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IZVIRNI ZNANSTVENI ČLANKI – ORIGINAL SCIENTIFIC PAPERS

CONVERGENCE OF BUSINESS CYCLES AS A CONFIRMATION OF OCA THEORY

Konvergenca poslovnih ciklov kot potrditev teorije optimalnega valutnega področja

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Abstract

This paper examines business cycles in EU members and compares them with the business cycles of the economic and monetary union in Europe (EMU) members assumed to satisfy the optimal currency area (OCA). Accordingly, a multi-resolution decomposition of GDP growth signals is used, and correlation coefficients are computed for decomposed signals to assess the numerical values of synchronicities of business cycles. Our results reveal indications that areas adopting the euro in many ways confirm OCA theory and that the business cycles of most of the new EU members are not synchronized with the EMU; as such, these members might experience some difficulties if joining the euro too early.

Keywords: convergence, business cycles synchronization, wavelets, multi-resolution analysis

Izvleček

V članku so obravnavani konjunkturni cikli in še posebej njihova konvergenca v evrskem območju, kakor to predpostavlja teorija optimalnega valutnega področja (OCA). Uporabljena je bila multiresolucijska dekompozija časovnih vrst BDP, za pridobitev numeričnih vrednosti sinhronizacije konjukturnih ciklov pa so bili izračunani korelacijski koeficienti dekomponiranih časovnih vrst. Rezultati kažejo, da območje evra v marsičem potrjuje teorijo OCA, hkrati pa tudi opozarjajo, da utegnejo imeti nove članice EU težave, če se odločijo prezgodaj pridružiti evrskem območju.

Ključne besede: konvergenca, konjunkturni cikli, valčki, multiresolucijska analiza

1 Introduction

   The topic of business cycles, especially convergence, has received a great deal of attention in recent years, mainly motivated by the economic and monetary union in Europe (EMU). In the context of a single currency and common monetary policies in the euro-adoption area, the similarity of the business cycles of the participant countries is a major concern. Nowadays, the enlargement process of the European Union has resulted in pressing questions about the preparedness of the candidate countries for integration. The literature on business cycle synchronization is related to that on optimal currency areas and, more broadly, on economic unions. If several countries delegate to some supranational institution the power to perform a common monetary (or fiscal) policy, then they lose this policy stabilization instrument. With the recent enlargement of the European Union, the interest on this topic is guaranteed for a while. The optimal currency area (OCA) theory states that countries are more suited to belonging to a monetary union when they meet certain criteria related to the real convergence of an economy— namely, a high degree of external openness, mobility of factors of production,

and diversification of production structures. According to this theory, if there is a clear convergence between business cycles of countries willing to join the monetary union and the business cycle within the currency area, then this tends to prove that these countries are ready to enter the currency area. A revival of the empirical testing of the OCA theory preceded the introduction of the monetary union in Europe. Usually, empirical studies tend to assess the correlation between the German (or another large EU economy) business cycle and business cycles in other potential member countries (De Bandt, Herrmann, & Parigi 2006).

A relatively unexplored tool for forecasting is wavelets. Wavelet multi-resolution analysis allows one to decompose a time series into a low-frequency base scale and higher-frequency scales. Those frequency components can be analysed individually or compared across variables (Rua, 2010). As business cycles can be statistically decomposed into components with different frequencies (trend, season, noise), it is natural to use multi-resolution analysis to compare gross domestic product (GDP) with the components of well-defined frequencies that allow such comparison. The aim of this paper is to treat business cycles in the EU members and compare them with the business cycles of EMU members that are assumed to satisfy the optimal currency area. Accordingly, a multi-resolution decomposition of GDP growth signals is used, and correlation coefficients are computed for decomposed signals to assess the numerical values of the synchronicities of business cycles.

This paper is organized as follows. After a brief literature review, the methodological framework is addressed, the multi-resolution decomposition is presented, and a brief description of the database and calculations is provided. The results of the convergence of business cycles are then discussed. Finally, the results are summarized in the conclusion.

2 Literature Review

The term *economic convergence* refers to a diminishing of the differences in living standards (in the opposite case, we use the term *divergence*), economic levels, and the manufacturing performance of particular countries or their regions (Nachtigal et al., 2002). A widely used device for measuring the symmetry or asymmetry of shocks is a measure of the synchronicity of business cycles (Artis, Marcellino, & Proietti, 2004). Various authors have attempted to assess and explain business cycle convergence and synchronization. Artis and Zhang (1997) addressed the question of whether the exchange rate mechanism (ERM) has implied an increasing conformity among the business cycles of the participant countries. Angeloni and Dedola (1999) compared business cycle fluctuations of output, industrial production, stock indices, and prices across countries in various sub-samples. Wynne and Koo (2000) documented differences and similarities between business cycles in the European Union and business cycles in the Federal Reserve districts in the United States.

The literature on business cycle synchronization is related to the literature on optimal currency areas and, more broadly, economic unions. The topic of business cycles—especially their convergence—has received a great deal of attention in recent years, mainly motivated by the economic and monetary union in Europe. The optimal currency area theory (OCA) is one theory that helps make decisions on whether or not certain countries enter the monetary union. According to OCA theory, developed roughly five decades ago, two countries or regions will benefit from a monetary union if they share similar business cycles, trade intensively, and rely on efficient adjustment mechanisms to smooth out asymmetric shocks. OCA theory was developed in the Bretton Woods system by Mundell (1961), McKinnon (1963) and Kenen (1969). After the breakdown of the Bretton Woods system, the OCA theory was regularly used to assess the desirability of having a fixed exchange rate in different countries.

Although papers on this topic apply various methods (see Table 1) to reach different results, most find that the business cycles in several new member states are about as synchronized with the euro area as several of the peripheral members of the euro area. Many approaches have been used by various authors to assess the numerical values of the European economic activity convergence. Some papers examine the correlations of a detrended indicator of aggregated output. Business cycle coordination is analyzed mainly from the perspective of the international transmission of business cycles. Several authors apply various filters (e.g., Hodrick-Prescott [HP] or Band-Pass filters) or use time-series models. In addition, value at risk models (VaR), particularly structural VaR, are used to recover underlying shocks with properties derived from the economic theory.

Economic time series contain important information about economic activity, from long-run movements in productivity to business cycle fluctuations. They also contain high frequency noise, whose sources range from transitory shocks to measurement error. Linear filtering is a useful tool for extracting the component of interest (e.g., the business cycles component of real gross national product [GNP]) from the economic time series. Prominent examples in the economics literature include the Hodrick and Prescott (1980) filter and the approximate Band Pass filter (Baxter & King, 1999). Multi-resolution wavelet analysis is an alternative linear filter-based method; it is a natural way to decompose an economic time series into the long-run trend, the business cycle component, and high frequency noise (Yogo, 2008).

3 Methodological Framework

Fourier analysis is a mathematical tool for studying the cyclical nature of a time series in the frequency domain. However, under the Fourier transformation, the time information of a time series is completely lost. Meanwhile, the wavelet transformation breaks down a time series into shifted and scaled versions of a mother wavelet function that has a limited spectral band and limited time duration.

Table 1: *Various Methods Used for Correlation of Business Cycles*

Author(s)	Methodology and Economies	Results
Boone and Maurel (1998)	Assessed whether it would be optimal for the Central and Eastern European Countries to form a monetary union with either Germany or the EU using the Hodrick Prescott filter method.	The percentage of the Central and Eastern European Countries business cycle fluctuations explained by a German shock is very high; furthermore, the impulse responses are positively correlated.
Fidrmuc and Korhonen (2001, 2003)	Assessed the correlation of supply and demand shocks between the countries of the euro area and the accession countries in the 1990s.	Some accession countries have a quite high correlation of the underlying shocks with the euro area. Many EU countries seem to have a much higher correlation with the core euro area countries than in the previous decades. Continuing integration within the EU also seems to have aligned the business cycles of these countries.
Fidrmuc (2001, 2004)	Computed the potential correlation of the business cycle in Germany and in the Central and Eastern European Countries using Frankel and Rose's (1998) relation between the degree of trade integration and the convergence of the business cycles of trading partners.	The discussion focused on five associated countries (Czech Republic, Hungary, Poland, Slovenia, and Slovakia) and confirmed previous findings, such as that the Central and Eastern European Countries have rapidly converged to the EU countries in terms of business cycles and trade integration. In particular, business cycles in several Central and Eastern European Countries (Hungary, Slovenia and, to a lesser extent, Poland) have been strongly correlated with the business cycle in Germany since 1993.
Korhonen (2001, 2003)	Examined the correlation of short-term business cycles in the euro area and the EU accession countries with the help of vector autoresression models.	Clear differences emerged in the degree of correlation among accession countries. Generally, for smaller countries, the relative influence of the euro area business cycle is larger. Also, the most advanced accession countries are at least as integrated with the euro area business cycle as are some small current member countries of the Economic and Monetary Union.
Artis et al. (2004)	Analyzed the evolution of the business cycle in the accession countries after a careful examination of the seasonal properties of the available series and the required modification of the cycle-dating procedures. The analysis was based on the industrial production index (total industry) series using the Hodrick Prescott filter method.	The degree of concordance within the group of accession countries is not, in general, as large as that between the existing EU countries (the Baltic countries constitute an exception). Between them and the euro area, the indications of synchronization are generally rather low, with the exception of Poland and Hungary, and lower relative to the position obtained for countries taking part in previous enlargements (again with the exceptions of Poland, Hungary, and this time Slovenia).

4 Wavelet Multi-resolution Decomposition

As a coherent mathematical body, wavelet theory was developed in the mid-1980s (Goupillaud & Morlet, 1984; Grossmann & Morlet, 1984). The literature rapidly expanded, and wavelet analysis is now extensively used in physics, statistics, econometrics, and applied economics. In this respect wavelet tools have also been generalized to accommodate the analysis of time-frequency dependencies between two time series, e.g. the cross-wavelet power spectrum, the cross-wavelet coherency, and the phase-difference (Aguiar-Conraria & Soares, 2009)

Computational tools known as wavelets, particularly multi-resolution (MR) analysis, allow for the decomposing of a signal (e.g., a time series of gross domestic product [GDP], industrial production, inflation, stock returns) into high and low frequency components (Chui, 1992; Percival & Walden, 2000). High frequency (irregular) components describe the short-run dynamics whereas low-frequency components represent the long-term behaviour of a signal. Identification of the business cycle involves retaining the intermediate frequency components of a time series—namely, we disregard very high- and low-frequency components. For instance, it is customary to associate a business cycle with cyclical components between 6 and 32 quarters (Burda & Wyplosz, 2005).

Wavelets were specifically designed for isolating short-lived phenomena from long-term trends in a signal (Baqaee, 2009). Wavelet methods have been popular due to their computational efficiency, flexibility, and overall superiority to established techniques of analyzing and transforming data. One of the greatest strengths of wavelets over conventional frequency-domain techniques is their ability to deal with non-stationary data (Crowley, 2007). Wavelet analysis performs the estimation of the spectral characteristics of a time series as a function of time, revealing how the different periodic components of the time series change over time. Although the Fourier transformation breaks down a time series into constituent sinusoids of different frequencies and infinite duration in time, the wavelet transform expands the time series into shifted and scaled versions of a function that has limited spectral band and limited duration in time. Wavelets can be a particularly useful tool when the signal shows a different behaviour in different time periods or when the signal is localized in time as well as frequency. As it enables a more flexible approach in time-series analysis, wavelet analysis is seen as a refinement of Fourier analysis (Rua, 2010).

We can also describe this in a more formal manner (Wolfram Research, 1996). Let us mark the resolution level with an integer j (i.e., $j \in N_0$), and let the scale associated with the level $j=0$ have a value of one while at the level j have a

value of 1/2^j. Let $f(t)$ be a function, where $f(t){\in}L^2$(R), where L^2(R) is the space of measurable functions f, defined on the real line R, that satisfy

$$\int_{-\infty}^{\infty} |f(t)|^2 \, dt < \infty.$$

Mark with $f_j(t)$ the approximation function $f(t)$ on resolution level j. On the next level of resolution, $j+1$, we add fluctuation or details and mark them with $d_j(t)$; the approximation function $f(t)$ on the new resolution level is then $f_{j+1}(t)=f_j(t)+ d_j(t)$. We obtain the original function $f(t)$ when we let the resolution go to infinity:

$$f(t) = f_j(t) + \sum_{k=j}^{\infty} d_k(t).$$

The concept of multi-resolution marks the simultaneous presence of different resolutions. However, the previous equation presents only one possibility of the development or decomposition function $f(t)$ to its smooth part and details. We can suppose analogously that L^2(R) is the space of square-integrable functions as composed of a sequence of subspaces $\{W_k\}$ and V_j. With V_j we denote the subspace of functions that contain signal information down to scale 2^{-j}. The multi-resolution analysis involves a decomposition of the function space into a sequence of subspaces V_j, such that subspace V_j is contained in all the higher subspaces. If we denote the approximation to $f(t)$ at level j by $f_j(t)$, then $f_j(t){\in}V_j$. Since information at resolution level j is necessarily included in the information at a higher resolution, V_j must be contained in V_{j+1} for all j. The difference between $f_{j+1}(t)$ and $f_j(t)$ is the additional information about details at scale $2^{-(j+1)}$, which is denoted by $d_j(t)= f_{j+1}(t) - f_j(t)$. Thus, we get

$$f_{j+1}(t) = f_j(t) + d_j(t)$$

and can further decompose our subspaces accordingly, writing

$$V_{j+1} = V_j \oplus W_j,$$

where W_j is called the detail space at resolution level j and is orthogonal to V_j. We can continue the decomposition of the space V and obtain

$$V_{j+1} = W_j \oplus V_j = W_j \oplus W_{j-1} \oplus V_{j-1} = {}_\mu = W_j \oplus W_{j-1} \oplus W_{j-2} \oplus {}_\mu \oplus W_{j-J} \oplus V_{j-J}.$$

Thus, we can conclude that the approximation space at resolution j (i.e., Vj) can be written as a sum of subspaces. Similarly, the approximation of the function $f(t)$ at resolution j (i.e., $f_j(t)$) is contained in subspaces V_j, and details $d_k(t)$ in W_k. The function that we are using for this purpose is called a "wavelet".

We can introduce wavelets in many possible ways (Chui, 1992; Valens, 1999), including considering the space L^2(R). The local average value of every function in L^2(R) must "decay" to zero at $\pm\infty$. It follows that the base function must be oscillatory (wavelike). Therefore, we look for "waves" generating L^2(R) that, for all practical purposes, decay sufficiently fast. We can say we look for small waves or "wavelets" to generate the space L^2(R) and we prefer to have a single function, say ψ, to generate all of L^2(R). Because the wavelet ψ has very fast decay, an obvious way to cover the entire real line R is to shift the wavelet function ψ along the real line. Shifting a wavelet simply means considering all the integral shifts of ψ—namely,

$$\psi(t\text{-}k), k{\in}Z,$$

where Z denotes the set of integers. Next, to properly represent $f(t)$, we must also consider waves with different frequencies—in particular, waves with frequencies partitioned into consecutive "octaves" or frequency bands or scales. For computational efficiency the integral powers of 2 are used for frequency partitioning. So we can now consider wavelets of the form

$$\psi(2^j t\text{-}k), j,k{\in}Z.$$

The family $\psi(2^j t\text{-}k)$ is thus obtained from a single wavelet function $\psi(t)$ or mother wavelet by a binary dilation (by 2^j) and a dyadic translation (or shift of $k/2^j$). The definition of wavelets along with $\psi(t)$ also requires a scaling function $\varphi(t)$. The wavelet function is in effect a band-pass filter; scaling it for each level halves its bandwidth. As a result, in order to cover the entire spectrum, an infinite number of levels is required. The scaling function filters the lowest level of the transformation and ensures that the entire spectrum is covered (Valens, 1999).

For example, the simplest possible wavelet is the Haar wavelet, defined as

$$\psi(t) = \begin{cases} 1, & 0 \le t < 1/2 \\ -1, & 1/2 \le t < 1 \\ 0, & otherwise \end{cases}$$

Its scaling function φ can be described as

$$\varphi(t) = \begin{cases} 1, & 0 \le t < 1 \\ 0, & otherwise \end{cases}$$

We can note that any continuous real function can be approximated by linear combinations of the constant function $\psi(t), \psi(2t), \psi(4t), \ldots, \psi(2^j t), \ldots$ and their shifted functions. The technical disadvantage of the Haar wavelet is that it is not continuous, and therefore not differentiable, yet this property can be an advantage for the analysis of time series with sudden jumps.

Wavelets have many characteristics. Here we mention just a few important ones. According to Sheng (1996), functions $\psi(t){\in}L^2$(R) satisfying the admissibility condition expressed as

$$\int_{-\infty}^{\infty} \frac{|\Psi(\omega)|^2}{|\omega|} d\omega = 0,$$

where $\Psi(\omega)$ stands for the Fourier transformation of $\psi(t)$, can be used to first analyze and then reconstruct a time series without the loss of information. Moreover, the admissibility condition implies that the Fourier transformation of $\psi(t)$ vanishes at the zero frequency:

$$|\Psi(\omega)|^2\big|_{\omega=0} = 0.$$

A zero at the zero frequency also means that the average value of the wavelet in the time domain must be zero:

$$\int_{-\infty}^{\infty} \psi(t) dt = 0.$$

This implies, as previously mentioned, that the wavelet function $\psi(t)$ must be oscillatory—in other words, a wave. Finally, we can state some sort of admissibility condition for the scaling function $\varphi(t)$ as well

$$\int_{-\infty}^{\infty} \varphi(t) dt = 1,$$

which implies that the zero moment of the scaling function cannot vanish.

As previously mentioned, the shift and scaling of the wavelet function ψ can be written as

$$\psi_{b,a}(t) = \frac{1}{\sqrt{a}} \psi\left(\frac{t-b}{a}\right),$$

where a is the scale factor, b is the translation factor, and $a^{-1/2}$ stands for energy normalization across the different scales. To express the time series $f(t)$ based on function ψ, we define wavelet transformation as

$$(W_\psi f)(b,a) = \int_{-\infty}^{\infty} f(t) \frac{1}{\sqrt{a}} \psi\left(\frac{t-b}{a}\right) dt,$$

where $a = 2^{-j}$, $b = k/2^j$, $(j,k) \in Z^2$. The time series $f(t)$ can now be written as

$$f(t) = \sum_{j,k=-\infty}^{\infty} c_{j,k} \psi_{j,k}(t),$$

where the coefficient $c_{j,k}$ is expressed as

$$c_{j,k} = (W_\psi f)\left(\frac{k}{2^j}, \frac{1}{2^j}\right)$$

and we call them the wavelet transformation coefficients.

Let us now return to the multi-resolution analysis. As previously stated, the multi-resolution analysis of a time series breaks it into pieces or "decomponents" it into a hierarchical set of its approximations and detail levels. On every level j, we build approximation A_j of this level and deviation from this level, which we call details j of level D_j.

In the original time series, it can look like an approximation of level 0, A_0. Of course, it is valid as this:

$$A_j = A_{j+1} + D_{j+1}$$

At a given j, the detail level D_j of MR analysis of time series can now be written as function

$$D_j(t) = \sum_{k \in Z} c_{j,k} \psi_{j,k}(t),$$

and finally, we make the entire time series as

$$f(t) = \sum_{j \in Z} D_j.$$

If we define approximation level J, A_J, as

$$A_J = \sum_{j>J} D_j,$$

we can express time of series f as sum of approximation A_J and details of level D_j

$$f = A_J + \sum_{j \le J} Dj.$$

Concerning the choice of the wavelet function for the multi-resolution decomposition, we chose the Meyer family wavelets for those members that are infinitely continuous differentiable; this allowed for smooth functions at every level of details. The Meyer wavelet ψ and its scaling function φ are in the frequency domains defined as follows (Misiti, Oppenheim, & Poggi, 2005)

$$\psi(\omega) = \begin{cases} (2\pi)^{-1/2} e^{i\omega/2} \sin\left(\frac{\pi}{2} v\left(\frac{3}{2\pi}|\omega|-1\right)\right), & \frac{2\pi}{3} \le |\omega| \le \frac{4\pi}{3} \\ (2\pi)^{-1/2} e^{i\omega/2} \cos\left(\frac{\pi}{2} v\left(\frac{3}{4\pi}|\omega|-1\right)\right), & \frac{4\pi}{3} \le |\omega| \le \frac{8\pi}{3} \\ 0, & |\omega| \notin \left[\frac{2\pi}{3}, \frac{8\pi}{3}\right] \end{cases}$$

and

$$\phi(\omega) = \begin{cases} (2\pi)^{-1/2}, & |\omega| < \frac{2\pi}{3} \\ (2\pi)^{-1/2} \cos\left(\frac{\pi}{2} v\left(\frac{3}{4\pi}|\omega|-1\right)\right), & \frac{2\pi}{3} \le |\omega| \le \frac{4\pi}{3} \\ 0, & |\omega| > \frac{4\pi}{3} \end{cases}$$

where $v(a) = a^4 (35 - 84a + 70a^2 - 20a^3)$, $a \in [0,1]$. Both functions are shown in Figure 1.

5 Database and Calculations

In this paper, quarterly data are analyzed. The multi-resolution scales are such that scale (or detail) 1 (D1) is associated with 1- to 2-quarter dynamics, scale 2 (D2) with 2- to 4-quarter dynamics, scale 3 (D3) with 4- to 8-quarter or 1-

Figure 1: *Meyer wavelet family (author's calculations).*
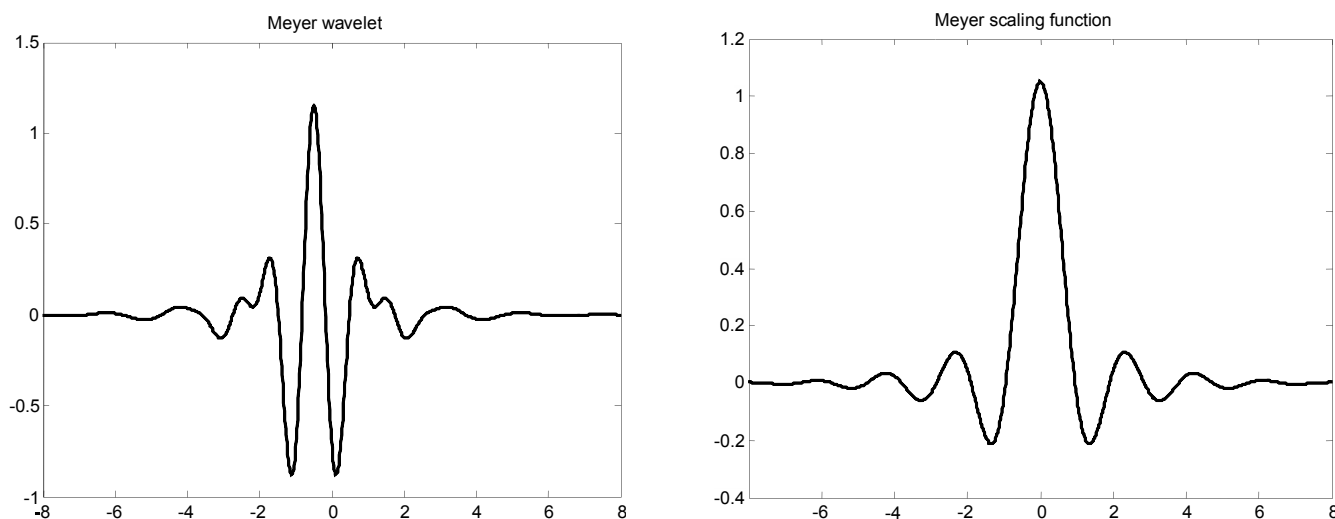
to 2-year dynamics, scale 4 (D4) with 8- to 16-quarter or 2- to 4-year dynamics, and scale 5 (D5) with 16- to 32-quarter or 4- to 8-year dynamics. Quarterly data for the GDP of EU countries, Austria (at), Belgium (be), Bulgaria (bg), Czech Republic (cz), Germany (de), Denmark (dk), Estonia (ee), Spain (es), EU 15 (eu15), EU 25 (eu25), Euro Area 12 (ez12), Finland (fi), France (fr), Hungary (hu), Ireland (ie), Italy (it), Latvia (lt), Lithuania (lv), the Netherlands (nl), Poland (pl), Romania (ro), Sweden (se), Slovenia (si), Slovakia (sk), and the United Kingdom (uk), measured in millions of euros at constant 1995 prices and exchange rates, were obtained from Eurostat. Most data range from 1996Q1 to 2008Q2, except for Romania (2000Q1–2008Q2) and Ireland (1998Q1–2008Q2). From these, due to potential seasonality in the data, the business cycle time series for a country i was computed as $GDP_{i,t}/GDP_{i,t-4}$. Descriptive statistics for the obtained real GDP growth series are presented in the Appendix (Table A1).

The GDP growth time series was then fed into the MATLAB software with the wavelets toolbox, through which every GDP growth series was decomposed into smooth level and five detail levels (D1-D5) using, due to their indefinitely differentiability, the Meyer family of wavelet functions. To ensure better convergence illustration or synchronization of cycles at the different scales of detail, for selected analyses we show countries together with components at all scales (D1-D5) as well as the original signals in the Appendix (Figure A1). At first glance, one can assess the different synchronizations of business cycles on individual scales of details, which also confirms the numerical calculation of correlation coefficients in the Appendix (Table A2).

6 Results

Numerically, different levels of synchronicity of the GDP growth time series can be represented by correlation coefficients. All correlation coefficients for different EU member countries are computed with respect to the euro area and the results are shown in the Appendix (Table A2). For each country, the overall correlation coefficient was computed between that country's GDP growth series and the euro area's GDP growth series (second column), together with correlation coefficients among the five MR components of the country's GDP growth series and the five MR components of the euro area's GDP growth series. The diagonal cells with the same frequency are shaded grey; for convenience, the correlation coefficients with the absolute value above 0.5 are printed in bold.

From the overall correlation coefficients, four main different levels of synchronicity of business cycles can be seen. Large, old EU members have a high synchronicity to the euro area and correlation coefficients values above 0.8 (e.g., Germany 0.91, Italy 0.90, France 0.89) The same high level of synchronicity can also be seen at almost all different same-frequency levels of GDP MR components. The second group includes the smaller euro area economies, with correlation coefficients above 0.5 (e.g., the Netherlands 0.78, Belgium 0.75, Finland 0.65). Also in this group are the old EU members not in the euro area, with Sweden being the most synchronous with the euro area (correlation coefficient=0.71). The third group is composed primarily of new members of the EU (in 2004), with $0.1<\rho<0.5$. Among these, Slovenia, which joined the euro area in 2007, has only a weak correlation with euro area (0.43). The last group is composed of new EU members that have negative, although

weak, overall correlation with the euro area (e.g., Czech Republic, Slovakia). The same results also hold for different MR components of GDP growth series.

Once detail correlations have been obtained, co-correlations can be calculated so as to study the individual country phase relationship versus the euro area. These co-correlations only measure how the correlations change by lagging the country series against the equivalent euro area series, thereby allowing for a study of phasing of the cycles rather than the magnitude of the correlations themselves. Somewhat surprisingly, the results of co-correlation analysis show that, in terms of synchronicity of cycles, the EU member countries roughly fall into the following groupings:

(a) member states that are relatively well synchronized against the euro area (France, the Netherlands, and Bulgaria);

(b) member states that are synchronized at high frequency cycles, but not at low frequency cycles with a slight lead in long-term cycles (Austria, Belgium, Germany, Denmark, Italy, Spain, and Sweden);

(c) member states that are synchronized at high frequency cycles, but not at low frequency cycles with the slight lag in long-term cycles (Slovenia, Hungary, Estonia, Latvia, Lithuania, and the UK); and

(d) member states that are not synchronized at either low or high frequency cycles (Finland, Czech Republic, Slovakia).

Thus, it can be concluded that the euro area in many ways confirms OCA theory and that most of the new EU members might experience some difficulties if they join the euro area too early.

7 Conclusion

This paper considered business cycles, especially their convergence in the euro area, which was assumed to satisfy the optimal currency area requests. A major advantage of wavelet techniques is their ability to decompose a time series locally, both in frequency and time domain. In our research, the multi-resolution decomposition of the GDP growth signal was used, and correlation coefficients were computed for decomposed signals to assess the numerical values of the synchronicities of business cycles. Although the performance of the approach based on the wavelets remains overall comparable with those of the two filters (i.e., Hodrick Prescott and Baxter King), filtering by wavelets allows us to perform temporal and frequency analyses of the cyclical component simultaneously. Using an example based on the American GDP, Ahamada and Jolivaldt (2010) showed that filtering based on wavelets is more powerful. The conclusion is that the euro area in many ways confirms OCA theory and that most of the new EU members might experience some difficulties if they join the euro area too early.

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APPENDIX

Table 1: *Descriptive statistics for the real GDP growth series*

	Average	Standard deviation	Maximum	Minimum	Asymmetry	Skewness
Austria	2.4	1.3	5.0	-0.5	-0.27	-0.59
Belgium	2.3	1.2	5.2	-0.6	0.13	-0.27
Bulgaria	3.3	6.6	18.3	-21.5	-2.27	6.96
Czech Republic	3.5	2.7	7.9	-2.1	-0.37	-0.68
Denmark	2.1	1.6	4.5	-1.3	-0.43	-1.04
Estonia	6.9	3.6	12.0	-1.1	-0.92	0.09
EU 15	2.3	1.0	5.1	0.3	0.40	0.42
EU 25	2.4	1.0	5.1	0.4	0.34	0.33
Euro area 12	2.2	1.0	5.0	0.0	0.38	0.37
Finland	3.8	1.6	7.1	-1.3	-0.35	0.68
France	2.2	1.1	5.2	0.4	0.44	0.15
Irland	6.5	3.2	14.4	-1.3	0.02	0.64
Italy	1.4	1.2	4.2	-0.6	0.50	-0.49
Latvia	7.3	3.2	12.9	0.1	-0.31	-0.52
Lithuania	6.6	3.3	11.6	-4.3	-1.36	2.56
Hungary	3.8	1.5	6.6	0.6	-0.84	0.12
Germany	1.6	1.3	4.4	-1.1	0.27	-0.16
Netherland	2.8	1.5	5.8	-0.2	-0.47	-0.48
Poland	4.7	2.4	11.8	-0.3	0.27	0.38
Romania	5.5	3.3	9.8	-5.7	-2.06	5.85
Slovakia	5.2	3.2	14.3	-2.7	-0.21	0.84
Slovenia	4.5	1.3	7.4	2.4	0.37	-0.78
Spain	3.6	1.0	7.3	1.6	0.84	2.42
Sweden	3.0	1.6	6.2	-1.5	-0.50	0.10
United Kingdom	2.9	0.9	5.7	0.4	0.19	1.58

Source: Eurostat, own calculations.

Figure 1: *MR components of GDP growth at different scales of details*
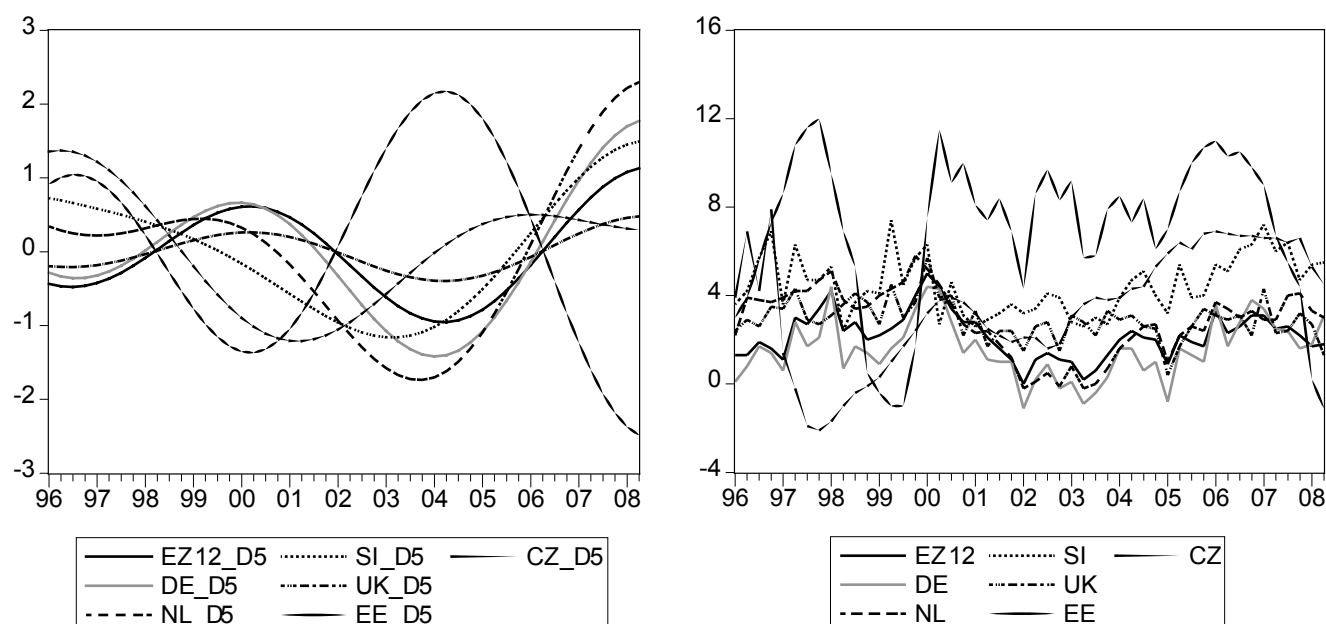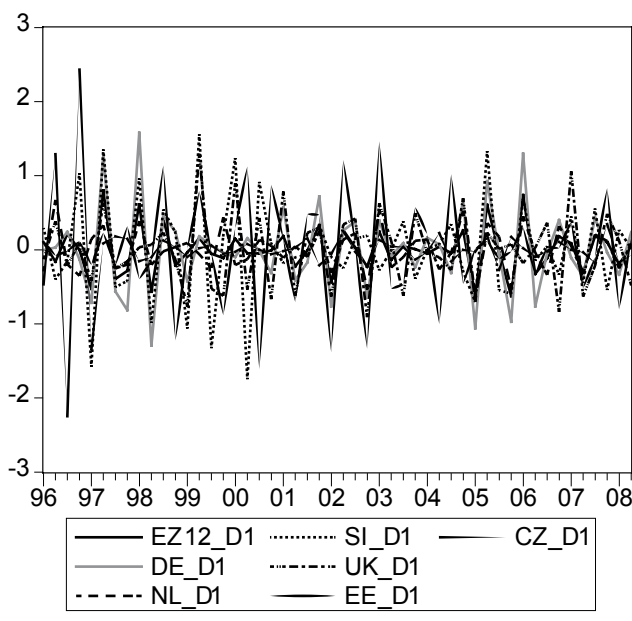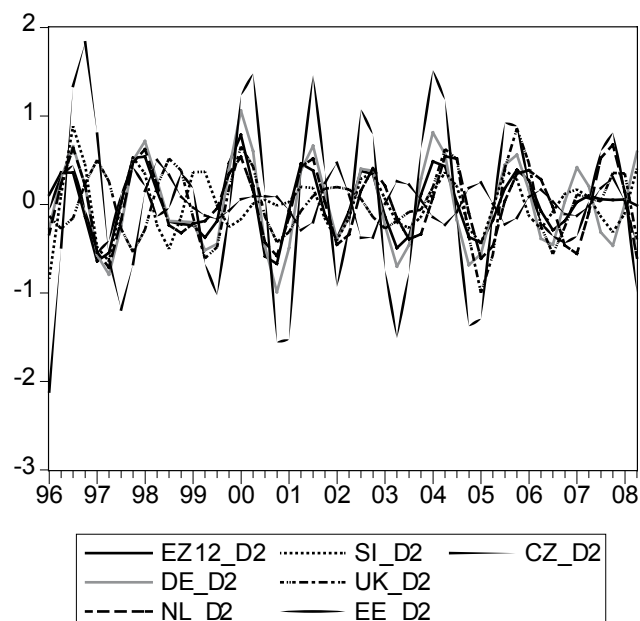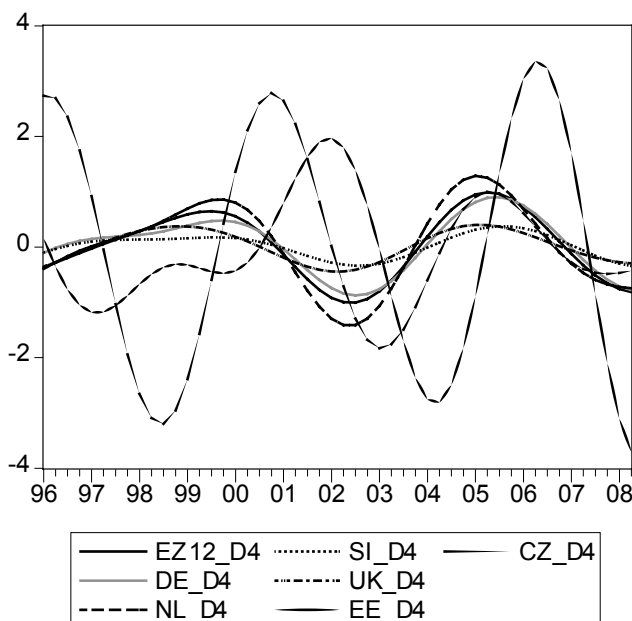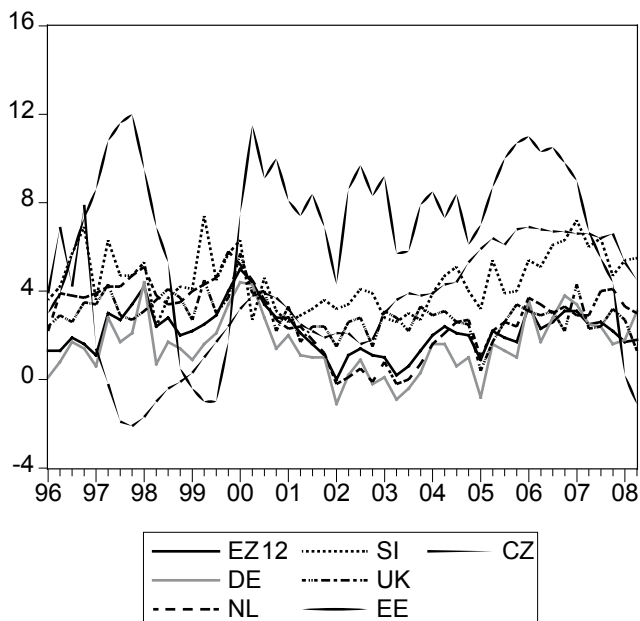
Source: Eurostat, own calculations.

Table 2: *Correlation coefficients of GDP growth between EA and EU members countries*

Euro area 12							
Country	*Correlation*	*L*	d1	D2	d3	d4	d5
EU25	0.9770	d1	0.953752	0.004493	-0.003975	-0.003641	-0.003703
		d2	-0.006145	0.934317	0.009582	-0.016525	-0.013868
		d3	-0.007213	0.018677	0.990372	0.037329	0.042178
		d4	-0.004723	-0.027715	0.042398	0.998219	0.135373
		d5	-0.005428	-0.003962	0.046966	0.240061	0.992227

Euro area 12							
Country	Correlation	L	d1	D2	d3	d4	d5
EU15	0.9814	d1	0.959111	0.004415	-0.003289	-0.003347	-0.003403
		d2	-0.003350	0.945447	0.014130	-0.017631	-0.015363
		d3	-0.006978	0.022870	0.992213	0.039622	0.042446
		d4	-0.004628	-0.027397	0.044016	0.997837	0.130394
		d5	-0.005373	-0.005861	0.047946	0.165739	0.999982
Austria	0.7267	d1	0.221615	-0.013512	0.004412	0.008193	0.005469
		d2	0.008791	0.551204	0.035231	-0.028576	-0.012460
		d3	-0.007923	-0.130513	0.745668	-0.003088	0.038970
		d4	6.98E-05	0.031206	-0.006458	0.602028	0.592158
		d5	-0.003051	-0.032062	0.023135	0.771726	-0.288128
Belgium	0.7511	d1	0.244746	-0.026349	0.003470	0.018998	0.004229
		d2	0.002427	0.463686	-0.001840	0.007603	-0.017793
		d3	-0.011423	0.022295	0.855342	0.068431	0.047890
		d4	0.004843	0.065799	-0.028445	0.237741	0.457648
		d5	-0.002934	-0.030143	0.024163	0.766913	-0.255445
Germany	0.9143	d1	0.916335	-0.008807	0.002924	0.007536	0.001821
		d2	-0.011282	0.845426	0.005632	-0.006739	-0.006604
		d3	-0.011483	-0.017649	0.960187	0.077957	0.065914
		d4	-0.003143	-0.004493	-0.000544	0.822916	0.522826
		d5	-0.001068	-0.005782	0.024373	0.610699	0.433593
Spain	0.7389	d1	0.232214	-0.023824	0.009215	0.015346	0.007185
		d2	-0.022159	0.195177	-0.000497	0.028376	0.019600
		d3	-0.011107	0.083164	0.485736	0.076802	0.056102
		d4	0.006014	0.068939	-0.040926	0.121846	0.486614
		d5	-0.002816	-0.041915	0.042982	0.702226	0.147526
Finland	0.6582	d1	0.404893	-0.007645	0.003548	0.007027	-0.000159
		d2	-0.004789	0.183430	0.020013	0.025999	0.010029
		d3	-0.009720	-0.071808	0.867501	0.007402	-0.036164
		d4	-0.003807	0.046464	-0.082226	0.162488	0.733442
		d5	0.003885	-0.000589	-0.011487	0.468575	-0.210425
France	0.8865	d1	0.788831	0.009152	-0.006027	-0.006696	-0.005213
		d2	0.003949	0.931527	0.012191	-0.028121	-0.020396
		d3	-0.012532	-0.011675	0.806189	0.090417	0.050699
		d4	0.003856	0.045745	-0.051823	0.570423	-0.004155
		d5	-0.004820	-0.034371	0.054166	0.620719	0.672344
Ireland	0.6219	d1	0.034247	-0.003750	-0.005454	-0.002731	-0.000559
		d2	0.011503	0.466659	0.024766	-0.000583	0.000205
		d3	0.006187	0.029541	0.638025	0.003253	0.016160
		d4	-0.044933	0.015634	0.188287	-0.006750	0.516102
		d5	0.043476	-0.002117	-0.091410	0.839392	0.347320
Italy	0.9045	d1	0.797997	-0.001365	-0.001164	0.001281	-0.002544
		d2	0.008453	0.839144	0.027627	-0.035797	-0.014922
		d3	-0.008898	0.065115	0.907917	0.081863	0.057536
		d4	0.001522	0.044549	-0.048528	0.296512	0.720939
		d5	-0.002909	-0.042378	0.045228	0.689488	0.189953
Netherland	0.7762	d1	0.610808	-0.016453	-0.006174	0.009572	-6.17E-05
		d2	-0.003976	0.717838	-0.033273	-0.015649	-0.027906
		d3	-0.008811	-0.023475	0.736669	0.032510	-0.002305
		d4	-0.000787	0.026985	0.017112	0.370969	0.718304
		d5	-0.001327	-0.013659	0.000779	0.793836	-0.128897
Slovenia	0.4383	d1	0.463952	0.040292	-0.023124	-0.031356	-0.017091
		d2	-0.036525	0.273216	-0.038937	0.017112	0.002676
		d3	-0.015467	-0.187438	0.339077	-0.008406	-0.002994
		d4	0.000994	0.044913	0.041432	0.264106	0.666294
		d5	0.000545	-0.007411	-0.006576	0.640032	-0.379520

Euro area 12							
Country	Correlation	L	d1	d2	d3	d4	d5
United Kingdom	0.5582	d1	0.440933	-0.013967	0.004817	0.009926	0.005741
		d2	0.012807	0.246886	-0.008436	-0.007249	-0.004945
		d3	-0.010388	-0.171022	0.764814	-0.040809	-0.013740
		d4	-0.004015	0.037436	-0.065790	0.087530	0.656455
		d5	0.004993	0.006707	-0.025100	0.418329	-0.356038
Sweden	0.7119	d1	0.750696	-0.016912	0.007216	0.012551	0.005373
		d2	0.000834	0.426320	-0.014615	-0.016828	-0.033004
		d3	-0.007498	0.056066	0.652777	0.066009	0.063388
		d4	0.000829	0.044120	0.005872	0.485278	0.397688
		d5	0.002194	-0.003840	-0.010581	0.603667	-0.250228
Denmark	0.5516	d1	0.744414	-0.015639	0.003707	0.011546	0.003823
		d2	-0.016402	0.306012	-0.021566	-0.005414	-0.018197
		d3	-0.014390	-0.273655	0.328073	0.081528	-0.051045
		d4	-0.002282	0.006732	0.052323	0.535333	0.668383
		d5	0.003865	0.018804	-0.043349	0.410551	-0.554542
Czech Republic	-0.2224	d1	-0.183917	-0.003059	-0.000600	0.003314	0.000539
		d2	-0.032550	-0.450248	-0.129607	0.031627	-0.011535
		d3	0.008479	0.041839	-0.356920	-0.005123	0.098226
		d4	0.007126	0.016343	0.027367	-0.043548	0.174019
		d5	0.001969	0.012885	-0.031348	0.318478	-0.686259
Poland	0.4673	d1	0.018754	-0.006183	0.000475	0.004349	0.000865
		d2	0.012605	0.838604	0.058924	-0.040491	-0.009589
		d3	-0.001679	0.099140	0.811693	0.012552	0.086035
		d4	-0.001478	-0.038569	0.041335	0.867092	-0.083008
		d5	0.002920	0.017318	-0.031815	0.429657	-0.499836
Hungary	0.4016	d1	0.086229	0.006322	0.011257	0.000373	0.004616
		d2	-0.003471	0.503662	-0.010206	-0.012392	-0.021968
		d3	-0.007421	-0.028442	0.597110	0.062781	-0.068015
		d4	-0.006103	-0.022644	0.040922	0.584100	-0.202258
		d5	-0.003996	-0.017526	0.041996	-0.274862	0.727780
Slovakia	-0.2317	d1	0.282341	0.000638	0.011722	0.006080	0.006834
		d2	-0.023639	0.048875	-0.009270	0.019093	-0.010061
		d3	-0.009638	0.041192	0.413700	0.071956	0.099270
		d4	-0.006244	-0.011548	0.047270	-0.260726	0.820830
		d5	0.008413	0.031452	-0.059975	0.094142	-0.659212
Estonia	0.2371	d1	0.336771	0.006878	-0.001689	-0.004143	-0.001565
		d2	0.008066	0.838602	0.054474	-0.027623	-0.009407
		d3	-0.005963	-0.002362	0.651685	0.061304	-0.054919
		d4	0.001835	0.041663	-0.036439	-0.466674	0.501049
		d5	0.002269	0.015875	-0.033917	0.352139	-0.629330
Latvia	0.1174	d1	0.515277	0.004087	0.004177	-0.001845	0.000862
		d2	0.001597	0.731896	0.044161	-0.017963	0.000237
		d3	-0.007105	-0.032310	0.472825	0.060387	-0.074309
		d4	-0.005583	0.028042	-0.035941	-0.003753	0.687280
		d5	0.001031	0.013536	-0.024616	0.432807	-0.511381
Lithuania	-0.2773	d1	0.591051	0.004955	-0.003121	-0.005275	-0.002548
		d2	-0.000269	0.150302	-0.000887	0.001715	0.016680
		d3	-0.001932	-0.008769	0.300380	0.022602	-0.078080
		d4	-0.001439	0.015498	-0.057654	-0.777292	-0.131135
		d5	0.004703	0.013651	-0.045760	0.178073	-0.844302
Bulgaria	0.3525	d1	0.322482	-0.016906	0.005630	0.011514	0.005716
		d2	0.013024	0.651294	0.032749	-0.058798	-0.014800
		d3	-0.004951	0.116993	0.280922	0.075319	0.055107
		d4	0.004641	0.057039	-0.019272	0.481563	0.152503
		d5	-0.008909	-0.041416	0.077538	0.297245	0.896321

Euro area 12							
Country	*Correlation*	*L*	d1	d2	d3	d4	d5
Romania	0.0186	d1	0.310376	-0.011776	0.003404	-0.009169	-0.010616
		d2	0.050558	0.533389	-0.154589	0.029973	-0.010387
		d3	0.011205	0.117284	0.545343	-0.054872	-0.009940
		d4	-0.010032	-0.030445	-0.214020	-0.935397	-0.313396
		d5	-0.017401	-0.026685	-0.138098	0.475455	-0.713575

Source: Eurostat, own calculations.

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LEGAL REGULATION OF TAX ADVISORY SERVICES IN RELATION TO THEIR QUALITY

Pravna ureditev davčnega svetovanja v povezavi s kakovostjo izvajanja storitev

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Abstract

This article analyzes the suitability of the legal regulation of tax advisory services in relation to their quality based on our comparative analysis of the (non)regulation of tax advisory services in selected EU states, our analysis of the existing regulatory framework in Slovenia, as well as stakeholders' opinions. We use the results of all three analyses to propose an optimal model of regulation of the profession and the level of regulation, centred on the need to ensure quality services for clients, service providers, the state, and society as a whole. The key finding is that greater regulation would improve the quality of tax advisory services, which is important not only for clients of services, but also the public interest as it increases confidence in tax returns and financial statements prepared by tax advisors, which in turn improves the economy and mitigates operative risks.

Keywords: tax, tax advisory services, regulated professions, quality of services

Povzetek

V prispevku je analizirana primernost pravne ureditve davčnega svetovanja kot dejavnika kakovosti izvajanja storitev davčnega svetovanja in temelji na primerjalni analizi (de)reguliranosti poklica v izbranih državah EU, analizi obstoječe ureditve v Sloveniji ter pridobljenih mnenjih deležnikov davčnosvetovalne dejavnosti. Iz rezultatov vseh treh analiz je izpeljan predlog optimalnega modela ureditve tega poklica in stopnje reguliranosti dejavnosti, v jedru katerega je funkcija kakovosti izvajanja storitev davčnega svetovanja tako za uporabnike in izvajalce storitev kot tudi za državo in družbo kot celoto. Ključna ugotovitev napotuje na trditev, da je z večjo stopnjo regulacije mogoče zagotoviti tudi večjo kakovost izvajanja storitev davčnega svetovanja, kar pa ni pomembno samo za naročnike, ampak dosega tudi dimenzije t. i. javnega interesa, saj povečuje zaupanje v davčne obračune in računovodske izkaze, pri katerih je sodeloval davčni svetovalec, s tem pa se izboljšuje tudi ekonomsko okolje gospodarstva in znižujejo tveganja za poslovanje.

Ključne besede: Davki, davčno svetovanje, regulirani poklici, kakovost storitev

1 Introduction

At the EU level, significant convergence can be noted in the area of tax advisory services and professions involved in such activities, although complete harmonization has not yet occurred. Our comparative analysis shows that some countries encounter more severe conditions in their professional activities than others, indicating an absence of complete liberalization of the profession (Waschkau, 2007). In accordance with its fundamental guidelines, the EU is striving towards deregulating and liberalizing the market of professional services, although at the same time it conveys upon professional services a special status, allowing states

to regulate them based on their traditional, geographical, and demographic characteristics. The state can regulate tax advisory services in various manners, such as by determining the conditions to undertake and carry out the profession, protecting the title without any formal legal regulation of the profession and authorizing private professional organizations to award titles, or regulating who may represent taxable persons.

Tax Advisory as a Legally Regulated Profession

In states where tax advisory services are legally regulated, tax advisory is deemed a public profession. Chambers of tax advisors have special legal authorities and are charged with protecting the interests of members and ensuring that they operate in accordance with the law. They also have powers in disciplinary matters, which distinguishes chambers from private associations. They usually require special training and a test of professional knowledge and are charged with recognizing the professional qualifications of tax advisors from other member states. Usually, membership in chambers is mandatory and linked to obtaining the professional title. Systems making use of chambers legally regulate the rules of the chamber (Klement, 2008).

Tax Advisory as a Legally Unregulated Profession

In many European states, tax advisory services are not legally regulated. This "shortfall" is remedied by private professional organizations that represent the profession. In such states, providing tax advisory services is not exclusively reserved to a certain profession, but can be conducted by anyone, as in certain states that make use of chambers (e.g., Belgium, France, and Italy). Professional associations are responsible for professional training. Membership in the professional organization and the use of its name are not a condition for carrying out the profession, although the quality of the individual tax advisory is reflected in his or her professional organization membership. This ensures that tax advisors are interested in using the name of the professional organization and adhering to its professional rules. Some professional associations—although they do not use a protected title—still have strict rules of member conduct (e.g., in the Netherlands: *Orde van Balastingadviseurs*). Their purpose is to protect and further the standing and independence of the profession as well as represent the interests of members. They provide regular and additional training, give professional advice to members, act in disciplinary affairs, and protect the title. Many associations participate in improvements to tax legislation and propose improvements (Klement, 2008).

2 Short Overview of Theoretical Starting Points

Modern theory of tax advisory services maintains that the tax advisor must primarily strive to resolve the client's tax problems while simultaneously maintaining an active tax policy. It should be emphasized that solely preparing tax returns based on existing facts and in accordance with tax legislation is not enough (Schmitz, 2002); on the contrary—the tax advisor must strive to provide clients with complete data on their tax position, timeframes, and tax liabilities. The client should be continuously informed of the activities undertaken by the tax advisor. In addition, the client must have constant access to all documentation to allow an uninvolved party to perform external supervision of the tax advisor's work.

Despite the fact that the tax advisor is primarily responsible to the client and must work to the client's benefit, the wider public, tax authorities, and directly or indirectly involved stakeholders also benefit from quality tax advisory services. Undoubtedly, the fundamental benefit of tax advisory services is the regulated and supervised collection of taxes, as the quality of tax returns would be lower without professional and reliable tax advisory services. Therefore, quality tax advisory services require a professional approach to work, while tax advisors must be knowledgeable, independent, and neutral while operating in the public benefit.

If tax advisors are to operate in the public benefit, they must not focus solely on their own profit; rather, they must consider the goals of the client, the professional organization, and society, which implies the need to maintain high ethical conduct and a sense of responsibility. In theory, tax advisors protect the law; therefore, they can have an important social, not only profitable, goal. The tax advisor serves and is responsible to the wider society (Pasch, 1997). From the legal perspective, several characteristics give tax advisory the appearance of a profession in the public interest (Mann, 2004): specialized, highly professional training; advisory-emphasized personal component of tax advisory services; self-responsibility and professional independence; importance of the confidential relationship between the advisor and the client; and the public's perception of the profession as trustworthy.

Quality of Tax Advisory Services

The term *quality* is understood as the optimal satisfaction of the client's needs through faultless services, in accordance with legal and professional regulations. The tax advisor must satisfy the client's professional and subjective quality requirements. The tax advisor views quality through the prism of statutory and professional requirements and evaluates quality based on his or her professionalism and understanding of the service performed.

Fundamentally, we can differentiate between quality requirements of the service provider and the client. The service provider defines quality from the point of view of the quality standards of the tax advisory firm whereas the client views quality through the prism of benefits received. The tax advisor defines quality as a service, performed beyond reproach and in accordance with professional rules, aimed at satisfying the client's tax liabilities. However, the literature emphasizes that how quality is viewed by the client is most important. If the client's expectations and understanding of quality are balanced, it is difficult to shift the

perception of quality to generally applicable requirements and measures. The subjective perception of quality highlights the level of satisfaction of the client's needs and the client's own perception of quality (Fischer, 2004).

Pestke (2000) categorized the quality of tax advisory services according to three criteria depending on the quality type, level, and instrument. He distinguished among the following types of quality:

– Structural quality, the level of which is determined by professional rules (namely the obligation to undertake basic and continuous training, professional requirements, professional liability, and the supervision of tax advisors);

– Procedural quality, which requires the client's heavy involvement in discerning the actual facts of the case at hand. Procedural quality has the following prerequisites: acting in accordance with applicable legislation, being familiar with and using jurisprudence, employing a planned process of verifying the actual facts, and demonstrating reliability in managing and archiving documentation;

– Objective quality, which encompasses not only the quality goals as defined by professional rules (structural quality) or the tax advisory firm (procedural quality), but also the quality and service itself. Objective quality relates to the service's professional correctness, timeliness, and provision in the anticipated form;

– Subjective quality, which is critical as the client is not familiar with the professional value of the service rendered and thus applies other quality measures. Factors of subjective quality include a positive attitude to the client, informing the client in a timely fashion and in a comprehensible form, explaining the effects of business decisions on tax matters, and working in a simulative environment;

– Innovative quality, the purpose of which is to improve the attained level of quality of services as well as optimize and continuously improve business processes; and

– Applicable quality, the highest level of which is reached when the quality is verified and confirmed by an independent external evaluator or when the advisor obtains a quality certificate.

In terms of the level of quality, we can differentiate among:

– Minimum quality standards, where the minimum quality standard is achieved when tax regulations and rules of the profession are adhered to;

– Security quality standards, which assume that—in tax advisory—it does not suffice to consider only legislation and professional guidelines, as services must be provided in a constant, predetermined manner;

– "Client utility" standards, which presuppose that lawful and well-planned services cannot be of a high quality unless they have a useful value for the client.

– Client comfort standards, which imply that the tax advisor must provide individualized and non-standard services to the client;

– Combined quality standards, from which it follows that, when the tax advisory firm provides professionally correct, tailor-made services, it reaches a higher level of quality; and

– Top quality standards, at which level the tax advisory firm engages external independent assessors and/or evaluators to evaluate the quality level attained and strives towards top quality standards (best practices).

Finally, in terms of the quality instrument, we differentiate among:

– Professional rules of conduct, which are the basis of professional and lawful tax advisory services. They concern "objectively determinable quality" and encompass conditions for conducting the profession—namely, independence, responsibility, secrecy, proficiency, and professional liability insurance. Professional guidelines do not provide the advisor with instruments to ensure higher quality, process optimization, innovative services, or tailor-made services for important clients. However, they do provide a baseline quality level.

– Risk management, which is a preventative instrument aimed at protecting the tax advisor from risks. Risk management does not directly improve quality and does not enable certification or external evaluation of quality, but it does continuously analyse risks and allow a risk prevention strategy to be designed.

– Quality management, which encompasses management's activities in relation to establishing a quality system, such as the quality policy, quality goals, allocation of responsibilities, and asset-based system implementation, including quality planning, managing, and assurance. Quality management is defined by the organizational structure, responsibilities, processes, procedures, and means used to ensure quality.

– Quality assurance, which encompasses planned and systematic activities within the system that are widely supported by management, staff, clients, and the wider public.

– Overall quality management, which is a management method encompassing all stakeholders. It is focused on quality, which is measured through client satisfaction and the consequent long-term success of the firm and employee satisfaction.

Risk Management as a Function of the Activity's Quality

In tax advisory services, risk management can be understood as a combination of measures aimed at mitigating or reducing risks; it is a consistent part of the quality system, which reduces the number of claims and loss events and improves the quality of services provided. Its purpose is to detect, manage, and incorporate existing and potential risks. Risk management is part of the business strategy and is reflected in the pricing strategy, client management strategy, and services. Risks to which tax advisors are exposed can be categorized into two groups: risks originating from clients and those originating from the tax advisor. The risks originating from the advisor can be further divided into business risks due to operating in the market and professional risks arising from the special characteristics of the profession. The most significant business risk is the risk of providing incorrect advice. The specific characteristics of ever-changing tax legislation, as well as the differing interpretations of it, often generate doubt in taxable persons as well as in tax advisors. Therefore, the risk of various professional mistakes is quite high. Due to their unfamiliarity of tax legislation and its differing interpretations, clients often believe that their tax advisors are to blame for mistakes. Tax advisors can avoid these risks only by recognizing them and introducing appropriate measures.

3 Analysis of Tax Advisory Services in the Republic of Slovenia

In Slovenia, although the profession began developing soon after our national independence in both the Slovenian Audit Institute and the Chamber of Tax Advisors, it has not yet become an organized progression as both organizations have only 167 licensed advisors. Compared to the number of advisors in Germany (more than 88,000 tax advisors), we can conclude that Slovenia has too few licensed tax professionals. In Slovenia, in addition to licensed tax advisors, tax advisory services are provided by accounting service providers, stock brokers, bank clerks, attorneys at law, and notaries public. In these groups, tax advisory services mainly occur as a result of their everyday work; thus, such services cannot be deemed as planned advisory services. This unplanned development has resulted in tax advisors having varying degrees of knowledge offering services of a varying quality. As the initial costs of entering the profession are low, some persons without appropriate education, experience, and professional liability insurance provide tax advisory services in Slovenia. As a result, we decided to ask service providers and clients about the services. Our study included:

– Small, medium-sized, and large companies, where the questions related to how they perceived tax risks, whether they make use of tax advisory services, who provides such services, which factors were most important when choosing their tax advisor, what are the main factors of quality tax advisory services and

how they perceive such quality, which measures would improve the quality of tax advisory services, and which regulative mechanisms should be used to limit entry into the market.

Table 1: *Respondent users of tax consulting services – depending on their size*

Firm size	Number of questionnaires sent	Number of questionnaires received	Response ratio (in per cent)
Small	830	181	21.8
Medium	463	147	31.7
Large	207	120	58.0
No response in terms of size	-	12	2.6
Total	1500	460	30.6

– Tax advisory service providers, where we surveyed independent tax advisors, audit companies and accounting service providers, and in-house tax advisors. The questions related to their opinion of the status and development of services in Slovenia, their perception of quality, the impact of quality on obtaining new clients, their perception of risks, and their awareness of their responsibility to clients, the public, and legislators.

Table 2: *Respondent tax consultants*

Tax advisory service providers	Number of questionnaires sent	Number of questionnaires received	Response ratio (in per cent)
Chartered tax advisor	99	50	50.5
Tax advisor	66	19	28.8
Accounting service provider	1100	134	12.2
Certified auditor	200	54	27.0
Total	1465	257	17.5

In order to identify the optimal model of legal regulation of tax advisory services in Slovenia, we studied and interviewed relevant stakeholders. We wanted to find the optimal combination (relationship) among quality tax advisory services, social responsibility, and associated risk management as well as among the various legal frameworks or models of regulating tax advisory services.

We synthesized and identified the four possible models of regulating tax advisory services. In the first model, the Tax Advisory Act determines the conditions for obtaining the title of tax advisor as well as the rules of conduct; persons without the title may not provide tax advisory services. In the second model, the Tax Advisory Act gives one or several professional organisations the concession for performing training for the tax advisor title, conferring the

title, and supervising tax advisors. The act protects the title of tax advisor. This model allows tax advisory services to be carried out by unlicensed persons, although they must not use the title of tax advisory or tax practitioner. In the third model, the Ministry of Finance, together with one or more professional organizations, awards the title of tax advisor based on the Tax Advisory Act and supervises tax advisors while awarding concessions for tax advisor training to other organizations. This model allows tax advisory services to be carried out by unlicensed persons, although they must not use the title of tax advisor or tax practitioner. In the fourth model, tax advisory services remain unregulated.

The results of our study of the quality and regulation of tax advisory services are summarized in the following points, including participant responses. Based on these results, in the conclusion we suggest the optimal model of regulating tax advisory services.

In terms of the perception of the quality of tax advisory service clients, several results were found. First, tax advisory clients mainly choose their tax advisor based on the recommendations of other users (53%) or as a result of their presence at the tax advisor's lectures and the advisor's professional recognition (22%). The results indicate that a significantly greater proportion of small enterprises than medium-sized or large enterprises randomly select their tax advisor (large companies in the fewest cases). In contrast, as the company size grows, so does to a statistically significant degree the proportion of responses that the selection was a result of attending the tax advisor's lectures: 12.7% of small, 19.7% of mid-sized, and as much as 32.5% of large enterprises gave such a response (the difference is statistically significant).

The most important competitive factor when selecting a tax advisor is professionalism, followed by trust in the tax advisory services provider, a personal relationship with the tax advisor, and the tax advisor's public image. The quality of services rendered is a significantly more important factor when choosing a tax advisor for clients (88%) than the price of services (5%). Our statistical test revealed no statistically significant differences between different sized respondents in terms of factors influencing their choice of tax advisor. When assessing quality, clients find the following factors most important: acting in accordance with tax legislation, jurisprudence, and professional guidelines (79.6%); having practical experience as a tax advisor (52.4%); providing the timely delivery of services and costs (45.2%); and responding to and understanding the client and his or her needs (44.3%).

Several statistically significant differences were noted with respect to the main factors of quality tax advisory services per company size, including the advisor's practical experience as well as response to and understanding of the client's needs and expectations. As the company size increases, the practical experience of the tax advisor is more often cited as an important factor of quality. In large companies, the share is 63%, while it is only 48.6% in small

companies. Similarly, large companies to a greater degree appreciate the tax advisor's quick response as well as the advisor's understanding of the client's needs and expectations (57.5%), compared to only 41.4% of small companies. Finally, outcome quality[1] (mean value of 1.3) is most often cited as the most important quality factor (on a scale from 1 to 4), followed by procedural quality (2.27), client quality (2.64), and service provider quality (3.19). No statistically significant differences per company size were noted.

In terms of tax advisory service providers, several findings are worth noting. Tax advisory service providers recognize the tax advisor's professionalism[2] as the most important competitive factor (mean value 3.04), followed by the quality of the tax advisory services (3.66), response to client's requests (4.16), personal relationship with the client (4.42), client confidentiality (4.73), links to accounting services (4.95), and cost (5.18). The proximity of the tax advisory firm and the number of tax advisors are viewed as unimportant. Our analysis of the differences shows that the responses of all tax advisory service providers are quite homogenous when it comes to the three most important competitive factors.

When assessing the factors of quality tax advisory services, tax advisory service providers identified several factors as being important, including acting in accordance with tax legislation (81.3%), demonstrating the practical experience of tax advisors (59.1%), responding to and understanding the client's needs and expectations (49.8%), showcasing the personal traits of tax advisors (45.5%), and delivering services in a timely manner in the anticipated form and meeting the cost-benefit ratio (44.7%). An individualized approach to the client and the status of the tax advisor are viewed as the least important factors. Statistically significant differences among service providers emerged only in terms of their individual approach to clients. The test conducted of service providers and clients showed significant differences in individual approach to the client, status of the tax advisor (chartered or not), and personality traits of tax advisors. Tax advisory service providers attribute statistically significantly more value to individual treatment of the

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[1]   *Outcome quality* refers to the substantive correctness of the service, approval of the service by the tax authorities and judicial bodies, managed documentation, correctness of tax returns, explanations of tax legislation to the client, and management of disputes and client complaints. *Procedural quality* refers to the formal process of service delivery, length and duration of service delivery, response rate of the firm, atmosphere in the office, relations among staff members, overall attitude of members of staff towards the client, and handling of the client's documentation. *Client quality* refers to preparedness to cooperate with the advisory and be included in the service delivery process as well as communicating with the tax advisor. *Service provider quality* refers to the location of the tax advisory firm, interior design and appearance of the office, equipment of the office, number and professional level of employees, opening times, external recognisability of the office, recommendations of satisfied clients, charisma, and recognition of members of staff.

[2]   1 denotes the minimum mark while the maximum is 10.

client than the clients themselves. At the same time, service providers attribute more importance to the status of the tax advisor and his or her personal traits than clients.

Outcome quality is most often cited as the most important quality factor and has the lowest mean value of 1.51 (on a scale of 1 to 4); the mean value of procedural quality is 2.5 while the mean value of client quality is 2.8. When classifying quality factors per importance, service providers are in accord, as they classified outcome quality (top classification) as the most important (between 70% and 74% of cases). The mean values of service provider quality are notably lower in the case of tax advisors. We noted no statistically significant differences in the classification of the factors that all groups of tax advisory services classify as most and second most important (outcome and procedural quality). Tax advisory service providers more often than their clients cite quality of the service provider. To a statistically significant degree, clients classify other aspects of quality (such as client quality, procedural quality and outcome quality) higher than service providers.

The findings related to tax advisory service clients and their perception of risk highlighted several important concepts. Regardless of company size, clients use tax advisory services to reduce the risk of non-compliance with legislation (61%), criminal risk (54.3%), professional risk (40.0%), business risk (36.9%), and inspection risk (32.4%). In this regard, no statistically significant differ-

ences were noted among companies of different sizes. In addition, regardless of company size, tax advisory service clients affirm that professional liability insurance is an important factor when selecting advisor (86%), while only 8% responded that insurance is not important. No statistically significant differences were noted. Furthermore, and again regardless of their size, tax advisory service clients confirmed that they would file a claim against the insurance policy if the advisor made a professional error (73.5%).

In terms of perception of risk, the findings can be summarized as follows. For tax advisory service providers, the most important risk is the risk of non-familiarity with tax legislation and jurisprudence (43.6%), followed by the inspection risk (38.5%), risk of professional error (35.0%), price non-competitiveness (33.1%), and non-management of operational risks (32.3%). The loss of the public's and clients' trust, competitiveness due to low service quality, and frequent complaints of unhappy clients are viewed as less important risks. Several statistically significant differences appeared among tax advisory service providers— namely, professional errors, non-managed operative risks, frequent complaints of unhappy clients, and the loss of the public's and clients' trust.

Tax advisors recognized the following most important business risks of the tax advisory firm: reduction in service fees (49.8%), loss of key clients (46.3%), unprofessionalism of members of staff (42.0%), too few clients (38.9%),

Figure 1: *Factors of quality tax advisory services*
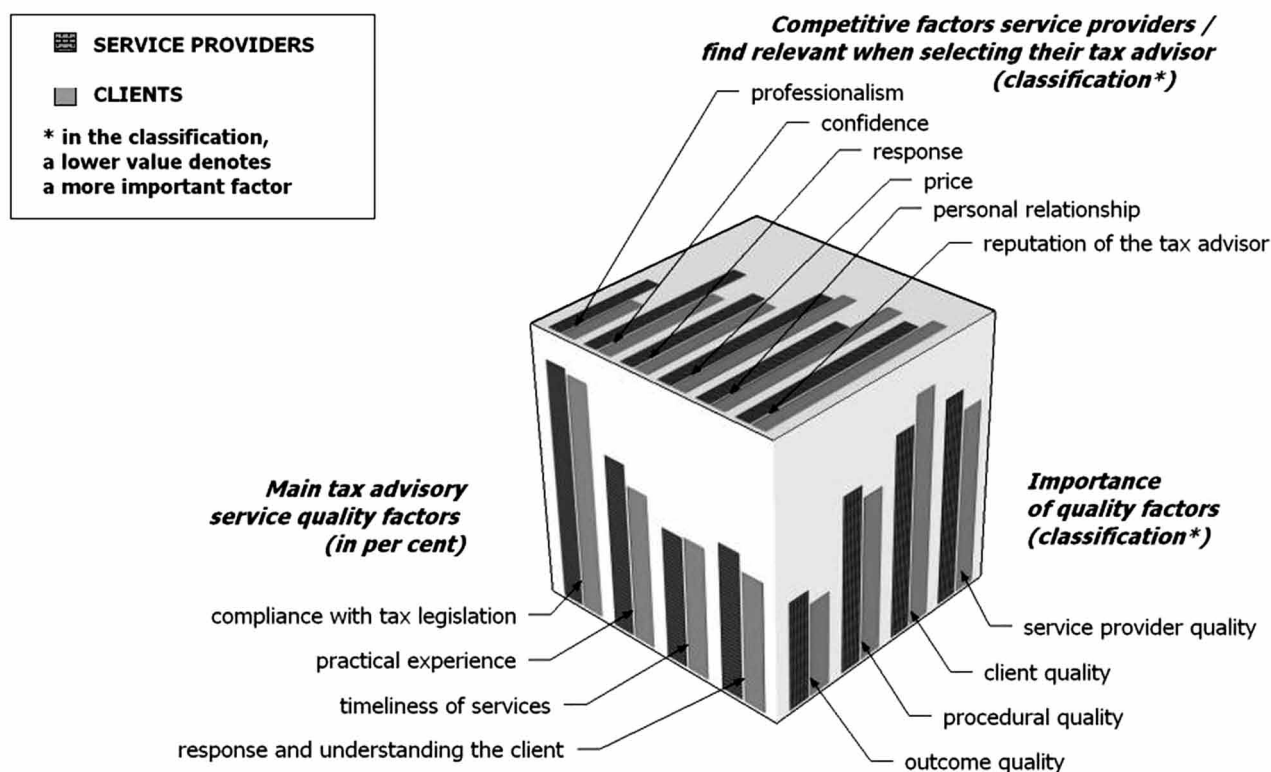
loss of key staff members (31.5%), and claims due to errors (24.5%). They recognized financial risks, the entry of new competitors into the market, the lack of employee motivation, extremely high employee expectations, inadequate IT support, and costs of replacing lost clients as the least important business risks. Several statistically significant differences were noted among different groups of tax advisors concerning operational risks, including the reduction of fees, which is most often cited as a business risk by chartered auditors (approximately 60%) and about half of tax advisors and accounting service providers, but only 30% of chartered tax advisors. The loss of key members of staff was cited as a risk by 40% of chartered tax advisors, tax advisors, and chartered auditors but by only around 20% of accounting service providers. All four groups view the entry of new competitors into the market as a lesser risk, although statistically significant differences emerged among the groups: accounting service providers (27%), chartered auditors (24%), chartered tax advisors (12%) and tax advisors (5%). Meanwhile, 32% of accounting service providers cited financial risks among key business risks, while the share in the other groups was around 13%.

Several risk mitigation instruments are vital for tax advisors, including cooperating with other tax advisors, auditors, accountants, surveyors, attorneys, and professional organisations (72.4%); planning tax advisor training (59.5%); rejecting risky clients (56.4%); maintaining professional liability insurance (46.7%); and rejecting problematic clients (45.5%). Using internal controls, planning resources, and acquiring a quality certificate are less important risk mitigation instruments. Statistically significant differences were noted among different groups of tax advisors concerning operational risks in terms of rejecting problematic clients and maintaining professional liability insurance.

Legal Regulation of Tax Advisory Services

This section summarizes the findings of providers of tax advisory services regarding the suitability of the legal regulation of tax advisory. Tax advisory service clients recognized legal regulations as the most important measure for improving quality (59%), followed by internal supervision (33%) and a quality certificate (15%). Statistically significant differences between service clients were also noted in terms of legal regulation of tax advisory services and internal control in the tax advisory firm. Larger firms more often viewed the legal regulation of tax advisory services as the most effective route to improving their quality. To a statistically significant degree, smaller firms more often than mid-sized and large firms view that quality could be improved with internal controls in the firm.

Figure 2: *Risk factors related to tax advisory services*
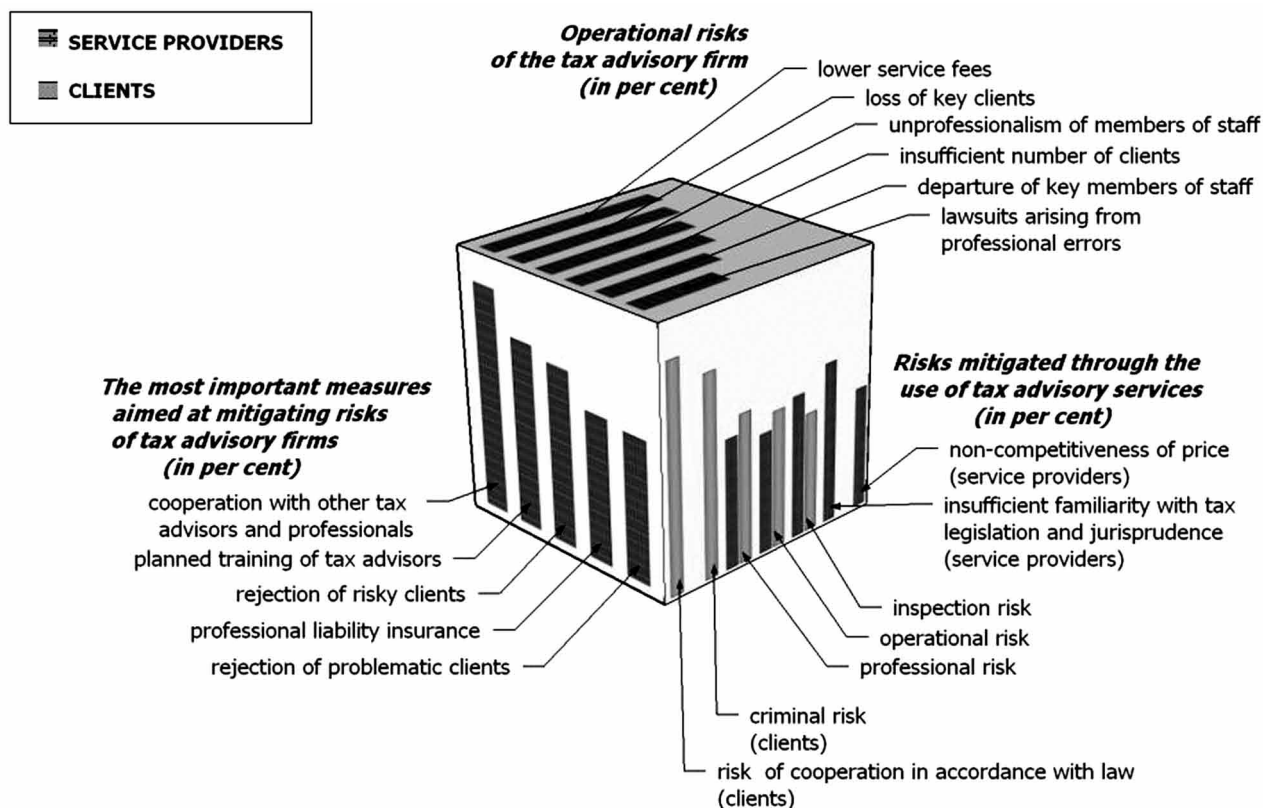
Regardless of their size, tax advisory service providers recognized all three models of legal regulation as suitable (model 1 38%, model 2 30%, model 3 26%), while they rejected the fourth model (6%), under which tax advisory services would remain unregulated. In terms of the suitability of legal regulation of tax advisory services in Slovenia, we found no statistically significant differences per company size.

Service clients cited several regulative mechanisms barring market entry as important, including practical experience (75%), certificate (71%), and formal education (47%), whereas recommended prices and price fixing were viewed as unimportant. Our statistical test of service providers and clients showed significant differences in practical experience, professional exam (certificate), and recommended prices in terms of barring market entry. Users of tax advisory services—more often than service providers—believe that practical experience and recommended prices should be introduced as regulative mechanisms barring market entry. In contrast, service providers more often cited the professional exam (certificate) than service users. No statistically significant differences in the responses concerning other offered regulative mechanisms appeared.

In terms of the suitability of the legal regulation of tax advisory, several important findings emerged. Providers of tax advisory services viewed legal regulation of the profession as the most important measure for improving service quality (76%), followed by internal control (28%) and acquiring a quality certificate (17%). Differences in service providers' responses appear only with regard to acquiring a quality certificate. In addition, to a significant degree, service providers (more often than their clients) view legal regulation as the most effective route to improving the quality of services. On the other hand, to a statistically significant degree, clients view that additional measures are not needed.

Tax advisory service providers recognized all three models of legal regulation as suitable (model 1 40%, model 2 29%, model 3 27%), but they rejected the fourth model (11%). No statistically significant differences were noted in the views of various groups of service providers in terms of model suitability, although service providers supported the second model more often than their clients as well as leaving tax advisory unregulated to a statistically significant degree. In terms of the other two proposals, no statistically significant differences occurred between service providers and their clients.

For service providers, legal regulation mostly affects their handling of tax law (66%), followed by the reliability and correctness of advice (65%), status of the tax advisor (50%), compliance with guidelines, and practical experience of advisors (48%). The legal regulation to a lesser degree affects the practical experience of tax advisors, their specific industry know-how, the cost-benefit ratio, personal traits of tax advisors, their response to and understanding

of their clients, their individual approach to clients, and the timely provision of services.

Accounting service providers' responses significantly differ from the responses of the other groups. Most chartered auditors (70%) view that the legal regulation of the field would most positively contribute to professional guidelines, which is slightly higher than the share of chartered tax advisors (64%), tax advisors (58%), and accounting providers (32%). Approximately 60% of chartered tax advisors, tax advisors, and chartered auditors agree that the legal regulation of tax advisory services would affect the tax advisor's status, while only 40% of accounting service providers agree. Accounting service providers are to a greater degree of the view that legal regulation of the field would affect the practical experience of tax advisors (42%). This view is shared with only a quarter of chartered tax advisors and tax advisors and only 17% of chartered auditors. Similar findings apply to industry-specific know-how.

Service providers believe that the tax advisor should have at least a university degree and five years of experience; they believe that several regulative mechanisms barring entry into the market are desirable, including a professional exam (82.5%), practical experience (66.1%), and formal education (51.7%). Price fixing and recommended prices are viewed as unimportant regulative mechanisms. Significant differences were noted when comparing the responses of different groups of service providers. The response "practical experience" was most often given by accounting service providers (75%), followed by chartered tax advisors (62%), tax advisors (58%) and chartered auditors (only 50%). In contrast, 100% of chartered tax advisors, 95% of tax advisors, 93% of chartered auditors, and only 70% of accounting service providers believe a professional exam should be introduced as a regulative mechanism barring market entry. Our statistical test of service providers and clients shows statistically significant differences in terms of practical experience, professional exam (certificate), and recommended prices.

Clients more often than service providers believe that practical experience and recommended prices should be introduced as regulative mechanisms barring market entry. In contrast, service providers more often cite the professional exam (certificate) than service users. No statistically significant differences appear in the responses concerning other regulative mechanisms. Service providers believe in the significance of professional organizations primarily because they organize round tables, seminars, and lectures (78%); provide professional help to tax advisors (74%); cooperate in establishing the tax system (69%); conduct training for obtaining the title of tax advisor (62%); cooperate with other related institutions (54%); strive to improve the tax advisor's reputation (54%); perform oversight over tax advisors (53%); and strive to provide additional training (46%).

Figure 3: *Suitability of the legal regulation of tax advisory services*
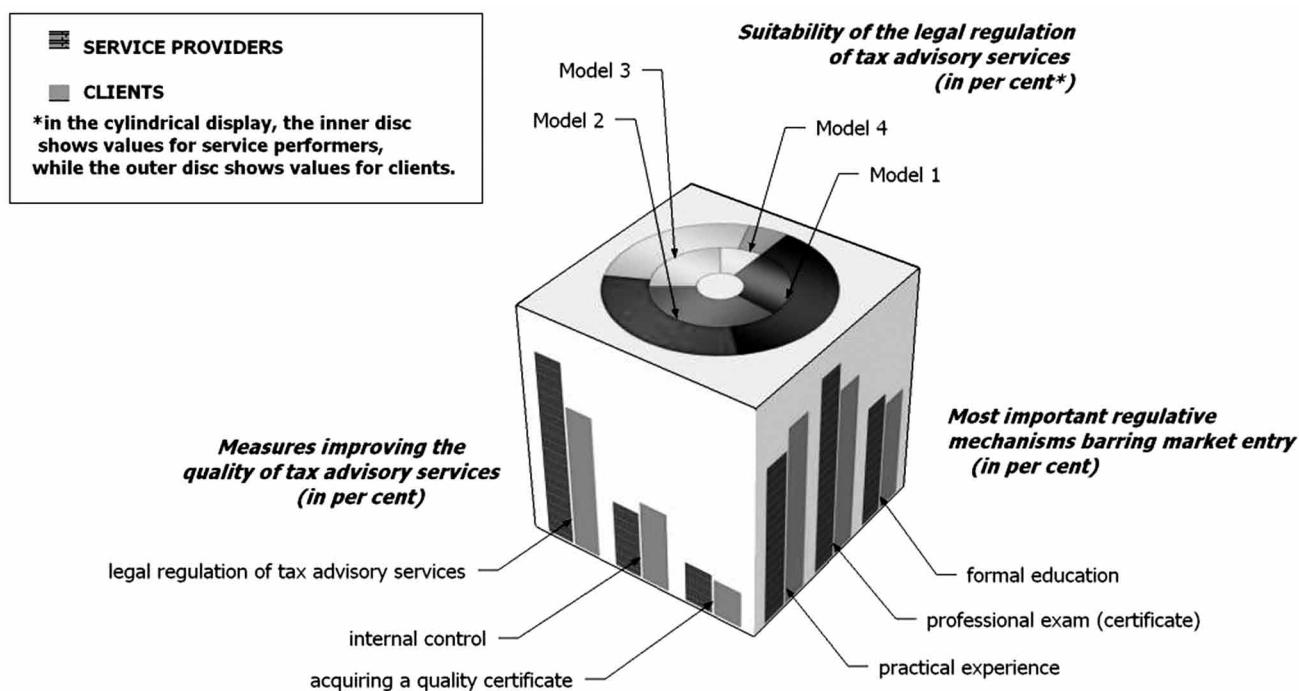

4 Conclusion

Based on our findings, we prepared a model of the legal regulation of tax advisory services. The proposed legal regulation is in accordance with EU law and allows tax advisory services to be carried out by unlicensed persons, although they must not use the title of tax advisor or tax practitioner. By legally regulating tax advisory services, the responsibilities of tax advisors and tax practitioners become broader and include their civil liability towards their clients and third persons with whom they have no contractual relationship, professional liability of experts and providers of professional services, as well as criminal liability, due to the fact that both tax advisors and tax practitioners can be accessories to tax fraud when they act unlawfully for the benefit of their client. Despite the fact that both tax advisors and tax practitioners work for the benefit of their client, they also represent the public interest as they respect and enforce trust in tax regulations and ensure their effective implementation. As a result, tax advisory services serve as protectors of tax law. According to a study conducted by Kolar (2008), 47% of accountants have senior or high school education; the study found no statistically significant correlation between the skills of accountants obtained through education and the success of their companies. In our study, accounting service providers are the most important tax advisors as they have a 65% share of the market of small companies and a 20% share of the market of medium-sized companies, which reinforces our belief that tax practitioners should be regulated in order to ensure high-quality tax advisory services for small companies and advisors with

less formal education. Figure 4 shows the proposed legal regulation of tax advisory services as we propose according to our main research findings.

The state should legally regulate the activity by:

– Giving concessions to professional tax advisory organisations;

– Protecting the professional title of tax advisor and tax practitioner;

– Requiring professional organizations to adopt professional and ethical rules, thereby ensuring the secure and diligent operation of tax advisors;

– Defining the conditions for performing tax advisory services;

– Requiring professional liability insurance;

– Ensuring public records of tax advisors and tax practitioners;

– Defining the minimum level of education of tax advisors and practitioners and determining the conditions for obtaining licences and educational institutions able to award the titles;

– Together with professional organisations, naming a committee charged with awarding the tax advisor and tax practitioner titles;

– Together with professional organisations, providing professional assistance to tax advisors and practitioners to prevent them from giving incorrect tax advice. This rep-

Figure 4: *Proposed legal regulation of tax advisory – Model 2*
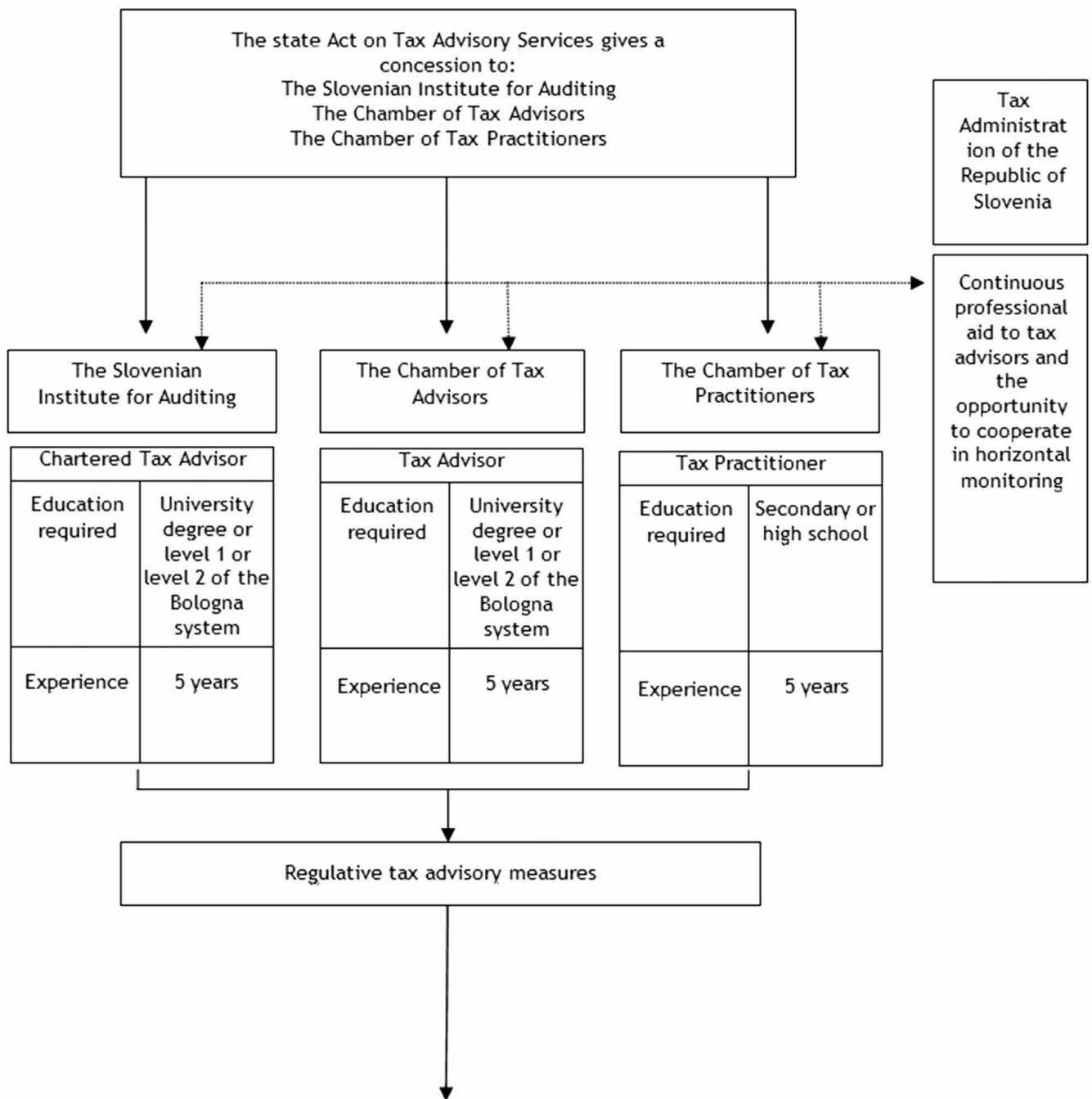
resents strengthening responsibility for high-quality tax advisory services;

– Requiring professional organizations to establish a quality management system for tax advisory services, which should be independent and subject to public scrutiny, financed securely and without undue influence of tax advisors, have appropriate human and financial resources, ensure that tax advice is provided by people with an appropriate professional education and appro-

priate experience and training, ensure an objective procedure for selecting supervisors to prevent conflicts of interest between supervisors and supervised persons, and after supervision, clearly note any findings in the report and ensure annual publication of results relating to tax advisory; and

– Requiring professional organisations to appoint committees to carry out inquiries and handle disciplinary measures and sanctions.

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3

A STUDY OF KEY FACTORS
FOR ENERGY POLICY MODELLING

Študij ključnih dejavnikov za modeliranje razvoja energetske politike

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Abstract

Environmental problems and high fossil fuel import dependency are core energy problems facing the EU, which has therefore committed itself to increasing its share of renewable energy sources (RES) to 20% by 2020. The implementation of planned measures is usually the most challenging issue in such a situation; therefore, energy models addressing this issue were studied. Because their specificity means that their usability is limited, we developed a more general model focused on the implementation of the planned measures for the development of a more sustainable energy policy with a higher share of RES. The key factors for modelling this transition were identified and examined, and a comparative analysis of Slovenian, EU, and global energy statistics and analyzed energy mix were carried out. In addition, RES potentials were evaluated, future energy demand was forecast, and compatibility of RES potentials and future energy demand was tested. Based on the results, two energy modelling approaches were developed.

Keywords: energy, renewable energy sources, energy policy modelling, Slovenia, renewable potentials

Izvleček

Okoljski problemi in visoka uvozna odvisnost od fosilnih goriv so ključni problemi energetike Evropske unije (EU), zato se je EU med drugim zavezala k povečanju deleža energije iz obnovljivih virov (OVE) na 20 % do leta 2020. Pri tem je posebej problematično izvajanje ukrepov za doseganje teh ciljev, zato smo proučili energetske modele, ki vključujejo tudi delež obnovljivih virov. Energetski modeli so zaradi specifičnosti le omejeno uporabni, zato smo razvili splošnejši model, osredotočen tudi na izvajanje ukrepov za doseganje ciljev energetske politike. Za razvoj trajnostne energetike, z višjim deležem OVE, smo identificirali ključne dejavnike za modeliranje prehoda v trajnostno energetiko. Izvedli smo primerjalno analizo energetske statistike Slovenije, EU in sveta, proučili mešanico energetskih virov, ocenili potenciale OVE in prihodnje povpraševanje po energiji v Sloveniji ter ocenili njuno skladnost. Na tej osnovi smo razvili dva pristopa k modeliranju energetike.

Ključne besede: energija, obnovljivi viri energije, modeliranje razvoja energetske politike, Slovenija, potenciali obnovljivih virov energije

NG

1 Introduction

The 20th century has seen a 20-fold increase in energy consumption (IEA, 2010) and this trend is expected to continue (Combanous & Bonnet, 2008). The International Energy Agency (IEA) noted that, by 2030, the predicted increase in energy demand will simultaneously result in higher energy prices and greenhouse gas (GHG) emissions. Energy-related GHG emissions already account for 80% of all GHG emissions. Therefore, the IEA is drawing attention to the en-

vironmental problems caused by fossil fuels and proposing an international agreement to cut GHG emissions. Due to pollution, rising energy demands, and the high import dependency of energy, renewable energy sources (RES) are seen as a long-term solution to these problems. The EU is aware of these problems and supports the development of more sustainable energy comprising two key components: energy efficiency (EE) and RES (Afgan, 2008; Lund, 2010; Obrecht, Denac, Furjan, & Delčnjak, 2011). The use of local RES is of vital importance since RES cause less pollution, enable the use of local resources, lower import dependency, and increase EU competitiveness at the same time.

In 2001, the EU set the first (ambitious) goal of reaching a 12% share of RES by 2010; however, this aim was not reached. The second goal set was included in the energy climate package, known as the 20/20/20 objectives, requiring 20% of RES, 20% lower GHG emissions, and 20 % higher EE in the EU by 2020. The specific RES share target for Slovenia is 25%. Achieving this objective is also encouraged by the renewable energy Directive on the Promotion of the Use of Energy from Renewable Sources (EP, 2009), which requires member states to submit and implement a National Renewable Energy Action Plan (NREAP). Each plan must provide a detailed roadmap of how each member state expects to reach its legally binding target. The EU member states were obliged to define sectoral targets, the technology mix they intend to use, and the measures and reforms they will undertake (NREAP, 2010). The express purpose of these plans is to force the EU member states to commit fully to the 20/20/20 goals.

The energy industry and energy policy development have also affected the energy model development. The development of energy models flourished during the first oil crisis in 1973 (Lund, 2010). After studying more than 200 models for energy sector development and policy, models were divided into groups according to their similarities. Jebaraja and Iniyan (2006) proposed classification into six groups: energy planning models, energy supply-demand models, forecasting models, optimization models, emission reduction models, and neural networks models. Despite the relevance of sustainable development issues, the literature review did not identify many models with sustainable characteristics or any separate group of sustainable energy development models. Undoubtedly, new energy models must be developed in order to encourage sustainable energy policy development (Afgan, 2008). Furthermore, no model has been found to specifically address the problem of the implementation of planned energy policies.

The implementation of the planned measures is crucial; therefore, existing models are first identified in this paper. The core factors in energy policy planning are determined and examined based on a comparative analysis of the models studied and then integrated into two newly developed energy policy models. Our thesis is that the consideration of the analyzed factors and the development of future energy policy with an appropriate modelling approach will result in more efficient and sustainable future energy development.

2 Methodology

The key factors in energy policy development are identified and examined in order to determine the possibilities for energy policy modelling. The data for the study of the factors and for modelling were gathered from various independent sources, including specialized databases, statistical offices, national, international and private studies and analysis, scientific papers, and national energy balances. Data on energy consumption, national energy mix, RES share, RES potentials (total, technical and economic), and all other statistical data were analyzed, compared, complemented, and upgraded with data from specialized databases. The upgrading of the data with specialized databases and our own calculations (described below) was crucial for the comprehensive study of energy modelling factors and for developing new approaches to energy modelling.

First, the energy balance and the consumption structure of energy sources in Slovenia, the EU, and the world between 2000 and 2010 are analyzed and compared. Energy production and the share and growth of RES in Slovenia are compared with the average global and EU values (situation analysis). Our aim is to identify and combine the data, since individual data from different sources cannot be compared as they were obtained using varying methodologies. Using the combined data, similarities and differences in energy statistics among Slovenia, the EU, and the rest of the world are examined and compared. Second, Slovenia's energy mix is analyzed, placing special emphasis on an examination of the changes that occurred between 2005 and 2010. Third, Slovenian RES potentials were examined and evaluated. A large number of existing studies, evaluations and documents are examined and critically evaluated. Where the deviations in RES potential between individual studies are significant, the data are additionally upgraded and compared with our own calculations of RES potentials (i.e., the natural and physical characteristics of Slovenia, theoretical energy conversions). The estimation of solar potential is calculated based on the average annual solar radiation and total surface of Slovenia since wood biomass potential is calculated according to the annual increase of natural forests and annual forest cut-down rates and supported with the average heat of wood combustion. The survey and analysis of Slovenian RES potentials is carried out on the basis of currently established economical, technological and environmental acceptability.

Various forecasts of future energy use are then analyzed and the main findings synthesized into the modified forecast on the Slovenian energy future. This provides the basis for the compliance testing of RES potentials and the forecast of future energy demand. Using the factors mentioned for energy policy development, two different modelling approaches are developed and discussed. Although the same factors are employed in both models, the importance they are ascribed differs (with the goal of encouraging the implementation of planned energy policy measures).

3   Analysis of Key Factors for Energy Policy Modelling

3.1   Key Factors for Developing an Energy Policy

Researchers have proposed various factors for modelling energy development (Afgan, 2008; Jebaraj & Iniyan, 2006; Lund, 2010). Based on the analysis of energy models in Jebaraj and Iniyan's (2006) review of energy models, the World Energy model developed by IEA (2011), and an analysis of sustainable energy models developed by Afgan (2008), Foidart, Oliver-Solá, Gasol, Gabarrell, and Rieradevall (2010), Lund (2010), Kaya and Yokobory (1997), and Kyung-Jin (2000), the most frequently applied factors relevant for energy modelling were identified. Five were identified as core factors based on their effect on energy policy development. The identified factors and the additional reasons for selecting them are:

– National, EU, and world energy statistics (current energy use and RES share, future trend of energy demand and future RES share) as an indicator of the current state of the energy sector, which is important for the evaluation of the situation and trends in the global energy market;

– Energy mix (national) as an indicator of the current state of the energy sector, which is important for situation analysis and development of the national energy industry;

– RES potentials (national) as an indicator of available opportunities, which is important for the evaluation of the possibilities for the transition to more sustainable and domestic energy sources;

– Future energy demand (national, EU, and the world) as an upgraded combination of different forecasts of the future state of the energy sector, which is important for planning measures to direct future energy production and use; and

– Compatibility of RES potentials with future energy demand (national) as an indicator of the feasibility of possible transition to renewable energy.

It is important to consider that different key energy factors result in different energy modelling; therefore, our energy models are based on these identified factors only.

Comparative analysis of energy statistics in Slovenia, EU, and the world. In order to achieve the development of sustainable energy policy all over the world, an international agreement similar to the 20/20/20 objectives is necessary. The analysis of energy statistics is vital for the preparation of an international energy-climate agreement as well as for the effective modelling of national energy policy development.

Gross inland consumption of primary energy in Slovenia compared to the EU and the world from 2000 to 2009 is presented in Table 1, which shows that the EU RES share and the production of energy from RES increased more rapidly than in Slovenia. The pattern of RES share growth, based on the data from Table 1, illustrates that EU-27 is reaching its target of RES share much faster than Slovenia alone.

The share of RES in Slovenian gross primary consumption remained more or less constant from 2000 to 2009, with wood and hydroelectric energy accounting for the largest share. Minor changes in the RES share between 2000 and 2009 can largely be attributed to hydrological conditions in Slovenia. The RES share and energy production from RES have been growing steadily since 2007, while RES share in the EU-15, the EU-25, and the EU-27 has grown continuously since 2002.

The peak of gross primary consumption was reached in Slovenia in 2008, while the EU-15 and EU-25 hit peak consumption in 2005, the EU-27 in 2006, and the world in 2007 (Eurostat, 2011; IEA, 2010; SURS, 2011). A significant decline in energy production can be observed in all the analyzed objects in 2009, which reflects the cooling of the economy, especially in the most highly developed EU countries, and can be seen as a forecast of economic trends in the near future.

Because of the increased energy production and consumption in 2008 (the year of peak energy production), Slovenian energy intensity (the ratio between the energy consumption and the gross domestic product [GDP] for a given calendar year) also slightly increased in 2008. In 2009, it returned to the 2007 level (SURS, 2011). Meanwhile, EU energy intensity has been declining continually since 2003 (Eurostat, 2011) and is therefore independent of the EU's peak energy production and use. Thus, energy use in Slovenia in 2008 increased more rapidly than the GDP, contrary to EU trends.

The comparison of Slovenian and world energy statistics based on the data from Table 1 indicates some similarities as well, such as peak energy consumption and the RES share in world primary energy consumption. These pattern similarities are sometimes even stronger and more obvious than the similarities between Slovenia and the EU. However, world energy production from RES is growing although the RES share remains more or less constant, which could be explained by the fact that total global energy production and use are growing at almost the same level as global energy production from RES.

Energy mix of Slovenia. Energy mix represents the combination of energy sources for the production of energy in different geographical areas. The energy mix of a particular country, region, or organization can significantly impact future energy policy development. Energy policymakers must be aware of the current state of energy mix and the possibilities available; therefore, analysis and examination of energy mix are essential for efficient energy planning and evaluating the environmental impact of national energy production. Analysis of energy mix also enables the visualization of the trends in energy development in the "business as usual" scenario.

Table 1. *Total Primary Energy Supply (TPES), Energy Supply from RES, and RES share in TPES (2000-2009)*

Region/year	2000	2001	2002	2003	2004	2005	2006	2007	2008	2009
Slovenia[a, b]										
TPES (ktoe)	6360	6749	6820	6931	7129	7307	7318	7336	7749	6990
RES (ktoe)	761	776	716	714	822	774	768	735	845	874
RES share (%)	12.0	11.5	10.5	10.3	11.5	10.6	10.5	10.0	10.9	12.5
EU-15[c]										
TPES (Mtoe)	1454	1469	1502	1497	1530	1552	1552	1544	1527	n.a.
RES (Mtoe)	85	88	85	92	99	103	110	124	130	n.a.
RES share (%)	5.8	6.0	5.7	6.2	6.5	6.6	7.1	8.0	8.5	n.a.
EU-25[c]										
TPES (Mtoe)	1655	1668	1706	1702	1743	1766	1766	1764	1747	n.a.
RES (Mtoe)	90	93	97	95	103	111	115	123	137	n.a.
RES share (%)	5.4	5.6	5.7	5.6	5.9	6.3	6.5	7.0	7.9	n.a.
EU-27[c]										
TPES (Mtoe)	1724	1763	1759	1803	1825	1825	1826	1808	1799	1681
RES (Mtoe)	98	101	100	108	116	121	129	143	151	151
RES share (%)	5.7	5.8	5.7	6.0	6.4	6.6	7.1	7.9	8.4	9.0
World[d, e]										
TPES (Gtoe)	10,02	10,17	10,23	10,58	11,04	11,44	11,60	12,06	12,00	n.a.
RES (Gtoe)	1.29	1.29	1.31	1.33	1.37	1.41	1.44	1.50	1.47	n.a.
RES share (%)	12.9	12.7	12.8	12.6	12.4	12.3	12.4	12.4	12.3	n.a.

TPES – total primary energy supply
RES – renewable energy sources
Sources: [a] = Obrecht et al. (2011), [b] = Trpin (2010), [c] = Eurostat (2011), [d] = Combanous and Bonnet (2008), [e] = IEA (2010).

Figure 1: *Changes of Slovenian energy mix between 2005 and 2010 (SURS 2011)*
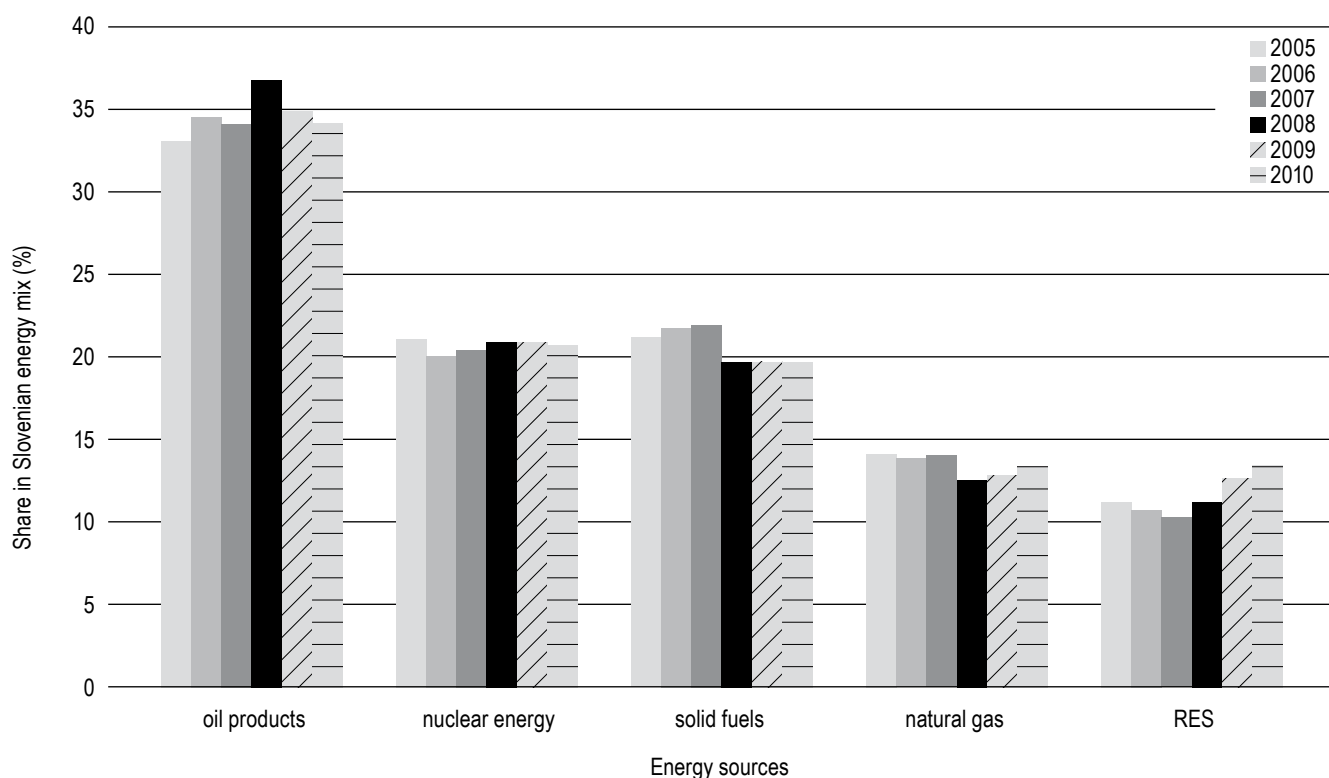
The Slovenian energy mix and the changes it underwent between 2005 and 2010 are presented in Figure 1. The situation and changes in the share of particular energy sources in the Slovenian energy mix also show the influence of the economic crisis, particularly the lower use of solid fuels and natural gas in 2008 and 2009. This could partially be a consequence of the substitution of conventional energy sources (CES) for RES. Because energy demand exceeds Slovenian production capacity, Slovenia imports approximately 50% of its energy (EU-25 average is 51%) (Eurostat, 2011). Data show that Slovenia and the EU are highly dependent on oil, leading to economical, political, and social vulnerability, which must be seen as an opportunity for the sustainable energy industry.

The constant increase in the RES share in the last four years can also be seen in Figure 1. This should be seen as encouraging for future development as it indicates a positive trend in the implementation of the 20/20/20 objectives, despite significant previous fluctuations in RES share. However, the biggest fluctuations can be seen in the use of oil products, the share of which increased in 2008 despite the economic crisis, mostly as a result of transport sector growth and increased transit through Slovenia. The impact of the economic crisis on the use of oil products was strongly reflected in 2009 in particular. However, the consumption of oil products in the transport sector in 2009 and 2010 remained at the same level as in 2008, which means that oil product consumption was reduced mainly in the industrial sector. The lower petroleum product prices than in neighbouring countries supports this conclusion as well.

The share of nuclear energy is more or less constant, mainly because of technological limitations (base load energy). The energy mix analysis indicates that, if we cannot place our expectations on the intensification of nuclear energy, Slovenia will have to limit its attention to sustainable energy technologies that could be introduced on a significant scale in the near future.

RES potentials in Slovenia. RES are the key factor in sustainable energy; we therefore examined and analyzed detailed data on RES potential in Slovenia (see Table 2). The presented data are not fully comparable, as they are combined from a variety of sources and studies of RES potentials in Slovenia that were or at least should have been considered in preparing national energy policy and compared with our own calculations. Differences also occur because forecasting RES potentials is not totally reliable. Indicative prices for RES energy plants are subject to investment in electricity (cogeneration) power plants only.

The diverse results in Table 2 are a result of the use of multiple studies and evaluations incorporated into the National Energy Programme Draft (NEP) as well as additional RES potential studies and our own RES potential evaluations. By presenting of a wide range of estimated RES potential, we wanted to show the complexity of renewable energy potential assessment.

Because of the wide range of estimated RES potential, it is very difficult to assess how efficient Slovenia will be in reaching its energy policy objectives. However, minimal technical potential and minimal economical potential by 2020 will both enable a 25% share of RES in final energy consumption in Slovenia by 2020.

A number of factors suggest that hydro electric power plants (HEPPs) should be the focus of the Slovenian energy industry: Slovenia's high hydro energy potential, the high efficiency of HEPPs, their long life expectancy (more than 100 years), their non-emission operation, and their cheap energy production. HEPPs can also significantly impact the mid-term replacement of CES. Slovenia's hydro energy potential allows for the construction of small HEPPs with an additional 100 MW installed power (HSE, 2010; Raner & Žebeljan, 2009). Small HEPPs also have a positive impact on the decentralization of the energy industry. The technical and economic potential of large HEPPs is much greater than the potential of their smaller counterparts; however, large

Table 2. *RES Potentials in Slovenia at the End of 2010*

RES	Total potential (TWh/a)	Technical potential (TWh/a)	Economical potential by 2020 (GWh/a)	NREAP 2020 goal[c] (GWh/a)	Investment costs[d] (million EUR/MW)	Installed[,] (MW)
Hydro	19.4[a]	9.1[a]	6370[b]	923		
large HEPP		8.6[a] -8.0[a]	6070[b]	837	1.5-2.6	953[g]
small HEPP		0.5[h]-1.1[h]	300[b]	86	1.3-3.0	118[g]
Solar	25835.4[h]	8.6[a]-2777.8[a]	139[a]-1300[a]	343	3.0-5.0	17[g]
Wind	15.6 [a]	3.1[a]	226[a]-1000[a]	191	1.0-1.4	0[g]
Wood biomass	19.6 [a]	2.9[a]-10.1[a]	300[a]-4305[h]	1249	2.0-4.5	115[g]
Biogas	47.3[a]	2.8[a]-4.3[a]	265[a]-927[f]	255	3.6	21[g]
Geothermal	>5.4 [a]	0.6[a]	44.4[a] – 150[a]	38	4.6	0[g]

Sources: [a] = IJŠ (2010), [b] = HSE (2010), [c] = NREAP (2010), [d] = Obrecht and Denac (2011), [e] = Trpin (2010), [f] = KGZ (2010), [g] = Jarse (2011b), [h] = author's calculations.

HEPPs have a considerable impact on the environment whereas small HEPPs cause less environmental strain, can be built in a variety of locations, require relatively low total investment, attract private capital, and present social and economic benefits for rural areas.

The total solar energy potential is approximately 25.84 PWh/year. As shown in Table 2, technical potential is estimated to be approximately 8.6 to 2777.8 TWh/year (IJŠ, 2010). If Slovenia wants to achieve the maximum technical potential value, which is 10.8% of the total potential, then all appropriate surfaces in Slovenia should be covered. This is an unrealistic value despite the 57% growth of photovoltaic witnessed in 2010 (Jarse, 2011a; Jarse, 2011b). However, reference costs decreased by 20% in 2011, and a 30% decrease is expected in 2012 (Government of Republic of Slovenia, 2009); therefore, moderate growth can be expected in the future.

Wind energy potential in Slovenia is currently totally unexploited (Trpin, 2010) despite the fact that wind is one of the cleanest and fastest-growing RES in the world. The use of wind power plants (WPP) is limited due to the lack of appropriate geographic locations as well as the fact that almost 36% of Slovenia is included in the NATURA 2000 network. However, synergy with nature can be achieved by thoughtful and sustainable positioning of WPPs, especially in degraded areas near highways. We propose the installation of a few pilot WPPs and an analysis of their operation. The results obtained would facilitate decisions on new WPPs and address the criticisms of non-governmental organizations that oppose WPPs in Slovenia. Given the tendency towards WPP in the EU, Slovenia plans to compile a list of environmentally undisputed areas with sufficient wind to attract potential investors and enable faster development of WPPs.

The maximal technical potential of wood biomass estimated in the NEP seems excessively high. Technical potential is indeed estimated from 2.9 to 10.1 TWh/year (IJŠ, 2010); however, the estimated 2.9 TWh/year covers only wood biomass exploited in minor energy plants and households, while the maximum estimation also covers the wood biomass that can be exploited in major energy plants and as co-incineration in thermal power plants. The differences in wood biomass potential estimations are still significant and differ widely from our calculations. The annual increase in natural forests in Slovenia is 8 million m³ and the average energy potential calculated from the average heat of combustion of 11 different types of domestic Slovenian wood is 2440 GWh per million m³ of wood (IJŠ, 2010; KGZ, 2010). In order to achieve maximal technical potential, Slovenia should exploit approximately one half of that annual forest increase, which is almost impossible because of the wood processing industry and because the current annual cut down stands at approximately only 3 million m³ of wood (KGZ, 2010). This figure has been overestimated, and such an ambitious goal for wood biomass will have to be well supported.

Slovenia's relatively high biogas potential also seems to have been overestimated. In similar studies, which were not included in the preparation of the NREAP and NEP (such as the study of BigEast), the estimated technical and total potential are both lower. However, the NREAP goal is not particularly ambitious. The KGZ (2010) study estimates biogas potential in 2020 at 927 GWh/year—almost 4 times higher than the NREAP goal for 2020.

Slovenia currently exports a large amount of organic waste to Austria (ARSO, 2011). Instead of exporting it, Slovenia should investigate ways in which organic waste can be exploited to a larger degree domestically. Stronger emphasis must be placed on the cogeneration of heat and electricity and the greater use of landfill gas. The use of heat from biogas plants is especially challenging because they are primarily situated in areas where few heat consumers live. Slovenia should also support proven effective private–public partnership that would be suitable for rural development and job creation in rural areas. Despite the planned measures, the main problem concerning biogas exploitation is whether to exploit rural areas for food or energy crops.

The estimated geothermal energy potential of Slovenia differs significantly because geothermal energy potential data are collected every five years. The last available data are from 2005. Nevertheless, the annual potential is at least 5443 GWh (IJŠ, 2010).

Future energy demand. The IEA (2010) reference scenario forecasts an approximately 52% rise in world energy demand from 2005 to 2030, while the World Energy Council forecasts a doubling of energy demand by 2050. Fossil fuels will remain the dominant energy source in the EU, covering approximately 75% of all energy needs until 2035 (Böhme, 2009; Combanous & Bonnet, 2008). Energy demand forecasts can vary widely and are particularly dependent on the economic situation, international agreements, transnational directions, and future technological development. Without limitations on emissions, RES and EE energy use would most likely increase much more rapidly.

Forecast energy demand in Slovenia is presented in Table 3. The NREAP predicts a moderate growth in energy use by 2015 and a slowdown by 2020. The calculation of future energy use in Slovenia for 2016 is based on the objections and methodology of the Directive on Energy End-Use Efficiency and Energy Services (EP, 2006). The NREAP forecast shows that the 20/20/20 objectives are achievable. Future energy end use in 2020, which is particularly dependent on transport sector development due to its rapid growth in Slovenia, is presented in the last column of Table 3. Future energy consumption in 2020 is not precisely defined; RES share is expected to increase by 25% or more. Electricity use is less problematic, as it has been decreasing constantly since 2006 (SURS, 2011). However, it is realistic to expect smaller growth in energy consumption by 2015 as a result of economic recovery.

Table 3. *Final Energy Consumption (FEC) in Slovenia*

Category	2007[d]	2008[d]	2009[d]	2010 forecast[a]	2010[c]	2012 forecast (Kyoto)[a]	2016 objective (- 9%)	2020[a] objective (20/20/20)
FEC in Slovenia (ktoe)	4867	5232	4891	4927	5013	5031	4267[b] / 5214[a]	5232
RES in FEC in Slovenia (ktoe)	745	780	787	872	858	941	1137[a]	1324/ 25 % of FEC

FEC – final energy consumption

Sources: [a] = NREAP (2010), [b] = objective of directive on energy end-use efficiency and energy, [c] = author's calculations from partial data, [d] = SURS (2011)

In order to achieve efficient managing of future energy use, it is vital to bring about lifestyle changes as well as educate and inform the public about the measures and contributions that the individual can undertake.

Compatibility of RES potentials with future energy demand. The compatibility of RES potentials with future energy demand must be carefully examined because it is essential for future energy policy planning. The transition to sustainable energy can only be achieved through realistic planning and the implementation of efficient measures. According to current energy use analysis, future energy demand forecasts, and the evaluation of RES potentials in Slovenia, it is not certain that Slovenia has adequate technical potential for a complete transition to RES. The conclusions are:

– Slovenia's minimal technological RES potential can cover at least 50% of its energy demand;

– Slovenia's average technological RES potential can cover its entire energy demand; and

– Because of the differences in energy mixes and possibilities in various energy sectors (heating and cooling, electricity production, and transport), RES potential is compatible with heating and cooling and electricity production but is especially problematic in the transport sector (due to the problems in Slovenia's transport sector, as previously described).

3.2 Modelling Future Energy Policy Development

A number of facts must be taken into account when modelling future energy development. As an EU member state, Slovenia was obliged to submit a NREAP in regard to meeting the 20/20/20 objectives. The NEP, another strategic document, currently in preparation, should set clear directions for future energy development. The issue of disregarding Kyoto is also crucial. The planned closure of inefficient blocks of thermal power plants could be carried out by 2012 instead of 2014. As energy use declined in 2009 (Eurostat, 2011; SURS, 2011), this is a realistic option (Obrecht & Denac, 2010). With this measure, Slovenia would significantly reduce the possible penalty for failing to achieve Kyoto targets and strengthen the foundations for the next international agreement that will succeed Kyoto. However, implementation of the planned measures remains the most challenging issue in the Slovenian energy sector.

For more efficient energy development, two simplified energy policy models were proposed. These two models represent useful tools for greater RES exploitation, more accurate and predictable future energy policy measures, and the meeting of international agreements and objectives more efficiently. Model 1 is presented in Figure 2. Modelling based on model 1 begins with an analysis of energy statistics and energy mix. This step involves gathering data on the present situation while simultaneously evaluating RES potentials and forecasting future energy demand. Within this step, opportunities for more sustainable energy production and use are identified and the future situation in the energy sector is analyzed. In the third step, the compatibility of future energy demand with estimated RES potentials must be tested and the feasibility of the transition to sustainable energy, based on sustainable domestic RES, estimated. Based on all these factors and in accordance with international agreements, a new energy policy for a transition to more sustainable energy can be designed.

The second proposed energy model—model 2 (see Figure 3)—is similar but contains a very different final goal. Model 2 also starts with energy statistics and energy mix analysis (situation analysis). At the same time, RES potentials are evaluated to determine the most appropriate options for future energy production and use from the sustainability point of view. Based on these three factors and on the forecast future energy demand (in the "business as usual" scenario) and international agreements, a new energy policy can be shaped, with which future energy demand and supply can be designed and directed. In this model, the compatibility of future energy demand with new energy policy can also be tested.

As such, model 2 shapes the direction of future energy demand and energy supply in order to achieve the legally binding objectives and the transition to more sustainable energy.

Figure 2: *Energy policy model 1*
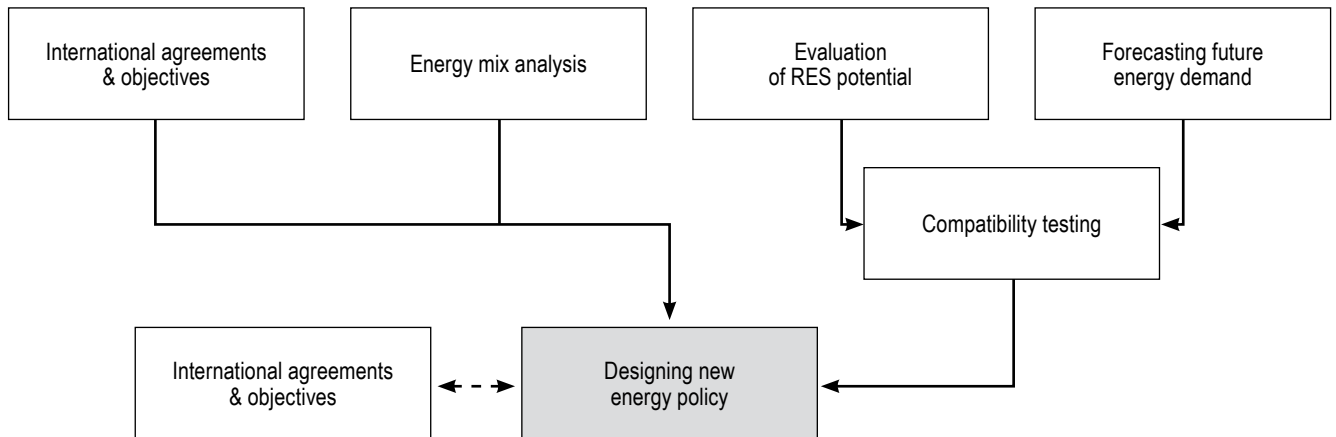
Figure 3: *Energy policy model 2*
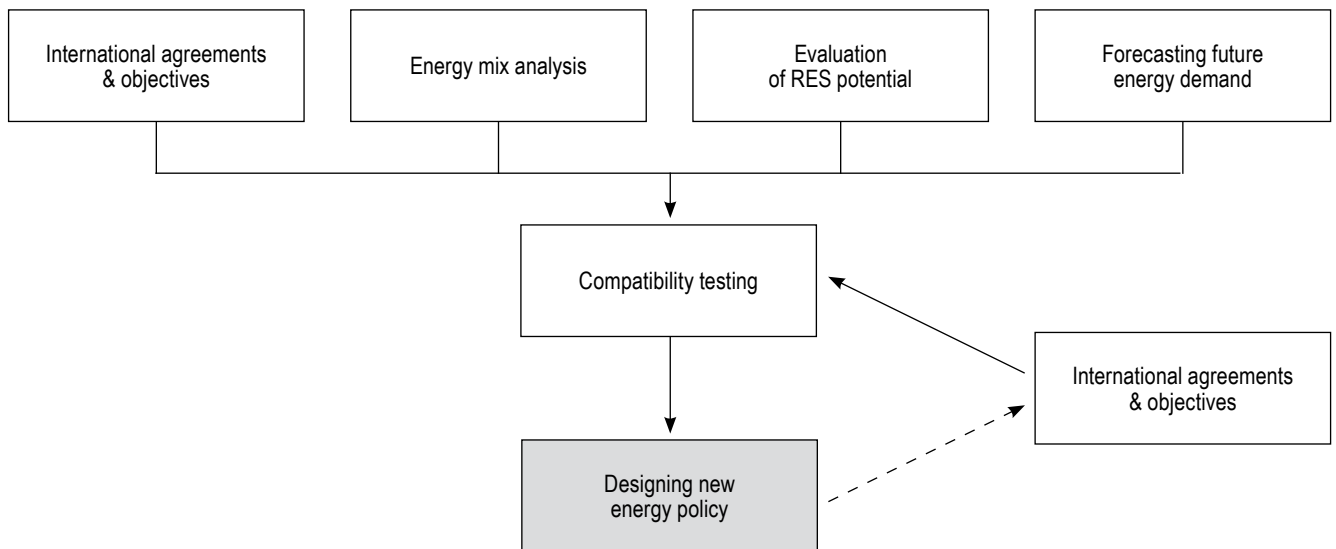
The core difference between the two proposed models lies in their goals. The goal in model 1 is a new energy policy directed towards sustainable energy. Although this is an appropriate aim, its implementation is questionable. Thus, model 1 should be seen as suitable for countries or organizations with a strong commitment to energy policy goals. It is also more accurate because it tests the compatibility of RES potentials with future energy demand. However, as the review of best practices demonstrated, a strong commitment to energy policy goals is very rare; therefore, model 2 is preferable as it forces energy policymakers into action, thinking in the long-term and implementing measures for the transition to a more sustainable energy sector. Model 2 is especially appropriate for countries or organizations that have displayed a weaker environmental commitment to

past goals in the energy sector. Space and time limitations mean that the detailed testing of the developed models will be addressed in future research.

4 Conclusions

This paper examined important factors for energy policy modelling, including energy statistics, energy mix, RES potentials, future energy demand, and the compatibility of future energy demand with RES potentials. The main findings are as follows:

– in some cases, Slovenian energy statistics are more similar to the global situation than that in the EU;

– the largest changes in energy mix are a consequence of the economic crisis and changes in energy policy;

– RES potentials differ significantly and render future energy planning partially inaccurate;

– the wide range of estimated RES potential makes it difficult to assess how efficient Slovenia will be in reaching its energy policy objectives;

– energy demand is expected to rise by 2015 and then slightly decrease by 2020; and

– the compatibility of RES potential and future energy demand is going to be particularly problematic in the transport sector.

Two models for energy development were constructed. Model 1 is more accurate but is appropriate only for countries with a strong commitment to international agreements. Model 2 is particularly suitable for countries with a poor commitment to international agreements because it encourages energy policymakers to take action. Increased EE and a gradual change in consumer habits should also be fully included in energy policy planning to ensure the best long-term opportunity for decreased and efficient energy use and to ensure sustainable energetics.

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4

NAČRTOVANJE OKOLJU PRIMERNEJŠIH PROIZVODOV V SLOVENSKIH PROIZVODNIH PODJETJIH S CERTIFIKATOM ISO 14001

Product Ecodesign in Slovenia's ISO 14001-Certified Manufacturing Companies

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Izvleček

Proizvodnja in uporaba proizvodov izjemno vplivata na obremenjevanje okolja ter izčrpavanje naravnih virov. Osnovna zamisel okoljskega načrtovanja proizvodov (ekodizajn) je z izboljšanim načrtovanjem zmanjšati njihove vplive na okolje v celotnem okoljskem življenjskem ciklu. Namen raziskave, opravljene na vzorcu proizvodnih podjetij v Sloveniji, je ugotoviti, koliko standard ISO 14001 za sistem okoljskega menedžmenta pripomore k ekodizajnu proizvodov oz. vpliva nanj. Ugotovili smo, kateri so najpomembnejši okoljski kriteriji oz. indikatorji, ki jih podjetja upoštevajo pri ekodizajnu, kateri so glavni motivacijski dejavniki in ovire v tem procesu in kje podjetja iščejo informacije o tovrstnem konceptu razvoja proizvodov.

Ključne besede: proizvodi, ekodizajn, ekoinovacije, sistem okoljskega menedžmenta, ISO 14001

Abstract

The manufacturing and use of products have extreme impacts on the natural environment and the depletion of natural resources. Product ecodesign principles are based on the idea of the inclusion of environmental aspects of a product over its entire environmental lifecycle. The aim of the study was to gather and evaluate situations on ecodesign in ISO 14001-certified manufacturing companies in the Republic of Slovenia in order to investigate whether product ecodesign measures are promoted as a result of adopting ISO 14001 certification or not. The most important ecodesign criteria were evaluated and prioritized. In addition, the main drivers and barriers as well as information sources on product ecodesign were determined.

Keywords: products, ecodesign, eco-innovations, environmental management system, ISO 14001

1 Uvod

Okoljevarstvene zahteve se iz leta v leto zaostrujejo tako v gospodarskih kot negospodarskih dejavnostih. Kar je bilo nedavno še nepotrebno, postaja danes pomembna konkurenčna prednost, jutri pa bo nujni pogoj za učinkovito poslovanje podjetij. Okoljska problematika je postala sestavni del političnih in gospodarskih agend (še posebej v EU) in jasno je, da se tako gospodarstvo kot družba v celoti ne bosta mogla ustrezno razvijati brez upoštevanja okoljevarstvenih meril. Povpraševanje po okoljskih tehnologijah, proizvodih in storitvah ne glede na krizne čase v svetu hitro narašča.

Leta 2010 je Evropska komisija izdala *Strategijo za pametno, trajnostno in vključujočo rast Evropa 2020* (Evropska komisija 2010). Med tremi prednostnimi nalogami te strategije pomeni »pametna rast« razvoj gospodarstva, ki temeljni na znanju in inovacijah, trajnostna rast pa na spodbujanju bolj konkurenčnega in »zelenega« gospodarstva, ki gospodarneje izkorišča naravne vire. S tem poudarkom je Evropska komisija potrdila, da ji pomeni varstvo okolja eno izmed ključnih prioritet razvoja v prihodnjem desetletju, okoljske inovacije proizvodov, procesov ter storitev (imenovane tudi ekoinovacije) pa zelo pomembno podporo pri doseganju takšnih strateških ciljev. Zato je namen Akcijskega načrta EU za ekoinovacije iz leta 2011 prav to: povečati število inovacij, ki omogočajo boljše odzivanje na okoljske pritiske, in jih približati trgu. Omenjeni akcijski načrt poudarja pomen raziskav za razvoj inovativnih tehnologij in proizvodov ter njihovo uvedbo na trg (Evropska komisija 2011). Podjetja se ob tem soočajo še z vse večjimi stroški za surovine in materiale, pri čemer njihova redkost in nestanovitnost cen slabo vplivata na gospodarstvo. Po podatkih ene izmed študij bi lahko samo v Nemčiji izboljšanje učinkovitosti virov v proizvodnji prihranilo od 20 do 30 % stroškov (Evropska komisija 2011a). Velja poudariti dejstvo, da so evropske države vse bolj odvisne od uvoza primarnih virov iz drugih regij sveta. Surovinski viri so s proizvodi povezani bodisi neposredno v smislu materialne proizvodnje bodisi posredno v obliki energijskih virov za proizvodnjo energije, potrebne pri njihovi uporabi. Zato postaja jasno, da bo imelo izpolnjevanje (ali neizpolnjevanje) okoljevarstvenih zahtev velik in neposreden vpliv tudi na konkurenčnost slovenske industrije v mednarodnem merilu

Okoljska politika EU se vseskozi spreminja in dopolnjuje. Pred desetletji so bili napori usmerjeni v minimiziranje emisij, ki povzročajo kisli dež, zimski smog in razgradnjo ozonskega sloja, sledilo je uvajanje sistemskih pristopov k reševanju določenih tokov odpadkov (npr. embalaže) in zatem usmeritev v celovito (integralno) modernizacijo industrijskih procesov (npr. direktiva IPPC). Nato so se iniciative okoljske politike EU začele od procesov vse bolj usmerjati k proizvodom. Temu trendu smo že priča, zagotovo pa se bo še intenziviral v prihodnje. Dodatna značilnost, ki jo lahko zaznamo v okoljski politiki EU, je tudi ta, da se bodo parcialno obravnavani pristopi zmanjševanja vplivov na okolje postopno nadomeščali s sistemskimi oz. holističnimi. Ponazorjeno s primeri, to pomeni, da je dozorelo spoznanje, da je npr. učinkovitost nekega sistema ravnanja z odpadki odvisna od same zasnove in sestave izdelka, ki sta opredeljeni v razvojni fazi, ali da izdelek za okolje in zdravje ni problematičen le, ko postane odpadek, temveč je v njem akumulirana velika poraba primarnih surovinskih virov (tako snovnih kot energijskih), da izdelki posredno vplivajo na okolje pri transportu, številni pa neposredno med uporabo itn. Skratka, postalo je jasno, da izdelki niso problematični za okolje le kot odpadki po uporabi, temveč je njihov vpliv na okolje in zdravje mnogo kompleksnejši.

Od kod vse večji interes okoljskih politik in zakonodajnih ukrepov za proizvode? To ne preseneča, saj so prav proizvodi[1] ključni povezovalni element med podjetjem in potrošnikom na eni strani ter naravnim okoljem na drugi. V proizvodih se kaže celoten spekter poslovnih odločitev: izbira surovin, materialov, kemikalij, embalaže, značilnosti proizvodnega procesa, logistike ter vrste in način rabe energije, ki so vsi povezani s problematiko onesnaževanja okolja.

Zato ne preseneča, da postajajo zakonodajne okoljevarstvene zahteve EU za proizvode iz leta v leto obširnejše in zahtevnejše, prav tako pa se razvijajo tržni mehanizmi, ki dodatno spodbujajo ekoinoviranje. Poleg zakonodajnih zahtev se v gospodarstvu uveljavljajo tudi (trenutno še) prostovoljni pristopi za vrednotenje okoljskih vplivov proizvodov, med katerimi zagotovo po svoji popularnosti (kljub očitnim konceptualnim pomanjkljivostim) velja omeniti t. i. ogljični odtis. Novost, ki jo na področju vrednotenja vplivov proizvodov na okolje pripravlja Evropska komisija, je izračunavanje celovitejšega »*okoljskega odtisa proizvodov*«. Trenutno se pripravlja harmonizirana metodologija izračunavanja vplivov na okolje za različne skupine proizvodov, temelječa na konceptu okoljskega življenjskega cikla. Na razvoj in inoviranje proizvodov naj bi imela dolgoročen vpliv, saj naj bi okoljski odtis proizvodov v prihodnje postal tudi kriterij za primernost plasiranja izdelka na trg EU (Evropska komisija 2011b). Zaradi omenjenih trendov postaja razvoj oz. načrtovanje okolju primernejših proizvodov (ekodizajn), ki temelji na zmanjševanju vplivov proizvodov na okolje v njihovem celotnem okoljskem življenjskem ciklu, za proizvodna podjetja vse pomembnejši.

Vse več podjetij na mednarodnih trgih prepoznava vključevanje okoljskih vidikov v razvoj proizvodov kot pomembno konkurenčno prednost; hkrati se zavedajo, da se bo takšen trend v prihodnje še intenziviral, zato se vanj že aktivno vključujejo in ga sooblikujejo (Rydberg 1995; Hanssen 1999; Charter in Tischner 2001; van Hemel in Cramer 2002; Triebswetter in Wackerbauer 2008; Albino idr. 2009). Slovenska podjetja so v preteklosti v povprečju konkurenčno prednost svojih novih proizvodov redkeje poskušala ustvariti z okoljskimi atributi oz. so okoljske kriterije postavljala na sam rep spremenljivk, ki pojasnjujejo prednosti določenega proizvoda (Bastič 2002). Toda nekatere ugotovitve nakazujejo, da se ta trend spreminja tudi v Sloveniji (Maletič idr. 2010).

Poleg trendov na področju razvoja okolju primernejših proizvodov se je v zadnjih petnajstih letih v svetu uveljavil še drugi okoljski podjetniški pristop. Da bi bile podjetniške okoljske zahteve za organizacije v mednarodnem merilu natančno definirane in harmonizirane, so bili oblikovani standardi za okoljski menedžment oz. okoljsko upravljanje, kot je npr. ISO 14001. Standard zajema aktivnosti, s

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[1]   V članku s pojmom »proizvodi« opisujemo izključno proizvode kot materialne dobrine. V angleški strokovni literaturi pojem »product« namreč velikokrat zajema tako materialne dobrine (»goods«) kot tudi storitve (»services«).

katerimi organizacije sistematično ocenijo, presodijo ter ovrednotijo, kako njihove dejavnosti vplivajo na okolje, in ki vključujejo ukrepe, da se negativni vplivi na okolje minimizirajo ali celo v celoti odpravijo. Celovit pristop k reševanju okoljskih problemov je namreč lažje izvajati, če je v podjetju uveden organiziran sistemski pristop k reševanju okoljskih vidikov poslovanja, podprt v najvišjem vodstvu (Radonjič in Tominc 2007).

Namen prispevka je predstaviti rezultate raziskave, ki smo jo opravili na vzorcu certificiranih proizvodnih podjetij v Sloveniji in s katero smo ugotavljali nekatere trende na področju ekodizajna proizvodov ter pomen cer-tificiranega sistema okoljskega menedžmenta pri razvoju okolju primernejših proizvodov. Prispevek je strukturiran po poglavjih. V drugem poglavju so predstavljena teoretič-na izhodišča za oblikovanje okolju primernejših proizvodov (ekodizajn) s poudarkom na opisu okoljskega življenj-skega cikla proizvoda ter povezanostjo med standardom ISO 14001 ter konceptom ekodizajna. V tretjem poglavju podrobneje opredeljujemo namen in cilje raziskave, ki jih v četrtem poglavju dopolnimo z opisom raziskovalne meto-dologije. Sledijo predstavitev in diskusija o rezultatih (peto poglavje) ter sklep (šesto poglavje), v katerem strnemo ključne rezultate in jih povežemo z raziskovalnimi omeji-tvami in predlogi za prihodnje raziskave.

## 2 Oblikovanje okolju primernejših proizvodov (ekodizajn)

2.1 Okoljski življenjski cikel proizvodov

Za razumevanje sodobnega koncepta okoljskega na-črtovanja proizvodov je treba dobro poznati koncept in strukturo t. i. okoljskega življenjskega cikla proizvoda. Ta se začne pri pridobivanju potrebnih primarnih surovinskih virov iz narave in poleg tega obsega proizvodnjo materia-lov, kemikalij in sestavnih delov, proizvodnjo, distribucijo in transport, uporabo ter ravnanje z odpadki po uporabi. V obravnavanje okoljskega cikla izdelka mora biti vključena tudi proizvodnja energije, potrebne za pridobivanje in predelavo surovin, za proizvodnjo, transport, distribucijo, uporabo in ravnanje z izdelkom po uporabi (Radonjič 2010). Primer poenostavljene sheme okoljskega življenjskega cikla z osnovnimi fazami je prikazan na sliki 1.

Organizacija je največkrat neposredno vključena zgolj v eni sami fazi celotnega okoljskega življenjske-ga cikla proizvoda. Vendar pa odnos z dobavitelji, ki poteka po verigi navzgor, ter s poslovnimi partnerji, po-trošniki in družbami za ravnanje z odpadki, ki poteka po verigi navzdol, pomeni, da imajo posamezne organizacije posreden vpliv (in odgovornost) za vplive njihovih proizvo-dov na okolje v mnogo širšem kontekstu. Na okoljskem ži-vljenjskem ciklu temelječa analiza proizvoda zato omogoča boljši vpogled v sestavo komponent in funkcij ter v medse-bojne odnose znotraj dobavne verige.

Kako pomemben postaja koncept okoljskega življenjske-ga cikla v okoljski in gospodarski politiki EU, kaže njegova

Slika 1: *Shematski prikaz okoljskega življenjskega cikla proizvoda (prikazane so osnovne faze)*
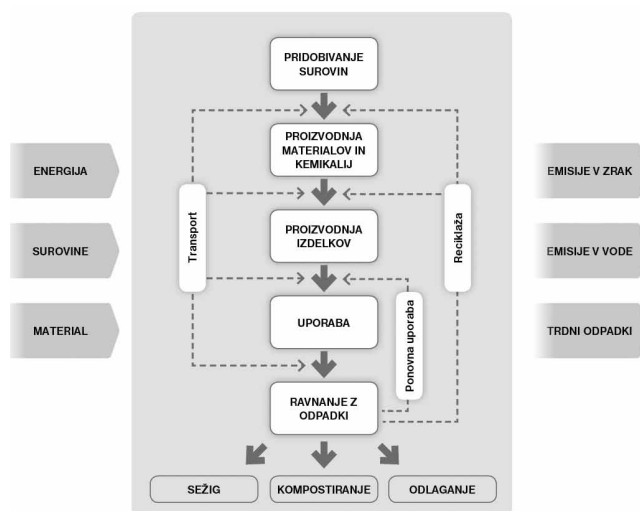
vključenost v pomembne okoljske dokumente oz. strategije EU, sprejete v zadnjih letih, kot so npr.:

– Integrirana politika proizvodov (2003),

– Tematska strategija o trajnostni rabi naravnih virov (2005),

– Tematska strategija o preprečevanju in recikliranju odpadkov (2005),

– Akcijski načrt o trajnostni potrošnji in proizvodnji (2008),

– Časovni okvir za Evropo, gospodarno z viri (2011).

Na podlagi omenjenih dokumentov Evropska komisija že pripravlja ukrepe za razširitev odgovornosti proizvajal-cev na celoten življenjski cikel proizvodov, ki jih proizva-jajo. Podelitev nekaterih tipov znaka za okolje za proizvode že temelji na življenjskem ciklu izdelka (Evropska komisija 2010a). Tudi pri zelenem javnem naročanju se srečujemo s konceptom okoljskega življenjskega cikla izdelka kot enega odločitvenih kriterijev.

2.2 Okoljske inovacije proizvodov in koncept ekodizajna

Ekodizajn je definiran kot *vključevanje okoljskih vidikov v oblikovanje in razvoj proizvodov z namenom zmanjše-vanja negativnih vplivov na okolje v njihovem celotnem okoljskem življenjskem ciklu* (ISO 2010). Pri ekodizajnu želimo z uporabo ustreznih materialov, konstrukcije in teh-nologije zmanjševati materialno in energijsko porabo na enoto proizvoda, odpraviti uporabo strupenih in škodljivih snovi in/ali olajšati reciklažne postopke. Zaradi pomena, ki ga ima za evropsko gospodarstvo v prihodnosti pri razvoju konkurenčnejših proizvodov, je koncept ekodizajna postal sestavni del okoljske politike EU, za nekatere skupine proi-

zvodov pa so že oblikovane skupne smernice ter zahteve za okoljsko načrtovanje (Evropska komisija 2012).

Ekodizajn usmerja zanimanje za preprečevanje vplivov na okolje v zgodnejšo fazo v verigi dodane vrednosti, in sicer v proces načrtovanja proizvoda. Znano je, da se v razvojni fazi opredeli v povprečju 70–80 % vseh vplivov na okolje v povezavi z nekim proizvodom in njim pripadajoči stroški (Holloway idr. 1994; Fiksel 1996; Reid in Miedzinski 2008). Ko je namreč dokončana glavna zasnova proizvoda in so določene proizvodne specifikacije, ostanejo samo še majhne možnosti za izboljševalne ukrepe glede zmanjševanja vplivov na okolje. Tudi najnaprednejša tehnologija reciklaže bo morala opraviti s tem, kar je bilo opredeljeno že v fazi načrtovanja proizvoda. Identifikacija problemov v zgodnejših fazah omogoča organizacijam, da po eni strani sprejemajo ustreznejše odločitve, po drugi pa bolje razumejo, kako takšne odločitve vplivajo na okoljske vidike, ki jih obvladujejo drugi akterji, npr. proizvajalci in dobavitelji osnovnih ter pomožnih materialov, predelovalci odpadkov idr. (Radonjič 2008). Resnični koncept ekodizajna mora zato temeljiti na preventivnem pristopu, in sicer tako, da se negativni vplivi na okolje in zdravje poskušajo odpraviti, še preden se sploh pojavijo, oz. da se bistveno zmanjšajo v celotnem okoljskem življenjskem ciklu proizvoda.

V osnovi lahko ločimo med štirimi osnovnimi tipi ali pristopi k ekodizajnu proizvodov, ki se posledično kažejo z doseženo stopnjo njihove okoljske učinkovitosti, kar je prikazano na sliki 2 (Brezet 1997). Pri prvem pristopu obstoječe proizvode z izboljšavami prilagodijo trenutni zakonodaji ali hitreje izvedljivim ukrepom (npr. izločitev škodljivih snovi ali odvečne embalaže, uporaba reciklatov itn.), s čimer pa se le v omejenem obsegu izboljša njihova okoljska učinkovitost. Pri drugem pristopu koncept in osnovna izvedba proizvoda ostaneta enaka, vendar je treba ponovno razmisliti o celoviti konstrukciji, o uporabljenih osnovnih materialih in surovinah, večji energetski učinkovitosti v različnih fazah življenjskega cikla ipd. Pri tretjem tipu ekodizajna proizvod zadosti svoji funkciji na osnovi popolnoma novega koncepta izdelave (npr. skupni električni polnilnik za baterije elektronskih aparatov namesto več posameznih), pri četrtem pristopu pa gre za sistemske pristope k inovativnim rešitvam, ki ne vključujejo le celotnega proizvodnega sistema, temveč tudi organizacijske in/ali infrastrukturne spremembe (npr. uvajanje vozil na električni pogon, za katera sta potrebni gradnja polnilnic baterij in nova servisna dejavnost). Seveda obstajajo opazne razlike glede na čas razvoja in vložena sredstva med posameznimi koncepti opisanega ekoinoviranja. Toda nobenega izmed teh pristopov ne gre podcenjevati, saj ima marsikdaj veliko število manjših izboljšav velik skupni učinek.

Ekodizajn torej pomeni specifični koncept v okviru procesa načrtovanja oz. oblikovanja proizvodov na različnih ravneh oz. stopnjah kompleksnosti izboljšav, kar zagotovo pospešuje kreiranje inovativnih produktnih rešitev. Vendar pojma ekodizajn ne gre zamenjevati s pojmom okoljske

Slika 2: *Različni pristopi k ekodizajnu proizvodov (prirejeno po Brezet 1997)*
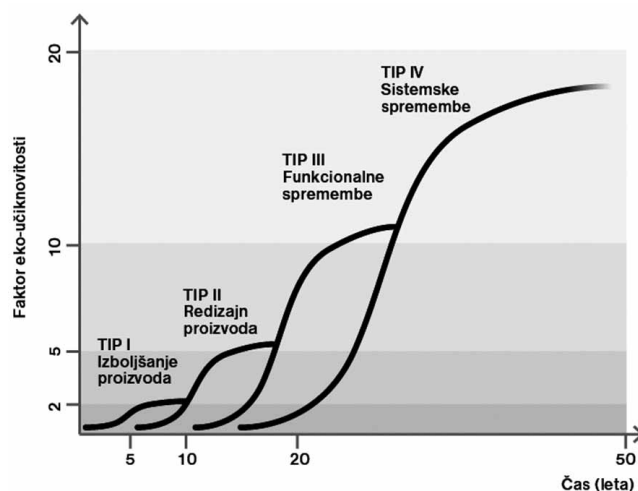
inovacije (ekoinovacije) produktov, ki je širši in splošnejši pojem. Za definiranje slednjih so bile predlagane številne definicije. Akcijski načrt za ekoinovacije EU (Evropska komisija 2011) jih definira kot katero koli obliko inovacij, s katero dosežemo znaten in viden napredek pri doseganju ciljev trajnostnega razvoja zaradi zmanjševanja vplivov na okolje ali doseganja učinkovitejše in odgovornejše rabe naravnih virov. V zadnjem času pa se v študijah in drugi strokovni literaturi vse pogosteje uporablja naslednja opredelitev: »*Ekoinovacija* je oblikovanje novih in cenovno primernih dobrin, procesov, storitev, organizacijskih postopkov ali trženjskih pristopov, ki zadovoljujejo človekove potrebe ter zagotavljajo boljšo kakovost življenja ob minimalni rabi naravnih virov in minimalnih izpustih škodljivih snovi v celotnem življenjskem ciklu.« (Eco-Innovation Observatory 2010; Reid in Miedzinski 2008). Definicija ekoinovacij se spreminja skladno s tehnološkim razvojem in spremenjenimi družbenimi potrebami. Ključni okoljski izziv v 21. stoletju namreč ni več le zmanjševanje ali odpravljanje onesnaževanja, pač pa tudi racionalna raba omejenih naravnih surovinskih virov. Razumevanje pojma ekoinovacije se je zato razširilo v smislu vključevanja učinkovitosti rabe snovnih in energijskih virov za celotni okoljski življenjski cikel. Zato ne preseneča, da slednjega poudarjata tako definicija okoljskih inovacij kot definicija ekodizajna kot iztočnico za izboljšave, kar povezuje oba pojma. Koncept ekodizajna ponuja izhodišča in s tem dodatne možnosti, da se o proizvodih razmišlja na celovitejši način, s tem pa se omogoča iskati inovativne ideje pri njihovem razvoju.

2.3 Povezanost standarda ISO 14001 z ekodizajnom

Mednarodni standard ISO 14001 za certificiranje sistemov okoljskega menedžmenta med drugim zahteva, da podjetje oblikuje svojo okoljsko politiko ter okvirne in operativne cilje, da prepozna okoljske vidike njenih

minulih, obstoječih in načrtovanih dejavnosti, proizvodov in storitev z namenom, da določi pomembne vplive na okolje, pri čemer upošteva vse zahteve okoljske zakonodaje. Podjetje je tako odgovorno za vse tiste vplive na okolje, ki so pod njegovim nadzorom oz. na katere lahko neposredno vpliva (ISO 2005). V ta namen ISO 14001 opredeljuje elemente učinkovitega sistema varovanja okolja, ki jih je možno integrirati z drugimi zahtevami vodenja, in s tem organizacijam pomaga doseči tako okoljevarstvene kot tudi ekonomske cilje. Tako vzpostavljena okoljska politika vključuje zavezanost k stalnemu izboljševanju in preprečevanju onesnaženja, temelji pa na učinkovitem gospodarjenju z energijo, vodo in odpadki, zmanjševanju uporabe nevarnih snovi, uvajanju obnovljivih virov energije, obvladovanju gospodarjenja z materiali ter analizo proizvodnje in procesov ob polnem upoštevanju zakonskih zahtev (Marcus in Willig 1997). Število podjetij, certificiranih v skladu z zahtevami standarda ISO 14001, od leta 1996 tako v Sloveniji kot EU-27 narašča. Slovenija sodi po številu podeljenih certifikatov ISO 14001 v sam vrh EU. Leta 2009 je bilo v Sloveniji tako registriranih 191 organizacij na milijon prebivalcev, medtem ko je znašalo povprečje EU-27 162 organizacij na milijon prebivalcev (ARSO 2011).

Standard ISO 14001 omenja proizvode in njihov razvoj kot potencialne dodatne elemente oz. vidike znotraj širše opredeljene okoljske politike podjetja. ISO 14001 neposredno ne zahteva, naj podjetje pri tem upošteva okoljski življenjski cikel proizvoda, vendar je prav ta konceptualno jedro ekodizajna. Kljub temu da razvoj proizvodov ne pomeni osrednjega fokusa med zahtevami standarda ISO 14001, je razumljivo, da lahko njegove zahteve in vodila oplemenitijo celovit sistem upravljanja okolja. Sistem okoljskega menedžmenta v skladu z zahtevami ISO 14001 je namreč dovolj fleksibilen, da ga je možno razširiti tudi na raven okoljskega načrtovanja proizvodov. Vendar to pomeni, da mora organizacija razširiti tudi percepcijo svojih vplivov na okolje, saj na okoljskem življenjskem ciklu temelječi sodobni ekodizajn obvezno vključuje tudi optimiranje tistih okoljskih vidikov, ki niso v neposredni kontroli podjetja (npr. pridobivanje surovin, uporaba proizvoda, ravnanje z odpadki). Z namenom, da bi razširili učinkovitost ISO 14001, je Mednarodna organizacija za standardizacijo ISO nedavno izdala standard ISO 14006 z naslovom *Smernice za vpeljevanje ekološkega načrtovanja* (ISO 2010), s katerim želijo zagotoviti vodila za pomoč organizacijam pri organiziranju, dokumentiranju, vpeljevanju in vzdrževanju dejavnosti okoljskega načrtovanja proizvodov kot integralnega dela celovitega sistema okoljskega menedžmenta. S tem se tudi formalno potrjuje kompatibilnost obeh pristopov.

Številni avtorji so poročali o ugodnostih certificiranja v skladu z zahtevami ISO 14001 za podjetja, ki pa so bila velikokrat povezana predvsem z optimiranjem procesov (npr. z rabo energije in materialov, zniževanjem količin trdnih odpadkov, porabo vode, zaščito pri delu) in z njimi povezanimi proizvodnimi stroški. Posredni vplivi

na okolje, ki se pojavljajo zunaj lokacije podjetja (npr. faza uporabe proizvoda, ravnanje z odpadki po uporabi), pa so v okoljskih politikah certificiranih podjetij marsikdaj ostajali neupoštevani (Dyllick in Hamschmidt 2000; Hertin idr. 2004; Zutshi in Sohal 2004; Rennings idr. 2006; Radonjič in Tominc 2006; Radonjič in Tominc 2007; Schylander in Martinuzzi 2007; Wagner 2008). Ob tem so nekateri avtorji ugotovili slabo oz. nezadostno povezavo med sistemom okoljskega menedžmenta ISO 14001 in razvojem proizvodov na splošno (Wehrmeyer idr. 2002; Morrow in Rondinelli 2002; Kautto 2006; Schylander in Martinuzzi 2007; Johnstone in Labonne 2009).

Kljub omenjenim spoznanjem pa vendar poznamo primere, da je soodvisnost med ekodizajnom in sistemom okoljskega menedžmenta ISO 14001 lahko pozitivna oz. sinergična (Frei 1998; Ammenberg in Sundin 2005; Radonjič in Tominc 2006). Tudi Hoffmann s sodelavci (2003), Ziegler in Rennings (2004) ter Rehfeld s sodelavci (2007) so ugotovili, da je uveden certificirani sistem okoljskega menedžmenta v nemških podjetjih pospešil okoljske inovacijske procese. Na Nizozemskem so v okviru večletnega projekta kontinuirano uvajali okoljsko načrtovanje proizvodov, temelječe na načelih ekodizajna, v številna podjetja, certificirana po ISO 14001, katerih okoljska politika je bila pred tem usmerjena predvsem v optimiranje tehnoloških procesov. Posledica tega je bilo izboljšanje raznovrstnih komercialnih in tehničnih proizvodov (van Berkel 1999; Ammenberg in Sundin 2005).

3 Namen in cilji raziskave

Iz pregleda literature in raziskav s področja okoljskega načrtovanja proizvodov (ekodizajna) ter dejstev, navedenih v drugem poglavju, je razvidno, da so informacije o povezavi med standardom ISO 14001 in ekodizajnom proizvodov omejene, včasih tudi nasprotujoče si. To področje je šele v začetnih stopnjah raziskovanja. Čeprav obstajajo v svetu številne raziskave o pomenu in uvajanju ekodizajna v podjetja, pa (tudi v mednarodnem merilu) še niso jasno odgovorila na vprašanje, kako lahko aktivna okoljska politika, vpeljana po načelih in zahtevah standarda ISO 14001, promovira in vključuje okoljsko oblikovanje proizvodov. Razlog ni le v tem, da so se koncepti ekodizajna razvijali neodvisno od razvoja sistemov za upravljanje okolja, ampak tudi, da je koncept življenjskega cikla proizvoda, ki pomeni jedro sodobnega ekodizajna, relativno mlada disciplina v primerjavi z nekaterimi že utečenimi poslovnimi praksami s področja varovanja okolja.

Idejni okvir izvedene raziskave temelji na predpostavki, da mora aktivna okoljska politika v proizvodnih podjetjih v današnjem času vključevati tudi okoljsko optimiranje proizvodov. Ključno vprašanje raziskave se tako glasi: v kolikšni meri pridobljeni certifikat v skladu z zahtevami standarda ISO 14001 za sistem okoljskega menedžmenta pripomore k ekodizajnu proizvodov v certificiranih podjetjih oz. vpliva nanj? To je še toliko pomembneje, ker so kljub veliki popularnosti standarda ISO 14001 v Sloveniji

(in širše v svetu) podrobnejši podatki o tem, kako pridobljeni certifikat ISO 14001 vpliva na razvoj okolju primernejših proizvodov, zelo omejeni oz. jih sploh ni. Obenem pa se slovenska proizvodna podjetja vse več srečujejo z zakonodajnimi in tržnimi zahtevami okoljskega oblikovanja proizvodov. Podobno velja za podatke o tem, kako se podjetja lotevajo ekodizajna, katere kriterije pri tem upoštevajo in kaj jih pri tem motivira oz. ovira. Pomembno je ugotoviti, ali se v slovenskih proizvodnih podjetjih nakazuje prehod iz okoljskih strategij, povezanih z optimiranjem procesov, na okoljske strategije, ki vključujejo optimiranje okoljskih vidikov, ki niso v neposredni kontroli podjetja (npr. pridobivanje surovi, uporaba, ravnanje z odpadki).

V okviru tega nas je zanimalo, kateri so najpomembnejši okoljski kriteriji oz. indikatorji, ki jih podjetja upoštevajo v procesu razvoja proizvodov, kateri so glavni motivacijski in oviralni dejavniki pri tem procesu ter kje podjetja pridobivajo informacije za ekodizajn svojih proizvodov. Nekatere vidike ekodizajna, kot so motivacijski in oviralni dejavniki, želimo primerjati z rezultati, ki so jih dobili raziskovalci v drugih državah. Pri tem velja poudariti, da so določeni proučevani vidiki (npr. kvantificiranje kriterijev ekodizajna) pomanjkljivo proučevani tudi v mednarodnem merilu. V tem prispevku predstavljeni rezultati pomenijo del širšega raziskovanja ekodizajna proizvodov v Sloveniji, ki doslej na ta način sistematično še ni bil proučen. Z raziskavo prav tako nadgrajujemo spoznanja, pridobljena v preteklih letih, in

sicer o vplivu certifikata ISO 14001 v slovenskih proizvodnih podjetjih na tehnološko in okoljsko optimiranje proizvodnih procesov (Radonjič in Tominc 2006, 2007, 2007a).

4 Metodologija raziskave

Na podlagi podatkov Gospodarske zbornice Slovenije smo januarja 2010 vsem proizvodnim podjetjem v Sloveniji, ki imajo pridobljen certifikat v skladu z zahtevami standarda ISO 14001, razposlali anketni vprašalnik. V vzorec smo vključili tista certificirana podjetja, ki jih po kriteriju števila zaposlenih lahko uvrstimo med srednja (50–249 zaposlenih) in velika podjetja (več kot 250 zaposlenih), in sicer predvsem iz dveh razlogov: (a) delež oz. prispevek teh podjetij k izvozu in tudi bruto domačemu proizvodu je značilno večji v primerjavi z majhnimi podjetji in (b) za ta podjetja obstaja večja verjetnost, da imajo razvit oddelek ali službo za razvoj proizvodov oz. specializirano znanje s tega področja. Čeprav mala podjetja predstavljajo pomemben delež v celotni strukturi podjetij v Sloveniji in je njihov skupni vpliv na okolje zagotovo pomemben, jih nismo vključili tudi zato, ker se pogosto srečujejo z drugačnimi ovirami pri implementaciji okoljske politike kot večja podjetja (Hillary 2004). Anketne vprašalnike smo naslovili na osebo, zadolženo za razvoj proizvodov oz. razvojne aktivnosti podjetja. Marca 2010 smo poklicali v podjetja, od katerih še nismo prejeli izpolnjenih vprašalnikov, in jih ponovno prosili za sodelovanje.

Tabela 1: *Struktura vzorca po velikosti podjetij glede na število zaposlenih*

Velikost podjetja	Število vseh certificiranih podjetij v Sloveniji	Število vseh certificiranih proizvodnih podjetij	Število podjetij, vključenih v končni vzorec
veliko	171	67	31
srednje veliko	93	41	25
malo ali mikro	125	–	–
skupaj	389	108	56

Vir: Lastna raziskava na podlagi podatkov iz AJPES-a in GZS.

Tabela 2: *Struktura anketiranega vzorca glede na panogo*

Panoga	Koda NACE	Frekvenca	Odstotek
proizvodnja tekstilij	C 13	2	3,6
obdelava in predelava lesa; proizvodnja izdelkov iz lesa, plute, slame in protja, razen pohištva	C 16	2	3,6
proizvodnja papirja in izdelkov iz papirja	C 17	4	7,1
proizvodnja kemikalij, kemičnih izdelkov	C 20	9	16,1
proizvodnja izdelkov iz gume in plastičnih mas	C 22	6	10,7
proizvodnja nekovinskih mineralnih izdelkov	C 23	2	3,6
proizvodnja kovinskih izdelkov, razen strojev in naprav	C 25	8	14,3
proizvodnja računalnikov, elektronskih in optičnih izdelkov	C 26	2	3,6
proizvodnja električnih naprav	C 27	11	19,6
proizvodnja drugih strojev in naprav	C 28	2	3,6
proizvodnja motornih vozil, prikolic in polprikolic	C 29	3	5,4
proizvodnja pohištva	C 31	2	3,6
druge raznovrstne predelovalne dejavnosti	C 32	3	5,4
skupaj		56	100,0

Kot je razvidno iz tabele 1, smo od začetnih 108 odposlanih vprašalnikov dobili vrnjenih 61. Med temi jih je bilo pet zaradi neustreznih ali nepopolnih odgovorov neuporabnih, tako da smo v analizo rezultatov zajeli 56 podjetij in dosegli relativno visok odstotek vrnjenih vprašalnikov (51,8 %). Struktura celotnega vzorca zajema 55,4 % srednjih in 44,6 % velikih podjetij. Iz tabele 1 je razvidno, da je na naš vprašalnik odgovorilo 46,3 % izmed vseh v anketo vključenih velikih podjetij in 61 % izmed vseh v anketo vključenih srednjih podjetij. Delež anketiranih podjetij glede na panogo po klasifikaciji NACE je prikazan v tabeli 2. V vzorcu prevladujejo podjetja v domači lasti, ki jih je 73 %, medtem ko je 26,8 % podjetij v tuji lasti. Velika večina analiziranih podjetij, natančneje 92,7 %, jih pretežno posluje na tujih trgih in le 7,3 % pretežno na domačem trgu. Med analiziranimi podjetji jih kar 89 % poroča o lastnem oddelku ali službi za raziskave in razvoj.

Podatke smo vnašali v standardizirano matriko podatkov SPSS ter jih obdelali s statističnim programom SPSS 17.0, in sicer z opisno statistiko. Določili smo povprečne vrednosti, frekvence in odstotke oz. deleže. Pri izbiri okoljskih kriterijev, ki smo jih vključili v vprašalnik, smo kot izhodišče uporabili Brezetov in van Hemlov priročnik UNEP (Brezet in van Hemel 1997).

5   Rezultati in diskusija

5.1   Upoštevanje okoljskih kriterijev pri razvoju proizvodov

V anketiranih podjetjih smo ugotavljali, kateri vidiki ekodizajna, ki naj bi temeljili na celotnem okoljskem življenjskem ciklu, so upoštevani pri razvoju njihovih proizvodov. Pri tem so lahko navajali več različnih kriterijev. Kot je razvidno s slike 3, analizirana podjetja v splošnem najpogosteje navajajo naslednje okoljske kriterije: zmanjševanje nastajanja odpadkov med proizvodnjo (94,1 %), manjša raba energije v procesu izdelave (90,2 %) in zmanjšanje porabe materialov na enoto proizvoda (88,2 %). Ta trend se do določene mere kaže tudi pri finančnih izdatkih za okolje v slovenski industriji, v kateri predstavlja ravnanje z odpadki glavni delež tekočih izdatkov, po deležu investicij pa zaseda drugo mesto (SURS 2010). Po drugi strani pri razvoju novih proizvodov podjetja redkeje upoštevajo okoljske kriterije, kot so: manj sestavnih delov za hitrejšo demontažo in reciklažo (54,9 %), uporaba recikliranih materialov za embalažo (55,8 %) in manj različnih vrst embalažnih materialov za učinkovitejšo reciklažo (64,7 %). Ti rezultati kažejo, da kriteriji, ki so povezani z optimiranjem procesov, prevladujejo nad strategijami, ki so bolj neposre-

Slika 3: *Najpogosteje upoštevani okoljski kriteriji pri razvoju novih proizvodov v slovenskih proizvodnih podjetjih*
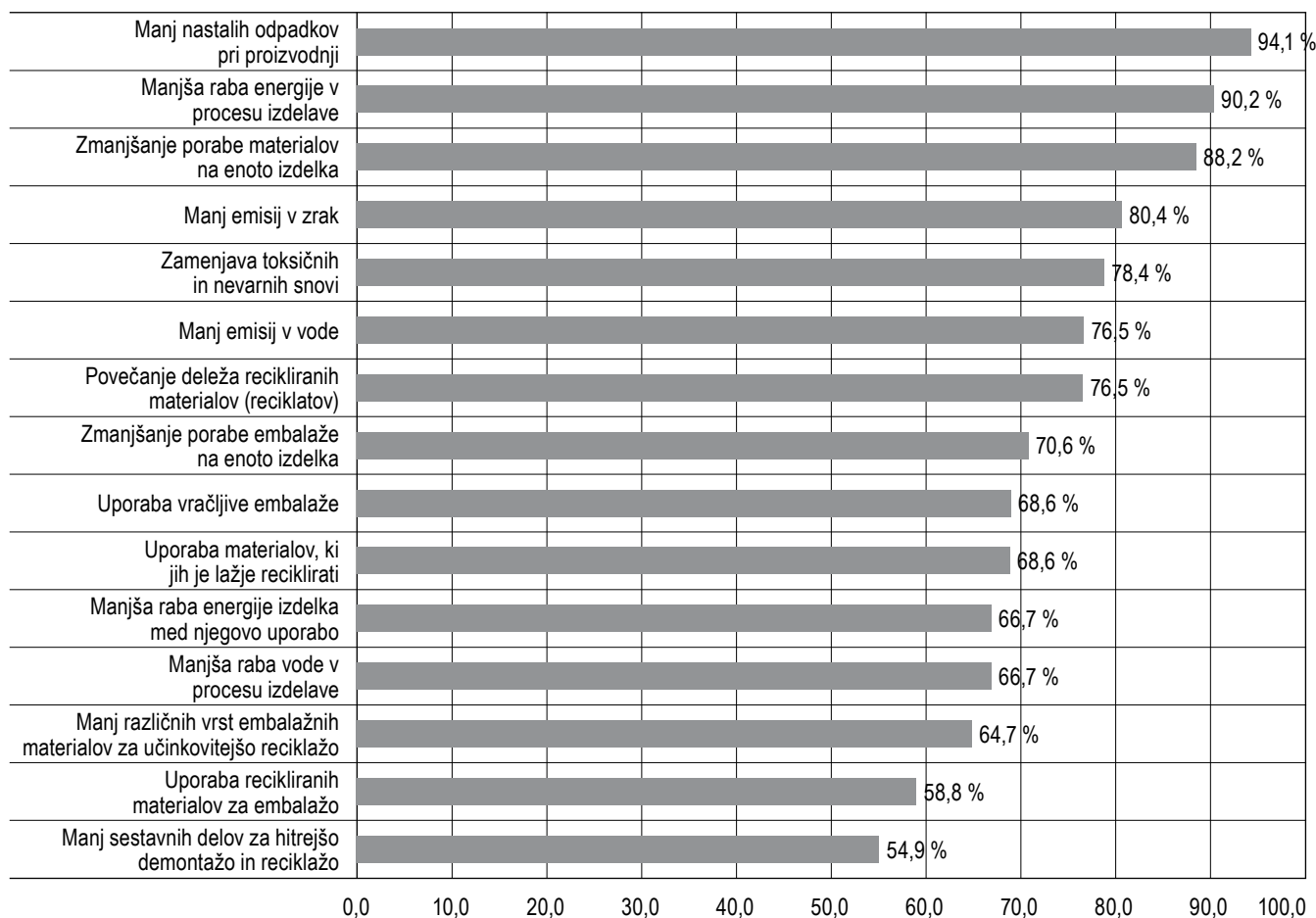
Slika 4: *Povprečne ocene pomembnosti okoljskih kriterijev (ekodizajn) v procesu razvoja novih izdelkov (1 – dejavnik sploh ni pomemben, 2 – manj pomemben dejavnik, 3 – pomemben dejavnik, 4 – zelo pomemben dejavnik, 5 – izjemno pomemben dejavnik)*
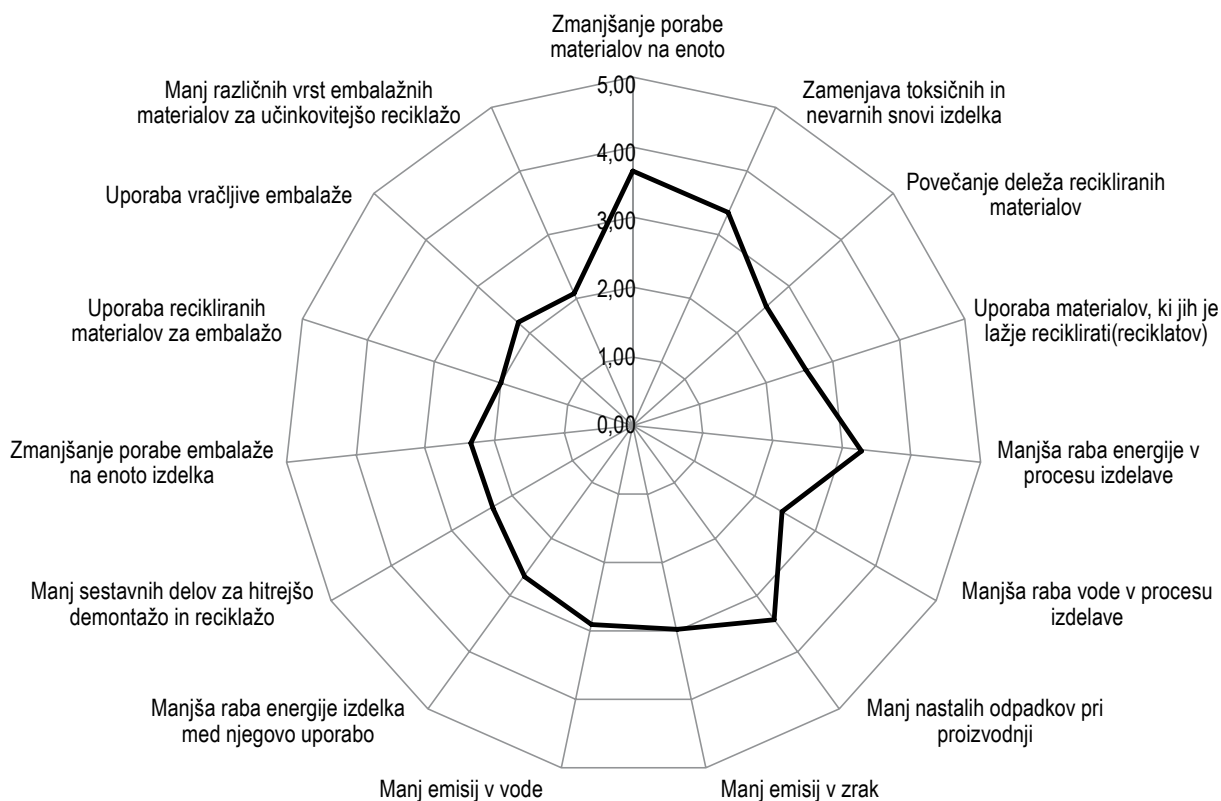
dno usmerjene k samemu proizvodu. Ne glede na razvoj zakonodaje in spremembe na trgu veliko podjetij na svoj vpliv na okolje še vedno gleda relativno (pre)ozko, večinoma omejeno na posamezno dejavnost oz. tehnološki proces izdelave. Situacija v Sloveniji je do določene mere primerljiva z rezultati študije o stanju ekodizajna proizvodov med industrijskimi podjetji baltskih držav (Belmane idr. 2003). Podobno kot podjetja v Sloveniji so tudi podjetja v baltskih državah realizirala večino izboljšav v fazi proizvodnje, in sicer v kategorijah manjše porabe surovin, zamenjave nevarnih snovi, energijske učinkovitosti, zmanjšanja trdnih odpadkov ter zmanjšanja emisij v vodo in v zrak. Okoljsko načrtovanje proizvodov v nekaterih razvitih državah kaže na drugačne prioritete pri ekodizajnu, kot smo jih ugotovili s pričujočo raziskavo v slovenskih podjetjih. Analiza 77 nizozemskih malih in srednje velikih podjetij v industrijskih sektorjih metalurgije, predelave lesa ter plastike, tekstilne industrije in elektronike je npr. pokazala, da se v nasprotju s slovenskimi podjetji nizozemska podjetja v prvi vrsti osredinjajo na reciklažo materialov, uporabo recikliranih materialov in nizko rabo energije pri ekodizajnu njihovih proizvodov (van Hemel in Cramer 2002). Podoben trend so za španska podjetja potrdili Santolaria in sodelavci (2011).

Da bi dobili natančnejši vpogled v pomembnost kriterijev, smo uporabili petstopenjsko lestvico, v kateri je ocena 1 pomenila »kriterij sploh ni pomemben« in ocena 5 »kriterij

je izjemno pomemben«. Na sliki 4 so prikazane povprečne ocene pomembnosti okoljskih kriterijev za celoten vzorec. V povprečju analizirana podjetja ocenjujejo zmanjšanje porabe materialov na enoto izdelka kot najpomembnejši okoljski kriterij (povprečna ocena 3,65), sledi kriterij manj nastalih odpadkov pri proizvodnji (povprečna ocena 3,41), zamenjava toksičnih in nevarnih snovi (povprečna ocena 3,34) in manjša raba energije v procesu izdelave (povprečna ocena 3,29). Kot najmanj pomembne kriterije so ocenili: uporabo materialov, ki jih je laže reciklirati, povečanje deleža recikliranih materialov, različne možnosti v zvezi z okoljskim optimiranjem embalaže in manjšo porabo vode med proizvodnim procesom. Voda ni potrebna pri vsakem tehnološkem procesu, kar je lahko vzrok, da je v kumulativnem povprečju ta kriterij manj pomemben, saj se z njim sreča le omejeno število podjetij. Vendar pa so kriteriju manjših emisij v vodo pripisali relativno veliko pomembnost (povprečna ocena 2,90).

Na prvi pogled se morda zdi presenetljivo, da je kriterij manjše porabe materiala tako pomemben za proizvodna podjetja v vzorcu. Toda to ugotovitev lahko povežemo s poročilom, pripravljenim pod okriljem Evropske komisije, o vedenju in odnosu evropskih malih in srednjih podjetij do razvoja in uvajanja ekoinovacij kot odgovor na vse višje cene naravnih virov oz. pomanjkanje le-teh (EC Survey 2011). Kar tri četrtine malih in srednjih podjetij v EU poroča, da

so se v zadnjih petih letih soočila s povišanjem materialnih stroškov. Ob tem je 26 % anketirancev izjavilo, da je bilo povišanje materialnih stroškov v njihovem podjetju dramatično visoko. Podatki so pokazali, da v Sloveniji 23 % malih in srednje velikih podjetij navaja dramatično povečanje, 43 % pa jih je poročalo o zmernem povečanju tovrstnih stroškov (prav tam). Poleg tega je skoraj 90 % podjetij navedlo, da predvidevajo povišanje cen materialov tudi v naslednjih 5 do 10 letih. S pomočjo teh spoznanj laže razumemo, zakaj so anketirana podjetja v naši raziskavi uvrstila kriterij zmanjšanja porabe materialov podjetja med najpomembnejše. Še posebej se je pomembnost tega kriterija pokazala pri podjetjih, ki proizvajajo električne aparate in kovinske proizvode (Radonjič idr. 2011).

Med rezultati naše raziskave velja opozoriti na podatek, da analizirana podjetja kriterije v povezavi z reciklažo ocenjujejo kot relativno manj pomembna pri razvoju proizvodov. Čeprav so morala proučevana podjetja že prej razviti lastno okoljsko politiko zaradi zahtev ISO 14001, reciklaža očitno še zmeraj ni med pomembnimi vidiki te politike. Primerjava rezultatov s slike 4 s tistimi, ki smo jih pridobili s prejšnjo študijo (Radonjič in Tominc 2006; Radonjič in Tominc 2007), v kateri smo proučevali vpliv in pomen certifikata ISO 14001 na uvajanje novih proizvodnih tehnologij v Sloveniji, kaže podobne rezultate: med osmimi okoljskimi indikatorji je bilo povečanje deleža recikliranih materialov v proizvodnem procesu na predzadnjem mestu. Kaže, da pomen reciklaže v zadnjih letih v certificiranih podjetjih v splošnem ni narasel. To je zanimivo, saj sta učinkovita raba materialov na enoto proizvoda in reciklaža odpadkov medsebojno povezani področji. Po drugi strani pa je res, da reciklirani materiali glede na svoje tehnične karakteristike marsikdaj še vedno zaostajajo za svežimi materiali, vendar je to odvisno od vrste materiala in kakovosti posameznih tokov odpadkov. Pomemben vpliv pri pospeševanju uporabe reciklatov imata tudi stopnja razvitosti reciklažne infrastrukture in trga sekundarnih surovin. Raziskava, ki

so jo opravili Babakri in sodelavci (2004) in ki je zajemala industrijska podjetja v ZDA, certificirana po ISO 14001, je pokazala, da lahko certifikat ISO 14001 izjemno pozitivno vpliva na učinkovitost reciklaže, kar kaže na to, da je učinkovitost okoljske politike v podjetjih v veliki meri odvisna tudi od dejanske notranje organiziranosti in zavezanosti vodstva z jasno zastavljenimi cilji in ne le od formalne pridobitve certifikata.

Rezultati, prikazani na slikah 3 in 4, predstavljajo povprečne vrednosti za vse predelovalne oz. industrijske panoge. Razumljivo je, da imajo industrijske panoge različne specifike ne le glede vplivov njihovih proizvodov na okolje, vrste uporabljenih surovin, materialov in tehnoloških procesov, ampak tudi glede zakonodajnih zahtev ter značilnosti trga za te proizvode. S podrobnejšo analizo rezultatov smo ugotovili tudi, da panoga elektro in elektronske industrije daje večini okoljskih kriterijev s slike 4 večjo prioriteto, kot je povprečje vseh odgovorov, medtem ko npr. podjetja v metalurški panogi dajejo večji poudarek uporabi recikliranih materialov v primerjavi s kumulativnimi povprečnimi rezultati. V prvem primeru lahko z večjo verjetnostjo trdimo, da je razlog tudi sprejeta in veljavna zakonodaja, ki že nekaj let zavezuje podjetja v elektronski in elektroindustriji k upoštevanju principov ekodizajna, medtem ko lahko v drugem primeru razloge iščemo v neposredni odvisnosti metalurških podjetij od primarnih surovin in rasti njihovih cen (Radonjič idr. 2011).

5.2 Pomen certifikata ISO 14001 za razvoj okolju primernejših proizvodov

Nekaj več kot 9 % certificiranih podjetij navaja, da je sistem okoljskega menedžmenta v skladu z zahtevami standarda ISO 14001 nujen pogoj za uspešno okoljsko načrtovanje proizvodov, medtem ko 38,2 % podjetij meni, da je ISO 14001 zelo uporabno orodje, in 47,3 %, da je koristno orodje. Le 5,5 % podjetij meni, da standard ISO 14001 pri

Slika 5: *Pomen standarda ISO 14001 za razvoj novih, okolju primernejših proizvodov v slovenskih proizvodnih podjetjih*
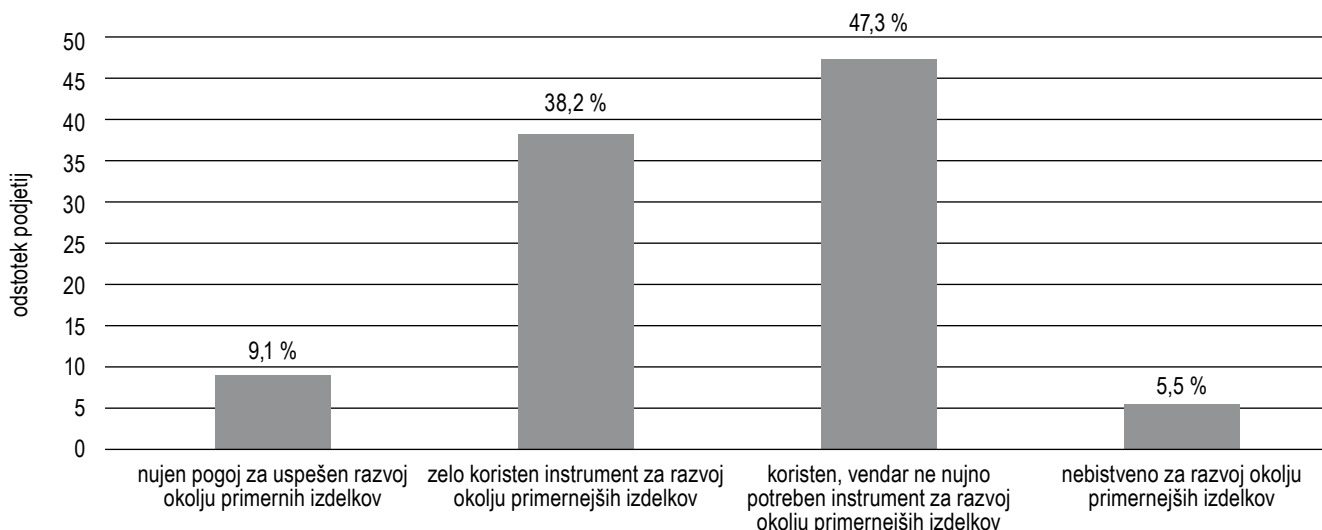
Slika 6: *Motivacijski dejavniki okoljskega oblikovanja (ekodizajna) proizvodov v slovenskih proizvodnih podjetjih*
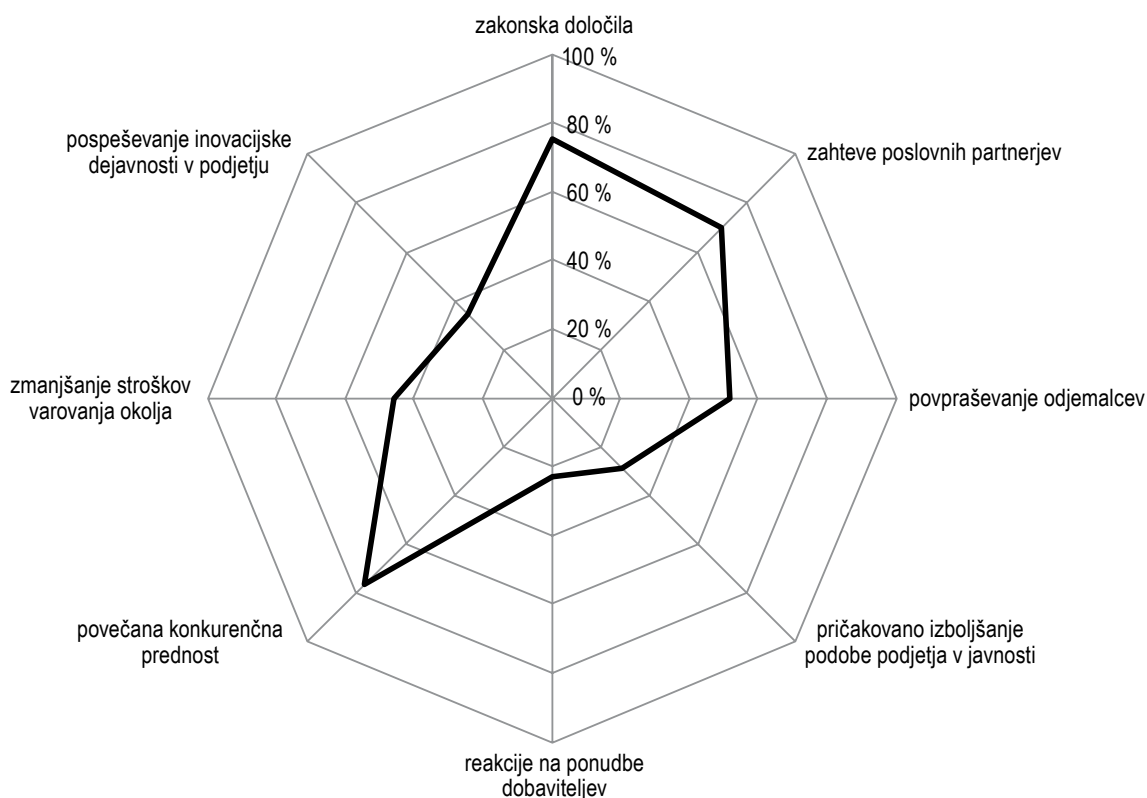
tem ni pomemben (slika 5). Razvoj proizvodov sicer ni eksplicitna zahteva standarda ISO 14001, a ta standard zagotavlja smernice za vpeljavo sistema okoljskega menedžmenta, ki v razširjeni obliki seveda lahko zajema tudi zasnovo in razvoj izdelkov. Kljub temu skoraj polovica analiziranih podjetij ocenjuje ISO 14001 le kot koristen, a ne nujno potreben instrument za vključevanje okoljskih vidikov v zasnovo izdelka. Poglobljena analiza rezultatov je pokazala, da vsa podjetja, ki navajajo ISO 14001 kot nujen pogoj za uspešno okoljsko zasnovo izdelkov, proizvajajo električno in elektronsko opremo oz. gospodinjske aparate (Radonjič idr. 2011). Večina podjetij, ki menijo, da je ISO 14001 zelo uporabno orodje, je iz metalurgije (62 %), medtem ko večina podjetij, ki menijo, da je ISO 14001 koristno orodje, sodi v kemijsko in sorodne industrije (89 %). Ob tem velja spomniti na rezultate predhodne raziskave, da so podjetja, ki so više ocenila pomen certifikata ISO 14001 za uvajanje oz. izboljševanje tehnologije, v povprečju tudi više ocenila njegov pomen za razvoj okolju primernejših proizvodov (Radonjič in Tominc 2006; Radonjič in Tominc 2007a).

Rezultati raziskav, ki so jih o podobnih temah objavili tuji avtorji, kažejo, da se lahko vpliv sistema okoljskega menedžmenta na inoviranje proizvodov zelo razlikuje. Rehfeld s sodelavci (2007) ter Ziegler in Rennings (2004) so ugotovili, da ima certificiranje sistema okoljskega menedžmenta velik pozitiven učinek na okoljske inovacije proizvodov in procesov v nemških podjetjih. Po drugi strani pa so Kautto (2006), Schylander in Martinuzzi (2007), Wagner (2008) ter Johnstonne in Labonne (2009) odkrili

šibkejšo povezavo med certifikatom ISO 14001 in ekoinovacijami proizvodov. Kautto (2006) opisuje primer finske električne in elektronske industrije, ki sta sicer v inovativnosti med vodilnimi panogami v državi in svetu, a je več kot 83 % anketirancev odgovorilo, da sistem okoljskega menedžmenta ni bistven pri razvoju proizvodov, saj menijo, da je preveč splošen in osredotočen na procese v primerjavi z izjemno dinamično naravo razvoja proizvodov. To spoznanje ni v skladu z mnenjem v analiziranih podjetjih v Sloveniji. Omenjene tuje študije ocenjujejo, da je namesto neposrednega in jasnega vzročnega odnosa med vpeljanim sistemom okoljskega menedžmenta na eni strani in ekoinovacijskimi dejavnostmi na drugi odnos med njima kompleksnejši in bolj dinamičen kot pri posodabljanju tehnoloških procesov. So pa objavljeni rezultati specifični za posamezno državo in panogo, zato so potrebne nadaljnje raziskave, da bi lahko bolje razumeli razlike tudi med posameznimi panogami.

5.3 Motivacijski in oviralni dejavniki razvoja okolju primernejših proizvodov (ekodizajna)

Na razvoj okolju primernejših proizvodov (ekodizajn) v podjetjih vplivajo razni motivacijski in oviralni dejavniki. Na sliki 6 so prikazani motivacijski dejavniki, ki jih pri aktivnostih ekodizajna zaznavajo slovenska certificirana proizvodna podjetja. Največ podjetij (76,8 %) meni, da je povečanje konkurenčnosti najvplivnejši motivacijski dejavnik. Drugi najpogosteje omenjeni motivacijski dejavnik so zakonska določila (75,0 %), sledijo pa zahteve

poslovnih partnerjev (69,6 %) in povpraševanje odjemalcev (51,8 %). Po drugi strani so podjetja redkeje omenjala naslednje motivacijske dejavnike: pospeševanje inovacijske dejavnosti v podjetju (33,9 %), pričakovano izboljšanje podobe podjetja v javnosti (28,6 %) in odziv na ponudbo dobaviteljev (23,2 %). Rezultati jasno kažejo, da imajo tržni dejavniki skupaj z zakonskimi določili pomembno vlogo pri dejavnostih ekodizajna proizvodov. Kot smo že omenili, podjetja, zajeta v vzorec, delujejo predvsem na tujih trgih z drugimi evropskimi in globalnimi proizvajalci. Poleg tega okoljevarstvena zakonodaja EU prehaja od osredinjanja na zahteve za tehnološke procese na zahteve za končne proizvode. V razvitih državah se je ta trend začel že pred časom. Tako je npr. v raziskavi 300 proizvodnih podjetij na Švedskem v začetku devetdesetih let le nekaj podjetij izjavilo, da so tržni dejavniki zanje pomembni, pet let kasneje pa je najmočnejši dejavnik postalo prav povpraševanje odjemalcev po okolju primernejših proizvodih (Markusson 2001). Podobno sta van Hemel in Cramer (2002) analizirala uvajanje ekodizajna proizvodov v nizozemskih malih in srednje velikih podjetjih. Na podlagi analize 77 podjetij sta ugotovila, da so notranji dejavniki, npr. bolj pospešeno iskanje novih tržnih priložnosti in zniževanje stroškov, pomembnejši od zunanjih motivacijskih dejavnikov, kot je npr. zakonodaja. Ne glede na to pa upoštevanje okoljskih predpisov v splošnem ostaja eden ključnih motivacijskih dejavnikov ekoinoviranja v okoljsko proaktivnih in kreativnih podjetjih (Reid in Miedzinski 2008), kar je potrdila tudi naša raziskava.

Povprečni rezultati kažejo, da aktivnosti v povezavi z ekodizajnom proizvodov ne pospešujejo v večji meri inovacijske dejavnosti. Le 33,9 % podjetij je namreč povedalo, da se jim to zdi pomemben motivacijski dejavnik. V tem primeru tudi nismo zaznali razlik med tremi najbolj zastopanimi panogami v raziskavi (Radonjič idr. 2011). To je do neke mere presenetljivo, saj Evropska komisija začenja Akcijski načrt za ekoinovacije, ki naj bi pomenile enega izmed stebrov tehnološkega in gospodarskega razvoja EU v prihodnjem obdobju (Evropska komisija 2011). V nasprotju z odgovori slovenskih anketiranih podjetij sta van Hemel in Cramer (2002) v svoji študiji, v katero so bila vključena nizozemska mala in srednja podjetja, ugotovila, da so najvplivnejši notranji dejavnik ekodizajna zanje prav inovacijske priložnosti, ki jim sledijo možnosti povišanja ravni kakovosti obstoječih proizvodov. Tudi za nemška podjetja je imelo vključevanje koncepta okoljskega življenjskega cikla v načrtovanje proizvodov v podjetjih, certificiranih po ISO 14001 in EMAS, očiten pozitivni učinek na ekoinoviranje (Ziegler in Rennings 2004). Razlogov, zakaj slovenska proizvodna podjetja v povprečju ne povezujejo ekodizajna z inovacijsko dejavnostjo, čeprav na drugi strani zaznavajo konkurenčno prednost ekodizajna kot enega najpomembnejših motivacijskih dejavnikov, na osnovi doslej dobljenih

Slika 7: *Oviralni dejavniki okoljskega oblikovanja (ekodizajna) proizvodov v slovenskih proizvodnih podjetjih*
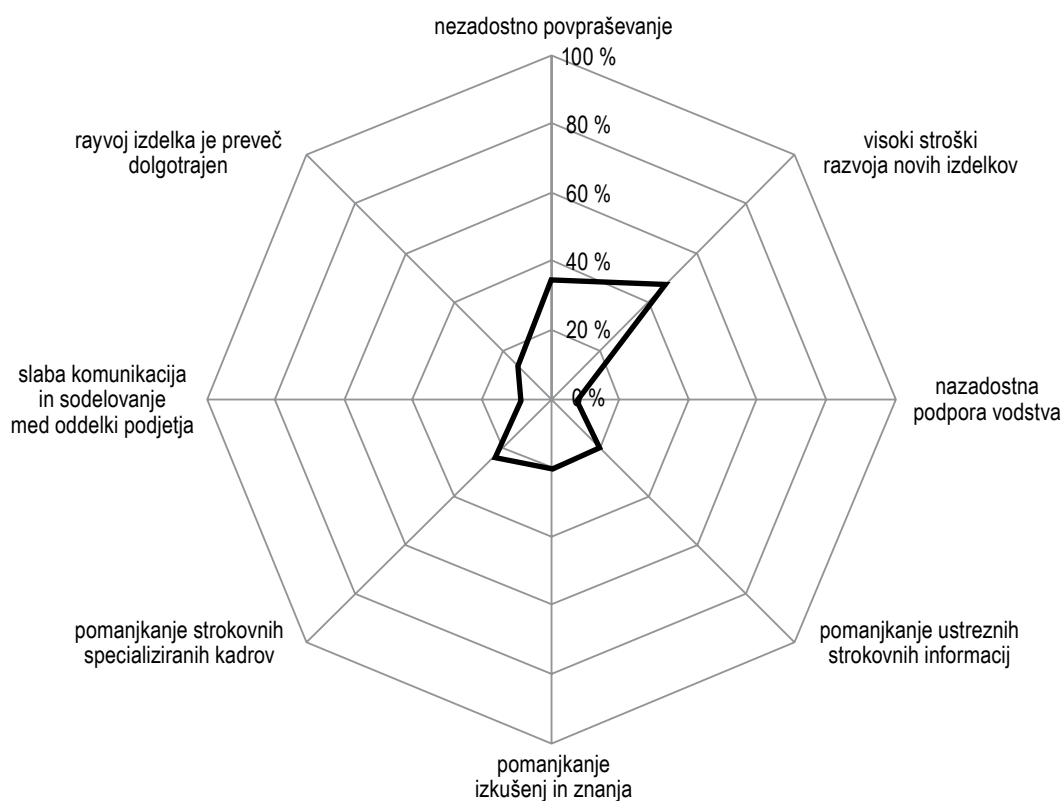
rezultatov ni možno našteti in jih bo treba ugotoviti z nadaljnjimi raziskavami.

Na sliki 7 so prikazani oviralni dejavniki, s katerimi se podjetja srečujejo v procesu razvoja okolju primernejših proizvodov. Največji odstotek podjetij (48,2 %) za najvplivnejši oviralni dejavnik ekodizajna navaja previsoke stroške takšnega razvoja, sledi nezadostno povpraševanje na trgu (35,7 %) in pomanjkanje strokovnih specializiranih kadrov (23,2 %). Izkušnje slovenskih podjetij, ki so svojo konkurenčno prednost gradila z okolju primernejšimi proizvodi, kažejo, da je bil ta način v preteklosti uspešnejši na trgih razvitih držav, medtem ko domači potrošniki še niso bili pripravljeni kupovati več tovrstnih proizvodov (Bastič 2002), čeprav danes tudi slovenski potrošniki vse bolj prepoznavajo pomen okolju primernejših proizvodov (Maletič idr. 2010). Tudi izkušnje v nekaterih razvitih državah potrjujejo,

da so za tesnejšo povezavo okoljskega upravljanja in razvoja okolju primernejših proizvodov marsikdaj odločilne prav zahteve in odziv potrošnikov (Charter in Tischner 2001; van Hemel in Cramer 2002). Nezadostna podpora vodstva podjetja je navedena kot najmanj vpliven oviralni dejavnik (slika 7). Le 19,6 % podjetij meni, da njihove aktivnosti v okviru ekodizajna ovira pomanjkanje izkušenj in znanja ali pomanjkanje ustreznih strokovnih informacij (19,7 %), le 14,3 % podjetij pa meni, da je razvoj izdelkov preveč dolgotrajen. Slednje je zanimivo, ker drugi avtorji poročajo nasprotno, da je namreč prav dolgotrajnost razvoja proizvodov eden najvplivnejših dejavnikov v procesu tehnološkega inoviranja (Fiksel 1996; Charter in Tischner 2001).

V mednarodnem merilu je bilo v preteklih letih objavljenih več študij s poudarkom na motivacijskih in oviralnih dejavnikih v podjetjih, ki uporabljajo pristope ekodizaj-

Tabela 3: *Primerjava motivacijskih in oviralnih dejavnikov pri razvoju okolju primernejših proizvodov*

Študija	MOTIVACIJSKI DEJAVNIKI[1]	OVIRALNI DEJAVNIKI[2]	VRSTA PODJETJA
Radonjič in Pisnik	• povečanje konkurenčnosti • zakonska določila • zahteve poslovnih partnerjev	• previsoki stroški razvoja • nezadostno povpraševanje na trgu • pomanjkanje specializiranih kadrov	srednja in velika v Sloveniji
Tukker idr. (2000)	• stroški odpadkov • priložnosti na trgu • zahteve odjemalcev	• stroški razvoja • ozaveščenost trga • čas razvoja	mala in srednja (EU-15)
van Hemel in Cramer (2002)	zunanji dejavniki: • povpraševanje odjemalcev • zakonodaja • sektorske iniciative notranji dejavniki: • pospeševanje inovacijske dejavnosti • izboljšanje kakovosti izdelka • bolj pospešeno iskanje novih trgov	• nizko zaznavanje okoljske problematike • nobenih jasnih okoljskih prednosti za podjetje • nobene alternativne rešitve na voljo	mala in srednja (Nizozemska)
Belmane idr. (2003)	• zakonska določila • povpraševanje na trgu • zmanjšanje stroškov	• pomanjkanje informacij na trgu • omejitve lokalnega trga • previsoki stroški razvoja	osredotočenost na večja podjetja (Litva, Latvija, Estonija)
Tien idr. (2005)	• povpraševanje odjemalcev • vladne politike • zahteve dobavitelja	• ni specificirano	ni specificirano (Tajvan)
Reyes idr. (2006)	• definiranje jasne okoljske politike za proizvode • nizka sinergija z deležniki • razlikovanje od konkurence	• nezadostna predanost vodstva podjetja • upiranje spremembam • pomanjkanje delitve odgovornosti	ni specificirano (Francija)
Woolman in Veshagh (2006)	• okoljski predpisi • konkurenčnost • znižanje stroškov	• dolgo obdobje odplačevanja/ visoki stroški • pomanjkanje kapitala za investicije • pomanjkanje povpraševanja odjemalcev	mala in srednja (Velika Britanija)
Boks (2006)	• prilagojena orodja, smernice in standardi za ekodizajn • integracija okoljskih problemov v vse poslovne dejavnosti • predanost in podpora vodstva	• pomanjkanje povpraševanja na trgu • vrzel med predlagatelji in izvajalci • organizacijska kompleksnost	multinacionalke s področja elektronike (Japonska, Južna Koreja)
Reid in Miedzinski (2008)	• izboljšana podoba podjetja • okoljski predpisi • varni obstoječi trgi	• previsoki inovacijski stroški • pomanjkanje primernih finančnih sredstev • prevelika ocenjena ekonomska tveganja	ni specificirano (države EU)
Evropska komisija (2011)	• pričakovano povišanje cene energije v prihodnje • trenutne visoke cene energije • trenutne visoke cene materiala (EU-27), dobri poslovni partnerji (Slovenija)	• pomanjkanje sredstev v podjetju • nejasne zahteve trga (EU-27), nezadosten dostop do obstoječih subvencij (Slovenija) • predolgo obdobje odplačevanja za ekoinovacije (EU-27), negotova dobičkonosnost investicij (Slovenija)	mala in srednja (države EU)

[1] Trije najpomembnejši motivacijski dejavniki, ugotovljeni v raziskavi.

[2] Trije najpomembnejši oviralni dejavniki, ugotovljeni v raziskavi.

na oz. razvoja okolju primernejših proizvodov. V tabeli 3 so primerjalno prikazane ugotovitve, povezane z motivacijskimi in oviralnimi dejavniki ekodizajna proizvodov v različnih državah in obdobjih, vključno z našimi ugotovitvami. Za vsako navedeno referenco so predstavljeni trije najpomembnejši motivacijski in oviralni dejavniki. Splošna ugotovitev je, da podjetja v različnih državah v osnovi zaznavajo podobne oviralne dejavnike pri razvoju okolju primernejših proizvodov in da o teh dejavnikih poročajo daljši čas, tj. v desetletnem obdobju.

## 5.4 Viri informacij o ekodizajnu proizvodov

Anketirana podjetja so lahko izbrala hkrati med več odgovori o virih informacij o ekodizajnu. Za 76,8 % podjetij so glavni vir informacij o razvoju okolju primernejših proizvodov njihove stranke in kupci. Nadalje je 66,1 % podjetij kot vir informacij navedlo dobavitelje materialov in sestavnih delov, 64,3 % konference in sejme, 57,1 % podjetij pa internet. Po drugi strani so viri informacij, ki jih je navedlo najmanj podjetij, naslednji: sodelovanje z javnimi raziskovalnimi inštituti (16,1 %), dobavitelji strojne opreme (25 %) ter strokovna in panožna združenja (28,6 %). Dobljeni odgovori deloma sovpadajo s spoznanji, prikazanimi na sliki 6, o motivacijskih dejavnikih ekodizajna. Zahteve poslovnih partnerjev in povpraševanje odjemalcev predstavljajo pomembne motivacijske dejavnike in so, kot kaže, obenem za podjetja tudi najpomembnejši vir informacij. Čeprav je razumljivo, da so tovrstne zahteve zelo pomembne in jih je treba implementirati v proizvode, pa ostaja vprašanje, v kolikšnem obsegu lahko kupci oz. stranke anketiranim podjetjem zares posredujejo informacije v povezavi z okoljskimi življenjskimi cikli, kar je jedro sodobnega ekodizajna. Ker se zakonodajne zahteve ves čas zaostrujejo, je čakanje podjetij, da bodo informacije o novih zahtevah prispevali njihove stranke in kupci, razvojno vprašljivo. Kot je bilo pojasnjeno v drugem poglavju, je pričakovati, da bo koncept okoljskega življenjskega cikla v prihodnje pridobival zakonodajni in tržni pomen. Samo podjetja, ki bodo na to pripravljena, bodo tudi v prihodnje hitreje odgovorila ne le na zahteve svojih odjemalcev, ampak tudi zakonodajalcev. Dejstvo je tudi, da informacije o ekodizajnu v razvitejših državah marsikdaj zbirajo in posredujejo preko panožnih združenj (nacionalnih in mednarodnih) ali pa jih podjetja iščejo v okviru specializirane programske opreme, ki je za tuja podjetja marsikje dodaten pomemben podporni element ekodizajna. Tovrstnih pristopov v primeru slovenskih proizvodnih podjetij iz odgovorov ni zaznati oz. je ta vir informacij po pomembnosti bistveno nižji.

6 Sklep

Osnovna zamisel okoljskega načrtovanja proizvodov (ekodizajn) je, da z izboljšanim načrtovanjem (zasnovo) zmanjšujemo njihove vplive na okolje v celotnem okoljskem življenjskem ciklu. Z raziskavo smo želeli ugotoviti: (a) katere okoljske vidike vključujejo slovenska srednja in velika certificirana proizvodna podjetja v razvoj njihovih proizvodov in kakšne prioritete jim dajejo, (b) koliko certifikat ISO 14001 za sistem okoljskega menedžmenta pripomore k razvoju okolju primernejših proizvodov oz. vpliva nanj, (c) kateri so motivacijski in oviralni dejavniki pri tovrstnem razvoju in (d) kje podjetja pridobivajo informacije za ekodizajn svojih proizvodov.

Slika 8: *Najpogosteje uporabljeni viri informacij za ekodizajn v slovenskih proizvodnih podjetjih*
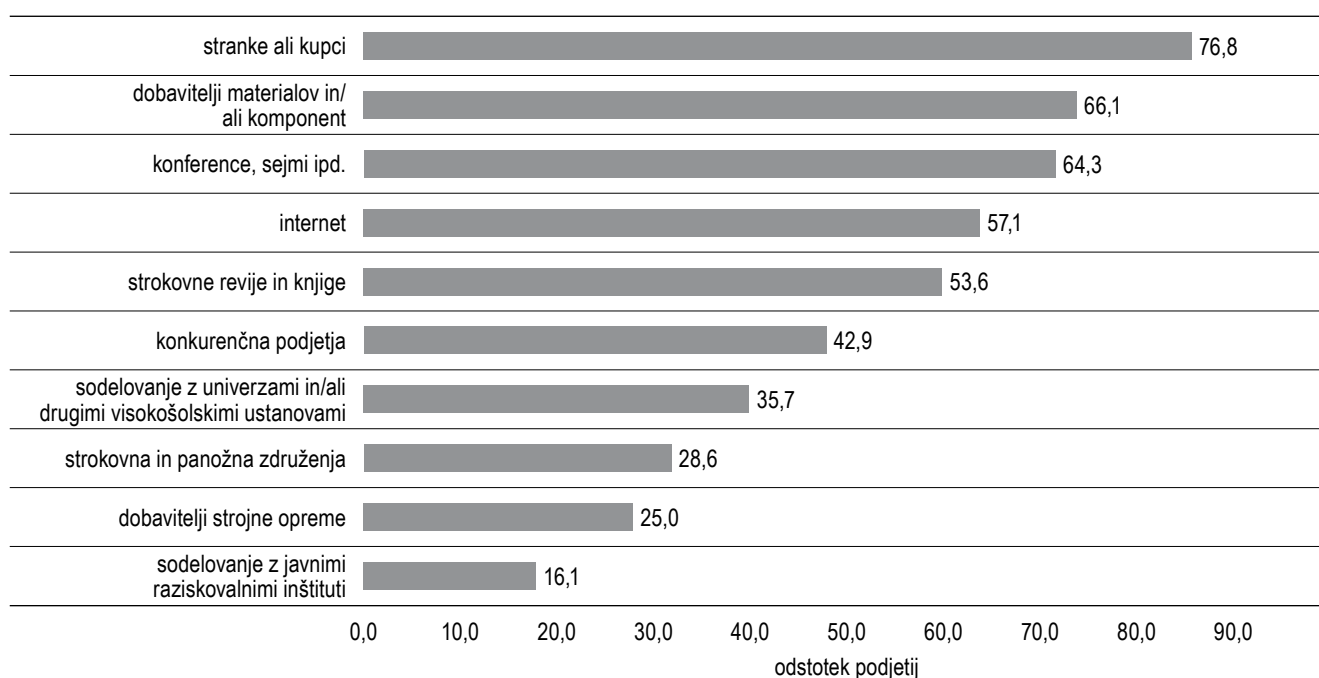
Proučevana podjetja največ pozornosti pri razvoju proizvodov namenijo zmanjšanju količin trdnih odpadkov in rabe energije med proizvodnjo, zmanjšanju porabe materialov na enoto izdelka, zmanjšanju emisij v zrak ter v vodo in zamenjavi toksičnih in nevarnih snovi. Ne glede na razvoj zakonodaje EU in spremembe na mednarodnih trgih dobljeni odgovori nakazujejo, da veliko podjetij na obvladovanje vplivov svojih proizvodov na okolje gleda relativno ozko, tj. osredinjajo so bolj na aktivnosti v povezavi s proizvodnimi procesi. Slovenska certificirana proizvodna podjetja zaznavajo kriterij zmanjšanje porabe materialov na enoto proizvoda kot najpomembnejšega v povezavi z okoljsko primerno zasnovo proizvodov. Ob tem očitno manj pozornosti namenjajo vprašanjem, ki se nanašajo na druge faze okoljskega življenjskega cikla, npr. na ravnanje z odpadki, vključno z reciklažo. Med kriterije z manjšo pomembnostjo se uvršča tudi optimiranje embalaže. Ta spoznanja so v marsičem v nasprotju s trendi v razvitejših državah in z usmeritvami okoljske politike ter zakonodaje EU. Slednja se namreč od procesov vedno bolj preusmerja prav v proizvode. Razlogi za takšno situacijo v slovenskih proizvodnih podjetjih, certificiranih po ISO 14001, zahtevajo dodatno proučevanje v prihodnje, čeprav je res, da razvoja proizvodov praviloma niti ni mogoče realizirati brez sodobne tehnologije. Ob tem velja poudariti, da je uspešen razvoj okolju primernejših proizvodov največkrat kompleksnejši proces kot organiziranje sistematičnih izboljšav v proizvodnji, saj praviloma vključuje sodelovanje več podjetij, ki so vključena v različnih fazah okoljskega življenjskega cikla proizvoda (proizvajalci in dobavitelji osnovnih ter pomožnih materialov, sestavnih delov, embalaže idr.), kakor tudi tesno sodelovanje različnih oddelkov v posameznem podjetju, npr. prodajno-marketinškega, nabavnega in drugi (Reijnders 1996).

Dobljeni rezultati kažejo, da večina slovenskih srednjih in velikih proizvodnih podjetij meni, da je standard ISO 14001 zelo koristen oz. koristen in da jim lahko pomaga pospešiti dejavnosti v povezavi z ekodizajnom. Rezultati so do neke mere presenetljivi, če jih primerjamo z ugotovitvami iz nekaterih drugih držav, ki so navedene v poglavju 2.3. Rezultati primerljivih študij namreč nakazujejo na raznovrstno dojemanje pomena standarda ISO 14001 pri razvoju okolju primernejših proizvodov. Enega izmed razlogov lahko verjetno najdemo tudi v dejstvu, da standard ISO 14001 eksplicitno ne predpisuje ekodizajna proizvodov. Vendar pa dodatna spoznanja naše raziskave (o kateri smo poročali drugje, npr. Radonjič idr. 2011) kažejo, da podjetja, ki so si pridobila certifikat v skladu z zahtevami standarda ISO 14001, uspešneje in intenzivneje razvijajo okolju primernejše proizvode (tj. upoštevajo več kriterijev in dajejo večji pomen reciklaži) v primerjavi s tistimi podjetji, ki imajo certifikat krajši čas. Podoben trend so za ameriška podjetja ugotovili Babakri idr. (2004). Osredinjanje zmanjševanja vplivov tehnoloških procesov na okolje v podjetju je marsikdaj značilno za okoljske politike v zgodnejših fazah njene implementacije. Iz rezultatov anketne raziskave je možno zaznati tudi, da podjetja sicer trdijo, da

uporabljajo smernice sodobnega ekodizajna proizvodov, a se iz odgovorov zdi, da so to pogosto le lokalno omejeni pristopi, ki ne temeljijo na celotnem življenjskem ciklu izdelka, kar je temelj sodobnega ekodizajna proizvodov. Možno je, da slovenska podjetja različno tolmačijo pojem ekodizajn proizvodov in s tem razumevanje njegovega dejanskega koncepta. Da je (bil) ta problem dejansko prisoten tudi v tujih podjetjih, so opozorili že Baumann idr. (2002).

Slovenska srednja in velika proizvodna podjetja zaznavajo motivacijske in oviralne dejavnike podobno kot podjetja v drugih državah. Motivacijski dejavniki zajemajo sklop tržnih in zakonodajnih vidikov, kot so povečana konkurenčna prednost, zakonska določila in predpisi in zahteve poslovnih partnerjev. Primerjava rezultatov je pokazala, da tuja podjetja pogosteje zaznavajo tržno povpraševanje po okolju primernejših proizvodih kot pomemben dejavnik v primerjavi z anketiranimi slovenskimi podjetji. Izrazito najpomembnejši oviralni dejavnik pa proučevana slovenska podjetja vidijo v previsokih stroških razvoja, kar je podobno kot v drugih državah.

V zvezi z rezultati velja omeniti tudi nekaj omejitev, ki izhajajo iz vzorca podjetij. Slovenija je sicer majhno gospodarstvo z velikim deležem majhnih in mikro podjetij, ki pa iz že navedenih razlogov niso bila vključena v raziskavo. S tega vidika rezultatov raziskave ne moremo posplošiti na vsa proizvodna podjetja v Sloveniji, certificirana po ISO 14001, čeprav je vzorec srednje velikih in velikih podjetij reprezentativen. V prihodnje bi lahko podobna raziskovalna vprašanja zastavili tudi menedžerjem v malih in mikro podjetjih ter ugotavljali razlike in podobnosti z rezultati te raziskave. Čeprav je bil eden ključnih namenov raziskave ugotoviti vlogo certifikata v skladu z zahtevami standarda ISO 14001 pri načrtovanju okolju primernejših proizvodov, pa je eno izmed pomembnejših vprašanj tudi, kako intenzivno uvajajo koncept ekodizajna proizvodov v necertificiranih podjetjih.

Dobljeni rezultati so specifični za slovensko gospodarstvo. Raziskava je bila izvedena v podjetjih, ki poslujejo v različnih industrijskih panogah, med katerimi je veliko strukturnih razlik (velikost, panoga, tržna orientacija, značilnosti proizvodov, uporabljeni materiali idr.). Podjetja v posameznih panogah se prav tako soočajo z različnimi pravnimi in tržnimi zahtevami. Proizvajalci električnih in elektronskih polproizvodov in komponent za končne proizvajalce vidijo npr. zahteve trga drugače kot proizvajalci bele tehnike. Zato so naši rezultati splošni in nakazujejo le povprečne trende. Poleg tega lahko druge ovire, npr. višje cene določenih skupin proizvodov, igrajo dodatno vlogo pri tem, da tovrstni izdelki intenzivneje ne prodrejo na trg (Rehfeld idr. 2007). Zaradi tega je pomembno najti kompromisne rešitve z drugimi pomembnimi karakteristikami kakovosti proizvodov, kot so npr. oblika, cena in delovanje (funkcionalnost), ki jih v pomembni meri zaznavajo odjemalci in trg. Zgolj vključevanje novih znanstvenih in tehničnih rešitev pri razvoju proizvodov ne bo zadostovalo za tržni uspeh. Omeniti velja tudi, da med določenimi

panogami obstajajo očitne razlike v prioritetah pri upošte-vanju okoljskih kriterijev ekodizajna njihovih proizvodov (Radonjič idr. 2011). Da bi lahko še bolje razumeli pove-zanost med upoštevanjem različnih okoljskih kriterijev ter motivacijskimi in oviralnimi dejavniki, pa bodo potrebne nadaljnje raziskave (tudi znotraj posameznih panog).

Posebno vprašanje je, ali podjetja dejansko poznajo sodobne smernice ekodizajna, temelječega na analizi celotnega okoljskega življenjskega cikla. Dosedanje osebne izkušnje pri kontaktih in sodelovanju avtorjev raziskave s podjetji namreč marsikdaj kažejo prav obratno sliko, in sicer soočanje z nezadostnim poznavanjem koncepta eko-dizajna ter podpornih metodoloških orodij, kar pa bo treba v prihodnje preveriti na statistično značilnem vzorcu podjetij. Baumann in sodelavci (2002) so v svoji obsežni pregledni študiji opozorili, da je ena izmed zaznavnejših težav pri razvoju okolju primernejših proizvodov prav po-manjkanje razumevanja, kako je neko podjetje sploh v in-terakciji z drugimi podjetji v proizvodni verigi oz. kako proizvodi vplivajo na okolje, ko pridejo na trg, med uporabo ter po uporabi. Z drugimi besedami, za resnično učinkovit sodobni ekodizajn ni dovolj spremeniti le določenih vidikov v okviru dejavnosti končnega proizvajalca znotraj podjetja, ampak se celovitejši učinki dosegajo z odločitvami, ki nujno vključujejo več akterjev v celotni proizvodni verigi. Kot katero koli drugo metodološko oz. inženirsko orodje pa tudi koncept ekodizajna zahteva jasno podporo vodstva podjetja. Ob tem so pomembna podporna orodja za ekodizajn (npr. metoda LCA), in sicer zato, ker z njimi identificiramo najv-plivnejše faze v okoljskih življenjskih ciklih proizvodov ter celovito kvantificiramo vplive na okolje. To pa pomeni, da se z njihovo pomočjo podjetja lažje in natančneje odločajo, kateri so dejansko najvplivnejši okoljski kriteriji ekodizaj-na, ki kažejo na to, kam je treba usmeriti razvoj.

Zahvala

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VPLIV DEJAVNIKOV VODITELJSTVA NA UVAJANJE OKOLJSKE SESTAVINE TRAJNOSTNEGA RAZVOJA V ORGANIZACIJO

The Impact of Leadership Factors on Deployment of Environmental Component of Sustainable Development in the Organization

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Izvleček

V prispevku prikazujemo rezultate raziskave, v okviru katere smo proučevali vpliv dejavnikov voditeljstva vrhnjih menedžerjev na uvajanje okoljske sestavine trajnostnega razvoja – standarda ISO 14001:2004 v velikih slovenskih organizacijah. Kvantitativna raziskava temelji na 96 pravilno izpolnjenih vprašalnikih. Ugotovili smo, da so prevladujoči dejavniki voditeljstva, ki pozitivno vplivajo na uvajanje okoljske sestavine trajnostnega razvoja v organizacijo in na katere morajo biti vrhnji menedžerji še bolj pozorni, naslednji: vizija, kredibilnost, sodelovanje, odgovornost in usmerjenost k dejanjem.

Ključne besede: raziskava, ISO 14001:2004, okoljska sestavina trajnostnega razvoja, voditeljstvo

Abstract

The paper presents the results of the research in which the impact of leadership factors on deployment of environmental components of sustainable development (standard ISO 14001:2004) in large Slovenian organizations was studied. Quantitative research was designed based on 96 fully completed questionnaires. The results indicated that the dominant leadership factors positively affecting the implementation of the environmental component of sustainable development in organizations, to which managers should give more attention, are vision, credibility, cooperation, responsibility, and orientation to action.

Keywords: ISO 14001:2004, environmental component of sustainable development, leadership

1 Uvod

V zadnjih dveh desetletjih se je popularnost koncepta trajnostnega razvoja intenzivno povečevala. Verjetno je prvi razlog za to vse večja ozaveščenost ljudi o nevarnostih, ki pretijo naravnemu in s tem tudi družbenemu okolju. Drugi razlog je širitev paradigme trajnostnega razvoja onkraj okoljskih tematik (vključitev različnih socialnih in gospodarskih dejavnikov), tretji razlog pa je ugotovitev, da je paradigma vedno bolj prevladujoče delničarske vrednosti pri korporativnem obvladovanju (upravljanju in menedžmentu) neustrezna za soočenje s trenutnimi

družbenimi izzivi (Vitols 2009, 2). Trajnostna paradigma narekuje drugačne smernice razvoja – razvoja, ki omogoča zadovoljevanje potreb današnjih generacij, ne da bi omejeval možnosti prihodnjih pri vsaj enako uspešnem zadovoljevanju njihovih potreb (prirejeno po Friedl 2010, 32). Tudi Plut (2008, 68) poudarja, da naj bi trajnostni razvoj prihodnjim generacijam zapuščal enako ali po možnosti povečano zalogo okoljskega (naravnega), gospodarskega (fizičnega) in človeškega ter družbenega kapitala.

Evropska komisija je leta 2002 sprejela Strategijo trajnostnega razvoja Evropske unije, v kateri predstavlja dolgoročno politiko in ukrepe na vseh treh sestavinah trajnostnega razvoja, družbeni, ekonomski in okoljski (Kralj 2010, 732). V Republiki Sloveniji in tudi v drugih državah Evropske unije se načela trajnostnega razvoja postopno uresničujejo, vendar ob ohranjanju slabosti in neravnovesij pri vseh treh njegovih sestavinah (Fink-Babič 2006, 314). Iz neravnovesja najbolj izstopa okoljska sestavina, saj pospešen gospodarski razvoj povečuje pritiske na okolje, kar ni v skladu s temeljnimi cilji trajnostnega razvoja (Vendarmin 2007, 1).

Smernice uspešnega delovanja – delati prave stvari na pravi način, ob pravem času ter na pravem mestu – narekujejo organizacijam pot do poslovne uspešnosti. Mednje sodi tudi standard ISO 14001:2004 Sistemi ravnanja z okoljem – Zahteve z navodili za uporabo (v angleščini: ISO 14001:2004 Environmental management systems – Requirements with guidance for use; v nadaljevanju: ISO 14001:2004). Strašek (1998, 10) navaja, da postaja sistem ravnanja z okoljem pomemben dejavnik pri načrtovanju razvoja organizacij. V organizacijah, v katerih se tega ne bodo pravočasno zavedali, bodo v bližnji prihodnosti obsojeni na stagnacijo, saj ne bodo mogli več poslovati in biti konkurenčni na zahtevnejših tržiščih. Tudi Biloslavo (2010, 4–5) poudarja, naj bi v organizacijah v prihodnje – če bodo želeli postati resnično trajnostno usmerjeni – gradili na novi strateški viziji, ki bo istočasno spodbujala dvig kakovosti ekosistema in družbene blaginje in na ta način zagotavljala dolgoročno preživetje organizacije.

Sistem ravnanja z okoljem naj bi sodil v samo jedro poslovne politike organizacij in njihovega preoblikovanja (Fink-Babič 2006, 317). Dolgoročni uspeh zahteva integracijo trajnostnega razvoja in s tem tudi njegove okoljske sestavine v vizijo, poslanstvo, smotre, cilje in strategijo ter v filozofijo organizacije kot formalno obliko kulture organizacije. Glavni nosilci teh prizadevanj naj bi bili vrhnji menedžerji v organizacijah, saj so, kot navaja Kralj (2001, 122), prav oni snovalci trajnosti v okviru politike organizacije. Brez njihovega zanimanja, soglasja in aktivne podpore ni mogoče učinkovito uvajati in vzdrževati sistema ravnanja z okoljem. Uspešnost implementacije sistema naj bi bila tudi naloga vsakega zaposlenega sodelavca, z jasno določenimi zahtevami, ki naj bi jih vrhnji menedžerji izrazili in pokazali (Pribaković-Borštnik, Zornik in Žagar 2004, 73).

Uvajanje trajnostnega razvoja in z njim povezanega sistema ravnanja z okoljem je za nekatere vrhnje menedžer-

je nov izziv, vendar pri mnogih ostaja le osnutek in teorija (Potočan in Mulej 2003, 3; IISD 2010). To nakazujejo tudi podatki podjetja SAM Indexes (2010a; 2010b), saj samo 10 % od skupaj 2.500 največjih organizacij na svetu temelji na vseh treh kriterijih trajnostnega razvoja, v Evropi pa le 20 % od skupaj 600 največjih organizacij. Kar zadeva mednarodni standard ISO 14001:2004, ima v Evropi po zadnjih podatkih iz leta 2009 dobrih 40 % organizacij pridobljen certifikat (ISO 2009). Po podatkih Gospodarske zbornice Slovenije (2011) se je v Republiki Sloveniji – z omejitvijo na velike organizacije – od leta 2006, ko je začel veljati standard in s tem pridobivanje certifikata po ISO 14001:2004, do konca leta 2010 delež pridobljenih certifikatov po ISO 14001:2004 povečal samo za 34 %, in sicer 8 % leta 2006, 11 % leta 2007, 4 % leta 2008, 7 % leta 2009 in 4 % leta 2010. Slednje ne nakazuje (morda pričakovane) eksponentne rasti glede na to, da naj bi Strategija trajnostnega razvoja Evropske unije in Strategija razvoja Slovenije, ki je obenem tudi Strategija trajnostnega razvoja (sprejeta leta 2005), priznavali napredovanje na vseh sestavinah trajnostnega razvoja.

Zaradi navedenega smo izvedli raziskavo problematike z vidika voditeljstva vrhnjih menedžerjev na področju okoljske sestavine trajnostnega razvoja v velikih slovenskih organizacijah ter oblikovali predloge za izboljšanje ugotovljenega stanja.

V prispevku se osredotočamo zgolj na analizo vpliva dejavnikov voditeljstva vrhnjih menedžerjev (vizije, kredibilnosti, sodelovanja, povratne informacije in priznanja, odgovornosti, komunikacije in usmerjenosti k dejanjem; Krause 2005, 48) na uvajanje okoljske sestavine trajnostnega razvoja – standarda ISO 14001:2004 v velikih slovenskih organizacijah. Ob tem izpostavimo in testiramo tudi dve raziskovalni hipotezi:

H1: *Vizija in usmerjenost k dejanjem vrhnjih menedžerjev imata pozitiven vpliv na uvajanje standarda ISO 14001:2004 v velikih slovenskih organizacijah.*

H2: *Sodelovanje vrhnjih menedžerjev z zaposlenimi ima pozitiven vpliv na uvajanje standarda ISO 14001:2004 v velikih slovenskih organizacijah.*

2 Metodologija

2.1 Ciljna populacija

V raziskavo smo vključili velike slovenske organizacije (z več kot 250 zaposlenimi), ki so bile evidentirane v poslovnem imeniku BIZI na dan 8. 11. 2010 kot delujoči subjekt. Teh je bilo 321, kar predstavlja ciljno populacijo.

2.2 Metoda zbiranja podatkov

Pri zbiranju podatkov smo se odločili za kvantitativno metodo anketiranja. Kot tehniko anketiranja smo izbrali anketiranje po elektronski pošti, saj smo pričakovali približno enako odzivnost kot pri anketiranju po klasični pošti, po kateri povprečno odgovori od 20 do 40 % anketirancev (Flere 2000, 128).

Vprašalnik, ki smo ga posredovali vsem vrhnjim menedžerjem v raziskavo vključenih organizacij, je vseboval vprašanja zaprtega tipa v prvem, drugem in tretjem tematskem delu ter trditve z Likertovo 5-stopenjsko ocenjevalno lestvico v četrtem tematskem delu, pri čemer je ocena 1 pomenila »sploh se ne strinjam«, ocena 5 pa »se povsem strinjam«. S prvim delom vprašalnika smo pridobili podatke o organizacijah, in sicer. v kateri panogi delujejo (SKD-klasifikacija), v katero statistično regijo spadajo in koliko let delujejo na tržišču. Drugi del vprašalnika nam je omogočil pridobitev demografskih podatkov anketirancev glede na spol, starost, dokončano stopnjo izobrazbe, delovno dobo in funkcijo v organizaciji. S tretjim delom smo preverili stanje v organizacijah na področju sistema ravnanja z okoljem po standardu ISO 14001:2004. V četrtem delu vprašalnika pa smo raziskali vodstveno samooceno v smislu sedmih dejavnikov voditeljstva.

Raziskavo smo opravili februarja 2011. Po prvem pošiljanju smo prejeli 58 izpolnjenih vprašalnikov in tri negativne odgovore za sodelovanje. Po drugem pošiljanju smo prejeli še 41 izpolnjenih vprašalnikov. V celoti smo prejeli 99 vprašalnikov od 321 poslanih. Odzivnost je bila pričakovana – 30,84-odstotna. V empirični del raziskave smo tako vključili 96 pravilno izpolnjenih vprašalnikov.

2.3 Metode analize podatkov

Podatke smo statistično obdelali in analizirali s pomočjo programske opreme SPSS, verzija 19.0. V raziskavi smo opravili:

– opisno oz. deskriptivno analizo,

– analizo variance,

– (multiplo) diskriminantno analizo.

Z opisno oz. deskriptivno analizo smo prikazali osnovne značilnosti vzorca in spremenljivk, npr. frekvence, deleže, povprečne vrednosti in standardne odklone.

Z analizo variance smo preverili enakost povprečij odvisnih spremenljivk – dejavnikov voditeljstva – glede na neodvisno spremenljivko sistem ravnanja z okoljem po standardu ISO 14001:2004, ki je sestavljena iz štirih kategorij (ne uvajamo, planiramo, v fazi uvajanja, že imamo). S tem smo dobili informacije, ali so razlike v povprečjih odvisnih spremenljivk statistično značilne (oz. ali jih lahko posplošimo na populacijo, ki jo proučujemo). Najprej smo s Kolmogorov-Smirnovim testom preverili, ali se odvisne spremenljivke normalno porazdeljujejo, nato pa preverili enakost oz. homogenost varianc z Levenovim testom. Glede na dobljene rezultate Levenovega testa smo preizkus enakosti povprečij izvedli s pomočjo F- in Welchevega testa.

Z (multiplo) diskriminantno analizo smo želeli ugotoviti, po katerih neodvisnih spremenljivkah se kategorije odvisne spremenljivke sistem ravnanja z okoljem po standardu ISO 14001:2004 najbolj razlikujejo. Zanimalo nas je torej, kako dobro te neodvisne spremenljivke pojasnju-

jejo ravnanje vrhnjih menedžerjev glede sistema ravnanja z okoljem po standardu ISO 14001:2004. Najprej smo z Boxovim M-testom preverili enakost variančno-kovariančnih matrik v posamezni kategoriji odvisne spremenljivke sistem ravnanja z okoljem po standardu ISO 14001:2004. Nato smo določili relativno pomembnost diskriminantnih spremenljivk in koeficient kanonične korelacije ter statistično značilnost diskriminantnih spremenljivk. Sledil je izračun strukturnih uteži oz. korelacijskih koeficientov med diskriminantnimi in merjenimi neodvisnimi spremenljivkami ter določitev centroidov skupin – povprečnih vrednosti diskriminantnih spremenljivk v določeni kategoriji.

3 Rezultati

V empiričnem delu raziskave se je odzvalo največ organizacij (41,7 %) iz predelovalne dejavnosti in organizacij, ki imajo sedež v osrednjeslovenski statistični regiji (37,5 %). Glede na čas delovanja oz. starost organizacije jih je večina, kar 75 %, imela že več kot 40-letno tradicijo poslovanja.

Od vseh anketiranih je sodelovalo 27,1 % žensk in 72,9 % moških. Največ anketirancev (40,6 %) je bilo starih nad 50 let. Več kot polovica (59,4 %) jih je imela končano visokošolsko ali univerzitetno izobrazbo. Večina anketirancev je imela nad 15 do 25 let (33,3 %) ali nad 25 do 35 let (37,5 %) delovne dobe. Glede funkcije v organizaciji jih je največ (25,0 %) opravljalo funkcijo generalnega direktorja, sledili so jim predsedniki uprave/upravnega odbora in člani uprave/upravnega odbora (po 16,7 %).

Pri ugotavljanju stanja na področju sistema ravnanja z okoljem po standardu ISO 14001:2004 smo ugotovili, da je sistem utečen že pri 54,2 % sodelujočih organizacijah. V 8,3 % organizacij je sistem v fazi uvajanja, 11,5 % organizacij ga planira, 26,0 % organizacij pa sistema ravnanja z okoljem po standardu ISO 14001:2004 ne uvaja.

Pri vodstveni samooceni smo ugotovili, da so vrhnji menedžerji po lastnem mnenju v okviru vizije (tabela 1) najbolj dovzetni za nove, tudi okolju prijazne ideje (povprečna vrednost 4,57), kar lahko opredelimo kot dobro podlago za inovativno dejavnost, ki v sredino postavlja tudi varovanje naravnega okolja. Najmanj so pripravljeni pomagati preostalim zaposlenim, da lahko sami razrešijo izzive standarda ISO 14001:2004 (povprečna vrednost 3,67). To lahko razumemo kot odraz časovne obremenitve ali premajhne zainteresiranosti vrhnjih menedžerjev ter obremenitve z drugimi, morda pomembnejšimi zadevami.

Tabela 1: *Izidi samoocene vizije*

Vizija	Povprečna vrednost	Standardni odklon
Prikazujem visok osebni standard v odnosu do standarda ISO 14001:2004.	4,00	1,086
Pomagam preostalim zaposlenim, da začnejo sami razmišljati o lastnih standardih v odnosu do standarda ISO 14001:2004.	3,67	1,073
Osebno sporočam vizijo zaposlenim.	4,18	0,871
Zavedam se, da je vizija osnovna usmeritev pri delovanju vsakega zaposlenega v organizaciji.	4,17	0,660
Sem dovzeten za nove, tudi okolju prijazne ideje.	4,57	0,576
Znam definirati prepričljiv okvir delovanja v prihodnosti.	4,24	0,661
povprečje vizije	4,14	

V okviru kredibilnosti (tabela 2) se vrhnji menedžerji po lastnem mnenju najbolj zavzemajo za enakost in pravičnost (povprečna vrednost 4,61), kar lahko bistveno pripomore k večji zaupljivosti zaposlenih do vrhnjih menedžerjev in večjemu občutku pripadnosti pri zaposlenih ter posledično k večji uspešnosti organizacije. Najmanj pa so pripravljeni sprejemati rešitve, ki so v skladu z zahtevami standarda ISO 14001:2004 (povprečna vrednost 3,80). Glede na to, da je trditev *Korektno izvajam predpisane standarde, tudi okoljske*, prejela precej visoko povprečno oceno (4,25), menimo, da se vrhnji menedžerji vse bolj zavedajo pomena upoštevanja tudi okoljskih standardov oz. predpisov. Pomembno je, da se to zavedanje udejanji in da ne ostane zgolj osnutek in teorija.

Tabela 2: *Izidi samoocene kredibilnosti*

Kredibilnost	Povprečna vrednost	Standardni odklon
Priznam lastne napake pred drugimi.	4,19	0,685
Moje besede so skladne z mojimi dejanji.	4,41	0,515
Iščem predloge in ideje za lastno izboljšanje.	4,45	0,630
Korektno izvajam predpisane standarde, tudi okoljske.	4,25	0,711
Delam dostojanstveno in spoštljivo z ljudmi.	4,52	0,598
Zavzemam se za vse zaposlene.	4,45	0,647
Zavzemam se za enakost in pravičnost.	4,61	0,489
Sprejemam rešitve, ki so v skladu z zahtevami standarda ISO 14001:2004.	3,80	1,062
povprečje kredibilnosti	4,41	

Vrhnji menedžerji po lastnem mnenju v okviru sodelovanja (tabela 3) najbolj promovirajo sinergijo – načelo ustvarjalnega sodelovanja (povprečna vrednost 4,40), kar lahko opredelimo kot dobro podlago za dosežek vrhunske

kakovosti: nenehno izpopolnjevanje in stalno prenavljanje. Pomoč preostalim zaposlenim, da lahko sami razrešijo izzive standarda ISO 14001:2004, pa postavljajo na zadnje mesto (povprečna vrednost 3,54). Druge vrste sodelovanja lahko razumemo bolj kot prenos aktivnosti na sodelavce, ki jim zaupajo in delegirajo.

Tabela 3: *Izidi samoocene sodelovanja*

Sodelovanje	Povprečna vrednost	Standardni odklon
Promoviram sinergijo – načelo ustvarjalnega sodelovanja.	4,40	0,624
Spodbujam in omogočam zaposlenim vključitev v aktivnosti izboljševanja zadev, vezanih na zahteve standarda ISO 14001:2004.	3,74	1,107
Spodbujam k sprejemanju in implementaciji novih rešitev.	4,22	0,699
Pridobim soglasje preostalih zaposlenih pred implementacijo novosti.	4,05	0,773
Zaupam v druge zaposlene.	3,86	0,720
Pomagam preostalim zaposlenim, da lahko sami rešijo izzive standarda ISO 14001:2004.	3,54	1,104
Podpiram samostojne odločitve zaposlenih.	4,28	0,593
povprečje sodelovanja	4,01	

V okviru povratne informacije in priznanja (tabela 4) so vrhnji menedžerji po lastnem mnenju najbolj naklonjeni javnemu priznavanju prispevka drugih (povprečna vrednost 4,53), kar nakazuje, da se zavedajo potrebe zaposlenih po redni povratni informaciji (tako konstruktivni kritiki kot pohvali oz. priznanju) glede svojega dela, kajti le tako so lahko resnično uspešni. Na zadnje mesto so postavili dajanje pozitivnih povratnih informacij o ukrepih, vezanih na zahteve standarda ISO 14001:2004 (povprečna vrednost 3,53).

Tabela 4: *Izidi samoocene povratne informacije in priznanja*

Povratna informacija in priznanje	Povprečna vrednost	Standardni odklon
Javno priznam prispevek drugih.	4,53	0,542
Pravočasno in ustrezno dajem priznanja skupinam in posameznikom za njihova prizadevanja na vseh ravneh organizacije.	4,03	0,656
Motiviram vse zaposlene v organizaciji.	3,89	0,613
Pozitivno vzpodbujam in ne kritiziram poizkusov.	4,03	0,606
Dam pozitivne povratne informacije o ukrepih, vezanih na zahteve standarda ISO 14001:2004.	3,53	1,105
Zbiram povratne informacije zaposlenih in jih ocenjene tudi posredujem.	3,83	0,777
Sprejemam povratne informacije o sebi.	4,08	0,763
povprečje povratne informacije in priznanja	3,99	

Vrhnji menedžerji po lastnem mnenju v okviru odgovornosti (tabela 5) najbolj spodbujajo in omogočajo samostojnost pri delu (povprečna vrednost 4,44) ter zahtevajo odgovornost zaposlenih za sprejete naloge (povprečna vrednost 4,43). Slednje nakazuje omogočanje zaposlenim večje odgovornosti, inovativnosti in ustvarjalnosti pri delu. Najmanj pa so pripravljeni definirati odgovornosti glede nalog, vezanih na zahteve standarda ISO 14001:2004 (povprečna vrednost 3,52). Glavni razlog za to verjetno je, da zahteve standarda ISO 14001:2004 niso prioriteta.

Tabela 5: *Izidi samoocene odgovornosti*

Odgovornost	Povprečna vrednost	Standardni odklon
Enoznačno in pregledno definiram vloge v organizaciji.	4,02	0,680
Definiram odgovornost glede nalog, vezanih na zahteve standarda ISO 14001:2004.	3,52	1,205
Zahtevam odgovornost zaposlenih za sprejete naloge.	4,43	0,628
Definiram merila za zastavljene cilje.	4,09	0,712
Periodično analiziram dosežene rezultate na osnovi definiranih meril.	4,08	0,691
Prepoznam potrebo po spremembah in jih izvajam.	4,24	0,628
Spodbujam in omogočam samostojnost pri delu.	4,44	0,662
povprečje odgovornosti	4,12	

V okviru komunikacije (tabela 6) vrhnji menedžerji po lastnem mnenju najbolj poudarjajo, da druge vprašajo za njihovo mnenje (povprečna vrednost 4,32). Iz tega razumemo, da stremijo k vključevanju zaposlenih v reševanje in izboljševanje organizacijskih zadev ter tako uresničujejo tisto, kar komunikacija obsega – izmenjavo misli, občutkov ali razumevanja zaznamovanj (Možina idr. 2004, 20). Najmanj pa so pripravljeni obravnavati dogajanja neposredno na mestu nastanka (povprečna vrednost 3,99). To nakazuje odsotnost procesnega načina organiziranosti, pri čemer je obravnavanje dogajanja na mestu nastanka neke vrste stalnica v poslovanju, saj je vrhnji menedžment vpet v vse segmente delovanja organizacije, skratka, vzpostavljen je sistem neposrednega komuniciranja med najvišjim vodstvom in posameznikom v organizaciji. Posredno lahko sklepamo, da je hierarhični način vodenja in komuniciranja v velikih organizacijah še vedno prisoten.

Tabela 6: *Izidi samoocene komunikacije*

Komunikacija	Povprečna vrednost	Standardni odklon
Vzpostavim in pospešujem mrežo osebnih povezav znotraj svojega delokroga kot tudi znotraj celotne organizacije.	4,12	0,684
Vprašam druge za njihovo mnenje.	4,32	0,703
Povem, kar mislim, na konstruktiven način.	4,30	0,600
Delim z drugimi pridobljene izkušnje in lastno motiviranost.	4,29	0,695
Obravnavam dogajanja direktno na mestu nastanka.	3,99	0,718
Vzpostavim vzdušje, ki omogoča drugim, da spregovorijo o izzivih na sproščen način.	4,06	0,765
Pozorno poslušam.	4,16	0,686
povprečje komunikacije	4,18	

Vrhnji menedžerji po lastnem mnenju v okviru usmerjenosti k dejanjem (tabela 7) na prvo mesto postavljajo spodbujanje inovativnosti in ustvarjalnosti (povprečna vrednost 4,37). Spodbujajo zaposlene k razmišljanju oz. iskanju novih možnosti in načinov za izboljšanje/optimiziranje delovanja organizacije ter s tem stopajo v korak s časom. Na zadnje mesto pa postavljajo načrtno spodbujanje zaposlenih k sprejemanju zahtev standarda ISO 14001:2004 (povprečna vrednost 3,60), iz česar lahko razberemo, da je sprejemanje zahtev tega standarda sekundarnega pomena in da so prioritete drugje.

Tabela 7: *Izidi samoocene usmerjenosti k dejanjem*

Usmerjenost k dejanjem	Povprečna vrednost	Standardni odklon
Definiram razumne prioritete.	4,21	0,664
Izkoristim vsako priložnost, ki omogoča izboljšavo.	4,05	0,731
Spodbujam inovativnost in ustvarjalnost.	4,37	0,669
Stremim k vključevanju oz. vključujem zahteve standarda ISO 14001:2004 v politiko organizacije.	3,77	1,128
Načrtno spodbujam zaposlene k sprejemanju zahtev standarda ISO 14001:2004.	3,60	1,110
povprečje usmerjenosti k dejanjem	4,00	

V okviru vodstvene samoocene smo ugotovili, da se vrhnji menedžerji v velikih slovenskih organizacijah, v smislu omenjenih dejavnikov voditeljstva, relativno visoko cenijo. To nakazujejo povprečne ocene posameznih dejavnikov voditeljstva. V glavnem so vrhnji menedžerji na prvo mesto postavili lastno kredibilnost, sledijo ji komunikacija, vizija, odgovornost, sodelovanje, usmerjenost k dejanjem ter povratna informacija in priznanje.

Rezultati po našem mnenju ne odražajo popolnoma realnega stanja v proučevanih organizacijah, a za to trditev nimamo strokovno utemeljenega argumenta. Običajno se pri tovrstnem pridobivanju informacij izkaže, da so anketiranci (v našem primeru vrhnji menedžerji) nekoliko preveč »prizanesljivi« sami do sebe. Ob snovanju, pošiljanju in analiziranju smo se zavedali te omejitve, a zanimal nas je zgolj njihov, subjektivni vidik zaznavanja proučevane tematike. Verjamemo, da so odgovori vrhnjih menedžerjev odraz njihovega trenutnega zaznavanja situacije in da so na vprašanja odgovarjali pošteno ter odkrito, saj je šlo za anonimno raziskavo. Kljub temu je to le enostranski pogled na proučevano zadevo, zato predlagamo, da se v morebitnem nadaljnjem raziskovanju enaka anketa opravi tudi med zaposlenimi oz. se ugotavlja, kako oni zaznajo voditeljstvo pri uvajanju standarda ISO 14001:2004.

3.1 Vpliv dejavnikov voditeljstva na uvajanje standarda ISO 14001:2004 v organizacijo

Na osnovi dobljenih rezultatov smo nato izvedli analizo variance in (multiplo) diskriminantno analizo. Vrednosti spremenljivk (vizija, kredibilnost, sodelovanje, povratna informacija in priznanje, odgovornost, komunikacija in usmerjenost k dejanjem), vključenih v obe analizi, smo dobili tako, da smo sešteli vrednosti vseh spremenljivk v posameznem sklopu četrtega dela vprašalnika (vodstvena samoocena) ter jih delili s številom spremenljivk v posameznem sklopu.

Z analizo variance (tabela 8) smo ugotovili, da so razlike med povprečnimi vrednostmi spremenljivke vizija statistično značilne pri stopnji značilnosti p < 0,001. Enake ugotovitve veljajo za spremenljivke kredibilnost (p < 0,05), sodelovanje (p < 0,001), odgovornost (p < 0,01) in usmerjenost k dejanjem (p < 0,001) glede na kategorije spremenljivke sistem ravnanja z okoljem po standardu ISO 14001:2004. To pomeni, da se organizacije razlikujejo med seboj po izvajanju dejavnosti, ki se nanašajo na vizijo, kredibilnost, sodelovanje, odgovornost in usmerjenost k dejanjem glede na to, v kateri fazi sistema ravnanja z okoljem po ISO 14001:2004 so. Razlike med povprečnimi vrednost-

mi spremenljivk povratna informacija in priznanje niso statistično značilne (p > 0,05). Enaka ugotovitev velja za povprečne vrednosti spremenljivke komunikacija (p > 0,05) glede na kategorije spremenljivke sistem ravnanja z okoljem po standardu ISO 14001:2004, kar pomeni, da se organizacije ne razlikujejo med seboj pri povratnih informacijah in priznanjih ter komuniciranju glede na to, v kateri fazi sistema ravnanja z okoljem po ISO 14001:2004 so.

Na osnovi rezultatov (multiple) diskriminantne analize smo ugotovili, da od treh možnih diskriminantnih spremenljivk največ razlik med kategorijami spremenljivke sistem ravnanja z okoljem po standardu ISO 14001:2004 pojasni prva diskriminantna spremenljivka (79,4 %; tabela 9). Druga in tretja diskriminantna spremenljivka pojasnita malo variabilnosti med kategorijami (17,3 % in 3,3 %) in imata nizko lastno vrednost (0,135 in 0,026), zato sta za razlikovanje med kategorijami manj pomembni (tabela 9).

Tabela 9: *Relativna pomembnost diskriminantnih spremenljivk in koeficient kanonične korelacije*

Diskriminantne spremenljivke	Lastna vrednost	% pojasnjene variance	Kumulativa (%)	Koeficient kanonične korelacije
1	0,622[a]	79,4	79,4	0,619
2	0,135[a]	17,3	96,7	0,345
3	0,026[a]	3,3	100,0	0,158

[a] V analizi so bile uporabljene prve tri kanonične diskriminantne spremenljivke.

Korelacijske koeficiente med diskriminantnimi in merjenimi spremenljivkami smo določili z uporabo matrike ocenjenih strukturnih uteži. Pri tem smo ugotovili, da s prvo diskiminantno spremenljivko najbolj korelirajo prve štiri spremenljivke (tabela 10). Torej meri prva diskriminantna spremenljivka vpliv sodelovanja, usmerjenosti k dejanjem, vizije in odgovornosti na uvajanje sistema ravnanja z okoljem po ISO 14001:2004 v organizacijo.

Tabela 8: *Analiza variance*

Dejavniki voditeljstva	Sistem ravnanja z okoljem po standardu ISO 14001:2004				Analiza variance	
	ne uvajamo	planiramo	v fazi uvajanja	že imamo	statistika F/ Welch	stopnja značilnosti (p)
vizija	3,75	3,91	4,13	4,38	9,006	0,000
kredibilnost	4,44	4,05	4,46	4,46	3,980	0,010
sodelovanje	3,65	3,70	4,05	4,25	10,518	0,000
povratna informacija in priznanje	3,91	3,79	4,13	4,05	1,370	0,257
odgovornost	3,90	3,83	4,21	4,27	4,821	0,004
komunikacija	4,17	3,88	4,14	4,25	2,026	0,116
usmerjenost k dejanjem	3,57	3,69	4,13	4,26	8,968	0,000

Tabela 10: *Strukturna matrika*

Spremenljivke	Diskriminantna spremenljivka		
	1	2	3
sodelovanje	0,722*	0,368	0,093
usmerjenost k dejanjem	0,703*	0,271	0,370
vizija	0,682*	0,168	−0,080
odgovornost	0,461*	0,409	0,312
kredibilnost	0,120	0,943*	0,121
komunikacija	0,151	0,609*	−0,256
povratna informacija in priznanje	0,193	0,336	0,491*

* Največje absolutne korelacije med posamezno spremenljivko in katero koli diskriminantno spremenljivko.

Iz tabele 11, v katero so vključena povprečja diskriminantnih spremenljivk v določeni kategoriji, lahko razberemo, da je povprečje prve diskriminantne spremenljivke med organizacijami, ki sistema ravnanja z okoljem po ISO 14001:2004 ne uvajajo, ga planirajo ali pa so v fazi uvajanja, precej nizko (vrednosti: −1,165, −0,401 in 0,005). To pomeni, da dosegajo nižje povprečne vrednosti pri spremenljivkah, ki bolj korelirajo s prvo diskriminantno spremenljivko, in sicer s sodelovanjem, z usmerjenostjo k dejanjem, z vizijo in odgovornostjo. Obratno je pri organizacijah, ki sistem ravnanja z okoljem po ISO 14001:2004 že imajo. Tukaj je povprečje prve diskriminantne spremenljivke precej visoko (znaša 0,644), kar nakazuje višje povprečne vrednosti pri spremenljivkah, ki bolj korelirajo s prvo diskriminantno spremenljivko. Iz povprečnih vrednosti prve diskriminantne spremenljivke po vseh štirih kategorijah je razvidno tudi to, da povprečne vrednosti spremenljivk naraščajo v povezavi s tem, v kateri fazi je uvajanje sistema ravnanja z okoljem v organizaciji. To pomeni, da organizacije, ki že imajo sistem ravnanja z okoljem po ISO 14001:2004, posvečajo sodelovanju, usmerjenosti k dejanjem, viziji in odgovornosti večjo pozornost v primerjavi z organizacijami, ki sistema ravnanja z okoljem po ISO 14001:2004 ne uvajajo, ga planirajo ali pa so v fazi uvajanja.

Tabela 11: *Centroid skupine*

Kategorije	Diskriminantna spremenljivka		
	1	2	3
ne uvajamo	−1,165	0,240	−0,055
planiramo	−0,401	−0,983	−0,016
v fazi uvajanja	0,005	0,087	0,519
že imamo	0,644	0,079	−0,050

Ugotovimo lahko, da se kategorije spremenljivke sistem ravnanja z okoljem po standardu ISO 14001:2004 najbolj razlikujejo glede na naslednje spremenljivke oz. dejavnike voditeljstva: sodelovanje, usmerjenost k dejanjem, vizija in odgovornost.

3.2 Potrditev hipotez

Na osnovi rezultatov (multiple) diskriminantne analize je hipoteza H1 potrjena, saj imata (dejavnika voditeljstva) vizija in usmerjenost k dejanjem statistično značilen vpliv na uvajanje sistema ravnanja z okoljem po ISO 14001:2004 v organizacijo (glej tabelo 10). To pomeni, da imata vizija in usmerjenost k dejanjem vrhnjih menedžerjev v velikih slovenskih organizacijah pozitiven vpliv na uvajanje omenjenega standarda.

Tudi hipoteza H2 je na osnovi rezultatov (multiple) diskriminantne analize potrjena, saj ima dejavnik voditeljstva sodelovanje statistično značilen vpliv na uvajanje sistema ravnanja z okoljem po ISO 14001:2004 v organizacijo (glej tabelo 10). To pomeni, da ima sodelovanje vrhnjih menedžerjev z zaposlenimi pozitiven vpliv na uvajanje standarda ISO 14001:2004 v velikih slovenskih organizacijah.

4 Sklep

O ključni vlogi vrhnjih menedžerjev pri uvajanju trajnostnega razvoja v organizacijo in s tem tudi njegove okoljske sestavine govorijo številni avtorji. Menedžerji naj bi pri tem izkazovali ustrezno zanimanje in pripravljenost ter spodbujali zaposlene k sodelovanju. Na zaposlene naj bi vplivali kot mentorji in vzorniki ter jih usmerjali k doseganju skupnih ciljev. Govorimo o voditeljstvu kot glavni sili pri izvedbi uspešnih sprememb. Zato smo raziskali vpliv dejavnikov voditeljstva vrhnjih menedžerjev na uvajanje okoljske sestavine trajnostnega razvoja – standarda ISO 14001:2004 v velikih slovenskih organizacijah.

Raziskava je pokazala, da so prevladujoči dejavniki voditeljstva pri vrhnjih menedžerjih, ki pozitivno vplivajo na uvajanje okoljske sestavine trajnostnega razvoja – standarda ISO 14001:2004 v organizacijo (in na take morajo biti vrhnji menedžerji še bolj pozorni), naslednji: vizija, kredibilnost, sodelovanje, odgovornost in usmerjenost k dejanjem. Iz rezultatov raziskave lahko povzamemo, naj vrhnji menedžerji pri snovanju vizije upoštevajo dejstvo, da mora vizija povezovati in izražati pomembne in dolgoročne interese pomembnih udeležencev organizacije, da bo kot konkretna podoba prihodnosti dovolj blizu, da se bo zdela uresničljiva, in dovolj oddaljena, da bo v organizaciji vzbujala navdušenje za novo stvarnost (prirejeno po Tavčar 2009, 119). Poskrbeti morajo tudi za visoko kredibilnost, saj bodo z njo prispevali k večji motiviranosti, zadovoljstvu in pripadnosti zaposlenih. Glede na to, da so zaposleni pogoj za obstoj in delovanje organizacije, naj jim vrhnji menedžerji omogočajo tudi sodelovanje v procesu odločanja ter pri opredeljevanju in doseganju ciljev. Dejstvo je, da so vrhnji menedžerji odgovorni za kakovost poslovanja. Pri tem je

pomembno, da del svoje odgovornosti prenesejo oz. delegirajo drugim zaposlenim, ki bodo tako postali močnejši in samostojnejši, bolj se bodo tudi zavedali pomembnosti svoje vloge v organizaciji. Usmerjenost k dejanjem pa je tisti dejavnik voditeljstva, ki vodi organizacijo k večji fleksibilnosti in odzivnosti na spreminjajoče se zahteve oz. smernice okolja, med katere spada tudi uvajanje standarda ISO 14001:2004.

Z raziskavo smo postavili del temelja, na osnovi katerega bo lahko to slabo obdelano področje v prihodnje še bolj poglobljeno in/ali v celoti raziskano. Smiselna bi bila razširitev raziskave tudi na dejavnike pri vrhnjih menedžerjih, ki dejansko spodbujajo potrebo in primerno pozornost do okoljske sestavine trajnostnega razvoja – standarda ISO 14001:2004. Rezultati bi morali dati vhodne podatke za ukrepe, kako izboljšati situacijo, da bo sistem ravnanja z okoljem postal sestavni del politike organizacij.

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MERJENJE KAKOVOSTI STORITEV

Measuring Quality of Services

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Izvleček

Dileme, kako konceptualizirati in operacionalizirati kakovost storitev, so v literaturi pogoste. Naš pristop se zgleduje po najsodobnejših in obetavnejših znanstvenih pristopih h konceptualizaciji in operacionalizaciji konstruktov. Implikacije fokusnih skupin so pokazale, kako slovenski uporabniki zaznavajo kakovost storitev. Z empirično študijo na vzorcu 1154 slovenskih uporabnikov treh različnih vrst storitev smo nadalje potrdili, da je naša operacionalizacija kakovosti storitev, ki vključuje izkušnje o kakovosti storitev gledano v celoti, primerjavo, koliko kakovost storitev zadovolji dejanska pričakovanja uporabnika, in primerjavo kakovosti storitev s konkurenco, pomemben metodološki prispevek k merjenju kakovosti storitev. Zanesljivost merjenja vseh treh spremenljivk je zgledna v vseh treh vrstah storitev, potrdili pa smo tudi konvergentno veljavnost merjenja.

Ključne besede: kakovost storitev, latentna spremenljivka, manifestne spremenljivke, konceptualizacija, opracionalizacija

Abstract

Dilemmas on how to conceptualize and operationalize quality of services are common in the literature. Our approach is inspired by the most advanced and promising scientific approaches to the conceptualization and operationalization of constructs. The implications of the focus groups showed how Slovenian consumers perceive quality of services. The empirical study on a sample of 1154 Slovenian consumers of three different types of services confirmed our operationalization of service quality that includes the experience of service quality on the whole, a comparison of how much the quality of services meets the actual expectations of service customers, and a comparison with the competition. This is an important methodological contribution to measuring service quality. Reliability of measuring all three variables is exemplary in all three types of services; in addition, we confirmed the convergent validity of the measurement.

Keywords: quality of services, latent variable, manifest variables, conceptualization, operationalization

1 Uvod

V zadnjih tridesetih letih lahko opazimo veliko zanimanje za raziskave v storitvenih dejavnostih, saj so akademiki in menedžerji spoznali, da se pomen storitev v vseh razvitih ekonomijah povečuje. V Sloveniji je leta 2010 delež storitev predstavljal že 67,6 % BDP (Statistični letopis RS 2010) in bo nedvomno še naraščal. Sočasno, ko se razvija področje kakovosti storitev, opazimo tudi velik napredek v razumevanju kakovosti storitev.

Kakovosti storitev ne moremo izboljšati, če je ne merimo. Toda težava pri tem je, da je kakovost storitev v nasprotju s kakovostjo proizvodov težko meriti. Kakovost storitev je namreč abstrakten in težko opredeljiv koncept, in to predvsem zaradi treh lastnosti, značilnih za storitve: heterogenost, neopredmetenost in nedeljivost. Ker je ne moremo meriti z objektivnimi merili, jo merimo s subjektivno zaznavo uporabnikov. Med nudenjem storitve uporabnik zaznava njene posamezne elemente in zavestno ali nezavestno oblikuje oceno o

njeni kakovosti. Iz tega izhaja naše osnovno raziskovalno vprašanje: *Kako meriti zaznavanje kakovosti storitev med slovenskimi uporabniki?*

V literaturi prevladujeta dva pogleda o tem, kako uporabniki zaznavajo kakovost storitev oz. njene elemente ali dimenzije. Prvi je pogled severnoameriške šole, drugi nordijske. Naš namen je raziskati, kako konceptualizirati in operacionalizirati kakovost storitev, kot jo zaznavajo slovenski uporabniki, ter podati zanesljive in veljavne manifestne spremenljivke za latentno spremenljivko kakovost storitev, ki bodo slovenskim raziskovalcem pomagale pri snovanju vprašalnikov za merjenje kakovost storitev. V ta namen bomo najprej predstavili obe prevladujoči šoli ter empirične rezultate drugih svetovnih študij, v katerih je bil razvit in raziskovan koncept kakovosti storitev. Na teoretičnih osnovah bomo nato pripravili opracionalizacijo kakovosti storitev, ki jo bomo s kvalitativno raziskavo fokusnih skupin ovrednotili, da preverimo, ali so teoretična izhodišča skladna z zaznavanjem kakovosti storitev slovenskih uporabnikov. Z empirično študijo na vzorcu 1154 slovenskih uporabnikov bomo preverili zanesljivost in veljavnost merjenja koncepta kakovost storitev na treh različnih vrstah storitev ter na koncu navedli prispevke in ugotovitve te raziskave.

2 Dimenzije kakovosti: razmejitev med severnoameriško in nordijsko šolo

V literaturi je kakovost storitev največkrat opredeljena kot porabnikova subjektivna ocena zaznane storitve (Ganguli in Roy 2010, 405). Zaznana kakovost storitev je uporabnikova sodba o celostni odličnosti ali superiornosti organizacije (Thuy 2011, 478). Na področju kakovosti storitev danes prevladujeta dve šoli, ki različno opredeljujeta njene dimenzije. Prvo označujemo kot *severnoameriško šolo*, najbolj znano po dimenzijah kakovosti SERVQUAL. Ameriški guruji trženja storitev (Parasuraman idr. 1985, 44–49) so postavili lestvico, imenovano SERVQUAL, v kateri so sprva opredelili 10 dimenzij kakovosti storitev: zanesljivost, odzivnost, znanje, zaupanje, empatija, dostopnost, komuniciranje, vljudnost, razumevanje uporabnikov in oprijemljivost. Kasnejša empirična preverjanja so odkrila visoko medsebojno povezanost meril, ki so jih zato skrčili na pet dimenzij: zanesljivost, odzivnost, zaupanje, empatija in oprijemljivost (Parasuraman, Berry in Zeithaml 1988, 23).

Drugače kot severnoameriška šola je dimenzije kakovosti opredelila *nordijska šola* (Lehtinen in Lehtinen 1991, 287–302; Grönroos 1984, 36–43), ki ponuja modele z dvema ali tremi spremenljivkami. Finska raziskovalca (Lehtinen in Lehtinen 1991, 287–293) predlagata dva različna pristopa, tridimenzionalnega in dvodimenzionalnega. V tridimenzionalnem pristopu sta postavila tri dimenzije kakovosti: fizična kakovost, kakovost, vezana na interakcijo, in kakovost, vezana na podjetje. Fizična kakovost se nanaša na fizični proizvod in vse oprijemljivo, vezano na storitev (okolje, oprema in orodje). Kakovost,

vezana na interakcijo, se nanaša na odnos porabnika do interakcijskih elementov podjetja. Ti so lahko njihovo osebje ali fizična oprema. Tretja dimenzija, tj. kakovost, vezana na podjetje, pa je gledanje na podjetje kot celoto, inštitucijo, njegov imidž ali profil in je edina dimenzija, ki jo porabnik lahko zazna, preden izkusi storitev. V dvodimenzionalnem pristopu avtorja opredelita dve dimenziji: kakovost procesa in kakovost rezultata. Kakovost procesa je porabnikova subjektivna ocena, ki temelji na tem, kako porabnik vidi proces nudenja storitve in kako mu ustreza. Pri tem je pomembna njegova vpletenost v proces. Kakovost rezultata pa se nanaša na porabnikovo oceno rezultata celotnega proizvodnega procesa. Rezultat je lahko oprijemljiv ali neoprijemljiv. Švedski raziskovalec (Grönroos 1984, 36–40) je raziskal dvodimenzionalni vpliv tehnične in funkcionalne kakovosti na zaznano kakovost storitev posredno, prek koncepta imidž. Očitno je, da je fizična kakovost, kot sta jo opredelila Lehtinenova in Lehtinen, podobna tehnični kakovosti, kot jo je opredelil Grönroos, in da se kakovost, vezana na interakcijo, finskih raziskovalcev nanaša na funkcionalno kakovost švedskega raziskovalca. Če poenostavimo, gleda nordijska šola na kakovost storitev v smislu, kaj uporabnik dobi kot rezultat interakcije s storitvenim podjetjem in kako to dobi.

Mnoge raziskave o zadovoljstvu uporabnikov so pokazale, da so dimenzije kakovosti storitev, kot jih opredeljuje nordijska šola, uporabnejše za raziskovanje zadovoljstva uporabnikov kot dimenzije severnoameriške šole (Yang in Coates 2010, 763; Ekinci, Dawes in Massey 2008, 43; Kristensen, Martensen in Grønholdt 2000, S1009; Ciavolino in Dahlgaard 2007, 549), zato bomo temu sledili tudi v naši raziskavi in kakovost konceptualizirali z dvema dimenzijama: s kakovostjo storitev (kot tehnično kakovostjo) in kakovostjo osebja (kot funkcionalno kakovostjo oz. kakovostjo, vezano na interakcijo). V nadaljevanju se bomo zaradi širine tega področja v skladu z našim osnovnim raziskovalnim vprašanjem omejili le na kakovost storitev.

3 Teoretična izhodišča operacionalizacije kakovosti storitev

Dabholkar, Shepherd in Thorpe (2000, 142) opozarjajo, da veliko raziskovalcev pri merjenju kakovosti storitev uporablja samo eno spremenljivko, kar onemogoča oceniti zanesljivost konstrukta. Zeithamlova in sodelavci (1999, 38) kakovost storitev operacionalizirajo z več spremenljivkami: kot kakovost storitev, gledano v celoti, in kot tehtano povprečje zaznanega delovanja dejavnikov SERVQUAL. Čeprav se zdi taka operacionalizacija na prvi pogled najprimernejša, nas od nje odvrnejo rezultati, ki jih je dobil Johnson s sodelavci (2001, 235). V raziskavo, ki so jo izvedli v petih storitvenih panogah, so na osnovi SERVQUAL-a vključili pet dimenzij kakovosti, vendar večina teh dimenzij v izbranih petih panogah ni pokazala značilne povezanosti z zadovoljstvom. Zato Johnson in sodelavci (2001, 242) predlagajo vključitev spremenljivke celostna kakovost izdelka, kar je kasneje v svoji študiji

uporabil tudi Thuy (2011, 478), zato jo vključimo tudi v našo raziskavo:

– ocena izkušnje glede kakovosti storitev, gledano v celoti.

K temu dodajmo še spremenljivki, ki so ju Kristensen in sodelavci (2000, S1009) uporabili v Evropskem indeksu zadovoljstva:

– ocena, koliko kakovost storitev zadovolji dejanska pričakovanja uporabnika,

– ocena kakovosti storitev v primerjavi s konkurenco.

4   Kvalitativna raziskava: fokusne skupine

4.1 Namen fokusnih skupin

Sangeetha in Mahalingam (2011, 99) na osnovi poglobljene študije različnih modelov kakovosti storitev in njihovih operacionalizacij ugotavljata, da je upravičeno razvijati prilagojene merske lestvice za merjenje kakovosti storitev v različnih kulturah in državah. Osrednji namen naše kvalitativne raziskave je tako opredeliti kakovost storitev tako, kot jo dojemajo slovenski uporabniki. Zanima nas, ali je njihovo zaznavanje skladno z opredelitvijo koncepta v teoriji. S tem bomo dobili implikacije za konceptualizacijo in operacionalizacijo latentne spremenljivke kakovost storitev. Fokusne skupine bomo oblikovali za vsako izmed treh izbranih storitvenih panog posebej, in sicer posebej z uporabniki avtocest, z uporabniki mobilne telefonije in z uporabniki frizerskih storitev. Analiza v več različnih storitvenih panogah nam omogoča, da bomo rezultate laže posplošili in raziskali, kako dojemajo kakovost storitev uporabniki storitev na splošno, ne glede na značilnosti panoge.

4.2 Implikacije fokusnih skupin za konceptualizacijo in operacionalizacijo kakovosti storitev

Sodelujoče v prvi fokusni skupini smo izbrali glede na kriterij, da so vozniki in se vozijo po slovenskih avtocestah, vsi imajo tudi izkušnje z vožnjo po tujih avtocestah. K sodelovanju smo povabili šest oseb različnih starosti, spola in izkušenj z vožnjo po avtocestah, saj smo želeli, da je skupina čim bolj heterogena. Člani fokusne skupine uporabnikov slovenskih avtocest zaznavajo kakovost storitev prek rezultatov vožnje po avtocestah. Sodelujoče v fokusni skupini uporabnikov mobilne telefonije smo izbrali glede na kriterij, da so uporabniki mobilnega telefona. K sodelovanju smo povabili osem uporabnikov različnih starosti in spola, saj smo želeli, da je naša skupina čim bolj heterogena. Čeprav je ta fokusna skupina trajala najdlje med vsemi, smo ugotovili, da koncepta kakovost storitev nismo obdelali dovolj globinsko, zato smo se odločili, da med uporabniki mobilnih storitev oblikujemo še eno fokusno skupino, ki pa je bila bolj homogena. Želeli smo zajeti uporabnike, ki imajo več različnih izkušenj z uporabo mobilnega telefona (poleg telefoniranja uporabljajo še druge storitve mobilne telefonije) in so mlajši. Tako smo oblikovali fokusno skupino, v kateri je bilo osem študentov, starih od 19 do 24 let, ki imajo

sklenjeno naročniško razmerje, nekateri pri Mobitelu, drugi pri Simobilu. Ugotavljamo, da člani fokusne skupine uporabnikov mobilne telefonije zaznavajo kakovost storitev prek rezultatov (pokritost, signal, ponudba vseh storitev operaterja, da deluje) in o kakovosti storitev ne razmišljajo veliko, vse dokler telefon deluje. Sodelujoče v fokusni skupini frizerske storitve smo izbrali glede na kriterij, da imajo izkušnje s frizerskimi storitvami in so heterogeni glede na demografske značilnosti. Skupino je sestavljalo sedem članov, od tega jih ima pet izbranega frizerja, h kateremu hodijo vedno, brez izjeme, ena udeleženka pa ima izbrana dva frizerja in redno hodi k obema. Člani fokusne skupine frizerskih storitev zaznavajo kakovost storitev prek interakcij s podjetjem in rezultatov kakovosti storitev. Kakovost storitev ocenjujejo v primerjavi s konkurenco glede na to, kako zadovolji njihova pričakovanja in kakšna je kakovost storitev, gledano v celoti.

Primerjava analize zaznavanja kakovosti storitev pri vseh treh panogah pokaže, da uporabniki različnih storitev zelo podobno dojemajo ta koncept, predvsem *prek rezultatov in interakcij s podjetjem*. Na osnovi tega smo postavili konceptualizacijo kakovosti storitev:

Kakovost storitev se nanaša na uporabnikovo zaznavo rezultata, ki ga prejme prek interakcije s podjetjem.

Ko ocenjujejo kakovost svojega ponudnika, jo ocenjujejo tako, da jo primerjajo s konkurenco, glede na to, kako zadovolji njihova pričakovanja, in kot celostno izkušnjo s kakovostjo storitve. Čeprav monopolist Dars nima konkurence, primerjajo uporabniki kakovost storitev slovenskih avtocest s tujimi avtocestami kot enim izmed standardov. Na osnovi tega lahko potrdimo naslednje operacionalizacije kakovosti storitev, ki so skladne tudi s teorijo (Johnson idr. 2001, 242; Kristensen idr. 2000, S1009; Thuy 2011, 478):

– ocena izkušnje glede kakovosti storitev, gledano v celoti,

– ocena, koliko kakovost storitev zadovolji dejanska pričakovanja uporabnika,

– ocena kakovosti storitev v primerjavi s konkurenco.

5   Empirična preverba operacionalizacije kakovosti storitev

5.1 Način zbiranja podatkov in opis vzorca

Za zbiranje podatkov smo izbrali spletno anketo. Vzorec naše študije je priložnostno-slučajen. Ker nimamo dostopa do elektronskih naslovov vseh slovenskih porabnikov, smo anketo poslali le na tiste elektronske naslove, ki smo jih pridobili, nato pa smo čakali, da so anketiranci pošto posredovali znancem, prijateljem, sodelavcem. Ker je bila anketa dostopna uporabnikom na spletu štiri mesece, od 24. maja do 23. septembra 2009, in ker je vzorec velik, menimo, da smo se precej približali naključnemu vzorcu.

Anketiranci, ki so bili vključeni v našo raziskavo, so stari 18 let ali več in so uporabniki storitev vseh treh izbranih panog, ki smo jih proučevali že v okviru fokusnih skupin.

Anketo je izpolnilo skupaj 1154 uporabnikov vožnje po slovenskih avtocestah, frizerskih storitev in mobilne telefonije.

Naš vzorec sestavlja 66,98 % žensk in 33,02 % moških, kar je pričakovano glede na to, da smo med storitvami izbrali tudi frizerske storitve, ki jih ne uporablja toliko moških. Povprečna starost našega anketiranca je 34,3 leta, standardni odklon ± 9,83 leta. Večja zastopanost mlajših anketirancev v vzorcu je bila pričakovana, saj starejši ljudje predvidoma niso toliko uporabniki mobilne telefonije in se po avtocestah ne vozijo več v tolikšnem odstotku kot mlajši. Po izobrazbi ima največ anketirancev našega vzorca končano srednjo šolo (36,6 %). Glede na status je pričakovano največji delež anketirancev (70,3 %) zaposlenih. Glede na kraj bivanja jih največ živi v manjšem mestu (42,1 %), le nekoliko manj pa na podeželju (40,2 %). Po dohodku največ gospodinjstev (25 %) prejema dohodke med 1201 in 1800 EUR, nekoliko manj (23,7 %) pa med 1801 in 2400 EUR. Povprečno število članov gospodinjstva je 3,3, standardni odklon je ± 1,17.

5.2 Kakovost merjenja

Na tem mestu obravnavamo kriterije kakovostnega merjenja obravnavanih konceptov. Natančnost merjenja je pomembna zlasti zaradi vpliva, ki ga ima na testiranje hipotez. Ključni merski karakteristiki, ki omogočata oceno kakovosti operacionalizacije in merjenja obravnavanih konceptov, sta zanesljivost in veljavnost merskega instrumenta.

5.2.1. Analiza zanesljivosti merjenja

Zanesljivost je »zmožnost proizvesti enake vrednosti ob ponovljenem merjenju na istih enotah ob predpostavki, da vmes ni prišlo do sprememb v dejanskih vrednostih« (Ferligoj, Leskovšek in Kogovšek 1995, 8). V naši raziskavi bomo merili zanesljivost notranje konsistentnosti (angl. *internal consistency*). Izračunali bomo Cronbachov koeficient α in koeficient zanesljivosti Ω.

Koncept kakovost storitev smo operacionalizirali s tremi spremenljivkami, ki smo jih navedli v poglavju 4.2. Vsaka izmed teh spremenljivk meri določen vidik konstrukta, zato mora med njimi biti določena konsistentnost. Najprej smo izračunali koeficient α (Cronbachov koeficient α), ki je povprečje posameznih koeficientov, izračunanih iz polovice postavk. Vrednost tega koeficienta narašča s številom postavk, ki merijo konstrukt, kar je treba upoštevati pri interpretaciji rezultatov (Cortina 1993, v Field 2005, 668).

Tabela 1: *Cronbachovi koeficienti zanesljivosti α za koncepte kakovost storitev za vse tri vrste storitev*

	Cronbachov koeficient α za Dars	Cronbachov koeficient α za frizerske storitve	Cronbachov koeficient α za mobilne storitve
KAKOVOST STORITEV	0,938	0,930	0,930

Vir: anketa 2009.

Izračunane zanesljivosti merjenja za koncept kakovost storitev za vse tri vrste storitev so zgledne, saj so koeficienti α vsi nad 0,80 (upoštevali smo kriterij Ferligojeve idr. 1995, 157). Čeprav smo koncept merili le s tremi merskimi spremenljivkami, kažejo ocene zanesljivosti merjenja na zelo visoko notranjo konsistentnost. Najviše ocenjena je zanesljivost pri konstruktu kakovost storitev pri Darsu, vendar so razlike zelo majhne, kar kaže tudi na to, da je takšna operacionalizacija primerna ne glede na vrsto storitev, ki jo ocenjujemo.

Poleg metode notranje konsistentnosti lahko za ocenjevanje zanesljivosti sestavljene spremenljivke uporabimo tudi faktorsko analizo, katere cilj je poiskati faktorje, ki predstavljajo skupne razsežnosti izmerjenih spremenljivk. Tako lahko faktorsko analizo uporabimo kot merski postopek, s katerim merimo latentne, neposredno nemerljive spremenljivke. Koeficient zanesljivost Ω, ocenjen s faktorsko analizo, je primerljiv s koeficientom notranje konsistentnosti, le da je nekoliko večji in je najbližji dejanski zanesljivosti merjenja (Carmines in Zeller 1979, v Ferligoj idr. 1995, 44–47). Zato Malhotra in Birks (2007, 358) predlagata, da se koeficientu α doda koeficient Ω, ki pomaga določiti, ali je bil proces izračuna koeficienta α popačen.[1]

Tabela 2: *Koeficienti zanesljivosti Ω za koncept kakovost storitev za vse tri vrste storitev*

	Ω za Dars	Ω za frizerske storitve	Ω za mobilne storitve
KAKOVOST STORITEV	0,938	0,931	0,947

Vir: anketa 2009.

Koeficienti zanesljivost Ω, ocenjeni s faktorsko analizo, so enaki ali nekoliko višji kot Cronbachov koeficient α za koncept kakovost storitev pri vseh vrstah storitev. Koeficienti pri vseh izbranih vrstah storitev kažejo na zgledno zanesljivost merjenja.

Tudi modeliranje z linearnimi strukturnimi enačbami (ang. *structural equation modeling, SEM*) ponuja orodja za preverjanje zanesljivosti merjenja. Uporabili smo programski paket AMOS. Zanj smo se odločili, ker je v trženjski praksi v zadnjih letih zelo popularen, njegova uporaba pa dokaj preprosta. Tako smo zanesljivost indikatorja kakovost storitev ocenili tudi z mero za moč linearnih povezav, tj. kvadrati multiplih korelacij (R^2) za posamezne merske spremenljivke. R^2 predstavlja delež z latentno spremenljivko pojasnjene variance v indikatorju, preostalo je posledica merske napake. Visoke vrednosti R^2 pri vseh posameznih

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[1] Koeficient zanesljivosti Ω smo izračunali po obrazcu:
$$\Omega = 1 - (N - \textstyle\sum_{i=1}^{N} h_i^2)/(N + 2R),$$
kjer je h_i^2 komunaliteta i-te izmerjene spremenljivke X_i, N je število izmerjenih spremenljivk, R pa vsota vseh koeficientov korelacije (Ferligoj idr. 1995, 46).

merskih spremenljivkah za vse tri vrste storitev kažejo na visoko zanesljivost indikatorja.

Tabela 3: *Kvadrati multiple korelacije za indikatorje za posamezne vrste storitev*

	R² – Dars	R² – frizerske storitve	R² – mobil. storitve
Storitev 1: Ocena izkušnje glede kakovosti storitev, gledano v celoti.	,845	,834	,872
Storitev 2: Ocena, koliko kakovost storitev zadovolji pričakovanja uporabnika.	,883	,852	,822
Storitev 3: Ocena kakovosti storitev v primerjavi s konkurenco.	,787	,775	,763

Vir: anketa 2009.

Ugotavljamo, da nam oblikovana skupina merskih spremenljivk z relativno visoko zanesljivostjo omogoča merjenje koncepta kakovost storitev ne glede na vrsto storitev. Pogoj za doseženo kakovost merjenja je tudi veljavnost merjenja, ki meri prisotnost sistematičnih napak. Zato bomo v nadaljevanju ocenili še veljavnost merjenja konstrukta kakovost storitev.

5.2.2. Analiza konvergentne veljavnosti

Veljavnost merjenja ocenjuje »odstopanje izbranih merjenih spremenljivk od teoretičnih spremenljivk« (Ferligoj idr. 1995, 9). Veljavnost konstrukta (ang. *construct validity*) bomo izmerili s konvergentno veljavnostjo. *Konvergentna veljavnost* je stopnja, do katere lestvica pozitivno korelira z drugimi merili istega konstrukta (je pričakovano visoka). V ta namen smo izračunali korelacijske koeficiente med spremenljivkami konstrukta kakovost storitev za tri vrste storitev.

Opažamo močne korelacije med posameznimi merskimi spremenljivkami pri vseh treh vrstah storitev. Vse so statistično značilne, kar je z vidika konsistentnosti konstrukta kakovost storitev zaželeno. Visoki koeficienti korelacije med spremenljivkami istega koncepta kažejo, da je konvergentna veljavnost merjenja vzorna.

Preverjanje konvergentne veljavnosti pa smo izvedli tudi s pomočjo modeliranja z linearnimi strukturnimi enačbami. To je mogoče določiti iz merskega modela z ugotavljanjem, ali so uteži vseh merskih spremenljivk za latentno spremenljivko kakovost storitev dovolj velike. Za merilo uporabimo statistično vrednost t-preizkusa. Tiste merske spremenljivke, ki so bolj proste merskih napak, so primerne za merjenje latentnih spremenljivk. Za vse parametre, ki jih ocenjujemo v modelu, lahko na podlagi izračunanih t-vrednosti ugotovimo, da statistično značilno prispevajo k izgradnji modela. Ker so vse merske spremenljivke v našem modelu značilno povezane z latentno spremenljivko, s tem potrjujemo konvergentno veljavnost merjenja (tabela 5).

Tabela 4: *Korelacijski koeficienti med spremenljivkami konstrukta kakovost storitev za vse tri vrste storitev*

	D-S1	D-S2	D-S3	F-S1	F-S2	F-S3	M-S1	M-S2	M-S3
(D-S1)	1	**,879****	**,795****	,027	,026	,020	,165**	,179**	,164**
(D-S2)		1	**,827****	,051	,042	,041	,153**	,179**	,156**
(D-S3)			1	,031	,022	,032	,145**	,165**	,140**
(F-S1)				1	**,861****	**,788****	,224**	,204**	,187**
(F-S2)					1	**,802****	,186**	,180**	,165**
(F-S3)						1	,205**	,183**	,191**
(M-S1)							1	**,856****	**,802****
(M-S2)								1	**,793****
(M-S3)									1

** Korelacija je statistično značilna pri stopnji tveganja 0,01 (dvosmerno).

* Korelacija je statistično značilna pri stopnji tveganja 0,05 (dvosmerno).

Oznake:

Gledano v celoti, so moje izkušnje glede kakovosti Darsovega upravljanja in vzdrževanja slovenskih avtocest odlične (D-S1).

Moja pričakovanja glede kakovosti Darsovega upravljanja in vzdrževanja so v celoti izpolnjena (D-S2).

Kakovost Darsovega upravljanja in vzdrževanja v primerjavi s tujimi avtocestami je odlična (D-S3).

Gledano v celoti, so moje izkušnje glede kakovosti storitev frizerskega salona odlične (F-S1).

Moja pričakovanja glede kakovosti storitev frizerskega salona so v celoti izpolnjena (F-S2).

Kakovost storitev tega frizerskega salona v primerjavi s konkurenco je odlična (F-S3).

Gledano v celoti, so moje izkušnje glede kakovosti storitev tega mobilnega operaterja odlične (M-S1).

Moja pričakovanja glede kakovosti storitev tega mobilnega operaterja so v celoti izpolnjena (M-S2).

Kakovost storitev tega mobilnega operaterja v primerjavi s konkurenco je odlična (M-S3).

Vir: anketa 2009.

Tabela 5: *Standardizirana rešitev merskega modela zadovoljstvo uporabnikov za posamezne vrste storitev*

	St. vredn. uteži za Dars	St. vredn. uteži za friz. stor.	St. vredn. uteži za mobi. stor.
storitev 1	,919	,913	,934
storitev 2	,940	,923	,906
storitev 3	,887	,881	,874

Opomba: vse vrednosti so statistično značilne pri stopnji tveganja, manjši od 0,001.

Vir: anketa 2009.

Potrjeni zanesljivost merjenja (tabele 1, 2 in 3) ter veljavnost merjenja (tabeli 4 in 5) kažeta, da je kakovost merjenja konstrukta kakovost storitev z izbranimi tremi manifestnimi spremenljivkami dobra.

6 Prispevki in sklep

Znanstveni pristop k merjenju kakovosti storitev je zahtevno področje, saj je treba upoštevati kakovost merjenja. Kako doseči kakovostno merjenje posameznih konceptov, je odvisno od poglobitve akademikov v posamezno področje. Med obetavne znanstvene pristope danes sodijo kombinacije različnih metod in pristopov, ki vključujejo empirične raziskave, kvalitativne metode, ekonometrično modeliranje in več sodelovanja med praktiki in akademiki. Tem načelom smo sledili tudi v naši raziskavi, zato predstavljata konceptualizacija in operacionalizacija latentne spremenljivke kakovost storitev pomemben metodološki prispevek k znanstvenemu načinu merjenja kakovosti storitev.

Ker se pomen storitev v vseh razvitih ekonomijah, tudi v Sloveniji, povečuje, narašča tudi zanimanje za raziskovanje storitev. Sočasno opažamo velik napredek na področju razumevanja kakovosti storitev. Dileme, kako konceptualizirati in operacionalizirati kakovost storitev, so v literaturi pogoste. Pri konceptualizaciji in operacionalizaciji kakovosti storitev smo sledili najsodobnejšim metodološkim pristopom s tega področja. Po natančnem pregledu študij, ki merijo kakovost storitev, smo postavili tri manifestne spremenljivke za latentno spremenljivko kakovost storitev. Da bi konceptualizacija kakovosti storitev in njena operacionalizacija ustrezali zaznavanju slovenskih uporabnikov, s čimer bi prispevali k merjenju kakovosti storitev tudi v slovenski poslovni in akademski praksi, smo dodali štiri fokusne skupine med slovenskimi uporabniki različnih vrst storitev. Po kvalitativni raziskavi smo opravili še kvantitativno raziskavo.

Ocenjujemo, da je naša operacionalizacija kakovosti storitev, ki vključuje izkušnje glede kakovosti storitev, gledano v celoti, primerjavo, koliko kakovost storitev zadovolji pričakovanja uporabnika, in primerjavo kakovosti storitev s konkurenco, pomemben metodološki prispevek, saj se je zanesljivost merjenja pokazala kot zgledna v vseh treh vrstah storitev, potrdili pa smo tudi konvergentno veljavnost merjenja.

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INFORMATION SOURCES USED BY VISITORS LOOKING FOR DIFFERENT BENEFITS: THE CASE OF PORTOROŽ

Uporaba virov informacij med obiskovalci z različnimi motivi za potovanje – primer Portoroža

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Abstract

This paper examines the information sources of visitors to Portorož for four identified distinct clusters of visitors. The study focused on using a single one source of information about Portorož regardless of the cluster to which the visitors belonged. The Internet and brochures were identified as the most important sources of information in general. The cluster defined as "well-being visitors" demonstrated a significantly different structure of information sources, relying predominantly on brochures and the Internet. Unlike first-time visitors, regular visitors indicated a relatively low percentage of Internet and brochure use.

Keywords: market segments, information source, brochures, the Internet

Izvleček

Namen članka je proučiti vire informacij, ki jih uporabljajo štirje različni grozdi (ang. cluster) obiskovalcev Portoroža. Ne glede na grozd največ obiskovalcev Portoroža uporablja le en vir informacij. Splet in brošure so na splošno prepoznani kot najpomembnejši vir informacij. Grozd »well-being obiskovalcev« ima značilno drugačno strukturo z močnim poudarkom na pridobivanju informacij s pomočjo brošur in spleta. Le majhen odstotek obiskovalcev Portoroža za vir informacij uporablja internet in brošure, kar pa ne velja za tiste, ki Portorož obiščejo prvič.

Ključne besede: tržni segmenti, viri informacij, brošure, splet

1 Introduction

Potential visitors to destinations can access various sources of information that brings intangible tourism products, which cannot be tested in advance, closer to the potential consumers. As such, potential visitors can access information and increase their knowledge about tourism products and destinations in the earliest stages of the buying process (Bieger & Laesser, 2001).

Tourists use various types and amounts of information sources in their vacation planning (Fodness & Murray, 1999). Beatty and Smith (1987, cited in Crotts, 1999) defined four basic categories of information sources for consumers: (a) personal (advice from relatives and friends), (b) marketer-dominated (e.g., brochures, advertisements), (c) neutral (e.g., travel agents and travel

guides), and (d) experiential sources (e.g., past visits). Brochures remain the most widespread sources of information for travellers (see, for instance, Bieger & Laesser, 2000; Middleton, Fyall, & Morgan, 2009). Andereck (2005) found that a brochure significantly increases travellers' interest in first visiting a destination as well as subsequent visits. Information sources are designed to attract attention among potential travellers and stimulate interest for demand. Electronic media, especially the use of the Internet, is expanding rapidly in destination promotion. Buhalis (2003) highlighted the importance of the Internet for destination marketing. Kribel and Bojnec (2007) investigated the use of marketing communication channels and e-services, focusing on the Internet and web use for information service, communication, and marketing tools, among Slovenian travel agencies and compared the results to those from travel agencies in Turkey. The multivariate factor analysis for Slovenia confirmed that price and quality of services are the dominant factors for medium-sized travel agencies whereas for larger-sized travel agencies reservation information dominates and for small-sized travel agencies different information and links dominate.

A survey on information and communication technology usage in households and among individuals in the 27 EU member states as well as Norway, Iceland, and Croatia, conducted by Eurostat (European Travel Commission, 2010), showed that 26% of Slovenia's inhabitants aged 16 to 74 had used the Internet for travel and accommodation services in the first quarter of 2008. However, this percentage varies by country. Other sources of information for tourists include guidebooks, information given by travel agencies, word-of-mouth or information given by reference groups (e.g., friends and relatives), and participation in fairs and exhibitions.

Research on information sources used by travellers may have more practical value for destination management, marketing, and promotion if it is focused on specific market segments of tourists. Thus, market segmentation is usually used to acquire better insights into the usage of information sources. Indeed, tourism segmentation is an important tool for dividing the entire tourist market according to specific characteristics of the market's supply and demand. Middleton et al. (2009, p. 97) found that market segmentation helps identify the most productive targets for marketing activities. Market segmentation is "a division of large, heterogeneous markets into smaller segments that can be reached more efficiently and effectively with products and services that match their unique needs" (Kotler & Armstrong, 2009, p. 216). Segmentation in tourism helps identify the characteristics of specific segments of tourists. Such characteristics can encompass information about demographics, activities in which visitors or tourists engage, travel-related information, and other information. Understanding these characteristics is fundamental for designing appropriate and successful marketing strategies for a tourism destination.

This paper aims to investigate information-gathering efforts of different tourist market segments in Portorož according to benefits sought by visitors. Portorož, located on the Slovenian Adriatic coast, is the most important tourism destination in Slovenia according to tourists' arrivals and overnight stays. Specifically, the objectives of this paper are to:

– identify information sources of each segment of visitors,

– conduct empiric testing if statistically significant differences emerge in the usage of information sources among the segments, and

– examine the differences in the usage of information sources among first-time visitors and regular visitors for each cluster.

2 Literature Review

Searching for information on destinations has become one of the most popular issues in tourism research (Chen & Gursoy, 2000). Identifying and understanding information-gathering efforts among specific segments of visitors helps optimally allocate and direct information channels used by potential visitors to destinations. Such knowledge can in turn be used to determine strategies to enhance destination marketing. In addition, destinations are better able to reach more specific segments. Information available to potential visitors is used to make travel and destination choices. As such, it is not surprising that experts in tourist behaviour significantly emphasize information searches and the use of information sources. Understanding information source utilization helps marketers effectively tailor their marketing efforts (Gursoy & Chi, 2008). Market segmentation can even improve the knowledge of information sources, thereby providing important issues for specific segments of visitors. Schul and Crompton (1983, in Chen & Gursoy, 2000) found that information search behaviour is better explained by psychographic segmentation than demographic segmentation. Haley (1968) initially demonstrated that benefit segmentation can predict better buying behaviour of customers than geographic or demographic segmentation.

However, many distinct approaches and bases can be used for market segmentation. Homogeneous groups within the tourism market can be identified by a number of different segment variables depending on the purpose. This literature review highlights a number of studies using geographic segmentation of tourists (Kozak, 2002), demographic characteristics (Juaneda & Sastre, 1999), psychographics (Galloway, 2002), expenditures (Diaz-Perez, Bethencourt-Cejaz, & Alvarez-Gonzales, 2005; Mok & Iverson, 2000), motivations (Beh & Bruyere, 2007; Bieger & Lasser, 2002; Boo & Jones, 2009; Lee, Lee, Bernhard, & Yoon, 2006), activities (Choi & Tsang, 1999; McKercher, Ho, du Cros, & So-Ming, 2002), and benefit segmentation (Frochot, 2005; Jang, Morrison, & O'Leary, 2001), just to name a few studies. These segmentation techniques

can be divided into *a priori* and *a posteriori* segmentation (Mazanec, 2000) according to the approach used in the segmentation process. *A priori* or pre-existing market segments in the tourism industry are defined by splitting the market in advance, usually according to geographic or demographic variables of visitors (Dolnicar & Leisch, 2003). According to Dolnicar and Gruen (2008, p. 63), in *a priori* segmentation, "the crucial decision is on the selection of the segmentation criterion or criteria". On the other hand, in *a posteriori* segmentation, the identification of segments is derived from the exploratory study.

Dolnicar and Leisch (2003) found several differences regarding the use of various sources of information among winter tourist segments in Austria based on lifestyle segmentation. Differences were noted in the use of brochures, media ads, tour operators, friends and relatives, travel agents, and tourism bureaus, but no statistically significant difference in the use of the Internet was found. Bieger and Laesser (2000) segmented travellers in Switzerland according to the information sources used. The study found that the choice of destination, the type of trip taken, and the degree of packaging are inter-correlated to the information sources. Recently, Dey and Sarma (2010) confirmed differences in information source usage among motive-based segments in newly emerging tourist destinations of India's north-east region. Moreover, Sarigollu and Huang (2005) found differences among segments of tourists in Latin America in using the Internet and consulting travel agents and travel books; yet no differences emerged among segments regarding gathering information from friends and family, newspaper travel, travel brochures, and TV travel shows. Hu and Yu (2007), in their research on shopping-related beliefs and behaviours of craft souvenir buyers, found differences in information source use. In particular, a distinction was noticed among printed materials such as directories or shop maps, travel packets from state tourism bureaus prior to a trip, and the Internet. On the other hand, no statistically significant difference existed in the usage of brochures by different segments of tourists. Meanwhile, Sirakaya, Uysal, and Yoshioka (2003) explored the use of information by different segments of Japanese tourists visiting Turkey. They did not find differences between "escapers" and "seekers" regarding paid advertising and information from social sources (such as word-of-mouth info, business colleagues, friends and family). However, they identified differences in the use of information from the government and individuals' own sources (previous experience). Kozak and Kozak (2008) conducted important research on the relevance of information sources. They found that tourists visiting Turkey are provided with information from a range of different sources. In addition, they found that the information sources vary according to visitors' level of education of purpose of their visit. Indeed, an important difference exists between information sources used by first-time and non-first-time visitors. Chen and Gursoy (2000) found significant differences between first-time and repeat visitors. Moreover, Choi, Lehto, and Morrison (2008) segmented

Chinese tourists to Macao by information source available, focusing on first-time visitors.

3 Research Design

Marketers in tourism are facing a complex environment in the field of marketing and communication channels due to macro-economic developments, specific tourism developments, and marketing, information, and communication approaches. As such, they need to select the most effective tools for communication that cover the market and create awareness and interest for specific tourism products or destinations. Market segmentation can help marketers identify the most appropriate media for the specific segment. Middleton et al. (2009, 97) listed several functions of market segmentation and highlighted the segmentation as the basis for communicating relevant images to targeted potential users.

As such, acquiring knowledge about information sources is the predisposition for the sensible adoption of suitable information channels. The paper is built on Nemec Rudež, Sedmak, and Bojnec's (2011) study, which examined segments of visitors to Portorož during spring. The present research tries to analyse the connections between information sources and benefits sought by visitors. However, research in this area is lacking; thus, exploratory research is undertaken in order to answer the research question—namely, how benefits sought by visitors to Portorož and information sources are connected by different segments of visitors. In addition, the research tries to answer whether any difference exists in the usage of information sources among different segments of visitors, particularly in the usage of information sources between first-time visitors and regular visitors in each of possible cluster of specific market segments.

4 Methodology

The current study was undertaken to examine which communication channels are used by different market segments of tourists. Market segments were derived from the previous study (Nemec Rudež et al., 2011), the purpose of which was to segment the visitors according to the benefits they seek in Portorož. Multivariate factor and cluster analyses were used following Kachigan's (1991) approach. Nemec Rudež et al. (2011) identified four segments of tourists. The largest segment, "well-being visitors," seeks health and price convenience. Meanwhile, "friends-oriented visitors" prefer spending time with friends and enjoy passive approaches to leisure. "Curious passive visitors" are primarily interested in learning and having fun as well as engaging in passive ways of spending time at the seaside. Finally, "multifarious visitors" are interested mostly in spending time with friends, learning, and having fun, although they are also partly interested in relaxation, health, and price convenience.

In the current study, data used in the empirical analysis were collected by survey fieldwork using a written questionnaire between April 15 and May 31, 2010. Seven

possible sources of information for tourists were included in the written questionnaire: brochures, media advertising, guidebooks, the Internet, information from relatives and friends, tourism offices in Slovenia, and tourism fairs. More than one answer was possible as more information sources can be combined when searching for information about a destination. Respondents were selected according to the proportional quota sampling based on the structure of the nationality of foreign tourists in Portorož, resulting in 37.7% Italian visitors, 25.6% Austrian visitors, 12.0% German visitors, and 25.6% visitors from other countries. A total of 365 visitors of Pororož were included in the sample. The face-to-face survey was limited to foreign leisure visitors and was conducted in several public locations in Portorož. Written questionnaires were provided in English, German, and Italian languages.

The collected survey data were analysed using Statistical Package for the Social Sciences (SPSS). Four clusters representing four segments of visitors were cross-tabulated as external variables in order to specify information gathering by specific segments of visitors. A comparison between tourists visiting Portorož for the first time and regular visitors was performed as well.

5 Findings

The lowest share of visitors to Portorož who do not need any information is represented by "well-being visitors". Further, visitors to Portorož mostly use only one information source, varying between 40% and 61.3% of visitors in the cluster (Table 1).

Generally speaking, the most widespread information sources among the respondents are the Internet and brochures (Table 2): 124 (34.1%) respondents received information from the Internet and 121 (33.2%) respondents from brochures. Moreover, 67 (18.4%) respondents indicated receiving information from relatives and friends. The data reveal that 72 (19.8%) respondents obtained information about Portorož from guidebooks. Only 27 (7.4%) respondents answered that they obtained information from media advertising, a tourist information office in Slovenia, or a tourism fair.

The Chi square was calculated to determine if statistically significant differences in information sources exist among the four clusters (Table 2). The four clusters do not differ significantly in the use of the Internet (Chi square = 6.544, sig. = 0.088) or other sources of information (Chi square = 0.271, sig. = 0.965). However, some statistically significant differ-

Table 1. *Information Sources Used by Clusters*

	Cluster 1 – Friends-oriented visitors	Cluster 2 – Well-being visitors	Cluster 3 – Curious passive visitors	Cluster 4 – Multifarious visitors
No information needed	26 (32.1 %)	30 (18.1 %)	11 (20 %)	17 (27.4 %)
Use of one source	37 (45.7 %)	82 (49.4 %)	22 (40 %)	38 (61.3 %)
Use of two sources	15 (18.5 %)	45 (27.1 %)	20 (36.4 %)	5 (8 %)
Use of three or four sources	3 (3.7 %)	9 (5.4 %)	7 (1.2 %)	7 (1.2 %)

Source: Authors' survey results

Table 2. *Usage of Specific Information Source for Each Cluster*

	Cluster 1 – Friends-oriented visitors	Cluster 2 – Well-being visitors	Cluster 3 – Curious passive visitors	Cluster 4 – Multifarious visitors	Total	Chi-square (sig.)
Brochure	13 (16%)	87 (52.4%)	9 (16.3%)	12 (19.4%)	121	50.720 (0.000)
Guide books	17 (21%)	25 (15%)	18 (32.7%)	12 (19.4%)	72	8.222 (0.042)
Internet	21 (25.9%)	67 (40.4%)	19 (34.5%)	17 (27.4%)	124	6.544 (0.088)
Relatives and friends	19 (23.4%)	22 (13.3%)	9 (16.4%)	17 (27.4%)	67	7.817 (0.050)
Other sources	7 (8.6%)	12 (7.2%)	4 (7.3%)	4 (6.5%)	27	0.271 (0.965)

Source: Authors' survey results

Note: Numbers in parentheses indicate percentage of the segment

ences emerged among the four clusters in the use of guide-books (Chi square = 8.222, sig. = 0.042), brochures (Chi square = 50.720, sig. = 0.000), and information provided by relatives and friends (Chi square = 7.817, sig. = 0.050).

The highest percentage of visitors to use brochures was found among "well-being visitors", approximately 52.4% of whom use brochures. A lower percentage of visitors (between 16% and 19.4%) in other segments use brochures. The use of guidebooks for Portorož is the most widespread among visitors who belong to the "curious passive visitors" group, representing almost one third of the cluster. Other visitors use guidebooks slightly less often, varying from 15% to 21% of visitors in the cluster. The Internet is also important for all clusters and is the most used information source for "well-being visitors". The information given by relatives and friends surprisingly does not play a significant role for "well-being visitors"; rather, it is much more widespread among "multifarious visitors". Other sources of information proved to be relatively less important for all clusters.

Two of the most important information sources—the Internet and brochures—were analysed in more detail to investigate if any differences occurred in their use between first-time and non-first-time visitors as well as regular and non-regular visitors (Table 3). Both first-time visitors and regular visitors use brochures as a source of information. First-time visitors range in the use of brochures from 40% for "well-being visitors" to 69% for "friends-oriented visitors". The data indicated that the Internet is used as an information source by both first-time visitors and regular ones. Moreover, brochures and the Internet are less important for regular visitors. Due to the very small number of regular visitors using brochures and the Internet in each cluster, these results should be taken with caution.

6 Conclusions and Implications

This paper presents an in-depth look into the information sources used by visitors looking for different benefits in Portorož. These visitors mostly look for information before

they visit and primarily use a single information source, relying predominantly on the Internet and brochures. As in Dolnicar and Leisch's (2003) study, no significant differences were found in the current study concerning the use of the Internet. The difference between the two studies is that the Internet turned out to be a relatively unimportant source for tourists in winter in Austria whereas in our study it is one of the two most important sources of information. This may be explained by the 12-year lag between the two studies' data collection as Dolnicar and Leisch's study is based on data from winter 1997-1998. The shift is consistent with the development and use of the Internet in tourism promotion during the last decade (Kribel & Bojnec, 2007). No other research of information sources in tourism has yet been carried out in Slovenia or Portorož to the authors' knowledge. Furthermore, similar to Sarigollu and Huang's (2005) study, a statistically significant difference was found in the use of brochures among the segments. Therefore, brochures should be designed and delivered with consideration to their use in specific segments.

"Well-being visitors", representing the largest segment of visitors, rely on a much different structure of information sources, with the strongest source of information being brochures and the Internet. This segment seeks benefits connected with price convenience and health. Therefore, it is not surprising that this segment uses mostly information sources that are available free of charge. This finding may imply that brochures and their content should be more adapted to health and wellness characteristics of Portorož as well as to price promotion. The other three tourist segments have a much more similar structure of information sources that are also more evenly distributed among the different sources of information. Guidebooks, the most expensive source of information, has the highest share of use only among "curious passive visitors", visitors who show more interest in learning and fun (Nemec Rudež et al., 2011).

As expected, brochures and the Internet are more often used by first-time visitors than by regular visitors. Familiar-

Table 3. *Brochure and Internet Usage of First-time and Regular Visitors*

	Cluster 1 – Friends-oriented visitors	Cluster 2 – Well-being visitors	Cluster 3 – Curious passive visitors	Cluster 4 – Multifarious visitors
Usage of brochures				
First-time visit	9	35	5	7
% of all brochure users in the cluster	69 %	40 %	55 %	58 %
Regular visitors	2	22	3	3
% of all brochure users in the cluster	15 %	25 %	33 %	25 %
Usage of the Internet				
First-time visit	11	29	8	10
% of all Internet users in the cluster	52 %	43 %	42 %	58 %
Regular visitors	7	22	3	2
% of all Internet users in the cluster	33 %	33 %	16 %	11 %

Source: Authors' survey results

ity with the destination seems to play an important role regardless of the cluster. The use of the Internet ranges from 25.9% for "friends-oriented visitors" to 40.4% for "well-being visitors". This finding implies the need for upgrading the Internet as a source of information, using social media such as Facebook, Twitter, and YouTube. The combination of the two most important information sources—brochures and the Internet—should be developed in the form of e-brochures and podcasts (digital media files) about Portorož. According to the sample results, media advertising Portorož, visits to tourist information offices in Slovenia, and fair attendance—all included in "other sources"—seem to be quite unimportant for the promotion of Portorož. Thus, advertising in traditional media and fair attendance can be replaced or redirected into new social media, thereby providing the advantage of a cost-effective source of information. It is also necessary to consider the fact that media preferences change over the seasons (Calantone & Johar, 1984).

In terms of managerial implications, a significant difference emerged in the structure of visitors using different information sources and their tourist expectations, which calls for adjustments in both tourist product supply and the promotion of the tourism destination to be more in line with tourists' expectations and demands.

Some scepticism arises regarding the comparisons of information flows with the changing structures from the past and the most recent possible differences between tourist seasons, as our results are limited only to a single season. Therefore, destination marketers should investigate preferred information sources in other seasons as well given that our study is limited solely to the spring season. Future research may also be extended to other seasons to examine the relationship of information sources and travellers' country of origin in order to better allocate information sources, marketing, and distribution channels.

Finally, among the limitations of the study, only foreign leisure visitors were included in the research. In addition, the study investigated visitors during spring, who could have specific characteristics. Thus, the findings cannot be generalized to all visitors to Portorož, particularly those in other seasons.

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LABOUR MARKET SKILL DEFICIENCIES IN THE TOURISM AND HOSPITALITY INDUSTRY

Primanjkljaji na trgu delovne sile za potrebe turizma in gostinstva

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Abstract

The Slovenian tourism and hospitality labour market suffers from several deficiencies and structural imbalances. This paper focuses on one solution to these problems in terms of certifications of accredited national vocational qualifications. The tenth anniversary of Slovenia's adoption of the National Professional Qualifications Act seems a convenient time to evaluate the results of this certification system and measure the benefits. A survey was conducted on a sample of employers in the tourism and hospitality industry. Using quantitative data analysis as well as a correlation and multivariate factor analysis, the major deficiencies in the implementation of the certification system were identified.

Keywords: labour market, employers, national vocational qualification, certification, non-formal learning, informal learning

Izvleček

Strukturna neskladja in pomanjkanje znanja in delovne sile na slovenskem trgu dela se odražajo tudi v turizmu in gostinstvu. V prispevku obravnavamo eno izmed možnih rešitev problemov na trgu dela, povezano z uvajanjem sistema certificiranja nacionalnih poklicnih kvalifikacij. Ob deseti obletnici sprejetja Zakona o nacionalnih poklicnih kvalifikacijah ocenjujemo rezultate uvajanja tega sistema in zaznane prednosti pri deležnikih. Opravili smo anketno raziskavo na vzorcu delodajalcev v turizmu in gostinstvu. S kvantitativno analizo dobljenih podatkov, korelacijsko in multivariatno faktorsko analizo smo identificirali poglavitne dejavnike neuspešnosti pri implementaciji sistema certificiranja nacionalnih poklicnih kvalifikacij.

Ključne besede: trg dela, delodajalci, nacionalna poklicna kvalifikacija, certificiranje, neformalno učenje, izkustveno učenje

1 Introduction

The focal point of this analysis is the importance of the certification system (i.e., the system of assessment and validation of national vocational qualifications [NVQs]) as a competitive edge for our labour force in the tourist market. We focus here on non-formal and informal learning, which is often neglected while the validation and verification are ignored. The introduction of informal and non-formal learning into the system of NVQ accreditation has brought about several advantages for all stakeholders in the labour market. With the increased interest in human resources (HR) and the awareness of its importance as a key competitive priority of the society and the economy, all forms of lifelong learning have been recognized as important. Intellectual capital is more important than financial capital; thus, it is the employees who expand the value of the organisation and society. In education and learning, a new paradigm has emerged, integrating all forms of lifelong learning—formal, non-formal, and informal. Although the previous paradigm is based on education, the newer one stresses the importance of learning. Accoridng to Jelenc, Komljanc, and Žakelj (2007), authors of *Lifelong Learning Strategy in Slovenia*, the original paradigm was founded on a formalized structured process of education, formal relations

between the educator and the student, and the transfer of information, with the entire process leading towards certificates; meanwhile, the contemporary paradigm includes an outer circle of organized learning experiences, denoted by their voluntary nature and a zest for learning. Thus, learning is much more than education, and the complementarity of formal, non-formal, and informal learning is essential for HR development. Concurrently, a modern information society offers numerous, almost unlimited, opportunities for learning.

The introduction of informal and non-formal learning into the system of vocational qualification accreditation should bring about several positive impacts on employability, employee promotion, wage levels, and self-employment, among other factors. However, 10 years after Slovenia's adoption of the National Professional Qualifications Act (ZNPK, 2000), questions arise as to whether the certification system has actually had any effects, especially on the labour market.

Through negative demographic trends, high unemployment rates, and structural imbalances in the labour market, Slovenia has become increasingly aware of the significance of the increased market value of knowledge. Numbers of young people in the labour market have declined; at the same time, more elderly workers are in the labour market. Skill shortages at lower levels of qualification can be solved only through immigration flows. The quality of human resources changed considerably during the transition period. "It seems that human resources can grow mostly qualitatively, meaning by enhancing employees' knowledge, skills and competences" (Svetlik, 2004, p.7). HR's influence on organizational competitiveness and the economy has been emphasized by several other authors (Allen, Dawson, Wheatly, & White, 2008; Bryan & Joyce, 2007; Drucker, 2001; Pavlin, 2007; Senge, 2001; Vodopivec & Dolenc, 2009). The pace of the global market can be kept up only with lifelong learning and training. The system of NVQ certifications promotes lifelong learning in all its dimensions.

In Slovenia, both non-formal and informal learning have always supported the formal education process, although they have not been recognized—a problem the launch of the certification system in 2000 sought to overcome. The certification system was simultaneously merged with the vocational education and training (VET) system. OECD experts (Werquin, 2010) revealed that Slovenia seems to have many non-qualified workers, although they appear to have a level of performance meriting the award of a qualification. Slovenia also suffers from a shortage of semi-skilled workers. Much of these mismatches and deficiencies in the labour market can be solved through the use of NVQ certificates.

Dynamic business and social environments demand constant adjustments of school curricula as well as NVQ catalogues to the new conditions. Yet the Slovene educational system has often been criticized for failing to satisfactorily meet the demands of numerous companies. Such views

apply to the tourism and hospitality sector. The system of certifying NVQs can offer prospects for improving these anomalies as it is more flexible and dynamic; moreover, employers can provide initiatives for new NVQs. Furthermore, in the global labour market, NVQ certificates could represent a transparent qualification that can be compared among EU countries and would enable free movement of workers between member countries.

2 Research Context

A certification system means a publicly established set of bodies and procedures, which provide for the awarding of certificates. This means that the certificates issued have a similar meaning as the degrees/diplomas issued after one successfully finishes an educational programme. They give certain status and chances to individuals in the labour market. Employers are expected to view them as indicators of the quality of the labour supply and to respect them in recruitment, remuneration and other HR management procedures. In this respect, certificates should be transparent and shaped as much as possible in line with the other EU countries. (Svetlik, 2000, p. 8)

Here we must also draw attention to the specifics of the terminology because certificates generally provide written proof that students have finished certain programmes; however, in Slovenia, the term *certificate* has always been reserved for non-formal areas.

The main purpose of the certification system is to include knowledge, skills, know-how, competences, etc., acquired from outside the formal system through non-formal and informal learning among the formally recognized competences. In the past, people learned everything at school; such learning sufficed for their lifetime. Today, knowledge must be constantly upgraded and expanded; otherwise it is in danger of becoming dated. People do not just learn in school; they learn along with various activities, through practice, volunteer activities, hobbies, and the media, among others. In addition, new technologies are fostering an interest in learning and self-learning. Such tacit knowledge has to be made explicit and verified so that an individual's employability and competitiveness can be increased. People need formal proof that they possess certain competences: If this is managed, then the value of human capital in society can be utilized.

Different ways exist for recognizing non-formal and informal learning in Slovenia. The OECD national report for Slovenia indicates that the national concept of recognizing prior learning does not exist, although some forms—NVQ certifications—have been developed (Ivančič et al., 2007). Furthermore, the higher education sphere followed the example of the certification system when establishing recognitions on a tertiary level in 2003. Figure 1 shows both systems leading towards vocations under the auspices of the Ministry of Education (left side) and the Ministry of Labour (right side).

Figure 1: *The two paths towards vocation (CPI, 2011)*
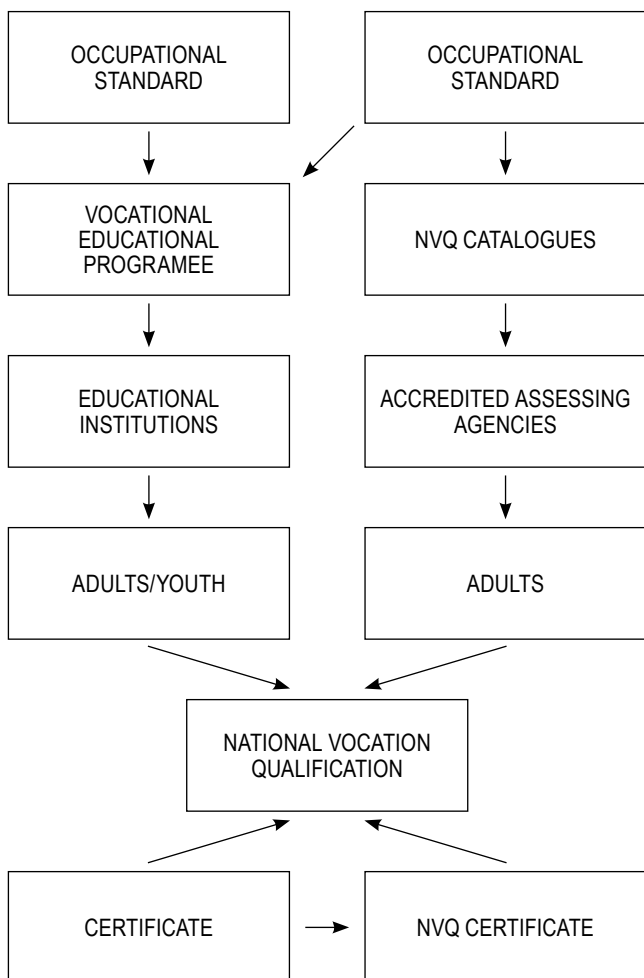
Thus, in Slovenia, individuals can obtain qualifications in two ways. The basis of vocational qualifications is occupational standards. These qualifications lead to either vocational educational programmes or catalogues of NVQs. The latter are only for adults whilst young people should attend formal educational programmes. They do not award degrees; rather, candidates receive a vocational qualification.

Several experts (OECD, 2007; Svetlik, 2000) have warned that NVQ certificates could lead to a parallel educational system that competes with the existing system. Concerns that the certification system could undermine the educational system are widely shared among other stakeholders as well. Would such a system create a shorter and easier way to obtain a proof of qualifications? The fact is that it can compensate for some deficiencies endemic to formal learning, but it does not lead towards higher education. In addition, it is intended exclusively for adults. More persuasive is the argument that the two systems should complement one another. The linking points are credits acquired through certificates that can be recognized in schools. Moreover, many people have expectations that NVQ certificates could help solve the problem of drop-outs. Duvekot,

Schuur, and Paulusse (2005, p. 198) agreed: "The fact that Slovenia has got relatively high rates of drop-outs from the formal educational system, gives more value to the validation of experiential learning as a factor of national policy of improving the qualification structure of the labour force."

3 Implementation of the NVQ Certification System

Between 1997 and 2000, the Ministry of Labour launched a pilot project for NVQ certification: 25 proposals for NVQ catalogues were introduced by chambers, ministries, or various associations. This pilot project ended rather miserably as all 25 proposals were rejected. Analysts blamed social partners for the lack of consensus, institutional barriers, indecisiveness of the authorities involved, and long-lasting procedures (Kopač, 2000). In 1999-2000, a PHARE Mocca project developed and implemented assessment and recognition procedures. In 2000, the National Vocational Qualifications Act was approved by Parliament and NVQ certifications were legally introduced in Slovenia. Another important milestone for the development of the certification system happened when they merged it with the VET system. Thus, some NVQ certificates can be obtained through a formal system of education while adults can also return and progress in the VET system after acquiring an NVQ certificate.

Thereafter, all national strategic documents addressing HR development and national strategies coping with unemployment problems and problems of structural disparities in the labour market (e.g., active labour market policy programmes, programmes addressing social cohesion) have been promoting the acquisition of NVQs based on non-formal education, learning and work experiences as an important measure directed towards the improvement of qualifications and employability of the labour force. (OECD, 2007, p. 17)

Table 1. *Results of the Certification System, 2000-2010*

Occupational standards	532
NVQ catalogues	247
Certificates	56,824
Accredited assessment institutions	147
Licensed members of assessing committees	1,907
Counsellors	320

Sources: Čot (2010), NRP (2011), RIC (2010)

Table 1 shows the necessary technical and organizational infrastructure for the NVQ system and its progress since 2000. Apparently, the number of ratified NVQ catalogues does not support the dynamics of ratified occupational standards. Furthermore, assessment institutions and counsellors seem numerous enough, but they do not cover all the regions. In addition, some NVQs are "dead" because assessment institutions and licensed assessors have not been accredited yet.

Table 2. *Development of NVQ Catalogues and Number of Issued Certificates (2000-2010)*

Year	2000	2001	2002	2003	2004	2005	2006	2007	2008	2009	2010
Catalogues	6	4	3	36	17	22	13	57	18	35	36
NVQ certificates	-	-	35	46	633	4258	7849	9589	14335	15357	4722

Sources: RIC (2010), NRP (2011)

Table 2 implies a constantly increasing number of NVQ catalogues and issued certificates, although the structure is unbalanced. The majority of certificates were awarded in the construction industry, security, agriculture, and transport services, where responsible ministries have included NVQs in sectoral legislation. However, the decline in issued certificates in 2010 stemmed from the exclusion of the NVQ Driver from legal requirements for this occupation.

4   Identified Problems

Objectives of this analysis result from several perceived problems concerning the certification system within the sphere of tourism and hospitality. The first problem is the limited number of NVQs that can be certificated for the sphere of tourism and hospitality. Initiatives for new NVQs are few, deriving mostly from schools, whilst employers do not seem to be interested in participating. Their acknowledgments of certificates when recruiting personnel seem unfavourable as they still prefer school diplomas. Employers demonstrate very weak awareness of the main distinctive features of the certification system. Results are discouraging as well when comparing demands for workers in the labour market with the collection of existing NVQs in the sector.

5   Research Methodology

A survey was performed on a sample of employers in tourism and hospitality as the most important stakeholders in the certification system. We focused on employers for several reasons. First, employers participate in the development of the certification system (an important distinction from the situation in the formal education system). Second, if certified NVQs are not acknowledged in the labour market (i.e., by employers), the whole system fails. Therefore, the success of the NVQ certification system rests on the basis of trust. As Ivančič (2000) pointed out, the value of experiential and non-formal learning in the labour market (as well as in the formal education system) is not only an administrative and a technical problem, but also first and foremost a problem of general trust.

The purpose of the analysis was to collect in-depth data concerning attitudes and viewpoints of key groups of stakeholders. We wanted to find out whether this system is known among stakeholders at all and observe their standpoints. The main goal of the research was to identify the deficiency factors of the implementation of the NVQ certification system. Additional aims of the research were to present the current state of NVQs in the tourism and hospitality industry and assess the responsiveness of employers to this new evidence of personal qualifications.

Complete, usable data were obtained from the respondents and processed using Microsoft Excel and SPSS. Using the data obtained, we tried to determine whether the hypotheses could be rejected or accepted. In the present study, we expressed relationships through the following hypotheses:

H1   Cooperation exists between social partners and an adequate organizational and administrative regulation of the system of certifying NVQs.

H2   The NVQ system is well-promoted, transparent, and simple, with low costs and without excessive bureaucracy in its procedures.

H3   Certified competences increase employability, mobility, and career promotion of the workforce, thereby enhancing their competitive edge in the labour market.

Since efficiency of the implementation of the certification system is not measurable we searched for factors in the background that influence the variable performance using a correlation and multivariate factor analysis. The extraction methods used were the principal axis factoring and the maximum likelihood. Thus, we recognized the major factors that affect the implementation of the certification system.

6   Data

Data were collected via questionnaires distributed to members of employers in the tourism and hospitality industry (management level). The questionnaire was designed for the purposes of this study, and all 22 questions were based on the three hypotheses. Questionnaires sought information on participants' attitude towards NVQs and their current practices when employing individuals, paying wages, and promoting personnel. Most questions were closed—some with yes-no options and others with a five-point Likert scale, ranging from 1 (I do not agree at all) to 5 (I agree entirely) or from 1 (very discouraging) to 5 (very encouraging). A neutral answer (neither agree nor disagree or indifferent) was adopted in order to reduce uninformed answers. Open-ended questions were added to elicit other attributes considered important by respondents. At the end we gathered demographic data.

Addressees were selected from the databases of the Chamber of Craft and Small Business and the Chamber of Commerce and Industry. When sampling, we tried to avoid small entrepreneurs where we expected less developed HR policies and a weak familiarity with NVQs. Ultimately, 250 questionnaires were distributed via email. Two reminder

emails followed. A total of 111 completed questionnaires were received, representing a 44% response rate; all data were usable. Of the 111 respondents, 60 were female and 51 were male; 18% were owners, 25% general managers, 22% HR managers, and 25% other members of middle management staff.

7 Results

The first aim of the research was to determine whether the certification system is even known among employers. The results of the analysis indicated a rather low familiarity with NVQ certificates. Only 19% of respondents had participated in the system although 59% knew of it. However, when asked to name some NVQs, 13% of the latter group listed several non-existent ones (e.g., tour guide, chambermaid, cook), suggesting rather limited knowledge. Almost half of the respondents were not informed of the possibility of participating (initiatives for new NVQs, verifying providers, etc).

In addition, 20% of the employers rejected this type of qualification, recruiting personnel only based on evidence of formal education or—surprisingly—based on past work experience. Yet NVQ certificates formalize work experience. Thus, these results suggest that participants are not informed about the system.

The research also sought to present the current state of NVQs in the tourism and hospitality industry and assess the responsiveness of employers to this new evidence of personal qualifications, especially in connection with industry vacancies. Regarding skill shortages in the tourism labour market, employers identified profiles that correspond with evidence of the Employment Service of Slovenia (ESS, 2011)—namely, waiters, cooks, bartenders, chambermaids, and animators. We checked whether these lists correspond with available NVQs in this area and found 10 existing NVQs in tourism and hospitality (NRP, 2011): NVQ Barman, NVQ Diet Cook, NVQ Catering Manager, NVQ Cook Assistant, NVQ Waiter Assistant, NVQ Sommelier, NVQ Cheese Sommelier, NVQ Croupier, NVQ Tourist Animator, and NVQ Tourist Informant. Evidently the available qualifications show a very weak correspondence with the needs of the sector. However, the certification system should adapt to the demands of the labour market, follow the trends, and be able to predict future job profiles, thereby gaining a distinct advantage over the formal system of education.

The quantitative analysis implied that employers have not yet acknowledged NVQ certificates for several reasons, varying from weak promotional and informative activities regarding NVQ certificates to a distrust of their quality and credibility and disappointingly ineffective institutions within the system (chambers, employer representatives, trade unions, professional bodies, as well as ministries). We asked employers to grade institutions within the certification system (chambers, trade unions, Ministry of Labour, Institute for the Vocational Education and Training, and the National Examination Centre). Their grades were quite unfavourable and ranged from discouraging to indifferent

(ratings between 2.0 and 2.8). Even ministries differ in their attitude towards this system: Some sectoral acts require an obligatory NVQ certificate for certain jobs (e.g., security) whereas others require other types of evidence (licences). Respondents were very critical of the institutional order of the system and evaluated the role of partners as ambiguous and unresolved (mean value 3.8). Thus, our hypothesis that cooperation exists between social partners and an adequate organizational and administrative regulation of the system of certifying NVQs cannot be confirmed.

Furthermore, respondents have not noticed any promotional activities of NVQ certificates. Only 7% of them have come across information on a website or in other media or received promotional materials from assessment institutions. Meanwhile, only 17% of them have heard of the national reference point for NVQs. Evidently, the information and promotional activities are scarce. Analogous results of surveys in two other fields (medical care and ICT) were published by Može (2005) and Vešligaj (cited in MVZT & Žejn, 2006); OECD experts pointed out the same weaknesses of the NVQ system (Ivančič et al., 2007).

Respondents want more information on the certificate system (3.9). They also want existing data on NVQs to be simplified and easily accessible and the terminology to be adapted to people with lower educational degrees (3.7). Respondents are dissatisfied with procedures that are too long and bureaucratic (2.9); information is not broadly available (1.7), and the language used is not comprehensible enough (1.7). Employers who participate in the system find the costs of participation too high and un-motivating (3.8). In further research the factor analyses emphasized the importance of the cost of the system to employers as one of the key factors for a successful implementation of NVQs. Therefore, the second hypothesis that the NVQ system is well-promoted, transparent, and simple, with low costs and without excessive bureaucracy in its procedures, cannot be confirmed.

Although NVQ certificates have existed since 2000, the number of them acquired in tourism and industry is still too low to evaluate their value on the labour market. A disappointing number of employers appreciate NVQ certificates, put them in tenders for recruits (4.5%), and include them in internal legal acts (4.5%). Although employers agreed that the certification system could provide a more qualified labour force (4), they confirmed that they prefer recruits with formal evidence (3.1). However, they indicated dissatisfaction with school programmes (2.7) and highly valued only those candidates with professional experience in the field (4.0). Vešligaj (cited in MVZT & Žejn, 2006, 12) came to the same conclusions: "Slovene companies are not willing to invest in the knowledge of their personnel, yet they expect them to appear on the labour market when needed." Thus, the third hypothesis—that certified competences increase the employability of the workforce their mobility, and their career promotion, thereby enhancing their competitive edge in the labour market—can be neither confirmed nor disproved.

The main goal of the research was to identify the deficient factors in the implementation of the NVQ certification system. Therefore, the next step was a correlation and multivariate factor analysis. First, we eliminated some variables with low correlations (with a Pearson correlation coefficient under 0.4). Finally we extracted eight dependent variables (Table 3). We used the principal axis factoring and the maximum likelihood methods to reduce the number of variables. The rates of explained variance were very high with the variables "Existent NVQs follow labour market demands" (follow_LABmarket), "Existent NVQs follow trends in the industry" (follow_TRENDS), "With NVQs employers have more labour choice" (LAB_Choice), "Recruiting requirements include NVQ certificates" (recruit_NVQ), "NVQ certificates are necessary for promotions" (NVQ_promotion), "Existent NVQs suit current demands of the industry" (NVQ_demand) and "With NVQs employers have lower training costs" (TRAINING_cost). They were very low with the variable "Some existing workpositions lack both an educational path and a NVQ" (WORK_NVQ_School).

Table 3. *Communalities*

Extraction method	Principal Axis Factoring		Maximum Likelihood	
	Initial	Extraction	Initial	Extraction
LAB_Choice	.521	.577	.521	.631
TRAINING_cost	.423	.362	.423	.436
Recruit_ NVQ	.415	.458	.415	.382
NVQ_promotion	.394	.458	.394	.368
NVQ_demand	.404	.406	.404	.403
Follow_LABmarket	.710	.955	.710	.974
follow_TRENDS	.594	.607	.594	.606
WORK_NVQSchool	.234	.167	.234	.177

The final results highlighted two factors; 61% of the total variability of the model could be explained by them (Table 4). Analogous results were yielded using the maximum likelihood method.

Table 4. *Total Variance Explained*

Factor	Initial Eigenvalues			Extraction Sums of Squared Loadings		
	Total	% of Variance	Cumulative %	Total	% of Variance	Cumulative %
1	2.911	36.384	36.384	2.516	31.449	31.449
2	1.967	24.582	60.966	1.474	18.422	49.870
3	.863	10.793	71.759			
4	.820	10.249	82.008			
5	.536	6.696	88.704			
6	.398	4.978	93.683			
7	.318	3.969	97.652			
8	.188	2.348	100.000			
Extraction Method: Principal Axis Factoring						

A scree diagram (Figure 2) confirmed that the two factors were the correct choice.

Figure 2: *Scree plot*
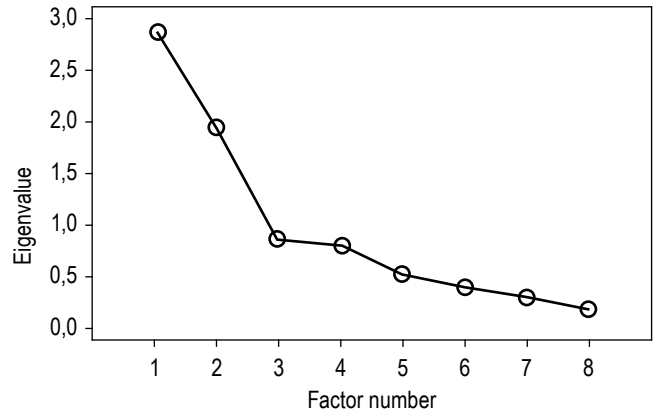
In order to get a stable matrix, we used Oblimin with Kaiser normalization rotations (Table 5). A rotational strategy enabled a clear pattern of loadings.

Table 5. *Rotated Factor Matrix*

Structure Matrix		
	Factor	
	1	2
LAB_Choice	-.239	.781
TRAINING_cost	-.135	.658
Recruit-NVQ	-.131	.615
NVQ_promotion	.071	.589
NVQ_demand	.619	-.219
Follow_LABmarket	.981	-.230
follow_TRENDS	.774	-.182
WORK_NVQSchool	.389	.110
Extraction Method: Maximum Likelihood. Rotation Method: Oblimin with Kaiser Normalization.		

Apparently, the first factor is more highly correlated with the variables than the second factor. We defined the first factor as the flexibility of available choice of NVQs; it consists of correlating current demands of the industry and the labour market as well as following trends in the industry and in the education system. We defined the second factor as the employers' costs for participating in the NVQ system and the implementation of NVQ certificates into the sectors' legislation. It consists of the influence of the NVQs on the quantity and quality of the workforce, labour costs, and implementation of NVQ certificates in HR procedures and legal acts.

8 Discussion

Theoretical bases have been tested using stakeholders in the tourism and hospitality industry. The correlation and factor analysis identified major factors in the deficiency of

the NVQ system. These comprise the system's recognition, effective promotion, cost acceptability and procedural efficiency, implementation of NVQs in the legislation, and adaptation to the needs of the market.

The results of this survey show that employers in the tourism and hospitality industry generally have no doubts about the benefits of recognitions of non-formal and informal learning, but only in theory. When it comes to practice, in HR activities and legal acts, they show less confidence in this system. One of the reasons lies in the existing collection of NVQs in tourism and hospitality, which does not match skill shortages in the industry. The results of the poll on the sample of employers revealed various reasons for this disappointing perspective: the system is not known among employers, inadequate promotional and informative activities, NVQ certificates have a low image, social partners act more as an obstacle to the system, and the role of the ministry in charge is too passive.

Although a high unemployment rate exists in Slovenia (8.7 per cent in 2011), large numbers of vacancies remain unfilled, especially in catering, the construction industry, and public utilities (ESS, 2011). According to Werquin (2010), general consensus exists about the fact that the recognition of prior learning outcomes may be beneficial for all levels of the population. However, certain groups are especially vulnerable to professional or social exclusion because they lack significant competences or, more precisely, recognised knowledge and skills. The real target group of NVQ certifications comprise workers without any qualifications, especially those with considerable experience. They can receive formal recognition of NVQ and increase their employability. Opportunities are also considerable for people who have prematurely left the formal education system. In the tourism and hospitality industry, plenty of opportunities for this labour force are available.

9 Conclusions

The recognition of non-formal and informal learning in Slovenia exists in various forms; the NVQ system seems, despite several weaknesses, the most developed. Although the legal basis for NVQ certification was established 10 years ago, the results thus far have not been satisfactory.

Certificates of NVQs will be fully asserted when employers treat diplomas and NVQ certificates equally and employees become interested in acquiring certificates because they bring about employment, promotions, and wage increases. They will be asserted when the formal educational system does not compete with the system of NVQ certifications, but realizes that it offers new opportunities as well, especially in times of decreasing youth population, to concentrate on adults. Training programmes for them can be tailor-made to the requirements of NVQs. To some degree, NVQs can solve the problem of drop-outs as well. Finally, it is high time for a coordinative functioning of all institutions within the system, with harmonized inter-sectoral legislation, fluid communication with stakeholders, and

clear roles of all partners. Sadly, respondents exposed the rather ignorant role of the caretaker, the Ministry of Labour.

Finally, we must bear in mind the limitations of this research. The findings of this analysis cannot be generalized beyond the margins of this industry. However, the sample is representative, for it consists of management staff from all types of tourism and hospitality companies. Further research on this topic is necessary, using a larger sample of relevant respondents from other industries. Furthermore, a large variety of stakeholders (e.g., employees) would also provide further insights into this area.

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NAVODILA AVTORJEM

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