MEASURING TOURISM SEASONALITY IN REGIONS OF LATVIA
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Abstract. Tourism seasonality is a global problem which affects the tourism in the regions of Latvia especially during the quiet season. Determination of seasonality in Kurzeme, Zemgale, Vidzeme and Latgale regions would allow reducing the influence of the causal institutional, social or economic factors. Qualitative and quantitative methods were used: content analysis of scientific and applied literature; quantitative - time series analysis method. Within the research the tourism seasonality in regions was ascertained whereupon in Vidzeme and Latgale an upward trend of seasonality was observed while in Kurzeme and Zemgale – a downward trend.

Key words: tourism seasonality, regions, tourist accommodation, time series analysis.

JEL code: R12

Introduction
The tourism seasonality is seldom a subject of research in Latvia, while it is a traditional theme of research in the international arena. The impact of seasonality to the tourism industry can cause losses for the national economy of Latvia and harm the ecological, social and cultural environment – this is the main reason for the necessity and importance of such research theme.

Research object: tourism seasonality;
Research aim: estimating of the tourism seasonality in the regions of Latvia.
Research tasks:
1) to investigate theoretical materials on the tourism seasonality, the methods for its estimation; 2) to define and to assess the tourism seasonality of regions of Latvia.
Research methods:
qualitative method is used – content-analysis of scientific and applied literature; quantitative - time series analysis method.

Theoretical background
The concept of tourism seasonality
Tourism seasonality is one of tourism sustainability problems which has been studied by multiple researchers (Butler R.W., 1994; Chung I.Y., 2009; Kolomiets A., 2010; Bigovic M. 2011; Rana A., 2014). Despite the long history of tourism seasonality research it is “one of the most problematic and one of the least examined tourism specifics” (Amelung B., Nicholls, S., 2007).

Each researcher defines the tourism seasonality differently. For instance, “seasonality is fluctuation within a year period which is directly connected with a certain part of season” or as it is described a global trend in the tourism industry caused by “a temporary movement of people” (Bender O., Schumacher K.P., Stein D., 2005; Chung I., 2009). Thereby, the fluctuation is one of the most frequent characteristics of tourism while the demand for tourism services is changing on an annual basis.

Seasonality is characterized by its cyclicity. The high-season during the warm period of year, the cold, quiet or empty season during the cold period of year as well as the mid-season in between the both seasons (Gilbert D., 1990). Nevertheless, there are some exceptions of seasonality, e.g. Singapore and Hong Kong where no cyclicity can be observed due to the destinations availability throughout the year, and the state of Dynamic Seasonality or the multiple-demand seasonality which is not associated with a fixed period of year.

Seasonality is defined and evaluated by different elements, such as “number of visitors, use of certain types of transport, employment dynamics, and the number of tourist destinations.” (Baum T., Lundtorp S., 2001).

Effect of the tourism seasonality
Seasonality can cause both positive and negative effects. The positive effects – the quiet season can create conditions for 1) period of rest for both the regeneration of the natural resources and the renewal of economy; 2) the local inhabitants to preserve their traditional lifestyle and identity and to “transfer it through time” (Butler R., 2001). While a restless use of natural resources can cause harm to the tourism destination the seasonality by reducing the flow of visitors can have beneficial attributes for sociological and ecological “refreshing of environment” (Hartmann C.J., 1986).

Seasonality’s negative aspects include serious economic and ecological effect which can be further
divided into distinct groups in accordance to their affect – economic, employability, ecological and social-cultural impact.

**Economic impact** is mainly related to the loss of profit due to the inefficient use of resources, lower investment return yields, problems related to employability as well as problems related to serious lack of visitor’ accommodation space during the high season etc. (Chung I., 2009).

Meanwhile the employability impact cause a rapid growth during the high season, high levels of unemployment during the quiet season and besides “instability within the job market, further facilitated by the short-term nature of employment in the tourism destinations”. (Kellens W., 2012).

The author notes that the tourism seasonality causes interruption in the employment continuity within all of the employment cycles, especially the cycles related to job acquisition and retention, training and development etc.

On the one hand, it affects the competitiveness; the entrepreneurs are not willing to invest in the employee training and development. These factors meanwhile impact the quality of end product and services, which eventually can negatively affect the consumer satisfaction and their plausible return to the destination. On the other hand unbalanced flow of tourists can undermine the sole existence of the ecology of the tourism destination.

**Ecological impact** – is mainly defined as a pressure of visitor concentration intensity on the vulnerable environment of the tourism destination territory during the **hot season**, which often causes further environmental contamination and loss of natural resources (Batler R., 2001; Corluka G., Matoševic M., 2013).

**Socio-cultural impact** – changes of the social characteristics of the tourism destination which can be related to foreign cultural influence, interference with the lifestyle of the local societies. The socio-cultural impact can also be related to such problems as increase of traffic, overpopulation, noise pollution, as well as significant increase of cost of public services and crime index due to the increased flow of people. Besides during the hot season the necessity for police, sanitary and medical personal is increased due to the increased risk of accidents which further negatively affect the traditional lifestyle of the locals etc. (Chung J.Y., 2009).

The positive and negative effects of the tourism seasonality are caused by factors, which have been investigated by researchers R.W. Butler (1994), I.Y. Chung (2009), A. Kolomiets (2010), M. Bigovic (2011), A. Rana (2014) et.al., who further classify the tourism seasonality by three main groups: 1) natural factors; 2) institutional factors; 3) social and economic factors.

**Natural factors** are related to natural phenomenon, i.e. annual precipitation, number of sunny days, temperature which all affect the tourism demand. Natural seasonal phenomenon has traditionally been considered as a permanent indicator, which nevertheless has been affected by the global climate changes, thus, making it less expectable. Meanwhile, tourists prefer destinations during warm season and are less likely to visit it during the cold and rainy ‘quiet’ season (Baum T., Lundtorp S., 2001).

**Institutional factors** – are a result of human interaction and influence politics, culture, religion and social life as such. For instance, school and national holidays are called **calendar effects**. These factors despite their various occurrence can be observed in almost every single country worldwide (Baum T., Lundtorp S., 2001).

**Social and economic factors** are related to employability, income, efficient use of buildings, emigration and social capital deficit of the population, quality of life etc. These factors are most often manifested in relation to regions where tourism has or might have a significant role in the development of the national economy (Butler R.W., 1994, Corluka G., et al., 2013).

In the existence of globalisation, the influencing factors of the tourism seasonality are complemented with calendar effects, traditions, sport events, inertia, social pressure, fashion etc.

While carrying out the analysis of theory, the author concludes that in the theory different authors portray the tourism seasonality factors in a similar fashion while determining the natural and institutional factors as being of an equal importance for affecting the tourism seasonality which is then to be followed by social and economic factors.

**Research methods of tourism seasonality**

Tourism seasonality can leave an impact both on physical and financial aspects of tourism development. Monetary indicators influence the profit whiles the non-monetary indicators – the number of attendees. The comparison of such indicators is of significant

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importance when developing the strategy for reduction of impact of seasonal factors (Ridderstaat J., 2013).

When carrying out the analysis of theory in the field of tourism seasonality author recognized use of six different methods: seasonal range method, seasonal ratio method, seasonal indicator method, estimation of Gini coefficient method and time series method.

Methods for estimation of tourism seasonality:
1) seasonal range estimation method is the difference between the highest and lowest index;
2) seasonal ratio estimation method, when the largest value of indicator is divided by the average;
3) seasonal indicator estimation method, when the average indicator value is divided by the largest value;
4) Gini coefficient estimation method is based on Gini coefficient, which is a statistical unit derived from the Lorenz curve. 1) Gini coefficient is calculated as the area between the curve and the imagined absolute equality line, positioned in a 45 degree angle, divided by the zone located underneath the equality line; 2) Gini index is calculated as the interrelation between the number of tourist arrivals and the cumulative number of tourist arrivals;
5) seasonality index estimation method – seasonality index (ω) is the proportion between the average number of tourist arrivals on a monthly basis and the largest number of estimated arrivals during a month (Chung J.Y., 2009; Petrevska B., 2012; Rana A., 2014);
6) time series analysis method is based on comparison of periodical data, i.e. time series, which determine the changes of the statistical object or phenomenon. This method is used in order to discover and analyse seasonal fluctuation, estimate the seasonality depth in a perspective of a year and to determine its changes (Salo A., et al., 2012; Sharma A., Bose M., 2013).

![Graph showing number of tourists serviced in hotels and other tourist accommodation establishments in regions of Latvia (2010-2015)](image)

*Source: author’s construction based on CSB, 2015a*

**Fig. 1. Number of tourists serviced in hotels and other tourist accommodation establishments in regions of Latvia (2010-2015)**

**Research methodology**

For determination the tourism seasonality in the regions of Latvia, namely – Kurzeme, Zemgale, Vidzeme and Latgale the author used data from the Central Statistics Bureau (CSP). Such information included the number of tourists which have settled in the tourist lodgings from 2010 to 2015 per quartiles. It must be noted that no data on earlier activity nor data on crosscut monthly activity is publicly available. Number of tourists who settled down in the tourist lodges has been used for the determination because it displays the real number of tourists in certain location.

Author used both quantitative and qualitative methods: content-analysis of scientific and applied literature and time-series method for determination of tourism seasonality in the regions of Latvia: Kurzeme, Zemgale, Vidzeme and Latgale. The use of time series method was justified by the availability of reliable data which cover annual quartiles which further constrained the use of other methods and the in-depth analysis of seasonality. The calculated dynamic series average level, the average absolute increase, increase rate and the average increase rate, standard deviation of each year as well as other descriptive statistics data allowed determining the tourism seasonality in Latvia.
Research results and discussion

When comparing the regions of Latvia by the serviced number of tourists in the tourist lodgings in period from 2010 to 2015 (Fig.1), it is acknowledged that Kurzeme regions has advantage over other regions in this regard.

Maximum number of serviced tourists in hotels and other tourist accommodation establishments in 2011 (Table 1) reached 106 623. The largest quantity of serviced tourists in Vidzeme was in 2015 – 48 006 tourists, in Latgale in 2013 at 30 920. Meanwhile in Zemgale the largest quantity of visitors was serviced in 2014 at 25 095. Author notes that the largest number of tourists can be attributed to the 3rd quarter, i.e., July, August and September. Meanwhile, the number of serviced visitors in first and fourth quartile is significantly smaller. In Kurzeme in 2010 it was 17 411, in Zemgale in 2015 – 2 500, in Vidzeme in 2010 – 8866, but in Latgale – 7968 serviced visitors which indicates towards presence of seasonality. One should agree with Butler (2001), that such significant fluctuation of the number of serviced visitors can only be attributed to the phenomenon of tourism seasonality.

Table 1

### Descriptive statistics on the serviced number of tourists in hotels and other tourist accommodation establishments in regions of Latvia from 2010 to 2015

<table>
<thead>
<tr>
<th>Year</th>
<th>Descriptive</th>
<th>Kurzeme</th>
<th>Zemgale</th>
<th>Vidzeme</th>
<th>Latgale</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Minimum</td>
<td>17 411</td>
<td>6 217</td>
<td>8 866</td>
<td>7 968</td>
</tr>
<tr>
<td></td>
<td>Maximum</td>
<td>98 946</td>
<td>14 419</td>
<td>29 051</td>
<td>17 930</td>
</tr>
<tr>
<td>2010</td>
<td>Mean</td>
<td>43 536</td>
<td>10 593</td>
<td>16 795</td>
<td>12 499</td>
</tr>
<tr>
<td></td>
<td>Std. deviation</td>
<td>37 762</td>
<td>3 448</td>
<td>8 618</td>
<td>4 123</td>
</tr>
<tr>
<td></td>
<td>Minimum</td>
<td>21 859</td>
<td>9 825</td>
<td>14 819</td>
<td>10 487</td>
</tr>
<tr>
<td></td>
<td>Maximum</td>
<td>106 623</td>
<td>17 014</td>
<td>31 618</td>
<td>20 405</td>
</tr>
<tr>
<td>2011</td>
<td>Mean</td>
<td>52 722</td>
<td>13 383</td>
<td>20 469</td>
<td>14 766</td>
</tr>
<tr>
<td></td>
<td>Std. deviation</td>
<td>38 132</td>
<td>2 972</td>
<td>7 617</td>
<td>4 228</td>
</tr>
<tr>
<td></td>
<td>Minimum</td>
<td>25 761</td>
<td>11 611</td>
<td>17 194</td>
<td>12 942</td>
</tr>
<tr>
<td></td>
<td>Maximum</td>
<td>89 607</td>
<td>21 957</td>
<td>32 461</td>
<td>18 270</td>
</tr>
<tr>
<td>2012</td>
<td>Mean</td>
<td>47 233</td>
<td>16 277</td>
<td>22 462</td>
<td>14 712</td>
</tr>
<tr>
<td></td>
<td>Std. deviation</td>
<td>29 342</td>
<td>4 428</td>
<td>6 872</td>
<td>2 447</td>
</tr>
<tr>
<td></td>
<td>Minimum</td>
<td>23 798</td>
<td>11 524</td>
<td>18 223</td>
<td>12 894</td>
</tr>
<tr>
<td></td>
<td>Maximum</td>
<td>91 507</td>
<td>22 201</td>
<td>36 148</td>
<td>30 920</td>
</tr>
<tr>
<td>2013</td>
<td>Mean</td>
<td>47 408</td>
<td>16 205</td>
<td>23 862</td>
<td>20 592</td>
</tr>
<tr>
<td></td>
<td>Std. deviation</td>
<td>30 918</td>
<td>4 430</td>
<td>8 418</td>
<td>7 768</td>
</tr>
<tr>
<td></td>
<td>Minimum</td>
<td>242</td>
<td>13 348</td>
<td>16 852</td>
<td>14 181</td>
</tr>
<tr>
<td></td>
<td>Maximum</td>
<td>98 738</td>
<td>25 095</td>
<td>49 278</td>
<td>31 394</td>
</tr>
<tr>
<td>2014</td>
<td>Mean</td>
<td>50 301</td>
<td>18 050</td>
<td>28 996</td>
<td>22 263</td>
</tr>
<tr>
<td></td>
<td>Std. deviation</td>
<td>34 100</td>
<td>5 718</td>
<td>14 160</td>
<td>8 208</td>
</tr>
<tr>
<td></td>
<td>Minimum</td>
<td>25 464</td>
<td>2 500</td>
<td>18 577</td>
<td>13 226</td>
</tr>
<tr>
<td></td>
<td>Maximum</td>
<td>95 103</td>
<td>18 661</td>
<td>48 006</td>
<td>29 479</td>
</tr>
<tr>
<td>2015</td>
<td>Mean</td>
<td>50 023</td>
<td>12 098</td>
<td>29 078</td>
<td>20 336</td>
</tr>
<tr>
<td></td>
<td>Std. deviation</td>
<td>31 815</td>
<td>6 903</td>
<td>13 311</td>
<td>684</td>
</tr>
</tbody>
</table>

Source: author’s calculations based on CSB, 2015b

The phenomenon of tourism seasonality is determined by using the time series model, in which the changes of indicators are indicated by specific indicators, i.e., dynamic series average level, the average absolute increase, increase rate and the average increase rate, standard deviation of each region (Table 2). Meanwhile the descriptive statistics was used for determination of seasonality. It showed that the highest number of serviced tourists in Hotels and other Tourist Accommodation Establishments in regions of Latvia during the time period from 2010 to 2015 (Table 1) can be attributed to Kurzeme region – 189 347 tourists accordingly. The large quantity of serviced visitors can be attributed to the large number of tourist lodges in the region in comparison to that of Latgale and Zemgale, and the larger quantity of bed places in the lodges themselves, and finally with the increased interest by the tourists about the attractions.
and tourism products in Kurzeme region, for instance Venstpils municipality (CSB, 2015b).

The average absolute increase determines the average amount by which the studied phenomenon has increased over the whole series of period of interest. The research reveals that in time period from 2010 to 2015 the average absolute increase of number of serviced visitors in Kurzeme region is negative (Table 2), while in Vidzeme the highest increase amounts to 9 827 tourists. The growth is indicated by the average absolute increase and the average increase of pace 101.73%, this defines the average intensity of changes of the phenomenon. On one hand as it was indicated by Butler (2001), the seasonality offers a relief for the natural resources and it plays a positive role, while Hartman (1986) suggests that a “refreshing” of both sociological and ecological environments take place. Meanwhile on the other hand – as it was indicated by Chung (2009) and Kellen (2012) – seasonality’s negative influence can cause economic, employment, ecological and social-cultural impact.

Standard deviation (SD) of number of serviced tourists in hotels and other tourist accommodation establishments of each regions of Latvia indicates the data dispersion around the average arithmetic. For instance, in 2015 (Table 1) in Kurzeme region in the distance of two Standard deviations from the average value (50023 - 2 * 31815; 50023 + 2* 31815), or in interval (-1 607; 113 653) all of the data can be located. Correspondingly during the same year intervals are: in Zemgale region (-1 708; 25 904); Vidzeme region (-23 644; 55 700) and Latgale region (-6 660; 34 012). When comparing the dispersion of the number of tourists serviced in Hotels and other Tourist Accommodation Establishments around the average arithmetical, author notes that in Zemgale and Latgale regions the tendency was similar, while the Kurzeme region is described by a larger dispersion. This means that the seasonality can be traced in all regions, but in Kurzeme region the author observed more articulate fluctuations. One of the reasons for such differences may be attributed to the larger number of visitors of hotels and other tourist accommodation establishments than that of other regions while the different reasons should be further investigated (CSB, 2015b).

It should be noted that the average increase pace of serviced tourists in hotels and other tourist accommodation establishments in regions of Latvia is not significant. In Vidzeme and Latgale it corresponds to 2% and thus the base-trend of tourism seasonality can be described as upward, meanwhile in Kurzeme (despite its larger number of visitors in comparison with other regions) and in Zemgale stagnation caused by the tourism seasonality can be observed and the base-trend in these regions is downward. The growth in Latgale and Vidzeme is more pronounced, which might be due to an offer of more high quality tourism services. In Vidzeme, it is fostered also by the larger number of hotels and other tourist accommodation establishments. Meanwhile in Kurzeme the saturation stage in tourism sphere has been reached and action aimed at the renewal of tourism destination offer as well as provision of new innovative services is needed. Altogether the author notes that there is an increased need for an in-depth research in the field of tourism seasonality in regions of Latvia in order not only to recognize the current situation but also to acknowledge the influential factors and to find ways for reducing the effect of seasonality. Besides for determination of tourism seasonality in regions of Latvia due to different reasons the current methods may not offer complete, in-depth analysis and for that reason combined methods i.e. triangulation should also be used.

### Table 2

<table>
<thead>
<tr>
<th>Indicators</th>
<th>Kurzeme</th>
<th>Zemgale</th>
<th>Vidzeme</th>
<th>Latgale</th>
</tr>
</thead>
<tbody>
<tr>
<td>Average number of serviced tourists</td>
<td>18 9347</td>
<td>55 496</td>
<td>90 650</td>
<td>69 012</td>
</tr>
<tr>
<td>Average absolute increase of number of serviced tourists</td>
<td>-349</td>
<td>1 204</td>
<td>9827</td>
<td>6270</td>
</tr>
<tr>
<td>Average growth pace (%)</td>
<td>100.44</td>
<td>100.41</td>
<td>101.73</td>
<td>101.53</td>
</tr>
<tr>
<td>Average increase of pace (%)</td>
<td>0.44</td>
<td>0.41</td>
<td>1.73</td>
<td>1.53</td>
</tr>
</tbody>
</table>

Source: author’s calculations based on CSB, 2015a; 2015b

### Conclusions

1) Tourism seasonality is a global challenge which is a characteristic of Latvian tourism. Seasonality is characterized by its cyclicality which is described by the hot season, the cold, quiet or empty season and the midseason. The positive side effects of seasonality include ‘refreshing of environment’. The negative impact of seasonality is caused by natural...
factors; institutional factors; social and economic factors. The tourism seasonality is mainly determined with the help of seasonal range, determination of seasonality ratio, determining of indicator, and calculation of Gini coefficient and time series methods.

2) The average number of serviced tourists in regions of Latvia from 2010 to 2015: in Kurzeme – 18 9347; in Zemgale - 55 496 with an average increase of pace 0%, in Vidzeme – 90 650 and in Latgale – 69 012 with an average increase of pace with a slight increase (from 1.53% to 1.73%).

3) In Vidzeme and Latgale the tourism seasonality base-trend is upward, while in Kurzeme and in Zemgale – downward. The growth of tourism and the number of serviced tourists is more distinct in Latgale and Vidzeme. In Kurzeme reconstruction as well as renewal of tourism destination offer as well as provision of new innovative services is needed.

4) In Zemgale and Latgale regions the tendency is similar, while in Kurzeme region it is described by a larger dispersion. This means that the seasonality can be witnessed in all regions, meanwhile in Kurzeme region the author notices more articulate fluctuations due to larger number of visitors of Hotels and other Tourist Accommodation Establishments during the season.

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