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SUMARIO

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Labour flexibility and productivity in the andalusian lodging sector

Flexibilidad laboral y productividad en el sector de alojamiento de Andalucia

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ABSTRACT

The purpose of this paper is to analyze the effects of labour flexibility on productivity in the lodging industry in Andalusia. We use the data obtained by the *Quality, Productivity and Competitiveness in the Hospitality Industry for Andalusia* project. Our model distinguishes two employment shares: full-time permanent employees (standard work) and temporary and part-time employees (non-standard work). The results obtained suggest that numerical flexibility reduces labour productivity in the Andalusian hotels and the productivity of workers with temporary or part-time contracts is lower than productivity of workers with full-time permanent contracts.

RESUMEN

El objetivo de este trabajo consiste en analizar el posible impacto de la flexibilidad laboral sobre la industria de alojamiento en Andalucía. Para ello usamos los datos generados por el proyecto Calidad, Productividad y Competitividad en la Industria de Alojamiento en Andalucía. Nuestro modelo distingue entre trabajadores permanentes a tiempo completo (contrato estándar) y trabajadores que no cumplen una o ambas características (contrato no-estándar). Los resultados demuestran que tanto la flexibilidad numérica como los tipos de contrato no-estándar disminuyen la productividad del trabajo en los hoteles andaluces.

1. INTRODUCTION

Labour flexibility not only entails hiring temporary workers, but also includes other non-standard forms of employment such as part-time work or indirect hiring

through temporary job agencies. This practice is usually called numerical flexibility to differentiate it from functional flexibility[1] (Arvanitis, 2005) and it has the aim of adjusting workloads to meet service or production needs.

This kind of flexibility can be achieved by the use of internal or external strategies. Internal numerical flexibility can be achieved by the use of overtime and/or part-time contracts that allow people with other responsibilities to work (for example, women with family duties or college students) or by setting flexible working hours according to service or production needs. That is, the number of workers does not change when an internal numerical flexibility strategy is applied, but there is freedom to adjust and redistribute the number of hours worked according to production needs. External numerical flexibility involves the possibility of changing the number of workers according to production needs. Thus, external numerical flexibility can be achieved by the use of fixed-term contracts, which can be directly made by the firm or through temporary work agencies. Regarding workers who are mainly involved in tourism, in both cases numerical flexibility may entail less job security, lower pay, a lack of training opportunities, or decreased possibilities of being promoted to a permanent job (Malo & Muñoz-Bouillon, 2008).

In Spain, the temporary work rate –understood as the percentage of employees with temporary contracts in relation to total employees– was 26.15% in the third quarter of 2015 after peaking at 34% in 2006, reflecting the enormous vulnerability of this group of workers with this type of contract in the current economic cycle. The temporary work rate is even higher in certain economic activities such as the hotel industry, which is characterized by high seasonality. The temporary work rate reached 41.63% in the third quarter of 2015 (ITE, 2015). The phenomenon of temporary contracts mainly affects women, young people, and low-skilled workers (Jimeno, 2005). In the hotel industry, four out of ten women and three out of ten men have temporary contracts (Malo & Muñoz-Bullón, 2008). However, despite the high unemployment rate in Spain, in the third quarter of 2015, only 16.32% of all employees and 14.71% of employees in the accommodation sector had part-time contracts (IET, 2015). As in the case of workers with temporary contracts, the most vulnerable workers with fewer choices dominate the group with part-time contracts: women, low-skilled workers, and, according to the type of part-time job, immigrants (Pedraza et al., 2010) and also have a lower wage (García Pozo et al., 2011).

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1   Functional flexibility suggests that workers have the skills needed to perform the work required at any moment. By increasing the range of tasks that an employee can undertake, employers expect employees to be capable of working in different functions within the same department, or even of working between departments. Such an approach can lead to increases in skills, job satisfaction, more meaningful work, and enhanced career prospects for employees (Nickson, 2007).

Authors who support increased flexibility in the labour market argue that temporary and part-time work can significantly reduce hiring and firing costs (labour costs), and can therefore improve firm performance, generate more jobs, and reduce unemployment in the overall labour market (Booth et al., 2002; Morikawa, 2010, among others). Employment flexibility is considered necessary since it allows firms to adjust the number and types of skills needed to cope with fluctuations in demand. In contrast, opponents of numerical flexibility argue that employment flexibility is simply a labour cost-saving practice that is implemented at the expense of worker job security and that replaces workers with permanent full-time contracts with various nonstandard workers at lower wage rates (Dolado et al., 2002; Arvanitis, 2005, among others). Thus, from a theoretical perspective, and according to the empirical results presented in the literature, it cannot be definitively shown whether hiring part-time or temporary workers has a negative or positive effect on labour productivity. The following section presents a summary of the theoretical arguments for and against labour flexibility. As these arguments are inconclusive, a summary of the available empirical work is also presented.

However, none of the studies we know of and present in Section 2 have analyzed the impact of labour flexibility on labour productivity in the hotel industry. This was the aim of the present paper, which presents an empirical analysis of some determinants of labour productivity in the Andalusian hotel industry. The analysis includes as an explanatory variable the aggregate percentage of workers with part-time contracts and temporary contracts in relation to the total number of employees in each hotel. The number of workers with part-time or temporary jobs has been converted into full-time equivalent jobs; obviously, workers with full-time permanent contracts are defined according to the same procedure. Therefore, in this paper we intend to analyze the influence of the type of contract in the productivity of the hotels.

The rest of the paper is organized as follows: Section 2 presents the theoretical background and empirical evidence; Section 3 develops the econometric specification; Section 4 describes the database used in the analysis and presents the descriptive statistics; Section 5 presents the econometric analysis used to determine to what extent labour flexibility contributes to the variations in hotel productivity levels; and Section 6 summarizes the main conclusions of the paper.

2. THE STATE OF THE ART

Several arguments have been proposed in the literature to explain the impact of labour flexibility on productivity[2]. It has been suggested that labour flexibility in

2   The determinants of productivity in the service sector in general and the hotel sector in particular are addressed in the comprehensive doctoral thesis of Benavides-Chicón (Quality and Productivity

the form of temporary contracts contributes to improving labour productivity or its growth rate. Booth et al. (2002) have suggested that temporary contracts can provide a mechanism that enhances labour market flexibility, since firms can adjust their workforces by varying the number of temporary workers. The use of temporary contracts can also provide the firm with new workers who are employed for a specific probation period to test whether they are suitable for an open-ended job. This type of employment can have a positive impact on the firm's performance if temporary workers perceive that the probability of rehiring depends on their aptitude and work effort. Moreover, temporary contracts may provide the firm with workers who replace staff on leave due to maternity, sickness, and so on. This is particularly needed in the service industries, where there is a strong requirement to meet certain standards. These contracts may also encourage entrepreneurship and business start-up by using agencies to reduce the fixed costs of recruitment, training, and redundancy (Green, 2008).

Other authors suggest that temporary contracts may be a sign of a loose labour market. In such a setting, innovative firms would use temporary contracts as a cost-saving strategy because workers would be more likely to accept the job despite the nature of contract (Malgarini et al., 2011). In this way, temporary contracts allow innovative firms to quickly adapt to demand fluctuations, thereby increasing productivity through a reduction of labour hoarding. Serrano and Altuzarra (2010) provide evidence for this effect, showing that numerical flexibility has a non-monotonic relationship with both innovation activity and R&D activities. The probability that a firm will innovate increases as the rate of use of temporary workers increases, but this probability decreases beyond a certain threshold. Thus, the use of temporary contracts enhances productivity until a specific rate of total employment is reached.

Finally, although Hirshch and Steffen (2006) found that the use of temporary contracts to enhance flexibility or to screen job candidates also leads to increased productivity, they also found that temporary workers' lower firm-specific human capital and spill-over effects on the user's permanent employees may adversely affect productivity. They also found a robust hump-shaped productivity effect of the share of temporary workers.

Despite the previous arguments in favour of a positive relationship between temporary contracts and productivity, the use of temporary contracts may negatively impact the firm's performance. Dolado et al. (2002) showed that the main distinguishing feature of temporary contracts is that they reduce labour costs more than

in the Andalusian Hospitality Industry; 2012).Available at: http://riuma.uma.es/xmlui/bitstream/handle/10630/5049/Tesis%20Doctoral%20de%20Carlos%20Guillermo%20Benavides%20Chic%C3%B3n.pdf?sequence=1

other types of contract. It is accepted that they lead to job creation, but this mainly occurs in economic sectors in which productivity is lower and employee turnover is high. Thus, the use of temporary contracts may have a negative impact on both job security and incentives to accumulate human capital and therefore on productivity.

Lucidi & Kleinknecht (2010) stated that labour market deregulation and wage flexibility facilitate the survival of less innovative companies that base their strategy on reducing labour costs. Although this strategy is favourable for maintaining employment –at least in the short-term– it could lead to an overall reduction in the quality of management and in the loss of innovative dynamism. Moreover, workers threatened by a hire-and-fire strategy have strong incentives to hide information that their work could be more efficient, thus discouraging R&D investments and innovation. In addition, these authors suggest that if the contract period is limited, the negative impact of numerical flexibility on training and human capital accumulation may be caused by employers being reluctant to invest in temporary workers' human capital, simply because the payback period is too short. In addition, the workers would show no interest in acquiring specific human capital if they considered that their tenure with the company would be short. Moreover, numerical flexibility may negatively affect firm performance by discouraging innovative activity and decreasing efficiency gains; a high labour turnover rate and low cost of dismissal might be interpreted as a strategy that reduces investment in trust, loyalty, and commitment. This could lead to decreased productivity due to the increased cost of monitoring and control and in the leakage of knowledge to competitors.

In the case of Spain, Sánchez and Toharia (2010) showed that an increase in the proportion of fixed-term workers has a negative effect on the firm's average level of effort because a fixed-term contract is less likely to be converted into a permanent contract. Ortega & Marchante (2010) showed that if labour turnover is low, then productivity will also be low, because the efficient reallocation of the productive factor would occur more slowly from jobs with lower productivity to those with higher productivity. Conversely, very high labour turnover would discourage both workers and employers from investing in training, thus making the accumulation of human capital more difficult. Therefore, temporary contracts would have marked effects on worker productivity due to their impact on job turnover.

However, the use of part-time contracts and their impact on productivity has generated theoretical arguments against those outlined above. For instance, Human Capital Theory, as pioneered by Becker (1964), suggests a negative relationship between part-time employment and productivity. This theory states that firms will invest in workers' human capital only if the expected rate of return exceeds the cost of investment. Thus, in relation to training decisions, the return period is the key factor that predicts whether firms will hire part-time workers or full-time workers (Backes-Gellner et al., 2011). Part-time workers will participate less in training because both

the workers and the firm have less time to benefit from their investment in training. The human capital argument holds for both formal and informal learning (Nelen & de Grip, 2009). Empirical research tends to support the hypothesis of Human Capital Theory. Jepsen (2001) showed how, in general, part-time women workers have a low level of human capital compared to full-time women workers and that their work is less valued. Maximiliano and Oosterbeek (2007) found that the workers' likelihood of training increases when contractual hours increase. Backes-Gellner et al. (2011) found significant gender differences in access to employer-provided training: whereas there were only minor differences between part-time and full-time women workers, part-time male workers experienced serious disadvantages. Finally, Connolly and Gregory (2008) showed that one-quarter of women moving from full-time work to part-time work are downgraded. Their findings indicate that economic efficiency is lost due to the skills of many part-time workers being underused.

Oi (1962) provided another argument against the use of part-time work: labour costs are effectively fixed, which implies that part-time work will be paid less per hour because it involves a relatively high cost to the firm per hour of work. This argument ignores the influence of the number of productive hours. Barzel (1973) suggested that many jobs involve a set-up cost, which implies that productivity only slowly picks up during the working day. Given that productivity during the final working hours could be greater than during the initial hours, the use of part-time contracts could have a negative impact on productivity.

Finally, the expectations of managers may not be fulfilled when employees change their status to a part-time contract, thus adversely affecting the effectiveness of flexible work policies (Stanworth, 1999). For example, Edwards and Robinson (2000) suggested that if opportunities for part-time work are to be significantly extended beyond the boundary of secondary labour markets, then employers would have to recognize the difficulties of fitting non-standard workers into inflexible systems designed for full-time employees. The move from full-time work to part-time requires a flexible approach that involves redesigning the full-time and part-time jobs to integrate a different temporal contribution and avoid assigning part-time workers to the same functions they fulfilled as full-time workers.

However, some theoretical arguments suggest that the use of part-time contract increases productivity. On the one hand, part-time contracts make it possible to divide working time between a larger number of workers and substantially increase the number of workers employed without increasing costs. The use of part-time contracts often means that employers have greater numerical flexibility at their disposal. Shepard et al. (1996) suggest that the use of flexible contracts could increase productivity and wages. As presented in subsequent sections, many authors have found a positive relationship between productivity and part-time work (Roux, 2007; Nelen et al. 2009, among others). On the other hand, employing part-time workers

TABLE 1
IMPACT OF LABOUR FLEXIBILITY ON PRODUCTIVITY

Authors	Year	Country	Type of contract	Sector/Industry	Data	Impact
Sánchez and Toharia	2000	Spain	Temporary	Manufacturing	Firm-level	Negative
Martín	2000	Spain	Temporary	Manufacturing	Firm-level	Negative
Khan	2000	USA	Non-standard work*	Private sectors	Industry-level	Inconclusive
Perotin and Robinson	2000	U.K.	Part-time	Trading sector	Firm-level	Inconclusive
Díaz-Mayans and Sánchez	2004	Spain	Temporary	Manufacturing	Firm-level	Negative
Arvanitis	2005	Switzerland	Temporary	Industry	Firm-level	Inconclusive
Arvanitis	2005	S Switzerland	Part-time	Industry	Firm-level	Negative
Kleinknecht et al.	2006	Holland	Temporary	Manufacturing and services	Firm-level	Negative
Boeri and Garibaldi	2007	Italy	Temporary	Manufacturing	Firm-level	Negative
Roux	2007	France	Part-Time	Private sectors (excluding Agriculture, Banking, Insurance and Real Estate sectors)	Firm-level	Positive
Nelen et al.	2009	Holland	Part-time	Pharmaceutical sector	Firm-level	Positive
Ortega and Marchante	2010	Spain	Temporary	All sectors	Regional data panel	Negative
Morikawa	2010	Japan	Temporary/Part-Time	Mining, Manufacturing, Electricity & Gas, Wholesale, Retail and several services industries	Firm-level	Positive
Lotti and Viviano	2011	Italy	Temporary	Manufacturing	Firm-level	Negative
Bardazzi and Duranti	2012	Italy	Temporary	Industry, construction and services	Firm-level	Negative

TABLE 1
IMPACT OF LABOUR FLEXIBILITY ON PRODUCTIVITY (CONCLUSION)

Authors	Year	Country	Type of contract	Sector/Industry	Data	Impact
Hirsch and Mueller	2012	Germany	Temporary/Agency work	Industry	Data panel	Non-linear hump-shaped relationship
Lasinio and Vallanti	2013	Italy	Temporary	Sectoral level	Data panel	Negative
Specchia and Vonbenberge	2013	Belgium	Part-time	Private Sectors		Negative (except for short term in the retail and trade industry)
Roca-Puig et al.	2015	Spain	Temporary	Industry	Firm-level	Negative

Note: (*) People employed by temporary work agencies and contract companies, on-call employees, and all additional workers who do not fall into one of these categories but expect their jobs to last for less than 1 year for non-personal reasons (Khan, 2000).

might be beneficial for firm productivity when the operating hours exceed the contracting hours or when there are peak hours in customer demand (Delsen, 2006).

The above notwithstanding none of the studies we know of and present in this section have analyzed the impact of labour flexibility on labour productivity in the hotel industry. In present paper, we present an empirical analysis of some determinants of labour productivity in the Andalusian hotel industry, where we have tried to verify the influence of labor flexibility in labour productivity in this sector.

Finally, part-time employment allows for a balance between work and life, especially among women with family duties or college students, which could lead to an increase in productivity. There is also some evidence that part-time work reduces stress (a phenomenon arguably related to multiple duties at work and home). For instance, Lee and Kim (2008) suggest that managers are interested in reducing the workday with the aim of retaining human capital, in particular among top talent. Other studies have suggested that the provision of a better balance between work and life by employers is associated with significantly higher productivity and self-assessed performance (Bloom et al, 2009).

The available empirical evidence has to be examined given that theoretical perspectives are unable to definitively indicate the relationship between labour productivity and the use of part-time contracts and temporary contracts. We do not offer an exhaustive analysis, but summarize the main results of recent papers.

Empirical studies on the effect of part-time and temporary employment on productivity have described a wide range of results. Depending on the country or industry, the approach used, and the econometric specification, the studies report positive-, negative-, or non-statistically significant effects. Most of the studies shown in Table 1 use the share-approach, which is also the approach used in this study. However, in some studies (e.g. Arvanitis, 2005), the measure of labour flexibility is calculated using dummy variables indicating whether part-time and temporary work are important within the firms.

In other cases, the effect of labour flexibility on productivity is non-linear or does not affect all the economic sectors in the same way. Thus, in the case of Germany, Hirsch and Mueller (2012) found a non-linear hump-shaped relationship between productivity and temporary employment with a maximum positive effect for firms hiring a share of above 11% of temporary workers over the total workforce. In the case of Japan, Morikawa (2010) suggested that the ratio of non-standard employees has a positive relationship with productivity and that the coefficients of non-standard workers are larger in highly volatile firms.

The study by Khan (2000) suggested that in the case of the USA the results differ according to the database used, whereas in the case of Belgium the use of part-time contracts has a different impact on productivity depending on the length of the contract as well as the activity sector.

Finally, we draw attention to the results obtained by Lassinio and Vallanti (2013) for the case of Italy. These authors suggest that the increase in labour flexibility due to the use of temporary contracts has decreased productivity in all sectors and has had a stronger impact on those sectors with a greater technological need for flexibility and lower skill contents.

3. ECONOMETRIC SPECIFICATION

The conventional theory of economic growth or neoclassical growth model developed by Solow (1956) suggests that generally production will depend on the amount of labour employed (L), the amount of fixed capital (K), and the available technology (i.e., the overall efficiency of labour and fixed capital applied to the production process). Subsequently, Mankiw, Romer & Weil (1992) noted that other factors, such as human capital, can affect the growth of production. Based on the information available on the hospitality industry, we extend the standard Cobb-Douglas production function used by Solow by distinguishing between part-time, temporary, and full-time labour inputs. We follow Brown and Medoff (1978), Ilmakunnas and Maliranta (2005), and Nelen et al. (2009) in the way they model the productivity effects of different employment shares. This so-called share-approach to the inclusion of heterogeneous labour inputs assumes that although different types of employees are perfect substitutes, they may have different marginal productivities. We divide the workforce into two employment shares: full-time permanent employees and temporary and part-time employees. Thus, in our case, the variable used to measure nonstandard (NS) work is the aggregate of part-time[3] and temporary work. Taking full-time permanent contracts as our reference group, and scaling its productivity to one, the relative productivity of the nonstandard employment share equals (γ_{ns}^{-1}). The number of part-time, temporary, and full-time permanent employees is calculated in terms of full-time equivalent filled jobs. The quality-adjusted labour input is therefore:

$$L^* = L\big[1 + (\gamma_{ns}\text{-}1)NS\big] \tag{1}$$

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3   We used a conceptualization of non-standard contracts that included all those that were not permanent full-time, for three main reasons: first, because we think that temporary contracts and permanent part-time contracts in the hotel sector, as a whole, generally exert a much stronger downwards pressure on productivity, for the reasons outlined in the text. Second, by the limited weight in our sample of the permanent part-time contracts (the average is 2.6%). Third, moreover eliminating the category of permanent part-time contracts from the aggregation of non-standard contracts, results would not differ significantly from robust estimation showed in this paper.

where   is the quality-adjusted labour input and   is the total number of full-time equivalent filled jobs.

Equation 1 can be simplified using the following expression:

$$ln[1 + (\gamma_{ns} - 1)NS] \approx (\gamma_{ns} - 1)NS \qquad (2)$$

The nonstandard employment share is thereby directly included in a log-form production function. Using L*, the production function is written as follows:

$$Y = AK^{\alpha}L^{*\beta} \qquad (3)$$

where represents the Gross Value Added (GVA), is the stock of physical capital, and A is a mathematical constant that reflects the cumulative effect of changes in the production function as a result of technical progress.

or in logs and using the expression in equation (2):

$$\ln(Y) = \theta + \alpha \ln(K) + \beta \ln(L) + \gamma_{ns}^* NS \qquad (4)$$

where $\theta = \ln(A) \; and \; \gamma_{ns}^* = \beta(\gamma_{ns} - 1)$

If γ_{ns} is greater than 1, this type of nonstandard employment is more productive than full-time permanent employment; if γ_{ns} is less than 1, the opposite holds. Brown and Medoff (1978) interpret (γ_{ns}-1) as the productivity differential of this group of workers and β (γ_{ns}-1) as the productivity differential of establishments.

The proposed empirical equation to be estimated is as follows:

$$Ln\left(\frac{Y}{L}\right)_i = \theta + \alpha Ln K_i + (\beta - 1)Ln L_i + \gamma_{ns}^* NS_i \qquad (5)$$

If it is further assumed that the models described present constant returns to scale L and K (that is,) –because as Solow (1956) suggested there are reasons to assume that for many real situations the Cobb-Douglas production function is a credible production function that has constant returns to scale– expression (5) is reduced to

$$Ln\left(\frac{Y}{L}\right)_i = \theta + \alpha Ln\left(\frac{K}{L}\right)_i + \gamma_{ns}^* NS_i \qquad (6)$$

The equations to be estimated are obtained by adding a vector of control variables to expressions (5) and (6), as well as random disturbance independently distributed as N~(0, ϑ^2) with ϑ^2 being constant. The additional variables considered in this study are introduced in the empirical model to control the observed heterogeneity related to the specific characteristics of the hotels in the sample.

4. DATA DESCRIPTION AND DESCRIPTIVE ANALYSIS

The database was created as part of the *Quality, Productivity, and Competitiveness in the Hospitality Industry for Andalusia* project[4]. After discarding the questionnaires[5] that had not been correctly completed this database includes representative parameters from 181 Andalusian hotels (75 rated as 3 star, 96 as 4 star, and 10 as 5 star) offering a total of 47881 beds representing 26.16% of the total beds offered by these types of establishments in Andalusia at the end of 2009. These parameters were obtained from semi-structured questionnaires administered to the hotel managers by the researchers. According to SIMA (the Multiterritorial Information System of Andalusia), which was created by the Institute of Statistics and Cartography of Andalusia, there were a total of 822 establishments in these categories in Andalusia in 2009, and thus the database provides direct information on 22.02% of all hotels in the region. Given that Andalusia is very large, we took the distribution of the sample into account bearing in mind the relative importance of the hotel sector in each province. In addition, we included control variables to identify establishments according to their location (coastal, inland, or capital city). Of the eight Andalusian provinces, four (Almeria, Malaga, Cadiz, and Huelva) have capital cities on the coast. In these cases, the establishments were classified as being located in a capital city rather than on the coast. Finally, other control variables were included that reflect the establishments' structural and management characteristics.

The fieldwork for the study was conducted in person by researchers from the universities of Malaga, Granada, and Seville in 2009 and 2010. The economic data was obtained directly via questionnaires and the annual accounts filed by firms in the Mercantile Registry.

A directory of the hotels to be surveyed was created using the Turespaña Hotel Guide, which lists certified hotels published by the local government of Andalusia (i.e. the Junta de Andalucía) and Camerdata, a company founded by the Spanish Chamber of Commerce for creating business databases that include the censuses of all Spanish Chambers of Commerce.

Table 2 shows how levels of apparent labour productivity vary according to the main features of the 181 hotel establishments whose data were used in the empirical analysis. These features are related to the size of establishments (number of full-time equivalent workers and number of rooms), the level of services rendered (hotel category), geographic location (coastal, in the capital of a province, or inland), other

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4   This project collects data only for 3, 4 and 5 stars hotels because we believed they were the most appropriate for our aims and also allowed us to verify their economic data in the Mercantile Registry.
5   The non-response rate in the sample was 20.86% and 6.44% of sampling error.

factors linked to specific aspects that could influence their management activities and service marketing (belonging to a chain and outsourcing some of the services provided to customers or services that are used in their production activities as intermediate inputs) and, finally, whether the establishment is a family business or its capital is fragmented among various stakeholders not belonging to the same family or their representatives.

The results presented in Table 2 are simply descriptive, since the differences detected in the levels of productivity of the establishments cannot be solely attributed to the factor adjusted for, since this factor may be correlated with other relevant factors mentioned above or with another factor that has been omitted.

Firstly, the results show that the average level of apparent labour productivity was estimated to be € 34,311.39, as measured by the ratio of Gross Value Added generated by the establishment and the number of full-time equivalent jobs in 2008. This figure is very similar to the € 35,227 per worker that was estimated in the Annual Services Survey compiled by the Spanish National Institute of Statistics for 2008, and thus there is a high degree of consistency between the two data sources. Taking as a reference the average of the sample used in this work, the most productive hotels are those have a workforce of 50 or more employees, with between 100 and 199 rooms, have 4 stars, belong to a chain, are not family businesses, are located in the capitals of provinces, and outsource some of their services.

These differential features of the hotels may explain the observed differences in productivity levels. However, in the subsequent econometric analysis, these determinants have to be controlled to determine whether, all being equal, the variable representing labour flexibility –the percentage of nonstandard work– could explain some of the variability in productivity observed in the establishments analyzed.

TABLE 2
APPARENT LABOUR PRODUCTIVITY OF THE HOTELS ACCORDING TO CERTAIN DETERMINANTS (INDEX NUMBERS. MEAN VALUE OF THE TOTAL SAMPLE = 100)

	GVA/Number of full-time equivalent jobs (at 2008 prices)		Number of establishments	% of the total in each group
	Mean	Standard deviation		
Sample	34311.39	20359.81	181	
Number of full-time equivalent workers				
Less than 20 workers	97.32	142.89	63	(34.81)
Between 20 and 49 workers	99.03	64.32	60	(33.15)
50 or more workers	103.92	70.84	58	(32.04)
Number of rooms				
Less than 50 rooms	83.48	91.87	49	(27.07)
Between 50 and 99 rooms	94.27	56.09	45	(24.86)
Between 100 and 199 rooms	117.37	154.80	40	(22.10)
200 or more rooms	107.92	71.79	47	(25.97)
Establishment category				
3 Stars	82.84	52.09	75	(41.44)
4 Stars	113.37	124.72	96	(53.04)
5 Stars	100.40	33.31	10	(5.52)
Chain or non-chain hotel				
Non-chain	86.90	118.64	70	(38.67)
Chain	108.26	83.84	111	(61.33)
Ownership				
Family owned	96.92	112.09	117	(64.64)
Corporate ownership	105.62	72.79	64	(35.36)
Establishment location				
Capital of a province	114.23	131.45	78	(43.09)
Inland	78.38	47.67	29	(16.02)
Coastal	93.47	65.53	74	(40.88)
Outsourcing of services				
Not outsourced	85.85	50.17	46	(25.41)
Outsourced	104.82	111.02	135	(74.59)

Source: Quality, Productivity and Competitiveness in the Hospitality Industry Project [PO7/SEJ-02889].

We now present the variables included in the econometric analysis. As mentioned, the GVA was used to calculate apparent labour productivity because this measure is not distorted by differences in the degree of outsourcing by hotels (Baker & Riley, 1994) in the way that total revenue would be. The number of full-time jobs was used as a measure of the labour factor. Each establishment's stock of physical capital was estimated using the number of rooms. Brown and Dev (2000) justified the use of this measure by analogy with the common practice of using selling space (i.e., the capital investment made in the physical size of the establishment) as a measure of capital input in the analysis of retail productivity. The number of rooms was also used as a proxy of the establishment's capital stock by Claver-Cortés et al. (2008) and Pereira-Moliner et al. (2010).

TABLE 3
DESCRIPTIVE STATISTICS OF THE VARIABLES USED IN THE ESTIMATION

Variable	Units	Mean	S. D.
GVA/Number of full-time equivalent jobs (at 2008 prices)	Euros	34311.39	20359.81
Number of rooms	Number	141.92	147.39
Number of full-time equivalent jobs	Number	46.98	45.90
Percentage of workers with nonstandard contracts	% workers	45.44	0.29
Establishment category	Stars	3.64	0.59
Dummy = 1 if the establishment belongs to a chain; otherwise = 0	% of establishments	61.33	0.49
Dummy = 1 if the establishment is a family business; otherwise = 0	% of establishments	64.64	0.48
Dummy = 1 if the establishment is located in the capital of a province; otherwise = 0	% of establishments	43.10	0.50
Dummy = 1 if the establishment is located inland; otherwise = 0	% of establishments	16.02	0.37
Dummy = 1 if the establishment is located on the coast; otherwise = 0	% of establishments	40.88	0.49
Dummy =1 if the establishment outsources services; otherwise = 0	% of establishments	74.59	0.44

Source: Quality, Productivity and Competitiveness in the Hospitality Industry Project [PO7/SEJ-02889].

Taking into account the previous descriptive analysis, the equation to be estimated includes a vector of control variables that represents the most important characteristics of the hotels for which we have information. These variables, which are shown in Table 3 together with the other variables that form the model, are used to control specific characteristics of the establishments and their management. These variables are as follows:

Establishment category. To control the level of services offered by the hotel, the variable *Category* is used to indicate the hotel's star rating (between 3 and 5 in the sample).

Membership of a chain. A dummy variable (*Chain*) is used that takes a value of 1 if the hotel belongs to a chain.

Family business. A dummy variable (*Family-owned*) is used that takes a value of 1 if the hotel is a family business. An establishment is considered a family business if most of the shares belong to the member or family members who founded the company or are owned by the person who has acquired the company's share capital or by their spouse, parents, children, or their direct heirs. In the case of listed companies, the establishment is considered a family business if the person who founded or acquired the company, or their relatives or descendants, owns at least 25% of the share capital. As shown in Table 3, 64.64% of the sample can be considered family businesses.

Location. Based on the available data, three dummy variables are used to represent the hotel's location: coastal, in the capital of a province, or inland. As there was no significant statistical difference between the first two variables in the econometric analyses, a dummy variable was introduced in the model that takes a value of 1 if the establishment is located inland (*Inland*).

Outsourcing. Finally, a dummy variable (*Subcontracted services*) is used to adjust for the fact that the establishment outsources some services that it uses or provides.

Together with these variables, and in line with the theoretical model presented, the percentage of full-time equivalent jobs held by workers with temporary and/or part-time contracts (*Nonstandard work*) is included in the econometric specification as an explanatory variable. The jobs held by part-time workers have been converted into full-time equivalent jobs assuming that the part-time employee works, on average, half the time of a full-time worker. We adopted this approach since there was no record in the available database of the number of hours worked. This assumption seems reasonable, given that some part-time workers work almost as many hours as a full-time worker, whereas others work only a few hours a week (Brown & Dev, 2000). As shown in Table 3, 45.44% of full-time equivalent jobs are held by workers with temporary or part-time contracts. Based on estimated data provided by the Labour Force Survey conducted by the Spanish National Institute of Statistics, the

Institute of Tourism Studies (2011) estimated that in 2010 the percentage was 44.7% in the accommodation industry. Although these findings are not strictly comparable, given that the EPA did not compute employment as full-time equivalent jobs, the figure derived from the sample used may slightly overestimate the relative importance of temporary and/or part-time work. It should also be taken into account that the sample used in the present study only included hotels with three stars or more.

5. RESULTS

Table 4 presents the results of estimating econometric specifications (5) and (6) by Ordinary Least Squares (OLS) regression. This economic specification was extended to include those variables that appeared to be potential determinants of hotel productivity in the descriptive study and discussion presented in section 4.

The explanatory capacity of the model is acceptable, since the adjusted R^2 has a value around 20% in the equations used. In addition, the F-test of overall significance of the regression model show statistically significant results and we used the White method to correct the effects of heteroskedasticity. For all these reasons, the estimated results of our linear regression model are robust.

Firstly, the estimated values for the elasticities of output in relation to the productive factors considered (labour and physical capital) are in line with those obtained in previous studies (Brown & Dev, 2000; Ortega & Marchante, 2010; Marchante & Ortega, 2012). The elasticity, α, in relation to capital as measured by the number of rooms, ranges from 0.2556 in equation 1 to 0.2262 in equation 3. The elasticity, β, in relation to labour as measured by the total number of full-time equivalent jobs, is 0.7706. The elasticities of the GVA in relation to the production factors suggest constant returns to scale. In fact, when the model imposes the restriction of constant returns to scale, the result obtained by the corresponding Wald test for linear restrictions yields a value by which the null hypothesis (H_0: $\alpha+\beta= 1$) cannot be rejected for equation 1. In addition, the remaining estimated coefficients for the other variables in the model barely changed. This result is consistent with results obtained by Brown and Dev (2000), Ortega and Marchante (2010), and Marchante and Ortega (2012), who also found empirical evidence indicating constant returns to scale in the hotel industry. It is also worth noting that these researchers use a monetary variable for the stock of physical capital, calculated according to its reinstallment value.

TABLE 4
DETERMINANTS OF APPARENT LABOUR PRODUCTIVITY

	(1)	(2)	(3)
LnK	0.2556*		
	(0.0764)		
LnL	- 0.2294**		
	(0.0900)		
LnL-LnK		0.2491*	0.2262*
		(0.0769)	(0.0724)
Nonstandard work	- 0.2680**	- 0.2504**	
	(0.1224)	(0.1227)	
Category	0.1213***	0.1404**	0.1526*
	(0.0668)	(0.0549)	(0.0557)
Chain	0.1751**	0.1906*	0.1573**
	(0.0699)	(0.0645)	(0.0727)
Family-owned	-0.0871	-0.0852	-0.0885
	(0.0593)	(0.0588)	(0.0597)
Inland	- 0.1270***	- 0.1376***	- 0.1408***
	(0.0754)	(0.0726)	(0.0751)
Subcontracted services	0.1683*	0.1658*	0.1522**
	(0.0596)	(0.0602)	(0.0617)
Cons	9.4899*	9.5014*	9.4016*
	(0.2392)	(0.2391)	(0.2468)
Obs.	181	181	181
R^2 adjusted	0.2098	0.2129	0.1918
F test	(8,172)7,56*	(7,173) 8,56*	(6,174) 9,38*
RSS	27.3485	27.4000	28.2970
Wald Test for lineal restrictions: H_0: $\alpha+\beta=1$	0,22 (0,6359)		

Note: Significant at: * 1%, ** 5%, and *** 10%. White-corrected standard errors are in parentheses.

Second, the following results were obtained regarding the characteristics of the hotels:

- The establishment category, measured by the number of stars, increases labour productivity. Specifically, labour productivity is increased by between 12.13% and 15.26% for each additional star. Thus, hotels that offer a higher level of service, identified by their category, are able to generate greater value added and, as suggested by the estimated result, achieve higher levels of productivity.
- The fact that an establishment is a member of a chain entails an increase in productivity that ranges from 21% in equation 2 to 17.04% in equation 3 compared to hotels with similar characteristics but that are not members of chain. Hotel chains have certain competitive advantages compared to independent establishments by having a uniform brand image and a reputation that promotes customer loyalty. These advantages can reduce uncertainties and may explain the trend in the sector towards greater concentration and/or coordination of activities (Ortega & Marchante, 2010). It is important to note that for all the dummy variables in the model, we used Halvorsen and Palmquist's criterion (1980) to calculate the relative effect on the dependent variable due to variations in a dummy variable, via the expression , where is the estimated relative effect.
- The classification of establishments as a family business has no impact on labour productivity, although in the descriptive analysis their level of labour productivity was slightly less than that of establishments with other forms of ownership and/or control. This result may be due to the fact that although some establishments are family businesses they are managed by a chain.
- A hotel located inland has an average labour productivity between 11.93% (equation 1) and 13.13% (equation 3), which is lower than those located on the coast and in the capitals of provinces. The location of the establishment can be considered a proxy for the characteristics of tourism markets in which it operates (sun and beach tourism, business tourism, rural tourism, etc).
- Providing all determinants remain the same, outsourcing services increases labour productivity. The hotels that outsource services have a mean productivity level between 16.44% (equation 3) and 18. 33% (equation 1), which is higher than those who do not outsource.

Our estimations indicate that, all other factors being equal, an increase of 10 percentage points in the percentage of full-time equivalent jobs held by workers with temporary and/or part-time contracts leads to an average reduction of between 2.6% and 2.5% in the level of productivity of the establishment (regressions (1) and

(2); Table 4). The coefficient can also be calculated γ_{ns}, that is, the productivity of workers with non-standard contracts compared to those with full-time permanent contracts, based on the parameters estimated for and presented in regressions (1) and (2). In regression (1) with and , and given that , is obtained. Similarly, in regression (2), the value of γ_{ns} is around 0.67. This result implies that the productivity of workers with non-standard contracts is between 33% and 35% lower than workers with permanent full-time contracts. Thus, although the use of non-standard employment enables businesses to make substantial savings in labour costs, it also reduces productivity. However, although the reduction in labour costs is readily observable, productivity is a more complex concept that depends on large number of variables and whose measurement is more difficult. According to Rodriguez-Gutierrez (2007), if firms only focus on the former effect, they may conclude that the use of nonstandard employment to save costs will lead to increased benefits.

Finally, equation 3 is included to show how the introduction of the variable *nonstandard* work only marginally alters the estimated parameters of the other explanatory variables, the most important change being the reduction in elasticity of the GVA, relative to capital, from 0.2556 to 0.2262.

6. CONCLUSIONS

This paper presents empirical evidence on the impact of non-standard contracts on labour productivity in a specific sector: the hotel industry. In Spain, this type of flexibility is mainly implemented through temporary contracts. The phenomenon of temporary contracts emerged in Spain in 1984. Until this year, the vast majority of contracts were permanent and the high firing costs associated with these contracts made it extremely difficult to adjust staff levels. To avoid such rigidity, the 1984 labour reform authorized the use of other more flexible hiring arrangements characterized by the virtual absence of adjustment costs. Since 1984, despite successive labour reforms, the use of this type of contract increased until 2006 when about 34% of employees had a temporary contract, followed by a decrease as a result of the economic crisis. In the hotel industry, the temporary employment rate is even higher, as stated in the introduction. In contrast, part-time work continues to have little impact on the Spanish economy and even less on the hotel industry. However, both types of labour contracts can be considered non-standard employment, which is the approach taken in this article. Numerical flexibility obviously reduces labour costs, but it also reduces labour productivity and, consequently, business profits (Rodríguez-Gutiérrez, 2007).

The main contribution of this work is the empirical result obtained for the variable representing the percentage of temporary and/or part-time contracts. This variable

has a large negative impact on labour productivity in hotels, in that the use of contract modalities different from full-time permanent contracts significantly reduces labour productivity. This result, which uses a different econometric specification, is consistent with previous results for the Spanish economy but for different sectors, as outlined in the introduction.

As noted in the introduction, there is no empirical evidence on the impact of numerical flexibility on productivity in the service sector in Spain. Thus, to the best of our knowledge, this study would be the first to use data on hotel establishments to provide empirical evidence on this sector. In this context, this work analyzes the determinants of labour productivity in the hospitality industry, and includes an additional explanatory variable: the percentage of jobs held by workers with part-time and/or temporary contracts.

Our results on the hotel industry are similar to those obtained in previous studies on the manufacturing industries and lead to the conclusion that numerical flexibility reduces labour productivity. Specifically, our analysis suggests that, providing all other factors remain equal, an increase of 10 percentage points in the percentage of full-time equivalent jobs held by workers with part-time and/or temporary contracts leads to an average reduction of between 2.6% and 2.5% in the level of labour productivity in hotels. In addition, the productivity of workers with temporary and/or part-time contracts is estimated to be between 33% and 35% lower than that of workers with permanent full-time contracts. In fact, this result is expected because, according to human capital theory, if workers with nonstandard contracts have less work experience than those with permanent contracts, then their level of productivity should be lower, providing all other determinants of labour productivity remain constant. Given the available evidence, what justifies the continued use of numerical flexibility? It may be because firms clearly perceive the impact of labour flexibility on labour costs, but not on labour productivity. The reduction in wage costs associated with nonstandard employment contracts is readily observable by managers; however, it is difficult to measure levels of productivity according to the different types of contract. The result is that companies expect numerical flexibility to improve profitability; in fact, although it could reduce labour costs per unit of output, it could also reduce worker productivity and possibly the profit rate.

Finally, we have to emphasize that the labour market segmentation caused by nonstandard labour contracts creates incentives to invest in low-technology sectors having low human capital requirements and whose competitiveness is exclusively based on low labour costs.

Limitations

This study is limited by the database used, which only contains data from hotels in Andalusia. Although there is no reason to believe that this region is different from other Spanish regions, the analysis of the results should take this into account. A

second limitation is related to the effects of the types of contract. If the effects of the different types of non-standard contracts could be separately estimated then it is likely that these contracts would have significantly different effects. Unfortunately, the database used does not allow for this distinction due to the existence of multi-collinearity between variables. Another limitation of this study is related to the timing of the field work, which was partly conducted in winter 2009 (few questionnaires were administered) but mainly in spring-summer 2010 in a general context of a deep economic crisis. In particular, 2009 and 2010 were the only years in which Spain (and Andalusia) received fewer tourists than in previous years. This situation could have influenced the results obtained. For example, this could have led firms that did not renew temporary contracts (or did not re-hire the following summer season) to having higher labour productivity and led to the effects shown. The only way to resolve this possibility is to work with new data from the subsequent years, which is a new goal for future research.

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