

# **(Inter)national Orientation of Croatian Social Sciences and Arts and Humanities Journals Indexed in the Web of Science Database**

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## **Abstract:**

After the beginning of the year 2007, the number of Croatian scientific journals indexed in bibliographical and citation database Web of Science (WoS) has rapidly increased, and among them the number of Croatian social sciences (SS) and arts and humanities (A&H) journals as well. In this paper, the (inter)national orientation of Croatian social sciences (SS) and arts and humanities (A&H) journals indexed in the period 2008-2010 in the Web of Science (WoS) database was analyzed. The analysis was conducted via language of the journal title and published papers, national distribution of authors and co-authorship structure, as well as via the INO indicator. For the purpose of this analysis, SS journals were divided into 2 groups – SS journals related to medicine and health (SSM) and other SS journals (SSO), while A&H journals were observed as one group (AH). Results of the analysis showed that Croatian SSM journals are the most internationally oriented among analyzed groups of journals according to all indicators, while the SSO journals have the strongest national orientation. However, all three analyzed groups of journals are still the most attractive first for Croatian authors, and than to authors from region (SSO, SSM) and top 20 countries in the world sciences (AH).

**Key words:** bibliometrics ; journals ; Croatia ; social sciences ; arts & humanities

## **Sažetak:**

Broj hrvatskih znanstvenih časopisa indeksiranih u bibliografskoj i citatnoj bazi podataka Web of Science (WoS) se nakon 2007. godine značajno povećao, a samim time i broj hrvatskih društvenih časopisa (SS) te časopisa iz područja humanističkih znanosti i umjetničkih područja (A&H). U ovom je radu istraživana (među)narodna orijentiranost hrvatskih društvenih časopisa (SS) te časopisa koji pokrivaju područje humanističkih znanosti i umjetničkih područja (A&H), a koji su u razdoblju od 2008. do 2010. godine bili indeksirani u bazi podataka Web of Science (WoS). Analiza je provedena na temelju jezika naslova časopisa te radova objavljenih u časopisu, nacionalne distribucije autora, koautorske strukture te INO indikatora. Za potrebe ovog istraživanja SS časopisi su podijeljeni u 2

skupine – SS časopisi povezani s medicinom i zdravstvom (SSM) i ostali SS časopisi (SSO), dok su A&H časopisi promatrani kao jedna skupina (AH). Rezultati analize su pokazali da su od tri promatrane skupine časopisa hrvatski SSM časopisi najviše internacionalno orijentirani, gledajući po svim pokazateljima, dok je kod SSO časopisa najizraženija nacionalna orijentacija. Međutim, sve tri promatrane skupine časopisa su još uvijek najatraktivnije hrvatskim autorima kao mjesta za objavljivanje njihovih istraživanja, nakon toga autorima iz regije (SSO, SSM) te autorima iz top 20 znanstvenih zemalja svijeta (AH).

**Ključne riječi:** bibliometrija ; časopisi ; Hrvatska ; društvene znanosti ; humanističke znanosti i umjetnička područja

## Introduction

The majority of bibliometric researches are based on the data from the bibliographical and citation database Web of Science (WoS) by Thomson Reuters, which consists of three citation indexes - Science Citation Index Expanded (SCI-Exp), Social Science Citation Index (SSCI) and Art and Humanities Citation Index (A&HCI) (Archambault et al., 2006). Some of the biggest drawbacks of WoS, and also most common objections, are uneven coverage of all the scientific areas by journals, high orientation towards the English speaking area, favouring US journals and weak coverage of journals from countries on the so-called 'scientific periphery' which are published in national languages, which is particularly the case with SSCI and A&HCI (Archambault et al., 2006; Katz, 1999). Numerous objections, and even more the appearance of the new citation database – Scopus, which indexes a significantly higher number of publications than WoS (19,413 active titles, out of which 18,436 journals, 101 Croatian) (Scopus Title List, October 2011), have compelled Thomson Reuters to consider the possibility of more progressive inclusion of new titles into its citation indexes. Therefore, Thomson Reuters has decided to enrich the existing corpus of significant and influential journals currently included in the WoS with a certain number of journals whose contents carry specific regional importance. With this aim, in the fall of 2006, the Editorial Development Department of Thomson Reuters has collected a list of over 10,000 scientific publications from all scientific fields which hadn't been included into WoS until then, and, as a consequence, in the next 12 months, the first 700 journals of regional importance have been selected to be included into WoS (Regional content expansion in Web of Science, 2009), and that process has been further continued. Croatian journals have also been included in this process. In December 2011 WoS has indexed 12,026 journals (8,339 journals in SCI-Exp, 2,925 in SSCI and 1,638 in A&HCI), out of which 61 are Croatian (38 in SCI-Exp, 13 in SSCI and 14 in A&HCI)<sup>1</sup>. Until 2007, only 16 of Croatian scientific journals were indexed in WoS citation indexes (11 in SCI-Exp, 3 in SSCI and 2 in A&HCI), while the rest of them were added after 2007 and Thomson Reuters decision about more progressive inclusion of new titles into WoS citation indexes.

Considering the world science in general, Croatia falls under the countries which are on the so-called scientific periphery, which are characterized by a small scientific community and a low share of GDP for research and development expenditures (Andreis and Jokić, 2008; Maričić 2007; Maričić et al. 2000; Pulišelić and Petrak 2006). According to the Eurostat report, in 2010 Croatia had

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<sup>1</sup> Some journals in WoS have been indexed in 2 citation indexes.

7.100 researchers (full-time equivalents (FTE)) (Eurostat R&D personnel, 2012), and in the same year it has invested only 0.73% of its GDP into the research and development sector (Eurostat R&D expenditure, 2012). According to the analysis by the Essential Science Indicators<sup>2</sup>, and bearing in mind absolute figures, Croatia is well placed considering the number of papers (N=23,251, 48<sup>th</sup> place out of 147) and citation (N=130,886, 48<sup>th</sup> place out of 147). However, when these two measures are put into ratio, Croatia falls onto the low 115<sup>th</sup> place which points to a low average citation rate (5.63) of Croatian papers.

## **(Inter)national orientation of social science and arts and humanities journals**

Previous researches have shown that a great part of the output in many social sciences (SS) and arts and humanities (A&H) fields is primarily oriented at national or regional topics and the local public, and they tend to publish their research in regional or national journals and monographs (Broadus, 1971; Hicks, 1999; Kyvik, 1988; Nederhof et al., 1989). According to the analysis of geographical distribution of publishing authors for all the journals indexed in the year 2002 in Thomson Reuters Citation Indexes, it was determined that journals in all SS and A&H disciplines tend to have much stronger national orientation than those in science disciplines (Moed, 2005). However, some research shows that some SS and A&H disciplines have a higher international orientation than others, such as, for example, philosophy, anthropology and psychology (Cullars, 1998).

When talking about national or international orientation of journals, the language of publishing is an important indicator of its scientific visibility. English has become the *lingua franca* in research literature and in the last two decades many journals have transitioned from the "national" to the "transnational" model and replaced their native languages with English (Zitt et al., 1998). Among them, there are also a few Croatian biomedical journals, and Pulišelić and Petrak (2006) showed that this transition, in the case of six Croatian biomedical journals which have changed their publishing language into English, had a positive effect on their international visibility.

What could a regional importance of Croatian SS and A&H journals mean? Croatia shares joint cultural, historical and political heritage with other countries from the former Yugoslavia. Similar languages and topics of mutual interest to the both SS and A&H scientific communities, and known and acknowledged scientific communities, make Croatian journals potentially attractive to the scientist from the South-East Europe region.

For the purpose of this research, SSCI journals were divided into two groups. First group is consisted of the SS journals related to medicine and health (SSM). With regard to the topics they cover, these journals are closer to medicine and health than to SS, and in bibliometric analyses they are often separated into a special group so as not to skew the data for the SS field as a whole (Moed, 2005). The other SS journals were placed into the second group (SSO). A&HCI journals composed a third, arts and humanities group (AH).

The aim of this research is to analyse (inter)national orientation of Croatian SS and AH journals indexed in SSCI and A&HCI in 2008, 2009 and 2010. Research problems are as follows: what is the difference between three (AH, SSM and SSO) groups of Croatian journals indexed in the SSCI and A&HCI according to the language of the paper, country of origin of the author, and how are

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<sup>2</sup> Essential Science Indicators<sup>SM</sup> has been updated as of January 1, 2012 to cover a 10-year + 10-month period, January 1, 2001 – October 31, 2011.

Croatian journals attractive to scientists from the South-East Europe region (former Yugoslavia countries) and scientifically most prominent countries?

## Research methodology

Papers published in the year 2008, 2009 and 2010 in Croatian scientific journals which were indexed in Web of Science's SSCI or A&HCI citation indexes were taken as the subject of this research. The years 2008, 2009 and 2010 were taken as the period in which productivity was to be observed because these are only complete years in which all the mentioned Croatian scientific journals were indexed in WoS. As a result of that, 25 scientific journals in total were analysed, out of which 14 were indexed in A&HCI and 13 in SSCI (four journals have been indexed in two citation indexes) (Table 1).

In the case of double indexing (Table 1), the classification of journals by the Croatian Ministry of Science, Education and Sports (MSES) from 2009 was consulted in order to place those journals into a single scientific field. Therefore, for the needs of this paper, 14 journals have been placed into the field of A&H (journals *Govor* and *Jezikoslovlje* were indexed in both A&HCI and SSCI, but were placed into AH group of journals). Out of 11 journals which cover the SS fields, 2 are indexed in both SSCI and SCI-Exp. These are *Kinesiology* and *Psychiatria Danubina*, journals which cover the subfields of rehabilitation and sports science, and psychiatry respectively. For the reason mentioned before, these SS journals which are more related to medicine and health have been separated into a different group from the other social sciences journals. To the SSM field a journal *Collegium antropologicum* was also added. Even though it is categorized in the anthropology and with it to the SS, in practice it covers more the field of medical sciences (Jokić et al., 2009). Additional reason for separating these three journals from the other SS journals is the fact that the MSES has classified *Psychiatria Danubina* and *Collegium antropologicum* into the field of biomedicine and health, and not SS. The analysed corpus of journals represents around 20% of all Croatian SS and A&H journals (Macan and Stojanovski, 2008).

The data on the papers published in the aforementioned journals have been downloaded from WoS on November 6<sup>th</sup> 2011. The database was searched by the title of the journal, and the results were later filtered according to the year of publication. These results have been exported for further processing and analysis. In order to analyse the productivity of co-authorship on the level of countries, the data on the addresses of the authors were uniformed, because the same country has been often noted differently in more different languages, and in some cases, when the WoS didn't have data on the addresses of the authors, the originals of the journals were consulted so these information, if they were available, were added.

Using Zitt and Bassecouard's (1998) list of bibliometric indicators for the analysis of the national or international orientation of a journal and according to the aim of this research, following measurements were chosen: the language of the title and the paper, national distribution of authors and co-authorship structure. The INO indicator was used for the analysis of journals' openness to foreign authors as well. INO indicator is defined as a journal's share of papers from the most represented country in relation with the total number of published papers in the same journal. The higher the INO indicator is, journal is more nationally oriented, while the international orientation is stronger when the value of the INO indicator is lower (Moed, 2005).

Twenty-five Croatian SS and A&H journals can be found in 21 different subject categories of the WoS. The most numerous subject category is philosophy with four journals (Table 1). The highest number of journals comes from the Croatian capital Zagreb – 19 of them, and this amounts to 76% of all Croatian SS and A&H journals indexed in WoS. Two non-university towns that appear as the head offices of a publisher are Jastrebarsko and Hrvatski Leskovac - small towns placed in the suburbia of the Croatian capital Zagreb. Dubrovnik and Zadar are the only Croatian university towns not represented by any of its SS or A&H journals in WoS<sup>3</sup>.

Statistical analyses have been conducted on the five types of documents which usually carry relevant scientific information: articles, review, proceedings papers, letters and notes. Descriptive statistics was used for the data analysis: frequencies, percentages and means. For the visualisation of the international cooperation programs Bibexcel and Pajek were used.

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<sup>3</sup> Even though Zadar is mentioned in the title of journal *Radovi Zavoda za povijesne znanosti HAZU u Zadru*, the head office of its publisher is located in Zagreb.

Journal title	Scientific field	WoS citation index	Start year in WoS	Head office of the publisher	Number of published articles				Subject category in the WoS
					2008	2009	2010	TOTAL 2008-2010	
Arti musices	AH	A&HCI	2008	Zagreb	8	13	9	30	music
Croatian journal of philosophy	AH	A&HCI	2007	Hrvatski Leskovac	17	14	17	48	philosophy
Filozofska istraživanja	AH	A&HCI	2008	Zagreb	59	49	44	152	philosophy
Govor	AH	A&HCI and SSCI	2007	Zagreb	11	6	7	24	linguistics; language and linguistics
Hrvatski filmski ljetopis	AH	A&HCI	2008	Zagreb	56	33	34	123	film, radio, television
International Review of the Aesthetics and Sociology of Music	AH	A&HCI	1975	Zagreb	8	12	16	36	music
Jezikoslovlje	AH	A&HCI and SSCI	2007	Osijek	7	8	7	22	linguistics; language and linguistics
Književna smotra	AH	A&HCI	2007	Zagreb	29	56	37	122	literature, Slavic
Prolegomena	AH	A&HCI	2008	Zagreb	7	10	10	27	philosophy
Prostor	AH	A&HCI	2007	Zagreb	18	32	33	83	architecture
Radovi Zavoda za povijesne znanosti HAZU u Zadru	AH	A&HCI	2007	Zagreb	12	10	16	38	history
Synthesis Philosophica	AH	A&HCI	2005	Zagreb	29	25	26	80	philosophy
Vjesnik za arheologiju i povijest dalmatinsku	AH	A&HCI	2007	Split	9	7	0	16	archeology
Život umjetnosti	AH	A&HCI	2007	Zagreb	16	13	13	42	art
Društvena istraživanja	SSO	SSCI	1994	Zagreb	53	53	52	158	social issues; sociology
Ekonomska istraživanja = Economic research	SSO	SSCI	2007	Pula	36	32	51	119	economics
Ljetopis socijalnog rada	SSO	SSCI	2007	Zagreb	20	26	18	64	social work
Odgojne znanost = Educational Sciences	SSO	SSCI	2007	Zagreb	27	30	29	86	education and educational research
Revija za socijalnu politiku	SSO	SSCI	2006	Zagreb	25	13	22	60	social issues
Sociologija i prostor	SSO	SSCI	2007	Zagreb	16	14	19	49	sociology
Suvremena psihologija	SSO	SSCI	2007	Jastrebarsko	15	25	13	53	psychology, clinical
Zbornik radova Ekonomskog fakulteta u Rijeci = Proceedings of Rijeka Faculty of Economics	SSO	SSCI	2007	Rijeka	13	14	11	38	business; economics
Collegium antropologicum	SSM	SSCI	1980	Zagreb	271	277	355	903	anthropology
Kinesiology	SSM	SSCI and SCI-EXP	2008	Zagreb	19	21	21	61	rehabilitation, sport sciences
Psychiatria Danubina	SSM	SSCI and SCI-EXP	2007	Zagreb	83	121	156	360	psychiatry

Table 1: Basic data on the analysed journals

## Research results and discussion

### *Language*

First bibliometric indicator that was analysed is the language of the journal, i.e. title of the journal and language of the journal's papers. The results showed that most of the Croatian AH and SSO journals have their titles in Croatian (N=17). Only SSM journals do not have their titles in Croatian – two journals have a title in Latin and one in English. (Table 2).

Group of journals	Language of journal's title in WoS	Number of journals	%
AH journals	Ancient Greek	1	7.1
	Croatian	9	64.3
	English	2	14.3
	Latin	2	14.3
	<b>Total AH journals</b>	<b>14</b>	<b>100.0</b>
SSM journals	English	1	33.3
	Latin	2	66.7
	<b>Total SSM journals</b>	<b>3</b>	<b>100.0</b>
SSO journals	Croatian	5	62.5
	Croatian and English	3	37.5
	<b>Total SSO journals</b>	<b>8</b>	<b>100.0</b>
<b>All journals</b>		<b>25</b>	<b>100.0</b>

Table 2. Language of the journal's titles in Web of Science database

By analysing the language of papers, the following results were obtained. All the papers published in Croatian SSM journals in 2008, 2009 and 2010 have been published in foreign languages, out of which the majority in English (99.2%). Around 65% of papers in SSO and AH journals have been written in Croatian, while only every 3<sup>rd</sup> paper was written in some foreign language. Out of them, the English language is absolutely dominant (Table 3). The analysed data show that, on average, SSM journals recognize more the importance of publishing papers in foreign languages, especially English, while a majority of papers of SSO and AH journals are still published in Croatian.

Group of journals	Journal title	Total no of papers 2008 -2010	Croatian language		English language		Other languages	
			No of papers	% of papers	No of papers	% of papers	No of papers	% of papers
AH journals (2008-2010)	Arti musices	30	27	90.0	3	10.0	0	0.0
	Croatian journal of philosophy	48	0	0.0	48	100.0	0	0.0
	Filozofska istraživanja	152	152	100.0	0	0.0	0	0.0
	Govor	24	22	91.7	2	8.3	0	0.0
	Hrvatski filmski ljetopis	123	122	99.2	1	0.8	0	0.0
	International Review of the Aesthetics and Sociology of Music	36	0	0.0	30	83.3	6	16.7
	Jezikoslovlje	22	7		14		1	
	Književna smotra	122	122	100.0	0	0.0	0	0.0
	Prolegomena	27	6	22.2	15	55.6	6	22.2
	Prostor	83	43	51.8	40	48.2	0	0.0
	Radovi Zavoda za povijesne znanosti HAZU u Zadru	38	38	100.0	0	0.0	0	0.0
	Synthesis Philosophica	80	9	11.3	53	66.3	18	22.4
	Vjesnik za arheologiju i povijest dalmatinsku	16	0	0.0	16	100.0	0	0.0
	Život umjetnosti	42	2	4.8	40	95.2	0	0.0
	<b>Total AH journals</b>	<b>843</b>	<b>550</b>	<b>65.2</b>	<b>262</b>	<b>31.1</b>	<b>31</b>	<b>3.7</b>
SSO journals (2008-2010)	Društvena istraživanja	158	128	81.0	30	19.0	0	0.0
	Ekonomska istraživanja	119	34	28.6	85	71.4	0	0.0
	Ljetopis socijalnog rada	64	55	86.0	9	14.0	0	0.0
	Odgojne znanost	86	53	61.6	22	25.6	11	12.8
	Revija za socijalnu politiku	60	51	85.0	9	15.0	0	0.0
	Sociologija i prostor	49	38	77.6	11	22.4	0	0.0
	Suvremena psihologija	53	46	86.8	7	13.2	0	0.0
	Zbornik radova Ekonomskog fakulteta u Rijeci	38	0	0.0	38	100.0	0	0.0
	<b>Total SSO journals</b>	<b>627</b>	<b>405</b>	<b>64.6</b>	<b>211</b>	<b>33.6</b>	<b>11</b>	<b>1.8</b>
SSM journals (2008-2010)	Collegium antropologicum	903	0	0.0	903	100.0	0	0.0
	Kinesiology	61	0	0.0	61	100.0	0	0.0
	Psychiatria Danubina	360	0	0.0	349	97.0	11	3.0
	<b>Total SSM journals</b>	<b>1324</b>	<b>0</b>	<b>0.0</b>	<b>1313</b>	<b>99.2</b>	<b>11</b>	<b>0.8</b>

Table 3: Number and percentage of papers published in different languages in the analysed journals for the year 2008, 2009 and 2010

### *National distribution of authors*

When the national distribution of authors of papers was analysed on the country level, the data showed that Croatia is the most represented individual country in all three groups of journals – among AH journals in 67.5% papers (N=569) at least one of the authors comes from Croatia; among SSO journals in 75.1% of papers (N=471), and SSM journals 68.9% (N=912) (Table 4). After Croatia, the single most represented countries in AH journals are the USA (N=45; 5.3%) and Serbia (N=29; 3.4%); in SSO journals Slovenia (N=59; 9.4%) and Serbia (N=23; 3.7%), and finally in SSM journals Bosnia and Herzegovina (N=113; 8.5%) and Slovenia (N=108; 8.2%).

In order to take a closer look at the attractiveness of Croatian journals to the scientists in the region and those coming from the scientifically most prominent countries, the authors divided scientists' countries of origin into 4 different groups: Croatia, the region (former Yugoslavia countries



without Croatia), top 20 countries in the world's science<sup>4</sup> and the rest of the world. The results showed that the majority of the papers single or co-authored by foreign scientists in SSO (N papers=103; 16.4% of all published papers in SSO journals) and SSM journals (N papers=272; 20.5%) are coming from the authors from the region. Only Croatian AH journals attracted relatively more authors from the top 20 countries (N=150; 17.8%) (Table 4), which could partly be a consequence of strong international orientation of certain AH journals (see Table 6).

All three groups of Croatian journals have a pronounced orientation toward Croatian scientists. Besides them, Croatian journals were also attractive to the scientists from the region and scientifically most prominent countries.

Group of journals	AH journals		SSO journals		SSM journals	
Total No of papers	843		627		1324	
Authors (with regards to their country of origin)	No of papers	% of papers	No of papers	% of papers	No of papers	% of papers
Croatian authors	569	67.5	471	75.1	912	68.9
Authors from the region	73	8.7	103	16.4	272	20.5
Authors from the top 20 countries	150	17.8	47	7.5	195	14.7
Authors from the rest of the world	53	6.3	41	6.5	122	9.2
No address	9	1.1	2	0.3	1	0.08

Table 4: Number and percentage of all papers with regards to the country of origin of the authors and their share in the total number of published papers for the three analysed groups of journals

In the same manner the co-authored papers were analysed. Results showed that, on the country level, Croatia is again the single most represented country in all three groups of journals (Table 5). After Croatia, among AH journals, follow Serbia (N=5; 6.2%). When looking at SSO and SSM journals, the majority of co-authored papers, after Croatia, come again from the regional countries – Slovenia (SSO N=36; 10.3%; SSM N=78; 6.5%), Bosnia and Herzegovina (SSM N=108; 9.0%) and Serbia (SSO N=15; 4.3%)

By focusing further analysis of all the co-authored papers on scientists' countries of origin group level, similar results were obtained. Again it is shown that in SSO and SSM journals, the largest number of co-authored papers comes from the authors from the region (Table 5). In AH journals there is an equally low number of co-authored papers by the authors from the region (N=8; 9.9%) with those from the top 20 (N=9; 11.1%) and the rest of the world (N=6, 7.4%) (Table 5). Obtained results show that a certain amount of regional orientation of the Croatian SS journals is coming from the scientific cooperation with neighbouring countries as well.

Group of journals	AH journals		SSO journals		SSM journals	
Total No of co-authored papers	81		350		1200	
Authors (with regards to their country of origin)	No of papers	% of total papers	No of papers	% of total papers	No of papers	% of total papers
Croatian authors	63	77.8	272	77.7	878	73.2
Authors from the region	8	9.9	61	17.4	234	19.5
Authors from the top 20	9	11.1	33	9.4	166	13.8
Authors from the rest of the world	6	7.4	21	6.0	99	8.3

4 According to Thomson Reuters Essential Science Indicators top 20 countries by citations are (by rank): USA, Germany, England, Japan, France, Canada, China, Italy, the Netherlands, Australia, Spain, Switzerland, Sweden, South Korea, Belgium, India, Scotland, Denmark, Israel and Brazil (20.2.2012).

Table 5: Number and share of co-authored papers in the total number of published papers with regards to the country of origin of the author for the three analysed groups of journals

### *International co-authorship*

Internationally co-authored papers whose authors come from at least two different countries were also analysed<sup>5</sup>. Out of the total 81 co-authored papers of the Croatian AH journals, only 5 of them had international co-authorship. This makes the share of internationally co-authored papers among Croatian AH journals only 0.6% in the total number of published papers. That is lower than the world average, which was around 2.0% in 2002 for A&H journals (Larivière et al., 2004).

Among Croatian SSO journals there are 34 internationally co-authored papers (5.4% of all papers of the Croatian SSO journals), but this is a half of the world average for SS journals which is around 10.0% (Larivière et al., 2004). Out of 34 internationally co-authored papers, 21 of them include at least one author from Croatia. Figure 1 shows the network of international co-authorships in Croatian SSO journals for the period 2008-2010. The size of circles depends on number of internationally co-authored papers, while the thickness of lines which are connecting two countries depends on the number of papers which are co-authored by authors from those two countries.

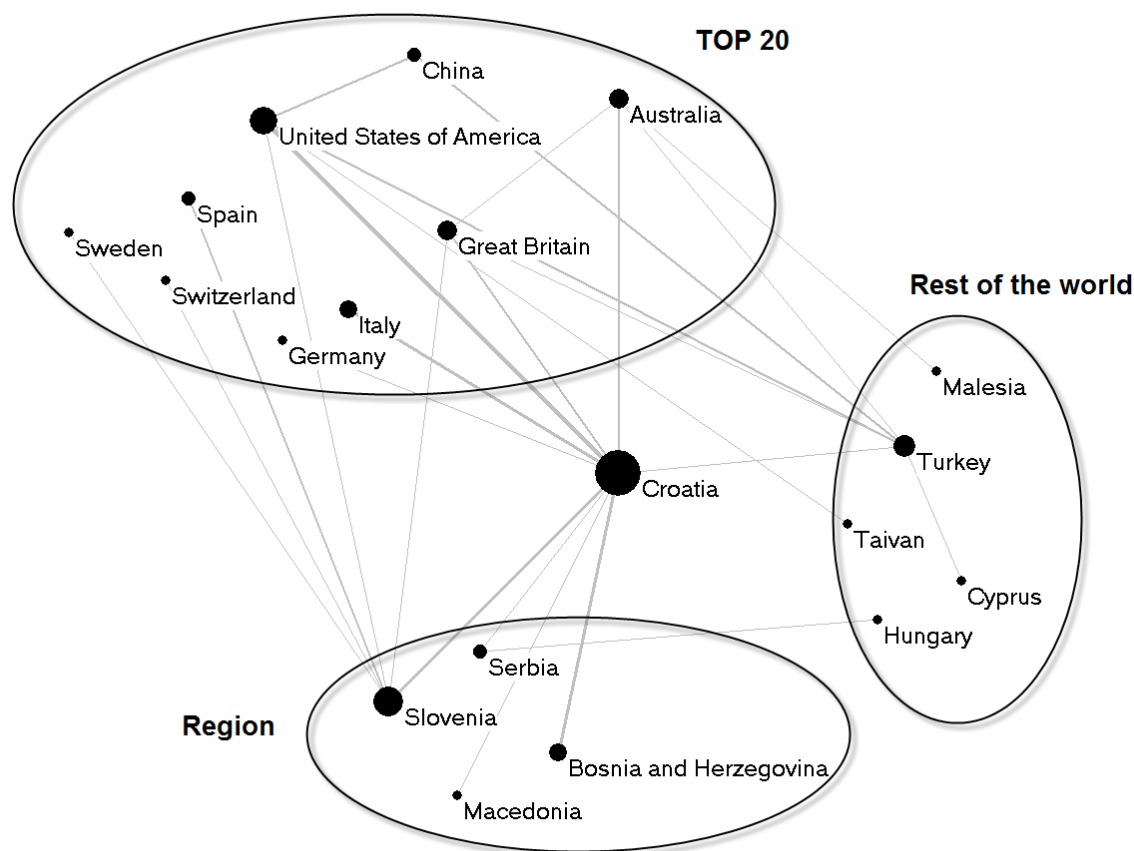


Figure 1: Network of international co-authorships of Croatian SSO journals in 2008, 2009 and 2010

<sup>5</sup> Papers written by one author which has two addresses from two different countries were not taken into consideration.

International co-authorship on papers is the most common in Croatian SSM journals (Figure 2), where 165 papers (12.5% of all the papers of Croatian SSM journals) were the result of co-authorship of authors coming from 2 or more different countries. Figure 2 shows that the highest number of internationally co-authored papers includes Croatia (N=128; 77.6%), followed by Bosnia and Herzegovina (N=70; 42.4%), and Slovenia (N=18; 10.9%). Figure 2 also shows that the strongest co-authorships in Croatian SSM journals are established between authors from Croatia and Bosnia and Herzegovina (N=65; 39.4%), Croatia and Slovenia (N=12; 7.3%) and Croatia and the USA (N=10; 6.1%).

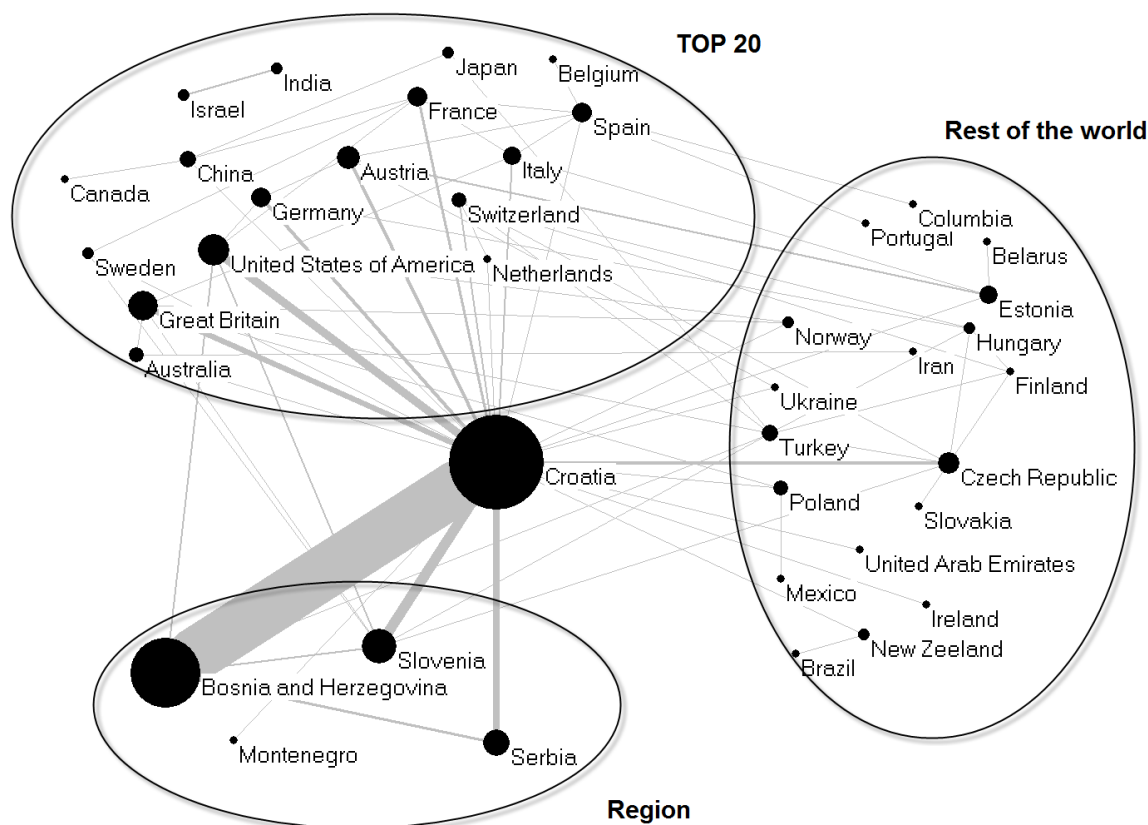


Figure 2: Network of international co-authorships of Croatian SSM journals in 2008, 2009 and 2010

## INO indicator

To analyse the national distribution of authors on a journal level the indicator of national orientation of journals (INO) was used (Moed, 2005). Table 6 shows that 4 out of 14 Croatian AH journals are internationally oriented ( $INO < 34$ ), which means that in those journals no country has the vast majority in the published papers (the value of INO indicator shows the percentage of the most represented country by the number of published papers in certain journal). Three out of 4 Croatian AH journals which cover field of philosophy are strongly internationally oriented, and this confirms previous researches and the thesis that field of philosophy has a higher international orientation than other SS and A&H disciplines (Cullars, 1998). Fourth Croatian philosophical journal (*Filozofska istraživanja*) is markedly nationally oriented, what could be explained with the fact that it publishes

exclusively papers in Croatian language. Only strongly internationally oriented Croatian AH journal not covering field of philosophy is *International Review of the Aesthetics and Sociology of Music* (INO=27.8), which covers field of music. Its strong international orientation could be partly explained with the fact that this journal has been indexed in WoS for 38 years and had enough time to transform from a national to an international journal, as its title suggests. The majority of AH journals (N=10) have INO indicators in the range between 79 and 90 with Croatia as the most represented country of origin of authors, which means that those journals have a more pronounced national orientation.

Within the group of SSO journals, only the journal *Zbornik radova Ekonomskog fakulteta u Rijeci* has the INO indicator lower than 50 (INO=39.5), while all the other journals are more nationally oriented. The same journal is also the only SSO journal where the most represented country of origin of authors isn't Croatia, but Slovenia. The rest of Croatian SSO journals are nationally oriented, even the journal *Suvremena psihologija* (INO=86.8) covering field of psychology, which is, according to Cullars, more internationally oriented field of science (Cullars, 1998).

Two out of 3 Croatian SSM journals are internationally oriented (*Kinesiology* - INO=26.2 and *Psychiatria Danubina* - INO=36.5). The only SSM journal which results how strong national orientation is the journal *Collegium antropologicum* (INO=85.1), covering field of anthropology – field which along with philosophy and psychology, according to Cullars, has in general higher international orientation than other AH and SS fields (Cullars, 1998). Although *Collegium antropologicum* publishes papers exclusively in English, this shows that the language solely is not sufficient reason for the journal to be more internationally oriented.

Scientific field	Journal title	INO indicator	Subject category in WoS	The most represented country
<b>AH journals</b>	Prolegomena	25.9	philosophy	Croatia
	International Review of the Aesthetics and Sociology of Music	27.8	music	United States of America
	Croatian journal of philosophy	29.2	philosophy	United States of America
	Synthesis Philosophica	33.8	philosophy	Croatia
	Jezikoslovlje	54.5	linguistics; language and linguistics	Croatia
	Život umjetnosti	54.8	art	Croatia
	Govor	79.2	linguistics; language and linguistics	Croatia
	Književna smotra	79.5	literature, Slavic	Croatia
	Prostor	81.9	architecture	Croatia
	Arti musices	83.3	music	Croatia
	Hrvatski filmski ljetopis	83.7	film, radio, television	Croatia
	Vjesnik za arheologiju i povijest dalmatinsku	87.5	archeology	Croatia
	Filozofska istraživanja	88.2	philosophy	Croatia
	Radovi Zavoda za povijesne znanosti HAZU u Zadru	89.5	history	Croatia
<b>SSO journals</b>	Zbornik radova Ekonomskog fakulteta u Rijeci	39.5	business; economics	Slovenia
	Odgojne znanost	58.1	education and educational research	Croatia
	Ekonomska istraživanja	62.2	economics	Croatia
	Ljetopis socijalnog rada	82.8	social work	Croatia
	Revija za socijalnu politiku	85.0	social issues	Croatia
	Sociologija i prostor	85.7	sociology	Croatia
	Suvremena psihologija	86.8	psychology, clinical	Croatia
	Društvena istraživanja	89.9	social issues; sociology	Croatia
<b>SSM journals</b>	Kinesiology	26.2	rehabilitation, sport sciences	Croatia
	Psychiatria Danubina	35.6	psychiatry	Croatia
	Collegium antropologicum	85.1	anthropology	Croatia

Table 6: INO indicators and the most represented country of the analysed Croatian social and humanities journals for 2008, 2009 and 2010

## Conclusion

In the past five years, due the changes of editorial policy of Thomson Reuters, the number of Croatian social sciences (SS) and arts and humanities (A&H) journals in the WoS has increased as high as 5 times – from 5 to the current 25 journals. By aiming to answer the question how open are these Croatian journals to the international scientific community, selected bibliometric indicators were used for the analyses: language of the journal title, language of the paper, national distribution of authors, co-authorship structure and INO indicator. For the purpose of this research journals were grouped into three categories: SS journals related to medicine and health (SSM), other SS journals (SSO) and arts and humanities journals (AH). SSM journals are expected to have bibliometric characteristics closer to medicine and health than to rest of the social science journals, and for this reason they were separated into a special group.

The results of this research showed strong orientation toward Croatian authors regardless of the three analysed groups. Croatia as the country of origin of the authors of the published papers is the most represented in all three groups of journals, both in papers with single authors, and co-authored papers. Besides the largest majority of Croatian authors, among SSO and SSM journals follow the papers which are authored by authors from neighboring, former Yugoslavia countries. Unlike them, AH journals are more oriented to the leading scientific countries of the world.

Despite the strong national orientation regarding the country of origin of the author in all three categories, SSM journals are more internationally oriented then others considering the language of the journals' title and papers. These journals published all of their papers in non-native language: predominantly in English and less in German and the titles are in Latin and English.

Analysis on the journal level showed that four journals are more strongly internationally oriented than others, i.e. INO indicator was less than 30. These are *Kinesiology* from the SSM category of journals, and three AH journals - *International Review of the Aesthetics and Sociology of Music*, *Prolegomena* and *Croatian journal of philosophy*, where latter two are Croatian philosophical journals. The field of philosophy tends to be more internationally oriented, and this was again confirmed by this research. However bibliometric analysis of the great majority of Croatian A&H and SS journals confirmed strong national orientation typical for the A&H and SS field.

In the following period, it is to be expected that being included into the WoS citation indexes will help Croatian journals to become more open to the world scientific community, increasing the share of authors from abroad, especially the region, as well as in increasing the share of co-authored papers, which can, along with the possible shift to English as the language of publication, increase the possibility that papers in those journals will be cited.

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