





A demand analysis with a dynamic approach to LA/AIDS for the Italian bottled water industry and its related non-alcoholic beverages

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Abstract

This paper analyses the demand for non-alcoholic beverages in Italy with Istat and Bevitalia data, including bottled water, soft drinks and juices, over the period of 2011–2020, using a dynamic approach based on the Linear Approximate-Almost Ideal Demand System (LA/AIDS). The analysis takes into account the correlation among the bottled water, soft drink, and juice industries, and the effects of changes in prices, income, and quantities on the demand for each type of beverage. Our findings suggest that, in Italy, during the considered period, the income elasticity of the three products was positive, indicating that they are normal goods, albeit bordering on the line between necessary and luxury goods. Bottled water and juices are classified as luxury goods, whereas soft drinks are more inclined to be classified as necessary goods. Additionally, soft drinks and bottled water are price-elastic goods, whereas juices and bottled water, or juices and soft drinks, are price-inelastic goods. Our results also indicate that bottled water is the most widely consumed good, followed by soft drinks and juices. Finally, we recommend policy interventions aimed

at promoting healthier consumption habits, such as taxes on sweet drinks or subsidies for drinking water consumption. Overall, our findings provide new insights into the dynamics of demand for non-alcoholic beverages in Italy, which can inform policy decision-makers focused on promoting public health and welfare.

Introduction

Water is the most precious common good found in nature; it is a source of life but also a cause of conflict in many parts of the world (Zeitoun et al., 2010, Rahaman, 2012, Gleick, 2014, Gilmartin, 2020). However, several socio-economic and environmental factors have affected the quantity and quality of water in recent decades. These factors include population growth, industrialisation, and urbanisation, which are all related to an increase in human-made activities. As a result, concerns about pollution caused by the consumption of bottled water have also increased over the past few decades (Abolli, Ahmadi Nasab, Yaghmaeian, & Alimohammadi, 2022, Birzul et al., 2019).

Particularly, several studies have explored the bottled water industry (Ballantine, Ozanne, & Bayfield, 2019, Dege, 2011, Dupont, Adamowicz, & Krupnick, 2010, Hawkins, 2017, Hawkins et al., 2015, Jaffee & Newman, 2012, Maestu, 2012, Ulfah, Ariana, & Lintang Trenggonowati, 2021, Vásquez, 2016, Vieux, Maillot, Rehm, Barrios, & Drewnowski, 2020, Wilk, 2016, Younos and Grady, 2014). More recently, the relationship with non-alcoholic beverages has been studied using a demand system in several countries, also comparatively (Andreyeva, Long, & Brownell, 2010, Mirasgedis, Georgopoulou, Sarafidis, Papagiannaki, & Lalas, 2013, Stacey, Tugendhaft, & Hofman, 2017, Grumezescu et al., 2019a, Grumezescu et al., 2019b). These all studies contribute to providing a comprehensive and up-to-date understanding of bottled water research and related industries. However, with reference to the Italian market, as far as we know, there are not studies that analyse the industry-growth, as well as consumer behaviour with the demand system.

The bottled water industry and its related industries in Italy create interesting and profitable markets with significant implications for productivity and employment, overall. Italy is a country rich in water resources and exhibits important regional differences (Bevitalia, 2020).

Our analysis will consider three categories of products that are closely correlated, aggregating several goods from the bottled water, soft drinks, and juices industries. Firms within these industries have the opportunity to exploit economies of scope by producing correlated and diversified products.

Our study analyses the demand for non-alcoholic beverages in Italy from 2011 to 2020 using the Linear Approximate-Almost Ideal Demand System (LA/AIDS) and a model with lagged demand values to capture the persistence of consumption patterns over time (e.g.: see Ainslie, 2010; Blawatt, 2016; Solomon, 2017; Cherubino et al., 2019). Additionally, as a novelty, we introduced the consumed budget shares with one order of lags in the price equation given by Stone (1953) to jointly capture a persistence effect due to both income levels and prices.

This paper has been structured as follows: (i) the theoretical framework of analysis, (ii) the empirical analysis, (iii) the conclusion.

Section snippets

The industry life cycle theory

Since the Nineties, Italy has become the leading country in Europe for bottled water consumption and exported values (Bevitalia, 2020). Therefore, this is the main market of non-alcoholic beverages industry. Fig 1 shows the trend of operative volumes in the bottled water from 1980 to 2020, showing the classical s-shaped form. The industry has entered the shake-out stage and maturity stage subsequently. According to industry life cycle theory, oligopolistic competition is the most appropriate...

The methodological note

According to the Italian Statistical Institute (ISTAT), the classification codes of the industries representing the non-alcoholic beverages can be easily identified with the ATECO (2007) codes: fruit and vegetable juices with the code C.10.32.00, while bottled waters and soft drinks with the code C.11.07.00.

The ATECO (2007) industry code is a classification system for industries approved by ISTAT, and it was last updated in 2007. It is a standardised classification for firms based on their core ...

Contribution and concluding remarks

Water for human consumption is the most precious common good found in nature, a source of life but also a cause of war in many parts of the world (Gilmartin, 2020, Gleick, 2014, Rahaman, 2012, Zeitoun et al., 2010). The well-known issues of water scarcity and climate

change – which are also linked to the globalisation process, have prompted a reconsideration of these critical issues in the debate among economists and beyond, also with reference to the bottled water industry (Dell, Jones, &...

Consent for publication

The author releases the consent to the publication of this study....

Authors contribution

The author is alone responsible for the conception and design of the study....

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Declaration of Competing Interest

The authors declare that they have no known competing financial interests or personal relationships that could have appeared to influence the work reported in this paper....

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