



*Faculty of Economics, University of Niš, 13 October 2016*

International Scientific Conference

**THE PRIORITY DIRECTIONS  
OF NATIONAL ECONOMY DEVELOPMENT**

**IMPACT OF THE BUSINESS SOPHISTICATION INDICATORS ON  
THE REAL ECONOMIC INDICATORS**

**Goran Balotić \***

**Sladana Paunović •**

**Jelena Mičić ♦**

***Abstract:** The basic precondition for good economic performance of a country, expressed through key macroeconomic indicators such as the industrial production level, GDP, exports and unemployment, lies in the competitive strength of its economy. Since the competitiveness of an economy is based on the competitive strength of its companies, the paper analyzes the factors which directly act on the micro-economic level, and in the case of developed countries, contribute to their overall economic prosperity. Business sophistication is the main subject of this work, particularly in the segment concerning its impact on overall economic dynamics, both those of most developed countries and those of developing countries, which are in various phases of transition process.*

***Keywords:** Competitiveness of economy, Real macroeconomic indicators, Business sophistication, Competitive capacity of companies, GCI.*

**1. Introduction**

Actual economic trends in the world show that economies with higher levels of industrial competitiveness are more resistant to the crisis. In statistical terms, referred statement is corroborated by monitoring of indicators movement, which are directly linked to the industrial competitiveness of a country, such as the share of industrial value added in GDP, the share of exports and changes in GDP, unemployment and so on. Tracing the analysis of factors that determine industrial competitiveness in this paper will examine the

---

\* University of East Sarajevo, Faculty of Business Economics, Bijeljina, BiH,  
✉ goran.balotic@gmail.com

• University of East Sarajevo, Faculty of Business Economics, Bijeljina, BiH,  
✉ sladjanapaunovic11@gmail.com

♦ University of East Sarajevo, Faculty of Business Economics, Bijeljina, BiH,  
✉ helena.jelena@gmail.com

UDC 65.2:330.3

existence and intensity of the interdependence between business sophistication (and its consisting components), and listed real economic indicators, closely associated with the achieved level of industrial competitiveness. Given the fact that competitiveness and the strength of an economy is based on the ability of its companies to export and generate profit, analysis of improving the competitive position should be based on establishing the key factors that contribute to it. The key factors that determine the competitive position of companies in developed countries are the quality and development of business networks, as well as the quality of operations and strategies that these companies apply. This eventually results in the good macroeconomic performance of these countries and their capacity to deal more easily with the present economic crisis on the global and regional levels. These are the countries whose competitiveness is based on an innovative approach in the fields of organization, marketing, technology and production of highly sophisticated products with a high level of added value, as well as ways of marketing. As these countries have already reached a high level of factors productivity, and development of production-technological capacities, focus of its competitive struggle is placed on the development of creative potential, contributing to their better and more recognizable image and market dominance in relation to global competition. On the other hand, the less developed countries, such as countries in transition, are still at that stage of development, when their competitiveness primarily depends on the efficiency of product markets, or production factors, and achieved level of technological readiness. However, this should not exclude the importance of the factors such as innovation and business sophistication in building and strengthening the competitive position of those countries, bearing in mind that these factors directly reflect the enterprises competitive ability and their potential to operate effectively and profitably.

## **2. Business sophistication as a factor for increasing competitiveness**

The Global Competitiveness Index (GCI) of the World Economic Forum (WEF) acknowledges that there are numerous factors which explain the competitiveness of national economies in today's globalized world. All the factors are classified into 12 categories or pillars of competitiveness. The aim of this factor clustering is to recognize the key areas of competitiveness activity in a clearer way. Based on the premise that the importance of certain factors of competitiveness will depend on the degree of the achieved economic development of the country, all the indicators that constitute the Global Competitiveness Index are grouped into three segments (Table 1). The first segment consists of four pillars which are primarily essential for those countries which are at the low level of economic development, the so-called initial phase of development, where the economy is driven by fundamental factors, i.e. where competitiveness is determined by the quality of institutions, infrastructure, macroeconomic stability, health and quality of primary education. The second segment includes 6 pillars with dominant influence on the competitiveness on those countries which are in the mature stage of development. These are crucial and key factors for efficiency of economy (higher education and training, goods market efficiency, labor market efficiency, financial market development, technological readiness, market size).

**Impact of the business sophistication indicators on the real economic indicators**

**Table 1. The weights for GCI formation**

	Factory driven economies	Efficiency driven economies	Innovation driven economies
Basic requirements	60%	40%	20%
Efficiency enhancers	35%	50%	50%
Innovation and sophistication factors	5%	10%	30%

*Source:* WEF, The Global Competitiveness Report 2015–2016

The third segment comprises two pillars - business sophistication and innovation. It is characteristic for the most mature stage of competitiveness that is the most important for innovation driven economy.

Respecting the aforesaid, the aim of this study is to determine and measure how much is the business sophistication, as the 11<sup>th</sup> pillar of the GCI, relevant as a determinant of industrial, economic and overall macroeconomic trends of different countries during observed period. The aim of this paper is to examine the initial assumption that changes in assessment of business sophistication (aggregate and individual indicators of 11<sup>th</sup> pillar) have different implications on real economic developments of countries which are at the different phases of economic development. In this regard, we will analyze and compare the dynamic of business sophistication indicators of 18 countries, divided into 3 different categories, according to the achieved level of GDP per capita, as the basic economic criterion for determining achieved level of economic development. Pursuant to the data availability, the analysis will cover the period 2006-2014 Global Competitiveness Report of the WEF. Through the study, we will seek to determine how the deviations and changes in these indicators correlate with variations of certain real microeconomic and macroeconomic variables, which are set as dependent variables in this analysis. The dependent variables are: 1. Industry value added (% of GDP), 2. Relative share of goods and services exports (% of GDP), 3. The industrial competitiveness index (data until 2012), 4. Unemployment rate and 5. GDP per capita (according to PPP). Business sophistication (as an independent variable in this analysis) refers to two components (two groups of indicators) that are closely connected and which participate equally in the structure of the overall evaluation of this pillar (both are weighted with 50%): The quality of the overall business networks of a country and The quality of operations and strategies of individual companies. These factors (along with factors of 12<sup>th</sup> pillar - Innovation) are particularly important for countries at an advanced development stage, wherein other possibilities to improve productivity are, more or less, exhausted. At these countries the third segment indicators (11 and 12 pillar) participate in the weight of the GCI with 30%, at efficiency driven economies with 10%, and at economies in the initial stage of development with 5%. Despite these differences in weighting 11<sup>th</sup> and 12<sup>th</sup> pillars in GCI, should not be overlooked the effect that these pillars have on overall economic trends, even at those countries in the first or second phase (or transition) whose economies are primarily based on the factors and efficiency. Analysis of the results should show whether these countries in the lower stages of development should focus solely on improving the factors relating to the first 10 pillars or that their public policies at the same time should focus their efforts on improving important factors that constitute 11<sup>th</sup> pillar - business sophistication.<sup>1</sup> Quality of business networks and supporting

---

<sup>1</sup> Structure of the Survey questions based on which business sophistication indicator is formed is in the Appendix 1

industries, measured by the quantity and quality of local suppliers and their integration degree is of great importance in a national economy. Greater integration of companies and suppliers of a particular sector through clusters, increases efficiency and opportunities for innovation in technological production processes and generating new value, while reducing entry barriers for new firms in the business sector, that further supports strengthening and development of the market. Sophisticated operations and strategies of individual companies based on branding, marketing, distribution, improved manufacturing processes, the production of unique and sophisticated products with a relatively high share of value added are remitted to overall economy, likewise modernization of business processes in different business sectors in the country improve the overall economic performance of a country. The second group of indicators of 11<sup>th</sup> pillar, relating to the quality of operations and strategies of individual companies, includes 6 following indicators: Nature of competitive advantage, Value chain breadth, Control of international distribution, Production process sophistication, Extent of marketing and Willingness to delegate authority. Although the public policy influence to actively improve business sophistication is limited, experience has shown that the geographical concentration of firms (clustering) can greatly improve the activity of the company. The geographical proximity allows vertical and horizontal cooperation between firms that increases their productivity.

### **3. The econometric estimation results**

In order to analyze the impact of business sophistication indicators on movement of selected real economic indicators, we used econometric analysis of panel data. First, we evaluated a panel model with fixed effects and examined the fulfillment of assumptions about the absence of autocorrelation and heteroscedasticity. We used a modified Wald test for groupwise heteroskedasticity and Wooldridge's test for serial correlation. The obtained results indicate the existence of first order autocorrelation and heteroscedasticity. Consequently, we choose the estimation with Newey-West standard errors and AR(1) process in the error terms. The results are presented in Tables 2-4.

Table 2 analyzes the impact of business sophistication and its 9 components on 3 macroeconomic variables (Industrial value added, Export and Unemployment) at the period from 2006 to 2014 for a group of 6 countries with the lowest GDP per capita in this study: Bosnia and Herzegovina, Serbia, Macedonia, Albania, Bulgaria and Romania. Results showed that the overall index of business sophistication has a statistically significant impact on all three dependent variables in this model. The largest number of indicators of 11<sup>th</sup> pillar (even 4 of 9 indicators) has a significant influence on Industrial value added (State of cluster development, Extent of marketing, Willingness to delegate authority and Nature of competitive advantage), while only one affects the other two dependent variables. Indicator Value chain breadth impacts Export, and indicator Nature of competitive advantage impacts Unemployment. Of all observed indicators of 11<sup>th</sup> pillar of competitiveness, the most significant impact on the dependent variable has the indicator Nature of competitive advantage, which significantly affects the Industrial value added and Unemployment.

**Impact of the business sophistication indicators on the real economic indicators**

**Table 2. Estimations of results (I group of countries)**

Variables	Model 2 (Export)	Model 3 (Industrial value added)	Model 4 (Unemployment)
C	44,5957 (29,552)	26,3510 (6,0668)	43,3063 (16,9198)*
I Local supplier quantity	-8,1604 (6,1779)	4,8324 (3,1711)	-15,3113 (10,3741)
II Local supplier quality	3,3561 (7,2402)	-3,2075 (3,6584)	8,1862 (10,4855)
III State of cluster development	2,9248 (3,2402)	2,7635 (1,5135)*	-5,7783 (4,8048)
IV Nature of competitive advantage	-8,5669* (4,4297)	8,7039 (1,6581)***	-19,6033 (4,4823)***
V Production process sophistication	5,5297 (3,9086)	0,02949 (1,8212)	-5,1615 (5,1787)
VI Willingness to delegate authority	1,01449 (2,8725)	1,4764 (1,7822)***	-4,6253 (7,1923)
VII Control of international distribution	9,8289* (3,7233)	2,4724 (1,8461)	-5,1782 (5,0223)
VIII Extent of marketing	5,0841 (4,2644)	3,6684 (2,2169)*	-8,5800 (6,1098)
IX Value chain breadth	25,5186*** (6,2579)	-0,4030 (2,6415)	4,3966 (6,1062)
TOTAL	36,4868** (19,9935)	26,2878 (9,922165)***	43,9486 (28,9601)

Note: \*\*\*, \*\*, and \* indicate significance at the 0,01, 0,05 and 0,10 levels, respectively.

*Source:* Author's calculation

Table 3 analyzes the impact of business sophistication and its 9 components on 3 macroeconomic variables (Industrial value added, Export and Unemployment) at the period from 2006 to 2014 for a group of 6 countries with the medium levels of GDP per capita in this study: Czech Republic, Slovakia, Hungary, Slovenia, Croatia and Poland. These countries, according to the official WEF statistics, are at the transition between efficiency-driven economies and innovation-driven economies, measured by GDP per capita. We are referring to countries that relatively successfully completed the process of transition to a market economy. It is symptomatic that in these countries, impact of business sophistication indicators on real economic indicators has increased compared to the previous group of analyzed countries. This influence is mostly reflected in movement of

Industrial value added, which has a statistically significant effect of all 9 indicators of 11<sup>th</sup> pillar. The highest impact has indicator 5 - Production process sophistication, which has a statistically significant impact on all three dependent variables observed in this model.

**Table 3. Estimations of results (II group of countries)**

Variables	Model 2 (Export)	Model 3 (Industrial value added)	Model 4 (Unemployment)
C	28,1506 (4,6538)***	-7,8839 (3,8315)**	23,1088 (40,5203)
I Local supplier quantity	-13,8038 (13,26514)	122,4109 (9,9710)***	-91,6338 (115,8256)
II Local supplier quality	32,56923 (7,4419)	-426,9884 (33,4284)***	328,7787 (388,147)
III State of cluster development,	5,3243 (7,4419)	-75,0979 (5,5669)***	65,4151 (64,9144)
IV Nature of competitive advantage	8,6068 (6,6423)	-65,3295 (4,9546)***	59,2734 (57,9027)
V Production process sophistication	-6,2398 (0,4116)***	5,0069 (0,3152)***	16,1887 (3,6045)***
VI Willingness to delegate authority	0,3724 (5,9898)	-62,5654 (4,5139)***	42,0317 (52,3269)
VII Control of inter-national distribution	6,8713 (9,9992)	-100,2338 (7,5253)***	67,6955 (87,3302)
VIII Extent of marketing	0,8989 (6,7778)	55,0026 (5,0771)***	-52,8988 (59,1395)
IX Value chain breadth	-3,89607 (12,5433)	-120,5613 (9,4404)***	97,88276 (109,5505)
TOTAL	34,5102 (67,5105)	676,7313 (50,8218)***	523,3133 (589,6459)

Note: \*\*\*, \*\*, and \* indicate significance at the 0,01, 0,05 and 0,10 levels, respectively.

Source: Author's calculation

Table 4 analyzes the impact of business sophistication and its 9 components on 3 macroeconomic variables (Industrial value added, Export and Unemployment) at the period from 2006 to 2014 for a group of 6 countries with the highest level of GDP per capita in this study: France, Italy, Sweden, Germany, Netherlands and Austria. These countries, according to official WEF statistics, due to the high GDP per capita, placed in the category of countries whose economies are driven by innovation. As expected, these countries have

### **Impact of the business sophistication indicators on the real economic indicators**

significantly greater impact of business sophistication indicators on real economic indicators, compared to the previous two groups of analyzed countries. Results showed that overall index of business sophistication has a statistically significant impact on all three dependent variables in this model. Statistically significant impact on Export have indicators 1, 4, 6, 8 and 9, on the Industrial value added - indicators 1, 2, 5, 8 and 9, and on Unemployment - indicators 4, 8 and 9.

**Table 4. Estimations of results (III group of countries)**

Varijable	Model 2 (Export)	Model 3 (Industrial value added)	Model 4 (Unemployment)
C	104,2205 (48,51919)**	-4,8723 (8,2920)	-5,3921 (11,2748)
I Local supplier quantity	20,8483 (10,4115)*	-6,6846 (1,5210)***	-0,6704 (1,1947)
II Local supplier quality	-14,9679 (12,4017)	9,5708 (1,6285)***	-2,3487 (1,9612)
III State of cluster development,	-14,27091 (10,5445)	-2,6832 (1,6945)	1,7591 (1,7556)
IV Nature of competitive advantage	-22,5295* (12,5684)	-0,4275 (2,1391)	7,3774 (2,5776)***
V Production process sophistication	10,4097 (9,4605)	-2,9392 (1,6931)*	0,2521 (2,1795)
VI Willingness to delegate authority	6,8707 (4,1835)*	-0,3638 (0,8162)	-0,1022 (0,8337)
VII Control of inter- national distribution	-8,1495 (8,9679)	-1,6951 (1,1424)	-1,0558 (1,8804)
VIII Extent of marketing	-19,8582 (9,4833)**	-13,7767 (1,6867)***	5,5835 (1,6852)***
IX Value chain breadth	-45,8103 (8,0757)***	4,8630 (1,1445)***	3,2759 (1,4670)**
TOTAL	79,6079 (36,7588)**	19,1744 (7,4075)*	-12,4047 (7,1201)*

Note: \*\*\*, \*\*, and \* indicate significance at the 0,01, 0,05 and 0,10 levels, respectively.

*Source:* Author's calculation

### **4. Conclusion**

In this paper, using an appropriate econometric panel, is analyzed the impact of business sophistication indicators (and its components) on real macroeconomic variables (Exports, Industrial value added and Unemployment) for three groups of 6 countries in dynamics 2006-2014 year. Guided by the WEF criteria, 18 analyzed countries were classified into 3 different groups, depending on achieved level of GDP per capita. The aim was to carry out a comparative analysis of these impacts on the three groups of surveyed

countries, as well as to determine which components of business sophistication has prevailing impact on the real economic indicators at different stages of economic development. The analysis showed that business sophistication, as 11<sup>th</sup> pillar of Global Competitiveness Index has the greatest influence on the real economic indicators in the case of the third observed group, i.e. group of countries with high GDP per capita. The lowest influence is in the first group of countries, where are, among others, BiH and Serbia.

In the case of the first group of countries, business sophistication has a relevant impact on Export and Industrial value added.

When it comes to the second group of countries, business sophistication, generally, has the greatest impact on the Industrial value added, where a key role plays the Production process sophistication.

In the third group of countries with the highest GDP per capita, business sophistication has a statistically significant impact on all three observed dependent variable in the model. The most important influence have Value chain breadth, Extent of marketing as well as Nature of competitive advantage.

### **References**

1. Dragičević, M. (2012) *Konkurentnost*, Zagreb:Školska knjiga
2. Fageberg, J.: *Technology and Competitiveness*, Oxford Review of Economic Policy, 1996
3. Lloyd-Reason, L., Wall, J.: *Dimensions of Competitiveness: Issues and Policies*, Edward Elgar Publishing, Cheltenham, 2010
4. Maksimović, Lj., Radosavljević, G., Marjanović, G.: *Global Competition and TNC Strategy*, International Scientific Conference: Challenges of Economic Science and Practice in the 21st Century, Ekonomski fakultet Niš, 2011
5. Maksimović, Lj., Grbić, M., Mihajlović, V.: *Impact of Technological Innovations on the Competitiveness of Transition Countries*, Actual Problem Economics, No.7 (133), 394-403, 2012
6. Nelson, R.: *National Innovation Systems* A Comparative Analysis, Oxford University Press, New York, 1993
7. Porter, M.E.: *Building the Microeconomic Foundations of Competitiveness*, The Global Competitiveness, 2005
8. Porter, M.E.: *The Competitive Advantage of Nations*, The Free Press, New York, 1998
9. Vogelpang, B.: *Econometrics Theory and Applications with EViews* Pearson Education Limited, 2005
10. World Economic Forum: *The Global Competitiveness Report 2006-2007*, New York: Oxford University Press, 2006
11. World Economic Forum: *The Global Competitiveness Report 2007-2008*, New York: Oxford University Press, 2007



### **Impact of the business sophistication indicators on the real economic indicators**

---

12. World Economic Forum: *'The Global Competitiveness Report 2008-2009'*, New York: Oxford University Press, 2008
13. World Economic Forum: *'The Global Competitiveness Report 2009-2010'*, New York: Oxford University Press, 2009
14. World Economic Forum: *'The Global Competitiveness Report 2010-2011'*, New York: Oxford University Press, 2010
15. World Economic Forum: *'The Global Competitiveness Report 2011-2012'*, New York: Oxford University Press, 2011
16. World Economic Forum: *'The Global Competitiveness Report 2012-2013'*, New York: Oxford University Press, 2012
17. World Economic Forum: *'The Global Competitiveness Report 2013-2014'*, New York: Oxford University Press, 2013
18. World Economic Forum: *'The Global Competitiveness Report 2014-2015'*, New York: Oxford University Press, 2014
19. Srpski ekonomski forum, *Metodologija Svetskog ekonomskog foruma*, [http://www.sef.rs/uporedna\\_ekonomija/metodologija-svetskog-ekonomskog-foruma.html](http://www.sef.rs/uporedna_ekonomija/metodologija-svetskog-ekonomskog-foruma.html) (26.05.2016)

### **UTICAJ INDIKATORA POSLOVNE SOFISTICIRANOSTI NA REALNE EKONOMSKE POKAZATELJE**

*Apstrakt: Osnovni preduslov dobrih ekonomskih performansi jedne zemlje, izražen kroz ključne makroekonomske indikatore poput nivoa industrijske proizvodnje i BDP-a, izvoza i stope nezaposlenosti leži u konkurentskoj snazi njene privrede. Kako konkurentnost jedne privrede počiva na konkurentskoj snazi njenih preduzeća u radu su analizirani oni faktori koji neposredno djeluju na mikro nivou i u primjeru najrazvijenijih zemalja doprinose njihovom ukupnom ekonomskom prosperitetu. Navedeni faktori su grupisani u dva segmenta, inovacije i poslovna sofisticiranost. Upravo će poslovna sofisticiranost biti predmet analize u ovom radu i to u segmentu koji se tiče njenog uticaja na ukupnu privrednu dinamiku, kako onih najrazvijenijih zemalja, tako i onih zemalja u razvoju, koje su u različitim dostignutim fazama tranzicije.*

*Ključne reči: Konkurentnost privrede, Realni makroekonomski indikatori, Poslovna sofisticiranost, konkurentska sposobnost preduzeća, Indeks globalne konkurentnosti .*

## Appendix

### Pillar 11: Business sophistication

#### Subindicators:

##### 11.01 Local supplier quantity

In your country, how numerous are local suppliers? [1 = largely nonexistent; 7 = extremely numerous] Source: World Economic Forum, Executive Opinion Survey.

##### 11.02 Local supplier quality

In your country, how do you assess the quality of local suppliers? [1 = extremely poor quality; 7 = extremely high quality] Source: World Economic Forum, Executive Opinion Survey.

##### 11.03 State of cluster development

In your country, how widespread are well-developed and deep clusters (geographic concentrations of firms, suppliers, producers of related products and services, and specialized institutions in a particular field)? [1 = nonexistent; 7 = widespread in many fields] Source: World Economic Forum, Executive Opinion Survey.

##### 11.04 Nature of competitive advantage

On what is the competitive advantage of your country's companies in international markets based? [1 = primarily low-cost labor or natural resources; 7 = primarily unique products and processes] Source: World Economic Forum, Executive Opinion Survey.

##### 11.05 Value chain breadth

In your country, how broad is companies' presence in the value chain? [1 = narrow, primarily involved in individual steps of the value chain (e.g., resource extraction or production); 7 = broad, present across the entire value chain (e.g., including production and marketing, distribution, design, etc.)] Source: World Economic Forum, Executive Opinion Survey.

##### 11.06 Control of international distribution

In your country, to what extent do domestic companies control the international distribution of their products? [1 = not at all; 7 = to a great extent] Source: World Economic Forum, Executive Opinion Survey.

##### 11.07 Production process sophistication

In your country, how sophisticated are production processes? [1 = not at all—production uses labor-intensive processes; 7 = highly—production uses latest technologies] Source: World Economic Forum, Executive Opinion Survey.

##### 11.08 Extent of marketing

In your country, how successful are companies in using marketing to differentiate their products and services? [1 = not successful at all; 7 = extremely successful] Source: World Economic Forum, Executive Opinion Survey.

##### 11.09 Willingness to delegate authority

In your country, how do you assess the willingness to delegate authority to subordinates? [1 = not willing at all - senior management takes all important decisions; 7 = very Willing—authority is mostly delegated to business unit heads and other lower-level managers] Source: World Economic Forum, Executive Opinion Survey.<sup>2</sup>

---

<sup>2</sup> The Global Competitiveness Report 2015–2016, pages 380, 381