

THE PRIVATE RETURNS TO TOURIST HUMAN CAPITAL: ENDOGENEITY OF SCHOOLING AND RETURNS HETEROGENEITY

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INTRODUCTION

Human capital has become one of the main sources of competitiveness in the tourism sector. The aim of this paper is to study human capital in depth, trying to answer questions related to the extent to which this sector values the educational level of its workers.

This paper offers an empirical analysis of the private returns to education with OLS (ordinary least square) estimates of the traditional Mincerian equation with the aim of identifying the effect of schooling and experience on the earnings of wage and salary earners in the tourism Spanish sector.

The existence of a possible endogeneity in the schooling variable due to the ability bias (Heckman and Vytlacil, 2001) suggests the need to solve this problem through the inclusion of instrumental variables, IV from now on, a method in which precautions must be taken when selecting the instruments (Bound *et al.*, 1995).

We will thus have OLS and IV estimates and check that the returns obtained increase when the inclusion of instrumental variables is considered (Card, 1999). We will analyse the returns to schooling for different groups of individuals using both methods, starting from the assumption that these returns can be heterogeneous. We compared the results obtained for workers in the tourism sector, the service sector and the total of

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sectors. The wage and salary earners in the tourism sector, and more precisely those who work in the hotel and catering industry, have a lower schooling returns rate than those in the service sector as a whole and the total sample of wage and salary earners in all cases.

On the other, we carried out a study of the educational returns of wage and salary earners in the tourism sector according to their work experience, birth cohort and sex, in which outstanding differences came to light. We will also study the possible differences existing in the educational performance of wage and salary earners in the tourism sector who develop their professional activity in different Autonomous Communities (ACs). We have considered those communities which had the highest number of tourism employees: Andalusia, Balearic Islands, Canary Islands, Catalonia, Valencian Autonomous Community, and Community of Madrid.

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The data

In order to perform the present analysis, we used data corresponding to spanish salary earners of ages comprised between 16 and 64 years drawn from the *Encuesta de Calidad de Vida en el Trabajo* -Quality of Life at the Workplace Survey-, ECVT from now on, with the data pool of 1999, 2000, 2001, 2002 and 2003. This survey, carried out by the *Ministerio de Trabajo y Asuntos Sociales (MTASS)* -Ministry of Labour and Social Affairs- will allow us to obtain information about workers who develop their professional activity in firms with a reduced number of employees, or even with only one employee. This is important when it comes to analysing a sector like tourism, which can be characteristically described as an atomised sector with a considerable number of small enterprises that have a reduced number of employees.

Likewise, the fact that we were using transversal cut data led us to assess the potential presence of heteroskedasticity, which was confirmed in the contrasts carried out to that end. Thus, the White's contrast carried out for the sample of wage and salary earners in the tourism sector has a *pvalue* of 0.023, while the Breusch-Pagan and Cook-Weisberg contrasts have *pvalues* that equal zero, which confirms the existence of heteroskedasticity. This is why all our estimates will provide standard heteroskedasticity-robust errors obtained from White's variance-covariance matrix.

Educational returns and instrumental variables

The calculation the returns to education has as its aim to quantify the ratio existing between the earnings of individuals and the educational level reached during their formal schooling period. Therefore, the functional form of the income equation provided by Mincer (1974) is:

$$\ln w = b_0 + b_1 EDUC + b_2 EXP + b_3 EXP^2 + u \quad \text{where,}$$

$\ln w$ = logarithm of wages; $EDUC$ = No. of years of formal schooling, and EXP = No. of years of experience. It has been concluded in most of the studies focused on measuring the returns of investment in human capital from OLS estimates with Mincerian equations that the income flows received by workers adopt the graphical shape of an inverted U in relation to the individual's age or experience. For this reason, the expected sign of the b_2 coefficient is positive, whereas that of b_3 is negative.

Nevertheless, as is well-known, the ordinary least square, OLS, $y_i = x_i b + u_i$ are consistent if all x_i regressors are exogenous, i.e. if none of them is correlated with the perturbations of the u_i model. When $E(u_i / x_i) \neq 0$, $x_i = kx_i$; then the OLS estimator is not consistent.

The starting problem for estimating Mincerian income equations is the adequacy of considering the schooling variable exogenous in this model, since the error term may include the innate skill of individuals. If, in addition to this, the most skilful individuals are the ones who achieve the best marks and have the highest educational level, then the random perturbation and the schooling regressor would be correlated. The schooling variable's endogeneity problem thus arises (Griliches, 1977) when the existence of the so-called ability bias is considered.

One of the solutions to this problem is the method of instrumental variables, in which we use z_i instruments that are not correlated with the perturbations but are correlated with the x_i regressors that we consider exogenous, so that:

$$E(z_i u_i) = 0 / \mathbf{b}_{iv} = (z'x)^{-1} z'y.$$

Let us look at the following two equations:

$$\ln w_i = X_i \mathbf{a} + E_i \mathbf{b} + u_i$$

$$E_i = z_i \mathbf{g} + v_i$$

The first one is the Mincerian income equation, where $\ln w$ is the logarithm of wages, X_i is the vector of exogenous variables (experience and squared experience) and E_i would be the education that we consider endogenous.

The second is the schooling equation. It is the one we used on the first stage; we estimate education with the selected instruments and obtain the schooling prediction for education that we will use to estimate the income equation during the second stage.

We previously checked whether or not the schooling variable in our model is exogenous by means of Hausman's test (1978). This test was performed through an amplified model in which we included the residues obtained in the schooling equation as a regressor in the income equation and tested its significance. The result of Hausman's test is $F(1, 2207) = 15.66$ with a *pvalue* near zero, which confirms the schooling variable's endogeneity.

Instrument selection

Once the endogeneity of the schooling variable has been contrasted, we must be very careful in the selection of the instrument to be used in our model. As Bound (1995) pointed out, a strong correlation must exist between the instruments and the endogenous variable, otherwise the bias could be even greater with IV than with OLS.

The two types of instruments used in most studies are essentially those related to the individuals' family history and those which use what has come to be known as natural experiments. In the first group, the most common instruments are the ones which refer to the characteristics of the parents, like their schooling level or their professional category. The second group of instruments basically focuses on selecting some sort of random variable that can influence the schooling level, e.g. the proximity of the place of residence to an educational centre or the birth quarter.

These are examples of works that use different types of instruments: Angrist and Krueger (1991) introduced the birth quarter as an instrument in the schooling equation; Card (1993) included the geographical proximity of the place of residence to a university educational centre; Harmon and Walker (1995) changes in the compulsory schooling age; Uusitalo (1999) and Trostel *et al.* (2002), variables reflecting the individual's family environment, Ichino and Winter-Ebmer (2002), if the individuals were affected by World War II.

Most of these works obtained higher schooling returns when instruments were included. For a thorough review see Card (1995, 1999); de la Fuente and Ciccone (2002); Harmon, Oosterbeek and Walker (2003), and Heckman, Lochner and Todd (2003).

In the Spanish case, we can refer to the works by Barceinas et al. (2002), who used as a treatment the changes introduced in the Spanish educational legislation after the 1970 Law; Arrazola and Hevia (2001) who focused on the individuals who were affected by the Civil War; and Pons and Gonzalo (2002), who analysed the validity of the instruments used in the study of returns in Spain and concluded that family background and accessibility of educational centres are the most appropriate instruments.

The characteristics of our survey do not allow us to use variables of proximity to educational centres, but they do allow us to collect family history data. Thus, in the study by Mora (1996) an analysis of access to education in Spain was carried out, the result of which was that the access to post-compulsory education, i.e. secondary and university education is linked with economic and educational aspects specific to the family in which the individual had grown up. By means of the *EPF 90-91 (Encuesta de Presupuestos Familiares –Family Budget Survey–)*, he found out that the likelihood of accessing post-compulsory studies increased between 2.09 and 3.06 times if the parents had completed secondary or higher studies as opposed to cases of families with non-educated parents.

Therefore, we selected the head-of-family's schooling level as an instrumental variable because we thought it could be a good instrument that is correlated to the child's education but not with the random perturbation. We carried out the Bound test in order to check the quality of the instrument chosen since, as we have previously explained, a weak correlation between the instruments and the endogenous variable might result in IV estimates being more inconsistent than OLS estimates. The result of this test is $F(1, 2597) = 432.44$ with a *pvalue* = 0, which confirms that the instrument selected is valid.

Estimates and results of returns to education in tourism

The different estimates that we are going to present below seek to achieve a better understanding of the earnings-education relationships in the tourism sector. We used the traditional Mincerian income equation, which relates the earnings of wage and salary earners to their schooling level and experience. The education is measured as the years of schooling needed to obtain the corresponding educational level. The experience variable is not the potential experience, and is actually obtained as the difference between the worker's age and the age at which he started to work a minimum of three months running. The dependent variable is the income/hour neperian logarithm calculated from the number of weekly working hours declared by the individual.

The reason why no additional variables were included lies in the focus of this analysis on measuring the rates of returns attributed exclusively to education, which would be reduced if other explanatory variables were added. As was pointed out by Barceinas et al. (2002), the inclusion of additional variables in a Mincerian income equation has as its basic consequence the reduction of the returns rate. Likewise, Mincer (1974) argued that those estimates which consider other variables tend to underestimate the real schooling returns rate.

We are going to draw comparisons between the results obtained from OLS regressions and those derived from the application of methods of instrumental variables (IV) in all our estimates. It is assumed that using IV is a suitable method to estimate educational returns in a consistent way that tries to correct the bias produced by the relationship between the schooling level and the unobservable skill of individuals.

Besides, if we take into account that educational returns are not homogeneous for different groups of individuals depending on the economic activity they perform,

their degree of experience, cohort and sex, we must analyse the influence that belonging to these groups of individuals has on the study of returns to schooling among wage and salary earners in the tourism sector and draw the corresponding conclusions.

Comparison between tourism, hotel and catering industry, services and total of sectors

The results in Table 1 allow us to compare the returns to education of workers that perform activities specific to the tourism sector with those obtained in the service sector and the total of sectors.

The returns to schooling obtained from the estimated education coefficients is the increase of the worker's earnings with each additional year of schooling, the education-earnings elasticity. A 3.64% schooling returns for workers in the tourism sector is observed with OLS estimates, the figure being even lower, 2.37%, if they belong to the hotel and catering industry.

Both values are below those estimated for the total of the sample and for the whole group of wage and salary earners, who nearly double the result. This lower score of formal schooling among workers who perform their jobs in activities specific to the tourism sector confirms the conclusions reached in Lillo and Ramón (2005).

Estimates with IV show an increased schooling returns rate in all cases but to a greater extent for the wage and salary earners in the tourism sector and even more so in the hotel and catering industry. This result diminishes the significant differences obtained with OLS estimates.

Likewise, the returns of an additional year of experience in workers with jobs related to tourist activities is lower in both OLS and IV estimates.

Wage and salary earners in the tourism sector:

Comparison by levels of experience

We have defined work experience as the individual's age minus the age at which he started working. We saw that the total of wage and salary earners in the tourism sector have an average 17.44 years experience, with values comprised between 0 and 54 years.

Dougherty and Jiménez (1991) suggested that it would be advisable to analyse the existing differences when we compare workers with relatively few years of work experience with more experienced ones.

The returns to schooling of wage and salary earners in the tourism sector are estimated below from two sub-samples, namely workers with more than 18 years of work experience and those who have less than 18 years experience.

We can see that both for OLS and IV estimates, the returns to education of workers with extensive work experience is higher than that of workers with a shorter experience. This holds true even despite the fact that the schooling years average is higher in the second group.

One possible explanation for this result is that more experienced tourism sector workers hold positions better suited to their educational level and, with the passing of time, have consolidated a certain professional status thanks to which they can obtain a greater reward for their schooling years.

If we carry out the same analysis for the total of wage and salary earners in Spain with the same source and time period, the differences in returns to schooling between experienced workers and those who have less experience are not so significant as in the tourism sector. The returns obtained for the total sectors sample is 7.3 % and 6.4% for those with more than 18 years experience and those with less than 18 years experience respectively. Besides, the schooling years average is somewhat higher than

in the tourism sector, although the average years of experience is very similar. All the results obtained for the total sectors sample are available.

This leads us to the conclusion that, somehow, education in tourism is valued to a greater extent when a certain degree of professional experience has been achieved and can be verified. We observe that, even with IV estimates, the educational returns for those with more than 18 years experience are similar if compared with those obtained for the total sample.

Comparison by cohorts

Considering different cohorts of wage and salary earners in the tourism sector makes it possible to distinguish the following groups of workers. Those born before 1950, affected by the Spanish post-civil war, older and with a lower educational level, who most probably started their professional activity during the tourism boom years. Those born between 1950 and 1966, as an intermediate group with ages around 40 who also increased their schooling rates thanks to the generalisation of compulsory education (1970 Law). Finally, those who were born after 1966, the youngest cohort with wider access to higher education.

As Oliver *et al.*(1998) pointed out, while only 10% of the population had completed higher studies in 1970, the percentage had gone up to 42% in 1992.

Table 3 shows the OLS and IV estimates for the cohorts of wage and salary earners in the tourism sector considered. The schooling years average with the total sample is somewhat superior to that of tourism sector workers. More precisely, the schooling years average for those born before 1950 was 8.76, 10.45 for those born between 1950 and 1966, and 11.02 for people born after 1966.

The results highlight that schooling returns rates are different for each cohort of wage and salary earners in the tourism sector considered. However, considering the same cohorts, returns to schooling in the total sectors sample is only reduced in the youngest cohort, returns values being very similar for the other two.

Thus, returns to schooling increases in all cases with IV estimates, as could be expected. The highest returns, 8.37%, corresponds to the intermediate cohort of tourism sector workers.

This result shows us once again that education is more highly valued when the wage and salary earners in this sector have a certain degree of experience in their professional activity, to such an extent that they even obtain a better returns to schooling than workers belonging to the same cohort in the total sectors sample, 7,31%.

Besides, the fact that these returns for the 1966-1950 cohort are higher seems to be more in accordance with the evolution of the working life cycle. The results for the oldest and the youngest cohorts equal their returns around 5.36%, although the increase after considering schooling endogeneity was greater for the youngest.

Comparison between men and women

Gender differences are an important factor in the analysis of various issues related to the tourism labour market, previous studies (Sinclair, 1997; Sparrowe and Iverson, 1999, among others), have revealed the existence of differences because of sex among tourism industry workers.

The group of people professionally dedicated to tourist activities is largely formed by males, although we have witnessed a progressive incorporation of females into the sector in recent years. Thus, the study of the three cohorts described in the previous section reveals percentages of men of 73.85%, 64.12% and 54.69%

respectively. Likewise, we are going to estimate the returns to schooling differences linked with sex in this section, focusing specially on the youngest group, where the presence of females and males is more balanced.

We performed the Chow test (1960), $F(4,2288)=5,77.e^{-13}$, which indicates the existence of a structural change in model parameters when male and female subsamples are considered.

The results in Table 4 reflect the existence of significant differences in returns to schooling between males and females, both in the OLS and in the IV estimate. For the total sample of wage and salary earners in the tourism sector, we found that the reward corresponding to years of schooling is notably lower for women, and even less than half for the IV estimate, 3,1%.

If, besides, we pay attention to these sex-related differences in the youngest cohort (Table 4), results become significantly worse for women, unlike what happens to men. This result shows that the reduction of returns to education in the youngest cohort is due to the fact that women's educational level is less valued. We can also see that the schooling years average is very similar and even slightly higher for women.

The conclusion we can draw from all the above is that the educational level of women working in the tourism sector is far less appreciated than that of men employed in the same activity sector.

Furthermore, if we compare these results with those obtained for the total sectors sample, it can be checked that the returns to schooling of tourism sector female workers is well below the average of the total female wage and salary earners, and these differences are even more marked in the case of the youngest cohort. Thus, in the total sectors sample the returns to schooling for women are 6,4% and in the youngest cohort, the schooling returns in the total sample are 5.86% for women and 6,13 for men.

It becomes evident that the important sex-related educational differences in returns to schooling by sex identified among tourism workers do not represent a behaviour pattern repeated for all Spanish wage and salary earners, and therefore tourism stands out as the activity sector which values women's education the least. Besides, this lower returns to schooling for women significantly reduces the result obtained for the total of wage and salary earners in the tourism sector.

Comparison by Autonomous Communities (Regions)

We will study the possible differences existing in the educational performance of wage and salary earners in the tourism sector who develop their professional activity in different Autonomous Communities (ACs). We have considered those communities which had the highest number of tourism employees: Andalusia, Balearic Islands, Canary Islands, Catalonia, Valencian Autonomous Community, and Community of Madrid.

Table 5 shows the results obtained for the estimated educational performance in each of the ACs selected as well as in the rest of ACs.

The graph 1 based on the estimates from Table 5 show us the existence of marked heterogeneity in the educational performances of wage and salary earners in the tourism sector when the different Autonomous Communities are analysed. Figure 1 shows the discrepancies between the different Autonomous Communities and the whole of Spain (6.46%, Table 1) for wage and salary earners that develop their professional activity in the tourism sector.

As can be seen in this figure the Communities that achieve the highest educational performance are Madrid, Andalusia and the Balearics with rates located around 10.6%, 8.8% y 7.6% respectively.

The results obtained seem to prove that there are differences in the way educational performance in the tourism sector is rewarded in the different Autonomous Communities, and also that the communities with a greater presence of wage and salary earners in the sector are the ones which improve their educational performance. It is also worth mentioning that these selected communities are also the destinations preferred by foreign tourists.

It seems necessary to reflect on the behaviour of tourism in these three Autonomous Communities where workers obtain a better reward for their educational performance.

The behaviour of tourism in the Community of Madrid, the one with the best educational performance, can be easily distinguished from that of the other two. Due to the fact that Madrid is the capital city of Spain, this area offers a profile oriented toward business tourism, fairs and convention tourism, complemented with leisure and culture, for all of which a wide hotel offer is available.

This specialisation of tourism toward a mixed business-leisure model offers a high quality standard that meets the requirements of the demand and therefore, the demand of human capital selects qualified professional profiles that will probably explain why the educational performance of tourism employees in this Community is more highly valued.

As for the Andalusian Community, tourism accounts for 14% of the region's Gross Domestic Product, and its activities have become a priority in territorial and sectorial development strategies (Muñiz, 2004).

A particularly relevant aspect in this Community is the significant increase of public resources allocated to the development and promotion of this sector. Thus, the public budget in the Tourism Area grew in 2003, which made possible a number of

actions in the tourism fields the aim of which was to consolidate tourism as the key sector in the Andalusian economy.

The boost to tourism development in Andalusia, the growth of its tourist offer and diversification, and the higher demands for quality and competitiveness may be somehow related to the results obtained.

Mariscal (2005) claims that, although the job offer in Andalusia's labour market has not changed much in general terms, it is indeed going through changes as a result of the new paths followed by enterprises in this sector, which are increasingly concerned about quality.

Regarding the Balearics, traditionally considered a sun-and-beach destination, it is one of the Communities that receives more foreign tourists.

As Aguiló and Alegre (2004) pointed out, sun-and-beach tourism has not disappeared, and it seems that the reason why Europeans choose this type of destinations has not disappeared either. Their demands have increased though. Tourist satisfaction at the destination depends on various factors, but it is essential to make sure that what the tourist sees as the basic product has a suitable quality.

According to these authors, one of the most outstanding characteristics of traditional sun-and-beach destinations is the considerable proportion of repeat tourists, so much so that, for example, in the Balearic Islands, this repeat tourism has become of its main assets. However, loyalty to the destination can only be generated via adaptation to quality requirements.

Bardolet (2004) also argues that the Balearics have reached a remarkable degree of customer fidelisation (measured during the high season) that reflects a high level of satisfaction among the tourists who visit this tourist resort.

The fact that education in the tourism sector is being more highly valued may also give rise to a tendency to increase quality standards.

Thus, for example, the greater presence of large hotel chains in the case of Madrid and the fact that the main hotel multinationals tend to appear in the Balearics (Ramón, 2002) might also have some relationship with the higher educational performance achieved in these autonomous communities. Lillo and Ramón (2005) have found that larger-sized enterprises are also the ones that pay their workers more.

Furthermore, according to the neoclassical framework, the game played between supply and demand forces will most probably help to give a satisfactory explanation for the higher returns on education achieved in these communities. Let us think, for example, about the high season in the Balearics, with a considerable tourism demand that is also becoming more and more demanding. Of course, tourism entrepreneurs must find the way to offer tourism services that live up to the expectations of their customers, especially in a context of ever-increasing international competition. Therefore, more human capital will be required, and that increased demand will determine a pay rise, the salary reward being greater for those workers who have received better training.

In short, I think that one of the possible reasons for the increased returns on education is the low number of skilled workers on the supply side that are specialised in tourism, a situation that becomes even worse in the Balearics due to its insularity conditions.

Likewise, international comparisons of educational performances have revealed some factors that can help to explain the existence of discrepancies across countries: like per capita income, average educational level and the percentage of the GDP allocated to education expenses (Trostel *et al.*, 2002). This can perhaps become a new way to analyse the differences in educational performance between the different ACs,

carrying out studies that include the tourist GDP or the average expense per tourist, the level of educational expense on official and unofficial tourism training, and the percentage of the total of people employed in the tourism sector in each AC that corresponds to university graduates.

CONCLUSION

The improved knowledge of human capital in the tourism sector initially led us to ask ourselves how the tourism industry values the educational level of its workers. Different OLS and IV techniques have been used to try and answer this question.

One of the reflections derived from analysing the schooling returns for wage and salary tourism workers is that, a considerable increase of schooling coefficients is generally obtained when this model is estimated with the method of instrumental variables. In fact, the important differences in returns to education observed with the ordinary minimum quadratic estimates between this sector and the service sector as a whole, with the latter nearly doubling the former, become reduced when we include the head-of-family's educational level as an instrument. Nevertheless, the wage and salary earners in the tourism sector, and more precisely those who work in the hotel and catering industry, have a lower schooling returns rate than those in the service sector as a whole and the total sample of wage and salary earners in all cases.

We have also analysed the educational returns of tourism sector workers according to their degree of experience, cohort and sex. The result obtained from the estimates carried out is that, regardless of the method used, workers with a more extensive experience achieve a higher rates of returns despite having a lower schooling years average. This result leads to us to the idea that, in the tourism sector, the

employees' schooling years are not valued at the beginning of their professional life but when they have accumulated a certain degree of experience in the returns of their jobs.

The study by cohorts reveals that, with IV estimates, the intermediate cohort's returns is the highest, with values above the result obtained for the total of sectors too. This reinforces the conviction that schooling returns in tourism increases with the years of experience.

Likewise, the differences linked with sex highlight the fact the reward for years of schooling in the tourism sector is considerably lower for women, which reflects that women's educational level is much less valued than that of men working in the same activity sector. Besides, it can be seen that this result is far from being so clear for the total of sectors sample, which leads us to the conclusion that this discrimination regarding women's schooling level is a specific characteristic of tourism that reduces the educational returns of this sector as a whole.

Finally, because we have considered the Communities with a higher percentage of workers in the sector, we find that they achieve a better educational performance than the rest of ACs. Among the Communities selected, with the IV estimates, Madrid, Andalusia and the Balearics are the ones which obtain the highest educational performances for their tourism workers, which leads us to consider the possible existence of a certain link between the increased demand for workers in relation to the supply and educational performance in the tourism sector. Similarly, the appearance of higher quality standards can also be related to increased returns on education.

Nevertheless, it is necessary to introduce new lines of analysis that can help us to clarify the divergences found in terms of educational performance between the different ACs, including such factors as the tourist GDP or the average expense per tourist, the

level of investments made in tourist human capital and the 'weight' of university graduates in relation to the total of workers employed in tourism in each AC.

To sum up, the different analyses carried out lead us to the conclusion that, in a globalised context, achieving the high competitiveness parameters that are so necessary in this sector must be accompanied by better quality in the services offered and delivered, the improvement of education and training levels among people working in this sector being one of the basic factors.

In my view, the number of workers with high educational levels (university graduates and those who have completed specific professional/vocational training programmes) must be increased in order to obtain a better degree of qualification that will facilitate an easier and better assimilation of the new technologies and processes, an ability to adapt to changes and a closer connection between the tourist human capital and the motivations and goals of the different business organisations that hire them.

However, whereas it is true that one of the goals must be increasing the qualification level of its human capital, it is not less relevant to achieve a proper recognition of the educational levels in the sector, that is, to increase the returns that people working in this sector can obtain from their investments in education.

Therefore, since the results of this study show that education in the tourism sector is not so highly valued as in other sectors, it is necessary to reflect on the need to reward education and training in a sector where competitiveness parameters are indissolubly linked with the human capital, this being an effort that must be made by all the agents involved: tourism entrepreneurs (the demand for that human capital), the educational and tourism institutions (the supply of training) and the tourism sector workers (supply of human capital), in the context of a labour framework that suits the specific characteristics of this sector.

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Table 1.-Income equations: total of sectors, services, tourism and hotel and catering industry

Income/hour Ln	TOTAL OF SECTORS		SERVICES		TOURISM		HOTEL AND CATERING INDUSTRY	
	(1)OLS	(2)iv	(3) OLS	(4) iv	(5)OLS	(6) iv	(7) OLS	(8) iv
Education	0.0564* (0.0008)	0.0680* (0.0018)	0.0614* (0.0010)	0.0729* (0.0025)	0.0364* (0.0028)	0.0646* (0.0080)	0.0237* (0.0038)	0.0569* (0.0104)
Experience	0.0245* (0.0008)	0.0247* (0.0008)	0.0243* (0.0011)	0.02420* (0.0011)	0.0164* (0.0023)	0.0187* (0.0024)	0.0126* (0.0028)	0.0150* (0.0031)
Experience²	-0.0002* (0.0000)	-0.0002* (0.0000)	-0.0002* (0.0000)	-0.0002* (0.0000)	-0.0002* (0.0000)	-0.00016* (0.0000)	-0.0001** (0.0000)	-0.0001*** (0.0001)
Constant	0.6971* (0.0131)	0.5616* (0.0231)	0.6411* (0.0174)	0.4988* (0.0329)	0.9240* (0.0400)	0.6171* (0.0870)	1.0259* (0.0496)	0.6770* (0.1124)
N	19234	18623	11862	11506	2296	2212	1296	1242
R²	0.2788	0.2731	0.3026	0.2978	0.1242	0.0892	0.0793	0.0224

*Significant at 1%

**Significant at 5%

**Significant at 10%

Standard robust errors in brackets. Dummy Ti variables for the survey year are included, i=1999; 2000, 2001,2002, 2003.Omitted variable i=1999.

Table 2.- Income equations of wage and salary earners in the tourism sector by years of experience

Income hour Ln	Experience>18 years		Experience<18 years	
	OLS	iv	OLS	iv
Education	0.0454* (0.0045)	0.0751* (0.0114)	0.0305* (0.0036)	0.0565* (0.0110)
Experience	0.0136 (0.0113)	0.0206*** (0.0118)	0.0207** (0.0084)	0.0228* (0.0087)
Experience²	-0.0001 (0.001)	-0.0001 (0.0001)	-0.0004 (0.0004)	-0.0004 (0.0004)
Constant	0.8951* (0.1798)	0.5049** (0.2258)	0.9531* (0.0521)	0.6729* (0.1135)
N	947	918	1299	1246
R²	0.1226	0.0793	0.1023	0.0710
Years of experience	Experience>18 years		Experience<18 years	
Descriptive:	Mean	SD	Mean	SD
Education	8.49	3.18	10.44	3.33
Experience	29.26	7.92	8.36	5.15

*Significant at 1%

**Significant at 5%

**Significant at 10%

Standard robust errors in brackets. Dummy Ti variables for the survey year are included, i=1999; 2000, 2001,2002, 2003. Omitted variable i=1999.

Table 3.-Income equations for wage and salary earners in the tourism sector by cohorts

Income/Hour Ln	Born before 1950		Born between 1950 and 1966		Born after 1966	
	(1)OLS	(2)iv	(3) OLS	(4) iv	(5)OLS	(6) iv
Education	0.0421* (0.0086)	0.0536* (0.0155)	0.4475* (0.0041)	0.0837* (0.0118)	0.0295* (0.0041)	0.0536* (0.0139)
Experience	0.0044 (0.0088)	0.0028 (0.0093)	0.0191* (0.0063)	0.0144** (0.0068)	0.0167** (0.0083)	0.0162*** (0.0088)
Experience²	-0.0000 (0.0001)	-0.0000 (0.0001)	-0.0002 (0.0001)	-0.0000 (0.0001)	-0.0001 (0.0004)	0.0000 (0.0005)
Constant	1.2532* (0.1468)	1.1886* (0.1580)	0.8109* (0.0750)	0.4571* (0.1308)	0.9470* (0.0593)	0.6850* (0.1428)
N	273	266	912	881	1111	1065
R²	0.0989	0.0957	0.1621	0.0844	0.0996	0.0758
Cohort:	Born before 1950		Born between 1950 and 1966		Born after 1966	
Descriptive	Mean	SD	Mean	SD	Mean	SD
Education	7.5	3.45	9.32	3.25	10.37	3.26
Experience	37.33	8.68	22.38	7.35	7.94	5.25

*Significant at 1%

**Significant at 5%

***Significant at 10%

Robust standard errors in brackets. Dummy Ti variables for the survey year are included, i= 1999; 2000, 2001,2002, 2003. Omitted variable i=1999.

Table 4 . -Income equations for male and female wage and salary earners in the tourism sector

Net income/hour Ln	Wage and salary earners in the tourism sector by sex				Wages and salary earners: 1966 Cohort by sex			
	MEN		WOMEN		MEN		WOMEN	
Model	(1)OLS	(2)iv	(1)OLS	(2)iv	(3) OLS	(4) iv	(3) OLS	(4) iv
Education	0.0440* (0.0037)	0.0839* (0.0109)	0.0258* (0.0039)	0.0313* (0.0103)	0.0461* (0.0061)	0.0768* (0.0196)	0.0176* (0.0054)	0.0193 (0.0164)
Experience	0.0164* (0.0032)	0.0187* (0.0034)	0.0130* (0.0036)	0.0141* (0.0036)	0.0097 (0.0117)	0.0068 (0.0123)	0.0281** (0.0116)	0.03190** (0.0123)
Experience²	-0.0002* (0.0001)	-0.0001** (0.0001)	-0.0001*** (0.0001)	-0.0001*** (0.0001)	0.0003 (0.0006)	0.0007 (0.0006)	-0.0010*** (0.0006)	-0.0012*** (0.0007)
Constant	0.9110* (0.0549)	0.4901* (0.1183)	0.9680* (0.0558)	0.0898* (0.1114)	0.8738* (0.8333)	0.5661* (0.1977)	0.9637* (0.0814)	0.9222* (0.1722)
N	1396	1353	900	859	607	583	504	482
R²	0.1422	0.0668	0.0987	0.1062	0.1448	0.1057	0.0840	0.0968
Descriptive	Mean	SD	Mean	SD	Mean	SD	Mean	SD
Education	9.35	3.34	9.96	3.47	9.95	3.14	10.89	3.32
Experience	19.51	12.34	14.21	10.96	8.54	5.32	7.20	5.07

*Significant at 1%

**Significant at 5%

Robust standard errors in brackets. Dummy Ti variables for the survey year are included, i=1999; 2000, 2001,2002, 2003. Omitted variable i=1999.

Table 5- Income equations for wage and salary earners in the tourism sector by ACs.

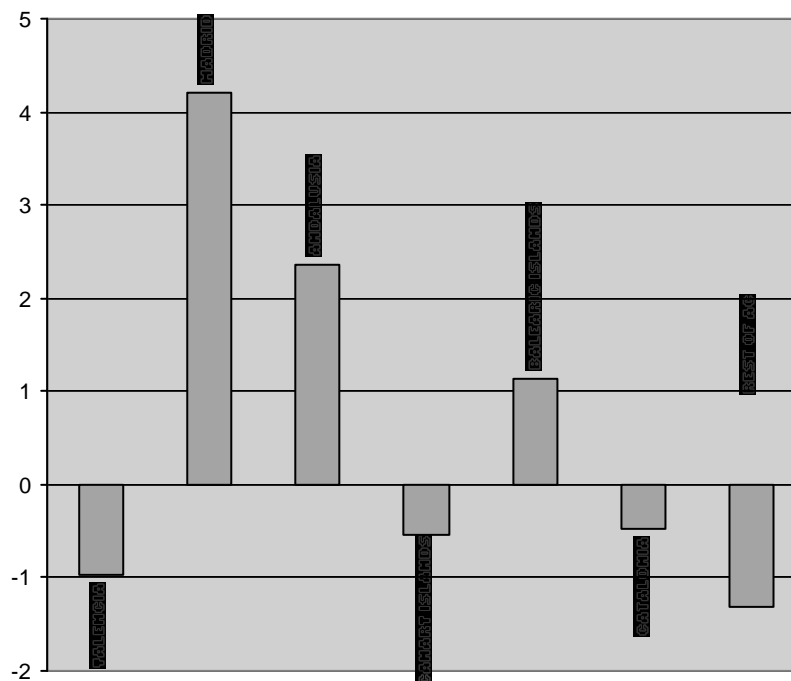
Income/hour Ln	Andalusia		The Balearics		The Canaries		Catalonia		Valencian Community		Madrid		Rest of ACs	
	(1) los	(2) iv	(3) los	(4) iv	(1) los	(2) iv	(3) los	(4) iv	(5) los	(6) iv	(3) los	(4) iv	(5) los	(6) iv
Education	0.0435* (0.0083)	0.0881* (0.0167)	0.0264* (0.0085)	0.0760* (0.0232)	0.0369* (0.0097)	0.0593** (0.0282)	0.0369* (0.0086)	0.0599 (0.0383)	0.0341* (0.0124)	0.0549 (0.0385)	0.0518* (0.0069)	0.1066* (0.0322)	0.0308* (0.0044)	0.0515* (0.0109)
Experience	0.0158** (0.0075)	0.0220* (0.0075)	0.0110** (0.0057)	0.0104*** (0.0061)	0.0057 (0.0062)	0.0087 (0.0094)	0.0230* (0.0077)	0.0247* (0.0089)	0.0052 (0.0083)	0.0073 (0.0085)	0.0233* (0.0070)	0.0236* (0.0072)	0.0169* (0.0041)	0.01799* (0.0043)
Experience²	-0.0001 (0.0001)	-0.0002 (0.0002)	-0.0000 (0.0001)	0.0000 (0.0001)	-0.0000 (0.0001)	-0.0000 (0.0001)	-0.0002 (0.0001)	-0.0002 (0.0002)	-0.0000 (0.0001)	0.0000 (0.0002)	-0.0002 (0.0001)	-0.0001 (0.0002)	0.0001** (0.0000)	-0.0001 (0.0001)
Constant	0.8382* (0.1404)	0.3682** (0.1767)	1.0290* (0.1054)	0.5348** (0.2407)	1.0789* (0.1226)	0.8399** (0.3443)	0.7986* (0.1097)	0.5674 (0.3954)	1.1264* (0.1740)	0.8936** (0.4133)	0.6810* (0.1155)	0.0425 (0.3354)	0.9771* (0.0654)	0.7505* (0.1260)
N	230	220	249	234	239	232	251	238	143	141	290	282	894	865
R²	0.1088	0.0406	0.1570	0.0003	0.0882	0.0609	0.1979	0.2019	0.1039	0.0666	0.2632	0.1069	0.1025	0.0834

*Significant at 1%

**Significant at 5%

Robust standard errors in brackets. Dummy Ti variables for the survey year are included, i=1999; 2000, 2001,2002, 2003. Omitted variable i=1999.

Figure 1.-Differences in returns to education between Autonomous Communities and Spain



Source: Elaborated by the author