

**Gülsüm Akarsu**

 <https://orcid.org/0000-0002-4877-1969>

*Ondokuz Mayıs University, Turkey*

## INTRODUCTION

In today's World, information and communication technologies (ICTs) have become indispensable for daily life. Digitalization has become one of the primary goals in the development plan of many countries to adapt to the evolving World. The United Nations, 2030 Agenda for Sustainable Development, has also focused on the essentiality of ICTs for inclusive economic growth and sustainable development of countries under Sustainable Development Goal (SDG) 9 (Build resilient infrastructure, promote inclusive and sustainable industrialization and foster innovation) directly and SDGs related to climate change, education, health, gender equality, and private sector development (European Union, 2022). From 2008 to 2017, internet users increased from 23% to 46% of the World population (The World Bank, 2022a). On the other hand, in most countries, the tourism sector may gain further importance by transforming industrial-dominated economies into service-based ones. The World Travel and Tourism Council's latest report shows that the sector has begun to recover after the Covid-19 pandemic in 2021 and is expected to grow at 5.8% per annum exceeding the economic growth of 2.7% between 2022 and 2032 globally. According to the World Bank World Development Indicators, World international tourism receipts have increased by nearly 45% between 2008 and 2017, whereas World international tourist arrivals have increased by 28.4%. From 2008 to 2017, the share of international tourism receipts from total exports increased from 5.7% to 7.1% in the World.

Information is an essential factor affecting the long value chain which characterizes the tourism sector (Lee et al., 2021). Information and communication technology (ICT) infrastructure is expected to contribute to the tourism development of a country as tourists can quickly obtain instant information related to tourism destinations through websites and mobile applications (Nadeem et al., 2020). Moreover, information and communication technologies contribute to the competitiveness and functioning of businesses by increasing the efficiency and quality of management procedures and transactions through innovation and collaboration (Bayrakçı & Özcan, 2022). Therefore, ICT infrastructure has become much more critical for the tourism sector due to the changing trends in this sector, as Nadeem et al. (2020) highlighted. The tourism sector has also been affected by digital transformation. In this context, new trends have been introduced in the sector, such as digital tourism and e-tourism. Value chains and processes can be digitalized by using ICTs in the tourism sector, as noticed by Gruescu, Nanu and Tanasie (2009), which provide an online presence of destinations, effective tourism management, empowered networking, dynamic personalization of value-added services, value chain expansions, and easy, direct, and affordable access to all customers (Adeola & Evans, 2019; Adeola & Evans, 2020). In the future, artificial intelligence- and virtual tourism-based applications can spread very rapidly for the development of the tourism sector (Kumar & Kumar, 2019). However, because of commoditization as an infrastructure, opportunity costs associated with information and communication technological investment, peer effect and time-lagging for adjustment, these technologies may lead to productivity decline, known as

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the information technologies' productivity paradox. (Lee et al., 2021). The dynamic effect of ICT can be considered, as it may take some time for the desired effect of ICTs, as suggested by Lee et al. (2021).

Safety is another critical factor affecting tourists' decision to visit a destination. If a destination is known with high crime rates, this situation may decrease the attractiveness of this destination. The theoretical background related to this can be found in the risk travel theory put forward by Roehl and Fasnmaier (1992), in which they group travellers into risk-neutral, functional risk, and place risk classes (Choudhary et al., 2020). Information and communication technologies can reduce crime rates in a country which has gained further importance with the increase in crimes following the Covid-19 pandemic, as discussed by Ochante-Huamactto et al. (2021). To reduce criminal activities, governments take many actions by spending a large amount of budget on law enforcement institutions, prisons, and crime prevention programs (Kizilgol & Selim, 2017). As a negative social externality of tourism, crime rates may also increase due to tourism because of increased mobility, the demand for illegal goods and services, lack of social and community control and information if necessary actions are not taken, and this causes doubts on the sustainability of tourism led growth, decrease in touristic destination attractiveness, and decrease in quality of residents' life as highlighted by Biagi, Brandano, and Detotto (2012).

Analysing the determinants of crime is vital to reduce and prevent it. These illegal activities have detrimental effects on economic growth because of their possible negative impacts on the sectors sensitive to safety issues, such as tourism, foreign direct investment, human and social capital, competitiveness, and productivity. They waste the country's resources (Kizilgol & Selim, 2017). Specifically, the societal cost of crime has been classified into four categories: costs incurred by victims directly and indirectly (for example, earning and property losses, pain, decrease in life quality, and medical care expenditures), costs related to the criminal justice system (government budget spent on legal services), and the opportunity cost of crime career (McCollister et al., 2010). Crime analysis can be performed following a multidisciplinary approach, including economics. Kizilgol and Selim (2017) defined criminality as a historical, social evolutionary phenomenon that can adapt to changes in society and technology and has various types, such as organized, violent, cyber, juvenile, and single crimes. The reasons behind crime should be analysed broadly, ranging from health, education, and ethics to financial problems. However, this study only focuses on the main economic determinants, tourism, and ICT use.

The primary purpose of this study is to examine relations among tourist arrivals, crime rates, and internet usage for a panel of 23 countries<sup>1</sup> over 2008-2017 based on data availability using panel Granger causality testing procedures. In addition, to gain a better understanding, the author investigates the main determinants of tourist arrivals and crime, including internet use, using the same data, including other factors. Figure 1 illustrates each country's tourist arrivals, internet usage and crime and theft index in 2017. Among the countries, the highest number of tourist arrivals was recorded by Mexico, with nearly 99 million in 2017. Internet usage is 99% and the highest in Saudi Arabia. According to the crime and theft index, El Salvador has the highest level, although there has been a decline over time. In contrast, the index implies that Malaysia is the safest among these countries, with an index value of 0.9 in 2017.

The organization of the chapter is as follows. A background section follows this introduction section. In the background section, the author discusses theoretical and empirical literature on the determinants of tourist arrivals and crime, focusing on information and communication technologies and studies analysing interrelationships between tourist arrivals, crime rates, and ICTs usage. Methodology, data, and empirical results are presented in the following section. After discussing solutions, recommendations, limitations of the study and recommendations for future research, the chapter concludes by summarizing significant findings and giving final remarks.

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