

# International Acquisitions and Labor Productivity in Serbian Cement Industry

Sladana Savović<sup>1\*</sup> | Dušan Marković<sup>2</sup>

<sup>1</sup> The University of Kragujevac, Faculty of Economics, Department for Management and Business Economics, Kragujevac, Serbia

<sup>2</sup> The University of Belgrade, Faculty of Economics, Department for Business Economics, Belgrade, Serbia

## ABSTRACT

This paper investigates the impact of international acquisitions on the productivity of acquired companies in the cement industry of the Republic of Serbia. We analyze the productivity of companies in the cement industry during the twenty-year period from 2000 to 2019. Acquisitions in the cement industry are one of the first international acquisitions realized in the Republic of Serbia. The multinational companies that took over the cement plants are from Switzerland, France and Greece. The paper analyzes the effects of international acquisitions on the productivity of acquired companies in the short and long term. The research results show that the productivity of all acquired companies improved both in the short term and in the long term after the acquisitions, with the largest productivity improvements being achieved in the short term. In addition, the research results show that Lafarge Serbia recorded the largest improvement in labor productivity, which, compared to other companies, optimized the number of employees and increased production volume.

**Key words:** *International acquisitions, labor productivity, cement industry*

**JEL Classification:** E24, G34, L61

---

## INTRODUCTION

The processes of liberalization, deregulation and privatization in emerging markets contribute to the development of a market economy, improving the business investment climate and creating conditions for more intense international acquisitions. International acquisitions are the preferred way for multinational companies to enter emerging market economies (Lebedev, Peng, Xie & Stevens, 2015). Motives for multinational companies to acquire companies in emerging economies include entering new markets, improving the acquired companies' operations, achieving various synergies, i.e. access to natural resources and an abundance of relatively cheap labor (Meyer, 2002; Dikova & van Witteloostuijn, 2007; Uhlenbruck, 2004; Khanna & Palepu, 2010). The specificity of the institutional environment in emerging market limits multinational companies to achieve synergy effects by simply transferring intangible assets to the acquired company (Peng, Wang & Jiang, 2008), so they need to adapt the competitive strategy to the business environment. The positive effects resulting from multinational companies' operations increase the interest of emerging markets in the realization

---

\* Corresponding author, e-mail: ssladjana@kg.ac.rs

of cooperation with them, because the inflow of capital, knowledge and modern technology contributes to economic growth and development (Stošić, 2014).

Although numerous studies analyze the effects of international acquisitions on productivity in developed economies (Modén, 1997; Gima & Gorg, 2002; Harris & Robinson, 2002; Gioia & Thomsen, 2004; Olford & Otchere, 2016), few studies have focused on studying the impact of international acquisitions in emerging markets (Lui & Qiu, 2013; Azdejković & Marković, 2016; Savović & Mimović, 2020). Hence, this study seeks to fill the research gap by analyzing the impact of international acquisitions on the acquired companies' productivity, focusing on international acquisitions made in the cement industry of Serbia.

We focus our research on cement industry because the industry is asset-heavy and technology intensive, so large multinational companies control lion – share of global market. Additionally, cement products are characterized by low value to weight ratio, so export as an internationalization strategy frequently is not profitable. Due to that, multinationals from cement industry establish foreign production subsidiaries aiming to serve demand in local markets. Tremendous economic development, considerable investment in transportation infrastructure and strong growth of real estate market, motivate multinational companies from developed countries to realize cross-border acquisitions in emerging markets. The acquirers transfer cutting-edge technology and marketing and management knowledge to the targets. The transfers and access to new customers result in improved the targets' business performance (Erić, Stošić & Dapčević, 2019). Three companies make up Serbian cement industry and all of them were acquired by multinational companies from developed markets, so the main aim of this paper is to find out how cross-border acquisitions have affected productivity of this strategic important industry.

The paper is structured as follows. First, the paper gives a review of literature on the effects of international acquisitions on productivity, thus creating a basis for formulating research hypotheses. Second, we describe the research methodology. Third, research results and discussion of results are presented. Finally, concluding remarks are given, with limitations and directions of future research, as well as the theoretical and practical implications of the paper.

## **REVIEW OF LITERATURE**

### **Motives of international acquisitions in emerging markets**

One of the motives for starting the processes of international acquisitions is faster entry into the new market. A firm may find that there is an untapped opportunity on a foreign market, but that it cannot take advantage of it through internal expansion, which is slow, especially given the rapid reaction of competitors (Gaughan, 2002). A large number of authors emphasize that international acquisitions allow faster entry into new markets compared to greenfield investment (Datta & Puia, 1995; Shimizu, Hitt, Vaidyanatah & Vincenzo, 2004). Exploring the motives of international acquisitions made by British companies in Europe and the USA during the 2000-2004 period, Ahammad, Tarba, Glaister, Kwan, Sarala & Montanheiro (2017) point out that the key motive for international acquisitions is the presence on new markets. By changing the way of doing business, changing inefficient management, transferring technology, as well as transferring management and marketing know-how, foreign companies can improve acquired companies' operations (Deng & Yang 2015).

The motive of international acquisitions in emerging markets is to transfer and further exploit intangible assets from the domestic market (Dunning & Lundan, 2008), and thus raise efficiency of the existing business model. In the specific context of international acquisitions in emerging markets, there are different ways of achieving synergetic effects. In the short term, it is possible to achieve business synergy effects due to the elimination of duplicate functions, division of business functions, thus achieving economies of scale, and division of production facilities, while

in the long run it is possible to achieve synergetic effects due to placement of existing products into new sales channels and joint creation of new products and new sales channels (Cullinan, Le Roux & Weddigen, 2004). In addition, the possibility of achieving financial synergies appears, when the superior credit rating of the investor can bring the acquired company loans under more favorable conditions (Fankner & Cambell, 2003).

In a large number of cases, multinational companies seek to increase business efficiency due to lower labor costs in emerging markets (Meyer, 2002; Dikova & van Witteloostuijn, 2007). Analyzing the motives of more than a thousand international acquisitions realized in the period 2000-2013, Cogman, Jaslowitzer & Rapp (2015) show that one third of international acquisitions realized by companies in emerging markets are made in order to access new markets, gain access to natural resources or improve efficiency.

Acquisitions are in themselves one of the riskiest competitive strategies, often leading to the destruction of value for owners (KPMG, 1999; Lodorfs & Boateng, 2006). An additional problem for companies realizing takeovers in emerging markets is facing a relatively inefficient institutional environment, a larger number of stakeholders and their greater impact on business than is the case on the markets of developed countries. In order to minimize the risks on this basis, foreign investors must carefully identify stakeholders, their interests and strengths, and try to form a partnership with them (Rondinell & Black Sloan, 2000), while in the long run it is necessary to actively work with stakeholders to improve efficiency of the institutional environment (Iankova & Katz, 2003).

### **The impact of international acquisitions on productivity**

There are no consistent findings about the impact of international acquisitions on productivity, as studies have come to different conclusions. While a number of studies reveal a positive impact (Modén, 1997; Karpaty, 2007; Modén, Norbäck & Persson, 2007; Liu & Qiu, 2013; Olford & Otchere, 2016; Azdejković & Marković, 2016; Savović & Mimović, 2020), there are studies in which this impact is not fully clear (Bandick, 2008; Girma & Görg, 2002; Schiffbauer, Siedschalg & Ruane, 2017), and a small number of studies find a negative impact of international acquisitions on productivity (Ataullah, Hang & Sahota, 2014; Harris & Robinson, 2002; Gioia & Thomsen, 2004).

Some studies find a positive impact of international acquisitions on productivity. Analyzing acquisitions in Sweden during the 1980-1994 period, Modén (1997) investigates the impact of domestic and international acquisitions on labor productivity and overall factor productivity. The research results show that the productivity of companies taken over in the processes of international acquisitions increases compared to the industrial average, while the productivity of companies taken over in the processes of domestic acquisitions remains at the same level or decreases. Analyzing the difference in the change in total productivity in international acquisitions of manufacturing companies in Sweden in the period from 1986 to 2002, Karpaty (2007) finds that international acquisitions contribute to productivity growth, but that productivity growth does not occur immediately but in a period of up to 5 years. Analyzing the effects of foreign ownership in Poland during the 1990s, Modén, Norbäck & Persson (2007) show that companies owned by foreign investors have on average higher labor productivity compared to companies taken over by domestic investors, as well as compared to state-owned companies. The authors point out that by investing resources and knowledge, foreign investors improve business efficiency of the acquired companies. Liu & Qiu (2013) investigate the impact of domestic and international acquisitions on the productivity and profitability of acquired and acquiring companies. The research covers American companies that made international acquisitions in developed and transition economies during the period 1991-2007. The research results show that the productivity of acquiring companies is better in international acquisitions in emerging markets, compared to international acquisitions made in developed economies.

Following international acquisitions in Canada during the period 1980-2010, Olford & Otchere (2016) analyze their impact on labor productivity. The research results show that international acquisitions have a positive impact on labor productivity. Analyzing the impact of international acquisitions on labor productivity, employment and employee wages in acquired companies in the Republic of Serbia during the period 2003-2009, Azdejković & Marković (2016) show that international acquisitions have had a positive impact on labor productivity and real wages, while the number of employees in the acquired companies has decreased. Savović & Mimović (2020) analyze the effects of international acquisitions in the cement industry of Serbia on the partial productivity of labor, materials and capital, as well as the total productivity of factors using the DEA (Data Envelopment Analysis) approach. The research results show that international acquisitions increase the partial productivity of labor, materials and capital, as well as the total factor productivity.

Some studies fail to find clear relationship between international acquisitions and productivity, emphasizing that the impact of international acquisitions can be both positive and negative depending on the level of analysis and criteria used (labor productivity vs. total factor productivity). Bandick (2008) analyzes changes in total productivity of international acquisitions in Sweden in the period from 1993 to 2002 and comes to the conclusion of international acquisitions contributing to productivity growth only in vertical, but not in horizontal acquisitions. Girma & Gorg (2002) investigate the effects of international acquisitions on productivity in different sectors in the UK and find positive effects in the food sector as well as negative effects in the electronics sector. Schiffbauer, Siedschalg & Ruane (2017) investigate the impact of international acquisitions on the productivity of companies in the short and long term, focusing on acquisitions in the UK realized during 1999-2007. The research results show that international acquisitions improve labor productivity, while there is significant heterogeneity in the effects of international acquisitions on the total factor productivity at the sector level.

On the other hand, the results of several studies show that international acquisitions have a negative effect on productivity. Exploring international acquisitions in developed and less developed economies realized during the period 1997-2008, Ataullah, Hang & Sahota (2014) investigate the impact of international acquisitions made by companies from emerging markets on labor productivity and employment growth. The research results show that international acquisitions in developed economies do not have a statistically significant impact on labor productivity, while in less developed countries and culturally different countries they have a negative impact on labor productivity. Similarly, certain studies of international acquisitions in developed economies, such as the United Kingdom (Harris & Robinson, 2002) and Denmark (Gioia & Thomsen, 2004), reveal a negative impact of international acquisitions on labor productivity.

Most previous empirical research in this area (Table A1 is given in the Appendix) show that labor productivity improves in the period after the realization of international acquisitions. Our study seeks to see how international acquisitions realized in the Serbian cement industry have affected the productivity of the acquired companies. One of the ways in which international acquisitions can improve the productivity of acquired companies in this industry is the transfer of modern technology (Deng & Yang 2015). In the period before the liberalization of the cement industry of Serbia, cement plants had outdated technology, so there was a need for significant modernization. The implementation of modern cost-effective technology provides an opportunity for the acquired companies to increase the volume of production, thus contributing to increased productivity. In addition, the implementation of the necessary restructuring measures in the post-acquisition period, which include, among other things, rationalization of the number of employees, brings savings and a lower degree of labor engagement as input, which contributes to increased productivity. The rationalization of the number of employees is much higher among production workers, due to the introduction of new technological solutions,

than among administrative workers (Lehto & Bockerman, 2008). Labor productivity in the acquired companies could be increased by developing a new system of employee values, i.e. by changing the existing organizational culture and adopting a new one based on greater employee commitment and motivation (Savović, 2017). The introduction of a new remuneration system in accordance with the achieved results encourages employees to engage more, contributing to increased productivity. Additionally, an increase in labor productivity can be achieved by knowledge transfer, which increases the ability of employees and allows them to perform tasks more efficiently (Meyer, 2002).

Based on the above, the following research hypotheses are formulated:

*Hypothesis 1:* International acquisitions in the cement industry of Serbia lead to an increase in the productivity of the acquired companies in the long and short term.

*Hypothesis 2:* The growth of labor productivity in the short run is predominantly a consequence of the decline in employment, while in the long run it is a consequence of the increase in the volume of production.

## METHODOLOGY AND DATA

This study analyzes the impact of international acquisitions on the productivity of acquired companies in the cement industry of the Republic of Serbia in the short and long term. The cement industry of Serbia is characterized by an oligopolistic market structure, in which only three companies are present (Commission for Protection of Competition, Republic of Serbia, 2018), both in the period before privatization and in the period after the realization of international acquisitions. The privatization of the cement industry in the Republic of Serbia was carried out in 2002, when three cement plants: Popovac cement plant, Beočin cement plant and Kosjerić cement plant were taken over by multinational companies: Holcim (Switzerland), Lafarge (France) and Titan (Greece). In 2015, the multinational Holcim and Lafarge merged globally. Due to the threat to competition on a large number of markets on which these companies operate, regulatory bodies required disinvestment, i.e. the sale of a certain number of cement plants. In the cement industry of Serbia, the integration of these companies would lead to the transformation of the oligopolistic market structure into a duopoly market structure, with one dominant competitor. In order to prevent the creation of a duopoly, Holcim was forced to sell its branch in Serbia to the Irish CRH in 2015. Despite these sales, the cement market is still characterized by a high degree of concentration measured by the Harfindal-Hirschman index. Theoretical values of this index range from 0 to 10,000, and values greater than 2,500 indicate a high degree of concentration in the sector. In the cement industry of Serbia, the value of this index is 3,576 (Commission for Protection of Competition, Republic of Serbia), based on which we can conclude that the degree of concentration is very high. Table 1 presents the companies in the cement industry of Serbia.

**Table 1.** Analyzed companies in the Serbian cement industry

Acquired company	Acquiring company	Country of acquiring company	Year of acquisitions	Company after acquisition
Cementara Popovac	Holcim	Swiss	2002	Holcim Serbia*
Cementara Beočin	Lafarge	French	2002	Lafarge Serbia
Cementara Kosjerić	Titan	Greek	2002	Titan Serbia

*Note:* Holcim Serbia was taken over in 2005 by the Irish company CRH

The paper analyzes labor productivity in the twenty-year period (2000-2019). Relying on the existing literature in this field and studies that analyze the effects of acquisitions on labor productivity (Conyon, Girma, Thompson & Wright, 2002; Schiffbauer, Siedschalch & Ruane, 2017;

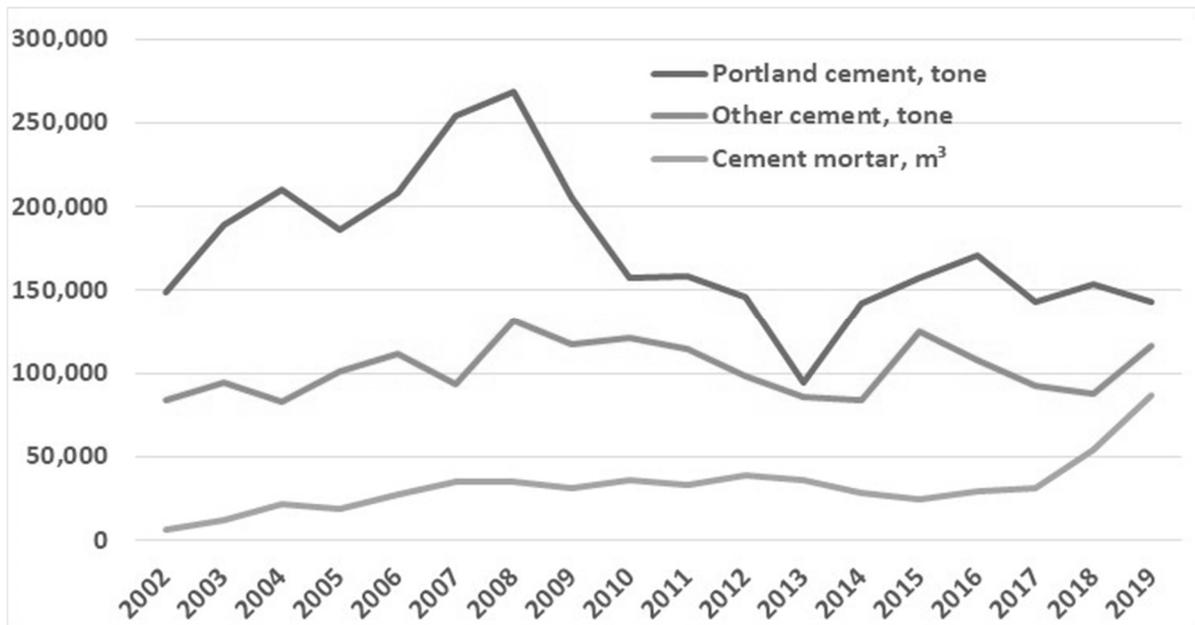
Bertrand & Capron, 2015), we measure labor productivity as the ratio of sales revenue and number of employees. Sales revenue represents the total value of products sold and is one way of expressing products in terms of productivity. In order to eliminate the effect of the change in current market prices on the change in income and enable the change in income to mean a change in the quantity of products, and thus a real change in labor productivity, we deflate sales revenue by using the constant price index of 2000. Data on inflation rates is taken from the IMF database.

To analyze the short-term effects of international acquisitions on labor productivity, we compare the average labor productivity two years after the acquisitions with the average labor productivity two years before the acquisitions. To find out the long-term effects of international acquisitions on labor productivity, the average labor productivity in the entire post-acquisition period is compared with the average labor productivity in the pre-acquisition period. To deepen our research, we analyze dynamics of the labor productivity. To analyze the labor productivity dynamics, we construct base and chain indices. Base index is an index number in which the value of every period in a time series is directly related to the same value of one fixed base period. Data from 2000 is used to construct base indices. We calculated the base indices by dividing the real productivity of acquired companies in each year by the realized productivity of the base year. Chain index is an index number in which the value of any given period is related to the value of its immediately preceding period. We calculated chain indices by dividing the real productivity of acquired companies in each year by the real productivity of the previous year. This approach enables us to create wider picture about influence of the cross – border acquisitions on the targets' labor productivity.

The data required for the research is collected from the official financial reports of the analyzed companies. Income statements, as well as data on the number of employees for the last three years of the analyzed period are available on the website of the Business Registers Agency, while income statements and data on the number of employees for all other years were received from the Business Registers Agency after an official request.

## **RESULTS AND DISCUSSION**

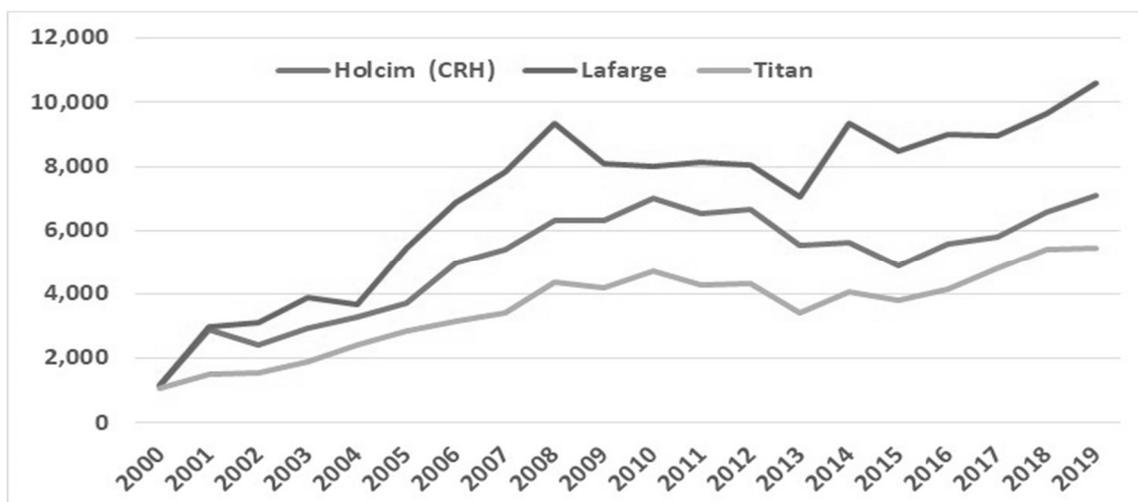
In order to adequately interpret short-term and long-term productivity, the motives for foreign companies in the cement industry to enter the Serbian market should be considered. Cement is a product where the ratio of value and weight is relatively low, which is why transportation costs have a significant share in the selling price. Given the above, companies strive to locate their facilities relatively close to customers, in order to minimize transportation costs, so that investment strategies are imposed as the expected way of internationalization. This is a capital-intensive activity and it is very important to achieve economies of scale, which is why acquisitions in this activity are frequent, and new plants are being raised relatively cautiously. Also, after the political changes and the change of the economic model in Serbia after 2000, strong growth was expected in the field of construction, which would affect the growth of demand for cement products (Chart 1). These factors have encouraged foreign cement plants to implement takeovers in the privatization process, although the business environment has been characterized by a relatively high degree of political and economic risk.



**Figure 1.** Quantity of installed construction material

Source: Statistical Office of Republic of Serbia, <https://www.stat.gov.rs/>, (accessed January 22, 2021)

Figure 1 shows that the demand for cement products grew rapidly until the beginning of the great recession in 2008, after which there was a large drop in demand for Portland and other types of cement, while the demand for cement mortar grew steadily. The recovery of demand for the first two types of products was gradual and irregular, so that in 2019 the aggregate demand was slightly higher than in the year of privatization of cement plants. On the other hand, the demand for cement mortar is more than 13 times higher than the demand in the year of privatization. The natural growth of demand and the change in customer preferences for new, better quality, and higher-priced products had a positive effect on the growth of revenues from the sale of cement plants in the period after privatization.



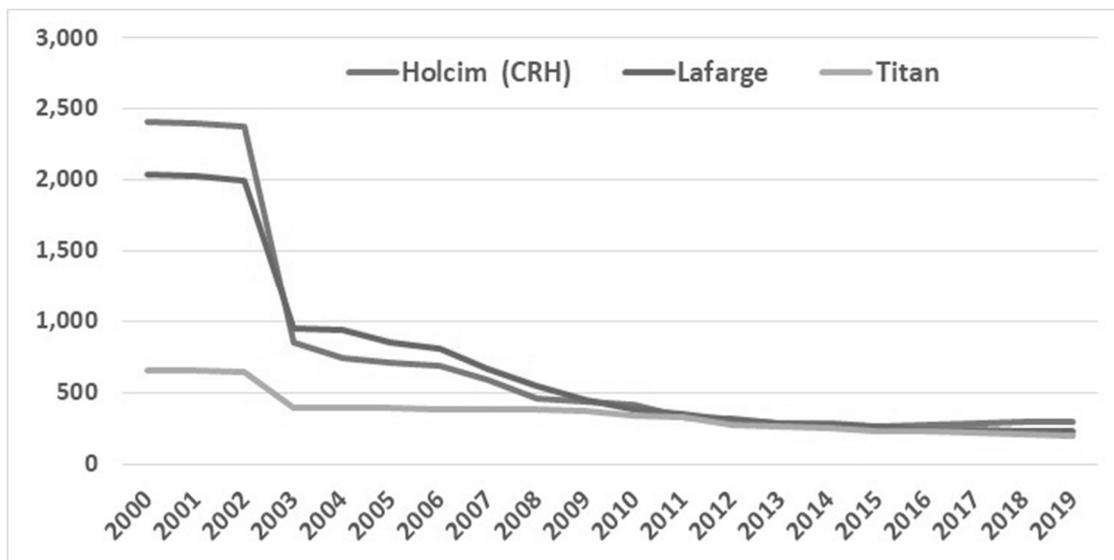
**Figure 2.** Real sales revenue in millions of RSD

Note: Revenues are deflated and reduced to the value from 2000; Source: calculation of the authors based on data obtained from the Business Register Agency and the IMF

Figure 2 shows that revenues from the sale of cement plants expressed in constant RSD in 2019 were 3.3 times higher than in the year of cement plant privatization, and that sales grew strongly until the great recession in 2008. During the recession, the market lost 20% of its value, and it took 10 years after the recession for real revenues from cement sales to reach pre-crisis levels. In the last year of the analysis, the market was only 15% higher than before the crisis maximum, which confirms the great damage that the cement industry suffered due to the global economic crisis and the slow economic recovery after it.

International acquisitions often result in radical restructuring of acquired companies, which is especially pronounced in acquisitions in transition countries and emerging markets (Meyer & Estrin, 2001; Meyer & Estrin, 2011), so that in these countries, due to the degree of restructuring, acquisitions often have brownfield investment characteristics. Specifically, in these countries, companies, due to state ownership and lack of the cutting-edge technology, have more workers than comparable companies in developed countries. After the takeover, foreign investors lay off workers who do not have full employment, (Santalainen, Baliga & Leiman, 2003), transfer new technological solutions to the target (Uhlenbruck & De Castro, 2000), but also provide additional training to employees (Meyer, 2002). The first measure will contribute to the decline in employment in the short term, while the other measures in the long run will contribute to further optimization of employment and growth of production.

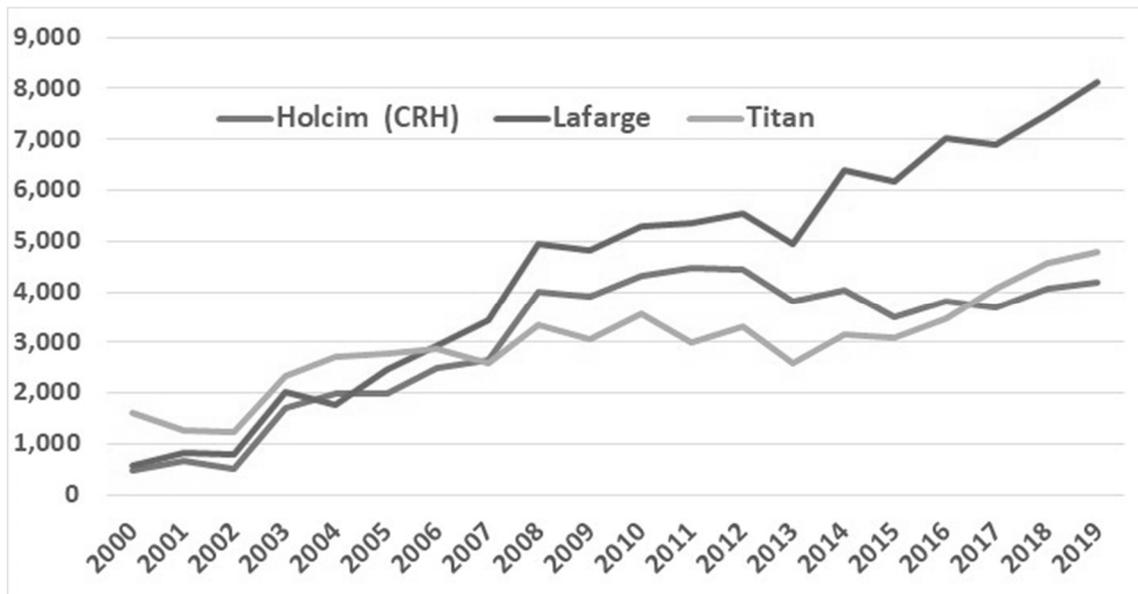
When it comes to the cement industry in Serbia, it employed over 5,000 workers in the year of takeover, and at the end of 2019, the number of hired workers was around 730 (Figure 3). The chart shows that the largest decline in the number of employees occurred in the first year after privatization, due to the reduction of the number of employees to the optimal level, and then in accordance with the introduction of new technologies, organizational solutions and employee training, the number of employees further decreased.



**Figure 3.** Comparative overview of number of employees during the period 2000-2019.

*Source: the Business Register Agency*

Based on data on the number of employees and real sales revenues, we calculate real productivity at the level of companies in the cement industry. Figure 4 shows the real productivity of the acquired companies during the period 2000-2019.



**Figure 4.** Comparative overview of real labor productivity during the period 2000-2019 (in 000 RSD/employee)

*Source: calculation of the authors based on data obtained from the Business Register Agency and the IMF*

Figure 4 shows that all three analyzed companies had different dynamics of labor productivity growth. Prior to the cement privatization process, Titan had the highest labor productivity, which increased sharply in the first two years after privatization. After that, productivity was relatively stable with minor oscillations, ending in 2015, after which productivity it rose sharply, as a result of which the company reached maximum labor productivity in 2019, and became the second most productive in the industry. Prior to privatization, Holcim had the lowest productivity, but after the change of ownership, productivity grew rapidly until 2011, when there was a decline and a slow recovery in productivity. Problems with productivity in the second decade of the 21st century are a consequence of the decline in real incomes as of 2011, and a slight increase in the number of employees, due to the change in management and ownership in 2015. Lafarge is the absolute industry leader in terms of productivity. At the same time, Lafarge aggressively reduced the number of employees and increased production, during the entire analyzed period, so that in 2019, the company productivity was slightly lower than the combined productivity of the other two competitors.

To deepen our findings about cross-border acquisitions' impact on labor productivity we analyze base and chain indices for all companies in the sample. Table 2 shows the companies' real labor productivity and base and chain indices during the period 2000-2019. According to base indices Holcim (CRH) had the largest labor productivity in 2011, when the real labor productivity was 850% larger compare to 2000 year. Titan and Lafarge had the largest labor productivity in the last analyzed year. The real labor productivity in that year was larger 200% and 1,344%, respectively, compared to the base year 2000.

Increase of the companies' labor productivity was not linear. After the privatization the companies' productivity was growing constantly until 2009. In that year the companies' productivity decreased, due to effects of global financial crisis. The second drop of the productivity was in 2013. In this year Holcim's (CRH) productivity decreased by 15%, Lafarge's productivity decreased by 11% and Titan's productivity plunged by 21%. The productivity decrease in this year was result of fiscal consolidation, postpone of public investments in infrastructure projects and decreasing private investments in real estates. In 2014 Serbia has been severely hit by floods. The floods cause significant damage of transport infrastructure and

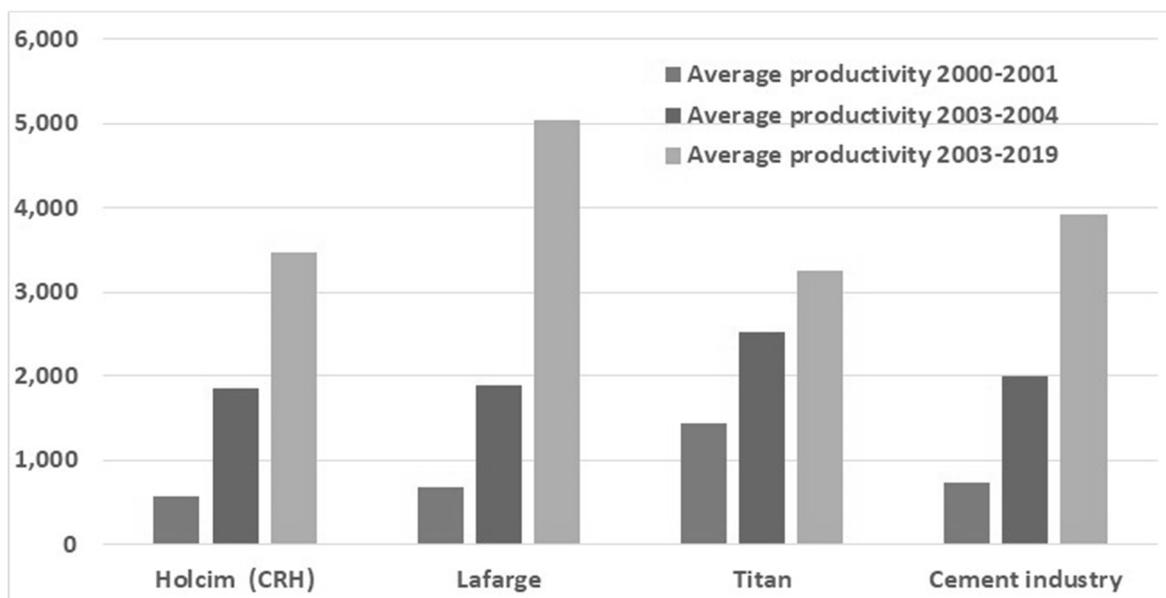
houses. Serbian government organized repairment of damaged infrastructure and real estates which positively affected the sales income and labor productivity in cement industry. When public investments in infrastructure and real estates recovery decreased in 2015, the industry productivity dropped sharply due to lower sales incomes. Since 2016 Serbian government has been increasing investment in hard infrastructure and real estate market has been booming, which has resulted in the productivity increase for all analyzed companies.

**Table 2.** Real productivity (000 RSD/employee), Base and Chain indices in the period 2000-2019

	Real productivity			Base indices			Chain Indices		
	Holcim (CRH)	Lafarge	Titan	Holcim (CRH)	Lafarge	Titan	Holcim (CRH)	Lafarge	Titan
2000	472	563	1,600	100	100	100			
2001	663	811	1,281	140	144	80	140	144	80
2002	513	791	1,240	109	140	78	77	98	97
2003	1,704	2,010	2,323	361	357	145	332	254	187
2004	1,993	1,763	2,707	422	313	169	117	88	117
2005	1,997	2,464	2,774	423	437	173	100	140	102
2006	2,491	2,948	2,867	528	523	179	125	120	103
2007	2,658	3,451	2,585	563	612	162	107	117	90
2008	4,008	4,943	3,348	849	877	209	151	143	129
2009	3,899	4,828	3,050	826	857	191	97	98	91
2010	4,312	5,287	3,558	914	938	222	111	110	117
2011	4,485	5,360	2,990	950	951	187	104	101	84
2012	4,453	5,549	3,303	944	985	206	99	104	110
2013	3,805	4,949	2,577	806	878	161	85	89	78
2014	4,043	6,396	3,166	857	1,135	198	106	129	123
2015	3,490	6,187	3,077	740	1,098	192	86	97	97
2016	3,809	7,028	3,462	807	1,247	216	109	114	112
2017	3,673	6,902	4,057	778	1,225	254	96	98	117
2018	4,054	7,497	4,580	859	1,330	286	110	109	113
2019	4,188	8,137	4,804	887	1,444	300	103	109	105

Source: calculation of the authors based on data obtained from the Business Register Agency

Figure 5 shows short-term and long-term changes in average productivity compared to the two-year average before the takeover. In the short term, all three companies improved productivity compared to the two-year average before the takeover. Short-term productivity at the industry level increased 2.73 times, in just two years after the change of ownership. Such a radical change in productivity is predominantly a consequence of the reduction in the number of employees, and to a much lesser extent of the increase in production volume. Looking at individual companies in the industry, it can be seen that short-term productivity improved the most at Holcim (CRH), by 3.26 times, followed by Lafarge 2.75 times and Titan 1.75 times. Titan had the lowest short-term productivity improvement, as it had an average productivity in the pre-acquisition period higher than Holcim (CRH) by 2.5 times, or 2.1 times compared to Lafarge, so it can be concluded that this company before the takeover had the best ratio of production and number of employees.



**Figure 5.** Comparative overview of the average real labor productivity in the pre-acquisition period and post-acquisition period (short and long term) (in 000 RSD/employee)

*Source: calculation of the authors based on data obtained from the Business Register Agency and the IMF*

When looking at the change in productivity in the long run, the situation is somewhat different than in the short-term change in productivity. Specifically, at the industry level, productivity increased 5.39 times, which is primarily a consequence of the increase in production volume, but also partly the introduction of new technological and organizational solutions that lead to further optimization of the number of employees. When the change in long-term productivity at the company level is observed, the situation has changed, so that the largest productivity improvement was recorded at Lafarge, 7.34 times. On the other hand, with Holcim (CRH), which improved productivity the fastest in the short term after the change of ownership, long-term productivity improved on average 6.12 times. By far the slowest growth in long-term productivity was recorded at Titan, only 2.26 times. Based on the results, we see that when productivity growth opportunities were exhausted by reducing the number of employees, Titan and Holcim did not sufficiently use productivity growth opportunities by introducing new technological solutions and better work organization, which strengthened Lafarge's leadership position and competitive advantage.

The analysis of productivity in the cement industry opens space for further discussion, at the level of companies, but also at the level of the national economy. The obtained results are in line with previous studies that suggest that international acquisitions contribute to productivity growth in emerging markets (Savović & Mimović, 2020; Azdejković & Marković, 2016).

At the micro level, it is evident that the privatized cement plants were burdened with redundancy and relatively old technology. Therefore, productivity growth in the short run was predominantly a consequence of optimizing the number of employees, and to a lesser extent, of increasing production volume. In the long run, when productivity growth opportunities have been exhausted by optimizing the number of employees, companies have sought to increase productivity by introducing new technologies and better work organization. This approach resulted in slower growth in average productivity between 2005 and 2019, which is partly due to declining sales during the global financial crisis, and a slow recovery thereafter in Serbia. On the other hand, it has been observed in international takeovers that there is a relatively stable number of employees, especially non-productive workers, who must be hired independently of the fluctuation of production and sales (Lehto & Bockerman, 2008).

The results also show that in the cement industry, as a capital-intensive one, there was an increase in employee productivity, which further raised the already high barriers to entry into the industry. With this in mind, there is little chance that late followers will appear on the market that would intensify competition, and reduce the level of concentration in the industry. Given the above, state authorities must carefully monitor developments in the industry, which is of strategic importance for the development of construction and road infrastructure, in order to prevent collusion between companies at the expense of customers.

At the level of the national economy, the benefits of these takeovers are relatively limited. Revitalization of acquired companies and growth of sales revenues have a positive effect on tax revenue collection, while this industry, due to the nature of products, is primarily focused on the domestic market, so there was no greater contribution to reducing the current account deficit. The negative consequence of these takeovers is a decline in employment. Specifically, in 2019, only 15% of the number of employees were engaged in all three companies in relation to the year of takeover. An additional problem is that the production facilities are located in municipalities that are poorly developed and devastated, and in which in the past cement plants were a significant, and, we can say, a dominant employer.

## CONCLUSION

Intensive globalization and liberalization of economic policies have created conditions for the growth of foreign direct investment inflows in the form of international acquisitions in emerging markets. Foreign investors' motives to make acquisitions in these countries are: access to large and growing markets, abundance of relatively cheap and skilled labor, the ability to transfer and further exploit intangible assets from the domestic market (technology, brands, management know-how, etc.) and achieving financial synergy. The acquired companies were mainly characterized by outdated technology, redundancy and inadequate management and marketing knowledge. Given the current situation, foreign investors have embarked on radical restructuring of the acquired companies, which contributes to improving business performance.

The cement industry is characterized by a low ratio of value and product weight, a high share of distribution costs in the selling price and capital intensity, which is why acquisitions are a common way of internationalizing business. With this in mind, Lafarge, Holcim and Titan have taken over three cement plants in Serbia, in order to be closer to customers. The paper sought to determine whether the new owners succeeded in improving the productivity of the acquired companies in the long and short term. Data on real (deflated) sales revenues and the number of employees in the period from 2000 to 2019 was used for the research.

The research results confirm the first hypothesis in the paper that international acquisitions lead to an increase in labor productivity in the short and long term. The results are in line with previous studies indicating that international acquisitions in emerging markets contribute to productivity growth. A deeper analysis showed that in the short run, productivity growth was predominantly due to optimization of the number of employees, while in the long run productivity grew more slowly and was predominantly a consequence of increased production, i.e. introduction of new technologies, better organization and higher employee motivation. The results also showed that foreign companies, which based the restructuring of the acquired companies largely on the reduction of employment, and not on the transfer of technology and knowledge, did not succeed in achieving the same dynamics of productivity growth in the long run as in the short run. In this way, the second hypothesis in the paper is proved.

The main limitation of the paper is that the number of analyzed international acquisitions, although covering the entire cement industry, is very small. Also, no domestic acquisitions were made in this industry, so it was not possible to determine whether foreign owners were more successful than domestic ones. Upgraded work and further research on this topic are abundant. Specifically, it is possible to analyze and compare post-acquisition productivity in the cement

industry of Serbia and other transition or emerging markets, as well as post-acquisition productivity in the cement industry and other industries in Serbia.

The theoretical implications of the paper are reflected in expanding the knowledge base on the effects of international acquisitions on productivity in emerging markets. This creates a basis for comparison with the research results in developed economies and allows the perception of certain specifics. In addition, by analyzing all acquisitions realized in the cement industry of Serbia, it expands the knowledge base on the specifics of acquisitions in this manufacturing industry. The practical implications of the paper are reflected in the benefits for managers who will be involved in future international acquisition processes, in terms of understanding the importance of successfully implementing various changes to improve labor productivity. Optimizing the number of employees in the short term contributes to improving productivity, but improving and reorganizing the entire business, including the implementation of modern technology, changing corporate culture, knowledge transfer, encouraging and motivating employees, is crucial for long-term success.

## ACKNOWLEDGMENTS

This paper is a result of a research project under the code 41010 (subproject: Management and Marketing Research as a Support to the Interdisciplinary Project Realization) financed by the Ministry of Science and Technological Development of the Republic of Serbia.

## REFERENCES

- Ahammad, Mohammad, Tarba Shlomo, Glaister Keith, Kwan Ian, Sarala Riikka, and Montanheiro Luiz.** 2017. "Motives for cross-border mergers and acquisitions: perspective of UK firms" In *Mergers and Acquisitions in Practice*, eds. Tarba, S., Cooper, C., Sarala R. & Ahammad, M., 16-44, London and New York: Taylor & Francis Group
- Atallah, Ali, Le Hang., and Sahota Amandeep.** 2014. "Employee productivity, employment growth and the cross-border acquisitions by emerging market firms." *Human Resource Management*, 53(6): 987-1004.
- Azdejković, Dragan, and Marković Dušan.** 2016. "The impact of cross-border acquisitions in Serbia on productivity, wages and employment". *Economic Annals*, 61(211): 47-68.
- Bandick, Roger.** 2011. "Foreign Acquisitions, Wages and Productivity.", *The World Economy*, 34(1): 931-951.
- Cogman, David, Jaslowitzer Patrick, and Rapp Marc Steffen.** 2015. *Why emerging-market companies acquire abroad*. McKinsey&Company.
- Commission for Protection of Competition, Republic of Serbia.** 2018, Report on the inquiry into competitive conditions on the cement market in the Republic of Serbia during the period 2014-2017. <http://www.kzk.gov.rs/kzk/wp-content/uploads/2018/12/INQUIRY-into-Competitive-Conditions-on-the-Cement-Market-in-the-Republic-of-Serbia-during-the-Period-2014-2017.pdf> (accessed 20 May, 2020)
- Conyon, Martin, Girma Sourafel, Thompson Steve, and Wright Peter.** 2002. "The productivity and wage effects of foreign acquisition in the United Kingdom." *Journal of Industrial Economics*, 50(1): 85-102.
- Cullinan, Geoffrey, Le Roux Jean Marc, and Weddigen Rolf –Magnus** (2004). "When to Walk Away from a Deal." *Business Harvard Review*, 82(4): 97 – 104.
- Datta, Deepak, and Puia George.** 1995. "Cross-border acquisitions: an examination of the influence of relatedness and cultural fit on shareholder value creation in US acquiring firms." *Management International Review*, 35(4): 337-359.
- Deng, Ping, and Yang Monica.** 2015. "Cross-border mergers and acquisitions by emerging market firms: A comparative investigation", *International Business Review*, 24(1):157-172.

- Dikova, Desislava, and van Witteloostuijn Arjen.** 2007. "Foreign direct investment mode choice: Entry and establishment modes in transition economies", *Journal of International Business Studies*, 38(6): 1013-1033.
- Dunning, John, and Lundan Sarianna.** 2008. *Multinational Enterprises and the Global Economy*, Edward Elgar Publishing Limited.
- Erić, Dejan, Ivan Stošić, and Vuk Dapčević.** 2019. "Post-Merger Performance in Financial Service Industry: A Case of the Republic of Serbia", *Economic Analysis*, 52(2): 28-42.
- Estrin, Saul and Meyer Klaus.** 2011. "Brownfield Acquisitions." *Management International Review*, 51: 483-509.
- Faulkner, David, and Cambell Andrew.** (2003). *The Oxford Handbook of Strategy*, Oxford University Press.
- Gaughan, Patrick.** 2002. *Mergers, Acquisitions and Corporate Restructurings*, Third edition, John Wiley & Sons.
- Gioia, Carmine, and Thomsen Steen.** 2004. "International acquisitions in Denmark, 1990-1997: Selection and performance", *Applied Economics Quarterly*, 50(1): 61-88.
- Girma, Sourafel, and Görg Holger.** 2002. "Foreign ownership, returns to scale and productivity: Evidence from UK manufacturing establishments.", CEPR Discussion Paper 3503.
- Harris, Richard, and Robinson Catherine.** 2002. "The impact of foreign acquisitions on total factor productivity: Plant-level evidence from UK manufacturing, 1987-1992." *Review of Economics and Statistics*, 84 (3): 562-568.
- Iankova, Elena, and Katz Jan.** 2003. "Strategies for Political Risk Mediation by International Firms in Transition Economies: The Case of Bulgaria", *Journal of World Business*, 38(3), 182 - 203.
- Karpaty, Patrik.** 2007. "Productivity Effects of Foreign Acquisitions in Swedish Manufacturing: The FDI Productivity Issue Revisited." *International Journal of the Economics of Business*, 14(2): 241 - 260.
- Khanna, Tarun, and Palepu Krishna.** 2010. *Winning in Emerging Markets: A Road Map for Strategy and Execution*, Harvard Business Press.
- KPMG.** 1998. "Unlocking Shareholder Value." KPMG International.
- Lebedev, Sergey, Peng Mike, Xie En, Stevens Charles.** 2015. "Mergers and acquisitions in and out of emerging economies." *Journal of World Business*, 50 (4): 651-662.
- Lehto, Eero, and Bockerman Petri.** 2008. "Analyzing the Employment Effects of Mergers and Acquisitions". *Journal of Economic Behavior & Organization*, 68(1): 112-124.
- Liu, Qing, and Qiu Larry.** 2013. "Characteristics of Acquirers and Targets in Domestic and Cross-Border Mergers and Acquisitions." *Review of Development Economics*, 17(3): 474-493.
- Lodorfos, George, and Boateng Agyenim.** 2006. "The role of culture in the merger and acquisition process: Evidence from European chemical industry." *Management Decision*, 44(10): 1405-1406.
- Meyer E. Klaus, Estrin Saul.** 2001. "Brownfield Entry in Emerging Markets." *Journal of International Business Studies*, 32(3): 575 - 584.
- Meyer, Klaus.** 2002. "Management challenges in privatization acquisitions in transition economies." *Journal of World Business*, 37(4): 266-276.
- Modén, Karl-Markus, Norbäck Pehr-Johan, and Persson Lars.** 2007. "Efficiency and ownership structure - The case of Poland." Research Institute of Industrial Economics, Stockholm, Sweden. IFN Working Paper 703.
- Modén, Karl-Markus.** 1997. "Foreign acquisitions of Swedish companies-Effects on R&D and productivity." The Research Institute of Industrial Economics (IUI), Stockholm.
- Olford, Erin, and Otchere Isaac.** 2016. "Are cross-border acquisitions enemy of labor? An examination of employment and productivity effects." *Pacific-Basin Finance Journal*, 40(B): 438-455.

- Peng, Mike, Wang Denis, and Jiang Yi.** 2008. "An Institution Based View of International Business Strategy: A Focus on Emerging Markets." *Journal of International Business Studies*, 39(5): 920 – 936.
- Rondinell, Dennis, and Black Sylvia Sloan.** 2000. "Multinational Strategic Alliances and Acquisitions in Central and Eastern Europe: Partnerships in Privatization." *Academy of Management Executive*, 14(4): 85 – 98.
- Santalainen, Timo, Baliga Ram, and Leimman Jaak.** 2003. "Straddling for Market Space: Transforming Estonian State-Owned Enterprises toward a Free Market Orientation." *International Business & Economics Research Journal*, 2(9): 75-89.
- Savović, Slađana.** 2017. "Organizational culture differences and post-acquisition performance: The mediating role of employee attitudes." *Leadership and Organizational Development Journal*, 38(5): 719-741.
- Savović, Slađana, and Mimović Predrag.** 2020. "Effects of cross-border acquisitions on efficiency and productivity of acquired companies: evidence from cement industry." *International Journal of Productivity and Performance Management*, ahead-of-print DOI: 10.1108/IJPPM-07-2020-0372
- Schiffbauer, Marc, Siedschlag Iulia, and Ruane Frances.** 2017. "Do foreign mergers and acquisitions boost firm productivity?" *International Business Review*, 26(6): 1124-1140.
- Shimizu, Katsuhiko Hitt Michael, Vaidyanath Deepa, and Pisano Vincenzo.** 2004. "Theoretical foundations of cross-border mergers and acquisitions: A review of current research and recommendations for the future." *Journal of International Management*, 10(3): 307-353.
- Statistical Office of Republic of Serbia.** <https://www.stat.gov.rs/>, (accessed January 22, 2021)
- Stošić, Ivan.** 2014. "Trends in corporate restructuring in the world and Serbia." *Poslovna ekonomija*, 8(1): 157-176.
- Uhlenbruck, Klaus.** 2004. "Developing acquired foreign subsidiaries: the experience of MNEs in transition economies." *Journal of International Business Studies*, 35(2): 109-123.
- Uhlenbruck, Klaus, and De Castro Julio.** 2000. "Foreign Acquisitions in Central and Eastern Europe: Outcomes of Privatization in Transitional Economies." *Academy of Management Journal*, 43(3): 381 – 402.

**APPENDIX:****Table A1.** A review of empirical studies on the impact of international acquisitions on productivity

Studies	Sample	Period	Productivity measures	Research results	Effect
Modén (1997)	Companies in Sweden	1980-1994	Labor productivity, Total factor productivity	After the realization of international acquisitions, there was an improvement in the productivity of the acquired companies compared to the industrial average.	<b>Positive</b>
Girma & Gorg (2002)	UK companies	1980-1994		After the international acquisitions there was increase in productivity in food industry, while productivity in electronic sector decreased	<b>Positive/ Negative (depending on the sector)</b>
Harris & Robinson (2002)	UK companies	1987-1992	Labor productivity	After international acquisitions realized a slight decrease in labor productivity	<b>Negative</b>
Gioia & Thomsen (2004)	International acquisitions in Denmark	1990-1997		International acquisitions had negative effect on productivity	<b>Negative</b>
Modén, Norbäck & Persson (2007)	Companies in Poland	1995-2000	Labor productivity	Companies owned by foreign investors have, on average, higher labor productivity compared to companies taken over by domestic investors, as well as compared to state-owned companies.	<b>Positive</b>
Karpaty (2007)	International acquisitions in Sweden	1986-2002		Productivity growth is achieved in a period of up to 5 years	<b>Positive</b>
Bandick (2008)	International acquisitions in Sweden	1993-2002	Total factor productivity	International acquisitions has positive effect on total factor productivity (this is the case for vertical acquisitions but not horizontal acquisitions)	<b>Positive/ Negative (depending on the type of acquisition)</b>
Liu, & Qiu, (2013).	US companies that have realized acquisitions in developed and transitional economies	1991-2007	Productivity and profitability	Performance acquired companies is better when they have participated in acquisitions in transitional economies, compared to acquisitions in developed economies	<b>Positive</b>
Ataullah, Hang & Sahota, (2014)	International acquisitions in developed and developing economies carried out by companies from developing economies	1997-2008	Labor productivity, employment growth	International acquisitions in developed economies do not have a statistically significant impact on labor productivity, while in developing economies they have a negative impact on labor productivity	<b>Negative</b>
Olford &	International	1980-2010	Labor	International acquisitions improve	<b>Positive</b>

<b>Studies</b>	<b>Sample</b>	<b>Period</b>	<b>Productivity measures</b>	<b>Research results</b>	<b>Effect</b>
Otchere (2016)	acquisitions in Canada		productivity	the productivity of acquired companies	
Azdejković & Marković (2016)	79 international acquisitions in Serbia	2003-2008	Productivity, employment and wages	International acquisitions have a positive impact on labor productivity and real wages, and a negative effect on the number of employees	<b>Positive</b>
Schiffbauer, Siedschalg & Ruane, 2017			Labor productivity, Total factor productivity		<b>Positive/Negative (depending on measures)</b>
Savović & Mimović (2020)	International acquisitions in cement industry in Serbia	2000-2018	Application of the DEA approach in monitoring the partial productivity of labor, material and capital, as well as the total factor productivity	International acquisitions have a positive impact on the partial productivity of labor, material and capital, as well as total factor productivity in the long term.	<b>Positive</b>

*Sources: authors according to the literature review*

<i>Article history:</i>	Received: February 18, 2021
	Accepted: May 24, 2021