Determinants of skills shortages and hard-to-fill vacancies in the Hospitality Sector

Andrés J. Marchante
(marchante@uma.es)

Bienvenido Ortega
(ortega@uma.es)

Ricardo Pagán
(rpr@uma.es)

Departamento de Economía Aplicada (Estructura Económica),

University of Málaga,

Plaza de El Ejido s/n, 29071 Málaga (Spain).

Fax: + 34 952 13 20 75. Tel.: +34 952 131186

Abstract

The aim of this paper is to analyse the regional determinants of hard-to-fill vacancies and skills shortages in the hospitality sector. The data source for this study was generated in the year 2000 and includes information on 181 hotels and 121 restaurants in Andalusia. The results of the estimations show that hourly net wages are the main instrument firms use to reduce hard-to-fill vacancies and skills shortages. However, there are several factors affecting the conditions of local labour markets - such as unemployment rates, the level of business activity, real estate prices and the location of the firm in relation to the main regional tourism destinations - that have a significant effect on the probability of having hard-to-fill vacancies and skills shortages.

Keywords: Skills shortages; hard-to-fill vacancies; hospitality.

Acknowledgements

Financial support by the European Regional Development Fund and the Ministry of Science and Technology (R+D National Plan project code 1FD97-0858) is gratefully acknowledged for the research project *'Skills shortages, productivity, and wages in the hospitality sector in Andalusia'*.

1. Introduction

There are an increasing number of factors associated with demands for the different types of skills required to perform a job in many occupations and sectors (Green and Owen, 2003; Berman and Machin, 2000; Machin and Manning, 1997). There also exists a range of studies that have pointed out the important contribution that human resource skills can make to productivity, employment and economic performance (Acemoglu, 2002; Giles and Campbell, 2003; O´Mahoney and de Boer, 2002; OECD, 2001). As a result, the role of skills and skills development is a topic of considerable academic and political debate (Baum, 2002): Skills matter for individuals, organizations and, more generally, society (Institute for Employment Research, 2004). Within this context, one of the most relevant key findings addressed in the literature is the existence of skills shortages and their possible economic implications (Bosworth, 1993; Green and Ashton, 1992; Haskel and Martin, 1991, 1993; Green, Machin and Wilkinson 1998). Green and Owen (2003, p. 126) point out that there is evidence that skills shortages lead to difficulties regarding several aspects related to the economic performance of the firms. For example, problems in providing suitable customer service, delays in developing new products and services, increasing operating costs and obstacles to meeting the required quality standards.

The analysis of skills shortages and hard-to-fill vacancies is especially relevant in the tourism sector. As Jensen (2001) points out for the European Union, tourism in some countries and subsectors is undergoing difficulties in recruiting the workforce due to competition from other economic sectors, the lack of adequate management of human resources, and unattractive working conditions. These problems are particularly important in the hospitality sector, especially regarding the high fragmentation of the industry's structure, with many small firms,

often family-owned. Following Baum (2002), hospitality work (and thus the skills that it demands) presents diversity in horizontal and vertical terms. In the horizontal sense, it includes a very wide range of jobs with different skill requirements and working conditions. This variety of jobs makes entry into the labour market easy to workers from other sectors of the economy (Szivas, Riley and Airey, 2003). The vertical diversity in hospitality work can be represented by the traditional classification that ranges from unskilled to semi-skilled, and from skilled to supervisory and management. Thus, the hospitality sector provides an appropriate environment in which to explore some of the current issues (e.g. skills shortages) in organizational studies and human resources management (Guerrier and Deery, 1998).

Although issues regarding labour market trends and labour turnover have been widely examined in the hospitality sector (Ladkin, 1999), the literature on skills shortages is not very abundant (for example, Haskel and Martin, 1993; Haskel and Holt, 1999; Green, Machin and Wilkinson, 1998; Bosworth, 1993; Borghans, de Grip and van Smoorenburg, 1998; Hart and Shipman, 1990). A review of these studies shows that it is difficult to design a suitable methodology to measure and analyse the data related to skills shortages[1]. In many cases, the ambiguity regarding the concepts of "skill" and "shortages" has hindered the interpretation of those imbalances that really have an effect on the "work" factor (Senker, 1992).

The purpose of this research is to analyse the factors involved in the existence of hard-to-fill vacancies and external skills shortages in the hospitality sector in Andalusia. Moreover, the study of skills shortages within a specific sector is not very common; thus, the present paper helps to

[1] See Bosworth, Dutton and Lewis (1992) for a more comprehensive analysis of these problems and difficulties.

fill this gap in the current literature. To achieve this objective, we first defined the concepts of hard-to-fill vacancies and internal and external skills shortages vacancies. For the empirical analysis we used the database generated in the year 2000 for the research project "*Skills shortages, productivity, and wages in the hospitality sector in Andalusia*". This database was built via information collected through interviews with hospitality workers and managers in hotels and restaurants with more than 7 workers. In addition to providing data on the vacancies existing in the last 12 months in a given establishment and the level of difficulty to fill the vacancies, the survey contains information on the main causes for such difficulties. Two other statistical sources completed this database, which were used to construct all the relevant variables included in the estimation (see Appendix 1): *The Economic Yearbook for Spain, 2001*, published by LA CAIXA and the *Interactive Statistical Atlas of Andalusia* taken from the *Sistema de Información Multiterritorial de Andalucía* (SIMA), published by the Andalusian Statistic Institute (IEA).

This article is organised as follows: Section 2 defines the concepts of vacancy, hard-to-fill vacancies, and internal and external skills shortages. Section 3 introduces the model used to analyse the determinants of hard-to-fill vacancies and skills shortages vacancies, the econometric specification, and the variables used in the estimation. Section 4 provides the results obtained in the estimation, and the final section presents the main conclusions and implications for policy. Three appendices are also included. The first one provides the sample means and statistical source of the variables used, the second shows the occupational categories used in the survey

according to the functional areas and professional levels considered[2], and the last, the spatial distribution of hard-to-fill vacancies and skills shortages as a percentage of employees in Andalusia at the local (municipal) level.

2. Methodological considerations: A brief description

Our research follows the methodology designed for the United Kingdom Department for Education and Skills by the National Skills Task Force (1998 and 2000) and the subsequent empirical work developed in the Institute of Employment Research of the University of Warwick led by Hogarth, Shury, Vivian and Wilson (2001)[3]. Regarding terminology, however, we have followed the work of Bosworth and Warren (1992) to distinguish between skills shortages in the internal and external market.

Thus, we consider there are skills shortages when there is an obvious scarcity of suitably skilled workers in the labour market[4]. This shortage can be the result of a lack of workforce (when unemployment rates are very low) or due to the existence of skills and spatial mismatches in the labour market. We have also distinguished between two types of skills shortages:

1. Skills shortages in the external labour market (*external skills shortages*). This occurs when the difficulties in recruiting the labour force for a given job are due to a greater demand for skills than those available in the external labour market. In this study we consider skilled

[2] See Marchante, Ortega and Pagan (2005) and Marchante, Ortega and Sanchez (2004) for a discussion on the methodological aspects concerning the database used in this paper.
[3] A more detailed analysis of this section can be found in the paper with the same title and presented at the 34th Annual Conference of the Regional Science Association International (British & Irish Section) held at UCC in Cork (August 2004).
[4] Other definitions have been suggested and different types of skills shortages have also been identified (see Borghans, De Grip and Van Smoorenburg, 1998, ch. 2 and National Skills Task Force, 2000, p. 86).

workers as those performing jobs classified in categories I and II in the Spanish National Labour Agreement for the Hospitality Sector (see Appendix 2). Furthermore, not all vacancies for skilled workers are classified as skills shortages, but only those for which businesses have a medium to high level of difficulty to fill, according to employers' perceptions[5] (Haskel and Martin, 1993, p. 576-577) and when the difficulty is due to lack of skills — insufficient academic qualifications and/or professional experience, and/or a low number of job seekers (Hogarth, Shury, Vivian and Wilson, 2001, p. 8).

2. Skills shortages in the internal labour market (*internal skills shortages*). This kind of shortage takes place when employers consider that their current workforce has fewer skills than those required to achieve their firms' objectives, and/or the new workers, who are apparently trained and skilled, lack certain abilities and knowledge required for the position (see Bosworth and Warren, 1992, p. 27). On the other hand, *skills gaps* were defined as those situations where the respondent found skills shortages in the employee and professional categories. Therefore, the generic term 'skills gaps' includes internal skills shortages.

Together with the skills shortages perceived by employers, there may be *latent skills shortages* (Hogarth, Shury, Vivian and Wilson, 2001 p. 8). These shortages would include situations where employers do not state there are vacancies or else do not perceive them, simply because they are not aware of the level of skills required from their workers to optimise the results of their firm. Obviously, in addition to the difficulties already mentioned, companies encounter other problems regarding the worker recruitment process. Such situations are all grouped under the term *other recruitment difficulties* in this study, and include scenarios

[5] Perceptions of the senior person responsible for human resources or personal issues in the firm.

originating from inadequate selection processes regarding personnel, the sector's bad image, low wages, and unattractive labour conditions. These difficulties can occur even if there are a sufficient number of skilled workers who are available for the post; this is especially relevant to the hospitality sector (Jensen, 2001), as we pointed out earlier.

Table 1 summarises the type of recruitment difficulties encountered by companies, classified by category and level of difficulty.

[TABLE 1]

The information used to detect and analyse skills shortages and hard-to-fill vacancies in this study was obtained via face-to-face interviews[6] conducted by a structured survey, based on the Employers´ Manpower and Skill Practices Survey (EMSPS) from the United Kingdom. This survey, together with the guidelines for use, was obtained from the ESRC Data Archive from Essex University (1994).

3. Empirical model

Following Haskel and Martin (2001), let us assume that the propensity of a company *i* to have hard-to-fill vacancies or skills shortages can be expressed as [7]:

$$Y^*_i = X_i \beta + u_i \qquad i = 1 \ldots N \tag{1}$$

[6] For a futher discussion of the variety of methods used in previous works to detect skills shortages, see Marchante, Ortega and Pagan (2004).

[7] From now on, when we talk about skills shortages we are refering to external skills shortages as defined in section 2.

where Y^*_i is a non-observed variable representing the propensity of a given firm *i* to have hard-to-fill vacancies or skills shortages, X_i is a vector (1 x m) of *m* explanatory variables in the firm *i*, β is a vector (m x 1) of coefficients, and u_i the error term with a normal distribution averaging zero and a constant variance per unit. The probability of there being hard-to-fill vacancies or skills shortages can be modelled through the specification of a probit model based on the following binary observable variable:

$$Y_i = 0 \quad if\ Y^*_i < 0$$
$$Y_i = 1 \quad if\ Y^*_i \geq 0 \qquad (2)$$

where Y_i is equal to 1 when firm *i* has hard-to-fill vacancies or skills shortages. The probability for firm *i* to have hard-to-fill vacancies or skills shortages can then be expressed as (Maddala, 1983):

$$P_i = \text{Prob}\ (\ Y_i = 1) = \Pr\ [\ X_i \beta + u_i > 0] = \Pr\ [\ u_j > - X_i \beta\, u_j\ ] = \Phi\ (X_i \beta) \qquad (3)$$

where Φ is a normal distribution function. According to the expression (3), a probit model is estimated to analyse the impact of each explanatory variable on the probability of firms having skills shortages or hard-to-fill vacancies. The explanatory variables to be included in vector *X* are similar to those included in other works, such as Haskel and Martin (1993), Bosworth (1993) and Green *et al.* (1998). They can be classified by differentiating between those internal to the firm, and therefore under its control, and external ones, which are outside the firm's control (e.g. those related to local labour market conditions).

When analysing the existence and duration of a hard-to-fill vacancy or vacancies with skills shortages, we found that wages is one of the most important internal factors involved. According

to Mortensen (1970), a firm will fill a vacancy faster when it offers higher salaries to potential candidates. Based on this view, we estimated two types of salaries in these equations: *hourly net wages paid by the firm* to categories I and II (in logarithms), and on the other, *hourly net wages paid in the sector* in the region where the firm is located (provinces, NUTS III) to categories I and II (in logarithms). The expected results of the estimation are to obtain a negative sign for the firm's wages (i.e. the firm can increase the wages offered and thus reduce the number of hard-to-fill vacancies or vacancies with skills shortages), and a positive sign for the wages paid in the sector within the provincial area (which means that the higher the wages in the province the smaller the number of possible applicants to fill a position, given a certain wage offer from the firm)[8].

In addition to wages, the firm can have other internal characteristics attractive to applicants which may ultimately lead them to accept the job. Among these we can mention factors related to safety and occupational health, profit sharing, union support, better contracts, etc., (Haskel and Martin, 1993). In our case, and in line with the data available, the estimation includes *profit sharing*, the *year the business was set up*, and the *size of the firm*[9]. The time the firm has been in business as measured by the set-up year can influence the rate of hard-to-fill vacancies or vacancies with skills shortages. Thus, older firms can experience less difficulty in filling vacancies because of their better knowledge of the labour market and, therefore, they are more effective while searching for skilled labour. Furthermore, internal promotion of workers to higher positions might be more common in these firms than in newer businesses. Concerning the size of the firm, larger firms are expected to pay higher wages and the characteristics and labour

[8] It was not possible to include mean wages in the province as a explanatory variable for all production sectors because such data were not available for the year 2000.

[9] We also included a variable which measures the percentage of fixed term contracts over the total number of contracts issued by the firm. However, the coefficient estimated was not significant.

conditions associated with the position should be more attractive to potential applicants. However, we have to bear in mind that larger firms require a greater variety of jobs and thus they are more likely to have more hard-to-fill vacancies or skills shortages in one or more of these occupations.

The number of vacancies within the firm is also determined by demand growth (Haskel and Martin, 1993). In order to measure the demand growth of the firm, these authors used variables such as the firm's variation in sales and employment as well as if the firm was in a good financial position. Given that the only data about the firm available refers to the year 2000, it is impossible to calculate variations in sales and employment levels. However, we used an *Index of Business Activity for the year 1999* at the municipal level as a *proxy* variable for the demand growth of the firm[10]. In addition to the demand indicators, Haskel and Martin (1993) include in their model the relationship between capital and workforce and the *firm's productivity*[11]. In our case, the productivity of the firm was measured by the gross value added and wages ratio[12].

It has also been taken into account that hard-to-fill vacancies or vacancies with skills shortages can be temporarily filled by making more intensive use of existing skilled labour by overtime or part-time contracts. We have also initially included a variable which measured the *percentage of part-time workers* in the firm, although the coefficient estimated was not significant. The same results were obtained for the variable created to measure the level of work

[10] See methodology notes from The Economic Yearbook for Spain, 2001, published by La CAIXA. The value of the index expresses the participation in economic activity (at a ratio of 1/100) of each municipality over a national basis of 100,000 equivalent units.

[11] In our estimation we included the relationship between capital and workforce, but its coefficient was not significant in either of the equations.

[12] Productivity is measured in monetary terms because it is difficult to quantify inputs and outputs, especially the quality of the work factor. Besides this, monetary measures could indicate with greater precision the lack of tangibility and heterogeneity of the product, which are so characteristic of this service sector (see Ojasalo, 1999).

(in hours) of the existing workforce (*yearly worked hours over standardized staff*[13]).Two additional variables have been included in the equations. In order to qualify the firm's labour force, we included the variable *workers´ mean years of schooling*. We also included a variable to measure the *participation of workers in training courses* organised by the firm in the last 12 months. Regarding this, it can be assumed that a firm can increase the number of courses offered to existing and new employees when there is a high level of hard-to-fill vacancies or vacancies with skills shortages.

Regarding those factors external to the firm, and in accordance with the theory of job matching (Blanchard and Diamond, 1989; Burgess, 1992), the number of hard-to-fill vacancies and vacancies with skills shortages will depend on the number of vacancies for workers (skilled workers in the case of skills shortages), on the number of people looking for a job, and the effectiveness of the search process (Mortensen, 1986 and Pissarides, 1990). To take into account the potential workforce available to the firm, we also included in the estimations: the *rate of municipal unemployment* (in logarithms), the rate of *employment growth in the services sector between 1994 and 1998 at the provincial level* (in logarithms), and the *percentage of employment in the services sector in 1998 at the provincial level* (in logarithms). To take into account existing barriers to labour mobility affecting the willingness to move from one municipality to another, we included the local real estate prices for the year 2000 (in logarithms).

[13] Standardized staff was obtained by adjusting the firm's staff according to the type of contract the workers had (part-time *versus* full-time contracts).

Finally, two new variables were included as additional external factors. First, the *geographical area* where the firm is located: the capital of the province, and coastal and inland areas. A dummy variable was created for each area, the firm being located inland being the reference variable. With these dummy variables we attempted to include factors specific to local labour markets which are not included in other variables of the model. In addition, a variable was included to measure the *flow of foreign immigrants in relation to the total population officially residing in the municipality* during the year 2000 (expressed as percentages). This variable was included because Andalusia is a community that receives a high flow of immigrant workers, especially in the hospitality sector. If foreign immigration increases the skilled labour supply, the effect on the dependent variables will be a reduction in the number of hard-to-fill vacancies or those with external shortages (Department of Education, Science and Training, 2002).

4. Results

Descriptive analysis

According to Table 2, the mean number of vacancies in the last 12 months in the 292 firms we had information on was 10.89[14]. From the total number of firms, 88.7% reported at least one

[14] Question 2 in the survey was used to determine the total number of vacancies in the firms: "*Approximately how many new workers were contracted in the last 12 months for each post?*" Question 5 was used to determine the number of hard-to-fill vacancies : "*What level of difficulty did you encounter to fill vacancies, both through new contracts, post-shifting and promotion within the last 12 months?"* As shown in Table 1, hard-to-fill vacancies were those that the respondent claimed to have a medium or high degree of difficulty to fill for each post under consideration. External skills shortages was obtained from question 8: "*What level of difficulty did you encounter to fill vacancies within the last 12 months?"* When the difficulty was considered "high" or "medium", the cause was "lack of skills" or "low number of applicants", and when the occupation belonged to categories I and II, the vacancy was classified as presenting external skills shortages (see Table 1). Finally, internal skills shortages was obtained from question 3: "*Approximately how many workers changed their job or were promoted in the last 12 months for each occupation?*."

vacancy in the last 12 months and the percentage of such vacancies over the total number of employees was 27.84%[15].

[TABLE 2]

The mean number of hard-to-fill vacancies in the last 12 months was 6.17. The percentage of firms having at least one difficult-to-fill vacancy was 58.56%. This figure is lower than that obtained before for the mean number of vacancies due to the way the two variables were defined. The hard-to-fill vacancies as a percentage of the total number of employees and the total number of vacancies was 15.78% and 56.68%, respectively. The mean number of vacancies presenting external skills shortages was 2.65. The percentage of firms with external skills shortages was 43.15% and the percentage of vacancies with external skills shortages in relation to the total number of employees was 6.79%. Thus, we find a relative greater incidence of hard-to-fill vacancies than skills shortages as a percentage of both total employment and total vacancies.

The figures included in Appendix 3 present the spatial incidence of hard-to-fill vacancies and skills shortages as a percentage of employees at the municipal level in Andalusia. The greatest percentages of hard-to-fill vacancies can be found in municipalities located in inland areas (except for the capital of the provinces) and the coastal areas of the provinces of Huelva, Granada, Almeria and part of the province of Cadiz. These areas represent less experienced and

[15] It must be borne in mind that 11,418 (80.45%) of the existing employees in the sector worked in hotels and 2,232 (19.55%) in restaurants.

consolidated tourism destinations in the region, but at the same time they have undergone a strong increase in the volume of tourists in recent years. In contrast, the municipalities located in the costal area of the province of Malaga show a lower incidence of hard-to-fill vacancies. This area is a traditional tourism destination within Andalusia characterized by a well-developed hospitality sector, with high knowledge of the local labour markets and the skills requirements that the sector demands. These spatial differences detected within Andalusia can be also found when we analyse skills shortages vacancies. The coastal areas and the capitals of the province have a relatively lower incidence of skills shortages compared with inland municipalities.

Econometric results

The results obtained from the estimation of equation (3) using either hard-to-fill vacancies or vacancies with skills shortages as the dependent variable are given in Table 3[16]. The number of significant coefficients is lower in the equation for hard-to-fill vacancies as a dependent variable than in the equation for skills shortages. This fact shows that the factors having an effect on both variables are different in each case[17].

[TABLE 3]

[16] The preferred specifications for both equations are shown in Table 3. Different specifications were tested including other variables for which we had information in the database used, but they were discarded from the final specification because they were not significant. The final sample is lower than the total number of firms shown in Table 2 because there was not enough information for some of the relevant explanatory variables.
[17] See the work of Green *et al.* (1998) about the differences detected between both concepts in a British context.

One of the main results obtained in our estimation is that firms use wages as instruments to reduce hard-to-fill vacancies and vacancies with skills shortages. That is, those firms that pay higher wages have a lower probability of reporting hard-to-fill vacancies or vacancies with skills shortages. This could be due to the fact that firms paying higher wages receive more and better quality applications for the existing vacancies. The coefficient of the variable measuring the wages paid in the sector at the provincial level has the expected sign, but it is only significant in the equation for vacancies with skills shortages. In this equation, the sign obtained shows that higher wages at the provincial level increase the probability of firms having vacancies with skills shortages mainly due to the lower number of applicants for the vacancy (Haskel and Martin, 1993).

As the size of the firm increases, the probability of having vacancies with skills shortages increases with respect to the reference category (less than 10 workers), although the coefficient estimated for a firm with a size ranging from 10 to 19 workers is not significant. In this regard, we have to bear in mind that large organizations may be more likely to report skills shortages because they are more demanding of the skills required in the external labour market. However, regarding the equation for hard-to-fill vacancies, none of the dummy variables for size are significant. The year the firm was set-up has a positive effect on the two dependent variables but it is only significant for the hard-to-fill vacancies equation. The sign obtained shows that longer-established firms have less difficulty in filling their vacancies. As previously mentioned, this result is due to the fact that older firms have better knowledge of the labour market in the sector, and therefore are more effective when searching for a skilled workforce well-suited to the requirements of the post.

The variable that measures the average real estate prices in each municipality in the year 2000 (in logarithms) has the expected sign and is significant in both estimated equations. An increase in the real estate price hinders labour force mobility, and hence the match between demand and supply, which has a direct effect on the probability of finding hard-to-fill vacancies or vacancies with skills shortages.

The coefficient of the variable that measures economic activity has a negative sign and is only significant in the equation for skills shortages. In other words, an increase in economic activity between municipalities reduces the probability of finding hard-to-fill vacancies. Although the increase in economic activity generates a greater demand for work, this result can also be associated with the greater availability of skilled labour in the different economic sectors. Some jobs in the hospitality sector might be filled by people from other occupations, or those waiting for occupations in other sectors within the same municipality. The results of this variable is highly linked to the variable that measures unemployment rates. When the number of job seekers increases in the labour market, measured through the municipal unemployment rate (in logarithms), the probability of finding a vacancy with skills shortages decreases. The sign of this variable is the one expected in the equation of hard-to-fill vacancies but it is not significant.

The variables controlling a firm belonging to a chain or having foreign capital investment are not significant in either estimation. If the firm has offered some training courses in the last 12 months, the probability of finding hard-to-fill vacancies increases. However, this variable is

not significant in the equation for skills shortages. If the worker participates in profit sharing, the probability of having hard-to-fill vacancies or vacancies with skills shortages should diminish. The estimation yields coefficients with the expected sign (negative sign) for this variable although they are not significant. The variable that measures the productivity of the firm has a negative sign in both equations, and is only significant in the equation for skills shortages. The negative sign of this variable can be explained by the relationship between the firm's productivity and business management. In those firms where management at financial, economic, and human resources levels is effective and suitable, there are improvements at the production level, because there is better adjustment between labour and capital stock and greater satisfaction at work.

The coefficient of the variable included in the equations to measure the worker's mean years of schooling is positive but non-significant. The coefficients of the variables that measure the growth of the service sector at the municipality level and the percentage of employed workers in the services sector in relation to total employed population (both in logarithms) are not significant either. The coefficient of the indicator of the level of foreign immigration is negative but only significant in the skills shortages equation. This means that a greater weight of foreign immigrants within the total population of 'legally resident' [18] people in the municipality reduces the probability of there being a vacancy with skills shortages.

Finally, the probability of a firm experiencing difficulties in filling vacancies or vacancies with skills shortages also depends on the location of the firm, which allows us to control for specific local factors that are not considered by other explanatory variables of the model. In

[18] By "legally resident people" we mean those people who are registered in the town for taxes and other purposes.

coastal areas and in the capital of the province, the probability of skills shortages in relation to the reference category (inland areas) is smaller. In addition, when the firm is located in the capital of the province, the probability of finding a hard-to-fill vacancy decreases. This may be explained by the fact that capital cities have a better workforce from a quantitative and qualitative point of view.

5. Conclusions

We have detected factors internal and external to the company that can affect the probability of having hard-to-fill vacancies or vacancies with skills shortages. However, according to our results, the factors having an effect on such probabilities are not always the same and their impact varies too.

Hourly net wages are the main instrument firms have to reduce hard-to-fill vacancies and vacancies with skills shortages. However, there are factors specific to the firm and to the local conditions of the labour market which have an effect on the probability of firms reporting hard-to-fill vacancies and skills shortages.

We can see that a higher wage level in the sector at the provincial level only increases the probability of there being skills shortages. Similarly, the size of the firm has an effect on this probability, whereas it does not affect the probability of there being hard-to-fill vacancies. In addition, the probability of reporting skills shortages is lower in coastal areas and in the capital of the provinces. On the other hand, an increase in real estate prices hinders labour force mobility

and the adjustment between work demand and supply. An important difference between the two estimations is that the rate of unemployment and the activity indicator we used only have a significant effect on the probability for skills shortages, but both yield a negative sign. The same occurs with the variables measuring the productivity of the firm and the level of foreign immigration over the total officially resident population.

From these results we propose, following Hogarth and Wilson (2004), that current skills policy must stress the importance of employers in deciding what skills are required and how individuals must make decisions regarding the type and level of skills to which they aspire. In this sense, the Government should become an economic agent providing an infrastructure of information, advice, and guidance to help people make informed choices. Moreover, training providers should be responsible to informed demand for learning in terms of time, mode, pace, and place of learning. The main emphasis has to be placed on the demand side of the market for skills (better coordinated and more efficient). In this sense, it is important to consider that the firms surveyed report having great difficulties in filling vacancies in some occupations such as cook, barperson and receptionist. These difficulties affecting 'key' posts in the hospitality firms may impede the opening of new firms and the development of the hospitality sector in the region. Human resource managers often mention that, as a consequence of the loss of attractiveness and prestige in some jobs in the sector, young people do not consider these posts when making career decisons, in contrast to what has happened in the past. In many cases, hiring immigrants is the solution used by managers to overcome this problem.

However, there are additional factors external to the firm that effect the probability of reporting hard-to-fill vacancies and skills shortages. These factors are mainly associated with the housing market and especially with the opportunities that local markets offer to the skilled workforce. Thus, these kinds of factors have some important effects on the firm's human resources management and shows that the skills policy must take into consideration the explicit spatial context of the firm.

Finally, it has to be pointed out that one of the main limitations of the empirical work carried out in this study, based on cross-sectional data, is the problem of causal relationships. As suggested by Haskel and Martin, (1993, p. 585), when estimating a reduced form of equation (1) in these types of studies, the estimated correlations are consistent with several economic mechanisms. However, as these authors point out, we consider that the results of our study, where both external and internal factors are combined, offer an important step towards understanding the causes underlying the existence of regional hard-to-fill vacancies or vacancies with skills shortages within the hospitality sector.

References

Acemoglu, D. (2002). Technical change, inequality and the labor market, *Journal of Economic Literature*, 40, 7-72.

Baum, T. (2002). Skills and training for the hospitality sector: a review of issues, *Journal of Vocational Education and Training*, 54 (3), 343-363

Berman, E and Machin, S. (2000). Skill-biased technology transfer around the world, *Oxford Review of Economic Policy*, 16, 12-22.

Blanchard, O. and Diamond, P. (1989). The Beveridge curve, *Brookings Papers on Economic Activity*, 1, 1-76.

Bosworth, B. (1993). Skills shortages in Britain, *Scottish Journal of Political Economy*, 40 (3), 241-271.

Borghans, L., A. De Grip and M. Van Smoorenburg (1988). *Measuring skills shortages*, Research Centre for Education and the Labour Market. Maastricht University.

Bosworth, B., Dutton P. and Lewis, J (1992). *Skills shortages: causes and consequences*, London: Ashagate Publishing Company.

Bosworth, B. and Warren, P. (1992). Modelling skills shortages, in Bosworth, D., Dutton, P. and Lewis, J. (ed.), *Skills shortages: Causes and consequences,* Ashagate Publishing Company.

Burgess, S. (1992). A search model with job changing costs: Eurosclerosis and unemployment, *Oxford Economic Papers*, 44, 75-89.

Department Of Education, Science And Training (2002). *Nature and causes of skills shortages*, monograph, Australia Government .

ESRC Data Archive (1994). *Employers´ Manpower and Skills Practices Survey (EMSPS). User Guide*, University of Essex, Colchester, UK.

Giles, L. and Campbell, M. (2003). The productivity and skill challenge, *Industry and Commercial Training*, 35 (3), 99-103.

Green, F. and Ashton, D. (1992). Skills shortage and skill deficiency: a critique, *Work Employment and Society*, 6 (2), 287-301.

Green, A. and Owen, D. (2003). Skills shortages: local perspectives from England, *Regional Studies*, 37 (2),123-134

Green, F., Machin S. and D. Wilkinson (1998). The meaning and determinants of skills shortages, *Oxford Bulletin of Economics and Statistics*, 60 (2), 165-187.

Guerrier, Y. and Deery, M. (1998). Research in hospitality human resources management and organizational behaviour, *Hospitality Management*, 17, 145-160.

Hart, P. and Shipman, E. (1990). Skills shortages in the UK: evidence from surveys, *Discussion Paper*. London: National Institute

Haskel, J. and Holt, R. (1999). Anticipating Future skill needs: can it be done? Does it need to be Done?, *Skill Task Force. Research Paper 1,* Department of Education and Employment, UK.

Haskel, J. and Martin, C. (1993). The causes of skills shortages in Britain, *Oxford Economic Paper*s, 45, 573-588.

Haskel, J. and Martin, C. (2001). Technology, wages, and skills shortages: evidence from UK micro data, *Oxford Economic Papers*, 60 (2), 165-187.

Hogarth, T. and Wilson, R. (2004). *Skills in England 2003, key messages*, manuscript, Institute for Employment Research, Coventry: University of Warwick.

Hogarth, T., Shury, J., Vivian, D. and Wilson, R. (2001). *Employers skill survey 2001. Statistical report*, Institute of Employment Research, Coventry: University of Warwick.

Institute for Employment Research (2004). *The skills in England 2003*, IER, Coventry: University of Warwick.

Jensen, J. (2001). *Improving training in order to upgrade skills in the tourism industry*, Tourism and Employment, Final Report of Working Group B, European Commission.

Ladkin, A. (1999). Hotel general managers: a review of prominent research themes", *International Journal of Tourism Research*, vol. 1, 167-193.

Machin, S. and Manning, A. (1997). Can supply create its own demand? Implication for rising skill differentials?, *European Economic Review*, 41, 507-516.

Maddala, G. S. (1983), *Limited dependent and qualitative variables in econometrics*, Cambridge: Cambridge University Press.

Marchante, A., Ortega, B. and Pagan, R. (2004). Déficit externo de cualificaciones en la hostelería andaluza, *Temas Laborales*, Consejería de Empleo y Desarrollo Tecnológico, Junta de Andalucía, 74, 137-163.

Marchante, A., Ortega, B. and Pagan, R. (2005). Educational mismatch and wages in the hospitality sector, *Tourism Economics*, 11 (1), forthcoming.

Marchante, A., Ortega, B. and Sanchez, J. L. (2004). Desajuste educativo y movilidad laboral de los trabajadores en la hostelería en Andalucía, *Revista de Estudios Regionales*, 69, 57-88.

Mortensen, D. (1970). A theory of wages and employment dynamic, in E. Phelps (ed.), *Microeconomic Foundation of Employment and Inflation Theory*, New York: Norton.

Mortensen, D. (1986). Job search and labour market analysis, in O. Ashenfelter and R. Layard (eds.), *Handbook of Labour Economics*, vol. II, Amsterdam: North-Holland.

National Skills Task Force (1998). *Towards a National Skills Agenda. First Report*, Department for Education and Employment, UK.

National Skills Task Force (2000). *Skill for all: Research report from the National Skills test Force*, Department for education and Employment, UK.

OECD (2001). *Education Policy Analysis*, Paris: OECD.

Ojasalo, K. (1999). *Conceptualising productivity in services*, Hantren Suenka Nandelshogskolan, nº 75, Helsingtors.

O´Mahoney, M. and De Boer (2002). *Britain's Relative Productivity Performance*. Update to 1999, NIESR.

Pissarides, C. (1990). *Equilibrium unemployment theory*, Oxford: Basil Blackwell.

Senker, P. (1992). Skills shortages and Britain's international competitiveness, in Bosworth, D., Dutton, P. and Lewis, J. (eds.), *Skills shortages: Causes and Consequences*, Avebury: Aldershot.

Szivas, E., Riley, M. and Airey, D.(2003). Labor mobility into tourism: attraction and satisfaction, *Annals of Tourism Research*, 30 (1), 64-76.

White, H. (1980). A heteroskedasticity-consistent covariance matrix and a direct test for heteroskedasticity, *Econometrica*, 48 (4), 817-838.

Table 1. Classification of recruitment difficulties

	Type of difficulty	Level [1]	Professional categories involved [2]
External market labour	Vacancies (all)	High, Medium, Low, None	All
	Hard-to-fill vacancies	High, Medium,	All
	External skills shortages	High, Medium	Those included in Categories I and II
	Other recruitment difficulties	-	All
Internal market labour	Internal skill gaps	High, Medium, Low, None	All
	Internal skills shortages	High, Medium	Those included in Categories I and II
	Latent skills shortages	-	Those included in Categories I and II
	Other recruitment difficulties	-	All

Notes: [1] External labour market: level of difficulty to fill vacancies according to the perception of the firm. Internal labour market: differences between the skills of current employees and the skills employer considers to be ideal.
[2] Classification of occupations in professional categories (four levels) according to the Spanish Labour Agreement for the Hospitality Sector (see appendix 2).

Table 2. Incidence of vacancies, hard-to-fill vacancies and skills shortages. Year 2000

Total vacancies	Mean number of vacancies	10.89
	% of firms reporting vacancies	88.70
	Vacancies as % of employment	27.84
Hard-to-fill vacancies	Mean number of hard-to-fill vacancies	6.17
	% of firms reporting hard-to-fill vacancies	58.56
	Hard-to-fill vacancies as % of employment	15.78
	Hard-to-fill vacancies as % of vacancies	56.68
Skills shortages	Mean number of skills shortages	2.65
	% of firms reporting skills shortages	43.15
	Skills shortages as % of employment	6.79
	Skills shortages as % of vacancies	24.38
	Skills shortages as % of hard-to-fill vacancies	43.01

Source: Own data from the Research Project 1FD97-0858 database.

Table 3. Estimation of a probit model which takes a value of 1 if the firm reports hard-to-fill vacancies or external skills shortages. Year 2000.

	Hard-to-fill vacancies		***Skills shortages***	
	Coefficient	*t*	*Coefficient*	*t*
Log (hourly net wage paid by the firm)	-1.3228 *	-1.79	-1.1853 *	-1.62
Log (hourly net wage paid in the sector at the provincial level)	1.0381	1.24	2.0231 **	2.15
= 1 if the firm is located in the capital of the province	-1.1343 **	-2.01	-1.4480 **	-2.46
= 1 if the firm is located in the coast	-0.6675	-1.52	-1.6072 ***	-3.37
= 1 if the firm has between 10 and 19 workers	-0.0302	-0.08	0.6301	1.44
= 1 if the firm has between 20 and 49 workers	0.3439	0.85	0.9412 **	2.04
= 1 if the firm has between 50 and 99 workers	0.4717	1.05	1.3448 ***	2.62
= 1 if the firm has more than 100 workers	0.1685	0.31	1.6143 ***	2.63
Log (real state prices in the year 2000)	0.4533 **	2.42	0.4864 ***	2.56
Economic activity indicator at the municipal level in the year 1999	-0.0006	-1.60	-0.0011 ***	-3.24
Log (unemployment rate in the year 2000)	-0.6653	-1.31	-0.7974 *	-1.64
= 1 if the firm belongs to a chain	0.1285	0.51	0.3869	1.52
= 1 if the firm has foreign capital	0.2088	0.45	-0.4745	-0.94
= 1 if the firm offers training courses	0.5575 **	2.38	0.2393	0.98
= 1 if the workers participate in profit sharing	-0.0611	-0.25	-0.3042	-1.19
Productivity of the firm	-0.2385	-0.80	-0.6909 **	-2.30
Workers´ mean years of schooling	0.0549	0.93	0.0644	1.04
Log (growth rate of employment in the service sector between 1994 and 1998)	0.2062	1.26	0.1336	0.81
Foreign immigrants/legal residents in the year 2000	-0.3871	-1.12	-0.5642 *	-1.74
Log (% of employed people in the service sector in the year 2000)	-1.4006	-0.82	0.3475	0.21
Year the firm was set up	0.0106 *	1.63	0.0074	1.16
Constant	-18.4652	-1.21	-27.1244 *	-1.80
Log likelihood	-94.79		-90.72	
Chi ^{2}	28.87		40.69	
Pseudo R^2	0.1279		0.1889	
Number of firms	162		162	

Source: Database generated for the Research Project 1FD97-0858. Year 2000.
Note: (*) significant at 10%. (**) significant at 5%. (***) significant at 1%. Standard errors are robust regarding heteroscedasticity according to the method suggested by White (1980).

APPENDIX 1: Sample means and statistical source of the variables used.

	Mean	Source
Dependent variables:		Database generated for the Research Project 1FD97-0858
= 1 if the firm have hard-to-fill vacancies	0.6049	
= 1 if the firm have skills shortages vacancies	0.4630	
Independent variables:		
Log (hourly net wage paid by the firm)	7.0236	
Log (hourly net wage paid by the sector at the provincial level)	7.0542	
= 1 if the firm is located in the capital of the province	0.4691	
= 1 if the firm is located in the coast	0.3272	
= 1 if the firm is located inland, except for capital of the province (*)	0.2037	
= 1 if the firm has less than 10 workers (*)	0.0802	
= 1 if the firm has between 10 and 19 workers	0.2469	
= 1 if the firm has between 20 and 49 workers	0.3395	
= 1 if the firm has between 50 and 99 workers	0.2346	
= 1 if the firm has more than 100 workers	0.0988	
= 1 if the firm belongs to a chain	0.4074	
= 1 if the firm has foreign capital	0.0679	
= 1 if the firm offers training courses	0.5432	
= 1 if the workers participate in profit sharing	0.3519	
Productivity of the firm	1.4711	
Workers´ mean years of schooling	9.9663	
Year the firm was set up	1981.2	
Log (% of employed people in the service sector in the year 2000)	4.1474	Economic Yearbook for Spain from LA CAIXA, year 2001
Log (growth rate of employment in the service sector between 1994 and 1998)	2.5349	
Economic activity indicator at the municipal level in the year 1999	480.12	
Log (unemployment rate in the year 2000)	1.5622	
Log (real state prices in the year 2000)	14.3558	Interactive Statistical Atlas Andalusia (SIMA)
Foreign immigrants/legal residents in the year 2000	0.2723	

Note: (*) Category of reference used in the estimation of equation (1).

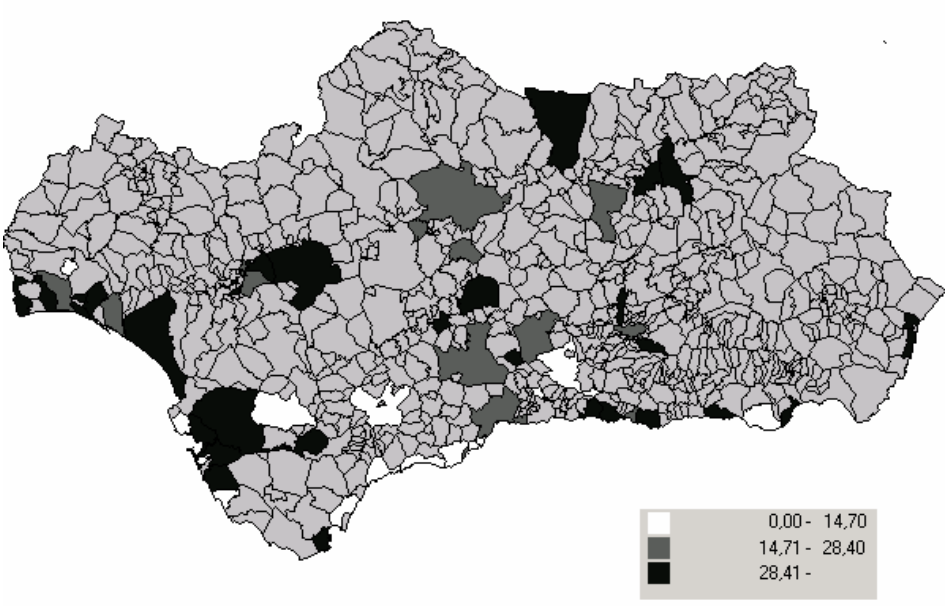
APPENDIX 2: Occupations by functional areas and professional levels (except for managing directors).

CATEGORIES/ LEVELS	*RECEPTION AND ADMINISTRATION* ***RA***	*KITCHEN* ***KT***	*RESTAURANTS* ***RE***	*CLEANING* ***CL***	*TECHNICAL SERVICES* ***TS***
I	Office manager Reception manager Staff manager Reception manager assistant Booking manager	Main chef Second chef	Bar or restaurant manager Maitre Second Maitre		
II	Receptionist Concierge Clerk officer Assistant clerk Accountant Secretary Telephonist	Cook Confectioner Wine cellar and stock officer	Waiter Bar person	Head room cleaner manager	Head maintenance officer
III	Assistant receptionist	Assistant cook	Assistant bar person	Room cleaner Laundry worker	Maintenance officer
IV	Bellboys	Dishwasher		Cleaner	Maintenance labourer

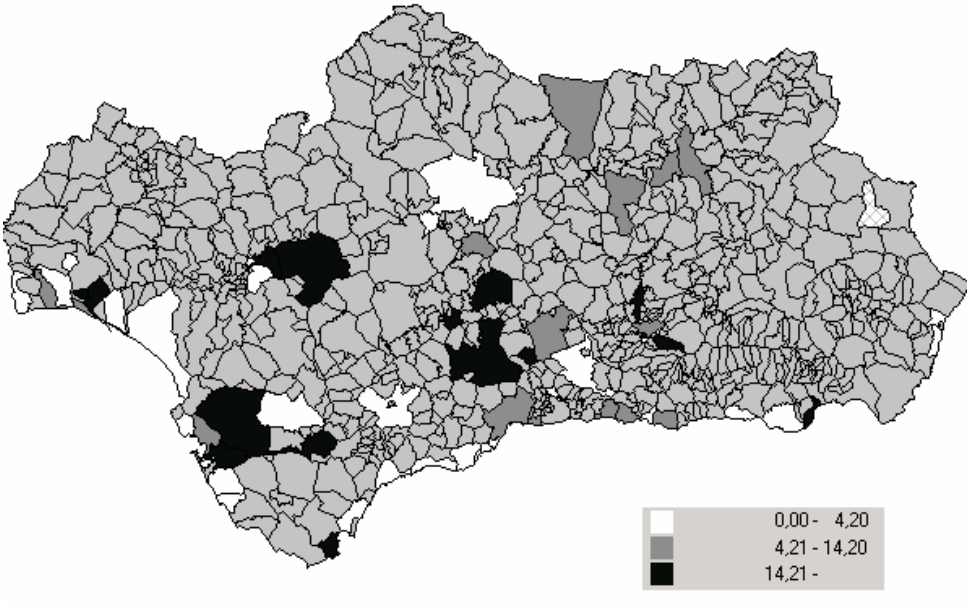
Note: 44 different occupations have been considered in the survey. These occupations are classified according to the responsibility levels defined in the Resolution of 24 June 1996 from the General Board of Work and Immigration of the Spanish Ministry of Work and Social Affairs published in the 'Nationwide Labour Agreement for the Hospitality Sector'. This is a more detailed classification than that considered by the OIT 'International Standard Classification of Occupations ISCO-88' published in 1991 (which only considers 3 different occupations within the hospitality sector).

APPENDIX 3: Spatial distribution of hard-to-fill vacancies and skills shortages as a percentage of employees in Andalusia (at municipal level). Year 2000.

Hard-to-fill vacancies (%)



Skills shortages (%)



Note: The municipalities which have been surveyed represent 59% of the total tourism supply in Andalusia. This percentage rises to 83% in the case of the province of Malaga. The non-surveyed municipalities are shown in grey in the map. Although they represent a large geographical proportion of the Andalusian territory, their participation in the supply of restaurants or hotels is very low. This is due to the high concentration of the supply in specific areas (especially in coastal areas).