Drivers of Productivity in the Portuguese Nature Tourism Industry

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Abstract. Considering the importance of tourism to the world economy, productivity measurement has been raising increasing interest in academia and recognized as critically important for the understanding of the strengths and weaknesses of the tourism sector. Thus, this paper analyses the determinants of firm-level labor productivity of Portuguese nature tourism firms. A fixed effects model was used to analyze the impact of physical capital, human capital, firm size, innovation, competition and agglomeration economies on labor productivity of Portuguese nature tourism firms, for 2014–2017. The sample comprises 369 firms, representing 55% of firms operating in nature tourism in the mainland. Results show that labor productivity is driven by physical capital, suggesting that human resources in nature tourism are more productive when helped by machinery and equipment, for example information technology. By contrast, the negative impact of the number of employees on labor productivity may be triggered by inefficiencies, due to dysfunctions in tourism services with excess of personnel. Also, and in the case of Algarve, the presence of agglomeration economies may hinder labor productivity. Indeed, the existence of many tourism firms in the region and, therefore, several employment opportunities, might dampen the incentive to increase productivity on the part of employees in nature tourism firms. These results can be of significant use to further understand the various dimensions of tourism management.

Keywords: Productivity · Regional analysis · Tourism

1 Introduction

Tourism involves a growingly wide range of stakeholders, activities, and types of firms [1, 2]. The spatial agglomeration of tourism activities has an impact on regional growth [3]. However, even when conducted at a regional level, the spatial issues are very often ignored in tourism studies. The tourism sector is of critical importance in the national and regional economy of Portugal. According to Travel BI, the number of guests in tourist accommodation in 2019 reached 27 million and, according to Pordata, in 2018,

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the number of guests was nearly 25.3 million, of which 22.9 million in the mainland. Yet, the distribution of guests is uneven: Lisbon and North capture a share of 51% in 2018, followed by Algarve (19%) and the Centre (15%). Madeira and Alentejo attracted 6% of guests each, and Azores captured 3% of guests. Considering the importance of tourism to the world economy, productivity measurement has been raising increasing interest in academia and recognized as critically important, since it is an important indicator for understanding the strengths and weaknesses of the tourism sector [4]. Still, to make comparisons across industries, productivity has been measured by a raw tool of 'inputs and outputs' (e.g., hours worked and turnover). The tourism industry has different challenges regarding productivity, and it is often reported as having low productivity when compared to other industries [5]. Significant productivity differences between firms have been reported at regional level in Portugal [6]. On the other hand, empirical evidence on the regional performance of the Portuguese firms are scarce. The analysis of determinants of labor productivity at regional level is key to understand the relationship between tourism and economic development. This paper attempts to fill the existing gap by testing the impact of several determinants on the labor productivity of nature tourism firms across regions. The remainder of the paper is organized as follows. Section 2 presents the empirical literature on the drivers of productivity. Section 3 describes the data and methodology. Results are reported in Sect. 4; and Sect. 5 concludes.

2 Literature Review

Firm-specific characteristics (e.g. physical capital, human capital and size), industrial structure (e.g., innovation) and regional characteristics (e.g., competition and agglomeration economies) can explain, at least in part, firms' performance [7, 8].

Physical Capital - A study for Greece [9], in 1995–1999, found that that investments in physical capital are related with productivity growth. Moreover, another study [10] for 45 countries, in 1980–2005, found a positive and significant role of Information and Communications Technology (ICT) investment on labor productivity growth. A third study [11] for 74 countries, in 1950–2010, found that labor productivity is stagnant with physical capital stagnation. Other study [12] for South-Eastern European countries, in 2000–2017, confirmed that changes in productivity are explained by changes in gross fixed capital formation.

Human capital - Several studies, using firm-level data, found that training have a positive and significant impact on firms' productivity [13, 14]. On study [15] examining the Asia-Pacific region, in 1980–2014, found that human capital has a significant impact on labor productivity. Another study [16], using an autoregressive-distributed lag technique, found that education has a significant positive impact on labor productivity in Iranian firms, in 1974–2014.

Firm size - Efficiency advantages may arise in larger firms [17]. A study for 8 African countries [18] concluded that productivity is positively correlated with firm size. Another study [19], using data from Tunisian manufacturing firms, for the 1998–2004, found that small firms fail to achieve economies of scale. However, another study [20] found a U-shape relationship between firm size and efficiency.

Innovation – A study [21] suggests that regional innovation may prompt externalities that lead to agglomeration economies. A second study [20] for the hotel sector in Spain, in 1999–2007, showed that innovation impacts on the productivity, but the magnitude depends on the geographic location. Moreover, a third study [22] on Pakistani Small and Medium Enterprises (SMEs), in 1980–2013, found a causal relationship among innovation and firm growth.

Competition - The competitive environment plays a key role on productivity growth [23, 24], by boosting innovation rates, reducing costs and improving efficiency. Cross section regression analysis for the 35 NUTS-3 regions of Austria performed by a study [24] showed that regions with high-competitive pressure display above-average productivity levels. Another study [25] for the hospitality industry in Spain, in 1996–2004, suggested that increases in competition (measured by the touristic intensity) have a positive impact on labor productivity growth. However, using regional data for the period 1996–2004, another study [26] for Spanish hotels found that increases in the number of hotels affected negatively productivity growth.

Agglomeration Economies – A study [27] for Egypt, using 342 firms in 27 regions, showed that SMEs are more likely to benefit from agglomeration than large firms.

3 Methodology

3.1 Data

The initial research of nature tourism firms in National Tourism Registry delivered 1023 touristic agents. There was a need to collect financial data from the SABI database financial reports. However, since SABI does not provide financial reports of entrepreneurs, 343 tourism agents were withdrawn. As a result, 428 firm reports were obtained. Because Quadros do Pessoal do not provide information regarding the qualification level of employees for the Islands, 14 firms located in Madeira and Azores were withdrawn. After the data cleaning procedure, the sample comprises 369 nature-based firms. Thus, the sample represents 55% of total firms operating in nature tourism in the mainland, in 2014–2017. The sample size grants the reliability of conclusions at 95% level of confidence. All nominal variables are deflated by the respective price index, obtained in the PORDATA database. The sectors with no specific deflator (e.g., some services) are deflated by the consumer price index (CPI). Missing values in the sample were filled by multiple imputation on Stata 13.0. Table 1 resumes the proxies and the expected sign as well as data sources.

3.2 Model Specification

The labor productivity is directly derived from an aggregate Cobb-Douglas type production function, where both sides are divided by labor (L). Taking logarithms and adding the control variables, the model is

Table 1. Proxies and expected sign

Independent variable	Proxy	Expected sign	Data source
Physical capital (K)	Tangible assets - depreciation	+	SABI
Human capital (H)	Number of employees with at least a degree at sectoral level	+	Quadros do Pessoal
Firm size	Number of employees (B) and turnover (Y)	+	SABI
Innovation (INOV)	Share of firms with innovation activities at sectoral level	+	Community Innovation Survey (2014–2016)
Competition [touristic intensity (TI)]	overnight stays per 100 inhabitants at regional level	+	PORDATA
Agglomeration Economies	firm density (FD) for each region	+	PORDATA

Source: Authors' elaboration

$$ln(PROD_{ijrt}) = \beta_0 + \beta_1\, ln(K_{ijrt}) + \beta_2\, ln(H_{jrt}) + (_3 ln(B_{ijrt}) + (_4 ln(Y_{ijrt}) + \beta_5\, ln(INOV_{jrt}) + \beta_6 ln(TI_{rt}) + \beta_7 ln(FD_{rt}) + \varepsilon_{ijrt} \quad (1)$$

Where, i, j, r and t denote firm, sector, region and time. The independent variables are described in Table 1. The balanced panel data set includes 369 firms for the 4 years in a total of 1476 observations (see Table 5 in the appendix for basic statistics). The Hausman test was the criterion for choosing between fixed and random effects. Thus, the labor productivity was regressed on its drivers using the a fixed-effects model in Stata 13.0. The three-sigma rule of thumb method is applied to define outliers. Table 5 (in the appendix) shows that none of the variables log-transformed falls outside of 3 standard deviations. As the study employs panel data it is expected that the result will not be affected by multicollinearity, which was confirmed by the application of the Variance Inflation Factor.

4 Results and Discussion

Table 2 shows the regression results for models 1, 2, 3 and 4. For the full model, and as expected, the contribution of physical capital is statistically and positively related to firm productivity ($\approx$0.01, $p < 0.001$). Also, the sign of the impact of firm size on labor productivity is confirmed when measured by turnover ($\approx$1.00, $p < 0.001$). However, when firms size is measured by the number of employees, results report a negative impact (≈ -1.00, $p < 0.001$) on labor productivity, suggesting service inefficiencies when the number of employees increase in the nature tourism firms. Contrary to what was expected, models 2 and 4 suggest that agglomeration economies exert a negative (≈ -0.09, $p < 0.05$) and significant impact on labor productivity. The determinants

human capital, innovation and *competition* do not appear to exert a significant impact on labor productivity for 2014–2017.

Table 2. Regression results for the whole sample

	(1)	(2)	(3)	(4)
Ln(K)	0.0125***	0.0125***	0.0123***	0.0123***
	(4.24)	(4.26)	(4.20)	(4.22)
Ln(H)	0.00440	0.00428		
	(0.78)	(0.76)		
Ln(B)	−1.000***	−1.000***	−1.000***	−1.000***
	(−172.60)	(−172.71)	(−172.71)	(−172.82)
Ln(Y)	1.009***	1.009***	1.009***	1.009***
	(241.24)	(244.68)	(241.50)	(244.80)
Ln(INOV)	−0.0236	−0.0246	−0.0141	−0.0147
	(−0.33)	(−0.35)	(−0.20)	(−0.21)
Ln(TI)	−0.00371		−0.00164	
	(−0.17)		(−0.08)	
Ln(FD)	−0.0934	−0.101*	−0.0880	−0.0913*
	(−1.51)	(−2.29)	(−1.43)	(−2.17)
_cons	0.270	0.274	0.241	0.243
	(0.83)	(0.84)	(0.75)	(0.76)
N	1082	1082	1082	1082
adj.	0.986	0.986	0.986	0.986

Notes: Statistics in parentheses * $p < 0.05$, ** $p < 0.01$, *** $p < 0.001$. k - physical capital, h - human capital, b and y - labor and turnover (proxies of firm size), INOV - innovation, ti - touristic intensity (as a proxy for competition), and fd - firm density (proxy for agglomeration economies. Source: Authors' calculations in Stata 13.0.

Table 3 show the regression results by region, for model 1. In model 1, the physical capital only affects significantly the productivity of nature tourism firms located in the North and Alentejo (respectively ≈0.009 and 0.076, $p < 0.01$). The sign and magnitudes of the impact of firm size on productivity follow the same pattern of the sample for the entire territory, both measured by turnover and number of employees. However, disaggregating by regions, results uncover a significant impact of regional competition (0.125, $p < 0.05$) and a negative and significant impact of agglomeration economies (−0.137, $p < 0.05$) in Algarve.

The results of model 2, by regions (Table 6 in the Appendix) show the same pattern of model 1, except for a non-significant impact of regional competition and agglomeration economies in all regions. Results of model 3, by regions (Table 7 in the Appendix) follow the same pattern of model 1, with a significant impact of regional competition (0.126, $p < 0.05$) and a negative and significant impact of agglomeration economies (−0.143, $p < 0.05$) in Algarve. Finally, the results of model 4 by regions

Table 3. Regression results of model 1 by NUTS II regions

	North	Centre	Lisbon	Alentejo	Algarve
Ln(K)	0.00933**	0.0139	0.00347	0.0763**	−0.00180
	(3.05)	(1.86)	(1.51)	(3.36)	(−0.95)
Ln(H)	−0.00240	0.0113	0.00651	0.0164	−0.00266
	(−0.39)	(0.57)	(1.60)	(0.41)	(−0.72)
Ln(B)	−0.986***	−0.993***	−1.000***	−1.044***	−0.988***
	(−189.05)	(−69.01)	(−198.71)	(−21.77)	(−260.00)
Ln(Y)	0.996***	1.001***	1.000***	1.037***	0.996***
	(226.10)	(104.57)	(278.50)	(42.76)	(312.86)
Ln(INOV)	−0.0133	0.0443	−0.0697	−0.0921	−0.0131
	(−0.21)	(0.29)	(−1.03)	(−0.20)	(−0.23)
Ln(TI)	−0.112	−0.101	−0.144	0.0450	0.125*
	(−0.95)	(−0.36)	(−0.47)	(0.20)	(2.21)
Ln(FD)	0.585	0.377	0.323	−0.329	−0.137*
Ln(K)	(0.91)	(0.21)	(0.45)	(−0.31)	(−2.11)
_cons	−1.063	−0.616	−0.433	−0.149	−0.600
	(−0.82)	(−0.23)	(−0.29)	(−0.08)	(−1.42)
N	230	191	271	125	265
adj. R-sq	0.997	0.986	0.997	0.953	0.998

Notes: Statistics in parentheses * $p < 0.05$, ** $p < 0.01$, *** $p < 0.001$. k - physical capital, h - human capital, b and y - labor and turnover (proxies of firm size), INOV - innovation, ti - touristic intensity (as a proxy for competition), and fd - firm density (proxy for agglomeration economies. Source: Authors' calculations in Stata 13.0.

(Table 8 in the Appendix) are like those of model 2, with no influence of competition and agglomeration economies on the labor productivity of nature tourism firms in Algarve. According to a study [10], the divergence in regional productivity can be explained by resource endowment. Results show that labor productivity is driven by physical capital, suggesting that human resources in nature tourism are more productive when helped by machinery and equipment, for example information technology. By contrast the negative impact of the number of employees on labor productivity may be triggered by inefficiencies, due to dysfunctions in tourism services with excess of personnel. In Algarve, the agglomeration economies may hinder labor productivity. The existence of many tourism firms with many employment opportunities, might dampen the incentive to increase labor productivity, with implications for tourism management.

5 Conclusions and Policy Implications

Considering the importance of tourism to the world economy, productivity measurement has been raising increasing interest in academia and recognized as critically important, since it is an important indicator for understanding the strengths and weaknesses of the tourism sector. However, tourism industry has different challenges regarding productivity, and it is often reported as having low productivity when compared to other industries. The management and monitoring of productivity in the tourism sector is much more difficult than in other economic activities due to a lack of accuracy of the measurement of productivity, especially in the service sector. Indeed, substandard service productivity definition and errors in costs and price of the factors have been reported in the sector [28]. Consequently, measurement improvements can be helpful in this regard. This paper is an attempt to fill this gap, by testing the impact of physical capital, human capital, firm size, innovation, competition and agglomeration economies on labor productivity of nature tourism firms located in the mainland, for 2014–2017.

Results suggest that human resources in nature tourism are more productive when assisted, for example, by information technology. Thus, capital expansion is predominantly an extensive form of raising firms' productivity. On the other hand, labor productivity appears to be hindered in firms with excess of personnel. This result seems to corroborate the U-shaped relationship between firm size and efficiency suggested by [20]. In Algarve region, it appears that several employment opportunities, triggered by the presence of high firm density, may be dampening the incentive to increase labor productivity. Practical implications of these results, regarding tourism management, include the choice of firm location in areas under a certain level of firm density and human resources management in nature tourism firms. Indeed, in tourism, more than in other sectors, the location of the activities is crucial for firm performance and for firm internal resources and characteristics [29]. Yet, considerations on human resources management in tourism are of complex nature due to the nature of the rapidly changing business structures, evidenced in the form of partnerships, alliances and franchises, along with multi-employer sites [30]. Indeed, employment in tourism is regarded as being "low-skilled" and is often perceived as low status and limited career [30–32]. In this context, the coordination between the private and government is of key relevance for productivity growth. Government officials can co-operate to assist productivity increases, with specifically tailored measures for small firms. Hence, government officials should focus on promoting especially the acquisition of IT equipment and training for managers on organizational skills in order to avoid the inefficiencies, due to dysfunctions in tourism services with excess of personnel. This could be achieved by providing incentives for training and education, especially in hospitality industry where the lack of skilled personnel is especially notorious in Portugal. Considering the data limitations, we were only able to study the drivers of productivity in nature tourism in relation to mainland Portugal for the period 2014–2017, so it is suggested that in future investigations include the islands of Madeira and Azores in order to obtain a more complete study in the area under analysis. In turn, the fact that only a limited period of time for analysis (2014–2017) was considered does not allow us to draw conclusions in

terms of the evolution of productivity in nature tourism, suggesting, therefore, a longitudinal study. With analysis of different periods a historical perspective of the phenomenon is also possible. An additional limitation is underlying the non-inclusion of some factors in the study, such as, for example, data on the characteristics of the regions, local government support or heterogeneous tourist resources, which should also be incorporated in future research. An interesting issue to be studied in the future is related to the negative relationship verified between labor productivity and excess staff, which contradicts some of the published works that claim, including that productivity is an effect of the agglomeration of personnel. As such, this seems to be an interesting point that must be studied.

Appendix

Table 4. Firms by NUTS II region

Region	# firms	% Total
North	79	21
Centre	64	17
Lisbon	101	27
Alentejo	45	12
Algarve	80	22
Total	**369**	**100**

Source: Authors' elaboration

Table 5. Basic statistics (n = 1476)

Variable	Mean	St. Dev.	Min.	Max
Ln(PROD)	3.27	1.18	0	7.49
Ln(K)	2.83	2.06	0	9.64
Ln(H)	9.10	0.76	4.98	10.96
Ln(B)	0.78	0.90	0	4.66
Ln(Y)	3.89	1.84	0	10.61
Ln(INOV)	4.29	0.06	4.08	4.41
Ln(TI)	6.29	1.13	5.12	8.43
Ln(FD)	2.96	1.21	0.92	4.77

Prod – productivity, k - physical capital, h - human capital, b and y - labor and turnover (proxies of firm size), INOV - innovation, ti - touristic intensity (as a proxy for competition), and fd - firm density (proxy for agglomeration economies. Source: Authors' elaboration

Table 6. Regression results of model 2 by NUTS II regions

	North	Centre	Lisbon	Alentejo	Algarve
Ln(K)	0.00947**	0.0140	0.00366	0.0764**	−0.00186
	(3.10)	(1.88)	(1.61)	(3.39)	(−0.97)
Ln(H)	−0.00282	0.0108	0.00649	0.0178	−0.00272
	(−0.46)	(0.55)	(1.60)	(0.45)	(−0.73)
Ln(B)	−0.986***	−0.993***	−1.000***	−1.042***	−0.988***
	(−189.15)	(−69.37)	(−199.37)	(−22.15)	(−257.62)
Ln(Y)	0.996***	1.001***	1.000***	1.037***	0.996***
	(226.67)	(104.93)	(281.36)	(43.13)	(309.92)
Ln(INOV)	−0.0138	0.0342	−0.0697	−0.0942	−0.0235
	(−0.22)	(0.23)	(−1.03)	(−0.21)	(−0.40)
Ln(FD)	−0.0238	−0.274	−0.0136	−0.134	−0.00335
	(−0.35)	(−1.28)	(−0.38)	(−0.31)	(−0.14)
_cons	0.134	0.305	0.253	−0.0871	0.146
	(0.41)	(0.44)	(0.74)	(−0.05)	(0.57)
N	230	191	271	125	265
adj. R-sq	0.997	0.987	0.997	0.954	0.998

Notes: Statistics in parentheses * $p < 0.05$, ** $p < 0.01$, *** $p < 0.001$. k - physical capital, h - human capital, b and y - labor and turnover (proxies of firm size), INOV - innovation, ti - touristic intensity (as a proxy for competition), and fd - firm density (proxy for agglomeration economies. Source: Authors' calculations in Stata 13.0.

Table 7. Regression results of model 3 by NUTS II regions

	North	Centre	Lisbon	Alentejo	Algarve
Ln(K)	0.00934**	0.0133	0.00326	0.0753**	−0.00170
	(3.06)	(1.80)	(1.41)	(3.35)	(−0.90)
Ln(B)	−0.986***	−0.991***	−0.999***	−1.046***	−0.988***
	(−189.59)	(−70.65)	(−198.68)	(−22.16)	(−260.41)
Ln(Y)	0.997***	1.001***	1.001***	1.037***	0.996***
	(230.68)	(104.85)	(278.19)	(43.02)	(315.94)
Ln(INOV)	−0.0138	0.0396	−0.0335	−0.0192	−0.0188
	(−0.22)	(0.26)	(−0.52)	(−0.05)	(−0.33)
Ln(TI)	−0.115	−0.0895	−0.138	0.0614	0.126*
	(−0.98)	(−0.32)	(−0.45)	(0.27)	(2.21)
Ln(FD)	0.591	0.352	0.326	−0.389	−0.143*
	(0.92)	(0.19)	(0.45)	(−0.37)	(−2.23)
_cons	−1.086	−0.501	−0.585	−0.341	−0.589
	(−0.84)	(−0.19)	(−0.39)	(−0.19)	(−1.39)
N	230	191	271	125	265
adj. R-sq	0.997	0.987	0.997	0.954	0.998

Notes: Statistics in parentheses * $p < 0.05$, ** $p < 0.01$, *** $p < 0.001$. k - physical capital, h - human capital, b and y - labor and turnover (proxies of firm size), INOV - innovation, ti - touristic intensity (as a proxy for competition), and fd - firm density (proxy for agglomeration economies. Source: Authors' calculations in Stata 13.0.

Table 8. Regression results of model 4 by NUTS II regions

	North	Centre	Lisbon	Alentejo	Algarve
Ln(K)	0.00949**	0.0134	0.00343	0.0753**	−0.00176
	(3.11)	(1.82)	(1.51)	(3.37)	(−0.93)
Ln(B)	−0.986***	−0.991***	−0.999***	−1.045***	−0.988***
	(−189.66)	(−70.98)	(−199.35)	(−22.46)	(−258.03)
Ln(Y)	0.997***	1.001***	1.000***	1.038***	0.997***
	(231.05)	(105.22)	(281.11)	(43.41)	(312.98)
Ln(INOV)	−0.0144	0.0308	−0.0336	−0.0133	−0.0294
	(−0.23)	(0.21)	(−0.53)	(−0.03)	(−0.51)
Ln(FD)	−0.0372	−0.226	0.00359	−0.122	−0.00899
	(−0.60)	(−1.16)	(0.10)	(−0.29)	(−0.41)
_cons	0.149	0.315	0.0740	−0.278	0.160
	(0.46)	(0.46)	(0.23)	(−0.16)	(0.62)
N	230	191	271	125	265
adj. R-sq	0.997	0.987	0.997	0.954	0.998

Notes: Statistics in parentheses * $p < 0.05$, ** $p < 0.01$, *** $p < 0.001$. k - physical capital, h - human capital, b and y - labor and turnover (proxies of firm size), INOV - innovation, ti - touristic intensity (as a proxy for competition), and fd - firm density (proxy for agglomeration economies. Source: Authors' calculations in Stata 13.0.

References

1. WTO - World Tourism Organization and International Labour Organization: Measuring Employment in the Tourism Industries – Guide with Best Practices, UNWTO, Madrid (2014)
2. Turismo de Portugal: Turismo em Portugal 2018 (2018). https://travelbi.turismodeportugal.pt/pt-pt/Paginas/turismo-em-portugal-2018.aspx. Accessed 28 May 2020
3. Lazzeretti, L., Capone, F.: Spatial spillovers and employment dynamics in local tourist systems in Italy (1991–2001). Eur. Plan. Stud. **17**, 1665–1683 (2009)
4. Santos, E., Correia, A., Ferreira, F.A., Nunes, A., Veloso, C.M. Fernandes, P.O.: Measuring nature tourism firms' productivity. In: XXX Jornadas Luso-Espanholas de Gestão Científica: cooperação transfronteiriça: desenvolvimento e coesão territorial: livro de resumos, p. 166. Instituto Politécnico de Bragança (2020)
5. Lau, E., Lonti, Z., Schultz, R.: Challenges in the measurement of public sector productivity in OECD countries. Int. Prod. Monit. **32**, 180–195 (2017)
6. Crespo, N., Proença, I., Fontoura, M.P.: The spatial dimension in FDI spillovers: evidence at the regional level from Portugal. Reg. Sect. Econ. Stud. **121**, 95–110 (2012)
7. Audretsch, D., Feldman, M.: Knowledge spillovers and the geography of innovation. In: Henderson, J.V., Thisse, J-F. (eds.) Handbook of Regional and Urban Economics, Chapter 61, vol. 4, pp. 2713–2739 (2004)
8. Henderson, J.V.: Understanding knowledge spillovers. Reg. Sci. Urban Econ. **37**(4), 497–508 (2007)
9. Papadogonas, T., Voulgaris, F.: Labor productivity growth in Greek manufacturing firms. Oper. Res. **5**(3), 459–472 (2005)

10. Choudhry, M.T.: Determinants of Labor Productivity: An Empirical Investigation of Productivity Divergence, Working paper, University of Groningen (2009)
11. Mendez-Guerra, C.: Labor productivity, capital accumulation, and aggregate efficiency across countries: Some stylized facts (2017)
12. Trpeski, P., Cvetanoska, M.: Gross fixed capital formation and productivity in South-eastern Europe. In: Proceedings of FEB Zagreb 10th International Odyssey Conference on Economics and Business, vol. 1, no. 1, pp. 1–876, Zagreb, 277 (2019)
13. Almeida, R., Carneiro, P.: The return to firm investments in human capital. Lab. Econ. **16**(1), 97–106 (2009)
14. Aggrey, N., Eliab, L., Joseph, S.: Human capital and labour productivity in East African manufacturing firms. Curr. Res. J. Econ. Theory **2**(2), 48–54 (2010)
15. Dua, P., Garg, N.K.: Determinants of labour productivity: comparison between developing and developed countries of Asia-Pacific. Pac. Econ. Rev. **24**(5), 686–704 (2019)
16. Ezoji, A., Arani, A.A., Vaez Mahdavi, M.R., Jahangard, E.: The impact of human capital health and education) on labour productivity: a composite model approach-a case study of Iran. Iran. Econ. Rev. **23**(2), 373–397 (2019)
17. Raspe, O., van Oort, F.: Growth of new firms and spatially bounded knowledge externalities. Ann. Reg. Sci. **46**(3), 495–518 (2011)
18. Van Biesebroeck, J.: Firm size matters: growth and productivity growth in African manufacturing. Econ. Dev. Cult. Change **53**(3), 545–583 (2005)
19. Thabet, Khaled: Industrial structure and total factor productivity: the Tunisian manufacturing sector between 1998 and 2004. Ann. Reg. Sci. **54**(2), 639–662 (2015)
20. De Jorge, J., Suárez, C.: Productivity, efficiency and its determinant factors in hotels. Serv. Ind. J. **34**(4), 354–372 (2014)
21. Marrocu, E., Paci, R., Pontis, M.: Intangible capital and firms' productivity. Ind. Corp. Change **21**(2), 377–402 (2012)
22. Subhan, Q.A., Mahmood, T., Sattar, A.: Innovation and economic development: a case of small and medium enterprises in Pakistan. Pak. Econ. Soc. Rev. **52**, 159–174 (2014)
23. Tödtling, F., Kaufmann, A.: Innovation systems in regions of Europe—a comparative perspective. Eur. Plan. Stud. **7**(6), 699–717 (1999)
24. Smeral, E.: The productivity puzzle in tourism. In: Keller, P., Bieger, T. (eds.) Productivity in Tourism, pp. 27–39 (2007)
25. Ortega, B., Chicón, C.G.B.: Determinants of regional labour productivity in the hospitality industry in Spain, 1996–2004. Tourism Econ. **19**(2), 393–414 (2013)
26. Aguaza, B.O.: Determinantes del crecimiento de la productividad regional del trabajo: un estudio para la hostelería en España. Investigaciones regionales J. Reg. Res. **2**(5), 89–110 (2013)
27. Badr, K., Rizk, R., Zaki, C.: Firm productivity and agglomeration economies: evidence from Egyptian data. Appl. Econ. **51**(51), 5528–5544 (2019)
28. Li, X., Prescott, D.: Measuring productivity in the service sector. Guelph, Ontario, Canada: Canadian Tourism Human Research Council and University of Guelph (2009)
29. Molina-Azorin, J.F., Pereira-Moliner, J., Claver-Cortés, E.: The importance of the firm and destination effects to explain firm performance. Tourism Manag. **31**(1), 22–28 (2010)
30. Santos, E.: Promoting firms' sustainability in tourism planning through employment. In: Advances in Tourism, Technology and Smart Systems, pp. 345–355. Springer, Singapore (2020)
31. Ladkin, A.: Exploring tourism labor. Ann. Tourism Res. **38**(3), 1135–1155 (2011)
32. Mooney, S.: Jobs for the girls? women's employment and career progression in the hospitality industry. In: Burke, R.J., Hughes, J.C. (eds.) Handbook of Human Resource Management in the Tourism and Hospitality Industries. Edward Elgar Publishing (2018)