Can Small and Medium-Sized Enterprises Drive the Circular Economy? An Empirical Approach

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Abstract

Lately, small and medium-sized enterprises have strived to find innovative manufacturing methods that boost productivity, cut waste, and support their competitiveness based on the environment. As a result, firms have been implementing lean management and the circular production system, two well-known modern operations management principles. The aim of the paper is to determine the effects of selected factors on social reputation in production-oriented small and medium-sized enterprises operating in Serbia. Causal relationships between selected factors were assessed using path analysis. According to the research results, higher levels of lean management cause higher levels of the circular production system. In addition, the results showed that higher levels of both lean management and circular production systems led to higher levels of zero-waste performance, value-based green competitiveness and social reputation. The research confirms the importance of implementing selected factors in order to improve the social reputation of small and medium-sized enterprises..

Keywords: *lean management, circular production system, zero-waste performance, green value competitiveness, social reputation.*

JEL classification: C03, L60, Q53.

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1. Introduction

In recent years, developed market economies have increasingly relied on micro, small, and medium-sized enterprises (SMEs) and entrepreneurship, which represent the most efficient segment of the economy. Given that small and medium-sized enterprises, which are characterized by a high degree of flexibility and adaptation to new market conditions (Pavlović et al., 2021), significantly contribute to employment, competitiveness, and exports (Vujičić et al., 2022), developed

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countries, and following their example, developing countries have systematically and in an organized manner encouraged their development and successful functioning. In Serbia, at the beginning of the 21st century, institutional reforms were implemented that improved the business environment and led to significant progress in establishing a support system for SMEs (Kostadinović & Stanković, 2021). However, in the case of production-oriented SMEs, their traditional business models have been subject to serious criticism due to their negative environmental impacts (Afum et al., 2020). Consequently, SMEs strive to introduce advanced green technologies into their production processes to reduce waste, enhance efficiency, and strengthen their environmental competitiveness (Agyabeng-Mensah et al., 2020). Lean management and the circular production system have thus emerged as two prominent approaches to modern operations management, increasingly adopted by production-oriented SMEs with the aim of mitigating environmental risks, enhancing competitiveness, and achieving broader social goals (Solaimani et al., 2019).

Each nation's transition from a linear to a circular economy is unique and context-specific. This approach applies to every aspect of society and every area that, in the context of the circular economy, needs to be founded on unambiguous business principles. It is not limited to any one industry or region. The Manifesto for a Resource-Efficient Europe document, released by the European Commission in 2017, makes it abundantly evident that the EU must move toward a circular economy model in order to transition from a resource-efficient to a regenerative one in light of the mounting pressure on natural resources and the environment. Serbia stands to gain a competitive edge, enhance environmental preservation, and provide new employment opportunities by implementing the circular economy. National policies and market demands must be in line with the demands of global competitiveness. As a result, when it comes to using the same model in the context of Serbia's adoption of the principles of circular economy, there is no one model that fits all situations. Enhancing the economic models and aligning business practices with the circular economy's tenets in Serbia can have a substantial impact on boosting national firms' competitiveness and resolving social and fiscal problems.

The need to interact with suppliers and customers, even if they are smaller businesses, means that the entire value chain must embrace the values of circularity, even though large companies are better organized when it comes to managing the transition to the circular economy. The idea of the owner-manager and informal contacts and communication procedures, among other SMEs' distinctive features, encourage the adoption of informal sustainability practices, making the shift to formalized and structured policies challenging in this setting (Gennari, 2023). Accordingly, SMEs' approaches to sustainability and social responsibility, if any, typically remain tacit or unspoken (Ormazabal et al., 2018). SMEs struggle to transform sustainability-oriented practices into a consistent business strategy from a circular perspective (Ormazabal et al., 2015; Gennari & Cassano, 2020).

After reviewing the relevant literature, the authors found that, as far as they know, the relationship between lean management, circular production system, green competitive value, zero-waste performance and social reputation is still not sufficiently clarified. Bearing in mind the above, the subject of the paper is the potential for initiating a circular economy within SMEs. According to the subject, the aim of the research is to determine the effects of selected factors (lean management, circular production system, green competitiveness based on value, and zero-waste performance) on the social reputation of production-oriented SMEs operating in Serbia.

This study suggests that implementing lean management alone may not be enough to improve zero-waste performance, give SMEs a competitive advantage in the green market, and improve social reputation. To make sure that lean management is successful in terms of improving zero-waste outcomes and strengthening green value competitiveness, it is necessary to use a circular production system. This would aid in impacting managers' behaviour, who could view the adoption of circular concepts as an oversimplified strategy.

The paper is structured as follows: after the introduction, a review of the relevant literature is presented. The subsequent section outlines the research methodology, followed by the presentation and discussion of results. The paper concludes with key findings, implications, limitations, and suggestions for future research.

2. Literature Review

Together with the green and bioeconomy, the circular economy highlights the need for a new economic model based on renewable resources and the benign processes of biodiversity, fulfilling both the economic and social needs of people, now and in the future (D'Amato & Korhonen, 2021). Previous research on manufacturing companies and the environment in Serbia has shown that green innovations can significantly contribute to business sustainability (Stevanović et al., 2022; Jovanović et al., 2023; Stanković et al., 2023; Ravić et al., 2023). Stanković et al. (2024) emphasize the importance of each subsystem of the green economy index (quality of the education system, economic aspects, political system, society, and natural environment) for achieving sustainable development goals. Small and medium-sized enterprises strive to adopt green solutions despite the challenges they face during the transition to a circular economy, primarily because they perceive a positive link between environmental protection and profit, which in turn leads to increased competitiveness (Centore & Mazzeti, 2023).

However, unlike the green economy, which primarily focuses on the application of green technological and social innovations, the circular economy emphasizes minimizing and eliminating waste. In this sense, the circular economy, within the broader context of sustainable development, represents one of the most important sustainability tools, as it reduces or completely eliminates waste through the automation of production processes and the redesign of economic systems. According to Murray et al. (2017), the United Nations' 17 Sustainable Development Goals recognize that the circular economy concept has the potential to contribute to sustainable development. The idea emerged in response to the crises of climate change and biodiversity, in which the industrial sector has played a significant role, as well as the growing demand for societal and economic advancement without jeopardizing the security of natural resource supply.

As one of the key forces driving the societal shift toward minimizing the use of natural resources, the circular economy has evolved in the industrial production sector from a focus on individual products or services to a more comprehensive production-systems approach (Bunea, 2021; Geissdoerfer et al., 2017; Konietzko et al., 2020; Lindahl et al., 2023; Staicu, 2025). As a new paradigm, the circular economy aims to reduce environmental problems in production processes (Salibi et al., 2022). The transition from the traditional linear economy to the circular economy requires changes in multiple areas. The primary obstacle, as suggested by Velenturf et al. (2018), to achieving circularity is the lack of integration and coordination of strategies, policies, and decisions made by policymakers, which, according to Velenturf et al. (2019), can lead to missed opportunities due to the inability to monitor economic progress and respond appropriately and timely.

Three principles can be used to classify circular solutions, all of which strive to minimize resource input and output (Petelin, 2024): closing, slowing, and narrowing loops. The goal of the "slowing loops" principle is to maintain product value for as long as possible. The "closing loops" principle aims to reduce system output by generating value from resources previously considered waste. The "narrowing loops" principle pertains to the efficient use and production of resources. The circular economy model promotes adopting a comprehensive perspective on production and entrepreneurial activities that incorporates environmental and stakeholder impacts into decision-making. Ghisellini et al. (2024) note that the increasing use of environmental product certifications (e.g., ISO Environmental Labelling Type I, II, III), environmental process certifications (e.g., ISO 14001 or EMAS III), and corporate social responsibility certifications (e.g., ISO 26001) reflects a broader vision that extends beyond traditional economic boundaries. In recent years, SMEs and newly established businesses have shown growing interest in these certification programs.

According to the resource-based view (Barney, 1991), a firm's performance is determined by its capabilities and resources. The circular economy primarily focuses on reusing existing materials, extending beyond the mere production of "sustainable" products (Medaglia et al., 2024). A circular production system is defined as a system intentionally designed to close the circulation of materials, energy, or products, preferably in their original form, through multiple life cycles (Asif, 2017; Rashid et al., 2020). This system comprises three components: 1) business model, 2) product design, and 3) supply chain. Together, these components support the development of the entire system, leveraging information and communication technology infrastructure for data creation and management (Rashid et al., 2020).

In recent decades, since Womack et al. (1990) published The Machine That Changed the World, there has been a significant increase in research on lean management. According to Taj (2008), lean management represents a set of ideas and strategies aimed at reducing waste in the production process and improving the flow of activities that, from the consumer's perspective, enhance product value. On the other hand, lean manufacturing, also known as lean production, is viewed as a means of optimizing the production process by coordinating actions efficiently and completing tasks without delay (Vasconcelos et al., 2019). Duarte and Cruz-Machado (2017) emphasize that lean strategies focus on continuous improvement and the elimination of all types of waste from the supply and production chain to reduce costs, improve quality, and deliver value to customers. The application of lean principles helps maximize value by minimizing waste (Nikolić et al., 2023). Many companies across various industries employ lean tools to improve operational performance (Silva et al., 2022).

The concept of green competitiveness first emerged in the 1990s (Porter, 1990). Strict environmental regulations and rising awareness of environmental protection can enhance market competitiveness through unique manufacturing strategies, due to firm heterogeneity and information asymmetry. According to Porter and Van der Linde (1991), achieving a green competitive advantage results from an economic model that integrates sustainable development and environmental protection. From 2008 to the present, green competitiveness has grown in two main ways. First, it supports domestic climate and environmental policies to ensure the sustainable competitiveness of trade-exposed industries, many of which are already weakened by global economic slowdowns and long-term trends in global competition. Second, it reflects international competition among countries promoting clean energy policies and investments to create new competitive opportunities (Fischer, 2011). A key indicator of industrial green development is industrial green competitiveness, which provides a foundation for national green development strategies. Sustainable development goals underpin green competitiveness, enabling regions to increase social welfare and gain competitive advantages by producing material and ecological wealth responsibly and efficiently (Chygryn et al., 2021).

In 2000, the concept of zero-waste was introduced for industrial purposes, aiming to achieve zero defects in manufacturing while addressing global warming. Zero-waste initiatives tackle social and environmental issues holistically, emphasizing fairness, resilience, and sustainable growth for all societal members. According to Ghisellini et al. (2016), certain frameworks are applicable at the macro level (e.g., regional and national), while others are designed for the meso level (e.g., eco-industrial parks) or micro level (e.g., firms and consumers). Globally, companies across industries - such as clothing and footwear (Jestratijevic et al., 2022), tires (Araujo-Morera et al., 2021), fashion and textiles (Angelova et al., 2023), and hospitality (Ioannidis et al., 2021), as well as consumers (Vinkóczi et al., 2024), are increasingly adopting zero-waste principles. These practices aim to reduce waste flows into the environment and ensure efficient use of materials, energy, and water (Geng et al., 2013). According to Dinshav et al. (2006), zero-waste practices represent a novel corporate strategy that reduces consumption, recovers resources from general waste streams, and incorporates a life cycle perspective into product design. Zaman (2015) emphasizes that revising existing systems of production, marketing, management, extraction, consumption, and treatment has become necessary to achieve zero-waste objectives.

Maintaining a positive social reputation is imperative for organizations. Reputation significantly influences the perceived value of an organization (Gotsi and Wilson, 2001) or a product (Feldwick, 1996) and is linked to leadership (Ammeter et al., 2002; Blass and Ferris, 2007) and managerial behavior (Ferris et al., 1994). Rindova et al. (2006) argue that reputation is based on the perceptions of others regarding an individual or group. Zinko et al. (2007) note that reputation plays a critical role in hiring, promoting, and retaining employees. An organization's ability to meet stakeholder and consumer needs is essential for developing a positive reputation. Because reputation is shaped by stakeholder perceptions, it represents an intangible asset. According to institutional theory, a positive reputation enhances firm legitimacy (Baah et al., 2021).

The literature shows that research findings on the effects of lean management and circular production systems on green competitiveness, zero-waste performance, and social reputation are often divergent or contradictory. Afum et al. (2022) reported a positive relationship, whereas Fahimnia et al. (2015) found a negative one. Most studies indicate a positive association between lean management and value-based green competitiveness (Agyabeng-Mensah et al., 2020; Afum et al., 2021; Afum et al., 2022), zero-waste performance (Agyabeng-Mensah et al., 2020; Afum et al., 2021; Afum et al., 2022; Nadeem et al., 2019), and social reputation (Afum et al., 2022; Baliga et al., 2019; Chavez et al., 2022). However, Carvalho et al. (2017) indicate that lean management is not a significant determinant of waste-free performance. In contrast, research highlights a positive connection between the circular production system and value-based green competitiveness (Afum et al., 2021; Afum et al., 2022; Jonker et al., 2017), zero-waste performance (Afum et al., 2022; Schmitt et al., 2021), and social reputation (Afum et al., 2022; Moktadir et al., 2020).

3. Research Methodology

3.1 Research Model

Figure 1 shows the initial research model, which covers the assumed relationships between the research variables. The model was designed according to the methodology suggested by Afum et al. (2022).

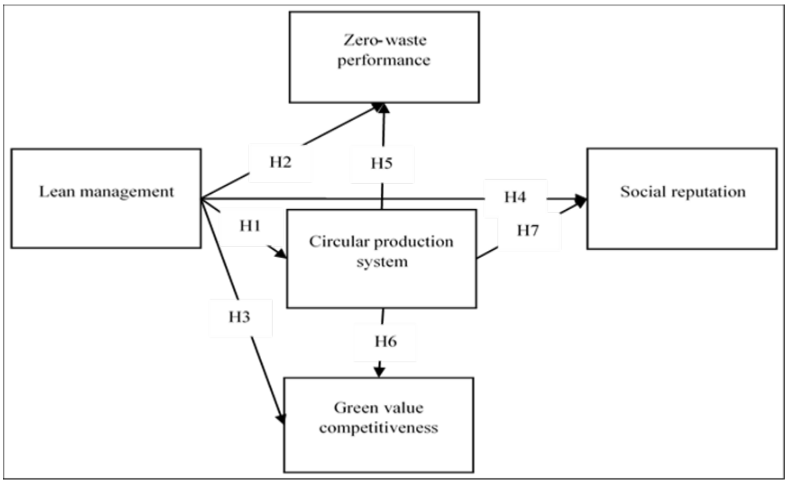

Figure 1. Initial model
Source: Authors' own creation

The research hypotheses are defined as follows:

H1: The higher the level of lean management, the higher the level of the circular production system;

H2: The higher the level of lean management, the higher the level of performance without waste;

H3: The higher the level of lean management, the higher the level of value-based green competitiveness;

H4: The higher the level of lean management, the higher the level of social reputation;

H5: The higher the level of the circular production system, the higher the level of waste-free performance;

H6: The higher the level of circular production system, the higher the level of value-based green competitiveness;

H7: The higher the level of the circular production system, the higher the level of social reputation.

It is expected that the research results will confirm the statistically significant, positive and direct hypothesized relationships between the selected variables.

3.2 Data Collection and Sample

For the purposes of quantitative research, based on a survey, a stratified sample included 276 respondents, from the category of senior management, in production-oriented SMEs operating in Serbia. The survey, together with the pilot test, was conducted in the period from 2023 to 2024. Questionnaires were distributed by mail. After the respondents were informed about the purpose of the research and the anonymity of the survey, they were asked to rate the statements in the questionnaire. Out of the 279 collected questionnaires, 276 were valid.

Table 1 shows the statistics of the research sample. Based on the tabular presentation, it can be noted that the sample consisted of 60% men and 40% women. According to the level of education, the majority of respondents have a high school or college diploma (43.9%), slightly fewer have a master's degree or doctorate (34.6%), and the least have a high school diploma (21.5%). The sample included 64.9% of small and 35.1% of medium-sized enterprises. The largest number of companies are engaged in food production (43.4%), followed by companies engaged in the production of furniture (25.4%) and plastics (17.6%), while less than 10% of the sample consists of companies engaged in the production of cosmetics (8.8%) and paper (4.9%).

Statistics of the research sample

Table 1

Characteristics	Indicators	%
Gender	Men	60
	Women	40
Education	High School	21.5
	College/Faculty	43.9
	Master's/PhD	34.6
Firm size	Small	64.9
	Medium	35.1
Firm type	Production of cosmetics	8.8
	Production of plastics	17.6
	Furniture production	25.4
	Paper production	4.9
	Food production	43.4

Source: Authors' own creation

3.3 Research Instrument

The survey questionnaire, as a research instrument, contained open-ended and closed-ended questions. The first part of the questionnaire included the sociodemographic characteristics of the respondents (gender, education, size and type of company). The second part of the questionnaire included statements related to lean management (LM). The scale for measuring lean management contained five statements. The third part of the questionnaire included statements related to the circular production system (CPS). The scale for measuring the CPS contained six statements. The fourth part of the questionnaire includes statements related to zero-waste performance (ZWP). The ZWP measurement scale contained four statements. The fifth part contains the statements, which are relevant for value-based green competitiveness. The scale for measuring green value-based competitiveness (GVC) contained four statements. The sixth part included statements related to social reputation (SR). The scale for measuring social reputation contained four statements.

All scales were taken from an earlier study by Afum et al. (2022). The statements were measured on a 5-point Likert scale (1 - I do not agree at all; 5 - I completely agree).

3.4 Analysis

Research hypotheses were tested using path analysis. Path analysis is a method for studying direct and indirect effects. The purpose of this analysis is not to discover the cause, but to consider the viability of the causal model, formulated by the researcher. Thus, the goal of path analysis is explanation, not prediction (Jeon, 2015). Path analysis can be viewed as a special form of structural equation modeling, which consists of observed variables, i.e., variables that are measured directly, rather than latent variables, i.e., variables that are not directly measured. Path analysis, which was once known as "causal modeling", can only identify whether the data are consistent with the model; it cannot establish causation or even determine whether a particular model is right (Streiner, 2005). Nonetheless, it is incredibly effective at delving into intricate models and contrasting various models to see which one most closely matches the facts.

Following the approach proposed by Anderson and Gerbing (1988), the measurement model was first evaluated (internal consistency - Cronbach's alpha, composite reliability, CR, convergent validity, based on the extracted average variance - AVE and discriminant validity, based on the root of the extracted average variance) a then the structural model (based on the determination coefficient R2 and the path coefficient - β).

Like other statistical methods, path analysis also has certain assumptions, and their fulfilment was checked before conducting the analysis. According to the results of Harman's one-way test, 32.02% of the total variance was explained on the basis of the first factor, and it can be concluded that there is no significant bias. Podsakoff et al. (2012) suggest that the first factor should not explain more than 50% of the total variance. The sample size is adequate, as Hoelter (1983) suggests a minimum of 200 respondents. According to the results of the VIF test, which are less than 3, the data do not have a problem with multicollinearity.

4. Empirical Results with Discussion

4.1 Evaluation of the Measurement Model

According to the results, shown in Table 2, the values of Cronbach's alpha and CR for each of the constructs are greater than 0.7, which is in accordance with the suggestions of the authors, Henseler et al. (2009), that the lower threshold of acceptance of Cronbach α and CR should be at least 0.7. In addition, the values of standardized factor loadings and AVE for each of the constructs are greater than 0.5, which, according to Henseler et al. (2009), is the lower threshold of acceptability. Such results indicate the convergent validity of the model.

Results of the measurement model evaluation

Table 2

Construct	Factor loading	Cronbach's alpha	CR	AVE
Lean management		.971	.971	.868
LM1	.906			
LM2	.902			
LM3	.931			
LM4	.945			
LM5	.973			
Circular production system		.902	.906	.617
CPS1	.795			
CPS2	.805			
CPS3	.853			
CPS4	.817			
CPS5	.770			
CPS6	.659			
Green value competitiveness		.865	.796	.618
GVC1	.801			
GVC2	.763			
GVC3	.726			
GVC4	.851			
Zero-waste performance		.905	.838	.706
ZWP1	.838			
ZWP2	.851			
ZWP3	.804			
ZWP4	.867			
Social reputation		.796	.730	.506
SR1	.704			
SR2	.662			
SR3	.705			
SR4	.769			

Source: Authors' own creation

According to the results, shown in Table 3, the values of the square root of the average variance extracted (AVE) of each construct in a pair are higher than the correlation between pairs of constructs. According to the Fornell-Larcker criterion (1981), these results indicated an acceptable level of discriminant validity of the measurement model.

Results of the measurement model discriminant validity

Table 3

Construct	LM	CPS	GVC	ZWP	SR
LM	.932*				
CPS	.441	.785*			
GVC	.568	.617	.786*		
ZWP	.236	.225	.170	.840*	
SR	.458	.485	.587	.676	.711*

Note: *- √AVE

Source: Authors' own creation

Based to the results of the confirmatory factor analysis, the fit indicators (GFI, TLI, CFI, RMSEA, and SRMR) indicate an adequate fit of the measurement model (Figure 2), since the value of each indicator is within the limits recommended by Hu and Bentler (1999).

4.2 Evaluation of the Measurement Model

The predictive power of the model was evaluated based on the value of the coefficient of determination (R^2), which Cohen (1988) suggests should be greater than 0.26. The coefficient of determination for the construct circular production system is 0.195, for the construct zero-waste performance is 0.074, for the construct green value competitiveness is 0.489 and for the construct social reputation is 0.627 (Table 4). Cohen (1988), suggests that a substantial model is indicated by an R^2 value greater than 0.26. The lower values of the coefficient of determination for the constructs of a circular production system and zero-waste performance indicate that these constructs are influenced by other variables and not only variables included in the model. Other values of this coefficient show the good predictive power of the model.

Based on the obtained research results, shown in Table 4, it was determined that lean management achieves a statistically significant, direct and positive effect on the circular production system ($\beta = 0.441$, $p < 0.001$). Such results are consistent with the results of earlier research, which confirmed a positive and significant connection between these two constructs (Afum et al., 2022; Nadeem et al., 2019; Kurdve and Bellgran, 2021). According to the obtained results, lean management achieves significant, positive and direct effects on green value competitiveness ($\beta = 0.366$, $p < 0.001$). The obtained results are similar to the results of earlier studies (Afum et al., 2021; Afum et al., 2022). Lean management achieves significant, positive and direct effects on zero-waste performance ($\beta = 0.169$, $p < 0.050$). While the authors of certain studies believe that lean management is not a necessary determinant of improving environmental outcomes (Carvalho et al., 2017; Dües et al., 2013), the results of the current research are in line with the research findings, which confirm the importance of this relationship (Afum et al., 2022; Chávez et al., 2019; Kamble and Gunasekaran, 2021; Vasconcelos et al., 2019). Vasconcelos et al. (2019) point out that lean production, together with lean management, can significantly contribute to the reduction of waste in production processes. Lean management practices achieve statistically significant, direct and positive effects on social reputation ($\beta = 0.178$, $p < 0.001$). Afum et al. (2022), also report the significance of this relationship, while Lizarelli et al. (2023) highlight the importance of the impact of social lean practices on social performance. Based on the results, the circular production system achieves a direct, positive and significant effect on zero-waste performance ($\beta = 0.150$, $p < 0.050$), which was also confirmed in earlier research (Afum et al., 2022; Schmitt et al., 2021). According to the research results, the circular production system achieves a significant, positive and direct effect on green value competitiveness ($\beta = 0.455$, $p < 0.001$). The results of earlier research also indicate the importance of introducing a circular production system in order to achieve green competitiveness based on the creation of value for the consumer (Afum et al., 2022; Jonker et al., 20147; Soh and Wong, 2021). Similarly, Afum et al. (2022a) indicate a significant direct impact of cleaner production on zero-waste performance, as well as a significant role of cleaner production as a mediator of the relationship between the adoption of circular economy principles and zero-waste performance. According to the research results, the circular production system has a significant, positive and direct effect on social reputation (β = 0.697, $p < 0.001$). The results of earlier research also indicated the significant role of the circular production system in improving the company's social reputation and social well-being (Afum et al., 2022; Moktadir et al., 2020; Jabbour et al., 2020).

Results of hypothesis testing

Table 4

Path	β	Std. errors	t	R^2	Decision
LM → CPS	.441*	.063	7.025	R^2_{CPS} = .195	Suported
LM → ZWP	.169**	.071	2.256	R^2_{ZVK} = .489	Suported
LM → GVC	.366*	.048	6.572	R^2_{PBO} = .074	Suported
LM → SR	.178*	.051	3.726	R^2_{SR} = .627	Suported
CPS → ZWP	.150**	.071	1.999		Suported
CPS → GVC	.455*	.048	8.168		Suported
CPS → SR	.697*	.051	14.629		Suported

Note: * - $p < 0.001$; ** - $p < 0.050$

Source: Authors' own creation

The graphic representation of the structural model is shown in Figure 2.

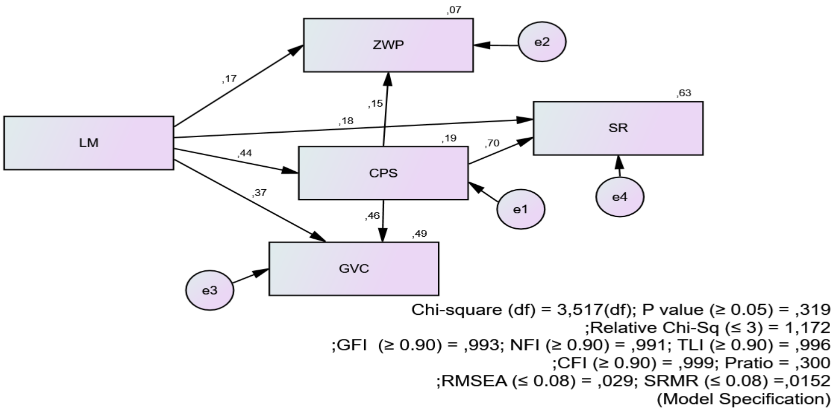

Figure 2. Structural model
Source: Authors' own creation

5. Conclusions

The main goal of the research was to determine the effects of selected factors on the social reputation of production-oriented SMEs operating in Serbia. Due to the role they play in solving the problems of environmental protection and sustainability, lean management and the circular production system are increasingly preferred business models of small and medium-sized enterprises.

The results showed that higher levels of lean management cause higher levels of circular production system, higher levels of zero-waste performance, higher levels of value-based green competitiveness and social reputation, which is why hypotheses H1, H2, H3 and H4 are accepted. The results of the accompanying research also showed that higher levels of the circular production system cause higher levels of zero-waste performance, value-based green competitiveness and social reputation, which is why hypotheses H5, H6 and H7 were accepted

Empirically, this research can contribute to the existing literature, which deals with issues of circular economy, because when it comes to lean management and circular production system, a consensus has not yet been reached regarding their relationship and role in waste reduction, green competitiveness and social reputation. The results of this research emphasize the importance of lean management for the implementation of a circular production system, through which it can further influence the reduction of waste, increase green competitiveness and establish a socially responsible company. Policymakers should provide economic incentives, such as subsidies and interest-free loans that will enable small and medium-sized enterprises to implement a circular production system and lean methodology.

The conducted research also has certain limitations. The first relates to bias. When it comes to research, which is based on the subjective answers of respondents, the validity of the results is questionable. Although the results of Harman's one-factor test showed that the data from the survey did not have problems with bias, this does not mean that it does not exist. Another limitation refers to the territorial limitation of the research only to Serbia, so future research could apply the model to other countries as well, and compare the results with the results of the current research. A third limitation relates to the fact that only direct effects between the selected variables were measured in the current research. Future research could also investigate indirect effects.

Finally, it is good that in small and medium-sized production-oriented enterprises, the transition from linear to circular economy is already happening. However, in order to overcome obstacles, whether temporal or structural, especially when it comes to developing economies, further introduction and implementation of support policies is needed, as a strong impulse for the application of circular economy.

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