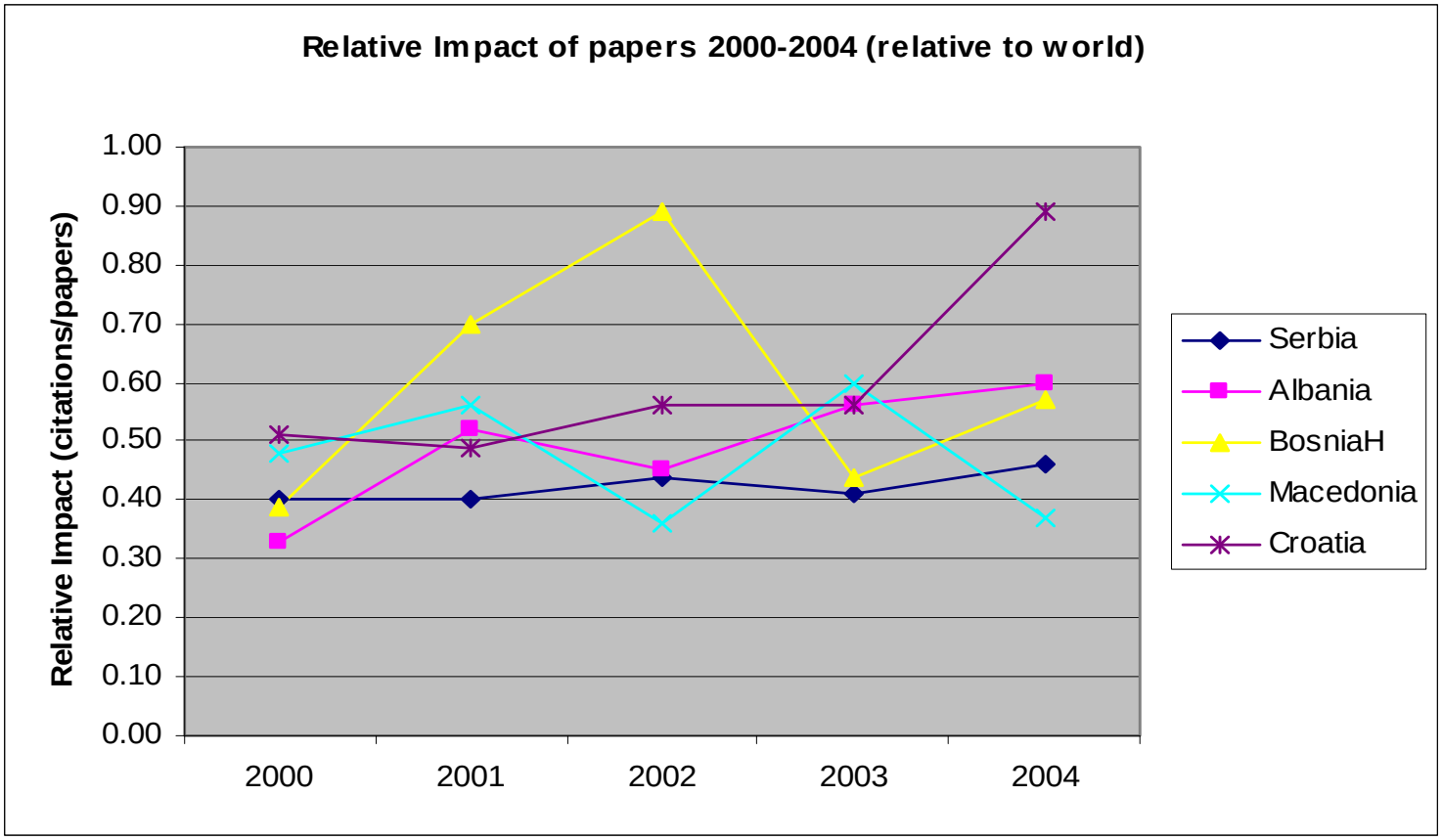
Quality of articles (Non-EU members) vs the world average (1.00)



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Middle and Eastern Europe—Macro Data and data on Higher education and research

	Slovenia	Czech Rep	Baltic Reps	Hungary	Poland	Slovakia	Romania	Bulgaria
economic/demographic								
population 2004	2,011,473	10,246,178	7,255,869	10,032,375	38,626,349	5,423,567	22,355,551	7,517,973
GDP per capita 2004	$19,000	$15,700	$11,300	$13,900	$11,100	$13,300	$7,000	$7,600
GDP growth, 2004	3.5%	3.8%	6.5%	3.8%	5.7%	5.1%	8.0%	5.5%
# of pc's 100 inhabitants 2003	33	18	25	11	14	24	10	5
research and higher education								
% of GDP to ST&M research	1.54%	1.30%	0.65%	1.01%	0.59%	0.59%	0.38%	0.49%
number of researchers (2003)	7,081	31,421	21,546	30,292	94,432	17,033	25,968	10,876
annual growth researchers, 98-03	2%	6%	6%	5%	2%	1%	-3%	-5%
number of Higher Educ. Students	101,000	287,000	348,000	390,000	1,983,000	158,000	644,000	230,000
growth students, 98-03	8%	6%	11%	9%	11%	7%	12%	-2%

Sources: OECD, Eurostat, Sales DB, UNICEF

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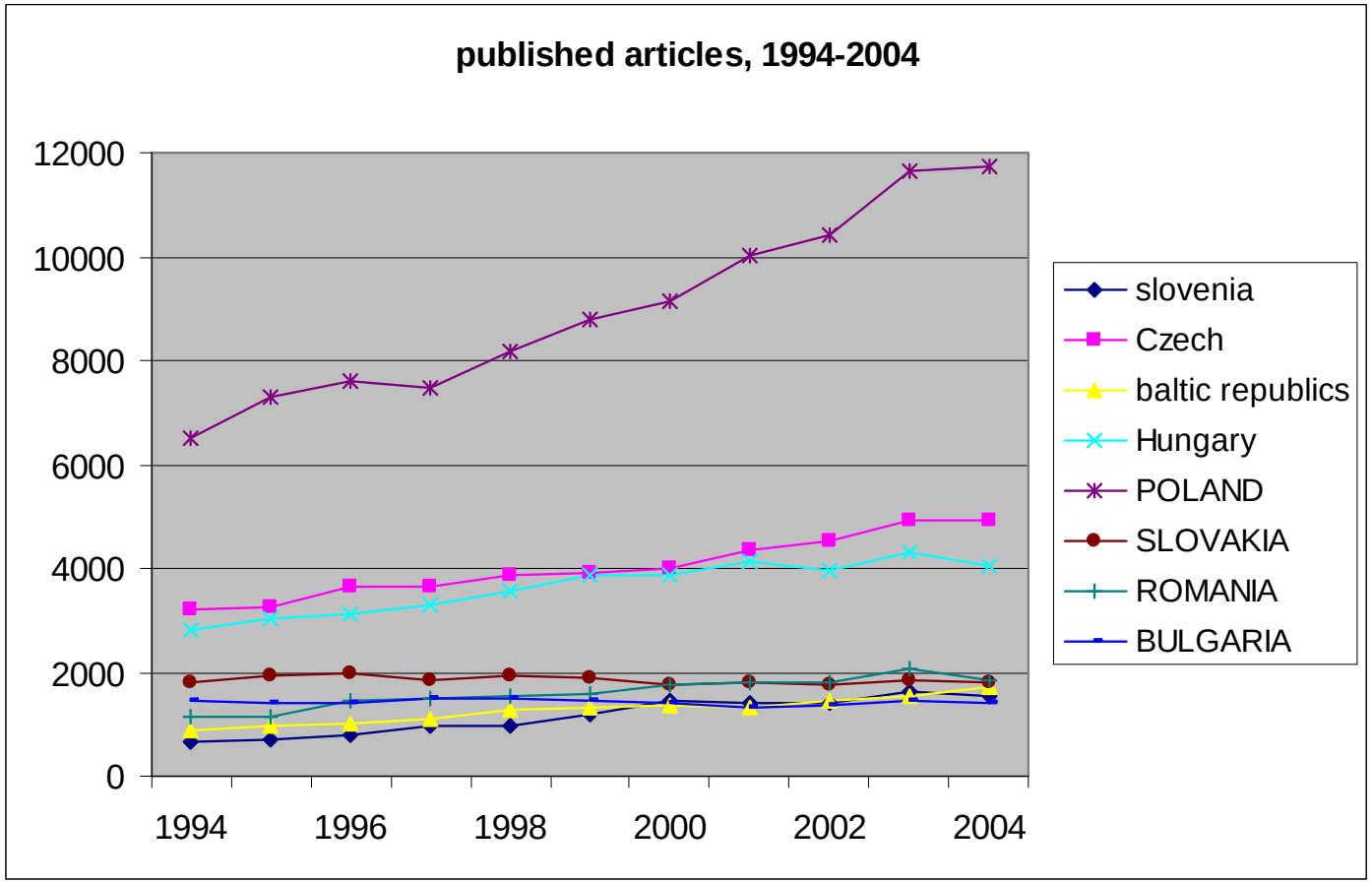
Article growth in Eastern Europe is in total 5% p.a., - over world average



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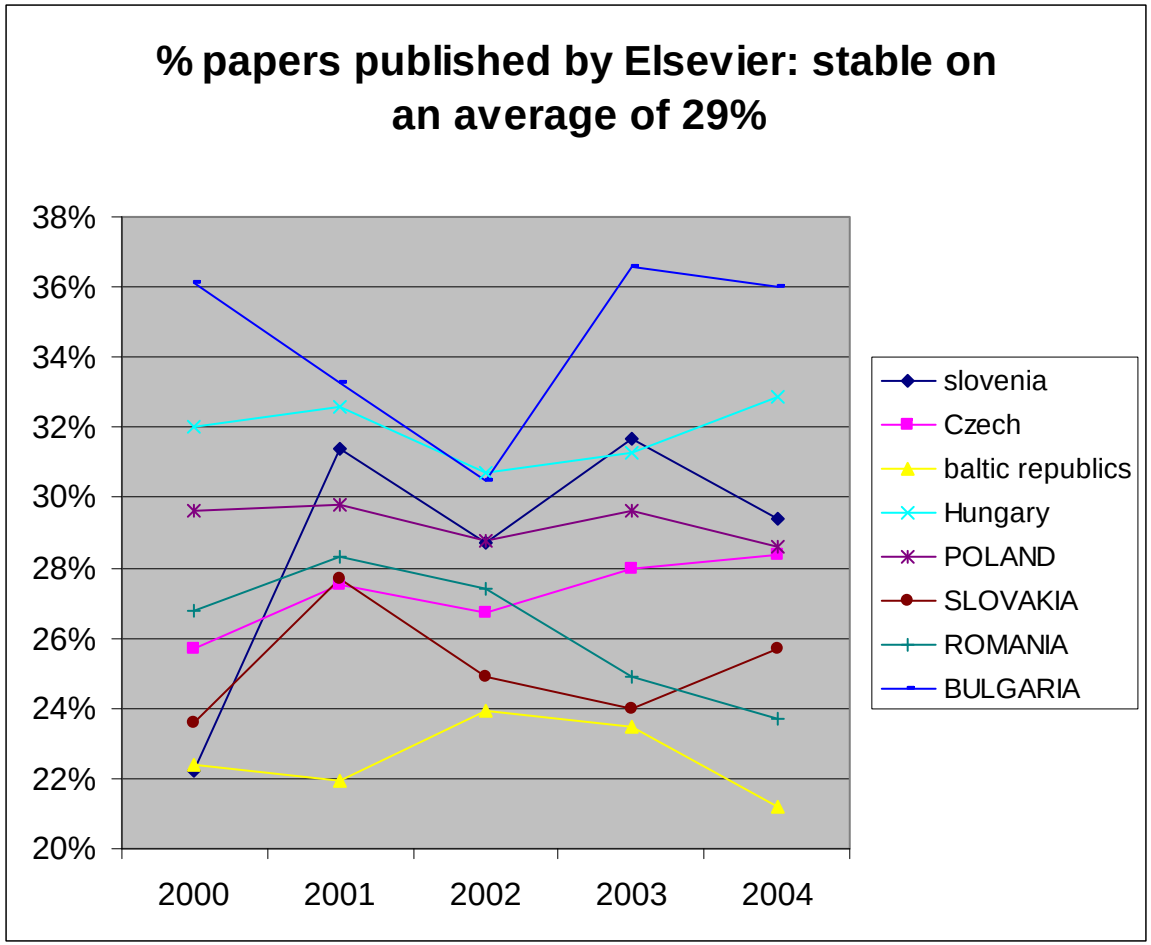
Articles published in Elsevier are stable on 29% and this is already over the world average of 25%.



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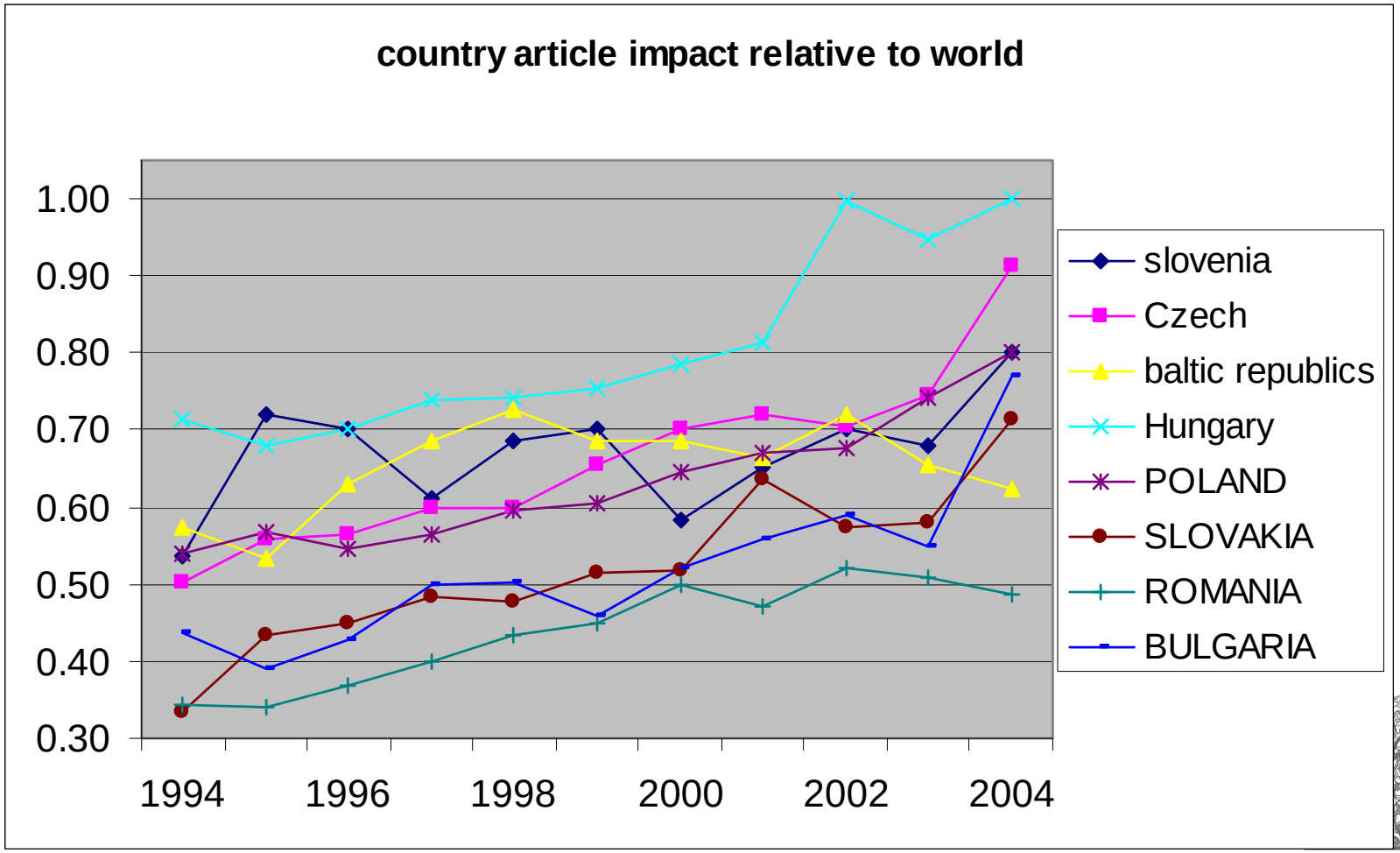
Quality of articles vs the world average (1.00)



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