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"Sustainable development" as a label within business studies: What can be learned from a bibliometric analysis?

Zastupljenost održivog razvoja u znanstvenim radovima iz ekonomije i poslovne ekonomije: što nam govori bibliometrijska analiza?

Abstract

In a modern society, the issues of sustainable development have evolved on different levels, from the new global frameworks over governmental policies to the new business models. In the 1980s, the term sustainable development emerged from the relationship between preserving the planet and meeting human needs (IUCN, 1980). The general idea behind the concept of sustainable development is to meet the needs of the present generation without compromising the ability of future generations to meet their own needs (United Nations General Assembly, 1987). As one of the main challenges in economics and business, the concept of sustainable development has also emerged in the wide area of business economics. The aim of this paper is to provide an extensive literature overview dealing with the concept of sustainable development within a field of business economics. For the purpose of the analysis a bibliometric approach with multiple correspondence analyses has been used on the Web of Science Core Collection database for the observed period of ten years. The results illustrate the importance of sustainable development as a topic, as well as wide range of approaches and variety of sub-topics linked to the concept of sustainable development in business and economics literature.

Keywords: sustainability, sustainable development, business economy, bibliometric analysis
JEL classification: O1, O2, C1, C3

Sažetak

U suvremenom društvu pitanja održivog razvoja razvijala su se na različitim razinama, od novih globalnih okvira, preko politika vlada do novih poslovnih modela. U 1980-ima pojam održivi razvoj nastao je iz međuodnosa očuvanja planeta i ispunjavanja ljudskih potreba (IUCN, 1980). Opća ideja koncepta održivog razvoja je zadovoljavanje potreba sadašnje generacije, bez ugrožavanja sposobnosti budućih generacija da zadovolje svoje potrebe (Opća skupština Ujedinjenih naroda, 1987.). Kao jedan od glavnih izazova u ekonomiji i poslovanju, pojam održivog razvoja pojavio se i na širokom području poslovne ekonomije. Cilj ovog rada je pružiti pregled opsežne literature, koja se bavi konceptom održivog razvoja u području poslovne ekonomije. U svrhu analize, korišten je bibliometrijski pristup s višestrukim korespondentnim analizama na bazama baze podataka *Web of Science Core Collection database* za promatrano razdoblje od deset godina. Rezultati ukazuju na važnost održivog razvoja kao teme, kao i na širok raspon pristupa i raznolikosti podtema koje su povezane s konceptom održivog razvoja u poslovnoj i ekonomskoj literaturi.

Ključne riječi: održivost, održivi razvoj, poslovna ekonomija, bibliometrijska analiza
JEL klasifikacija: O1, O2, C1, C3

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1. Introduction

Over the past 40 years, what began as a simple concern for the environment has matured into a widespread apprehension that is causing people from government to private enterprise to take action (Higgins, 2013). The World Summit on Sustainable Development (WSSD) in Johannesburg in 2002 was a landmark of forging partnerships between the United Nations, governments, business and NGOs to gather resources for addressing global environment, health and poverty challenges. International drivers such as the UN Millennium Development Goals and the UN Decade of Education for sustainable development 2005-2014 shape the reality of sustainable development today (Elkadi, 2010).

Academic and corporate interest on sustainable development has also risen considerably in recent years. Some authors consider sustainability as a synonym for sustainable development, and other authors see sustainability as a process which leads to the goal of sustainable development. Kahn (1995) noted that the paradigm of 'sustainable development' rests on three conceptual pillars. These pillars are 'economic sustainability', 'social sustainability', and 'environmental sustainability'. In the business economics, it became convenient to think of sustainability as a "triple bottom line" (Sartori, Latrônico & Campos, 2014). For Elkington (1997), creator of the term "Triple Bottom Line", sustainability is the balance between the mentioned three pillars: environmental, economic and social.

In the contemporary literature from the field of business economics, many questions about sustainability arise. One of the most important is the question about the relation between economic growth and sustainability: are economic growth and sustainability mutually exclusive (Higgins, 2014)? Beside many questions, there are also a lot of proposed approaches to the concept of sustainability. The approaches depend on the scientific field but also on the field of application.

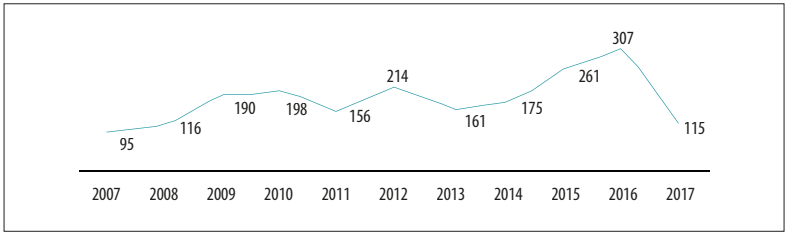
The main goal of this paper is to provide an inside view into the topic of sustainable development from the perspective of the academic literature in the field of business economics. In order to provide the map of the research topics, in combination with literature content analysis (Duriau, Reger & Pfarrer, 2007; Khoo, Jin-Cheon & Jaidka, 2011; Seuring & Gold, 2012), bibliometrics analysis and methods of multiple correspondences have been used (Thomson Reuters, 2008; Dabic, González-Loureiro & Furrer, 2014; Dabic, González-Loureiro & Harvey, 2015; López-Duarte, González-Loureiro, Vidal-Suárez & González-Díaz, 2016; Gonzalez-Loureiro, Sousa & Pinto, 2017).

2. Methodological procedure and findings

Based on the goals of this paper, we defined the criteria for selecting journals, papers and content analysis. Search was performed by using quotation string "sustainable development" in titles, keywords, and abstracts in the papers published in the journals from the field of business economics. Sample of journals from the field of business economics was gathered through one of the most relevant scientific citation databases Web of Science Core Collection database, which included indexes: SCI-EXPANDED, SSCI, A & HCI, CPCI-S, CPCI-SSH, BKCI-S, BKCI-SSH, ESCI, CCR-EXPANDED, and IC.

This procedure has returned a total of 1988 papers for a defined period of ten years. Generating the

Figure 1 Number of publications per year



Source: the authors.

number of publication per year in the period from 2007 to July 2017 demonstrates the development and importance of the field in question within the studies from the field of business economics. Each year academics published on average more than 181 papers on the topic of sustainable development (Figure 1).

Most relevant sources were some of the highly cited journals with high impact factors. *Ecological Economics* with 127 papers and impact factor 2.965 was the most relevant journal in this research topic. Some of the other also relevant sources/journals were: *Business strategy and the environment* (96), *Corporate social responsibility and environmental management* (70), *Amfiteatru economic* (60) and *Journal of business ethics* (54) with impact factors respectively 3.076, 2.852, 0.584, and 2.354. Journals with highest impact factors and a significant number of papers in the sample were also: *Tourism management* (4.707), *Supply chain management-an international journal* (4.072), *Energy Economics* (3.199) and *European journal of operational research* (3.297). The most influential journals from the perspective of sustainable development topic are listed in the table below (Table 1).

Counting the number of citations, most influential authors in the field for the period 2007-2017 are: Jayaraman, V. (427), Klassen, R. (388), Linton, J. D. (388), Zavadskas, E. K. (337), Geels, F. W. (251) and Schot, J. (251). Other authors with significant citations are listed in the table below (Table 2).

First of the three most influential authors, Jayaraman, Klassen and Linton (2007) have published a paper titled "Sustainable supply chains: An introduction", which is now counting 388 citations. Paper discusses the globalization of business processes and its sustainability regarding several phases:

Table 1 List of most influential sources/journals

Journal	F	Impact factor
ECOLOGICAL ECONOMICS	127	2,965
BUSINESS STRATEGY AND THE ENVIRONMENT	96	3,076
CORPORATE SOCIAL RESPONSIBILITY AND ENVIRONMENTAL MANAGEMENT	70	2,852
AMFITEATRU ECONOMIC	60	0,564
JOURNAL OF BUSINESS ETHICS	54	2,354
TECHNOLOGICAL AND ECONOMIC DEVELOPMENT OF ECONOMY	46	2,818
ACTUAL PROBLEMS OF ECONOMICS	42	N/A
FUTURES	39	1,802
TECHNOLOGICAL FORECASTING AND SOCIAL CHANGE	36	2,625
TRANSFORMATIONS IN BUSINESS & ECONOMICS	28	0,462
INTERNATIONAL ENVIRONMENTAL AGREEMENTS-POLITICS LAW AND ECONOMICS	27	1,651
WORLD DEVELOPMENT	25	2,848
TOURISM MANAGEMENT	22	4,707
MARKETING AND MANAGEMENT OF INNOVATIONS	19	0,567
AFRICAN JOURNAL OF BUSINESS MANAGEMENT	18	0,220
EUROPEAN JOURNAL OF OPERATIONAL RESEARCH	18	3,297
REGIONAL STUDIES	18	2,068
SYSTEMS RESEARCH AND BEHAVIORAL SCIENCE	18	1,034
MANAGEMENT DECISION	17	1,396
AGRICULTURAL ECONOMICS-ZEMEDELSKA EKONOMIKA	16	0,751
ENERGY ECONOMICS	15	3,199
ENVIRONMENTAL & RESOURCE ECONOMICS	14	1,582
INTERNATIONAL JOURNAL OF CONSUMER STUDIES	14	1,510
INTERNATIONAL JOURNAL OF STRATEGIC PROPERTY MANAGEMENT	14	0,710
INZINERINE EKONOMIKA-ENGINEERING ECONOMICS	14	1,160
SYSTEMIC PRACTICE AND ACTION RESEARCH	14	0,677
E & M EKONOMIE A MANAGEMENT	13	0,880
JOURNAL OF BUSINESS ECONOMICS AND MANAGEMENT	13	0,968
SUPPLY CHAIN MANAGEMENT - AN INTERNATIONAL JOURNAL	13	4,072
ACCOUNTING AUDITING & ACCOUNTABILITY JOURNAL	12	2,732

Source: the authors.

Product design, Manufacturing byproducts, Byproducts produced during product use, Product life cycle extension, Product end of life cycle, and Recovery process at the end of product life cycle. Authors emphasize optimization of supply chains aiming to generate highest added value considering external effects of businesses activities.

Jayaraman, Hsu, Tan and Zailani (2013) coauthored another paper titled "Supply chain drivers that foster the development of green initiatives in an emerging economy", which counted 39 citations. That paper is promoting organizational sustainability in the emerging economies and discovers drivers that motivate firms to adopt a green supply chain.

Zavadskas, also one of the most influential authors has coauthored a total of six papers on the topic of sustainability. In Zavadskas and Turskis (2011) authors emphasize an increasing importance of operational research and sustainable development approach in business decisions while other four papers co-authored by Zavadskas (2008; 2010; 2012; 2013; 2015) deal with sustainability in construction and buildings. Zavadskas et al. (2015) was the most recent paper regarding tourism titled "Sustainable tourism: a comprehensive literature review on frameworks and applications".

Geels and Schot (2008) have published a paper titled "Strategic niche management and sustainable innovation journeys: theory, findings, research agenda, and policy", discussing the framework necessary for technological advancement where new, more sustainable technologies, replace old ones which have so far been causing pollution.

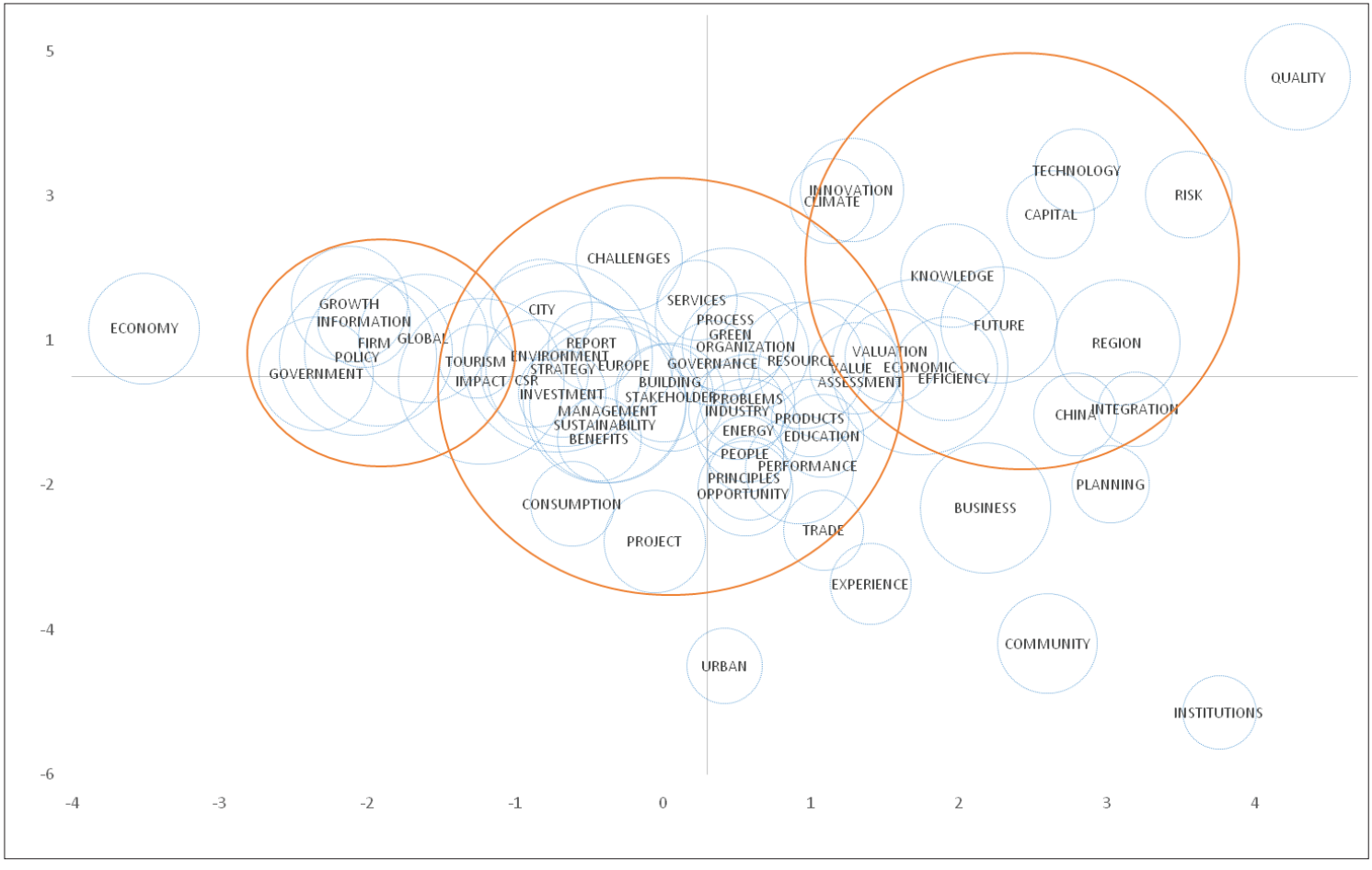
Seuring coauthored four papers and the one with most citations (151) was with Gold and Beske titled "Sustainable Supply Chain Management and Inter-Organizational Resources: A Literature Review" (2010), showing literature review of major Brazilian

Table 2 List of most influential authors

Author	Number of total citations	Number of papers with citation	Average number of citations per paper
Jayaraman, V	427	2	214
Klassen, R	388	1	388
Linton, JD	388	1	388
Zavadskas, EK	332	6	55
Geels, FW	251	1	251
Schot, J	251	1	251
Seuring, S	219	4	44
Turskis, Z	206	1	206
Intralawan, A	204	1	204
Landgrave, R	204	1	204
Martinez, ML	204	1	204
Perez-Maqueo, O	204	1	204
Sutton, P	204	1	204
Vazquez, G	204	1	204
Bohringer, C	198	1	198
Jochem, PEP	198	1	99
Yuan, JH	190	2	95
Hu, ZG	186	1	186
Kang, JG	186	1	186
Zhao, CH	186	1	186
Gray, R	174	1	174
Kolk, A	163	4	41
Klassen, RD	160	3	53
Beske, P	154	2	77
Gold, S	151	1	151
Boudreau, MC	146	1	146
Chen, AJ	146	1	146
Sarkis, J	146	3(4)	49
Watson, RT	146	1	146
Ciegis, R	135	7(8)	19

Source: the authors.

Figure 2 Two-dimensional map of the most important sub-topics regarding „sustainable development"



Source: the authors.

journals and conference proceedings. Seuring also coauthored other papers such as: "Environmental impacts as buying criteria for third party logistical services" (2010), "Business Strategy at the Base of the Pyramid" (2011) and "New players in FDI: sovereign wealth funds, private equity, and emerging-market multinationals" (2011).

Finally, one of the most influential authors was Martinez who in 2007 coauthored the paper "The coasts of our world: Ecological, economic and social importance". On the basis of their ecological, economic and social performance author stresses the importance of coastal countries recognizing them as important contributors to human prosperity whose sustainable development in the light of climate change is of great importance.

Additionally, the full list of the most cited papers for the observed period is visible in the Table 3. Bohringer and Jochem (2010) which belong in top ten cited papers coauthor the paper called "Measuring the immeasurable - A survey of sustainability indices", testing the goodness of various sustainability measures used in policy creation and came to a conclusion that most currently used indices lack the scientific stamina and therefore being useless and even misleading.

Furthermore, also in one of the most cited papers, Yuan, Kang, Zhao & Hu (2008) coauthoring "Energy consumption and economic growth: Evidence from China at both aggregated and disaggregated levels", prove the long-run connection among GDP, labor, capital and energy use of China. On the basis of their finding, they create recommendations for providing sufficient capacities of energy supply in the short-run (emphasizing on the electric power and oil reserves) while in the long-run increasing efficiency, diversifying sources and employing more renewable technologies in energy production. In conclusion, they recommend China's growth should be less dependent on energy and other non-renewable resource exploitation.

Gray (2010) has also one of the top ten cited papers called "Is accounting for sustainability actually accounting for sustainability and how would we know? An exploration of narratives of organizations and the planet" and examines the meaning of sustainability in accounting and finance and emphasizes rising critic of the sustainability reporting and speculation of possible advances in accounting for sustainability. The author also discusses definitions and contradictions in sustainable development touching upon dominant claims in the business movement of sustainability arena.

Watson, Boudreau and Chen (2010) in the paper "Information systems and environmentally sustainable development: energy informatics and new directions for its community" criticize information systems researchers, educators, journal editors and leaders to lag behind corporations and information systems units in application and underlying fundamental teachings of sustainability principles and therefore establish a new field of research called energy informatics, aiming to apply the knowledge of information systems for increasing energy efficiency.

Martinez-Alier et al. (2010) in the paper "Sustainable de-growth: Mapping the context, criticisms and future prospects of an emergent paradigm" with its origins in the field of ecology economics and anthropology present a growing body of research which is in contrast to the dominant growth imperative paradigm associated with unchecked consumerism, excessive materials use and fossil fuel addiction. They propose the development of more equal and democratic society transitioning to a smaller economy with less production and consumption.

Finally, Hall, Daneke and Lenox (2010) coauthored one of the most cited paper titled "Sustainable development and entrepreneurship: Past contributions and future directions", recognizing entrepreneurship as the source of society's transformation, dealing with two levels of actor incentives: individual and institutional.

As the final step in this literature review authors construct an illustrative map of the topics in the selected research field. Starting with all author's keywords, topics were derived by selecting those keywords which appear in most papers, abstract and keywords later arriving to their final number represented in at least 5% of all papers. Set of these unique topics were compared with each paper's title, abstract and keywords creating a data matrix. Rows of this matrix were papers, columns were topics and the heart of the matrix was consisted from zeroes and ones: 1 if the topic is included

Table 3 List of most cited papers

AU	TI	SO	DE	TC	PY
Linton, JD; Klassen, R; Jayaraman, V	Sustainable supply chains: An introduction	JOURNAL OF OPERATIONS MANAGEMENT	supply chain; Sustainability; by-products	388	2007
Schot, J; Geels, FW	Strategic niche management and sustainable innovation journeys: theory, findings, research agenda, and policy	TECHNOLOGY ANALYSIS & STRATEGIC MANAGEMENT	niche; quasi-evolution; multi-level perspective; sustainability; innovation policy	251	2008
Zavadskas, EK; Turskis, Z	MULTIPLE CRITERIA DECISION MAKING (MCDM) METHODS IN ECONOMICS: AN OVERVIEW	TECHNOLOGICAL AND ECONOMIC DEVELOPMENT OF ECONOMY	economics; multiple criteria; decision making; MCDM; analysis; overview	206	2011
Martinez, ML; Intralawan, A; Vazquez, G; Perez-Maqueo, O; Sutton, P; Landgrave, R	The coasts of our world: Ecological, economic and social importance	ECOLOGICAL ECONOMICS	coasts; environment; Ecosystem Service Product; human population	204	2007
Bohringer, C; Jochem, PEP	Measuring the immeasurable - A survey of sustainability indices	ECOLOGICAL ECONOMICS	sustainability indices; composite indicators	198	2007
Yuan, JH; Kang, JG; Zhao, CH; Hu, ZG	Energy consumption and economic growth: Evidence from China at both aggregated and disaggregated levels	ENERGY ECONOMICS	Cointegration; Vector error-correction; Energy consumption; Economic growth; China	186	2008
Gray, R	Is accounting for sustainability actually accounting for sustainability ... and how would we know? An exploration of narratives of organisations and the planet	ACCOUNTING ORGANIZATIONS AND SOCIETY		174	2010
Gold, S; Seuring, S; Beske, P	Sustainable Supply Chain Management and Inter-Organizational Resources: A Literature Review	CORPORATE SOCIAL RESPONSIBILITY AND ENVIRONMENTAL MANAGEMENT	sustainable supply chain management; sustainable development; inter-organizational resources; resource-based view; case studies; literature review	151	2010
Watson, RT; Boudreau, MC; Chen, AJ	INFORMATION SYSTEMS AND ENVIRONMENTALLY SUSTAINABLE DEVELOPMENT: ENERGY INFORMATICS AND NEW DIRECTIONS FOR THE IS COMMUNITY	MIS QUARTERLY	Environmental sustainability; energy informatics; IS community	146	2010
Martinez-Alier, J; Pascual, U; Vivien, FD; Zaccai, E	Sustainable de-growth: Mapping the context, criticisms and future prospects of an emergent paradigm	ECOLOGICAL ECONOMICS	Sustainable development; Post-development; Sustainable economics; Ecological economics; De-growth	132	2010
Hall, JK; Daneke, GA; Lenox, MJ	Sustainable development and entrepreneurship: Past contributions and future directions	JOURNAL OF BUSINESS VENTURING	Entrepreneurship; Sustainable development; Economic transformation	119	2010

Mollenkopf, D; Stolze, H; Tate, WL; Ueltschy, M	Green, lean, and global supply chains	INTERNATIONAL JOURNAL OF PHYSICAL DISTRIBUTION & LOGISTICS MANAGEMENT	Globalization; Sustainable development; Supply chain management; Environmental management; Lean production	118	2010
Pohl, C; Rist, S; Zimmermann, A; Fry, P; Gurung, GS; Schneider, F; Speranza, CI; Kiteme, B; Boillat, S; Serrano, E; Hadorn, GH; Wiesmann, U	Researchers' roles in knowledge co-production: experience from sustainability research in Kenya, Switzerland, Bolivia and Nepal	SCIENCE AND PUBLIC POLICY		111	2010
Nill, J; Kemp, R	Evolutionary approaches for sustainable innovation policies: From niche to paradigm?	RESEARCH POLICY	Evolutionary innovation policy; Sustainable development; Strategic niche management; Transition management; Time strategies	107	2009
Loorbach, D; Rotmans, J	The practice of transition management: Examples and lessons from four distinct cases	FUTURES		104	2010
Aidt, TS	Corruption, institutions, and economic development	OXFORD REVIEW OF ECONOMIC POLICY	corruption; growth; sustainable development; D78; D82	98	2009
Montiel, I	Corporate social responsibility and corporate sustainability - Separate pasts, common futures	ORGANIZATION & ENVIRONMENT	corporate social responsibility; social performance; sustainability; sustainable development; environmental management	96	2008
Henri, JF; Journeault, M	Eco-control: The influence of management control systems on environmental and economic performance	ACCOUNTING ORGANIZATIONS AND SOCIETY		93	2010
Kowalski, K; Stagl, S; Madlener, R; Omann, I	Sustainable energy futures: Methodological challenges in combining scenarios and participatory multi-criteria analysis	EUROPEAN JOURNAL OF OPERATIONAL RESEARCH	Participatory multi-criteria analysis; Energy scenarios; Renewable energy; Sustainable development	92	2009
Lopez, MV; Garcia, A; Rodriguez, L	Sustainable development and corporate performance: A study based on the Dow Jones Sustainability Index	JOURNAL OF BUSINESS ETHICS	competitive advantage; value creating; sustainable development; performance; Dow Jones Sustainability Index	89	2007
Bos-Brouwers, HEJ	Corporate Sustainability and Innovation in SMEs: Evidence of Themes and Activities in Practice	BUSINESS STRATEGY AND THE ENVIRONMENT	sustainable development; corporate sustainability; innovation; SME; organizational performance; case study	88	2010
Lin, BQ; Jiang, ZJ	Estimates of energy subsidies in China and impact of energy subsidy reform	ENERGY ECONOMICS	Price-gap approach; Energy subsidies; Energy subsidy reform; CGE model	87	2011

Krause, DR; Vachon, S; Klassen, RD	SPECIAL TOPIC FORUM ON SUSTAINABLE SUPPLY CHAIN MANAGEMENT: INTRODUCTION AND REFLECTIONS ON THE ROLE OF PURCHASING MANAGEMENT	JOURNAL OF SUPPLY CHAIN MANAGEMENT	sustainability; purchasing strategy; supplier relationships	85	2009
Kolk, A; van Tulder, R	International business, corporate social responsibility and sustainable development	INTERNATIONAL BUSINESS REVIEW	Consumers; Corporate social responsibility; Developing countries; Emerging markets; International business; Multinational enterprises; Stakeholders; Sustainable development; Sustainability	80	2010
Turton, H; Moura, F	Vehicle-to-grid systems for sustainable development: An integrated energy analysis	TECHNOLOGICAL FORECASTING AND SOCIAL CHANGE	Fuel cell vehicles; Hybrid vehicles; Ancillary services; Vehicle-to-grid power; Greenhouse gas emissions; Technological change; V2G	80	2008
Callan, SJ; Thomas, JM	Corporate Financial Performance and Corporate Social Performance: An Update and Reinvestigation	CORPORATE SOCIAL RESPONSIBILITY AND ENVIRONMENTAL MANAGEMENT	corporate social responsibility (CSR); corporate social performance (CSP); corporate financial performance (CFP); social performance measures; stakeholder theory; sustainable development	79	2009
Walker, H; Jones, N	Sustainable supply chain management across the UK private sector	SUPPLY CHAIN MANAGEMENT-AN INTERNATIONAL JOURNAL	Case studies; Corporate responsibility; Sustainable supply chains; Sustainable development; Supply chain management; United Kingdom; Multiple retailers	78	2012
Truffer, B; Coenen, L	Environmental Innovation and Sustainability Transitions in Regional Studies	REGIONAL STUDIES	Sustainability; Environmental innovations; Geography of transitions	75	2012
Awaysheh, A; Klassen, RD	The impact of supply chain structure on the use of supplier socially responsible practices	INTERNATIONAL JOURNAL OF OPERATIONS & PRODUCTION MANAGEMENT	Corporate social responsibility; Supply chain management; Operations management; Fair trade; Canada	74	2010
MacKerron, G; Mourato, S	Life satisfaction and air quality in London	ECOLOGICAL ECONOMICS	Life satisfaction; Subjective well-being; Environmental quality; Air pollution; Geographical information systems; London	74	2009
Tao, TCH; Wall, G	Tourism as a sustainable livelihood strategy	TOURISM MANAGEMENT	Sustainable development; Sustainable tourism; Sustainable livelihoods; Aboriginal communities; Taiwan	73	2009
Behrens, A; Giljum, S; Kovanda, J; Niza, S	The material basis of the global economy Worldwide patterns of natural resource extraction and their implications for sustainable resource use policies	ECOLOGICAL ECONOMICS	environmental policy; global resource use; international trade; material flow analysis; sustainable development indicators	72	2007

Bouchery, Y; Ghaffari, A; Jemai, Z; Dallery, Y	Including sustainability criteria into inventory models	EUROPEAN JOURNAL OF OPERATIONAL RESEARCH	Inventory; Sustainable supply chains; Multiobjective optimization; Interactive procedure	71	2012
Li, TH; Li, WK; Qian, ZH	Variations in ecosystem service value in response to land use changes in Shenzhen	ECOLOGICAL ECONOMICS	Ecosystem service value; Land use; Valuation; Shenzhen	70	2010
Mickaityte, A; Zavadskas, EK; Kaklauskas, A; Tupenaite, L	THE CONCEPT MODEL OF SUSTAINABLE BUILDINGS REFURBISHMENT	INTERNATIONAL JOURNAL OF STRATEGIC PROPERTY MANAGEMENT	Sustainable development; Building refurbishment; Healthcare; FP-6 Project Brita in PuBs	70	2008
Erkus-Ozturk, H; Eraydin, A	Environmental governance for sustainable tourism development: Collaborative networks and organisation building in the Antalya tourism region	TOURISM MANAGEMENT	Governance; Collaborative networks; New organisations; Environmental protection; Sustainability; Tourism	67	2010

Source: the authors.

and 0 if the topic is not included. Topics appearing in less than 5% of all papers were discarded from further observation. Following only most relevant topics, the previously mentioned matrix was imported in SPSS. Multiple correspondence analysis was conducted in order to obtain the two-dimensional coordinates of each keyword and its absolute frequency of appearances. Most relevant topics in ascending frequency are listed in Appendix 1. Two-dimensional map is generated on the basis of the topics in the sample of WOS on "sustainable development" topic in the analyzed papers from the field of business economics.

Figure 2 gives two types of information. First is the list of most relevant (most often used) topics and second information is given regarding their clustering on the basis of their mutual appearances. The following topics explain more than 50% of the sample variance (eigenvalues of the first dimension was .295 and second .228): Knowledge, Challenges, Quality, Corporate social, Stakeholder, Performance, Economy, Government, Growth, Future, Organization, Region, Resource, Global, Business, Value, Process, Firm, Strategy, Management, Policy, Sustainability, Impact, Economic and Environment.

Topics are clustered in four main areas. The first cluster, on the left side of the figure, deals with: growth, information, firm, global, policy and government. The second cluster, located in the middle of the figure, deals with challenges, city, tourism, impact, environment, report, strategy, Europe, investment, management, sustainability, benefits, consumption, project, services, process, green, organization, governance, building, stakeholder, resource, value, assessment, problems, energy, people, principles, opportunity, performance, education, products. The third cluster, located top right, deals with innovation, climate, technology, knowledge, capital, efficiency, future, risk, region, China and integration. The fourth and final cluster of topics, located bottom right, deals with business, planning, trade, experience and community.

3. Conclusion

There are several conclusions that emerged from the research presented in this paper. The overall analysis illustrates the appearance of wide range topics and sub-topics within a frame of sustainable development concept in the analyzed literature from the field of business and economics for the observed period of ten years. Therefore, it can be concluded that the concept of sustainable development is a well recognized, growing paradigm within the literature of business economics. The diffusion of the concept through business economics literature in the last decade has been recorded in multiple directions. The concept of sustainable development has been observed from different per-

spectives and on different levels of analyses. The level of analysis in the observed literature varies from the micro-organizational perspectives over economic policies and global issues considering economical aspects of sustainable development to the theoretical contributions in conceptualization and operationalization of the concept of sustainability in the field of business economics. Further similar researches should consider defining additional criteria to evaluate the importance of sustainable development for the purpose of categorization of the sub-topics and levels of analysis within the literature of business economics.

Literature

Böhringer, C., Jochem, P. E. P. (2007) Measuring the immeasurable – A survey of sustainability indices. *Ecological Economics*, 63 (1): 1–8.

Dabic, M., González-Loureiro, M., Furrer, O. (2014) Research on the strategy of multinational enterprises: Key approaches and new avenues. *BRQ Business Research Quarterly,* 17 (2): 129–148.

Dabic, M., González-Loureiro, M., Harvey, M. (2015) Evolving research on expatriates: what is "known" after four decades (1970–2012). *The International Journal of Human Resource Management*, 26 (3): 316–337.

Duriau, V. J., Reger, R. K., Pfarrer, M. D. (2007) A Content Analysis of the Content Analysis Literature in Organization Studies: Research Themes, Data Sources, and Methodological Refinements. *Organizational Research Methods; Thousand Oaks*, 10 (1): 5–34.

Elkadi, H. (2010) Advancing Architecture Ecologies: Energy Principles in Nature in Urban Systems. *Sustainable architecture and urban development* (SAUD 2010), 2: 81-97.

Elkington, J. (1997) *Cannibals With Forks: The Triple Bottom Line of 21st Century Business.* London: John Wiley and Sons.

Gold, S., Seuring, S., Beske, P. (2010) Sustainable supply chain management and inter-organizational resources: a literature review. *Corporate Social Responsibility and Environmental Management,* 17 (4): 230–245.

Gonzalez-Loureiro, M., Sousa, M. J., Pinto, H. (2017) Culture and innovation in SMEs: the intellectual structure of research for further inquiry. *European Planning Studies*, 0 (0): 1–24.

Gray, R. (2010) Is accounting for sustainability actually accounting for sustainability…and how would we know? An exploration of narratives of organisations and the planet. *Accounting, Organizations and Society,* 35 (1): 47–62.

Hall, J. K., Daneke, G. A., Lenox, M. J. (2010) Sustainable development and entrepreneurship: Past contributions and future directions. *Journal of Business Venturing*, 25 (5), 439–448.

Higgins, K. (2013) Economic growth and sustainability – are they mutually exclusive?[online] Elsevier Connect. Available at: https://www.elsevier.com/connect/economic-growth-and-sustainability-are-they-mutually-exclusive [5. 9.2017].

Higgins, K. (2014) *Economic Growth and Sustainability, Systems Thinking for a Complex World*, 1st Edition. Academic Press.

Hsu, C.-C., Tan, K. C., Zailani, S. H. M., Jayaraman, V. (2013) Supply chain drivers that foster the development of green initiatives in an emerging economy. *International Journal of Operations & Production Management*,

33 (6): 656–688.

International Union for Conservation of Nature and Natural Resources., United Nations Environment Programme, World Wildlife Fund, Food and Agriculture Organization of the United Nations, Unesco (1980) *World conservation strategy: Living resource conservation for sustainable development.* Gland, Switzerland: IUCN.

Kahn, M. (1995) Concepts, definitions, and key issues in sustainable development: the outlook for the future. Proceedings of the 1995 International Sustainable Development Research Conference, Manchester, England, Mar. 27/28. 1995, Keynote Paper, 2-13.

Khoo, C. S. G., Jin-Cheon, N., Jaidka, K. (2011) Analysis of the macro-level discourse structure of literature reviews. *Online Information Review,* 35 (2): 255–271.

Kracka, M., Zavadskas, E. K. (2013) Panel building refurbishment elements effective selection by applying multiple-criteria methods. *International Journal of Strategic Property Management*, 17 (2): 210–219.

López-Duarte, C., González-Loureiro, M., Vidal-Suárez, M. M., González-Díaz, B. (2016) International strategic alliances and national culture: Mapping the field and developing a research agenda. *Journal of World Business*, 51 (4): 511–524.

Martínez, M. L., Intralawan, A., Vázquez, G., Pérez-Maqueo, O., Sutton, P., Landgrave, R. (2007) The coasts of our world: Ecological, economic and social importance. *Ecological Economics*, 63 (2): 254–272.

Martínez-Alier, J., Pascual, U., Vivien, F.-D., Zaccai, E. (2010) Sustainable de-growth: Mapping the context, criticisms and future prospects of an emergent paradigm. *Ecological Economics*, 69 (9): 1741–1747.

Mickaityte, A., Zavadskas, E. K., Kaklauskas, A., Tupenaite, L. (2008) The concept model of sustainable buildings refurbishment. *International Journal of Strategic Property Management*, 12 (1): 53–68.

Ramamurti, R. (2011) New Players in FDI: Sovereign Wealth Funds, Private Equity, and Emerging-Market Multinationals. *The Future of Foreign Direct Investment and the Multinational Enterprise*, 15: 137–165.

Raslanas, S., Zavadskas, E. K., Kaklauskas, A. (2010) Land value tax in the context of sustainable urban development and assessment. Part i - policy analysis and conceptual model for the taxation system on real property. *International Journal of Strategic Property Management*, 14 (1): 73–86.

Sartori, S., Latrônico, F., Campos, L. M. (2014) Sustainability and sustainable development: a taxonomy in the field of literature. *Ambient. soc.*, 17 (1) Jan./Mar., online version ISSN 1809-4422.

Schrader, C., Freimann, J., Seuring, S. (2012) Business Strategy at the Base of the Pyramid. *Business Strategy and the Environment*, 21 (5): 281–298.

Seuring, S., Gold, S. (2012) Conducting content-analysis based literature reviews in supply chain management. *Supply Chain Management*, 17 (5): 544–555.

Thomson Reuters (2008) Whitepaper – Using Bibliometrics. A guide to evaluating research performance with citation data. Available at: http://ip-science.thomsonreuters.com/m/pdfs/325133_thomson.pdf [28.6.2017].

United Nations General Assembly (1987) *Report of the world commission on environment and development: Our common future.* Oslo, Norway: United Nations General Assembly, Development and International Co-operation: Environment.

Watson, R., Boudreau, M.-C., Chen, A. (2010). Information Systems and Environmentally Sustainable Development: Energy Informatics and New Directions for the IS Community. *Management Information Systems Quarterly,* 34 (1): 23–38.

Wolf, C., Seuring, S. (2010) Environmental impacts as buying criteria for third party logistical services. *International Journal of Physical Distribution & Logistics Management*, 40 (1/2): 84–102.

Yuan, J.-H., Kang, J.-G., Zhao, C.-H., Hu, Z.-G. (2008) Energy consumption and economic growth: Evidence from China at both aggregated and disaggregated levels. *Energy Economics*, 30 (6): 3077–3094.

Zavadskas, E. K., Turskis, Z. (2011) Multiple criteria decision making (MCDM) methods in economics: an overview. *Technological and Economic Development of Economy*, 17 (2): 397–427.

Zolfani, S. H., Sedaghat, M., Maknoon, R., Zavadskas, E. K. (2015) Sustainable tourism: a comprehensive literature review on frameworks and applications. *Economic Research-Ekonomska Istraživanja*, 28 (1): 1–30.

Appendix

DESCRIPTORS	x1	y1	f
TOURISM	-1,563	,209	101
INSTITUTIONS	3,462	-4,649	101
INTEGRATION	2,895	-,444	103
URBAN	,115	-4,000	107
PEOPLE	,256	-1,070	108
PRODUCTS	,691	-,577	111
PLANNING	2,728	-1,487	111
TRADE	,786	-2,119	119
SERVICES	-,073	1,062	119
EXPERIENCE	1,101	-2,868	121
CHINA	2,488	-,525	127
EDUCATION	,776	-,818	129
PRINCIPLES	,283	-1,399	130
TECHNOLOGY	2,496	2,846	132
BENEFITS	-,733	-,863	132
CONSUMPTION	-,914	-1,755	132
CLIMATE	,840	2,430	132
GOVERNANCE	,035	,185	133
RISK	3,255	2,515	140
CAPITAL	2,321	2,245	143
INVESTMENT	-,985	-,234	144
REPORT	-,779	,424	145
ASSESSMENT	1,002	,121	155
VALUATION	1,245	,281	160
INFORMATION	-2,322	,768	161
PROBLEMS	,269	-,348	165
OPPORTUNIT	,256	-1,551	168
EUROPE	-,562	,154	175
INDUSTRY	,200	-,477	175
BUILDING	-,295	-,225	178
COMMUNITY	2,297	-3,691	185

DESCRIPTORS	x1	y1	f
CITY	-1,126	,927	189
GREEN	,169	,425	191
PROJECT	-,359	-2,282	193
EFFICIENCY	1,611	,107	197
INNOVATION	,975	2,584	197
ENERGY	,271	-,742	199
KNOWLEDGE	1,657	1,401	199
CHALLENGES	-,530	1,646	206
QUALITY	3,991	4,147	207
CORPORATE SOCIAL	-1,171	,041	213
STAKEHOLDER	-,247	-,278	216
PERFORMANCE	,619	-1,282	217
ECONOMY	-3,814	,669	228
GOVERNMENT	-2,649	,041	241
GROWTH	-2,423	1,005	251
FUTURE	1,970	,712	252
ORGANIZATION	,284	,341	257
REGION	2,772	,473	295
RESOURCE	,633	,155	300
GLOBAL	-1,926	,531	309
BUSINESS	1,881	-1,814	315
VALUE	,819	,104	363
PROCESS	,125	,797	376
FIRM	-2,229	,341	406
STRATEG	-,977	,114	449
MANAGEMENT	-,674	-,386	452
POLICY	-2,367	,278	459
SUSTAINABILITY	-,695	-,335	494
IMPACT	-1,533	-,060	512
ECONOMIC	1,435	,132	575
ENVIRONMENT	-1,015	,269	664

Source: the authors.