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Forecasting Alcohol Consumption in the Czech Republic

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Abstract

The paper deals with a forecast of developments in alcohol consumption based on current alcohol consumption per capita (expressed in litres of pure alcohol), and time series extrapolations. Alcohol consumption is to be considered from the vantage point of knowing the specifics of the product and the consequences of its excessive consumption. The predictive methodology makes use of the Box-Jenkins method; the ARIMA model, taking into account the autocorrelation and partial autocorrelation process, which is a prerequisite for the successful identification of a time series model; model parameter estimation; appropriate transformations of time series; determining the order of differentiation and subsequent verification of the model. The chosen methodology for future trends in alcohol consumptions is a prerequisite for the proposed optional measures to control alcohol consumption in the Czech Republic. Due to the long term nature of the process to draw up and implement alcohol consumption regulation measures, the forecast covers the forthcoming 10 years.

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1. Introduction

The consumption of alcohol is a major social problem, because its use and overuse is linked with health, social, economic, cultural and political consequences, with a legislative context.

During the nineteenth and early twentieth century there was an upsurge of anti-alcohol movements in the greater part of Europe, which gradually diminished, and by the end of the twentieth century become almost insignificant. This reflects the current status, whereby the European Union comprises the region with the highest alcohol

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consumption in the world (Anderson, Baumberg, 2006). The average alcohol consumption across those 18 Member States of the EU for which statistics were available in 2012 was then around 10.6 litres of pure alcohol per adult (aged over 15) (OECD, 2015). Over the last three decades, alcohol consumption in some Member States has declined, while going up in others. In recent years we've seen changes in habits related to alcohol consumption, and an important role is played in this process by the convergence of alcohol consumption between Member States – for example, rising wine consumption in countries previously known for drinking beer, and vice versa (OECD, 2012). Changes in alcohol consumption between countries and over time are caused not only by changes in alcohol consumption practices, but also by policy measures aimed to control alcohol consumption. In particular, restrictions on advertising, on sales and increased taxation are evidently effective tools for restricting alcohol consumption (Bennett, 2003 in OECD, 2012; WHO Europe, 2012a in OECD, 2012).

Apart from the legislative measures, alcohol consumption is affected by a whole host of other factors. Pettigrew and Donovan (2003) speak of the family (family structure, family relationships, family conflicts, parental awareness, parental supervision, parental communication skills, parental attitudes to alcohol, etc.); peers (peer-group alcohol consumption, peer pressure); personal characteristics (age, gender, masculinity, income, education, marital status, religion, self-esteem, alcohol tolerance, aversion to alcohol, motivation and expectations related to alcohol consumption, health expectations, subject area knowledge of alcoholic beverages etc.); life experience (past experiences with alcohol, the death of a loved one, disability, unemployment, problems at school, etc.); moral values; socio-cultural factors, situational specifics; structural factors (price, affordability/availability, packaging size); advertising, marketing; media and local climate. As seen from the above, alcohol consumption is impacted by a number of incidental factors. Alcohol consumption and the consequences of its overuse can be addressed from different perspectives. All involved should, however, have objective information, not only about the current state of the consumption of different types of alcoholic beverages, but also about the expected developments in consumption. The forecasting of alcohol consumption values has to utilize the methods of time series analysis that benefit from theory-based assessments regarding the presence, in a given time series, of any trend, periodicity or stationarity, and so can help us choose the appropriate forecast model.

Excessive alcohol consumption causes damage not only to human health, but also to the social fabric (Anderson and Baumberg, 2006). Epidemiological studies confirm that apart from incorrect nutrition the risk factors to health in developed countries encompass the drinking of alcohol, while the effects of alcohol on population health are still being studied. Earlier research suggests (Gmel et al., 2002; Evstifeeva et al., 1997), that alcohol consumption negatively impacts overall mortality, both in connection with a number of diseases whose onset or progression involves alcohol consumption, and in connection with accidents. However, there are also studies (Howie et al., 2011; Pearson, 1996; Doll, 1998 in Csémy, Sovinová, 2003), claiming that alcohol consumption to a moderate degree has positive effects on human health. In the social sphere, alcohol consumption can lead to phenomena ranging from public harassment, through marital breakdown, abuse and child abuse, crime, violence to homicide. In general it can be said that the higher the level of consumption, the more serious the concomitant offence or damage to health. (Anderson, Baumberg, 2006).

The Czech Republic is, by volume of alcohol consumption, among the front-runner countries of Europe. When compared with the European Union, the Czech Republic in 2012 exceeded the average consumption across the Member States by approximately 1 litre of pure alcohol per adult. Consumption was some 11.6 litres of pure alcohol per adult person (OECD, 2015). The Czech Statistical Office (2014) provides statistics on alcohol consumption per capita, i.e. including children and persons under the age of 15 years. According to these statistics in 2012 every member of the population (i.e. including children) averaged 9.9 litres of pure alcohol.

The aim of the present paper is to forecast future developments in alcohol consumption i.e. to generate values of alcohol consumption for the next 10 years, grounded on knowledge of existing long-term alcohol consumption as well as the theory underlying time series analysis. Making use of the Box-Jenkins method for models aware of autocorrelation and partial autocorrelation processes is a prerequisite for choosing the right forecasting model, in view of the large number of incidental factors influencing alcohol consumption.

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