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# SERBIAN ECONOMY RECOVERY IN THE POST COVID-19 ERA: CLUSTER APPROACH

## Oporavak srpske privrede nakon ere kovida 19 – pristup preko klastera

## Abstract

The COVID-19 crisis differs from previous ones. It disrupts global value chains, redirects business toward regional cooperation in a highly globalized world, and forces new business model development toward digitalization. This crisis affected both supply- and demand-side and all countries worldwide, regardless of their economic strength. To support economic recovery, while at the same time fighting for health system endurance through lockdowns and prevention measures, economic decision-makers all around the globe have been using expansive macroeconomic policies. One of the first measures was loosening monetary policy. Such measure was taken in 80% of the countries globally and in all emerging markets. Fiscal policy was significant in supporting demand in the short-term, simultaneously resulting in higher public debt, which is becoming one of the constraints for future development. While economists of today are discussing which letter visualizes the best the character of this crisis – V, U, L, W, we got the letter K, which indicates that recovery among countries will differ in growth rates and duration. Accordingly, we are going to live in a world where change is the only constant. To survive within these conditions, digitalization and key clusters' development are crucial for long-term competitiveness. In this paper, we analyzed the competitiveness of the Serbian economy by using the Country Competitiveness Index, emphasizing the importance of microeconomic indicators that represent a powerful tool in analyzing crucial segments for the economy's recovery. We also focused on three clusters' potential: tech, agribusiness and organic food, and tourism.

**Keywords:** *COVID-19 crisis, cluster, tech cluster, tourism, agribusiness, organic food, competitiveness, Serbia.*

## Sažetak

Kriza izazvana virusom kovida 19 se razlikuje od prethodnih, imajući u vidu da je prekinula globalne lance vrednosti, preusmerila poslovanje ka regionalnoj saradnji u visokoglobalizovanom svetu i u fokus stavila razvoj novih poslovnih modela zasnovanih na digitalizaciji. Ova kriza je uticala i na ponudu i na tražnju, ali i na sve zemlje širom sveta bez obzira na njihovu ekonomsku snagu. Da bi podržali ekonomski oporavak, istovremeno se boreći za održivost zdravstvenog sistema zaključavanjem i merama prevencije, donosioci ekonomskih odluka širom sveta koriste ekspanzivne makroekonomske politike. Jedna od prvih mera je bila popuštanje monetarne politike. Takva mera je preduzeta u 80% zemalja širom sveta i u svim privredama u usponu. Fiskalna politika bila je značajna u kratkom roku kako bi doprinela rastu tražnje, dok je istovremeno rezultirala većim javnim dugom koji postaje jedno od ograničenja za budući razvoj. I dok današnji ekonomisti raspravljaju koje slovo najbolje vizualizuje karakter ove krize –- V, U, L, W, dobili smo slovo K, koje ukazuje na to da će se oporavak među zemljama razlikovati u stopama rasta i trajanju tog oporavka. Shodno tome, živećemo u svetu u kome su promene jedina konstanta. Da bi opstali u takvom svetu, digitalizacija i razvoj ključnih klastera su presudni za dugoročnu konkurentnost. U ovom radu analizirali smo konkurentnost srpske privrede kroz indeks konkurentnosti zemlje i posebno istakli značaj mikroekonomskih determinanti koji predstavljaju moćno sredstvo u analizi ključnih segmenata za oporavak privrede. Fokus je bio na potencijalu tri klastera: tehnološkom, agrobiznisu i organskoj hrani i turizmu.

**Ključne reči:** *kriza izazvana kovidom 19, klaster, tehnološki klaster, turizam, proizvodnja hrane, organska hrana, konkurentnost, Srbija.*

## Introduction

The economic cost of the COVID-19 pandemic (C-19) is incalculable; the global GDP decline in 2020 was 3.3% and is comparable to the Great Depression of the 1930s and two world wars. However, this figure underestimates costs – it measures the decline of the world economy from the point where it was before the pandemic and not from the point where it would have been if the virus had not existed. At the beginning of 2020, the world economy was expected to grow by 2.5%, to USD 86,000 billion. Thus, the loss of global GDP in 2020 was probably 6.6%, which is equivalent to USD 5,500 billion (at market rates and prices in 2010). In 2021, the world economy should achieve growth, but even with that, the level of production will remain 5.3% below the forecast, which is a cost of USD 4,700 billion. So, in two years, the total cost of the C-19 crisis related to GDP will be approximately USD 10.3 trillion (of that loss, USD 2,000 billion is tied to the Eurozone, and USD 1,700 billion to the United States of America (USA), USD 950 billion to India and USD 680 billion to China).

For example, let us recall, e.g., recovery under The Marshall Plan, a 1948 American initiative (April 3rd) to help 16 Western European countries. Over four years, the USA donated USD 17 billion (USD 202 billion from 2019) in economic and technical assistance (6.6% of the U.S. GDP of USD 258 billion from 1948). It was replaced in late 1951 by the Mutual Security Plan with about USD 7.5 billion in annual assistance until 1961, when it was replaced by another program. This plan aimed to remove trade barriers, modernize industry, promote European prosperity and prevent the spread of the influence of communism, resulting in increased productivity and the introduction of modern business procedures. Most funds were received by the UK (26%), France (18%) and West Germany (11%), and GDP of these countries was 35% higher in 1951 compared to 1938, which corresponds to an average growth rate of 2.4% per year beginning with 1939. With this Plan, the world economy, especially the European one, entered a period of prosperity. Until 1975, no global recession was recorded, and since 1975, there has been one global recession in every decade.

**Table 1: Pandemic historical perspective**

| Event | Start | End | Deaths |
|---|---|---|---|
| 1. Black Death | 1331 | 1353 | 75,000,000 |
| 2. Italian Plague | 1623 | 1632 | 280,000 |
| 3. Great Plague of Seville | 1647 | 1652 | 2,000,000 |
| 4. Great Plague of London | 1665 | 1666 | 100,000 |
| 5. Great Plague of Marseille | 1720 | 1722 | 100,000 |
| 6. First Cholera Pandemic | 1816 | 1826 | 100,000 |
| 7. Second Cholera Pandemic | 1829 | 1851 | 100,000 |
| 8. Russia Cholera Pandemic | 1852 | 1860 | 1,000,000 |
| 9. Global Flu Pandemic | 1889 | 1890 | 1,000,000 |
| 10. Sixth Cholera Pandemic | 1899 | 1923 | 800,000 |
| 11. Encephalitis Lethargica Pand. | 1915 | 1926 | 1,500,000 |
| 12. Spanish Flue | 1918 | 1920 | 100,000,000 |
| 13. Asian Flu | 1957 | 1958 | 2,000,000 |
| 14. Hong-Kong Flue | 1968 | 1969 | 1,000,000 |
| 15. H1N1 Pandemic | 2009 | 2010 | 203,000 |
| 16. COVID-19 (as of April 2021) | 2019 | ? | 3,000,000* |

*As of April 12th, 2021
Source: [1].

The C-19 crisis is significantly different from the Great Recession (GR) of 2008. The current crisis is a public health crisis with severe economic consequences. Economic recovery will only be possible when the health crisis is under control and when economies can open up. Additionally, it is quite certain that it will not be a return to the former economy. It will be a step toward a new world, encouraging the development of key clusters such as tech, agribusiness with organic food[1], food processing, tourism, health and pharma, retail, energy, fintech.

It is pretty realistic that the supply chain structure will change, and that regional cooperation and geographically closer suppliers and markets will become more important. In these processes, Serbia can find its place, but it requires several very essential activities such as encouraging innovation, strengthening the health system, infrastructure development, especially digital, digitalization, and development of the green economy. Consequently, the aim of this paper is to emphasize the importance of microeconomic indicators that represent a powerful tool in analyzing key segments for the economy's recovery, with a strong focus on clusters' potential within C-19 conditions.

Empirical analysis of the crucial medium- and long-term effects of the 14th-century pandemics pointed out that

1 In this paper we focus on agribusiness since it is very sensitive to global market trends and spill-over effects from global commodity market, especially in the period of crisis. Since the agribusiness is a precursor in the value chain of food production, this cluster analysis should be a baseline for further researching within food production cluster.

pandemics differ from other types of economic disasters (see Table 1) [6], [13], [1]. Jordà, Singh and Taylor [13] found that macroeconomic after-effects in pandemic cases sometimes lasted for decades, which is in stark contrast to what happened after the wars. During the wars, capital is destroyed, but pandemics may induce relative labor scarcity and/or a shift to greater precautionary savings.

In the last 50 years, global economic growth has been extremely fast – the world economy has quadrupled, a billion people have been lifted out of poverty. This growth has been based on both increasing the number of employees (growth of 1.7% on average per year) and raising productivity (1.8%). Consequently, the production growth per employee was 2.4% on average per year, with global employment growth slowing for more than two decades. Within the following sections, the focus will be on the importance of microeconomic determinants for competitiveness upgrading within the C-19 crisis, with emphasis on clusters' potential.

## The overall framework of the C-19 crisis

The global character of the C-19 crisis, which is a medical and economic crisis, indicates that it must be viewed from the broadest perspective. In that context, we will refer to the attitudes and warnings of several of our contemporaries from other fields – politics, history, philosophy, literature, music, etc.

Kissinger [17] in the *Wall Street Journal*, at the beginning of the crisis, points out that scientists have the greatest responsibility for the development of vaccines and control of the pandemic, and politicians and elites are responsible for protecting citizens from the pandemic. The next step is to rebuild the global economy within conditions that are much more complex than in 2008. We need programs to help those who have been hit hardest by this crisis and whose losses have been the greatest.

Harari [9], the world's leading historian and philosopher, disputes at *The Time* at the beginning of the crisis the views that globalization is to blame for the C-19 crisis and the lack of true leaders. He also emphasized that general trust has to be regained in order to defeat pandemics.

Harari [10] has recently pointed out in the *Financial Times*, that in 2020, science turned epidemics into challenges it can overcome, where the world received several mass-produced vaccines in less than a year.

Kovačević [18], our most respected playwright, said at the beginning of the pandemic that the C-19 virus is a yellow card that the planet sent to humanity because we have been destroying it for a long time.

Vox [44], the U2's frontman, gifted us the first new music since 2017, Let Your Love Be Known, on St. Patrick's Day March 17th, 2020, devoted to quarantined Italians singing to each other from balconies. And The Rolling Stones [32] have dedicated their song Living In A Ghost Town to the current crisis.

*Economic policy in the C-19 era* – Unlike natural disasters, the C-19 crisis does not harm physical capital but disrupts value chains and supply chains – these are deep disruptions that redirect business toward regional cooperation and the development of new business models based on digitalization. The C-19 crisis differs from the previous ones because it has affected both supply and demand and acts globally.

Baldwin and Freeman [4] point out that there are two shocks in the C-19 crisis: the first, which results from measures to suppress the pandemic in the form of a lockdown, which leads to a reduction in supply, and the second, related to demand regarding manufacturing goods, because consumers and companies are very cautious.

Due to the fall in production, the negative supply shock directly affects the reduction of supply, because supply chains have been interrupted, resulting in shortages and liquidity problems. In order to understand the complexity of modern business, we should keep in mind that e.g., Pfizer-BioNTech vaccine has 280 components made in 19 countries.

A negative demand shock increases uncertainty that leads to declining revenues and declining consumption and borrowing. Simultaneously, the C-19 crisis came when both inflation and interest rates were at low levels, which enabled the implementation of extensive macroeconomic stimulus.

Monetary policy was the first line of defense. In the initial phase of the crisis, monetary policy measures

accounted for 60% of incentives, primarily in the form of liquidity injections, and later reduced to 15%. That is why the central banks worldwide and above all the Fed and the NBS, reacted quickly by loosening monetary policy. The latter was done in 80% of the countries in the world and in all emerging markets.

On the other hand, fiscal policy has been significant because it can combat long-term economic damage by maintaining investment levels at a high level, strengthening health, education, ecology, energy efficiency, etc., together with fiscal sustainability.

The strong and targeted macroeconomic policies are essential, since the current macroeconomic environment is defined by the estimated global fiscal deficit of USD 10,000 billion in 2020 (of which USD 2,000 billion in the US, 10% of GDP), and the cumulative one from 2020 to 2023 will be 30,000 billion or about 30% of GDP. To support demand, the global fiscal stimulus to households and firms reached USD 16,000 billion, followed by interest rate reduction measures and other central bank measures that reached USD 9,000 billion. Consequently, the total volume of incentives and interventions at the global economy level is estimated at USD 25,000 billion.

Expectedly, all of this had spill-over effects on global public debt, which increased from 84% in 2019 to 98% of global GDP. Global trade fell by 9.6% in 2020 and is expected to grow by 8.5% in 2021 and by 6.5% in 2022. The IMF estimates that these measures have led to an increase in the fiscal deficit and public debt relative to GDP in 2020 (compared to 2019) to 13.3% and 123% in developing countries and 10.3% and 63% in emerging markets [12]. On this occasion, the world's leading authors in the field of debt Bulow, Reinhart, Rogoff, and Trebesch [5], analyzing the problems of debt growth, emphasize the necessity for new activities.

There were a lot of discussions about which letter of the alphabet best visualizes the character of the C-19 crisis - V, U, L, W, etc. The best variant was for the crisis to have the character of the letter V, which would mean a rapid, deep fall and a quick recovery with a relatively short-lived crisis.

Instead, within the C-19 crisis, we got a two-track recovery shaped crisis like the letter K. Today, it is increasingly obvious that this crisis will have the shape of the letter K, which means that some countries, some sectors, some parts of society will recover faster compared to others and there will be differences in growth rates and duration of recovery. This indicates that crucial global changes are taking place, that the structures of all economies are changing, that catching up with digitalization is important for survival, that the rich are becoming even more affluent, and some of the poor are returning to the circle of those who are highly endangered.

*Importance of microeconomic determinants for competitiveness upgrading in the C-19 crisis* – Explaining the growth projections of the IMF for 2021 and 2022, Gopinath [11] says that better prospects for global growth in the world economy stem from the fact that two processes have begun: vaccination and recovery of developed economies, especially the USA (6.4%), but still, most countries will reach the level of economic activity from 2019 only in 2022 or even 2023. Recovery is also expected in the Eurozone (4.4%). If we analyze the most important economic partners of Serbia – Germany and Italy, the projected growth is 3.6% in Germany and 4.2% in Italy in 2021.

Serbia's growth is projected at 5.0% in 2021, at 4.5% in 2022, and at 4% in 2023.

For full recovery of the economy from the C-19 cycle, along with measures related to public health and macroeconomic measures, which dominate the current debate, it is necessary to activate the microeconomic determinants of competitiveness as well.

**Table 2: The annual growth rate of GDP in %**

| | 2020 | 2021 | 2022 |
|---|---|---|---|
| World | -3.3 | 6.0 | 4.4 |
| Advanced economies | -4.7 | 5.1 | 3.6 |
| • USA | -3.5 | 6.4 | 3.5 |
| • Euro Area | -6.6 | 4.4 | 3.8 |
| ◦ Germany | -4.9 | 3.6 | 3.4 |
| ◦ Italy | -8.9 | 4.2 | 3.6 |
| Emerging market and middle-income economies | -2.4 | 6.9 | 5.0 |
| • China | 2.3 | 8.4 | 5.6 |
| • Russia | -3.1 | 3.8 | 3.8 |
| • India | -8.0 | 12.5 | 6.9 |
| • Brazil | -4.1 | 3.7 | 2.6 |
| Serbia | -1.1 | 5.0 | 4.5 |

Source: [12].

Ketels and Clinch [16] point out that a medium- and long-term sustainable recovery requires a whole set of policies that include both health and social policies. However, microeconomic improvements are also needed. Macroeconomic policies should provide liquidity and financial stability, while the microeconomic determinants of competitiveness should give the following three things: (i) improving the national business environment, (ii) developing clusters, and (iii) encouraging firms to improve their operations. In that sense, the microeconomic determinants of competitiveness will create preconditions for the smooth functioning of value chains and their restructuring to strengthen clusters and regional cooperation.

*Economic policies in Serbia during the C-19 crisis* – A detailed analysis of the measures implemented in Serbia during the C-19 crisis can be found in the National Bank of Serbia Inflation Reports [26], [27], as well as in the presentation of Jorgovanka Tabaković, NBS Governor at Money Fair 21 [37]. During the C-19 crisis, Serbia managed to preserve macroeconomic and financial stability by stimulating economic policy measures, with a small decline in GDP (-1.1%) and a slight increase in the number of employees. Monetary policy ensured: (i) maintaining low and stable inflation, (ii) high liquidity, and (iii) stability of the financial system, and fiscal policy measures in the form of a temporary increase in the fiscal deficit to increase public expenditures acted to raise demand.

The total volume of incentive measures for the firms and the households in Serbia amounted to EUR 5.8 billion (RSD 704 billion) or 12.5% of GDP. The policy rate was reduced by a total of 125 bp, two moratoriums on loans were introduced, and dinar and foreign currency liquidity was provided to commercial banks in a timely manner. For the third year in a row, the bank's lending activity is growing, now at a rate of 10% per year.

The consolidated fiscal deficit amounted to 8% of GDP and stemmed from strong stimuli introduced during the C-19 crisis in 2020. This level of deficit was acceptable, bearing in mind that the level of public debt has been on a downward path (reduced by 18.3 pp) since 2016. During 2020, central government public debt increased from 52.0% of GDP in 2019 to 56.8% of GDP, and general government public debt from 52.9% to 57.7% of GDP.

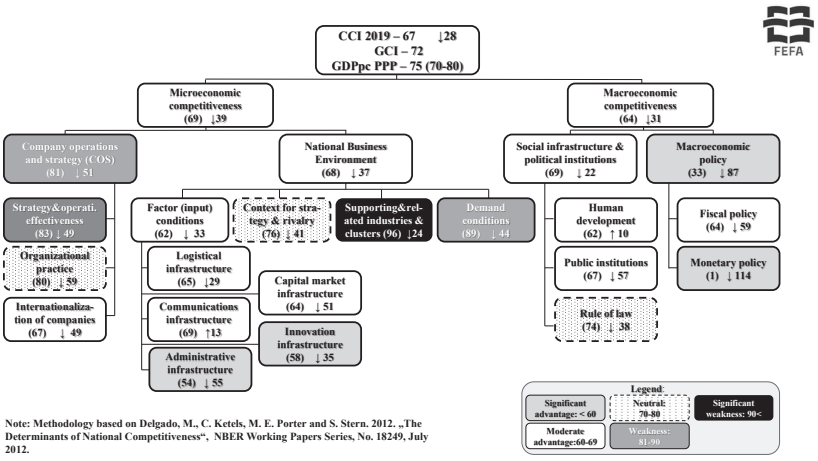
Despite the decline in external demand and the disruption of global value chains, exports remained relatively resilient thanks to the greater production and geographical diversification and the activation of export-oriented investments. There was a slight decline in exports of goods and services to EUR 20 billion, but it is still above the level of 2018 and resulted from a decline in exports of manufacturing and services. The decline in imports was greater than the decline in exports, and its recovery is slower due to the combined effect of reducing domestic demand and energy prices. The current account deficit is -4.2% of GDP. Since 2015, the current account deficit has been fully covered by net FDI inflows.

The net inflow of FDI in 2020 amounted to EUR 2.9 billion. Out of a total of EUR 7.3 billion in FDI in the period from 2018 to 2019, EUR 4.1 billion (56%) was directed to the tradable sectors, out of which EUR 1.9 billion (26%) was directed to manufacturing (metal processing, automotive, food-processing, car tires, etc.) with solid growth in employment, production, and exports.

The fall of GDP in Serbia in 2020 (-1.1%) was one of the smallest in Europe. This decline did not result from tradable sectors (agriculture, industry) but from the service sector (tourism, catering, transport, and a modest decline in construction). The projected GDP growth in 2021 of approximately 5% is based on growing domestic demand and exports. The risks of this projection are symmetrical – positive risks arise from the domestic market and negative from the international environment (pandemic development and GDP recovery in the region and Europe, especially Germany and Italy). On the expenditure side in 2021, the following is expected: recovery of private consumption, increase in consumption due to vaccination, increase in government consumption, and growth of fixed investments. On the production side, the recovery of service activities is expected, realizing the average level of agricultural production, the growth of manufacturing (with the activation of new capacities), and construction.

## Competitiveness in Serbia based on Porter's diamond

**Figure 1: ISC Competitiveness Index for Serbia, 2019 v. 2013**




Note: Methodology based on Delgado, M., C. Ketels, M. E. Porter and S. Stern. 2012. „The Determinants of National Competitiveness", NBER Working Papers Series, No. 18249, July 2012.

In this paper, we analyzed the competitiveness of the Serbian economy using the Country Competitive Index (CCI) developed by Porter, Delgado, Ketels and Stern [31] and which is methodologically detailed in Delgado, Ketels, Porter and Stern [7]. We presented the first analysis of this type on the example of Serbia in Savić (2012), comparing the competitiveness of Serbia in 2012 with 2008 [34]. In this paper, we will compare the competitiveness of Serbia in 2019 compared to 2013 and define recommendations for improving it. Serbia recorded in 2019, in comparison to 2013, an increase in Global Competitiveness Index (GCI) rank from 101 to 72, which represents an increase in Country Competitiveness Index (CCI) rank from 98 to 67.

According to the level of GDPpc adjusted by purchasing power parity, Serbia holds 75th place within the group of 140 countries included within the Global Competitiveness Report. So, the GDPpc PPP (75) level in 2019 is similar to GCI (72). But since the CCI achieved a rank of 67, which is higher than the rank of GDPpc PPP, there is certainly a need for further improvement of Serbian competitiveness.

We have defined as competitive disadvantages or advantages all ranks that deviate up to 10 places upward or downward from the GDPpc PPP rank (according to which Serbia ranked 75th). All ranks from 1st to 69th are treated as competitive advantages, while all ranks from 81st to 144th as competitive disadvantages.

We started our empirical analysis of the business environment in Serbia using Porter's diamond which gives us a comprehensive review of productivity through four elements of the national business environment – factor conditions, the context for firm strategy and rivalry, demand conditions, and related and supported industries [31].

## Three prospective clusters in Serbia

In the following sections, we will focus on analyzing three clusters of the Serbian economy which we consider important for the country's further development. Those clusters are: tech cluster, agribusiness with organic food, and tourism. Although there are various important clusters in Serbia such as energy, health and pharma, retail, fintech, and food processing, we will focus on these three clusters since they have a high potential for collaboration, contributing to other clusters development.

### Tech cluster in Serbia

Kerr and Robert-Nicoud [14, p. 3] define "tech" clusters to be: "locations where new products (be they goods or services) and production processes are created that impact multiple parts of the economy." They also pointed out that a tech cluster "must have a frontier edge to it, and it must extend beyond refinements to a single industry" [14, p. 3]. Therefore, we define the tech cluster in Serbia as the cluster of ICT industry and companies operating within the traditional sector of the economy, implementing new and emerging technologies in its products and services development, consequently creating competitive advantage.

Although the tech cluster history in the Serbian economy is not so long, the tradition of such cluster

**Table 3: Relative position of Serbia in competitiveness indexes in 2019**

| Competitive advantages | | Competitive disadvantages | |
|---|---|---|---|
| **Factor Conditions** | | | |
| Vocational enrollment | 12 | Brain retention | 123/140 |
| Quality of math and science education | 26/55 | Brain gain | 120/140 |
| Time to start business | 27/57 | Quality of roads | 98/119 |
| | | Burden of government regulation | 95/142 |
| | | Quality of vocational training | 84/111 |
| | | Electric power transmission and distribution losses | 84 |
| **Context for strategy and rivalry** | | | |
| Redundancy cost | 16 | Extent of market dominance | 110/142 |
| Import | 34 | Cooperation in labor-employer relations | 107/144 |
| Migrant stocks | 42 | Attitudes toward entrepreneurial risk | 107 |
| Rate of wage and salaried female workers to male workers | 44 | Intellectual property protection | 104/115 |
| | | Strength of auditing and reporting standards | 102/117 |
| | | Labor tax rate | 92 |
| **Demand conditions** | | | |
| | | Buyer sophistication | 124 |
| **Supporting and related industries** | | | |
| | | State of cluster development | 104/140 |
| **Company operation and strategy** | | | |
| | | Reliance on professional management | 114/135 |
| | | Extent of staff training | 104/140 |
| | | Strategy and operational effectiveness | 83/132 |

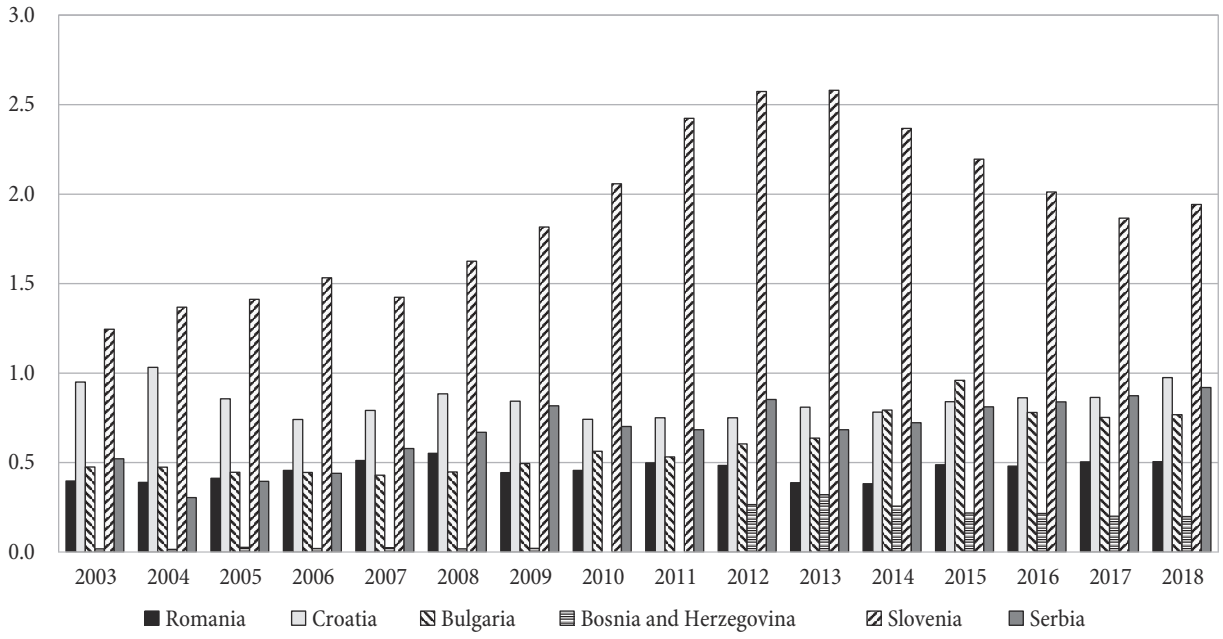
Note: Author's recalculations (GDPpc PPP=75). Rank versus 141 countries; overall, Serbia ranks 75th in 2019 PPP adjusted GDPpc and 72nd in the Global Competitiveness Report combined with data available in the Global Talent Competitiveness Index 2019, Future of Production 2018, and World Bank Doing Business 2019.
Source: Global Competitiveness Report 2013 & 2019.

development is. Even as a part of the Yugoslav economy, there were companies in Serbia that managed to develop the quality of engineering talents. Additionally, the quality development of engineering talent has its roots in traditionally strong technical faculties in the three largest cities: Belgrade, Novi Sad, and Niš. In the last two decades, this development has been supported by the establishment of foreign development tech centers and both foreign and local companies. Gained knowledge and experience in productive working places and educational institutions had a bulk knowledge spill-over effect leveraged in developing new firms that were creating high-quality products and services based on knowledge and the latest technologies.

Currently, data are showing that the tech cluster in Serbia has an emerging development trend. ICT production value contributes to 7.5% of GDP and has a rising trend of services export accounting for 22% of total services export (Eurostat and NBS data). Shining a light on product manufacturing with high R&D intensity, we can see that the high-technology export amounts to 1.7% of total export, which is below the EU average (where it accounts for 10% of total export) (Eurostat data). Although the R&D, as the most knowledge and capital-intensive process of value creation in one tech cluster, has had a rising trend since 2013, Serbia still lags behind the EU, and R&D expenditures account for 0.9% compared to 2.2% of GDP, respectively.

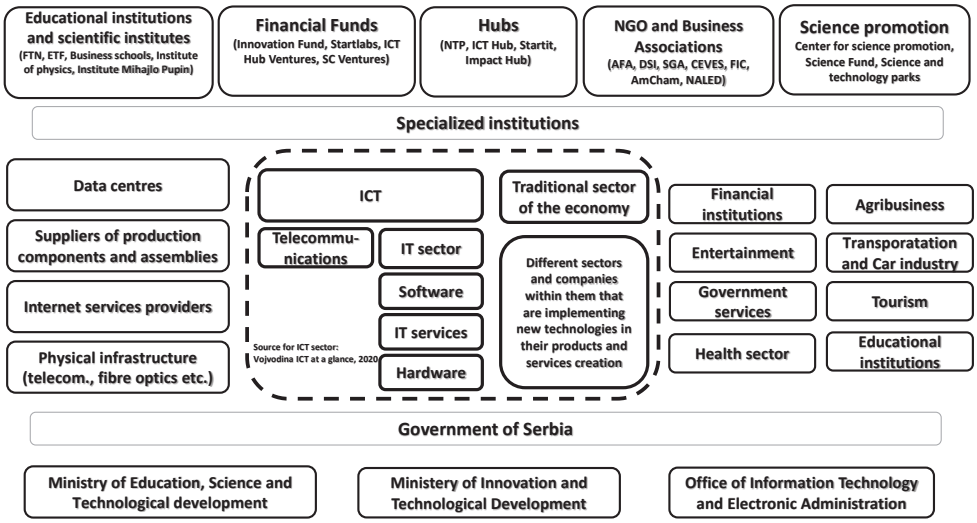
*Tech cluster map* – The tech cluster map is very complex, and it includes a number of important stakeholders in the process of creating unique and global competitive value. Down-stream actors on the left provide components and infrastructure for value creation in the center. The fundamental value and success of the cluster are given by ICT and companies from the traditional sector within the economy, which are implementing the latest technologies in its products and services development. Together, they produce a range of specialized and unique products and services for different sectors of the economy on the right. This is aligned with Kerr and Robert-Nicoud's tech cluster characteristics that: "lead to spill-overs across technological and industrial boundaries in the real economy" [14, p. 18]. Significant support to companies is provided by hubs, NGOs, and business associations, which are focal points for gathering tech community, creating programs to

**Graph 1: R&D as a % of GDP in Serbia and countries in the region**




Source: World Bank Data.

**Figure 2: Tech cluster map**

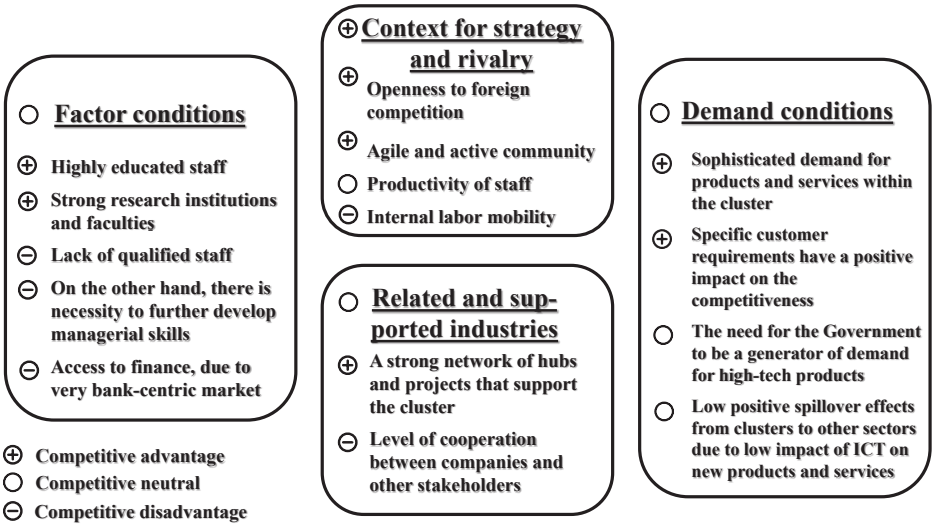



support ecosystem development, providing analytical and marketing support to the cluster, and raising awareness about important topics. Government institutions and ministries provide the regulatory framework for doing business within the cluster. Educational institutions and institutes are devoted to talent development, while institutions for science promotion support science and research and contribute to the collaboration of the scientific and private sectors. Available financial funds are supporting investments in innovative activities that should support high cluster potential.

*Porter's diamond of the tech cluster* – One of the main strengths in factor conditions has its roots in highly qualified staff. Serbia ranks in 26th place among 140 countries regarding the quality of math and science education (FOP data). That is why the most competitive companies in the cluster have emerged around three big cities and universities centers.

However, due to the very poor results of brain retention, companies in the cluster still face the deficit of needed talents, which unite cluster participants to create educational programs in collaboration with educational institutions.

**Figure 3: Porter's diamond of the tech cluster**




Higher participation of females should be further supported in STEAM occupations (science, technology, engineering, art, and math), since now we are far from their equal participation in those fields (for instance, 21% of all ICT specialists in Serbia are female – Eurostat data). Access to finance is one additional obstacle due to an underdeveloped financial market where domestic credit to the private sector accounts for only 42% of GDP, which is far below the EU average of 86%. Additionally, the fact that start-ups are vital participants in the tech cluster, it becomes even worse if we shine the light on seed investments. According to start-up scanner, Belgrade and Novi Sad have a 90% lower seed round than the global average, which results in EUR 20,000 of an average seed round [20, p. 10].

Openness to foreign competitors and strong relations to clients on foreign markets are the main strengths within the context for strategy and rivalry. One of the constraints in this segment is ICT sector productivity, reflected in gross value added per employee, which is 2.14 times lower than the EU average (Eurostat data). One of the main reasons relates to difficulties attracting high-qualified staff in companies with lower brand recognition (mainly B2B). A low level of internal labor mobility represents another issue, creating a barrier for the companies operating outside three big city centers that face the obstacles to attract and retain engineers and related staff. Additionally, the productivity gap could relate to the gap in R&D investments, which underline the need for higher spending on R&D-related activities.

Firms in the tech cluster can be divided into two groups, those that perform outsourcing activities and those that produce high-quality products and services. Since the outsourcing companies often create tailor-made solutions for the clients which operate in highly regulated industries (such as finance, media, health, etc.), companies in Serbia receive sophisticated requirements, which create positive pressure on its competitiveness development. On the other hand, companies with their own products and services are mainly part of the global competitive arena. They benefit from locally available knowledge and experience to meet specific global demand. However, the local demand is still not sophisticated enough, and this could be boosted through higher demand for tech-based products by the Government (that is well known as a best practice example in the cases of Finland, Estonia, etc.).

One additional source of cluster development could be low demand of the local private sector. Although most of the companies in Serbia are implementing at least one project related to digital transformation [33, p. 101], a comparative analysis which shows that ICT still does not sufficiently influence new products and services may indicate that other economies are transforming faster and more dynamically than the local ones. Vojvodina's ICT cluster also perceives a lack of cooperation between companies and other stakeholders as one of the weaknesses [22, p. 86]. Even though initiatives are contributing to higher cooperation, the latter is essential for cluster further development, especially for the newly established

firms. The importance of collaboration is confirmed by the start-up scanner as well, indicating that "start-ups with higher local connectedness manage to grow their revenue two times faster and have greater potential for bigger exits" [20, p. 54].

## Tourism cluster in Serbia

Within the period from 2015-2019, the tourism sector in Serbia has been gaining growing importance for the economy. In 2019, the total contribution to GDP was 10.3% (direct, indirect and induced effects) according to the World Travel Tourism Council (WTTC) Report [45]. In 2019, foreign currency inflow was USD 1.7 billion in comparison to USD 1 billion in 2015. However, these pandemic conditions influenced the current growth, and a slowdown is evident. According to the 2020 Tourism Turnover report, the overall number of arrivals reached 1.82 million (a decrease by 50.7% compared to 2019), and the overnights were reduced by 38.4% to 6.2 million in 2020 [36, p. 1].

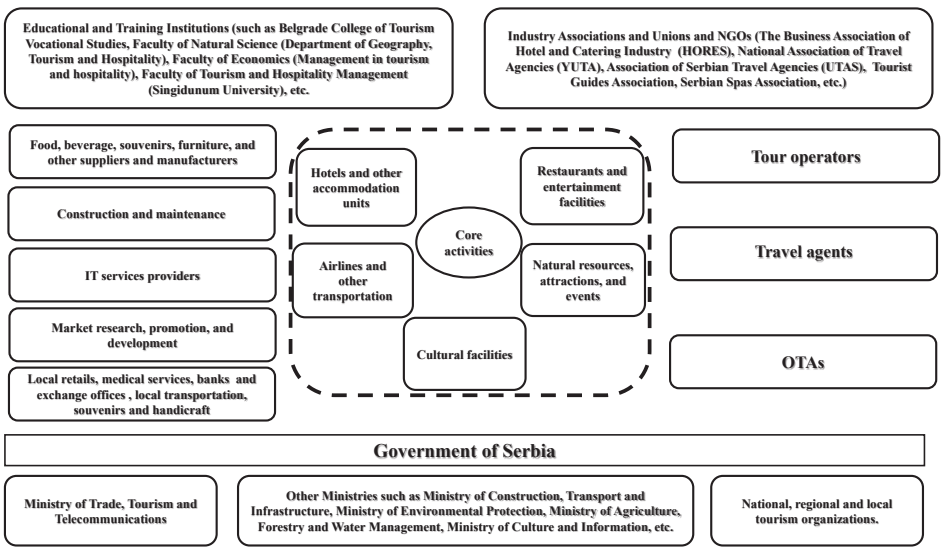
Bearing in mind that tourism is heavily hit by the C-19, some measures were introduced by the Government, including a decree related to the possibility for replacement trip, for the trips paid till March 2020, that should be realized by the end of 2021, or refunded by January 2022; 560,000 vouchers were issued for the trips in Serbia aiming to boost domestic demand within Serbia; subsidies for hotels, tour operators, travel agencies; liquidity guarantee schemes, etc. [24, p. 17]. Most of the tourism experts do not expect international tourism to return to pre-C-19 levels before 2023. The main reasons for this projection are travel restrictions, slow virus containment, economic environment, and the lack of coordinated response among countries [43, p. 13].

*Tourism cluster map* – Within this context, tourism clusters are gaining growing importance and the stronger cooperation within interconnected firms and local institutions, i.e., all the relevant stakeholders represent an essential precondition for sector recovery.

Ferreira and Estevao state that the tourism cluster represents a geographic concentration of companies and institutions that are interconnected within activities related to tourism [8, p. 40]. Consequently, tourism clusters focus on creating a bundle of complementary attributes in order to satisfy consumer needs, generating an increasing number of opportunities for the companies that are part of this cooperation.

According to the Tourism Development Strategy of the Republic of Serbia 2016-2025 [25, p. 35], tourism products that are relevant for tourism development are the following: 1) city breaks; 2) festivals/events (cultural, sporting, etc.); 3) mountain tourism; 4) spa and wellness/ health tourism; 5) thematic routes; 6) rural tourism; 7) nautical tourism; 8) meetings, incentives, conferences and exhibitions/events (MICE); 9) cultural heritage; 10)

**Figure 4: Tourism cluster map**



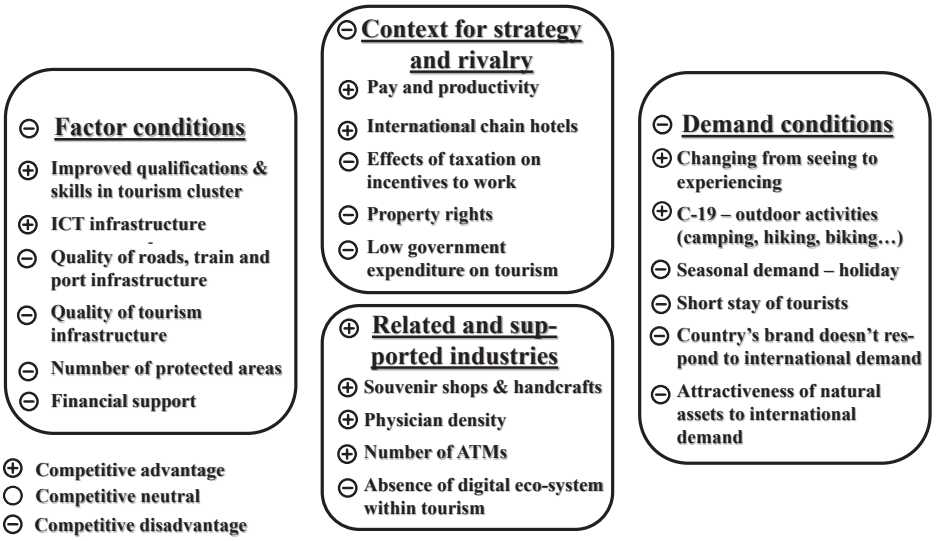
special interests; 11) transit tourism. Foreign tourists emphasize hospitality as one of the main reasons for visiting Serbia, while domestic tourists stress cultural-historical heritage [24, p. 62]. Generally, foreign tourists are more interested in city breaks, while domestic ones prefer mountain tourism.

The varieties in demand imply that more diversified tourism offer is the goal per se in the following period, and more efficient brand positioning is needed. Moreover, the importance of cluster is seen in expanding stays of tourist at the destinations, which is currently on average 3 days (domestic tourists) and 2 days (foreign tourists), [24, p. 50]. Also, in order to reduce the seasonality of visits, future products should be promoted to the elderly population too, boosting senior tourism, consequently reducing the seasonality of visits. Apart from core activities within the cluster, which involve close cooperation among stakeholders in order to create a diversified tourism offer that will satisfy both foreign and domestic demand, further support is essential to comply with the final demand. Core activities that create tourism product need suppliers and providers of necessary inputs (food, IT, construction, maintenance, promotion, local transportation, etc.). Also, close cooperation with supporting institutions is essential, such as educational institutions that will provide skilled labor force and business representatives. Also, government representatives and relevant ministries are important stakeholders as well and tourism organizations that will actively promote destinations through various channels. Finally, tourism products will be sold through tour operators, travel agents, and OTAs (online travel agency-booking.com, EXPEDIA, etc.), depending on the tourist's preference.

*Porter's diamond of the tourism cluster* – In the following paragraph, we will present Porter's diamond related to the tourism cluster combining Global Competitiveness Index and Travel and Tourism Competitiveness Index for 2019, both initiated by the World Economic Forum (WEF). The national business environment in Serbia for the tourism cluster has shortcomings, and needs further improvement.

Within factor conditions labor force made some improvements related to their skills. Regarding the fact that there is a lot of supporting educational institutions related to tourism, this progress is not unexpected. Also, there was some improvement in ICT readiness, which is important within these COVID conditions, where lockdowns and travel restrictions shifted destination promotion to more frequent usage of technology and digitalization such as QR codes, VR (virtual reality), AR (augmented reality), 360 videos, etc. However, there is an underdeveloped road, railroad, and port infrastructure in many parts of Serbia that may prevent arrivals of tourists and reduce the chances for future investments in tourism infrastructure, especially in spas. Also, the number of 'low carriers' should be increased as well. Even though Serbia is rich in landscape and natural resources, the percentage of

**Figure 5: Porter's diamond of tourism cluster**



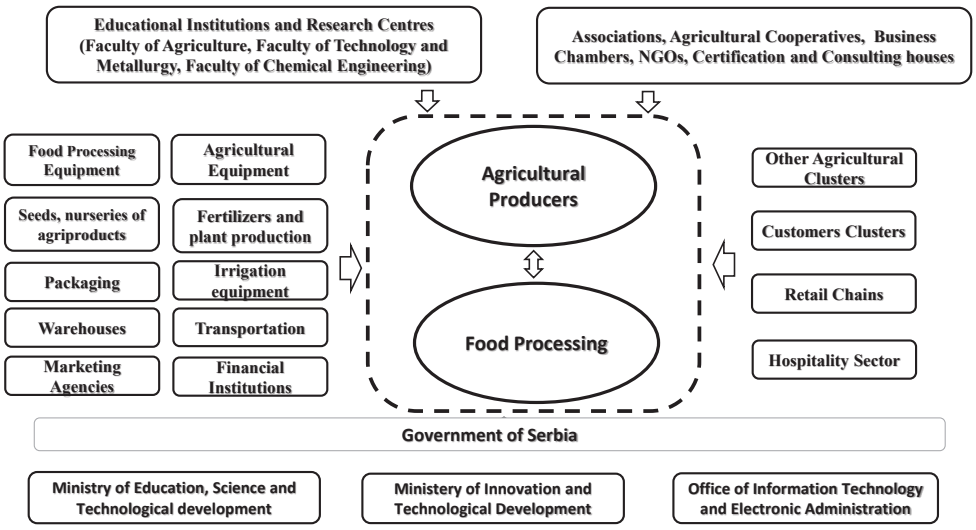
protected areas should be increased from the current 6% [42, p. 3]. Finally, there are restricted financial resources available to the companies operating within the tourism sector, bringing them to insolvency within these current pandemic conditions.

Regarding context for strategy and rivalry, there is improvement in pay and productivity, and competition induced by a growing number of international chain hotels (Hyatt, Crowne Plaza, Holiday Inn, Radisson Blu, Falkensteiner, etc.). However, reforms need improvement, especially regarding taxation and property rights. Within Travel and Tourism Competitiveness Report, according to the indicator Tourism and Travel government expenditure, Serbia is ranked in 137th place out of 140 countries, indicating the problem related to small and insufficient investments [42, p. 3]. Within supporting industries, there has been progress related to additional services that are available to the final consumer when staying at the destination. However, there is a necessity for creating one integrated digital ecosystem that includes a unified digital platform among all relevant stakeholders within the tourism industry (from National Tourism Organization to accommodation facilities, air carriers, tour operators, etc.). Generally, trends are changing regarding tourists' expectations related to the destination. There is a shift from 'seeing' to 'experiencing', that involves personalization within marketing trends. There are some changes in preferences of tourists within COVID-19 conditions that relate to individual traveling in comparison to the group one. Also, there is a focus on local and regional tourism offer compared to foreign destinations and more frequent usage of technology and digitalization such as QR codes, VR (virtual reality), AR (augmented reality). The emphasis is on health and hygienic safety as well and on outdoor activities. Further, demand is still very seasonal, and the stays are very short at the destination. Foreign tourists still prefer city breaks in comparison to other tourism products of Serbia, which indicates that further efforts have to be made related to country brand strategy on the international market, primarily through digital channels.

## Agribusiness and organic food cluster in Serbia

Food security is a crucial issue globally, and it is especially important for developing low-income and middle-income countries. This was even more emphasized in the current circumstance when the ongoing pandemic negatively influenced the global supply chains. The COVID-19 pandemic especially hit MSMEs on a worldwide scale, but in Serbia as well. The latter also relates to food security, bearing in mind that agricultural production and processing are usually coming from small and medium-sized firms, and in most cases, they are seen as a primary source of survival in the rural areas of the developing countries, including Serbia. Our primary agricultural production is susceptible to commodity movements globally, where all the adverse spillover effects are immediately felt.

**Figure 6: Agribusiness and organic food cluster map**



The agricultural value chain remains the priority sector for Serbia. It is widely recognized that agriculture continues to hold the key for broad-based economic growth, poverty reduction, and food security in Serbia and other transition economies.

Agribusiness and organic food cluster map of Serbia has 5.06 million hectares of agricultural land, of which 71% is used intensively (in the form of arable land, orchards, and vineyards), while 29% of agricultural land is natural grassland (meadows and pastures) [23, p. 12]. Due to the high share of arable land in the total agricultural land, Serbia can develop agribusiness. However, technological underdevelopment and low investment in agriculture are limiting factors for development.

Food products and processed products have a high share in exports. The main advantages of Serbian agriculture are natural resources and labor. However, the sector's development needs to be based on innovations, technology absorption, marketing activities, and brand development. Therefore, it is important to unite small agricultural producers in clusters because only by joint action micro, small and medium-sized enterprises can provide resources for investments in branding and innovation.

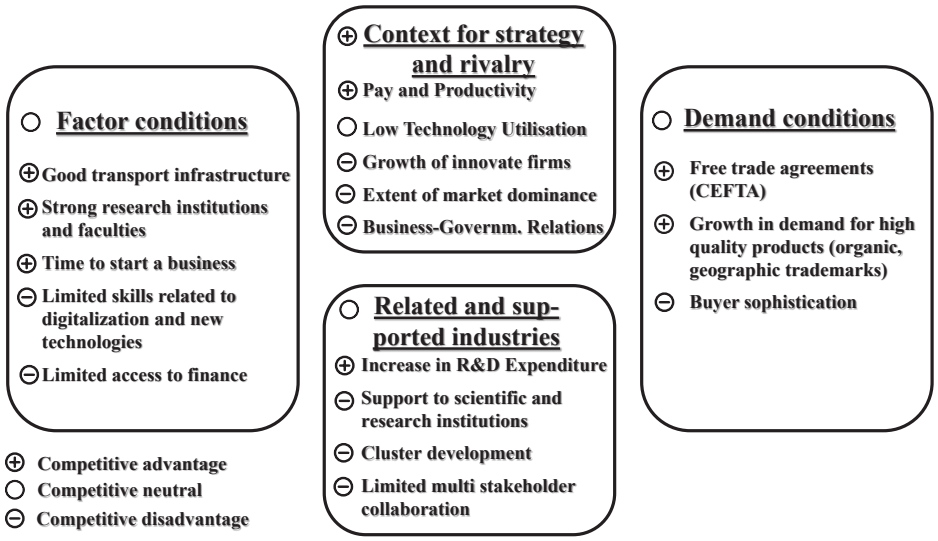
*Porter's diamond of agribusiness and organic food* – There is a significant number of agribusiness clusters in Serbia. However, they have not been successful in achieving benefits from cluster collaboration and a more substantial presence on foreign markets due to underdeveloped technologies and the inability to meet quality standards. Also, other reasons are inexperience and lack of financial resources, mistrust between cluster members, unsatisfactory cooperation with other clusters, and an underdeveloped business environment.

For the clusters to be successful, intensive cooperation between members, the concentration of many producers in a particular region, and strong partnership with educational, scientific research, and public institutions are needed [23, p. 42].

Within factor conditions, the quality of transportation infrastructure is satisfactory, although there are issues with underdeveloped road infrastructure in rural parts of Serbia. Also, the financial system represents a significant barrier for the agriculture cluster since there are low levels of investments in the sector, unsatisfactory financing of small and medium-sized enterprises, and unavailability of entrepreneurial capital. Chronic long-term underinvestment in agricultural markets and value chains has resulted in an agricultural industry that has been unable to play a role in transforming the Serbian economy, either by ensuring food security, creating jobs, or reducing poverty.

However, the Government is pursuing measures to support the sector through different granting schemes, including establishing a guarantee scheme to measure economic support for mitigating the consequences of the C-19 pandemic. Serbia has strong research institutions and faculties related to agriculture, but the wider workforce is still dealing with limited digitalization skills and new technologies.

**Figure 7: Porter's diamond of agribusiness and organic food**



Regarding strategy and rivalry, agriculture deals with low productivity because production is done traditionally and mainly not using innovative technologies. One of the reasons for the low productivity of Serbia concerning the region is precisely due to extremely unproductive agriculture. Upgrading the agricultural value chain includes introducing agricultural technology such as precision agriculture applications, digital advisory services, drip irrigation combined with soluble fertilizers, solar-powered pumps, soil and crop monitoring by humans or drones, and farm machinery guidance using positioning and mapping technology. By focusing on upgrading agricultural value chains, such as increasing yields through technology (precision farming, irrigation systems), productivity across the value chain can be improved.

In terms of agrotechnology and information and communication technologies, many promising startups in Serbia are on the frontline of agriculture development with a strong emphasis on using new technologies and digital solutions, which are of crucial importance for boosting agricultural productivity, which in turn could increase the competitiveness of the Serbian agricultural products. These companies are developing the newest technology and software solutions that are helping farmers to collect and analyze important data, which in turn supports them in better allocating available resources, reducing cost, and improving the management of agricultural holdings.

Although total employment in agriculture recorded high rates of decline, the share of agriculture in total employment in Serbia is still very high, among the highest in Europe, and amounts to over 20%. It can be explained by the high share of employees in seasonal and occasional jobs in agriculture, who are very sensitive to fluctuations in the labor market during the crisis. Bearing in mind that a significant proportion of these workers are not in the legal labor market, their rights are not guaranteed, which also calls for better regulation in this field.

There has been progress related to the increase in overall expenditure for research and development within supporting industries. However, the overall development of the agribusiness clusters is relatively low, with limited stakeholder collaboration. Further, in terms of demand conditions, bearing in mind that Serbia is a net exporter of agriculture goods, the existence of a significant number of trade agreements creates improved market conditions for Serbian products in the regional markets. However, this also creates considerable pressure for the domestic producers to increase productivity to boost the competitiveness of Serbian products and their inclusion in global supply chains. The latter is also related to the growing demand for high-quality products on both domestic and international markets. Also, there is a low sophistication of buyers on the domestic market, which indicates the importance of prices of products and services.

## Conclusion

The conclusion of this paper is based on reviewing the current literature, together with analyzing Serbia's economy competitiveness by using the Country Competitiveness Index, as well as analyzing the obstacles and opportunities for three clusters' further development: tech, agribusiness and organic food, and tourism. Analyzing the current literature, we find consensus regarding the fact that the COVID-19 crisis differs from previous ones: it impacts both supply- and demand-side; declines world GDP to the extent which is comparable to the Great Depression of the 1930s and two world wars; disrupts global value chains; changes direction from global to regional cooperation; and forces changes in business models toward digitalization. We also emphasized that global governance institutions predict better prospects for global growth due to the beginning of two processes: vaccination and recovery of developed economies, supported by expansive macroeconomic policies. Central banks were first to act by loosening monetary policy, and the fiscal policy supported demand in the short-term while simultaneously raising public debt as one of the constraints for future development. In Serbia, the macroeconomic policy measures were properly and timely implemented; and to support the full recovery of the economy, in addition to measures related to public health and macroeconomic measures, it is necessary to strengthen the microeconomic determinants of competitiveness further. The fall of GDP in Serbia in 2020 (-1.1%) was one of the smallest in Europe. This

decline did not result from tradable sectors (agriculture, industry), but from the service sector (tourism, catering, transport, and a modest decline in construction). We analyzed the competitiveness of the Serbian economy, and we emphasized the importance of microeconomic determinants that represent a powerful tool in analyzing key segments for the economy's recovery, with a strong focus on three clusters' potential. We also pointed out that there is enough space for further research regarding other important clusters such as: energy, health and pharma, retail, fintech, and food processing. In this analysis, we stressed the tech cluster's role as a frontier that impacts multiple sectors of the economy. Even though the national business environment is vital for this cluster's development, there are still obstacles for boosting further growth and they refer to: the necessity to strengthen policies and actions toward brain retention, make local demand more sophisticated, increase tech cluster influence on new products and services development, and strengthening R&D activities as a step toward cluster's higher productivity. Analyzing the tourism cluster, we stressed the COVID-19 impact on disrupting this sector globally by almost halving the key indicators. The national business environment in Serbia for the tourism cluster has shortcomings related to: the necessity for improving infrastructure, low usage and utilization of new and emerging technologies in tourism offer, improving conditions for access to finance, and taxation and property rights. In order to improve, the tourism cluster should be strengthened and offer new experiences to the customer who changes their preferences during this crisis (focus on outdoor activities, smaller groups, digitalization such as QR codes, etc.). In this paper, we also focused on agribusiness and organic food cluster, to create a more digitalized value chain of food processing. Therefore, we underlined the importance of actions toward higher productivity in the value chain by the usage of new and emerging digital technologies and supporting digital literacy, which is still at a low level among the related fields. Considering all the above, we see the tech cluster as a frontier of the multiple parts of the economy's long-term competitiveness that has the strong potential to support other sectors of the economy toward knowledge-based development.

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