

Assessing of the impact recycling. A comparison on the change in productivity and eco-productivity of electronic waste (e-waste): a case study for Chile.

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Information, telecommunications technology (ICT) and Internet computer networks are present in all aspects of modern life and positively affect human life concerning connectivity, even in the most remote areas of developing countries (Osibanjo, 2007). The rapid growth of ICTs increased in 2020, with the global situation of Covid-19, since it became not only an entertainment tool but also a work tool, leading to an improvement in the capacity of computers, cell phones, but at the same time to a decrease in the useful life of these products. As a result, increasing amounts of waste from electrical and electronic equipment (e-waste) are generated annually. This is why this study will focus on evaluating the performance of those in charge of e-waste management. In South America, no previous studies evaluate the change in productivity and/or eco productivity of those in charge of the collection and treatment of e-waste. From a methodological point of view, there are some studies in waste (waste of all kinds), water where they use efficiency and productivity indicators that have traditionally been used to support decision-making processes (Molinos-Senante et al., 2014; Llanquileo-Melgarejo et al., 2021). These indicators provide information on how the product-input relationships differ between decision-making units (DMU) or over time (Yu et al., 2008). As a concept, productivity is defined as the relationship between the results obtained and the resources used in their production over time. Unlike the change in productivity, the concept of eco productivity integrates inputs, desirable products and environmental variables (Molinos-Senante et al., 2014).

Regarding this topic, the literature is minimal and unique (Simoes et al., 2012), and Pérez-López et al. (2018) evaluated the change in the productivity of municipalities in the provision of MSW services using the Malmquist Productivity Index (IPM). However, this index has two significant drawbacks: i) it is necessary to choose between an entry orientation or an exit orientation (Williams et al., 2011) and; ii) MPI relates efficiency change (ECH) and technical change (TCH) (the two drivers of productivity change) through multiplication (Cook et al., 2010). To overcome these disadvantages, there is an alternative indicator, the Luenberger Productivity Indicator (LPI), which has been shown to have significant advantages over the MPI: i) the LPI relates ECH and TCH through summation; ii) they can simultaneously focus on increasing outputs, and decreasing inputs (Boussemart et al., 2003) showed that the MPI overestimates the change in productivity, unlike the LPI, concluding that the LPI is higher than the MPI.

Focusing on the change in eco productivity, that is, the dynamic performance of e-waste providers, including environmental variables, the literature review did not show previous studies evaluating the change in the eco productivity of municipalities in the provision of services. of e-waste. In other words, no previous studies are evaluating the change in productivity by simultaneously integrating waste not classified as unwanted products and recyclable waste as desirable products. To evaluate the impact of recycling on the performance of e-waste providers, this study calculates and compares estimates of productivity change and eco-productivity change. In doing so, the LPI was used to estimate productivity change scores, while the Malmquist-Luenberger Productivity Index (MLPI) (Chung et al., 1997) was calculated to measure the change in eco-productivity. The empirical application will focus on a sample of more than 300 Chilean municipalities (of 345 in total) that, through national platforms, report on the amount in tons per year and per commune generated about e-waste. The conclusions of this study will be of great use to the effective public and private policymakers to make the provision of e-waste services more profitable and environmentally friendly.

Abstract review

The abstracts will be reviewed by members of the Scientific Committee of the CORFU 2022 Conference.

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