

## IMPACT OF WEATHER CHANGES ON CONSUMPTION OF BEVERAGES IN THE HOSPITALITY INDUSTRY

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### **Abstract**

**Purpose** – The trends of consumption of beverages in the hospitality industry are an important segment of managers' prediction in the creation and planning of future tourist spending. Predicting the motives and needs of tourists in the consumption of alcoholic and non-alcoholic beverages is of special interest to managers in the hospitality industry. This paper analyses interdependence and the impact of weather changes on the consumption of alcoholic and non-alcoholic beverages. The objective is to analyse the interdependence of the weather (climate) and consumption so that the managers could more successfully create future level of tourist demand for alcoholic and non-alcoholic beverages as an important segment in the creation of tourist consumption in hospitality companies.

**Design** – The research model of the set tasks are hospitality companies for provision of beverage services, i.e. benchmarking with comparable hospitality companies. The used data are those of weather changes in the Adriatic destinations of Poreč, Opatija, Mali Lošinj, Zadar, Šibenik, Split, Hvar, and Dubrovnik.

**Methodology** – Regression analysis is used to verify the set hypothesis, that the quantity of consumed beverages increases with the increase in the number of overnights and air temperature.

**Approach** – The intention is to verify the hypothesis that the weather i.e. temperature changes, humidity, and precipitation determine pleasant atmosphere which affects the level of consumption of beverages.

**Findings** – Multiple determination coefficient of 99% shows that 99% of variations in the quantity of the consumed beverages is explained by changes in the number of overnights i.e. air temperature.

**Originality of the research** – The analysed impacts of climate changes on the consumption of beverages is analysed on the example of Adriatic tourist destinations. Research results are applicable in practice and are especially useful to managers on the tourist market regarding prediction of weather changes and, accordingly, creation of high-quality products and services.

**Keywords** consumption of beverages, tourist spending, weather, climate

### **INTRODUCTION**

Tourist offer of alcoholic beverages is a part of the overall tourist offer and must be synchronised with the needs and habits of the tourist demand. The paper presents general trends of consumption of drinks and beverages as important services in hospitality companies defined in the paper as *HoReCa* (hotels, restaurants, and coffee rooms). The research will define and determine the latest trends in the past decade. The recent research related to consumer behavior (Santos et al. 2013) claim that

consumption represents an important experiential area of human behaviour. The primary objective of that study is drinking-related consumption behavior in 30 European countries in order to prove the existing relationship between the culture and beverage consumption.

The objective of this research is to establish the impact of world trends on the consumption of alcoholic beverages in Croatian *HoReCa* hospitality companies. The authors want to analyse the trends of consumption of alcoholic beverages with special emphasis on consumption trends of basic alcoholic beverages like wines, beer, waters, spirits, and hot drinks. The research task is defined by the objective, and determined by the possible estimate using the regression function, to calculate whether the quantity of the consumed beverages will increase or decrease provided that temperature increases by one degree, with the same number of overnights. Additional tasks are also derived from the objective in collecting relevant data sources, with special emphasis placed on the authors' own research covering the consumption of the above-mentioned alcoholic and non-alcoholic beverages in the offer of hospitality companies.

In the realisation of the set objectives, the authors use several available work methods on data processing and system of analysis of the above-mentioned hypotheses, and the expected research results regarding the size and types of consumption of beverages in hospitality companies. They use deductive, inductive, mathematical, and statistical methods in order to reach quantitative verification of their initial hypotheses.

The set objective also formed the structure of the paper in which types and trends of sales and consumption of alcoholic and non-alcoholic drinks and beverages in the hospitality industry are defined. The general trends of consumption needs regarding drinks and beverages in hospitality companies are defined and presented as *HoReCa* establishments, or hospitality companies for providing services in hotels, restaurants, and coffee rooms, including separate facilities. Quantitative amounts of possible consumption of beverages for the following decade are presented below. Special emphasis is placed on verification of the level of consumption of beverages in future periods. The consumption of beverages is defined with special emphasis on the ratio of the consumption of alcoholic or non-alcoholic beverages in relation to the number of overnights in correlation with climate changes. Data of climate changes in the Adriatic destinations of Poreč, Opatija, Mali Lošinj, Zadar, Šibenik, Split, Hvar, and Dubrovnik as relevant tourist resorts with specific climate characteristics, whether according to precipitation or air temperature in the three summer months, are taken as a model for calculation of the set task. Conclusions and messages of the research are presented at the close of the paper.

## **1. GENERAL TRENDS ON THE TOURIST MARKET**

Tourist consumption is the totality of tourists' spending during a specific trip. The hospitality offer is a part of the tourist offer, and therefore, consumption of hospitality services is also a part of tourist spending. In order to determine general conditions and characteristics of the consumption of beverages in the hospitality industry, the authors present the basic characteristics of consumption in the hospitality industry. The basic

economic and political circumstances provide the basic framework for the analysis of all the forms of tertiary activities as a potential for possible consumption along with tourist trips as a form of consumption. This trend is also applicable on the increase in consumption in the hospitality industry. The WTO predicts slower increase in tourist revenue in the following decade, and they will surely be reduced, on average, from 2,7% of annual growth in the past decade to the expected 0,5% per year (Cerović, Grudić Kvasić, Ivančić 2013, 55). The following basic characteristics are well-known in the world, especially in Europe and Croatia, based on relevant quantitative and qualitative data:

1. The general travelling trend is reflected in the constant number of travellers to the Mediterranean destinations (although the trend of travelling to the Mediterranean destinations was reduced in the 1980's, this trend constantly grows, i.e. continues to grow over the long term). Moreno (2010) found 72% of respondents from Belgium and the Netherlands would still travel to the Mediterranean for holidays even if their self-defined preferred climatic conditions were available in Northern Europe. The upcoming recession period will benefit the trend to travel to „closer destinations“. Visiting large cities and winter ski resorts, especially the Alps, is a constantly growing trend. Visiting the Mediterranean has become a standard and a model of life of European citizens which they are not willing to give up even during crisis; particularly during the crisis and recession. The only questionable factor is the quality of the tourist offer of Croatian tourist destinations. The destination or site chosen for a given holiday or leisure activity has to meet motivational demands and provide satisfactory experiences in order to be successful (Gössling et al., 2012, 42). Tourist revenue in the Adriatic tourist destinations and the City of Zagreb will increase in particular.

2. Total Croatian tourist image and offer have in the past 15 years been marked by special conditions which competitive tourist markets did not have: war, aggression, refugees, transition, etc. This imposes the necessity to reposition the destination on the tourist market, i.e. to thoroughly change the level of quality of the tourist offer. Recession, which will mark the upcoming period, requires increasingly more complex service which implies experience intertwined with specific characteristics of the area, i.e. a locality which tourists visit with the pronounced need for quality of everything they will consume (Cerović 2008, 67).

3. Motives for travelling will also change its forms and travel interests. Vacationing at the sea and in the sun remains the basic travelling motive, because it always was and remained the basic motivator for the selection of Mediterranean destinations (Marušić, 2011). So far, the majority of tourists in Croatia, as much as 81%, used the main vacation time, 36% for entertainment, 32% for getting to know the nature and the landscape, and 19% for sports, culture, business, health. Although they amount to 19% of the possible motivators, they will become more significant in the future. In Croatia, the number of events will have to grow rapidly, which will increase the need to increase the offer of accommodation, food and beverages, and other services.

4. Trip length of European tourists has amounted, on average, from 4 to 7 overnights with 35% of participation; trip length of 12 to 15 days was that of a group of European tourists with 22%. The average of all European trips is 9,7 days (nights). Croatian tourist destinations have a different trend; so far, the average stay amounted 7,2 days (nights), and the length of tourists' stay from 4 to 7 days amounted only 33%, from 12 to 15 days only 11%. Therefore, it is evident that Croatian trends do not match European trends. In the future, the length of stay will keep decreasing, but this will be a result of more travels, i.e. multiple travels – vacations (Cerović, Cvelić Bonifačić 2013, 145).

5. Forms of organised travelling in European tourist travels - over 76% is organised in advance, i.e. it is organised through various forms of mediators, from which 33% buy organised and defined travel packages, while others use other forms of intermediary services. The general trend is increase in organised travels, especially with regard to longer trips, and especially increase in „all-inclusive“ arrangements. The situation significantly changes also in Croatia; 78% travel individually, i.e. without mediators, which is a reflection of the vicinity of our country and easy accessibility by car. It is fair to assume that this trend will change in two years and start following the European trend of increase in organised forms of tourist travels.

The basic characteristics of tourist demand trends may be summarised in the fact that Croatian tourist demand trends and tourists who are oriented to Croatian destinations are comparable with European trends.

A look into the future regarding tourist and hospitality trends in the demand is important in order to determine a predictable business future of hospitality companies.

## **2. GENERAL CONSUMPTION TRENDS IN THE HOSPITALITY INDUSTRY**

Demand for food and beverage services in hospitality companies will be emphasised in the following period through demand for an experience: of the destination, of the hospitality company, of food and the ambience in which food and beverage services are offered. There are five potential categories of factors that may influence tourist food consumption behaviour: cultural and religious influence, socio-demographic factors, food-related personality traits, exposure and past experience, and motivational factors (Mak et al., 2013, 929). Tourists will place special emphasis on „healthy“ food demand and proven „healthy“ drinks which will have to be of guaranteed and proven quality. Some study identified that eating local foods can be motivated through increasing tourists' well being and health. (Kim, Eves 2012, 1465) Quality of origin, manner of preservation of foodstuff and manner of preparing foodstuff will also be important, in order for the visitors of the hospitality company to enjoy something new and experiential. Increase in demand will be stimulated by popular brands of food and beverages. Thus, general trends in food, drinks, and beverages can be grouped as follows:

- Visitors of hospitality companies will keep decreasing their demand for complete food services (full board is disappearing), the trend of using bed and breakfast services without using half- or full board in the hotel will increase. This hypothesis is verified in Table 1.
- There will be growing increase in the need to use food and beverage services outside of the establishment which offers the basic accommodation service (hotel, camp, apartment complex, marina, etc.). Further increase in „Mediterranean cuisine“, Mediterranean dishes, olive oil, vegetables, salads, fish, etc. There is an increase in „fast food“ with local characteristics with emphasis on the desire for „healthy“, while the classic fast food offer will have a downward trend.
- Demand for hospitality in all forms and locations increases (boats, yachts, beaches, ski resorts, sports facilities), especially in the offer of food and beverages for business arrangements in large cities as well as holiday destinations for different events and large conferences.
- There will be a rapid increase in demand for natural and mineral waters, but artificially carbonated water will have a declining trend. The demand for carbonated beverages will keep decreasing; there is an expected decrease in the sales of Coca-Cola and similar drinks in the next decade with the average decline index of 2% per year. Emphasis in demand will be placed on natural juices, and there will be a great increase in the demand of fruit juices prepared in front of guests (fresh juices).
- Demand for beverages will remain stable, but with emphasis on more brands of coffee (more types of coffee preparation: decaffeinated, *Deutsch* filtered coffee, etc.), demand for teas will increase, especially natural teas, green teas of guaranteed quality.
- Demand for red wines will keep increasing, especially of branded wines of proven quality. New oenological technologies will be applied with emphasis on increasing phenols in the structure of wine, which indicates the return to technologies related to ecological standards.
- New equipment for food and beverage offer will be requested (new materials), and new forms of equipment which will enable preparation and preservation of meals i.e. which will provide the requested level of quality of the demand. Fast implementation of new technologies will also cause fast changes in the offer of drinks, beverages and food. With the revival of the system of „returnable packaging“, there is also the expected return of glass packaging with emphasis on drastic increase in the standard of collecting and disposing of non-returnable packaging and increase in waste disposal standards.
- Visitors of the hospitality companies (*HoReCa*) will require application of quality standards of the equipment, and atmosphere standards (air-conditioning in the establishment) as well as ambience in food and beverage establishments (air-conditioning, decoration, tables, equipment, cooling tables and showcases, special interior design, quality of interior decoration and specific features of the surrounding area...), full standardisation of equipment and interior decoration of the hospitality company (www.gastro.hr, 2013).

- Beer will not have an increasing growth trend: expectations are that it will retain a stable trend of the same level of consumption with emphasis on increase in beers from small breweries, beer manufactured by using special technologies and with emphasis on the preparation ecosystem (*weizen* beer).

Mak et al. (2012, 935) claims that understanding tourists' needs and wants in terms of food and beverage consumption is of paramount importance to hospitality businesses.

Table 1: **General characteristics of hotel rooms in ten European countries, from 1960 to 2010**

Years	1960	1970	1980	1990	2000	2010
Gross room surface (average of three, four and five stars hotels)	18 m <sup>2</sup>	22 m <sup>2</sup>	24 m <sup>2</sup>	28 m <sup>2</sup>	30 m <sup>2</sup>	36 m <sup>2</sup>
Usage of basic full- board hotel service	90 %	70 %	50 %	20 %	10 %	5 %
Room equipment (air-conditioning, mini bars etc.)	2 %	15 %	40 %	70 %	95 %	100 %

Source: Cerović Z, Grudić Kvasić S., Ivančić I. (2012), "Organization Culture in Croatian Hospitality Industry", 8th International Scientific Conference, The Function of Management in Increasing Tourism Consumption , Opatija May 2012, p. 109.

The conclusion is derived that the expected consumption of alcoholic and non-alcoholic drinks in the next decade will take place in hospitality companies with addition of experience of the establishment i.e. ambience. Emphasis will be placed on ecologically certified establishments, meals, beverages, and packaging which follows the process of preparation and serving drinks or beverages. Proven branded services will be requested with special emphasis on local and specific characteristics which will have to guarantee originality and specific features of the service in hospitality companies and tourist destinations.

### 3. BEVERAGE CONSUMPTION IN THE CROATIAN HOSPITALITY INDUSTRY

In 2012, 15.678 hospitality establishments were operating in the Republic of Croatia. This total was, in comparison with the average in the past ten years, lower by 7% of establishments. In this structure, there were 2021 establishments which provided accommodation services, and 13.134 establishments for food and beverage services i.e. 8% less than in the same period last year.

### 3.1. Beverage Consumption in Hospitality Companies

Hospitality establishments are classified into two basic types of legal structure:

- Hospitality establishments registered as a facility within a company, a total of 2.726 hospitality establishments – reduction of their number of 5% in a single year.
- Hospitality establishments as hospitality facilities registered as a business, i.e. in accordance with the Crafts Act, a total of 12.429 hospitality establishments – reduction of the number of hospitality establishments – businesses of 7% in a single year.

Total revenue from the sales of drinks in hospitality companies in 2012 in relation to 2011 grew at the rate of 6,0%, from which total revenue in accommodation facilities grew at the rate of 4,4%. In the establishments providing food and beverage services, revenue grew by 4,1%. Decrease and increase in revenue in hospitality companies is especially visible in the turnover of the following key beverage services (Croatian Bureau of Statistics, 2013):

- beer, increase of + 1,2%
- spirits, decrease of - 1,7 %
- wine, the same level of revenue, increase of + 1,6 %
- natural juices, increase of + 5,9 %
- non-carbonated mineral waters, increase of + 1,2 %
- coffee and beverages, increase of + 3,4 %
- other services in tourism and the hospitality industry, increase of + 3,9 %
- overnights in hotels and other accommodation facilities, increase of + 4,4 %
- turnover of food and services in the hospitality companies, increase of + 4,3 %

Hospitality companies in the Republic of Croatia realised the expected increase in consumption in 2012 in relation to 2011, especially regarding natural juices, non-carbonated water, and food. General increase was also recorded in the realised tourist revenue, i.e. increase in the number of overnights and visitors in Croatian hospitality accommodation facilities.

### 3.2. The Structure of Beverage Consumption in Hospitality Companies

The revenue of total hospitality industry according to the range of services and goods will be presented below in the establishments which are registered in the system of (within) companies. The turnover of beverages (in physical indicators) in the hospitality industry is presented in Table 2.

Table 2: Beverage consumption in hospitality companies

TYPE OF DRINKS	QUANTITY IN 000 LITRES			STRUCTURE IN %	
	2002	2012	Index 12/02	2002	2012
Beer	11.370	11.709	103,0	38,9	35,0
Wine	2.556	3.310	129,5	8,8	9,9
Brandy	142	131	92,3	0,5	0,4
Spirits	464	404	87,1	1,6	1,2
Concentrated fruit juices	184	211	114,7	0,6	0,6
Non-concentrated fruit juices	2.325	2.880	123,9	8,0	8,6
Non-alcoholic beverages	6.323	6.764	107,0	21,7	20,2
Mineral water – carbonated and non-carbonated	5.831	8.071	138,4	20,0	24,1
<b>TOTAL</b>	<b>29.195</b>	<b>33.480</b>	<b>114,7</b>	<b>100,0</b>	<b>100,0</b>

Source: Authors' calculations according to Croatian Bureau of Statistics, www.dzs.hr, 23.05. 2013

In 2012, in the entire hospitality industry of companies, there was a total of 33,5 million litres of different kinds of alcoholic and non-alcoholic beverages, juices, and mineral waters sold, which is 14,7% more than in 2012. With the realised 11,7 million litres, the most significant beverage in terms of quantity in the total hospitality industry in 2012 was beer, although in relation to 2000, its turnover increased only by 3,0%, which is significantly slower than in the total average of beverages. This resulted in decrease of its share in the total turnover of beverages, from 38,9% in 2000 to 35,0% in 2012.

In accordance with general trends in the changes of customers' habits, the fastest increase, of as much as 38,4% in 2012 in relation to 2002, was in mineral water (carbonated and non-carbonated). With the total of realised 8,1 million litres in total hospitality industry of companies, its share of 24,1% in 2012 made it the second most significant group of beverages according to the turnover.

Great increase in the turnover of wines (29,5%) should also be pointed out. This was surely contributed by an increase in the quality of local wines (which still make the majority of the range of hospitality services), as well as increasingly more visible inclination of foreign consumers towards consuming indigenous products of the country they are staying in).

The rising tendency of consumption of fruit juices should also be pointed out, especially of non-concentrated juices, which also indicates consumers' inclination towards natural ingredients.

Based on the turnover of beverages in total hospitality industry of companies, it is also possible to estimate total turnover of beverages in total Croatian hospitality industry in 2012.



When the estimated registered turnover in hospitality establishments of tradesmen is taken into consideration, except for the turnover of companies, as well as consumption at events and other turnover, it is estimated that, in 2012. the Croatian hospitality industry realised the total turnover of all types of beverages of about 83,5 million litres. However, when this turnover is added to a completely unregistered turnover which, according to estimates, amounts to 10-20%, it can be estimated that the real total turnover in the Croatian hospitality industry in 2012 amounted between 90 and 100 million litres of various types of beverages. Table 3 presents turnovers of beverages (selected types) according to regions/counties.

**Table 3: Beverage consumption in hospitality companies according to counties**

COU-NTY	Beer	Wine	Brandy	Spi-rits	Concentra-ted fruit juices	Non-concentra-ted fruit juices	Non-alcohol-ic drinks	Mine-ral water-s	TOTAL
of Istria	1.496	464	13	43	45	243	636	1.309	4.249
of Primorje-Gorski Kotar	1.845	601	24	63	10	463	867	1.293	5.166
of Lika-Senj	224	49	3	9	1	49	110	153	598
of Zadar	232	57	2	7	9	54	114	130	605
of Šibenik-Knin	334	101	2	8	16	60	178	249	948
of Split-Dalmatia	1.394	533	21	48	21	201	643	923	3.784
of Dubrov.-Neretva	638	374	7	36	28	144	322	604	2.153
City of Zagreb	1.847	467	24	60	40	694	2.140	1.759	7.031
Contine-ntal	3.699	664	35	130	41	972	1.754	1.651	8.946
TOTAL	11.709	3.310	131	404	211	2.880	6.764	8.071	33.480

Source: Authors' calculations according to Croatian Bureau of Statistics, www.dzs.hr, 23.05.2013

If the turnover of beverages in total hospitality industry of companies is analysed according to assortment, there are great regional differences conditioned by a different structure of the hospitality offer, as well as volume and structure of the demand.

While total demand for beverages in the hospitality industry in the continental area predominantly relates to local population, in the littoral part of Croatia, it is under great influence of demand/consumption and foreign tourists. Since in the littoral area there are about 9 million realised registered tourist arrivals, i.e. about 49 million of overnights, i.e. days of stay, it is clear that they, in certain areas, generate significantly greater demand than that of the local population. Besides, purchasing power of a great share of foreign visitors is significantly higher than the purchasing power of the local population, which also enables a higher level of demand for different types of hospitality services.

From the sales of all types of services and goods/products in the total hospitality industry, companies realised the total financial revenue of HRK 9,9 billion in 2012, which is 70,1% more than in 2002. Increase in financial transactions in the analysed period is significantly greater than the increase in physical turnover, virtually for all types of services and goods/products, which means that it was mostly the result of a great rise in prices.

From a general point of view, the great rise in prices was a result of Croatia's successful return to the international tourist market, expansion, and improvement of the total offer of hospitality and other services intended for tourists, which also resulted in the improvement of the structure of foreign visitors, in which guests with higher purchasing power had an increasingly large share. The level of prices which could have been achieved on the market in the analysed period for certain types of services and goods/products primarily depended on improvement of their quality, total demand volume, but also trends in the demand and habits of consumers which were changing significantly in the past few years. This is especially notable in the segment of food and beverages.

From the sales of drinks in the total hospitality industry, the companies realized HRK 1,2 billion in 2006 (or 39,2% more than in 2002), which means that financial turnover of beverages increased much faster than physical turnover. In the total financial turnover of companies, turnover of beverages in 2012 participated with 12,9%, while its share in 2002 amounted 14,7%. This means that the share of revenue from beverages in the structure of revenue from the total hospitality industry of companies decreased in favour of the increase in the revenue from other hospitality services, primarily accommodation and food.

The following segment of the research is focused on analysis of interdependence and the question which factors affect the consumption of drinks and beverages. A special subject of analysis will be whether the climate i.e. weather conditions (warmth and precipitation) affect the volume of consumption of beverages.

#### **4. TRENDS OF WEATHER CHANGES IN ADRIATIC DESTINATIONS**

Based on the available data from the Central Bureau of Statistics, we obtained data on the comparison of climate trends, comparison of average temperature, or average quantity of precipitation for June, July, August, September, of the respective year with the average of the same average parameters between 1961 and 1990 (Gajić-Čapka, Zaninović, Cindrić 2010, 137). Climate is surely an important factor and a kind of a motivator which affects the consumption of beverages. In order to analyse this hypothesis, the processed data are those of average air temperature and average precipitation for characteristic Adriatic tourist destinations: Poreč, Opatija, Mali Lošinj, Zadar, Šibenik, Split, Hvar, and Dubrovnik. The averages were calculated for the period between June 15<sup>th</sup> and September 15<sup>th</sup> on average for 2002 to 2012 (ww.dhz.hr, 2013).

Except in spatial terms, the climate also changes in time. There is a notable interseasonal variety of the climate as well as climate variations on annual and multiannual scale, but also during long periods such as, for example, ice ages caused by astronomic factors which change incoming solar radiation on the surface of the Earth. Climate variations are visible in changes of average state of the climate, changes of multiannual variability of climate parameters and other statistical units which describe the state of the climate like, for example, appearance of extremes. Statistically significant changes of the average state or variabilities of climate characteristics which lasted for decades and longer, are called „climate change“(United Nations Framework Convention on Climate Change, 2013).

Variability of the climate may be caused by natural factors within the climate system. Such climate variability is recorded in phenomenons like *El Niño – the southern oscillation*, which is a result of interaction of the atmosphere and the ocean in the tropical part of the Pacific ocean or the *North Atlantic oscillation* which represents variations of atmospheric pressure on the sea level in the area of Iceland and Asora, which affects the strength of Western circulations and trajectories of storms over the North Atlantic and a part of Europe (www.dhz.hr, 2013).

The human impact on climate was rapidly increasing in the second half of the 18<sup>th</sup> century with the beginning of the industrial revolution. Burning of fossil fuels, changing the types of groundwork originating from urbanisation, deforestation and development of agriculture caused a change in the chemical composition of the atmosphere i.e. increase in the concentration of greenhouse gases in the atmosphere in relation to pre-industrial era (before 1750). From the beginning of industrialisation until today, there has been a significant increase in concentrations of carbon dioxide, methane, nitrous oxide, and halocarbons in the atmosphere, which caused a stronger greenhouse effect and increased warming of the atmosphere than that which occurs naturally.

The above-mentioned general facts on climate change and the system of constant changes as well as factors affecting the changes leads to the question what are climate features of Adriatic tourist destinations in which 85% of Croatian tourist revenue are realised. In the analysed period of ten years, from 2002 to 2012 (see Appendix Table 1), air temperatures have been changing: they amounted average 25,5 °C, until they rose to 25,6 °C. Tourist seasons 2003 and 2011 were somewhat warmer, while tourist seasons 2005, 2006, and 2009 were cooler. The question is which consumption of beverages was average in these years and whether temperature (greater warmth) and a greater number of sunny days affected the volume of consumption of beverages. See Appendix – Table 2. The analysed changes in tourist destinations provide the insight that changes in temperatures were more or less the same along the entire Adriatic coastline, although temperature amplitudes were a bit more evident in southern destinations. However, in the tourist seasons in which it was warmer in the North Adriatic, it was also warmer in the south of the Adriatic.

## 5. INTERDEPENDENCE OF THE BEVERAGE CONSUMPTION AND CLIMATE CHANGES – REGRESSION ANALYSIS

In the following section of the paper, the authors want to verify the hypothesis that weather changes, especially temperature in Adriatic tourist destinations and other climate conditions affect the consumption of alcoholic and non-alcoholic beverages.

Empirical analysis was conducted using the method of regression analysis. The analysis was conducted on the basis of a ten-year average, from 2002 to 2012, for averages from June 15<sup>th</sup> to September 15<sup>th</sup> in the characteristic destinations: Poreč, Opatija, Mali Lošinj, Zadar, Šibenik, Split, Hvar, and Dubrovnik. The initial hypothesis was that the quantity of consumed beverages increases with the increase in the number of overnights and air temperature. The estimated regression function is expressed as follows:

$$y = 0,264x_1 + 735,7x_2$$

wherein:

y= drinks in 000 l

$x_1$ = number of realised overnights

$x_2$ = average air temperature

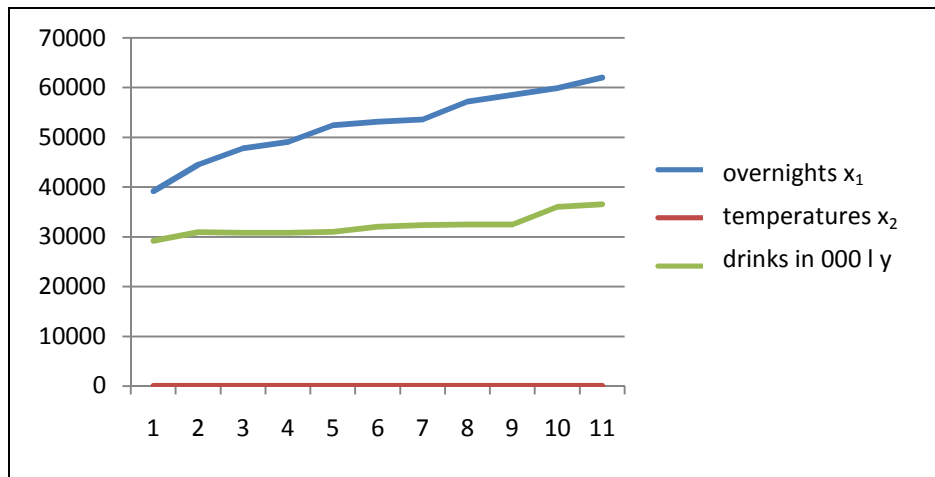
The tests show that the used independent variables are significant on the level of 0,05 and significance of the function is tested by the F-test.

The multiple determination coefficient of 99% indicates that 99% of variations in the quantity of consumed beverages is explained by changes in the number of overnights i.e. air temperature.

The estimated regression function indicates that the quantity of consumed beverages will increase on average for 0,269 thousand litres for each unit change of overnights provided that air temperature remained unchanged i.e. that consumption of beverages will increase by 735,7 thousand litres if the temperature increases by one degree, with the same number of overnights.

The following chart shows the trend of the consumption of beverages, number of overnights and air temperature.

Chart 1: **Trend of beverage consumption, number of overnights and air temperature**



Source: Authors' calculation according to tables in Appendix 1 and Appendix 2

The conclusion that is derived from the presented data is that the general trend of consumption of hospitality services (consumption of alcoholic and non-alcoholic beverages) indicates the expected further increase in tourist revenue, especially in the destinations which strive to increase the quality of hospitality services and which form their business policy in order to increase and make optimal use of competitive advantages of the Croatian hospitality industry in the Adriatic tourist destinations. The impact of climate changes in terms of precipitation and temperature were taken into consideration in the analysis presented in this paper in the following Adriatic tourist destinations in the past eleven years: Poreč, Opatija, Mali Lošinj, Zadar, Šibenik, Split, Hvar, and Dubrovnik, indicate the fact that temperature and precipitation do affect the consumption of alcoholic and non-alcoholic beverages

## CONCLUSION

Total turnover in tourism in the future periods will be conditioned by a range of impacts such as increase in the standard of living, fashion, quality of the offer, habits and motives of consumption, and a whole series of other impacts defined in the paper, but some of the most important factors will be quality and value for money system.

General characteristics of changes in the tourist demand can be summarised in the fact that Croatian tourist demand trends are comparable with European trends in the demand for alcoholic drinks and beverages.

In the following years, demand in the hospitality establishments, consumption of alcoholic and non-alcoholic drinks and beverages in the demand system will be marked with the addition of experience of the establishment, i.e. ambience and the requested quality of food and beverages. Emphasis will be placed on food and beverages labelled

„eco“, which follow the process of preparation and serving of drinks or beverages based on experience.

The expected trend of reduction of the volume of tourist revenue in the world may have an impact on Croatian tourist destinations, and it is to be expected that global influences of recession and crisis will have an impact on the consumption of alcoholic drinks and beverages in Croatian hospitality establishments. Consumption of beer, alcoholic spirits as well as carbonated drinks have a downward trend. Consumption of wine is the only one that is increasing, and the increase is very mild in relation to the possible trend of increase in the total tourist revenue. Conditions on the tourist market will surely slow down the growing trends and it is to be expected that increase in tourist revenue will be slowed down. The conclusion is derived that, in the total tourist consumption, the growth rate of wines will be faster than tourist turnover. The message is imposed that tourist demand for beverages will be directed to the desired level of quality with special emphasis on the expected increase in the consumption of wine as well as natural waters. In the process, climate conditions should be substituted by additional marketing activities to become less dependent on natural impacts.

The opinion and well-known fact was verified, that tourists (visitors) consume more beverages, especially beer, fruit juices and waters, when atmospheric and weather conditions are favourable and stimulate greater physiological need for consumption of water, drinks and in general, when physiological conditions are a stimulus and motive for consumption of more beverages. In the analysed period of ten years, it is verified that tourists' demand for beverages, especially beer and waters, was increased in the years when average air temperature was higher, and humidity lower.

Managers' activities on the tourist market must be directed to the quality of the offer of beverages and they should not wait for the impact of elementary powers, i.e. natural and climate factors.

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## Appendices

Table 1: **Average temperatures in Celsius and average precipitation for July and August in lit/m<sup>2</sup> for destinations Poreč, Rijeka, Mali Lošinj, Zadar, Šibenik, Split, Hvar and Dubrovnik (2002-2007)**

Destinations	2002		2003		2004		2005		2006		2007	
	T	P	T	P	T	P	T	P	T	P	T	P
Poreč	1,2	190,0	3,9	56,0	1,5	25,0	1,0	102,0	1,1	104,0	2,0	52,0
Rijeka	1,3	153,0	4,6	31,0	1,2	62,0	0,7	107,0	1,5	75,0	2,0	55,0
Mali Lošinj	1,2	180,0	4,1	30,0	1,1	65,0	0,6	102,0	1,1	98,0	1,8	149
Zadar	1,2	203,0	3,7	49,0	1,1	33,0	0,7	115,0	0,9	136,0	2,2	44,0
Šibenik	1,3	119,0	3,8	58,0	0,6	81,0	0,4	68,0	0,6	95,0	2,0	70,0
Split	1,1	165,0	4,1	37,0	0,9	56,0	0,5	89,0	0,8	139,0	2,3	60,0
Hvar	1,2	238,0	3,5	46,0	0,9	92,0	0,5	112,0	0,6	182,0	2,2	20,0
Dubrovnik	1,5	115,0	3,3	52,0	0,9	96,0	0,1	172,0	0,5	165,0	2,2	9,0
Ø	1,3	170,4	3,9	44,9	1,0	63,8	0,6	108,4	0,9	124,3	2,1	57,4
	25,5	152,1	26,1	42,4	24,2	56,2	23,8	96,9	24,1	109,7	25,3	51,6

\* T – temperature deviation, P – precipitation

Table 1 (continued): **Average temperatures in Celsius and average precipitation for July and August in lit/m<sup>2</sup> for destinations Poreč, Rijeka, Mali Lošinj, Zadar, Šibenik, Split, Hvar and Dubrovnik (2008-2012)**

Destinations	2008		2009		2010		2011		2012	
	T	P	T	P	T	P	T	P	T	P
Poreč	2,3	63,0	2,2	78,0	1,6	97,0	2,0	85,0	1,3	90,0
Rijeka	2,1	72,0	1,9	80,0	1,5	103,0	2,0	66,0	1,6	65,0
Mali Lošinj	2,1	82,0	1,9	60,0	1,5	86,0	1,9	84,0	1,5	51,0
Zadar	1,8	78,0	1,5	71,0	1,3	69,0	1,9	59,0	1,4	91,0
Šibenik	1,8	93,0	1,2	142,0	1,2	105,0	1,9	58,0	1,2	54,0
Split	2,0	89,0	1,3	102,0	1,4	76,0	2,0	119,0	1,5	46,0
Hvar	1,6	119,0	1,2	227,0	1,3	71,0	1,8	101,0	1,2	38,0
Dubrovnik	1,9	36,0	1,6	142,0	1,0	66,0	2,0	35,0	1,4	85,0
Ø	2,0	79,0	1,6	112,8	1,4	84,1	1,9	75,9	1,4	65,0
	25,2	70,3	24,8	101,2	24,6	74,7	25,7	67,6	25,6	57,8

\* T – temperature deviation, P – precipitation

Source: Authors' calculation according to Croatian Hydrological Service, [www.climate.hr](http://www.climate.hr), 16.06.2013

Table 2: **The structure of beverage consumption and overnight stays in hospitality companies (2002-2007)**

	2002	2003	2004	2005	2006	2007
Overnight stays	39.183	44.526	47.797	49.126	52.421	53.162
BASIS 2002	12	14	22	25	34	36
BASIS 2002	100	114	122	125	134	136
Consumption of beverages ( lit.)						
BEER	11.370	11.863	11.852	11.789	11.601	11.925
WINE	2.556	2.601	2.599	2.612	2.695	2.859
BRANDY, SPIRITS	606	611	609	607	601	591
WATER	2.509	2.892	2.752	2.691	2.851	2.952
Non-alcoholic.	6.323	6.425	6.419	6.411	6.491	6.521
Mineral water	5.831	6.529	6.579	6.691	6.792	7.211
	<b>29.195</b>	<b>30.921</b>	<b>30.810</b>	<b>30.801</b>	<b>31.031</b>	<b>32.059</b>
Consumption of beverages (%)						
BEER	39	38	38	38	37	37
WINE	9	8	8	8	9	9
BRANDY, SPIRITS	2	2	2	2	2	2
WATER	9	9	9	9	9	9
Non-alcoholic	22	21	21	21	21	20
Mineral water	20	21	21	22	22	22
	100	100	100	100	100	100
Consumption of beverages: guest/day (lit)						
BEER	0,2902	0,2664	0,2480	0,2400	0,2213	0,2243
WINE	0,0652	0,0584	0,0544	0,0532	0,0514	0,0538
BRANDY, SPIRITS	0,0155	0,0137	0,0127	0,0124	0,0115	0,0111
WATER	0,0640	0,0650	0,0576	0,0548	0,0544	0,0555
Non-alcoholic.	0,1614	0,1443	0,1343	0,1305	0,1238	0,1227
Mineral water	0,1488	0,1466	0,1376	0,1362	0,1296	0,1356
	<b>0,7451</b>	<b>0,6944</b>	<b>0,6446</b>	<b>0,6270</b>	<b>0,5920</b>	<b>0,6030</b>

Table 2 (continued): **The structure of beverage consumption and overnight stays in hospitality companies (2008-2012)**

	2008	2009	2010	2011	2012
Overnight stays	53.583	57.196	58.583	59.919	62.030
BASIS 2002	37	46	50	53	58
BASIS 2002	137	146	150	153	158
Consumption of beverages ( lit.)					
BEER	11.825	11.795	11.695	12.559	12.709
WINE	2.959	3.106	3.295	3.345	3.310
BRANDY, SPIRITS	582	576	561	542	535
WATER	2.990	2.998	3.001	3.286	3.391
Non-alcoholic.	6.484	6.501	6.401	7.581	7.623
Mineral water	7.534	7.492	7.526	8.726	8.971
	<b>32.374</b>	<b>32.468</b>	<b>32.479</b>	<b>36.039</b>	<b>36.539</b>
Consumption of beverages (%)					
BEER	37	36	36	35	35
WINE	9	10	10	9	9
BRANDY, SPIRITS	2	2	2	2	1
WATER	9	9	9	9	9
Non-alcoholic	20	20	20	21	21
Mineral water	23	23	23	24	25
	100	100	100	100	100



	2008	2009	2010	2011	2012
Consumption of beverages: guest/day (lit)					
BEER	0,2207	0,2062	0,1996	0,2096	0,2049
WINE	0,0552	0,0543	0,0562	0,0558	0,0534
BRANDY, SPIRITS	0,0109	0,0101	0,0096	0,0090	0,0086
WATER	0,0558	0,0524	0,0512	0,0548	0,0547
Non-alcoholic.	0,1210	0,1137	0,1093	0,1265	0,1229
Mineral water	0,1406	0,1310	0,1285	0,1456	0,1446
	<b>0,6042</b>	<b>0,5677</b>	<b>0,5544</b>	<b>0,6015</b>	<b>0,5891</b>

Source: Authors' calculations according to Croatian Bureau of Statistics, www.dzs.hr, 16.05.2013.

Table 3: Hospitality companies' total turnover (in HRK)

Type of service/goods	2002	2012	Index 12/02
Beer	242.122	307.481	127.0
Wine	144.749	247.338	170.9
Brandy	21.909	26.490	120.9
Spirits	86.863	107.225	123.4
Concentrated fruit juices	7.812	9.721	124.4
Non-concentrated fruit juices	90.731	117.835	129.9
Non-alcoholic drinks	185.990	235.436	126.6
Mineral water – carbonated and non-carbonated	74.051	137.615	185.8
TOTAL	854.227	1.189.141	139.2
Food	1.690.125	2.627.908	155.5
Beverages	205.443	369.108	179.7
Tobacco and matches	50.287	48.716	96.9
Overnights	2.738.348	5.225.102	190.8
Other total	256.411	396.798	154.8
TOTAL	5.794.841	9.856.773	170.1

Source: Authors' calculations according to Croatian Bureau of Statistics, www.dzs.hr, 23.05.2013

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