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Factors affecting bus users' satisfaction in times of economic crisis

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ABSTRACT

This paper continues the research effort that the authors began in 2008 on the quality factors that affect adoption of public transportation and retention of its users. The objective of this paper is to explore the impacts of the deep, 7-year economic crisis, on the perceptions of public transport users, with bus as their main transport mode, about service quality. Data from three user-satisfaction surveys that were conducted in Athens in 2008 (pre-crisis), 2013 (mid-crisis) and 2017 (deep-crisis) are used for the analysis. Mann Whitney/Wilcoxon test is applied for the distribution comparison of the responses between the pairs of consecutive years (2008–2013 and 2013–2017), in order to measure the change in users' preferences. Ordered logit models are developed for the user satisfaction and shift to public transportation after the beginning of the economic crisis.

The results of the analysis indicate that the satisfaction about quality attributes, such as service frequency, conditions at the stations and information provision, are important contributors of the total satisfaction, verifying the results of Tyrinopoulos and Antoniou (2008) and Efthymiou et al. (2014), but their impact varies over time. Despite the general decrease of commuting activities due to increase of unemployment, the shift to public transportation has increased. More specifically, demographic characteristics, such as age, occupation and gender, as well as qualitative factors, such as overall quality of service, service production, transfer quality, ticket services and environmental consciousness, have affected the decision of people to shift to and from public transportation.

1. Introduction

1.1. Background

The current economic crisis that Southern European economies, such as Greece, Spain and Portugal are (or were) experiencing, has a direct impact on public transportation (PT). In Greece, in particular, the economic crisis affects both the management/organizational and the social/economic sides of PT. On the social side, the increased unemployment and reduction of households' net income has led to decreased travel demand in general and public transport in particular, while PT may have increased its market share versus private transport modes, as being the more economical alternative. On the organizational side, public transport operators have

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been merged in an attempt to reduce their operational costs. While there are not clear side effects of this operational restructuring on service provision so far, the results of previous research (Efthymiou and Antoniou, 2017) indicate that there is a general reduction of quality of service comparing with the pre-crisis state (2013 vs. 2008). Other indicative changes that have taken place after the beginning of the economic crisis are the changes of ticket types, increase of ticket prices and shut down of tickets distribution locations. These factors could have probably affected the satisfaction of users and demand. Understanding the exact impact of these and other actions could give valuable insights to the PT operators and policy makers, and help them design their future operational strategies.

PT operators should place as a top priority in their agenda the improvement of the quality of their services. They should take advantage of the unique opportunity that has arose, to attract more customers/travelers that cannot afford using their cars, with whom they should create long-term relationships. In order to maintain or improve customer satisfaction at high levels and establish customer loyalty, PT operators should focus on the constant improvement of their services.

1.2. Objective and paper structure

The objective of this paper is to explore the factors affecting the adoption of bus PT and the evolution of users' satisfaction over time, using data from three time periods: pre-crisis (2008), mid-crisis (2014) and deep-crisis (2017).

The remainder of the paper is structured as follows: Following the introduction, a literature review on quality factors of PT that affect users' satisfaction and demand, as well as the existing research in Greece on this topic are presented. The next section presents the study area and data collection methodology. Then, the analysis of the results is demonstrated in Section 4. The paper ends with the conclusions.

2. Literature review

2.1. Factors affecting public transport satisfaction

The factors affecting adoption of PT systems, user satisfaction and retention have been investigated by a significant number of research papers, while transportation agencies and organizations have attempted to create a framework including directions and indices for public authorities (e.g. TRB, 1999; CEN, 2002).

Friman et al. (2001) found that PT employees' behavior, reliability, design and information simplicity are all factors that affect PT user satisfaction in Sweden. Analyzing data from PT operators of 265 urban areas in US, Taylor et al. (2008) found that on the one hand, increasing service frequency results to increase of demand and on the other, increasing prices leads to decrease. Moreover, PT quality depends on geography, economy, the road network but also the characteristics of the population that uses it. On the other side of the Atlantic, Felleson and Friman (2008) investigated the PT satisfaction of users in eight European cities. They found that the level of satisfaction depends on comfort, staff behavior, system and safety, while similar to Taylor in US (2008), they concluded that the perception of satisfaction depends on the characteristics of the population. Dell'Olivo et al. (2010a) explored the factors that affect satisfaction of bus users in Santander, Spain. They found that the stated, perceived satisfaction of the respondents mainly depends on reliability and waiting time at the station, therefore punctuality and headways should be the priorities of the service providers. Moreover, they observed that about 35% of the respondents modified their overall satisfaction score after being asked about specific factors of the PT systems. In addition, Dell'Olivo et al. (2010b) concluded that the most important factors for PT users in Santander are waiting time, cleanliness and comfort, while driver behavior, bus occupancy and time of journey are less important; the impact of these factors vary depending on the socio-economic characteristics of the users.

Cirillo et al. (2011) investigated the factors that affect PT satisfaction in Southern Italy, using data from a random sample of 470 students who use bus to their trips of a university campus. They found that punctuality is valued as the most important characteristic by the users, since one third of the respondents stated that they are willing to pay more in order to use an on-time service. Eboli and Mazzulla (2012) presented a detailed and comprehensive literature review on the performance indicators for measuring public transport service quality. They concluded that aspects of service quality that have been investigated in a great extend are the service availability and reliability, while others such as customer care and environmental protection have been ignored. Román et al. (2014) explored the impact of quality factors on the choices of PT users. The results of their research showed that the behavior of urban and interurban travelers differ because of the different perceptions of factors, such as frequency and willingness to pay. Carrel et al. (2012) focused their research on the impact of reliability and frequency of PT services on usage. The results of their research demonstrated that PT users rate punctuality as a highly important factor. More specifically, they prefer punctual modes even if they are smaller and crowded, instead of non-punctual larger and of low frequency of service. These finding shows the direction for strategic policies that the PT service providers should follow. Redman et al. (2013) reviewed a number of studies about factors that affect the adoption of PT and concluded that despite the fact that frequency and reliability are rated as very important by the users, these factors are not those that will affect the decision of travelers to switch from private to public transport. The shift depends on personal perceptions and motivations. De Oña et al. (2013) developed a SEM (structural equation models) to estimate satisfaction of bus users about the overall quality of service, with latent variables the service, personnel and comfort. The results showed that quality is the most important of the unobserved characteristics, while personnel and comfort follow. Two years later, De Oña et al. (2015) investigate the relationship between customer satisfaction and perceived accessibility for the Metro of Seville in Spain, using SEM models. The results of the SEM models indicate that users rate as most important the tangible service equipment, then accessibility, service availability, information, security, customer service, individual space and finally environmental pollution. De Oña and de Oña

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