- Published: 27 March 2019

Efficiency and productivity change of regional tax offices in Spain: an empirical study using Malmquist–Luenberger and Luenberger indices

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Empirical Economics (2019)Cite this article

Abstract

The paper presents an innovative empirical application to assess the efficiency of regional tax offices in Spain. The existing evidence about the performance of those administrative units is still limited; thus, our aim is to contribute to extend this line of research by incorporating three relevant issues into our empirical analysis. First, we consider the number of complaints against tax authority decisions as a quality measure of tax management. Since the evaluated units should aim to minimize the number of complaints, this variable represents an undesirable output; thus, we define a model that is adaptable to the special features of this unconventional output. Second, our empirical analysis covers the period 2005–2014; thus, we can analyze the productivity change across this 10-year period including different phases of the economic cycle. Finally, seeking robustness, we use enhanced versions of the Malmquist–Luenberger productivity index and the Luenberger productivity indicator that allow us to overcome some of the drawbacks suffered by the original approach. The results

obtained with both indices are very similar and indicate that during the evaluated period tax offices suffered a slight worsening in terms of productivity, especially during the years previous to the economic crisis (2005–2008). This regression was mainly due to the technical regression experienced by the majority of units during those years.

Fig. 1

Fig. 2

Fig. 3

Fig. 4

Fig. 5

Fig. 6

Fig. 7

Notes

1. 1.

   We can also find some studies applying parametric methods (Jha and Sahni 1997; Jha et al. 1999; Barros 2005; Lewis 2006).

2. 2.

   Some of these works apply a resampling procedure based on bootstrapping techniques to obtain confidence intervals for the estimated measures of performance (Førsund et al. 2006, 2015; Fuentes and Lillo-Bañuls 2015).

3. 3.

   Førsund et al.'s (2006, 2015) are the only papers to consider this information as an output in their assessment of Norwegian tax offices, albeit this variable is interpreted as an output to be maximized, since in Norway tax authorities prepared many of the complaints in order to make clear how the tax laws should be applied.

4. 4.

   Ideally, complaints should be zero, however regulations applicable to taxes are subject to interpretation, thus taxpayers have incentives to lodge a complaint when they feel they have to pay more than expected. For that reason, we only include data about complaints against tax authority decisions handled (wholly or partially) by tax offices.

5. 5.

   In the case of service production, it is not clear which are the material inputs that we have to be concerned with. Therefore, in some sense, the materials balance condition is not always applicable in this type of context. Nevertheless, even in that case, we believe that standard models for dealing with undesirable outputs in the literature may work in a suitable way.

6. 6.

   h and s can take two values, t and $t + 1$. In this way, using h and s, we are able to write four models in one through expression (2): $(h, s) = (t, t)$, $(h, s) = (t, t + 1)$, $(h, s) = (t + 1, t)$ *and* $(h, s) = (t + 1, t + 1)$. For example, $(h, s) = (t + 1, t)$ means that model (2) uses the technology estimated in period $t + 1$ for evaluating a unit observed in period t.

7. 7.

   The interpretation of the index and its components is in the line of other papers on evaluating efficiency and productivity change over time for tax offices (see, for example, Førsund et al. 2015).

8. 8.

   The layout of Spain's provinces closely follows the pattern of the territorial division of the country carried out in 1833.

9. 9.

   These regions can levy, manage, settle and collect their own taxes and they transfer a fixed quota to the central government. See Zabalza and López-Laborda (2017) for details.

10. 10.

    See Colino (2008) for details.

11. 11.

    In order to reflect appropriately the quality of tax offices services, we only consider the number of complaints (from the real estate transfer tax settlements and the inheritance and gift tax files) that have been positively resolved. This implies that taxpayers were right in their interpretation of the applicable regulation, i.e. the procedure carried out by the personnel of the tax office had some mistakes. In contrast, the negatively resolved can be interpreted as an appropriate interpretation of the regulation by workers (no mistakes), thus if taxpayer do not agree, they can go to court.

12. 12.

    For instance, in Portugal those measures were mainly focused on local governments. Specifically, there was a reduction of municipality staff by 2% in 2012 and 2013, a reduction of reduction of the state grants

to municipalities and a reshaping of the administrative map by reducing the number of local government units (Teles 2016).

13. 13.

    The procedure was first introduced as a method for ranking efficient units, but it can also been used for outlier-detection (Banker and Chang 2006).

14. 14.

    We have used a "Gaussian" smoothing kernel. The algorithm implements a rule-of-thumb for choosing the smoothing bandwidth of that "Gaussian" kernel density estimator. The kernels are scaled such that this bandwidth is the standard deviation of the smoothing kernel.

15. 15.

    The values of GL and its components GLEFFCH and GLTECH calculated for each two-year period are reported in Tables 7, 8, 9 in the “Appendix”.

16. 16.

    The Moran’s indices for GL, GLEFFCH and GLTECH are 0.272, − 0.152 and 0.046, respectively, and the corresponding *p* values are not statistically significant. See Griffith (2011) for details.

17. 17.

    The calculated values for each office are reported in Table 10 included in the “Appendix”.

18. 18.

    In both cases we rely on data of year 2014 to divide the sample. Data about population and incomes were gathered from the National Statistical Institute (INE).

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Funding

J.M. Cordero and C. Díaz-Caro thank the financial support from the Junta de Extremadura through Grant IB16171. J. Aparicio thanks the financial support from the Spanish Ministry for Economy and Competitiveness (*Ministerio de Economía, Industria y Competitividad*), the State Research Agency (*Agencia Estatal de Investigación*) and the European Regional Development Fund (*Fondo Europeo de Desarrollo Regional*) under Grant MTM2016-79765-P (AEI/FEDER, UE).

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Ethics declarations

Conflict of interest

The authors declare that they have no conflict of interest.

Ethical approval

This article does not contain any studies with human participants or animals performed by any of the authors.

Additional information

Publisher's Note

Springer Nature remains neutral with regard to jurisdictional claims in published maps and institutional affiliations.

Appendix

Appendix

See Tables 7, 8, 9 and 10.

Table 7 Average values of the GL (2005–2014)
Full size table ›

Table 8 Average values of the GLEFFCH (2005–2014)
Full size table ›

Table 9 Average values of the GLTECH (2005–2014)
Full size table ›

Table 10 Average values of GL, GMLEFFCH and GLTECH before (2005–2008) and after the economic crisis (2009–2014)
Full size table ›

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Cite this article

Aparicio, J., Cordero, J.M. & Díaz-Caro, C. Efficiency and productivity change of regional tax offices in Spain: an empirical study using Malmquist–Luenberger and Luenberger indices. *Empir Econ* (2019). https://doi.org/10.1007/s00181-019-01667-8

- Received: 10 April 2018
- Accepted: 13 March 2019
- Published: 27 March 2019
- DOI: https://doi.org/10.1007/s00181-019-01667-8

Keywords

- Efficiency
- Tax offices
- Public management
- Productivity change
- Administrative services
- Operations research

JEL Classification

- H21
- H71
- C61

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