

**Varazdin Development and Entrepreneurship Agency and University North**  
in cooperation with  
**Faculty of Management University of Warsaw**  
**Faculty of Law, Economics and Social Sciences Sale - Mohammed V University in Rabat**  
**ENCGT - Ecole Nationale de Commerce et de Gestion de Tanger - Abdelmalek Essaadi University**  
**Institute for Scientific Work in Varazdin**



## **Economic and Social Development**

97<sup>th</sup> International Scientific Conference on Economic and Social Development –  
"Modern technologies and innovative concepts in the function of promoting cultural heritage"

### **Book of Proceedings**

Editors:

**Anica Hunjet, Abdelhamid Nechad, Mustapha Machrafi**

ISSN 1849-7535



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Varazdin, 1-2 June, 2023

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**Publishing Editor** ■ Spomenko Kesina, Domagoj Cingula

**Publisher** ■ **Design** ■ **Print** ■ Varazdin Development and Entrepreneurship Agency, Varazdin, Croatia / University North, Koprivnica, Croatia / Faculty of Management University of Warsaw, Warsaw, Poland / Faculty of Law, Economics and Social Sciences Sale - Mohammed V University in Rabat, Morocco / ENCGT - Ecole Nationale de Commerce et de Gestion de Tanger - Abdelmalek Essaadi University, Tangier, Morocco / Institute for Scientific Work in Varazdin, Varazdin, Croatia

**Printing** ■ Online Edition

**ISSN 1849-7535**

The Book is open access and double-blind peer reviewed.

Our past Books are indexed and abstracted by ProQuest, EconBIZ, CPCI (Web of Science) and EconLit databases and available for download in a PDF format from the Economic and Social Development Conference website: <http://www.esd-conference.com>

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## **CONTENTS**

<b>THE ROLE OF DIGITAL COMPETENCE AND ENTREPRENEURSHIP EDUCATION IN RELATION TO ENTREPRENEURIAL INTENTION.....</b>	<b>1</b>
Isaree Karnreungsiri	
<b>SATISFACTION OF USING QR CODES BY CUSTOMERS ON THE CROATIAN MARKET .....</b>	<b>14</b>
Iva Gregurec, Miroslav Mandic, Ana Krce-Ivancic	
<b>THE CHALLENGES OF THE MINING INDUSTRY'S TRANSITION TO SUSTAINABLE DEVELOPMENT .....</b>	<b>27</b>
Abdelhamid Nechad, Khawla Zahir, Mohammed Rhalma	
<b>ORTHODOX AND HETERODOX VIEWS OF SUSTAINABLE DEVELOPMENT ...</b>	<b>33</b>
Abdelhamid Nechad, Khawla Zahir, Mohammed Rhalma	
<b>UNDERSTANDING THE FACTORS AFFECTING UNIVERSITY STUDENTS' INTENTION TO PURCHASE TERROIR PRODUCTS: AN S-O-R MODEL APPROACH.....</b>	<b>42</b>
Salma Housni, Ihssane Nechouani, Mustapha Machrafi	
<b>SWOT ANALYSIS AND DEFINITION OF POSSIBLE STRATEGIES FOR ACCEPTANCE OF THE NEW MODEL OF INSPECTION OF UNREGISTERED BUSINESS ACTIVITIES IN THE CUSTOMS ADMINISTRATION.....</b>	<b>55</b>
Kristina Marsic	
<b>THE EFFECT OF AMBIDEXTROUS STRATEGIC LEADERSHIP ON CREATING SHARED VALUE .....</b>	<b>63</b>
Kristian Pultz Schlosser, Aivars Spilbergs, Tatjana Volkova	
<b>STRUCTURAL CHARACTERISTICS OF HIGH VALUE ADDED SERVICE SECTOR OF THE REPUBLIC OF CROATIA.....</b>	<b>80</b>
Zrinka Lackovic Vincek	
<b>CRISES AND ECONOMIC IMBALANCES: FROM INFLATION TO EMPLOYMENT .....</b>	<b>88</b>
Humberto Nuno Rito Ribeiro, Bernardo Ribeiro Pereira, Sandra Raquel Pinto Alves	
<b>ECONOMICS CAREER OF AN INDIVIDUAL - ANALYSIS OF PERSONALITY CHARACTERISTICS IN CHOOSING A CAREER.....</b>	<b>98</b>
Irena Bilic, Dinko Primorac, Zeljka Marcinko Trkulja	
<b>THE ROLE OF PHILOSOPHY IN BOOSTING IMAGINATION AND CREATIVITY IN STE(A)M CURRICULUM .....</b>	<b>108</b>
Josip Hrgovic	
<b>DISABLED PERSONS INCLUSION PATTERNS IN THE CROATIAN EMPLOYMENT SECTOR.....</b>	<b>115</b>
Mirjana Radman-Funaric, Barbara Pisker, Katarina Potnik Galic	

**THE IMPORTANCE OF ORIGINALITY AND AUTOCHTONITY IN THE EXPERIENCE ECONOMY ..... 123**

Boris Juric, Dijana Vukovic, Anica Hunjet

**ABOUT THE MUSEUM AS AN EDUCATIONAL INSTITUTION IN THE SERVICE OF PRESERVING CULTURAL HERITAGE: THE CASE THE OF VARAŽDIN CITY MUSEUM..... 132**

Marija Jakovljevic, Klara Macolic Kuparic

**NATIONAL CULTURE AND POLITICAL DECISION: LEGITIMACY OF GOVERNMENT RESPONSES DURING THE COVID-19 CRISIS IN EUROPE ..... 141**

Mahmoud El Hassouni, Mustapha Machrafi

**PRIVATE ENTREPRENEURSHIP FINANCING ..... 151**

Stipe Milicevic, Ante Roncevic

**DIGITAL TRANSFORMATION IN DATING INDUSTRY: ONLYFANS PLATFORM ..... 162**

Josko Lozic

**MARKETING STRATEGIES FOR BUSINESS RESILIENCE DURING WARTIME IN UKRAINE: OVERCOMING CHALLENGES ..... 176**

Olga Prygara, Liudmyla Yarosh-Dmytrenko

**IS THERE A RISK OF GREENWASHING IN THE APPLICATION OF THE EU SFDR IN THE SRI FUND INDUSTRY? SOME CRITICAL ISSUES..... 187**

Maria Cristina Quirici

**ROLE OF AI-POWERED CHATBOTS IN BUILDING CUSTOMER-BRAND RELATIONSHIPS: USING SEQUENTIAL EXPLANATORY RESEARCH DESIGN ..... 197**

Mladen Pancic

## STRUCTURAL CHARACTERISTICS OF HIGH VALUE ADDED SERVICE SECTOR OF THE REPUBLIC OF CROATIA

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### ABSTRACT

*The subject of analysis in this paper are the structural characteristic of the high value added service sector in the Republic of Croatia and comparison with other European Union member states, in the time period from 2010 to 2020. High value added services (information and communication; professional, scientific and technical activities; administrative and support service activities) are very important for the entire economy, since they directly contribute to increasing efficiency and competitiveness, as well as the implementation of innovations in business. The aim of these paper is to analyze shares of high value added service sector in number of totally employed, wage adjusted labour productivity and gross operating rate. The results of research indicate that the movements of structural characteristics of Croatian high value added service sector are complied with structural characteristics of high value added service sector of other European Union member states. If the Republic of Croatia will continue to develop, and it can be assumed that the development process will harmonize the economic structures with the typical structure of the European Union member states, it is likely that the largest number of new jobs will be created in the high value added service sector. The expected contribution of this paper is unique research of structural characteristics of high value added service sector since there are no existing comparative research that analyze high value added service sector in Croatia and other European Union member states in longer term. The conclusion of this research has practical value for economic policy decision makers, who should focus on competitiveness strengthening through decrease of regulatory and administrative burden and stimulation of European Union funds usage. These policies should finally be useful for achievement of higher level of services export, competitiveness and growth of other economic sectors.*

**Keywords:** *structural characteristics, value added, services sector, Republic of Croatia*

### 1. INTRODUCTION

This paper analyzes the high value added service sector, which includes information and communication activities, professional, scientific and technical activities, and administrative and support service activities (according to NKD 2007 and NKD 2002 classification). The aforementioned service sector has not been researched so far in the context of its contribution to the development of the economy, and it is a sector of high technological development, which has a multiplier effect on other sectors of the economy. The aim of this paper is to analyze the high value added services from the aspect of structural business statistics in the Republic of Croatia and to compare them with the indicators of other European Union member states in a multi-year period. In accordance with the general aim of the study, a research question is: are the structural characteristics of the high value added service sector in the Republic of Croatia harmonized with other European Union member states? In order to answer the question, the following indicators that measure structural changes in the high value added service sector were used: shares in number of totally employed, wage adjusted labour productivity and gross operating rate. The time period of the analysis is from 2010 to 2020. This paper is organized as follow: The first section will examine the objective of the study.

The second section will give the theoretical background of the research, definition of the high value added service sector and will highlight the importance of high value added service sector in the country's economy. The third section will outline the methodology used in this study, including the scope, source and data collection for the analysis. The next section will present the results and findings of the analysis that will cover the shares in number of totally employed, wage adjusted labour productivity and gross operating rate. Lastly, this study will present the discussion on the findings and conclude the paper with a summary of significant findings and recommendation for future research.

## 2. THEORETICAL BACKGROUND

High value added service sector achieves revenue growth and employee growth in times of financial crises as well, which is way it is to be expected that there will be even faster growth and development under more favorable conditions. However, the mentioned sector is not treated as a driver of economic growth and development (Lacković Vincek et al., 2019). In the Republic of Croatia, 18.1% of totally employed were in the high value added service sector in 2020, while the EU27 average is 23.87% of totally employed (Eurostat, 2023). Scope of activities of the high value added service sector, most often used in international practice, according to the statistical classification of economic activities in the European Community NACE Rev. 2. and the Republic of Croatia NKD 2007, includes the following activities (see Table 1): information and communication (section J), professional, scientific and technical activities (section M) and administrative and support service activities (section N) and it is considered as high value added sector because, according to the mentioned scope, in 2020 it accounts for about one tenth of the gross added value in the Republic of Croatia (Croatian Bureau of Statistics, 2022). Mentioned high value added services show horizontal importance in impact on productivity growth within traditional business sectors, such as agriculture, manufacture, transport and construction, which enables them to move on higher levels in value added chain (Lacković Vincek et al., 2019).

<b>Information and communication (J)</b>	<b>Professional, scientific and technical activities (M)</b>	<b>Administrative and support service activities (N)</b>
Publishing activities	Legal and accounting activities	Rental and leasing activities
Motion picture, video and television programme production, sound recording and music publishing activities	Activities of head offices; management consultancy activities	Employment activities
Programming and broadcasting activities	Architectural and engineering activities; technical testing and analysis	Travel agency, tour operator and other reservation service and related activities
Telecommunications	Scientific research and development	Security and investigation activities
Computer programming, consultancy and related activities	Advertising and market research	Services to buildings and landscape activities
Information service activities	Other professional, scientific and technical activities	Office administrative, office support and other business support activities
	Veterinary activities	

*Table 7: Divisions of the high value added service sector  
(Source: Eurostat, 2008)*

According to Eurostat (2022) within the high value added service sector, the division of computer programming, consulting and related activities in the EU27 participates with the largest share in real gross value added (45%) and employs 55% of totally employed in the section J (in 2020). Furthermore, legal and accounting activities in the EU27 participate with the largest share in real gross value added (28.72% of the total section M), and they employ 28% of totally employed in the section M (in 2020). The division of employment activities participates with the largest share in the real gross value added (27.23% of the total section N) and employs 32.41% of totally employed in the section N (in 2020). In their research, Čardić and Šelebaj (2021) pointed out that previous domestic research of Croatian national bank show increase of exports and high value added products in the export structure after Croatian accession to the European Union in 2013. Furthermore, revealed comparative advantage indicators in higher value added products improved, export sophistication and complementarity of exports with the European demand increased and intra-industry trade strengthened. Peruško et al. (2018) in their paper suggest that Croatian growth is mainly driven by domestic value added, which accounts for as much as 80% of total Croatian exports, while the remaining part of value added is imported from a small number of countries, mainly from Germany and Italy. Kersan-Škabić (2017) points out that the Republic of Croatia achieves different results than other European Union member states with a high share of domestic value added in gross exports. Tica et al. (2023) state that the causes could be found in low foreign direct investments in the processing industry sector, which due to its technological complexity requires specialization, innovation and specific knowledge. Lacković Vincek et al. (2019) analyzed the changes in the relative position of exports of the high value added service sector of the Republic of Croatia on the European Union market, using the constant market shares method. However, neither domestic nor foreign research on high value added services from the aspect of structural characteristics has been published so far.

### **3. METHODOLOGY**

In order to analyze the trend of the structural characteristics of the high value added service sector in the Republic of Croatia and compare them with other European Union member states, the criterion of structural business statistics is applied to all sections (one-letter code), divisions (two-digit number) and groups (three-digit number) of high value added service activities, for which there are available data. According to the methodology of the European System of National and Regional Accounts (ESA 2010) gross value added is defined as output (at basic prices) minus intermediate consumption (at purchaser prices); it is the balancing item of the national accounts' production account (European Union, 2013). Gross value added at basic prices (formerly GDP at factor cost) is derived as the sum of the value added in the agriculture, industry and services sectors. If the value added of these sectors is calculated at purchaser values, gross value added at basic prices is derived by subtracting net product taxes from GDP. In the long term, it depends on the inclusion of knowledge (through the growing engagement of people and human capital, through technology or through greater efficiency in combining capital and labour) in production processes, and it is precisely the high value added sector that generates a high content of knowledge, creativity and potential for increasing process efficiency, which can potentially have an exceptional impact on strengthening competitiveness and economic development of the country. In addition, they contribute to the development of innovation and export orientation. Structural business statistics use the classification of activities up to the third digit of NKD 2007 and NACE Rev. 2 classification, which provides a basis for conducting a more detailed analysis compared to other available statistical sources. As part of structural business statistics, and based on the available data for the Republic of Croatia and other EU member states, this study further analyses the shares in number of totally employed, wage adjusted labour productivity (in order to eliminate differences in the average



level of economic development) and gross operating rate, calculated as the ratio of gross operating profit and income at the levels of sections, divisions and groups of activities of the high value added service sector. In this way are identified the sections, divisions and groups of activities of the high value added service sector, which realize the greatest potential for employment growth (measured by the difference in the share of employment in sections, divisions and groups of service activities of the high value added sector in the Republic of Croatia and other EU member states), the highest wage adjusted labour productivity and the highest level of gross operating rate. Data from the Croatian Bureau of Statistics and Eurostat are used to determine trends in the high value added service sector in the Republic of Croatia and other EU member states, for the period from 2010 to 2020.

## **4. RESULTS AND FINDINGS**

### **4.1. Shares in number of totally employed**

In order to calculate the shares in number of totally employed, data on the total number of employees from the labour force survey are used, which is why the shares of employment are underestimated, because structural business statistics only count the employment of entrepreneurs in the corresponding sector. Since the underestimation is systematic, it occurs in all the countries that are compared, and it is considered that it does not affect the relevance of the presented conclusions. The higher share of individual sectors of activity in number of totally employed in the European Union compared to the Republic of Croatia indicates the potential for above-average growth in the number of employees in the Republic of Croatia in the future. Table 2 shows the shares in number of totally employed of the high value added service sector in the Republic of Croatia and other EU member states in the period from 2010 to 2020. In the information and communication section (section J), in the ten-year observed period, a continuous increase in the share in number of totally employed in the Republic of Croatia was recorded, from 3.7% in 2010 to the level of 4.9% in 2020, while in other EU27 member states the share increased more slowly, from 4.4% in 2010 to 5.0% in 2020. From what is shown, it is evident that the share in number of totally employed in 2020 in the information and communication section in the Republic of Croatia (4.9%) is approximately equal to the share of other EU27 member states (5.0%). In the section of professional, scientific and technical activities (section M) in the Republic of Croatia, an increase in the share was recorded until 2013, after which it began to decrease until 2016 and stagnate until 2019, when it began to grow again, and in 2020 achieved a share of 7.9%. On the other hand, in the other EU27 member states, the share of the section M increases until 2017, after which it decreases slightly, reaching a level of 8.8% in 2020. In 2020, the Republic of Croatia has a smaller share in number of totally employed in the section of professional, scientific and technical activities (7.9%) than other EU27 member states (8.8%). In the section of administrative and auxiliary service activities (section N), the share in number of totally employed in the Republic of Croatia grows until 2019, when it starts to fall by 0.2% per year and in 2020 it reaches a level of 5.2%. Also, in the other EU27 member states, an increase in the share of administrative and auxiliary service activities was recorded until 2017, after which it began to fall and in 2020 the share remained at a high level of 10.0%. Since in the period from 2010 to 2020 was recorded an increase in the share in number of totally employed in the J, M and N section of the high value added service sector in the Republic of Croatia and in the other EU member states, it can be concluded that the movements of the share in number of totally employed in the J, M and N section of high value added service sector of the Republic of Croatia are aligned with the movements of the share in number of totally employed in the J, M and N section of high value added service sector in other EU member states.

Year	Croatia			EU27		
	J (%)	M (%)	N (%)	J (%)	M (%)	N (%)
2010	3.7	7.7	4.2	4.4	8.3	9.7
2011	3.7	7.8	4.4	4.4	8.4	9.9
2012	3.7	7.8	4.7	4.5	8.6	10.0
2013	3.8	8.0	4.6	4.6	8.8	10.2
2014	3.8	7.5	4.7	4.7	9.0	10.5
2015	4.0	7.2	5.0	4.8	9.2	10.7
2016	4.0	7.4	5.1	4.8	9.5	11.0
2017	4.2	7.4	5.5	4.6	8.8	10.9
2018	4.3	7.4	5.5	4.8	8.6	10.8
2019	4.6	7.6	5.4	4.8	8.7	10.6
2020	4.9	7.9	5.2	5.0	8.8	10.0

Table 8: Shares in number of totally employed at high value added service sector in the Republic of Croatia and other European Union member state, in the time period from 2010 to 2020, in percentage

(Source: Eurostat, author's elaboration)

#### 4.2. Wage adjusted labour productivity

Table 3 shows wage adjusted labour productivity in the high value added service sector of the Republic of Croatia and other EU member states. In the information and communication section (section J) in the observed period, a decrease in wage adjusted labour productivity was recorded in the Republic of Croatia, as well as in the other EU27 member states. However, the decrease in wage adjusted labour productivity level in 2020 compared to 2010 in the Republic of Croatia was higher (51.6%) than in other EU27 member states (11%). Despite this, the wage adjusted labour productivity level in 2020 in the Republic of Croatia (183.8%) is higher than in the other EU27 member states (156.0%). In the section of professional, scientific and technical activities (section M) in 2020 compared to 2010 wage adjusted labour productivity decreased in the Republic of Croatia, as well as in the other EU27 member states, but a smaller decrease was recorded in the other EU27 member states. However, wage adjusted labour productivity level in 2020 in the Republic of Croatia is higher (133.4%) than in the other EU27 member states (108.1%). Finally, in the section of administrative and auxiliary service activities (service N), wage adjusted labour productivity decreased in 2020 compared to 2010 in the Republic of Croatia by 8.0% and is at the level of 114.4%, while in other EU27 member states was recorded an increase of 4.11%. Wage adjusted labour productivity level in the period from 2014 to 2019 was higher in the Republic of Croatia than in other EU27 member states, however a sharp decline was recorded in 2020 and is now at a significantly lower level (114.4%) than in other EU27 member states (133.1%). According to the above mentioned, it can be concluded that in the period from 2010 to 2020, the movement of wage adjusted labour productivity in the J, M and N sections of the high value added service sector of the Republic of Croatia is harmonized with the movement of wage adjusted labour productivity of the same sections of the high value added service sector in other EU27 member states (with the exception of 2020 in section N).

Table following on the next page

Year	Croatia			EU27		
	J (%)	M (%)	N (%)	J (%)	M (%)	N (%)
2010	235.4	142.4	122.4	167	111	129
2011	221.4	142.4	131.8	167	110	130
2012	216.4	136.2	121.6	163	108	129
2013	214.0	142.7	135.8	159	109	131
2014	200	134.6	134	156	109	132
2015	203.4	143.2	138	153	109	133
2016	200.4	132.1	148.7	152	108	131
2017	203	132.7	145.6	153	110	133
2018	199.9	131	145.5	152	111	136
2019	192.1	136.9	138.3	153.6	108.9	135.6
2020	183.8	133.4	114.4	156	108.1	133.1

*Table 9: Wage adjusted labour productivity at high value added service sector in the Republic of Croatia and other European Union member state, in the time period from 2010 to 2020, in percentage*

*(Source: Eurostat, author's elaboration)*

### 4.3. Gross operating rate

Table 4 shows the trend of the gross operating rate of the high value added service sector in the Republic of Croatia and the other EU member states. The gross operating rate of the information and communication section (section J) in the Republic of Croatia increased by 0.6% in 2020 compared to 2010, however it fluctuated a lot from year to year. In other EU27 member states there is a noticeable decrease in the gross operating rate in 2020 compared to 2010 (by 1.7%), and in the entire observed period it decreased until 2020, when it increased by 1.0% (from 18.2% to 19.2%). In the section of professional, scientific and technical activities (section M) in 2020 compared to 2010 in the Republic of Croatia was recorded an increase in gross operating rate by 1.7% (from 19.4% to 21.1%), while in other EU27 member states was recorded a decrease of 1.0%. In the Republic of Croatia, as well as in other EU27 member states, the gross operating rate fluctuated a lot. Finally, in the section of administrative and auxiliary service activities (section N), the gross operating rate in the Republic of Croatia in 2020 was significantly decreased compared to 2010 (from 10.0% to 1.7%), while in other EU27 member states was recorded an increase of 1.8% (from 15.5% to 17.3%). Until 2020, the gross operating rate of section N in the Republic of Croatia grew, as in other EU27 member states, but in 2020 was recorded a significant decrease. In addition, in section N are noticeable the largest difference in the levels of the observed structural characteristic. According to the above mentioned, it can be concluded that in the period from 2010 to 2020, the movement of gross operating rate in the J, M and N sections of the high value added service sector of the Republic of Croatia is harmonized with the movement of gross operating rate of the same sections of the high value added service sector in other EU27 member states (with the exception in section N in 2018 and 2020).

*Table following on the next page*

Year	Croatia			EU27		
	J (%)	M (%)	N (%)	J (%)	M (%)	N (%)
2010	26.6	19.4	10.0	20.9	18.7	15.5
2011	26.9	17.8	11.8	20.1	17.6	14.1
2012	25.8	17.4	8.4	19.4	16.5	13.7
2013	25.4	19.3	11.8	19.0	17.3	14.6
2014	24.3	16.8	11.9	18.6	17.5	15.4
2015	24.5	18.6	12.6	17.8	16.9	15.4
2016	24.1	14.0	14.7	17.7	16.5	14.9
2017	24.2	15.7	14.2	17.6	17.2	15.3
2018	24.8	16.8	13.8	17.9	17.9	16.6
2019	26.3	21.3	13.4	18.2	17.0	16.3
2020	27.2	21.1	1.7	19.2	17.7	17.3

*Table 10: Gross operating rate at high value added service sector in the Republic of Croatia and other European Union member state, in the time period from 2010 to 2020, in percentage (Source: Eurostat, author's elaboration)*

## 5. DISCUSSION AND CONCLUSION

Based on the analysis of the structural characteristics of the J, M and N sections of high value added service sector of the Republic of Croatia and a comparison with other EU member states, more precisely data on the shares in number of totally employed, wage adjusted labour productivity and gross operating rate, it can be concluded that the trends in the share in the total number of employees in the J, M and N service sector of the Republic of Croatia with high added value in the period from 2010 to 2020 are aligned with the trends in the share in number of totally employed in the same sections of the high value added service sector of other EU member states. Furthermore, the movement of wage adjusted labour productivity of the J, M and N section of the high value added service sector of the Republic of Croatia in the period from 2010 to 2020 is harmonized with the movement of wage adjusted labour productivity of the same sections of the high value added service sector of other EU member states. Finally, the movement of the gross operating rate of the J, M and N sections of the high value added service sector of the Republic of Croatia in the period from 2010 to 2020 is harmonized with the movement of the gross operating rate of the same sections of the high value added service sector of other EU member states. Since the observed research examined the structural characteristics of the high value added service sector in the Republic of Croatia, future research should focus on examining other activities that make up the service sector, in order to gain a better insight into the structural characteristics of the entire service sector. Looking comprehensively, in the high value added service sector are activities that are very important for the entire economy, since they directly contribute to increasing efficiency and competitiveness, as well as the implementation of innovations in business. Also, these activities are extremely important because they employ a relatively large number of people, they have accumulated a large capital of knowledge and reputation, so they can be the basis for the growth and development of other industries. Overall, in the high value added service sector of the Republic of Croatia there are still activities that have the potential for above-average growth in the future. In case that the Republic of Croatia continues its development it can be considered that the development process will influence compliance of economic structure with the usual structure of EU member states and that highest percentage of new vacancies will be in the domain of high value added service sector.

It is therefore necessary to invest significant effort in attraction of foreign direct investment in order to achieve higher level of economic development and quicker convergence to other EU member states. Public policies for Croatian high value added service sector should focus on competitiveness strengthening through decrease of regulatory and administrative burden and stimulation of European Union funds usage. These policies should finally be useful for achievement of higher level of services export, competitiveness and growth of other economic sectors.

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