

Aila Civić<sup>1</sup>, Milan Jovanović<sup>2</sup>, Ivan Todorović<sup>2</sup>, Miha Marič<sup>1\*</sup><sup>1</sup>University of Maribor, Faculty of Organizational Sciences, Slovenia<sup>2</sup>University of Belgrade, Faculty of Organizational Sciences, Serbia

# Comparison of Attitudes in Slovenia and Serbia Towards Circular Economy in Textile Industry

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## Abstract:

**Research Question:** The study explores differences in the attitudes of youngsters in Slovenia and Serbia towards the sustainable use of clothing. **Motivation:** The concept of circular economy has received the attention of the world public in recent years. The prosperity of economies and companies is manifested by the safe and efficient use of resources. The circular economy should also be introduced in the textile industry, as waste continues to accumulate year after year. After the oil industry, the textile industry is the second largest polluter of the environment. We will describe the purchase and disposal of textile products and the development of the circular economy concept. **Idea:** The idea of this paper was to find out how people in Slovenia and Serbia treat clothes, especially waste from clothes, and what their perception towards reusing old clothes redesigned by an app is. **Data:** The research was conducted in two separate surveys. One was conducted among respondents in Slovenia on the sample that counts 66 people, mostly youngsters, and the same survey was conducted later, on the respondents from Serbia, on the same sample of 66 youngsters. **Tools:** SPSS was used to apply descriptive statistics techniques on the samples. **Findings:** The results of the survey show differences in perception between Slovenian and Serbian youngsters towards sustainable use of clothing. There are differences in how they are equipped with knowledge about the circular economy. In the two countries they have different main reasons for buying clothes and throwing away old clothes, but they agree that they should contribute to the reduction of waste generation in similar ways. **Contribution:** This research contributes to better understanding of perception that people have in Slovenia and Serbia towards a sustainable use of clothing and the circular economy concept.

**Keywords:** circular economy, waste management, textile, sustainability, ecology

**JEL Classification:** Q56, M21, P52, E21, D20

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## 1. Introduction

Linear economy is the model that has dominated since the beginning of the Industrial Revolution, but in terms of clothing production it may become dysfunctional (Koszewska, 2018). A lot of waste is generated during the process, so transforming the linear model into a circular one that enhances sustainability initiatives (James et al., 2023), was a very difficult task. Companies are faced with new experiences, challenges and opportunities that bring new guidelines, inventions, and models. Knowing the concept of circular economy and putting it into practice are important for transformation of production and consumption (Sirec et al., 2018).

The textile industry is the second biggest polluter of the environment (Chen et al., 2021; Gradisar, 2018; Gwozdz et al., 2017; Neumann et al., 2021; Stringer et al., 2020). Urska Rus (2021) says that most people buy clothes that end up in the trash after a few wears. The concept of circular economy has received the attention of the world public in recent years because the prosperity of economies and companies is

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\* Corresponding author: Miha Marič, e-mail: miha.maric@um.si

manifested by the safe and efficient use of resources (Sirec et al., 2018). The circular economy should also be introduced in the textile industry, as waste continues to accumulate year after year (Koszevska, 2018).

In the manufacturing industry, the textile industry is defined as one of the most complex industrial chains. It consists of various sub-branches. These cover the entire process, from raw materials to semi-finished products, and finished products (Environmental Research Institute, 2015). Clothing production has doubled since 2000 (Nguyen et al., 2020). The textile industry has entered the era of fast fashion (Niinimäki et al., 2020), where products with a shorter shelf life and a low price can be detected. The fashion industry employs more than seventy million people worldwide (UNECE, 2018).

As much as seventy-nine billion cubic meters of water were used in the clothing and textile industry in 2015. More than two thousand seven hundred liters of water are needed to make one T-shirt (Chen et al., 2021). Land is needed to grow various fibers and cotton. In 2017, the entire economy of the European Union consumed 266 billion cubic meters of water. However, cultivation is not the only way of consuming water, as we also wash the clothes we buy, so tons of microfibers are being thrown into the sea every year (European Parliament, 2020). A social economy should be embedding circularity (Ziegler et al., 2023).

Compared to some other economies, Slovenia and Serbia may be smaller, but that does not change the fact that these countries need to introduce a circular economy in all sectors. The COVID-19 pandemic set back the dream of reducing plastic waste, and in the textile industry this negative role is played by fashion with new trends. In this paper, we will introduce how residents of Slovenia and Serbia understand the concept of circular economy and differences in their attitudes regarding the purchase and disposal of textile clothing.

The first problem arises in the understanding of the circular concept, where knowledge of good practices is limited, although well-known companies such as BMW, Nike and Dyson are reaching out for it (Primc et al., 2021). Another problem has been suppressed over the years, but now it has come to one of the leading places. Fashion itself has destroyed the desire to reduce textile waste. It is always changing, new trends and innovations appear several times a year (Nguyen et al., 2020), with most people following them. The proverb we all know: "Clothes make the man" has now come true (Nieboer et al., 2021).

## 2. Literature Review

The textile industry has begun to produce more products, as consumers buy sixty percent more clothes than twenty years ago (Koszevska, 2018; McKinsey, 2016). One hundred and fifty billion pieces of clothing are produced annually by the textile industry (Blanchard, 2020). Increased production brings increased disposal of textile waste, which increased by as much as eight hundred and eleven percent between 1960 and 2015 (EPA, 2020).

With many purchases, huge amounts of waste are generated that serve out their life in a linear tract (Rus, 2021). When raw materials began to be in short supply, there was a need for a new model, known today as the circular economy (Godina Kosir et al., 2018). The circular concept has been described by many authors and organizations. What all definitions have in common is that the concept is "friendly" to the environment, as it reduces needs, hence the pressure on the environment is significantly reduced. Mitchell (2015) says that the circular economy enables the conservation of resources to the extent that we use their highest value, and Preston (2012) maintains that waste should become a valuable input for other processes.

In practice, the implementation of the circular economy is slow despite the business opportunities. By promoting innovative solutions and sustainable investments, we can remove the initial obstacles in the transition from a linear to a circular economy (Primc et al., 2021). The key role in the circular process is attributed to the customer who uses the product (Stringer et al., 2020). The focus is no longer on production, but on use (Koszevska, 2018), where long-term sales relationships are built. Although the circular concept brings environmental benefits, we encounter some of the following obstacles to the transition: lack of knowledge, tools, and experience (Lima-Toivanen & Valkokari, 2020).

Environmental challenges are a factor that is increasing the importance of the circular economy. The essence of the circular economy is to preserve the lifetime of components, materials, and the entire product. If companies want to introduce a circular concept into their process, they must radically change production, planning and sales (Primc et al., 2021). Historically, environmental destruction, wastefulness and overconsumption are nothing new. The shift that needs to be achieved in all generations is in the attitude and mindset about the use of resources (Sirec et al., 2018). The essence of the circular economy is waste reduction, aided by material flows that preserve the material throughout its life cycle (EMF, 2013).

The circular economy is a complex process, which is reflected in the range of aspects and tasks that each author defines slightly differently. Some are thinking about transforming the economic system, while others are focused on resource aspects. The diverse views make comparison more difficult, and international consensus on the importance of the circular economy will be difficult to determine (Rizos et al., 2017).

The main obstacles to moving to the circular model are low consumer interest and high start-up costs. Companies can achieve environmental, social, and economic impact if they introduce circular processes into their operations (Koszewska, 2018). Yang et al. (2014) define the circular economy as a model for resource conservation, environment, and economic growth. Sirec et al. (2018) believe that the linear model is interchangeable with the circular one if residents change their attitude towards the use of limited resources. The concept of reducing, reusing, and recycling is a solution for continued survival (Yang et al., 2014).

### 3. Research Methodology

With the research, we will try to analyze and compare the attitudes of consumers in Slovenia and Serbia towards sustainable use of clothing. The research will be based on the knowledge of the circular economy, the consumer's behaviour in the case of purchase and disposal, the amount of waste and the prevention of its disposal. We are interested in what the reasons for buying clothes in these two countries are as well as in the reason that these clothes end up in the trash after a few wears.

Both Slovenia and Serbia rank the circular economy among their strategic development priorities. Changing the process from a linear to a circular model is necessary, as this would enable a better quality of life for everyone. In Slovenia, the transition to a circular model has been taking place since 2016 through the framework of the Partnership for a Green Economy, (Godina Kosir et al., 2018) and in Serbia just one year after.

Countries around the world produce countless amounts of waste every year (Koszewska, 2018), and Slovenia and Serbia are no exception. If we want to be co-creators of a clean and healthy environment, the role of observers will not help us, quite the opposite. There are several potential solutions for further treatment of textile products, which include: recycling, transformation, reuse and use for the purpose of maintenance and cleaning (Environmental Research Institute, 2015).

In the research, we will try to find out from consumers in Slovenia and Serbia how much waste they throw away annually. The data was gathered via online survey on two samples separately, in Slovenia and Serbia.

The sample in Slovenia ( $n = 66$ ) consisted of 41 (62.12%) women and 25 (37.88%) men. The age of the respondents varies between 18 and 66 years. Most respondents were 21 years old, and the average age of all respondents was 26.59 years.

In the research conducted in Serbia, the sample ( $n = 66$ ) consisted of 48 (72.73%) women and 18 (27.27%) men aged between 21 and 29, where most respondents were 22 years old, contributing to an average age of 22.77 years.

At the beginning of the survey, we asked the respondents if they knew the concept of circular economy. Their belief was later compared with the answers to the next question in which respondents were asked to pick one correct definition of circular economy among several offered. In addition to their knowledge about the concept, we wanted to know where they have learned about circular economy, was it in educational institution, through internet, television, or some other media.

The next section of the questionnaire referred to sustainable shopping, where respondents were asked to choose who buys more sustainable, men or women, and which age group buys smarter. On top of that, they were asked to rate from 1 to 5 their own reasons for textile buying. Further, respondents were asked to rate (from 1 to 5) to what extent the offered methods contribute to the reduction of waste generation, why they throw away their clothes, and how much the clothes that match the style contribute to higher reputation, higher attractiveness, higher motivation, higher self-confidence, larger affiliation, and higher visibility.

Respondents were also asked to answer the question on how much clothes they throw away annually, expressed in kilograms and, at the very end, whether they would see an application to design a new fashion piece from their still usable clothing if there were one.

#### 4. Results and Discussion

To the question of whether they know what the concept of circular economy is, the respondents could choose between yes, no and I don't know. Most respondents in Slovenia, 77.27%, believe that they know the concept of circular economy, unlike respondents from Serbia, where only 25.76% of them think likewise. Viewed the opposite, the highest percentage of respondents in Serbia (39.39%) claim that they don't know what the concept stands for, in contrast to Slovenia, where only 12% of respondents believe that they do not know the concept.

Since we wanted to check the knowledge of the respondents to establish the exact number of those who really know the meaning of the circular economy, we decided on a question in which the respondents chose the correct definition of the circular concept. The correct definition of the circular economy is that it is a concept that extends the life of products and reduces waste. In Slovenia, only 24% of respondents truly knew the definition of the concept of a circular economy, even though more than two thirds of them were convinced that they were right. In Serbia, exactly half of the respondents ticked the correct answer to the question related to the concept of circular economy, although a small percentage of them believed they really knew.

Based on the answers to the questionnaire, there is a difference between channels from which most respondents acquired knowledge in those two countries. Most respondents in Slovenia (53.03%) learned about the concept of circular economy on the Internet in contrast to only 16.67% Serbian residents online, while in Serbia almost a third of them (30.30%) learned about the concept in an educational institution.

The Internet is a web of various information (Febryanthi et al., 2023), both necessary and unnecessary. There are various short films, shows, articles and research in the field of circular economy and textile industry published in it, but the question is whether all of them are relevant. Having in mind the results of the survey, the Internet can be an addition to a broader understanding of the concept, but educational institutions should be the first to implement various external lectures, courses, and workshops on the topic of resources, consumption, and the environment, to comprehend the concept of circular economy by younger generations.

An interesting fact is that in Serbia even 46.97% of respondents had not learned about the concept at all, but somehow, they managed to give the correct answer to the question regarding the definition of the concept of circular economy.

Research in the field of clothing has shown that, on average, men throw away clothes because they no longer fit them, they are useless, or they simply do not need them. The lifespan of clothes is said to last on average just over five years, but women discard them much earlier than men due to fast fashion (Nieboer et al., 2021).

Men shop with reluctance, but the opposite is true for women. Despite their work, many women organize their time well and are happy to visit a clothing or footwear store, as they define shopping as a recreational activity in their free time. Some research showed that fast fashion consumption is characteristic of younger female population (Barnes & Lea-Greenwood, 2006; Morgan & Birtwistle, 2009; Stringer et al., 2020). Men are oriented towards shopping for as short a time as possible, while women succumb to various marketing tricks and are very vulnerable to environmental stimuli (Virant, 2009). Women are the most frequent buyers, because they shop not only for themselves, but also for other family members (shoes, clothes, food, necessities, etc.). As a rule, women visit several stores and carefully study the price compared to the quality of the product (Malovrh & Valentincic, 1996).

Stereotypes may be just the influence of women's history. Some experts claim that there are no customers who can be divided into men and women, as the priority is to satisfy the individual (Virant, 2009). Most salespeople doubt that customer types are defined by gender. Circular economy has a transformative impact on marketing (Mostaghel et al., 2023) and presents new challenges.

Despite some claims that women are more concerned about environmental sustainability than men (Bray et al., 2011), answers show that even 78.79% of respondents in Slovenia believe that men shop more sustainably. Only 9.09% of respondents chose women and 12.12% chose both sexes, a lot less than in Serbia, where 31.82% of respondents claimed that women shop more sustainably, 19.7% opted for both sexes and 48.48% think that men are more sustainably orientated in that matter. In both countries, respondents agree that men are more sustainable shoppers, but that opinion is much more expressed in Slovenia in comparison with Serbia.

Age periods have a different effect on both a person's desires and needs. It is known that the age group of young people up to fourteen years of age depends mainly on their parents, who have purchasing power. Fashion and new trends nowadays leave consequences on parents, which are later passed on to children. For adolescents, buying often depends on imitating society or role models. Because of their jobs, habits and experience, shopping for adults does not take much time compared to younger generations. They know how to judge the quality of a product and the appropriateness of its price. The elderly prefer to skip novelties, as they interfere with ordinary goods (Malovrh & Valentincic, 1996).

The age group that was defined to more prudently, according to respondents from Slovenia, were the elderly (65+ years) people, 69.70% of the respondents, and mature individuals (15-64 years), 22.73% of respondents. The least (7.57%) of the respondents decided on the young age group, which includes those up to fourteen years old. In Serbia, only 1.52% of respondents think that the young buy more sustainably, but also that there is no such big difference between the elderly (54.55%) and the mature (43.94%) when it comes to sustainable buying.

Once upon a time, in the former Yugoslavia, there were large clothing manufacturers, but today, textile industries in Serbia and Slovenia are based mostly on micro-enterprises. Indicative data from the Slovenian research "Clothes make a person" show that more than twenty-three million pieces of clothing were produced in Slovenia in 2019 (Nieboer et al., 2021). According to the Statistical Office of the Republic of Serbia, in 2019 more than 336 million pieces of wearing apparels were produced, of which over 80% of all units produced are socks (Statistical Office of the Republic of Serbia, 2020).

Slovenians shop mostly for the fast fashion factor, which is evident with a mean of 4.35 and a standard deviation of 1.23, which is followed by the influence of the environment, where we place culture and society, with a mean of 3.91 and a standard deviation of 1.32. They also put individual differences (motivation) in the last place as a reason for buying, as it has the smallest mean of 2.12 and a standard deviation of 1.02.

According to the research, in Serbia, shopping reasons seems to be quite the opposite. The main reason for shopping is meeting needs, with a mean of 4.32 and a standard deviation of 0.91, which is by Slovenian respondents at the next-to-last place. It is interesting that almost the same influence on shopping in Serbia have individual differences, i.e., motivation, and psychological process, with a similar mean of around 3.5 and a standard deviation of 1.05 and 1.17 respectively. It seems that in Serbia, the influence of the environment and marketing gimmick with lowest means are not so often reasons for buying clothes.

**Table 1:** Reason for buying textile products, comparatively Slovenia and Serbia

	Slovenia		Serbia	
	Mean	St. d.	Mean	St. d.
Influence of the environment (culture, society)	3.91	1.32	3.09	1.13
Psychological process (perception)	2.60	1.18	3.50	1.17
Individual differences (motivation)	2.12	1.02	3.56	1.05
Marketing gimmick (sales)	2.18	1.11	3.00	1.24
Meeting needs	2.24	1.34	4.32	0.91
Fast fashion (trend)	4.35	1.23	3.26	1.33

In theory, the best waste is that which is not generated (Koszewska, 2018), and the subsequent treatments require both money and time. Reuse extends the life of the product (Chen et al., 2021). A certain thing that we define as waste, someone else really needs. The life story of textiles can thus be extended through various exchanges, donations, resale, and transformation.

In the following, we asked the respondents to evaluate how the following methods help to reduce the generation of waste. With a mean of 4.55 and a standard deviation of 0.90, the respondents in Slovenia estimate that thoughtful shopping contributes the most to reducing waste generation. It is interesting that, with a mean of 2.53 and a standard deviation of 1.0, respondents in Slovenia didn't rate recycling as one of the most effective methods to reduce the generation of waste, while in Serbia, that method seems to be the most effective according to responds, where the mean is 4.47 and standard deviation is 0.77. Thoughtful shopping is ranked at the third place with a mean of 4.21 and standard deviation of 0.77, behind reuse with a mean of 4.32 and a standard deviation of 1.02. The least effective way seems to be disposal in both countries, with means of 1.44 and 3.14 and standard deviations 1.05 and 1.33 in Slovenia and Serbia, respectively.



**Table 2:** To what extent the following methods contribute to the reduction of waste generation, comparatively

	Slovenia		Serbia	
	Mean	St. d.	Mean	St. d.
Reuse	4.36	0.94	4.32	1.03
Thoughtful shopping	4.55	0.90	4.21	0.77
Rework	2.38	1.26	4.17	0.90
Processing	2.17	1.18	3.82	0.94
Giving away	2.82	1.04	3.89	1.10
Exchange	2.79	1.02	3.83	1.03
Recycling	2.53	1.00	4.47	0.77
Resale	2.98	0.95	3.39	1.09
Disposal	1.44	1.05	3.14	1.33

Regarding the question about why consumers throw away clothes, six reasons were given, which they rated according to their habits. With a mean of 4.08 and a standard deviation of 1.59, users in Slovenia mostly discard clothes because they are no longer trendy, and after that because they have nowhere to put new clothes. The results show that the respondents do not throw away clothes because they are dirty (mean 1.42, standard deviation 0.90). The number one reason in Serbia for throwing away clothes is because it is torn, giving the mean of 3.87 and standard deviation of 1.25. A smaller number of people said that the reason is because they don't use it anymore, with a mean of 2.71 and a standard deviation of 1.41. All other reasons have a mean around 2 and it is interesting that the smallest number of respondents said that they throw clothes away because it is not trendy anymore, completely the opposite to Slovenian respondents.

**Table 3:** Why do respondents throw away their clothes, comparatively Slovenia and Serbia

	Slovenia		Serbia	
	Mean	St. d.	Mean	St. d.
Because they are dirty	1.42	0.90	2.06	1.24
Because they are torn	2.09	1.29	3.86	1.25
Because I don't use them	1.91	1.22	2.71	1.41
Because I have nowhere to put my new clothes	3.80	1.19	2.17	1.25
Because I don't like them	1.74	1.09	2.20	1.24
Because they are no longer trendy	4.08	1.59	2.02	1.21

Respondents tried to estimate the amount of clothing they throw away per year by entering a whole number in the unit kilogram. The average amount of discarded clothes in Slovenia is 8.7 kilograms, with the highest value of 30 kilograms and the lowest value of 0 kilograms, which is more than EU average of 6 kilograms per inhabitant (Koszevska, 2018). According to responses, where average amount of discarded clothes in Serbia is 2.8 kilograms and the heaviest weight of discarded clothes is 20 kilograms, it seems that people in Serbia act in a more friendly way towards environment in comparison with the majority of EU citizens.

In accordance with the above, the respondents were asked if they would use the application to design a new fashion piece from their still usable clothing. In Serbia 68% responded positively, while in Slovenia even 85% of respondents said that they would use the app.

Clothing that fits the style can contribute to increasing many factors relevant for youngsters especially. With a mean of 4.62 and a standard deviation of 0.74, Slovenian respondents agreed that stylistic matching of clothing helps to increase the visibility in the first place, and with a mean of 4.36 and a standard deviation of 1.02, this results in higher self-confidence. All other factors have lower contributions. Responses in Serbia were similar, where, with the mean of 4.04 and a standard deviation of 1.14, contribution to higher self-confidence ranks first and the higher visibility, with a mean of 3.89 and a standard deviation of 1.04, follows as second, but other factors had similar values too, just a bit lower.

**Table 4:** Clothing that fits the style contributes, comparatively Slovenia and Serbia

	Slovenia		Serbia	
	Mean	St. d.	Mean	St. d.
Higher reputation	2.33	1.22	3,50	1,22
Greater attractiveness	2.61	1.28	3,73	1,17
Higher motivation	2.59	1.08	3,67	1,21
Higher self-confidence	4.36	1.02	4,05	1,14
Greater affiliation	2.33	1.07	3,50	1,14
Higher visibility	4.62	0.74	3,89	1,04

## Conclusion

People are doing a kind of violence to the environment by making unnecessary purchases. We must be aware that a linear model can no longer exist and that circular movements are crucial (Koszevska, 2018). The linear model lived and lives because of consumer habits, new trends and fast fashion (Brewer, 2019). We believe that educational institutions should build knowledge about resources, the environment, and its saving at the beginning - among the youngest, so that this can be transferred into practice also among the more mature and older age groups, who, according to the answers, currently act in a more sustainable manner. It is crucial to incorporate subjective knowledge in environmental education and to make the youngsters aware of environmental problems (Rizkalla & Erhan, 2020).

It seems that there are different perceptions towards buying clothes in Slovenia and Serbia, considering that some buy clothes due to fast fashion and others to meet their needs, but in the matter of contribution of clothing that fits the style they agree that higher self-confidence is the number one result of buying it.

In addition to thoughtful shopping, other activities should be taken to reduce textile waste (Chen et al., 2021). One of solutions may be an application for creating a new fashion piece from the existing clothes, so there would be less clothes that are thrown away as waste every year by both Slovenian and Serbian people. Reuse and rework are methods to contribute to the reduction of waste generation recognized by young people in Slovenia and Serbia who mainly throw away their clothes because it is no longer trendy, because they have nowhere to put new clothes, or their clothes are rather dirty. Self-designed clothes can contribute to making one's own trend and through that maybe self-confidence too, but for sure someone's needs could be met through giving away newly designed textile, which is made by the app. None of us wants to feel threatened the way the environment does. That is why the less you have, the more you contribute to the environment.

Further research in this area can introduce other countries to question the differences of attitudes towards circular economy in textile industry in a wider region. Furthermore, other variables could be added to the questionnaire in order to determine the factors that influence the attitude of respondents towards circular economy.

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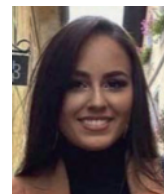


## About the Authors

### Aila Civić

University of Maribor, Faculty of Organizational Sciences, Slovenia  
civicaila6@gmail.com

Aila Civić is a graduate organizer of HR and educational systems. She upgrades her education at the University of Maribor, Faculty of Organizational Sciences, on the Master's study program Organization and Management of Personnel and Educational Systems. She is the author of several papers at international scientific conferences. The area of research she wants to focus on in the future is human resources and teamwork.



### Milan Jovanović

University of Belgrade, Faculty of Organizational Sciences, Serbia  
milan.jovanovic@fon.bg.ac.rs

Milan Jovanović is an associate at the Department of Business Systems Organization, at the Faculty of Organizational Sciences in Belgrade, where he is doing his PhD research in the field of management and organization. His research findings have been published several times in the proceedings of international and domestic conferences. His main areas of interest are consulting, organizational restructuring, business process management and entrepreneurship. As a project team member, he has participated in the realization of more than 10 management consulting projects on the topic of organizational structure redesign and business process optimization, in various industries. He was also involved in several research studies.



**Ivan Todorović**

University of Belgrade, Faculty of Organizational Sciences, Serbia  
ivan.todorovic@fon.bg.ac.rs



Ivan Todorović works at the University of Belgrade, Faculty of Organizational Sciences. His field of expertise includes organizational design, restructuring, management consulting, business model development and entrepreneurship. As a business consultant he has been hired by more than 50 companies that execute their business activities in Serbia and the region. He has participated in numerous research projects financed by the Republic of Serbia or international institutions like EBRD, UNIDO and USAID. He is a co-author of more than 75 publications in international and domestic monographs, journals and conference proceedings, and he serves as a reviewer for several international scientific journals and conferences. He was a visiting lecturer in Slovenia, at the University of Maribor, Faculty of Organizational Sciences. As an advisor for business model development, he has supported several startup companies. His student teams have won prizes at international startup and case study competitions, while he himself was a member of the winning teams at HULT Global Case Challenge 2012 in London and at the Balkan Case Challenge 2010 in Vienna. He also coaches academic mentors to work with student startups.

**Miha Marič**

University of Maribor, Faculty of Organizational Sciences, Slovenia  
miha.maric@um.si



Miha Marič, PhD, is a researcher in the field of leadership, management and organizational sciences. He holds a PhD from the Faculty of Economics, University of Ljubljana. He is currently employed as an associate professor at the University of Maribor's Faculty of Organizational Sciences. His research interests are power, leadership, organizational behaviour, human resource management, organization and management. He is the author of numerous original scientific articles, professional articles, papers at scientific conferences, scientific monographs, and was an editor and reviewer. He also participates in research projects and consulting work.