Rewards to education in the tourism sector: one step ahead

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The authors analyse private returns to education in the Spanish tourism sector – that is, the increase in salary associated with an additional year of study. Mincer-type functions are estimated, drawing on a large sample from the Spanish Survey on Working Conditions, which allows robust estimations. Unlike previous analyses, the existence of an ability bias is considered explicitly through the use of instrumental variables techniques. The results show that, contrary to previous estimates based on OLS, the estimated returns in the tourism sector are not significantly different from those of the Spanish economy as a whole. The authors also provide additional evidence on the heterogeneity that is apparent when the tourism sector workforce is disaggregated by age, sex and work experience.

Keywords: returns to education; wage; tourism sector; instrumental variables; Spain

It is difficult to exaggerate the relevance of the economic role that tourism plays in Spain. Besides being one of the most important employers, this sector created 11% of the Spanish GPD in 2004 according to the Tourism Satellite Account (TSA). In that year, tourism services contributed with a surplus of 3.2% of GDP to the Spanish balance of payments, compensating a deficit of 6.3 (%GDP) in the trade account. Moreover, according to the European Commission (2006b), Spain was the only EU(15) country where the hotels and catering sector (ISIC Rev. 3 code 55) appeared among the top six sectors in country specialization (in fact, in the Spanish case, this sector occupied the first position).

These figures are the result of Spain's significant position as an international tourism destination, a situation that is shared with other European countries. This state of affairs, however, might be at risk. As pointed out by the European Commission (2006a), although Europe is the most visited region of the world, it is facing increasing competition from alternative emerging destinations, with the result that tourist arrivals are growing at a lower rate than the world average (European Commission, 2006a).

The tourism sector is facing several challenges. Among those identified by the European Commission stand the lack of skilled manpower for certain jobs

– mainly because of the working conditions – and the need to adapt and incorporate new information and communication technologies (ICT) as a factor of competitiveness (European Commission, 2001). Such technologies are considered to be the backbone of the knowledge economy and account for around half of the productivity growth in modern economies (European Commission, 2005). Economies endowed with a skilled labour force are more able to create and make an effective use of new technologies (European Commission, 2005). Highly skilled people are best equipped to work with the most productive capital and to implement organizational changes appropriate for the new technologies. Education is therefore given a central role in the debate on competitiveness improvement policies. A better stock of human capital can raise labour productivity and contribute to technological progress in the sector, therefore increasing its competitiveness. Based on aggregate figures, it has been estimated that a one-year increase in the average education level of the labour force might add as much as 0.3 to 0.5 percentage points to the annual EU GDP growth rate (European Commission, 2005).

The European concern for education and its significant role as a driver of productivity and competitiveness exceeds the context of tourism. It is now recognized that Europe's performance has diverged from that of other competitors in other parts of the world where productivity is growing faster and larger increases in average incomes are being reached. With this fact in mind, the Lisbon Strategy, which was launched originally in 2000 and reformulated in 2005 (European Commission, 2005), had as its main goals the delivery of stronger, lasting growth and the creation of more and better jobs. The Lisbon Strategy gives equal importance to increasing employment and productivity through enhanced competitiveness. One of the key issues in this strategy is the need to improve the adaptability of a workforce, which has to be prepared to adjust to continuous restructuring and market changes. Such capacity to adapt to change is undoubtedly related to education, taken in a broad sense. The adoption of the Lifelong Learning Programme – one of the priorities of the strategy – responds to the consideration that Europe needs more and better investment in education and training so as to respond to such a challenging environment. Lifelong learning increases the flexibility of workers and enables elderly workers to preserve up-to-date human capital (Gelauff and Lejour, 2006). The capacity to upgrade skills to meet these and other new needs depends heavily on the existence of an initial education that can be upgraded.

The tourism sector is characterized overall by a workforce with relatively low levels of education. Structural and behavioural features of the sector conform to a framework which has been described as being 'replete with deflationary influences' (Riley and Szivas, 2003, p 446). The requirements in terms of knowledge, skills and abilities of many of the typical jobs in this sector are also much lower than in other parts of the economy.[1] The tourism sector has a low image as a place to work and this may contribute to the scarce capacity of this sector to attract qualified workers in competition with other industries. Sturman (2001) shows (based on a sample of graduate students from a prestigious school of hotel administration) that the pay levels of those students working in the hospitality sector are significantly less than the pay of graduates who take non-hospitality jobs (who, additionally, had during their university period better grade-point averages than their counterparts in the hospitality

sector). From this result, the author concludes that the hospitality sector may not be drawing the best graduates. As Marhuenda *et al* (2005) claim, if the sector really demands a differently skilled workforce, it has to offer them appropriate working conditions, otherwise tourism workers will consider their participation in the sector as a transitional period in their way towards other sectors with better career prospects. These working conditions refer to factors like seasonality, but also – and very notable – to pecuniary aspects.[2]

It seems clear that economic incentives are very relevant in fostering a worker's education. The aim of this paper is to explore the characteristics of the internal wage structure in the sector to find out how schooling is rewarded, since: (i) these years of formal education are relevant as an initial endowment that has an impact on productivity, and therefore the sector's competitiveness; and (ii) this formal endowment is the basis on which subsequent on-the-job training takes place: a better endowment facilitates the acquisition of additional skills and increases the willingness to participate in such training activities and to adopt and promote change.

Among the scarce previous examples of analogous analyses stand Lee and Kang (1998) and Sturman (2001). In their research based on data from South Korea, Lee and Kang (1998)[3] found that tourism generated a moderately equal distribution of earnings combined with the lowest median earnings among the industries they analysed. Compared to other sectors, and notably tertiary industries, tourism pays more earnings to lower-income groups of workers and less earnings to higher-income groups. Sturman (2001) shows that in the USA, the increases in average pay associated with increases in human capital are much lower in the hospitality sector than in the rest of the economy. The effect of a one-point increase in human capital is associated with 20% less increase in pay in the sector compared to other industries (the measure of human capital used by the author ranges between 0 and 4). Despite its undeniable relevance to the Spanish economy, very little is known about how the rewards to education in the tourism and hospitality sectors compare with those for the overall economy. One of the few studies in this field (Lillo and Ramón, 2005) concludes that the returns on education in the tourism sector are lower than in other service sectors in Spain, and notably lower than those in the Spanish economy as a whole. These results lead the authors to conclude that the Spanish tourism sector could be losing better qualified staff who might find better remunerated jobs in other industries and that over-education could be a relevant problem in the sector. They also suggest the promotion of a more specialized type of education for tourism at all levels, and notably university level, including the development of advanced educational programmes for tourism, and ensuring that postgraduate and masters degrees are well adapted to the needs of the sector so that firms might better appreciate such qualifications. Another recent paper by Marchante *et al* (2005) focuses on over-education. As a collateral result, their analysis offers evidence of the existence of educational returns in the tourism sector which are significantly lower than those obtained for the Spanish labour market as a whole.[4]

The fact that the labour market rewards more education with higher incomes is one of the empirical regularities more widely observed, although the exact measure of these rewards and their evolution over time is still a controversial issue. This paper is based on one of the most widely used frameworks for

approaching these topics, Mincer's original specification of his human capital earnings function, to provide an insight of how formal learning, such as that leading to recognized diplomas and qualifications, is rewarded by the tourism sector (and the 'horeca' – hotels, restaurants and cafes – subsector) in relation to the overall economy. This rather simple method allows us to calculate how an additional year of schooling is rewarded by the market; that is, the percentage by which incomes increase with every year of additional education.

The paper is organized as follows. The next section contains a brief methodological description on how the causal effect of education on earnings is estimated and the way the results can be interpreted. Special attention is paid to how the method proposed improves the robustness of the estimations with regard to previous exercises. The subsequent section provides a description of the database and the variables, with a discussion of the main results. The findings allow a comparison of the private returns to education in the Spanish tourism sector, and in the subsector of hotels and catering, with those of the overall economy and the service sector in particular. Moreover, we give additional evidence on the heterogeneity which is apparent when the tourism sector workforce is disaggregated by cohort, sex and work experience. The final section summarizes the main findings of the study and presents some policy and managerial implications.

Methodological considerations: estimation of the returns to education

One of the methods more widely used in the human capital literature to measure the influence of education on incomes is the estimation of Mincer-type functions (Card, 1999; Heckman *et al*, 2003) in which the log of individual earnings is explained by a schooling attainment term and a quadratic working experience term,

$$\log Y_i = \beta_0 + \beta_1 S_i + \beta_2 X_i + \beta_3 X^2_i + u_i \tag{1}$$

where i is a subscript for individuals ($i = 1,2,...,n$), $\log Y_i$ is log income, S_i is years of education, X_i is years of work experience after completing schooling and u_i is the random error term.

As pointed out by Heckman *et al* (2003), under certain conditions Mincer's framework captures two concepts: (i) a hedonic wage function that allows measuring how schooling and experience are rewarded in the labour market; and (ii) a rate of return to schooling (β_1) comparable with the return to alternative assets that allows establishing the rationality of investment in education. From Equation (1), β_1 can be interpreted as the rise in income associated with an increase of one in the amount of years of formal education held by the worker.

Since its formulation, Mincer's earnings function has become one of the empirical specifications more widely estimated. Most textbooks (Borjas, 2005, is an example) describe Mincer's equation as the culmination of the analysis of the implications of the human capital model for the age–earnings profile. Two different theoretical motivations[5] led Mincer to Equation (1). Of these, the most

frequently referred to is Becker's *human capital theory*, according to which an individual chooses the length of his education so that the present value of the stream of future income is maximized, net of the direct costs of education. Assuming that these costs are negligible,[6] it follows from the equilibrium condition that the return to an additional year of schooling is approximately the difference in log wages between studying for a given number of years and studying for that number less one. This rate of return to schooling can then be compared with the interest rate to test the optimality of investment in education from the individual's point of view.

Empirical research based on Equation (1) has usually relied on ordinary least squares (OLS). Nevertheless, it is well known that this procedure of estimation is only consistent if all the explanatory variables x_i are exogenous; that is, if none of them is correlated with the perturbations of the error term u_i. When $E(u_i/x_i) \neq 0$, $x_i = k \times 1$, the OLS estimator is not consistent.

The plausibility of the assumption of exogenous regressors in this context has been challenged by the literature, to the point that it has become a focus point for many analyses estimating Mincer's specification. The basic argument here is that some unobserved variables might simultaneously exert an influence on (i) workers' schooling attainments and (ii) their earnings.

As an example (Bound *et al*, 1995), innate 'ability' may be one of these forces, since it is quite likely correlated with schooling attainment (more skilful individuals achieve higher qualifications – study more years) and earnings (those with higher ability earn more). Since ability is not included explicitly as an explanatory variable, such effect is captured in the random term u_i. From (i) and (ii), S_i and u_i are correlated. Since OLS overlooks these endogeneity problems, derived estimations would therefore be biased. As has been pointed out before, the potential existence of such effects has largely been ignored in the tourism and hospitality literature.

Different strategies have been suggested by the literature to deal with the bias arising from endogeneity. Instrumental variables (IV) techniques are one of the most widely used (see Card, 2000, for a detailed discussion on this procedure). This technique is based on the use of instruments (z_i) that are not correlated with the perturbations but are correlated with the x_i regressors that we consider exogenous, so that: $E(z_i\ u_i) = 0/\beta_{IV} = (z'x)^{-1}\ z'y$.

The method consists of two stages. In the first, schooling (S_i) is estimated using Z_i (instrument) as a regressor (2). Z_i must be chosen carefully so that there is an absence of significant correlation between Z_i and u_i. This requires finding an instrument that is correlated with the true measure of schooling and uncorrelated with the measurement error.[7]

$$\hat{S}_i = \alpha Z_i + v_i \tag{2}$$

In the second stage, the schooling prediction $\hat{S}_i$ substitutes S_i in Equation (1).

Data and results

Data set and variables selection

The data used in the analysis come from the Spanish Survey on Working

Conditions (Encuesta de Calidad de Vida en el Trabajo, ECVT). Five waves (1999–2003) of the survey have been pooled to build the data set. This survey is especially adequate for our purpose: (i) in contrast to other sources, such as the Wage Structure Survey, the sample includes workers in firms with as few as one worker, something which is very relevant in a sector where many very small firms operate; (ii) the survey allows the calculation of income per hour and therefore the inclusion of all workers, independent of the length of their working day – something especially relevant in a sector with a high degree of part-time employment; (iii) the survey registers overall net incomes, including pecuniary compensations other than formal regular salary;[8] (iv) the survey allows the estimation of experience (X_i) in an accurate way, since it provides information about the time when the individual actually started to work, unlike other sources that force the adoption of additional assumptions;[9] (v) it also includes information on family background, which permits estimations through IV techniques that allow improving those carried out through ordinary least squares (OLS) regressions.

For the empirical estimation of the model, the use of White's variance–covariance matrix allowed us to obtain robust errors since the existence of heteroskedasticity, typical in cross-section data, was confirmed by the usual tests.

Instrument selection

As pointed out above, much of the general literature on returns to education has been concerned with the potential endogeneity of schooling attainment; that is, concerned with the fact that some of the forces influencing education are also relevant when earnings are to be explained. The relevant tests confirm the endogeneity of schooling attainment in our sample.[10] To cope with this, we used *instrument variables* (IV) techniques. This procedure requires finding variables (*instruments*) that are correlated with schooling but not with wage rates. Family background is one of the most popular sets of instruments[11] in this context.

According to Mora (1996), an individual's access to post-compulsory education in Spain, both secondary and university degrees, is linked strongly to his or her family's economic and education features. Moreover, previous analysis by Pons and Gonzalo (2002) showed that a parent's education and the availability of a college (the existence of a university in the province where the individual was living at the age of 16) were instruments that fitted the Spanish case better than those related to natural experiments like the season of birth and dummy variables capturing the effects of changes in the education laws, which were used in other international exercises. Moreover, they concluded that the efficiency obtained using a parent's education and university proximity was quite similar to that obtained using the parent's education alone.

In our exercise, we chose the variable 'education of the head of household the individual belonged to at the age of 16' (typically the father) as an instrument that was confirmed as appropriate by the relevant test.[12] After following the two-step procedure described earlier, an estimation of β_1 was obtained. Following previous discussion on this issue, we have interpreted this parameter to be the amount of rise in income associated with an increase of one in the number of years of formal education held by the worker.

Empirical results

The results[13] from the estimations in Table 1 show that the returns to education in the Spanish tourism sector are only slightly lower than those in the Spanish economy as a whole (6.46 and 6.80, respectively),[14] although the difference is slightly higher when comparing with the service sector (7.29). The returns to schooling in the horeca sector are, however, significantly lower: 5.69%. Previous research found that the average increase in earnings associated with an additional year of schooling in the tourism sector was 3.3%, approximately half of the value of that of the rest (the non-tourism) of the service sector (6.5%) (Lillo and Ramón, 2005). The difference between those results and the ones from the estimations in Table 1 derives from the lack of consideration of the potential endogeneity problem described in Section 2 in that exercise.

Table 2 shows the relevance of considering alternative divisions of the total sample, and the tourism sector workforce, into different groups by experience, age and gender.[15] From this table, it is clear that seniority improves education returns. This result is obtained for both the total sample and the tourism subgroup, but it is higher in the latter (7.2 and 7.8, respectively). It seems clear that as experience increases, workers move to positions better suited to their educational level and consolidate a certain professional status. The conclusions from the analysis by age group are especially interesting when we compare the results for the tourism subgroup and the total sample. The results show that education is less valued for the older age group (those born before 1950), probably due to a progressive depreciation of their skills in tourism (5.3). The results of the younger age group, those people born after 1966 (with less years of experience), are comparable in both samples (5.7 for the whole Spanish labour market; 5.4 for the tourism sector). The intermediate group (those born between 1950 and 1966) is the one that achieves higher returns. In this case, however, schooling returns in tourism (8.4) are one percentage point higher than those for the same cohort in the overall sample.

The most salient result in Table 2 is undoubtedly the difference in the returns to education by sex (8.4 for male workers versus 3.1 for their female counterparts[16]) and very notably, the gap between male and female workers when the youngest (those born after 1966) are considered: for this group, the male return is 7.7 (something coherent with the estimations from the analysis by age) and the female return to schooling is 1.9. These results contrast with those from the total sample. For our overall group of workers, the figures are 7.5% (male workers) and 6.4 (females) – 6.1 and 5.9, respectively, in the case of the youngest.[17] If we discard both explanations related to the quality of the education received by each of these groups – if the education received by females is worse, it might not generate human capital in the same proportion it will in their male counterparts – and the case for female workers in the tourism sector having less ability and motivation than their male counterparts, two much more likely explanations arise: gender discrimination and 'biased' over-education. Firstly, although its revision exceeds the aim of this paper, a large sample of the literature on labour economics and related fields has focused on the potential existence of explicit or tacit processes through which female workers are discriminated against, not only (but notably) in pecuniary terms. This is also the case in the field of tourism; see, for example, Mariscal (2005)

Table 1. Estimated returns to education.

	Years of education β_1	Experience β_2	Experience^2 β_3	Constant β_0	N	R^2	Years of education mean/std
Total economy	0.0680* (0.0018)	0.0247* (0.0008)	−0.0002* (0.0000)	0.5616* (0.0231)	18,623	0.2731	10.45 3.92
Services	0.0729* (0.0025)	0.02420* (0.0011)	−0.0002* (0.0000)	0.4988* (0.0329)	11,506	0.2978	11.38 3.95
Tourism	0.0646* (0.0080)	0.0187* (0.0024)	−0.00016 (0.0000)	0.6171* (0.0870)	2,212	0.0892	9.59 3.40
Horeca (Hotels, restaurants and cafes)	0.0569* (0.0104)	0.0150* (0.0031)	−0.0001*** (0.0001)	0.6770* (0.1124)	1,242	0.0224	9.17 3.14

Note: Dependent variable is net income per hour in logs. *Significant at 1%; ***significant at 10%. Dummy variables for the survey years (1999–2003) were included in the estimation. Standard robust errors are in parentheses.

Table 2. Estimated returns to education by subgroup, tourism sector.

	Tourism sector				Total sample			
	β_1	N	R^2	Mean and std	β_1	N	R^2	Mean and std
Experience ≥ 18 years	0.0779* (0.0112)	966	0.0791	8.55 3.20	0.0723* (0.0023)	8,840	0.2827	9.52 3.93
Experience < 18 years	0.0565* (0.0110)	1,246	0.0710	10.44 3.33	0.0640* (0.0027)	9,783	0.2222	11.33 3.70
Born before 1950	0.0536* (0.0155)	266	0.0957	7.50 3.45	0.0725* (0.0036)	2,462	0.3313	8.76 4.29
Born 1950–1966	0.0837* (0.0118)	881	0.0844	9.32 3.25	0.07316* (0.0027)	8,291	0.2794	10.45 3.97
Born after 1966	0.0536* (0.0139)	1,065	0.0758	10.37 3.26	0.0574* (0.0035)	7,870	0.1660	11.02 3.56
Male	0.0839* (0.0109)	1,353	0.0668	9.35 3.34	0.0751* (0.0022)	11,781	0.2839	10.01 3.87
Male born after 1966	0.0768* (0.0196)	583	0.1057	9.95 3.14	0.0613* (0.0044)	4,627	0.1750	10.42 3.47
Female	0.0313* (0.0103)	859	0.1062	9.96 3.47	0.0640* (0.0031)	6,842	0.2764	11.21 3.91
Female born after 1966	0.0193 (0.0164)	482	0.0968	10.89 3.32	0.0586* (0.0057)	3,243	0.1929	11.88 3.52

Note: Dependent variable is net income per hour in logs. Only estimations for coefficient β_1 in Equation (1) are reported here. The rest of the results are available from the authors on request. Dummy variables for the survey years (1999–2003) were included in the estimation. Standard robust errors are in parentheses. *Significant at 1%.

and Santos and Varejão (2007), where the difficulties faced by female workers in the sector to reach certain (more 'managerial' and therefore better paid) jobs are documented in both the Spanish and Portuguese case, respectively.[18] Secondly, our results are also compatible with the existence of an over-education problem affecting a higher proportion of female workers. This would be the case if, for example, the proportion of female workers holding university degrees is higher than for male workers, while the demand for such qualified workers tends to give priority to men in jobs with higher education requirements. This is quite a plausible explanation, since during the past few years, education in the tourism field has expanded in Spain, both at the vocational and higher education levels (where it has become a popular choice, especially among women), although testing this hypothesis will need further research.

Conclusions

This paper estimates the private returns to education in the tourism sector. As has been long established, education plays a very significant role in explaining the current performance of an economy and will be even more significant in the future. Educated workers are more flexible, are more prepared for international competence, are better in the use of new technologies and their willingness to acquire new skills throughout their working lives is also higher, something crucial in a dynamic and increasingly knowledge-based economy. Firms in which those more educated are relatively abundant are more prepared to anticipate, generate and absorb change, something of paramount relevance in a dynamic sector such as tourism. Education is therefore a key driver of productivity growth. Boosting productivity requires increasing the stock of human capital in firms, and the way human capital is economically rewarded within the sector undoubtedly has an influence on its relative abundance there.

One way of assessing how education is rewarded within a sector is the estimation of Mincer-type wage equations where wages are explained by experience and education. Such models allow the estimation of a private return to education, the percentage rise in wage resulting from an increase of one year in initial formal education. Previous literature on the causal effect of education on earnings has found that such private returns are much lower in the tourism sector than in that part of the service sector which is not related to tourism. The authors conclude that the sector could be losing better qualified staff and recommend the promotion of a more specialized type of education for tourism at all levels, one able to respond to the needs of the sector.

Earlier empirical estimates of the returns to education in the sector have, until now, relied on ordinary least squares. One rather technical issue might, however, undermine these estimates – the existence of the problem of endogeneity, which potentially can result in severely biased estimations. In this paper, these concerns are taken into account and the appropriate techniques are used, the result being that the private return to education in the Spanish tourism sector (6.46%) is considerably closer to that of the service sector (7.29%) and is also comparable to the estimations for the overall economy, both in this paper and in previous literature on the Spanish case.

Although our results smooth the differences between the service sector's and

the tourism sector's returns to education, the conclusions from other studies hold. The absence of significant differences between the returns on human capital investment between the tourism sector and the overall economy means that the 'departure point' is not in this sense so comparatively poor as previously thought. This means that within the sector, additional years of schooling result in wage increases that are comparable in percentage points to those in the overall economy. The average qualified worker will therefore find himself or herself in this sense well rewarded compared to less qualified workers, which is not necessarily equivalent to saying that the sector is as attractive to educated workers as the rest of the productive sectors. Besides, as suggested by Jacobs (2004), it is expected that overall returns will increase in the future, as a response to skill-biased technological change, internationalization and capital-skill complementarities. If this is the case, offering attractive professional careers to qualified job seekers may become crucial.

The paper has also provided estimations for several subgroups of workers in the tourism sector and the overall Spanish economy. Quite unsurprisingly, those with longer working experience exhibit higher returns, while the most striking result derives from the consideration of gender differences. Male returns to education are much higher than those of their female counterparts (8.39 versus 3.13%). Tentative explanations of this result, such as the existence of a pattern of gender discrimination or significant over-education, cannot be clearly established from our empirical results and will need further research. Other results concern the returns to education among the youngest workers, which are probably those with a higher relevance since these returns might be taken as an indicator for those who are still studying or deciding which field of study is more attractive. The diversity of returns is particularly remarkable when young male and female workers are considered. Estimated returns are 7.7% for those male workers born after 1966, while they are 1.9% for their female counterparts. Following one traditional strand of interpretation of such results, although devoting time to study might be a sound strategy for male workers oriented towards this sector (for example, those living in local labour markets where this is the predominant activity), it might not be the case for female workers, who could probably find many other alternative investments with higher rates of return. Our results therefore give evidence that the sector could be failing to provide an environment that rewards education, at least among certain groups of the population.

The results have additional implications for a variety of key stakeholders. In terms of policy making, although improving the competitiveness of the Spanish and European tourism sector is a multifaceted endeavour, labour productivity seems to be one crucial determinant. European universities are currently facing a challenging process derived from the development of the so-called Higher Education European Space. This is an opportunity to rethink tourism education and enhance the connection between the worlds of education and skills and that of the small businesses that form the majority of the sector. There is also a clear opportunity to improve vocational training so as to avoid over-education for certain jobs, which seems to be associated with university education, particularly for female workers. The public image of such vocational education in Spain should be improved (since this can act in the direction of reducing the likeliness of over-education). Tourism employers should also be aware of the

relevance of having qualified workers as a means to compete; this could translate into better pay, shorter hours and more training, since these are some of the negative attributes of these jobs (Szivas *et al*, 2003). In the context of wages which are higher than those in the non-European countries that compete with us in international terms – a situation that will be accentuated when successive waves of competitors enter the market and previous entrants start to behave as we do – it is crucial to guarantee that wage labour cost developments do not exceed productivity growth over the cycle. A relative abundance of qualified workers and an increase in productivity are mutually reinforcing: education contributes to productivity and an increase in productivity allows the payment of higher wages, which in turn makes the sector more attractive to those who are better educated and creates an appropriate scheme of incentives for those oriented towards the sector. A balanced change is therefore necessary in which the sector needs to attract workers through better working conditions and salaries and in which these incentives must be overcome by productivity growth. This will result in higher levels of competitiveness and, above all, in the improvement of overall conditions to face future challenges.

Endnotes

1. According to Sturman (2001), human capital requirements for hospitality jobs in the USA were statistically lower than those in non-hospitality occupations (he quantified human capital as the average of four indicators: specific vocational preparation and reasoning, mathematical and language development). Based on data from the US Department of Labor (*Dictionary of Occupational Titles*), and in a scale ranging from 0 to 4, the numbers were 1.45 for hospitality jobs versus 2.13 for non-hospitality jobs ($p < 0.0001$).

2. For instance, in their estimation of inter-industry wage differentials in Spain, Casado-Díaz and Simón (2008) found that salaries in the accommodation industry were 4% lower than the average.

3. Two aspects of their analysis must be taken into consideration since they could have influenced their conclusions: their data exclude small firms with less than 10 employees and their calculations are made on the basis of monthly wages.

4. However, the fact that their database refers to the Spanish region of Andalusia and that the dependent variable in their analysis is monthly net wages make the comparison difficult.

5. See Heckman *et al* (2003) for the derivation of Mincer's earnings specification from his compensating differences model (1958) and the accounting-identity model of human capital formation (1974).

6. Arrazola *et al* (2001) estimate that in the Spanish case opportunity costs account for more than 90% of total private education cost. The public administration's strong subsidization scheme (which assumes more than 80% of total direct costs) leads to a large similarity in the private returns that they estimate both through internal rates of return formulation and human capital based standard Mincer specification.

7. See Card (1999, 2000), Harmon *et al* (2003) and Heckman *et al* (2003) for comprehensive discussions on the instruments used in the recent international literature on the profitability of investment in education.

8. It must be noted that in countries with progressive tax systems, the use of net instead of gross incomes could potentially bias downwards the returns to education (higher educated workers are likely to earn more and therefore a larger proportion of their incomes would be detracted as taxes, thus reducing observed returns to education). As a result of this, the overall economy's return to education could somehow be higher (the proportion of higher educated workers is lower in the tourism industry). We assume that this effect, however, should be limited. Besides, if the agents assume that the nature of the tax system is a structural feature of the economy, decisions on investment in education are likely to be more influenced by net than by gross incomes.

9. Actual and not potential experience is used in the estimation. In the absence of information on

actual experience, experience has frequently been proxied by age less years of schooling (in the Spanish case, this is usually the minimum number of years necessary to complete the stated level of education), less six. By doing so, working experience is overestimated for employees who have spent more than the statutory number of years in obtaining a qualification or for those whom it has taken longer to find a job. Moreover, the estimation of experience in such a manner is controversial since if variable schooling is potentially endogenous, the same concerns should apply to experience defined as a function of schooling attainment. In part as a reaction to such concerns, variable 'experience' frequently has been substituted by 'age'. This is the case in the works of Barceinas *et al* (2002) and Pons and Gonzalo (2002) on the Spanish economy.

10. The Hausman (1978) test resulted in the rejection of the null hypothesis of exogeneity of schooling attainment, $F(1, 2,207) = 15.66$, $Prob > F = 0.0000$. Therefore, $E(u_i/x_i) \neq 0$ and OLS gives biased and inconsistent estimates of the causal effect of schooling attainment on earnings.

11. See Card (1999) for a discussion on family background instruments.

12. Its appropriateness (a strong correlation between S_i and Z_i) was confirmed by Bound's test. F-statistic on excluded instruments test, $F(1, 2,597) = 432.44$, $Prob > F = 0.0000$.

13. As most of the recent Spanish literature on the issue, our estimations based on IV increase OLS-based returns to education.

14. The Wald test confirmed that tourism's returns to education were not statistically different to those of the whole sample: $F(1, 2,204) = 0.17$, $Prob > F = 0.6802$.

15. The experience subgroups were defined with regards to average experience (18 years), while the age groups were related to changes in the legislation on education. Both the usual tests on median differentials and the non-parametric Mann–Whitney U-test allowed the rejection of the null hypothesis of equal population medians in schooling.

16. Thrane (2008) concluded that the returns to education in Norway were higher for women than for men, although the results were difficult to compare with those reported here: the potential effect of endogeneity was not considered; earnings were computed as annual incomes – although control variables for average working hours per week were included; and education was considered in terms of qualifications instead of schooling years.

17. The Wald test confirmed the significance of the differences between the estimations of the schooling parameter by experience, cohort and gender, 6% [$F(1, 958) = 3.61$, $Prob > F = 0.0578$], 2% [$F(1, 873) = 6.48$, $Prob > F = 0.0111$] and 1% [$F(1, 1,345) = 22.96$, $Prob > F = 0.0000$], respectively.

18. In their analysis of the Portuguese case based on the Oaxaca–Blinder decomposition procedure, Santos and Varejão (2007) concluded that only 45% of the wage differentials between male and female workers in the tourism industry were accounted for by differences in their characteristics, while the remaining 55% were unexplained and therefore attributed to discrimination (however, according to their results, such a discrimination was lower in this industry than in the rest of the economy, something that was attributed by the authors to the minimum wage legislation, which had a larger effect on low-wage sectors like the tourism industry).

References

Arrazola, M., De Hevia, J., Risueño, M., and Sanz, J.F. (2001), 'Estimación y comparación de las tasas de rendimiento de la educación en España', *Instituto de Estudios Fiscales. Papeles de trabajo* 2/01 (http://www.ief.es).

Barceinas, F., Oliver, J., Raymond, J.L., and Roig, J.L. (2002), 'Rendimientos de la educación y efecto tratamiento. El caso de España', *Moneda y Crédito*, No 215, pp 43–68.

Borjas, G.J. (2005), *Labor Economics*, 3rd edition, McGraw-Hill, New York.

Bound, J., Jaeguer, D.A., and Baker, R.M. (1995), 'Problems with instrumental variables estimation when the correlation between the instruments and the endogenous explanatory variables is weak', *Journal of the American Statistical Association*, Vol 90, No 430, pp 443–450.

Card, D. (1999), 'The causal effect of education on earnings', in Ashenfelter, O., and Card, D., eds, *Handbook of Labor Economics*, Vol 3A, Elsevier, Amsterdam, pp 1801–1863.

Card, D. (2000), 'Estimating the return to schooling: progress on some persistent econometric problems', NBER Working Paper 7769.

Casado-Díaz, J.M., and Simón, H. (2008), 'Industry wage premia and collective bargaining revisited: evidence from Spain', *Applied Economic Letters*, Vol 15, No 6, pp 477–481.

European Commission (2001), *Working Together for the Future of European Tourism*, COM (2001) 665 final of 13.11.2001.

European Commission (2005), *Working Together for Growth and Jobs A New Start for the Lisbon Strategy, Brussels*, COM (2005) 24 02.02.2005.

European Commission (2006a), *A Renewed EU Tourism Policy: Towards a Stronger Partnership for European Tourism*, COM (2006) 134 final.

European Commission (2006b), *European Competitiveness Report 2006*, SEC (2006) 1467/2, COM (2006) 697 final.

Gelauff, G.M.M., and Lejour, A.M. (2006), 'The new Lisbon Strategy. An estimation of the economic impact of reaching five Lisbon targets', Industrial Policy and Economic Reforms Papers, 1 report prepared for the Enterprise and Industry Directorate-General of the European Commission.

Harmon, C., Oosterbeek, H., and Walker, I. (2003), 'The returns to education: microeconomics', *Journal of Economic Surveys*, Vol 17, No 2, pp 115–155.

Hausman, J. (1978), 'Specification test in econometrics', *Econometrica*, Vol 46, pp 1251–1271.

Heckman, J., Lochner, L., and Todd, P. (2003), 'Fifty years of Mincer earnings regressions', NBER Working Paper No 9732.

Jacobs, B. (2004), 'The lost race between schooling and technology', *De Economist*, Vol 151, pp 47–78.

Lee, C.-K., and Kang, S. (1998), 'Measuring earning inequality and median earnings in the tourism industry', *Tourism Management*, Vol 19, No 4, pp 341–348.

Lillo-Bañuls, A., and Ramón-Rodríguez, A.B. (2005), 'Returns to education in the Spanish tourism labour market', *Tourism Economics*, Vol 11, No 1, pp 119–132.

Marchante, A., Ortega, B., and Pagán, R. (2005), 'Educational mismatch and wages in the hospitality sector', *Tourism Economics*, Vol 11, No 1, pp 103–117.

Marhuenda, F., Strietska-Ilina, O., and Zukersteinova, A. (2005), 'Factors shaping occupational identities in the tourism sector: research in Spain, the Czech Republic and Greece', in Strietska-Ilina, O., and Tessaring, M., eds, *Trends and Skills Needs in Tourism*, EurOp, Luxembourg, VI (Cedefop Panorama series; 115), pp 21–30.

Mariscal, A. (2005), *Mercado de trabajo y turismo en Andalucía. Actividad, ocupación y paro (1990–2003)*, Consejería de Turismo, Comercio y Deporte, Junta de Andalucía, Seville.

Mora, J.G. (1996), 'Influencia del origen familiar en el acceso a la educación, en la obtención de empleo y en los salarios', in Grao, J., and Ipiña, A., eds, *Economía de la Educación*, Temas de estudio e investigación, Servicio Central de Publicaciones del Gobierno Vasco, Vitoria-Gasteiz, pp 195–211.

Pons, E., and Gonzalo, M. (2002), 'Returns to schooling in Spain: how reliable are instrumental variables estimates?', *Labour Economics*, Vol 16, No 4, pp 747–770.

Riley, M., and Szivas, E. (2003), 'Pay determination: a socioeconomic framework', *Annals of Tourism Research*, Vol 30, No 2, pp 446–464.

Santos, L.D., and Varejão, J. (2007), 'Employment, pay and discrimination in the tourism industry', *Tourism Economics*, Vol 13, No 2, pp 225–240.

Sturman, M.C. (2001), 'The compensation conundrum: does the hospitality industry shortchange its employees – and itself?', *Cornell Hotel and Restaurant Administration Quarterly*, Vol 42, No 70, pp 70–76.

Szivas, E., Riley, M., and Airey, D. (2003), 'Labor mobility into tourism. Attraction and satisfaction', *Annals of Tourism Research*, Vol 30, No 1, pp 64–76.

Thrane, C. (2008), 'Earnings differentiation in the tourism industry: gender, human capital and socio-demographic effects', *Tourism Management*, No 29, pp 514–524.