

JOB SATISFACTION OF UNIVERSITY GRADUATES*

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This paper investigates the determinants of job satisfaction of university graduates in Spain. We base our analysis on Locke's discrepancy theory [Locke (1969)] and decompose subjective evaluation of job characteristics into surplus and deficit levels. We also study the importance of over-education and over-skilling on job satisfaction. We use REFLEX data, a survey of university graduates. We conclude that job satisfaction is mostly determined by the subjective evaluation of intrinsic job characteristics, with an asymmetric impact of surpluses and deficits. Over-skilling is much more important than over-education in explaining the job satisfaction of university graduates, although the latter is also significant.

Key words: job satisfaction, discrepancy theory, over-education, over-skilling.

JEL Classification: J28.

This paper investigates the determinants of the job satisfaction of Spanish university graduates. We base our analysis on Locke's discrepancy theory [Locke (1969)] by which individuals' job satisfaction is the result of their subjective evaluation of the existing discrepancy between what they want from their job and what they perceive they get from the job. We complement it with the basic assumption of prospect theory whereby economic agents value losses more than gains [Kahneman and Tversky (1979)].

We bring two important contributions to the literature on job satisfaction. Firstly, we decompose job characteristics into surplus and deficit levels in the worker's perception. We demonstrate that deficits and surpluses of certain desired job characteristics (such as work autonomy or learning opportunities) have an asymmetric impact on job satisfaction. Moreover, we show that omitting this distinction between deficits and surpluses might prevent the researcher from identi-

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ifying the effect of some job characteristics on job satisfaction, as is the case for challenging jobs and time for leisure in this paper.

Secondly, we contribute to the debate on job satisfaction of over-educated workers. While some research shows that having more education than required in the job makes people unsatisfied [Green and McIntosh (2007); Maynard, Joseph, and Maynard (2006); Pollmann-Schult and Buchel (2004); Vaisey (2006); Vila, Garcia-Aracil, and Mora (2007)], there is evidence showing no relationship between being over-educated and the level of job satisfaction [Allen and van der Velden (2001); Glenn and Weaver (1982)]. Our findings support the former view that over-education in the workplace diminishes the job satisfaction of workers. We demonstrate, however, that having more skills than necessary to perform the current job has a much stronger negative effect than over-education.

The paper is organized as follows. Section 1 presents the theoretical background necessary to understand our empirical analysis. Section 2 describes the data and econometric framework employed in this paper. In Section 3, we present the descriptive statistics relevant to our study. Econometric results are presented in Section 4 and Section 5 concludes the paper.

1. THEORETICAL BACKGROUND

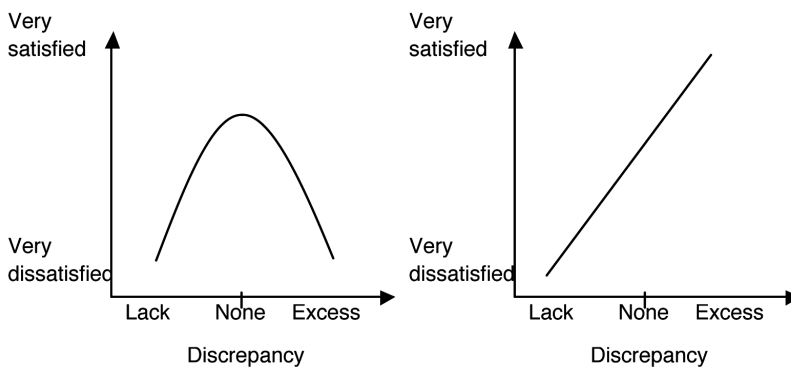
Job satisfaction has long been considered an important economic [Freeman (1978)], sociological [Kalleberg (1977)] and psychological variable [Locke (1969)]. Since the seventies, the literature on job satisfaction has grown to a considerable size. One can distinguish three major streams of research on job satisfaction. Firstly, gender differences in job satisfaction have been thoroughly investigated. The main finding is that women are usually more satisfied with their jobs than men, chiefly due to their lower expectations [Bender, Donohue, and Heywood (2005); Clark (1997); Hanson and Sloane (1992); Mora and Ferrer-i-Carbonell (2009); Sloane and Williams (2000); Sousa-Poza and Sousa-Poza (2000); Sousa-Poza and Sousa-Poza (2003); Sousa-Poza and Sousa-Poza (2007); Usui (2008)].

A second line of research investigates the relationship between job satisfaction and wages [Allen and van der Velden (2001); Bowles, Gintis and Osborne (2001); Clark (1996); Clark (1999); Clark and Oswald (1996); Gazioglu and Tansel (2006); Lydon and Chevalier (2002); Sloane and Williams (2000)]. In most of these studies, measures of relative wage, changes in income and future wage expectations tend to affect job satisfaction more than the level of pay itself.

The third aspect of studies on job satisfaction is education. The effects of education on job satisfaction tend to be positive when job characteristics are not controlled for [see Glenn and Weaver (1982)], while they become negative when job characteristics are included in the analysis [see Clark (1996); Clark and Oswald (1996); Clark, Oswald, and Warr (1996)]. As Fabra and Camisón (2009) point out, the positive effect is most likely due to better quality jobs achieved by higher educated individuals, which make them more satisfied. When controlling for job characteristics, the effect of the level of education on job satisfaction becomes negative, probably due to the higher expectations of better educated individuals.

We analyze the determinants of job satisfaction of Spanish university graduates. Our empirical strategy is based on Locke's discrepancy theory [Locke (1969)]. Locke distinguishes three elements affecting job satisfaction: 1) the worker's perception of some aspect of the job (not the objective description of it), 2) an implicit or explicit value standard (what one wants from the job), and 3) a conscious or subconscious judgment of the relationship between one's perception(s) and one's value(s) (perceived discrepancy). According to Locke, job satisfaction and dissatisfaction are a function of the perceived discrepancy between what one wants from the job (value standard), and what one perceives one gets from the job. Moreover, he admits the possibility of different functional forms for this relationship depending on the job characteristic. He discusses examples of two functional forms (Graphic 1). For some job characteristics (e.g. hours of work), the individual prefers some optimal amount and any deviations from this optimal amount (due to excess or deficit) diminish job satisfaction. This creates a bell-shaped function between discrepancies in these factors and job satisfaction (Panel a, Graphic 1). For some other job characteristics (e.g. pay) the function is found to be linear (Panel b, Graphic 1). Individuals compute their ideal pay (value) based on what similar others earn and the amount that would fulfill their economic wants. In this case, though, discrepancies in deficit decrease their job satisfaction, but discrepancies in excess make them more satisfied with their job.

Graphic 1: TWO POSSIBLE FUNCTIONAL FORMS OF THE RELATIONSHIP BETWEEN JOB SATISFACTION AND DISCREPANCY IN PERCEIVED JOB CHARACTERISTIC AND THE IDEAL VALUE OF THIS JOB CHARACTERISTIC



Source: Own elaboration.

It is therefore important to recognize the possibility of a bell-shaped functional form between perceived discrepancy and job satisfaction for the empirical analysis. One has to distinguish between excess and deficit of a job characteristic to be

able to identify any effect of this job characteristic on job satisfaction. The standard assumption of a linear relationship would mistakenly show no relationship when the underlying functional form is bell-shaped. The empirical strategy we follow is, thus, to distinguish between excess and deficit discrepancy in order to capture non-linear functional forms in the influence of job characteristics on job satisfaction.

Another central element in the theory of Locke is the intensity of values. The effect of a discrepancy on one's job satisfaction depends on the importance of the job characteristic for the individual. For instance, the effect of a pay increase on job satisfaction will be larger for someone who puts more value on money than for someone who considers it less important. Therefore, "satisfaction with some object or situation is a function not only of the *amount* of discrepancy between percept and value, but of the *importance* of that value to the individual" [Locke (1969), pag. 330]. The importance of a value is reflected in the slope of the functional form. The more important the value for the individual, the more it affects his/her satisfaction level and, therefore, the steeper the function. We expect to obtain a larger coefficient of one job characteristic for an individual who reports high importance of this job characteristic than for an individual who does not attach such importance to the job characteristic. Although Locke's theory has found large empirical support in the psychological literature [see Jackson and Corr (2002); Mobley and Locke (1970); Rice, Gentile, and McFarlin (1991)], it has not received much attention in the fields of economics and sociology except for Kalleberg (1977). If different functional forms and different intensities in the relationship between job characteristics and job satisfaction are common, then the consequent model misspecification might pose serious limitations to some of the existing literature on job satisfaction.

We complement discrepancy theory with the basic assumption of prospect theory whereby people value losses more than gains [see Kahneman and Tversky (1979)]. Therefore, we consider the possibility of different intensities in the relationship between job satisfaction and perceived discrepancy depending on the latter being deficit or surplus. If the assumption holds true in our context, we should obtain a stronger effect on job satisfaction for deficit discrepancies than for excess discrepancies. The REFLEX survey data provide information on the individual subjective evaluation of the following job characteristics: work autonomy, job security, learning opportunities, high earnings, new challenges, good career prospects, enough time for leisure, social status, useful for society and time for family. We introduce them all decomposing deficits and surpluses in our analysis.

Finally, in addition to analyzing the effects of perceived discrepancies in the job characteristics mentioned above, we also introduce educational mismatches as potential explanatory variables of job satisfaction.

Based on the previous theoretical discussion, we derive the following hypotheses:

Hypothesis 1: A perceived discrepancy in any job characteristic better explains the level of job satisfaction than the objective measure of the job characteristic.

Most papers on job satisfaction use objective/subjective job characteristics indistinctively depending on data availability. Locke's theory argues that job satisfaction depends on the worker's perception of some aspect of the job relative to

the value standard (perceived discrepancy). We want to test whether objective measures of job characteristics matter when subjective measures are also present in the equation. Only a few studies include both measures to check which one is relevant in explaining job satisfaction, and, when they do, they focus on a single job characteristic. Origo and Pagani (2009) study the effect of perceived and actual job stability on job satisfaction across several European countries. Their results show that perceived job stability, rather than actual stability, matters for job satisfaction. Sloane and Williams (2000) study the gender gap as well as the effect of objective and subjective comparative pay measures on job satisfaction. Once again, the subjective measure turns out to be significant. We want to investigate whether subjective or objective evaluations of wage, job stability, hours of work and job training are relevant for job satisfaction. We expect objective measures to become insignificant once we introduce their subjective counterparts.

Hypothesis 2: The relationship between perceived discrepancies and job satisfaction depends on two aspects: whether discrepancies are in surplus or deficit and on the importance that the individual gives to the job characteristic.

The two aspects should be taken into account. First, the relationship between perceived discrepancies and job satisfaction may be bell-shaped or linear¹. Therefore, we distinguish between discrepancies in deficit and excess to allow for other than linear functional forms. Second, the importance an individual gives to each aspect of the job matters for the intensity of the relationship. We allow for different effects of each discrepancy depending on the level of importance given to the aspect of the job. This distinction, furthermore, permits us to test whether deficit discrepancies have a stronger effect than excess discrepancies on job satisfaction, as the assumption of prospect theory would predict. As far as we are aware, this has not been analyzed so far in the literature on job satisfaction. If the asymmetric valuation of gains and losses in job satisfaction is confirmed, optimal policies to improve workers' well-being will be different from those under a symmetric valuation.

Hypothesis 3: Being over-educated and over-skilled reduces the job satisfaction of individuals.

While some research shows that having more education than required in the job makes people unsatisfied [Green and McIntosh (2007); Maynard *et al.* (2006); Vaisey (2006)], there is evidence showing no relationship between being over-educated and the level of job satisfaction [see Glenn and Weaver (1982)]. Many show that it is skill mismatch and not over-education that matters for job satisfaction [see Allen and van der Velden (2001); McGuinness and Sloane (2011)]. We contribute to this debate by introducing over-education and over-skilling into the equation on job satisfaction.

(1) The bell-shaped and linear functional forms are just two possibilities. One could imagine other functional forms that are also allowed with our estimation strategy.

2. DATA AND METHODOLOGY

We use REFLEX survey data². It consists of information on a representative group of individuals who graduated in 1999/2000 and were interviewed five years later in 2005. The survey covers several European countries and Japan. In this paper, we analyze the Spanish case.

The REFLEX survey provides information on the individuals graduate studies, personal background, first job and current job. We restrict our sample to individuals who are currently working at least 20 hours per week and are not self-employed³. Our final sample consists of 2,216 individuals.

Our dependent variable is the level of job satisfaction. Respondents were asked how satisfied they are with their current job on a 5-point Likert scale (1-very dissatisfied, 5-very satisfied). We construct a dichotomous variable, which takes value 1 if the respondent replied 4 or 5, and zero otherwise⁴. We use the logistic model throughout the analysis.

Respondents were asked to indicate how important the following job characteristics were to them personally, and to what extent they actually applied to their current job situation. In both cases, they could choose from among five categories between 1 (not at all) and 5 (to a very high extent). The job characteristics under evaluation were the following: work autonomy, job security, opportunity to learn new things, high earnings, new challenges, good career prospects, enough time for leisure activities, social status, chance of doing something useful for society, and good chance to combine work with family tasks.

The psychological literature considers that the report of how much each job characteristic applies to the current job is not affected by how satisfied the respondent is with it [see Locke and Latham (1990)]. It is, therefore, a good descriptive measure of perceived discrepancy between what one would like to obtain from a job and what one perceives she or he gets from the job. The same applies to the measure of the importance of each job characteristic [see Rice *et al.* (1991)].

Based on the replies to the questions mentioned above, we compute two sets of dummy variables for each job characteristic (Table 1). In the first set of variables, we distinguish between reporting a surplus (*jobfacetS*: if the respondent reported 4 or 5) and a deficit (*jobfacetD*: if the respondent reported 1 or 2) in the question “how much the job characteristic applies to your current job”. Clearly, we set the reference category to be when the respondent reported 3. In the second set of variables, the surpluses and deficits are decomposed by the level of importance assigned

(2) A detailed description of the REFLEX survey is available at <http://www.fdewb.unimaas.nl/roa/reflex/>

(3) We exclude self-employed and part-time workers because they form entirely distinct groups and do not permit the homogeneity of individuals in key job characteristics necessary to assess the influences of job characteristics on job satisfaction.

(4) In the ordered logit model, the cut-off parameters were not statistically significantly different from each other until we collapsed the categories to two.

to each job characteristic. We consider the job facet is important for the respondent when s/he reported 4 or 5, and non-important otherwise. Therefore, we obtain four dummy variables for each job characteristic in the second decomposition.

Table 1: DUMMY VARIABLES ON PERCEIVED DISCREPANCY,
DISTINGUISHING BY REPORTED IMPORTANCE

Perceived discrepancy	Perceived discrepancy by importance level	How much it applies to the current job	Importance of the job characteristic for the respondent
DEFICIT (D)	Low importance & Deficit discrepancy (DU)	1-2	1-3
	High importance & Deficit discrepancy (DI)	1-2	4-5
SURPLUS (S)	Low importance & Surplus discrepancy (SU)	4-5	1-3
	High importance & Surplus discrepancy (SI)	4-5	4-5

Note: Reference group: Those who report no discrepancy (“How much it applies to your job”= 3).
Source: Own elaboration.

The dummy *jobfacetSI* (surplus, important) takes value 1 if the individual responded 4 or 5 to both questions referring to this job facet; zero otherwise. The dummy *jobfacetSU* (surplus, unimportant) takes value 1 if the individual responded that the job facet has importance 1 to 3 and that the job facet applies to current job 4 or 5; zero otherwise. The dummy *jobfacetDI* (deficit, important) takes value 1 if the individual responded 4 or 5 on the importance of the job facet and 1 or 2 on how much it applies to the job; zero otherwise. Finally, the dummy *jobfacetDU* (deficit, unimportant) takes value 1 if the individual responded 1 or 2 in both measures; zero otherwise. The reference category is the same as previously, i.e. the respondent reported no discrepancy (the job characteristic applies with level 3, no matter how much importance the individual attaches to the job characteristic). These variables give us enough flexibility to test hypothesis 2, that is, to test whether surplus and deficit discrepancies have asymmetric effects and whether the reported importance of job characteristic matters.

In order to test hypothesis 1, whereby the subjective evaluation of job characteristics is better at determining job satisfaction than the objective job characteristics, we use objective variables on wage (standardized gross hourly wage), job stability (permanent contract), hours of work (standardized total working hours in current job per week) and job training (participated in job-related training in the last 12 months). The subjective counterparts of these job characteristics

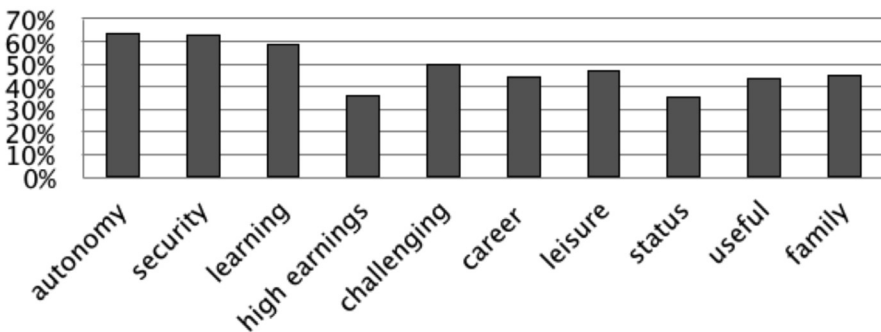
are the discrepancies reported in high earnings, job security, time for leisure and family tasks and learning, respectively.

We introduce subjective measures of over-education and over-skilling to test the third hypothesis. Over-education is a dummy variable that takes value 1 if the respondent felt that the appropriate level of education for the current job is lower than the one attained, zero otherwise. We consider over-skilled the individual who reported 1 or 2 from a 5-point scale (1-not at all; 5-to a very high extent) to the question: “to what extent are your knowledge and skills utilized in your current work?” Subjective measures are broadly used in the studies on educational mismatches.

3. DESCRIPTIVE STATISTICS

Here, we present the descriptive statistics of the main variables. Figure 1 presents the percentage of individuals who perceive that a job characteristic applies to his/her job with surplus (responded 4 or 5 on a 5-point scale). Figure 2 shows the same information for perceptions of deficit of each job characteristic (responded 1 or 2 on a 5-point scale). Most respondents perceive having a job with work autonomy, security and learning opportunities (Figure 1), while high earnings, status, usefulness for the society and time for family and leisure are the job characteristics respondents miss the most (Figure 2).

Figure 1: PERCEPTION OF SURPLUS IN JOB CHARACTERISTICS

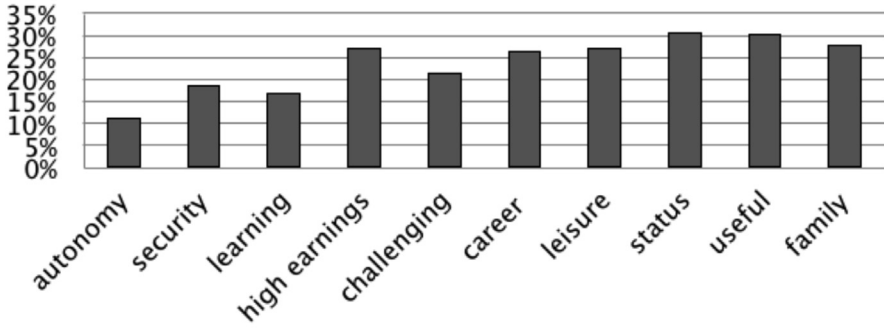


Source: Own elaboration.

Figure 3 shows the perception of deficit and surpluses decomposed by the importance of each job characteristic. SI (SU) indicates the percentage of individuals who report having surplus in the job characteristic and (do not) consider it important. DI (DU) indicates the percentage of individuals who report having deficit in the job characteristic and (do not) consider it important.

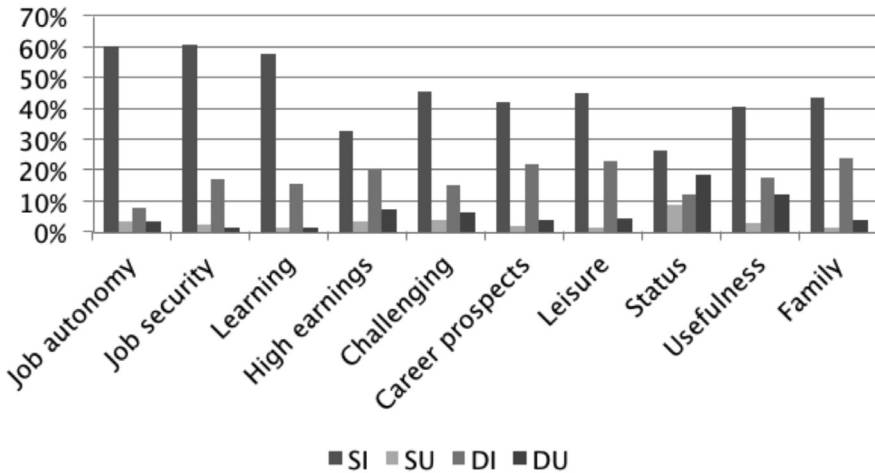
The first observation is that most individuals report having a surplus or deficit of a job characteristic when they care about it. This is especially true for

Figure 2: PERCEPTION OF DEFICIT IN JOB CHARACTERISTICS



Source: Own computations.

Figure 3: PERCEPTION OF DISCREPANCIES IN JOB CHARACTERISTICS PER IMPORTANCE

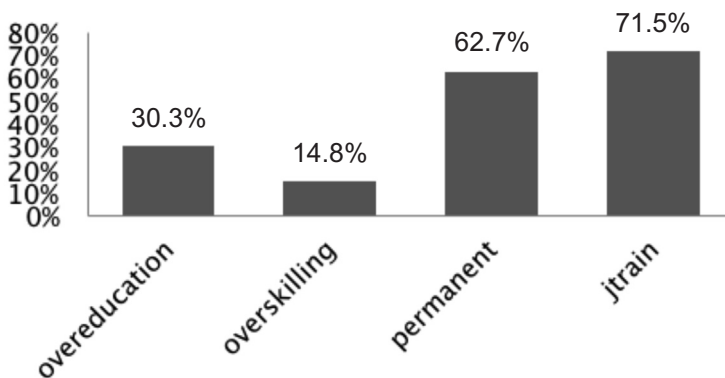


Source: Own elaboration.

surpluses. In contrast, those who consider a job characteristic unimportant tend to perceive neither deficit nor surplus of that job characteristic in their current job. The main exceptions occur in the evaluation of high earnings, challenging job, social status and usefulness of the job for the society. Those reporting surplus of a job characteristic which they do not care about are few (less than 10% in most cases). In terms of deficit of particular job facets, deficit in social status and usefulness of the job for the society are the most common.

Figure 4 shows the incidence of over-education and over-skilling, the percentage of individuals with permanent contracts and those who received job-related training during the 12 months before the interview. The incidence of over-education is double the incidence of over-skilling for Spanish university graduates; nearly 63% of graduates have a permanent job and 71% of individuals report having attended some job-related training during last 12 months.

Figure 4: INCIDENCE OF OVER-EDUCATION, OVER-SKILLING, JOB PERMANENCY AND JOB TRAINING



Source: Own elaboration.

4. RESULTS

In this section, we present and discuss the results of the econometric estimation. We estimate logistic regressions to explain the probability of being satisfied with the current job. We report coefficient results in Table A in the Appendix. In all the models, we control for education and skill mismatch (over-education and over-skilling), objective job characteristics (permanent, wage, hours of work, job training, tenure, public) and individual characteristics (gender, marital status, age, child, education level and field of study).

Model A presents the estimation results when the evaluation of how much each job characteristic applies to the current job is introduced. Recall that these variables are constructed on a 5-point Likert scale. In Model B, we decompose each job characteristic evaluation into two dummy variables, one for reported surplus and the other for reported deficit as explained above. Model C extends the analysis by additionally distinguishing between four possibilities: reported surplus and important, reported surplus and unimportant, reported deficit and important and reported deficit and unimportant.

4.1. Testing Hypothesis 1

To test hypothesis 1, whereby objective measures of job characteristics are not important in explaining job satisfaction, we test whether the coefficients of the variables job permanency (permanent), wage (stwage), job training (jtrain) and hours worked (sthrswrk) are all equal zero. We perform a log-likelihood ratio test for all three models, which rejects the null hypothesis in all cases⁵. From the table of coefficients in the Appendix (Table A), it is clear that wage has a strongly significant coefficient in all equations. Therefore, we can conclude that, in Spain, the wage level has a significant positive effect in explaining job satisfaction, even after controlling for the subjective evaluation of high earnings in the job. Notwithstanding, subjective measures of earnings also matter for job satisfaction as we discuss below. One explanation for the significance of the objective wage level might be that its subjective counterpart refers to having ‘high earnings’ instead of ‘fair earnings’, which would reflect the wage level of the respondent much more.

4.2. Testing Hypothesis 2

Hypothesis 2 states that subjective discrepancies on job characteristics should be decomposed into deficit and surplus to allow for both linear and other non-linear functional forms in their effect on job satisfaction. Furthermore, it argues that the reported importance of each job characteristic for the respondent should also be taken into account as it influences the strength of the relationship between the existing discrepancies and job satisfaction.

We observe that, for some job characteristics, it is important to decompose the deficit and surplus in order to identify their non-linear shape relationship with job satisfaction. Model A fails to identify a significant effect of having a challenging job, while Model B reveals that having positive discrepancy (surplus) in the amount of challenge in the job makes people more satisfied with their jobs. Similarly, in Model A, having time for leisure activities does not seem to affect job satisfaction. However, when decomposing leisure into surplus and deficit, results reveal that having less leisure time than one would desire significantly decreases satisfaction with the job. We can, therefore, conclude that our results support hypothesis 2.

Model C reveals that further decomposing the perceived discrepancies by job facet importance gives new information. First of all, job satisfaction is mostly affected by those job facets that the respondent considers important (learning, earning, career prospects, leisure time, usefulness and family time)⁶. We observe, however, an interesting result for the characteristic ‘challenging job’. Graduates who report deficit in this job facet and do not care about it are actually happy to get a non-challenging job.

Table C in the Appendix shows several specification and goodness of fit tests of the three models (A, B and C). Although the two information criteria (AIC and

(5) Results are reported in Table B of the Appendix.

(6) Notice, though, that most coefficients of the job facets reported as unimportant for the respondent (those finishing with SU or DU) have larger standard errors due to these variables having many zeros.

BIC) generally support Model A, Model C turns out to be a slightly better predictor of job satisfaction (larger adjusted count R-squared). Moreover, distinguishing between surplus, deficits and importance level (Model C) is the only specification that is not rejected by the link test. Therefore, our preferred specification is Model C, which confirms hypothesis 2.

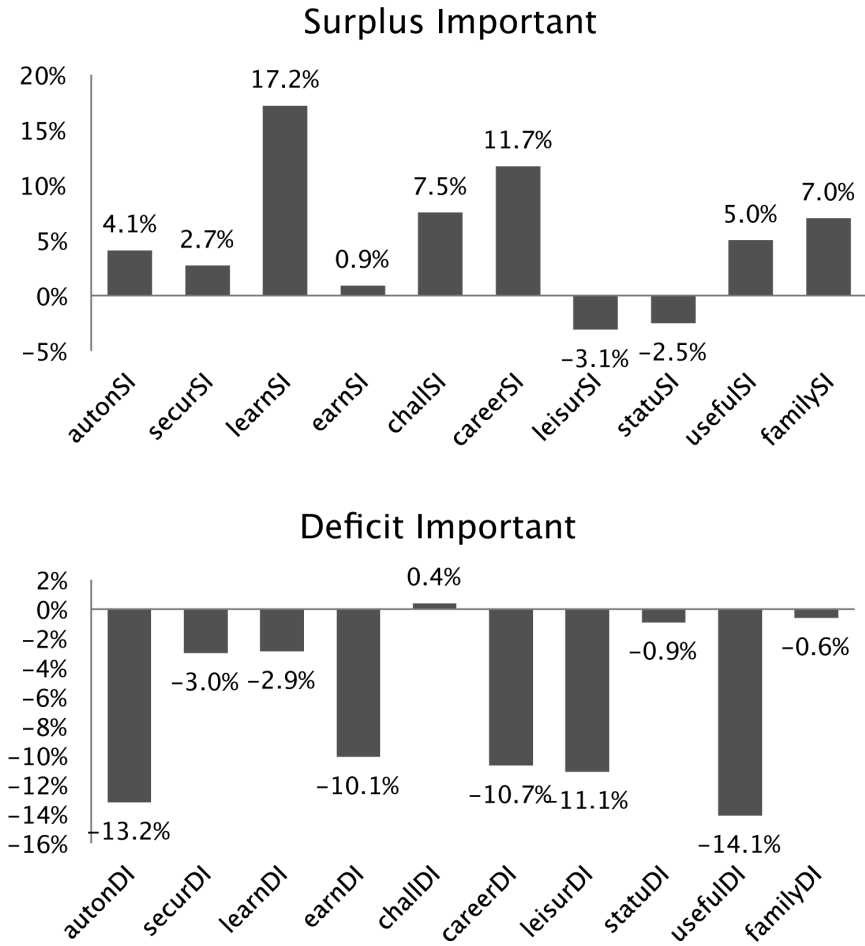
4.3. *Determinants of job satisfaction and prospect theory*

We proceed now to investigate the importance of each job characteristic in explaining job satisfaction based on our preferred specification (Model C). Figures 5 and 6 show the predicted discrete change in probability of being satisfied with the job when job characteristics are important and unimportant, respectively. They are computed for a 30 year-old male with a permanent job, average tenure (nearly 3.5 years) and zero perceived discrepancies in all job facets. Table F in the Appendix reports the same results plus their level of significance. As expected, the strongest effects occur when there is a perceived discrepancy in a job characteristic that is important to the respondent (Figure 5). Moreover, surplus discrepancies tend to increase job satisfaction when one cares about the job characteristic and deficit discrepancies tend to decrease job satisfaction when the job characteristic is important to the respondent. In contrast, discrepancies when the job characteristic is unimportant (Figure 6) do not generally affect job satisfaction and their effect is more mixed. While a surplus in learning opportunities and good career prospects increase the likelihood of job satisfaction, a surplus in job autonomy, job security and usefulness for society may decrease job satisfaction if the respondent does not find these job characteristics important. A deficit discrepancy in work autonomy decreases the probability of job satisfaction when the respondent reports these job facets as unimportant. Only having a deficit discrepancy in the degree of challenge of the job and learning possibilities increases the likelihood of being satisfied with the job when the respondent does not regard these job characteristics as important.

We find some support for prospect theory in this context. Figure 5 reveals that, for some job facets (work autonomy, high earnings, leisure time and usefulness for the society), the deficit discrepancies have a stronger effect on job satisfaction than the surplus discrepancies, as would be predicted by prospect theory. However, learning possibilities, challenging job, good career prospects and time for family show stronger positive effects of surpluses than the negative effects of deficits.

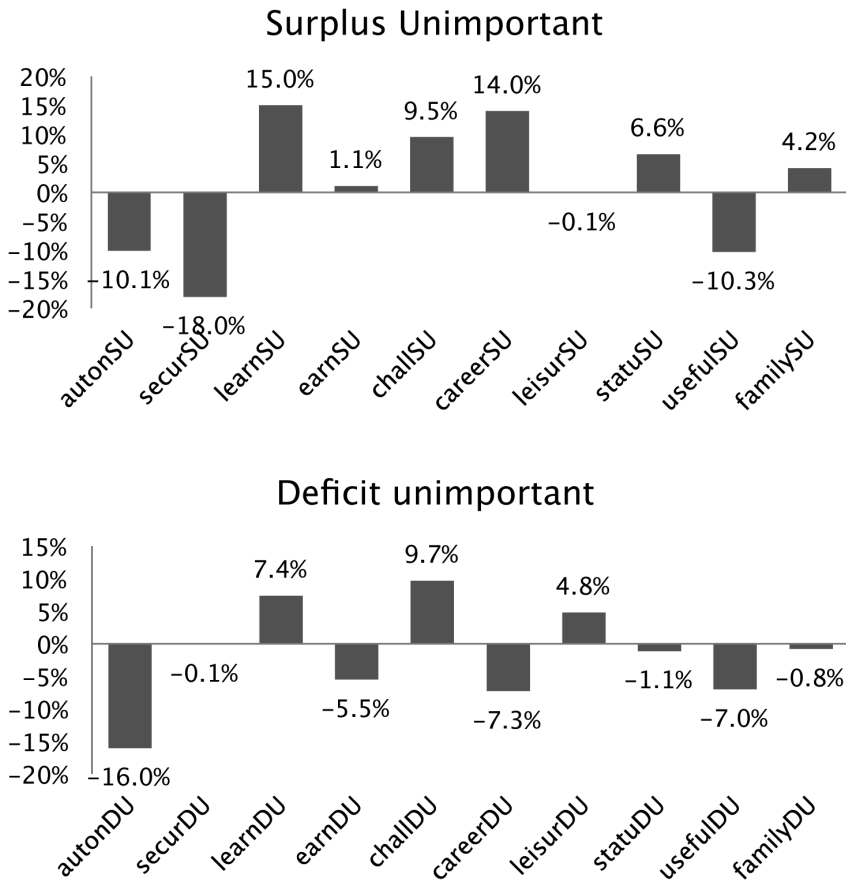
Summarizing, the most important job characteristics that lead to high job satisfaction are having learning opportunities, having a challenging job, good career prospects and having time for family tasks. In contrast, low work autonomy, little time for leisure and performing a job not useful for the society are the main factors that decrease job satisfaction. Extrinsic job characteristics, such as job security and social status, do not seem to matter strongly for being satisfied with the job.

Figure 5: INCIDENCE OF OVER-EDUCATION, OVER-SKILLING, JOB PERMANENCY AND JOB TRAINING



Source: Own elaboration.

Figure 6: CHANGE IN PREDICTED PROBABILITIES DUE TO DISCREPANCIES WHEN JOB CHARACTERISTIC IS UNIMPORTANT



Source: Own elaboration.

4.4. Testing Hypothesis 3

Table 2 reports the predicted change in the probability of being satisfied with the job caused by being over-educated and over-skilled. Results reveal that being over-skilled has a larger effect on job satisfaction than being over-educated. An over-skilled worker has as much as 25% less probability of being satisfied with the job than someone non-over-skilled. Nonetheless, being over-educated decreases the probability of job satisfaction by 5%. Therefore, our results are consistent with previous studies that find a significant negative effect of over-education on job satisfaction, although we show that mismatch in skills has a negative effect five times larger. This latter result is in line with the work of Allen and van der Velden (2001).

Table 2: DISCRETE CHANGE IN PROBABILITY OF JOB SATISFACTION
(BASED ON MODEL C)

overed	-0.055*
overskill	-0.256***

Note: permanent = 1 tenure = 41.2 age = 30 and rest at zero.

Source: Own elaboration.

5. CONCLUSIONS

In this paper, we have explored the determinants of job satisfaction of Spanish university graduates. We have based our analysis on Locke's discrepancy theory whereby job satisfaction depends on the subjective evaluation of the discrepancy between what one perceives he gets from the job and what he wants to obtain from it. We have decomposed these discrepancies in surplus and deficit as well as distinguishing by the importance level that the respondent associates with each job characteristic. These decompositions have proven to be relevant when estimating the effect of several job characteristics on job satisfaction since it allows for other than monotone relationships.

Our results show that, in general, subjective reports on the discrepancies in job characteristics are more important in explaining job satisfaction than the reported objective job characteristics. This was true for job training, hours of work and permanency of the contract. This result did not hold, however, for wage, which was significant as an objective measure and also as a subjective discrepancy measure. Moreover, we found that intrinsic job characteristics (work autonomy, learning opportunities, good career prospects and challenging job) are the most important ones in explaining the likelihood of job satisfaction, while extrinsic job characteristics (social status, job security) have small effects. We obtain support for prospect theory in some job facets (work autonomy, high earnings, leisure time and usefulness for the society), but not for the rest.

We also study the impact of over-education and over-skilling on job satisfaction for Spanish university graduates. Results reveal that not using all one's skills in the job reduces job satisfaction five times more than working in a job that requires a lower education level than the one acquired.

Our analysis shows that Locke's discrepancy theory should be considered when studying the effects of job characteristics on job satisfaction. First of all, the perceived importance of each facet by the individual strongly influences the effect of this facet on job satisfaction. Secondly, we found a non-linear functional relationship between two job characteristics (having a challenging job and having time for leisure) and job satisfaction, which would go undetected if one did not distinguish between the deficits and surpluses of the job characteristics.

APPENDIX

Data description: variables

Variable	Definition
dsatis	Dummy: =1 if reported 4-5 level of job satisfaction, =0 otherwise.
j1autona	To what extent work autonomy applies to your current work situation (1-not at all, 5-to a very high extent).
j1secura	To what extent job security applies to your current work situation (1-not at all, 5-to a very high extent).
j1learna	To what extent opportunity to learn new things applies to your current work situation (1-not at all, 5-to a very high extent).
j1learnia	To what extent high earnings applies to your current work situation (1-not at all, 5-to a very high extent).
j1challa	To what extent new challenges applies to your current work situation (1-not at all, 5-to a very high extent).
j1careea	To what extent good career prospects applies to your current work situation (1-not at all, 5-to a very high extent).
j1leisua	To what extent enough time for leisure applies to your current work situation (1-not at all, 5-to a very high extent).
j1statua	To what extent social status applies to your current work situation (1-not at all, 5-to a very high extent).
j1usefua	To what extent chance of doing something useful for society applies to your current work situation (1-not at all, 5-to a very high extent).
j1familia	To what extent good chance to combine work with family tasks applies to your current work situation (1-not at all, 5-to a very high extent).
j1autoni	how important is work autonomy to you personally (1-not at all, 5-very important).
j1secure	how important is job security to you personally (1-not at all, 5-very important).
j1learni	how important is opportunity to learn new things to you personally (1-not at all, 5-very important).
j1learnil	how important is high earnings to you personally (1-not at all, 5-very important).
j1challi	how important is new challenges to you personally (1-not at all, 5-very important).
j1careei	how important is good career prospects to you personally (1-not at all, 5-very important).
j1leisui	how important is enough time for leisure to you personally (1-not at all, 5-very important).
j1statui	how important is social status to you personally (1-not at all, 5-very important).

Variable	Definition
j1usefui	how important is chance of doing something useful for society to you personally (1-not at all, 5-very important).
j1famili	how important is good chance to combine work with family tasks to you personally (1-not at all, 5-very important).
overed	Dummy: =1 if reported appropriate education for the work lower than the level acquired, =0 otherwise.
overskill	Dummy: =1 if reported that knowledge and skills are not utilized in current work, =0 otherwise.
permanent	Dummy: =1 if permanent contract, =0 if fixed-term.
stwage	Standardized gross hourly wage.
jtrain	Dummy: =1 if had job-related training in the past 12 months, =0 otherwise.
sthrswrk	Total working hours in the present job (standardized).
female	Dummy: =1 if female, =0 otherwise.
married	Dummy: =1 if living with a partner at present, =0 Otherwise.
child	Dummy: =1 if having children, =0 otherwise.
edulvlG_2	Current level of education: dummy variable= 1 if isced 5a long programme providing direct access to doctorate or above, 0 otherwise (isced5a not providing direct access to doctorate).
public	Dummy for working in the public sector.
tenure	Number of months working with the current employer.
age	Age of the respondent when interviewed.
Education	Field of study: Education
Humanities	Field of study: Humanities and arts
Social	Field of study: Social Sciences, Business and Law.
Science	Field of study: Science, Mathematics and Computing.
Engineer	Field of study: Engineering, Manufacturing and Construction.
Agricult	Field of study: Agriculture and Veterinary
Health	Field of study: Health and Welfare
Services	Field of study: Services

Summary statistics

Variable	Mean	sd	Min	Max
dsatis	0.62	0.48	0	1
j1autona	3.75	1.01	1	5
j1secura	3.73	1.26	1	5
j1learna	3.65	1.13	1	5
j1learnia	3.10	1.11	1	5
j1challa	3.41	1.14	1	5
j1careea	3.25	1.17	1	5
j1leisua	3.32	1.24	1	5
j1statua	3.05	1.14	1	5
j1usefua	3.22	1.29	1	5
j1familia	3.30	1.24	1	5
j1autoni	4.26	0.75	1	5
j1secure	4.67	0.62	1	5
j1learni	4.61	0.62	1	5
j1learnil	4.14	0.81	1	5
j1challi	4.17	0.80	1	5
j1careei	4.39	0.73	1	5
j1leisui	4.50	0.74	1	5
j1statui	3.57	1.04	1	5
j1usefui	4.05	0.94	1	5
j1famili	4.51	0.77	1	5

Source: Own elaboration.

Variable	Mean	sd	Min	Max
dovered	0.30	0.46	0	1
overskill	0.15	0.36	0	1
permanent	0.63	0.48	0	1
stwage	0.00	1.00	-2.16	4.15
jtrain	0.71	0.45	0	1
sthrswrk	0.00	1.00	-2.23	9.05
female	0.62	0.48	0	1
married	0.45	0.50	0	1
child	0.09	0.29	0	1
edulvlG_2	0.69	0.46	0	1
public	0.33	0.47	0	1
tenure	37.76	34.22	0	401
age	29.86	3.20	26	54
Education	0.11	0.32	0	1
Humanities	0.07	0.25	0	1
Social	0.35	0.48	0	1
Science	0.15	0.35	0	1
Engineer	0.15	0.36	0	1
Agricult	0.04	0.19	0	1
Health	0.13	0.33	0	1
Services	0.01	0.08	0	1

Source: Own elaboration.

Econometric results: tables of coefficients

Table A: TABLE OF COEFFICIENTS						
			Model A	Model B	Model C	
j1autona	autonS	autonSI	0.156*** (0.060)	0.165 (0.126)	0.172 (0.130)	
		autonSU			-0.407 (0.313)	
	autonD	autonDI		-0.561*** (0.205)	-0.533** (0.242)	
		autonDU			-0.647** (0.326)	
	j1secura	securS	securSI	-0.00671 (0.054)	0.0750 (0.151)	0.113 (0.154)
			securSU			-0.729* (0.416)
securD		securDI		-0.120 (0.181)	-0.121 (0.187)	
		securDU			-0.00565 (0.494)	
j1learna	learnS	learnSI	0.396*** (0.067)	0.814*** (0.135)	0.795*** (0.138)	
		learnSU			0.677 (0.507)	
	learnD	learnDI		-0.108 (0.179)	-0.118 (0.188)	
		learnDU			0.315 (0.529)	
j1learnia	earnS	earnSI	0.139** (0.064)	0.0237 (0.142)	0.0381 (0.148)	
		earnSU			0.0474 (0.345)	
	earnD	earnDI		-0.355** (0.142)	-0.408*** (0.155)	
		earnDU			-0.222 (0.227)	

Table A: TABLE OF COEFFICIENTS (continuation)

			Model A	Model B	Model C
jlchalla	challS	challSI	0.0783 (0.072)	0.308** (0.140)	0.322** (0.145)
		challSU			0.411 (0.308)
	challD	challDI		0.143 (0.172)	0.0177 (0.197)
		challDU			0.419* (0.249)
jlcareea	careerS	careerSI	0.387*** (0.068)	0.514*** (0.144)	0.514*** (0.148)
		careerSU			0.629 (0.505)
	careerD	careerDI		-0.442*** (0.156)	-0.432** (0.169)
		careerDU			-0.297 (0.289)
jlleisua	leisurS	leisurSI	0.0762 (0.065)	-0.0909 (0.156)	-0.126 (0.159)
		leisurSU			-0.00392 (0.470)
	leisurD	leisurDI		-0.343** (0.163)	-0.449*** (0.172)
		leisurDU			0.204 (0.297)
jlstatua	statuS	statuSI	-0.0599 (0.062)	-0.0209 (0.143)	-0.101 (0.161)
		statuSU			0.281 (0.224)
	statuD	statuDI		-0.0629 (0.142)	-0.0364 (0.194)
		statuDU			-0.0454 (0.164)
jlusefua	usefulS	usefulSI	0.226*** (0.054)	0.164 (0.145)	0.209 (0.150)
		usefulSU			-0.415 (0.332)

Table A: TABLE OF COEFFICIENTS (continuation)

		Model A	Model B	Model C
usefulD	usefulDI		-0.423*** (0.147)	-0.568*** (0.174)
	usefulDU			-0.285 (0.187)
jlfamilia	familyS	0.113* (0.066)	0.286* (0.155)	0.297* (0.159)
	familySU			0.175 (0.477)
	familyD		-0.0203 (0.159)	-0.0247 (0.168)
	familyDU			-0.0323 (0.309)
overed		-0.262** (0.133)	-0.266** (0.134)	-0.225* (0.136)
overskill		-1.018*** (0.168)	-1.056*** (0.168)	-1.053*** (0.171)
permanent		0.294** (0.143)	0.219 (0.144)	0.221 (0.145)
stwage		0.282*** (0.071)	0.299*** (0.072)	0.322*** (0.073)
jtrain		0.00963 (0.124)	0.0235 (0.125)	0.0287 (0.127)
sthrswrk		-0.00548 (0.060)	0.00358 (0.060)	0.0288 (0.061)
female		-0.0516 (0.121)	-0.0248 (0.122)	-0.00813 (0.124)
married		0.164 (0.117)	0.210* (0.118)	0.227* (0.121)
child		-0.228 (0.213)	-0.260 (0.214)	-0.301 (0.217)
edulvlG_2		-0.0571 (0.138)	-0.0682 (0.140)	-0.104 (0.142)
public		0.622*** (0.145)	0.674*** (0.146)	0.665*** (0.149)
tenure		-0.000479 (0.002)	-0.000836 (0.002)	-0.00121 (0.002)

Table A: TABLE OF COEFFICIENTS (continuation)

	Model A	Model B	Model C
age	-0.0138 (0.022)	-0.0160 (0.022)	-0.0177 (0.022)
Education	-0.0549 (0.229)	0.0134 (0.227)	0.00590 (0.229)
Humanities	-0.171 (0.239)	-0.154 (0.240)	-0.180 (0.242)
Science	-0.403** (0.165)	-0.420** (0.167)	-0.401** (0.170)
Engineering	-0.415** (0.176)	-0.456** (0.179)	-0.497*** (0.181)
Agric. & Vet	-0.619** (0.271)	-0.660** (0.274)	-0.666** (0.278)
Health	-0.291 (0.199)	-0.306 (0.201)	-0.314 (0.206)
Services	0.671 (0.651)	0.485 (0.655)	0.498 (0.667)
_cons	-3.927*** (0.733)	0.640 (0.680)	0.707 (0.689)
<i>N</i>	2216	2216	2216
pseudo <i>R</i> ²	0.277	0.283	0.293
<i>AIC</i>	2185.4	2186.9	2199.0
<i>BIC</i>	2362.2	2420.8	2546.9
chi2	812.7	831.2	859.1

Dependent variable: Job satisfaction. Logistic estimation. Standard errors in parentheses. Reference field of study: Social Sciences.

* $p < 0.10$, ** $p < 0.05$, *** $p < 0.01$.

Source: Own elaboration.

Econometric results: post-estimation tests

Table B: LIKELIHOOD-RATIO TESTS ON THE OBJECTIVE JOB CHARACTERISTICS			
	Model A	Model B	Model C
LR chi2(4)	24.31	23.55	25.76
Prob > chi2	0.0001	0.0001	0.00

Table C: SPECIFICATION AND GOODNESS OF FIT TESTS			
	Model A	Model B	Model C
AIC	2185.4	2186.9	2199
BIC	2362.2	2420.8	2546.9
R2-count	77.66%	77.89%	78.47%
Adj. R2-count	0.407	0.413	0.429
HL Chi2	11.54	9.35	12.94
HL p-value	0.173	0.314	0.114
Link test (p-value)	0.016	0.085	0.288

AIC: Akaike's information criterion; BIC: Bayesian information criterion; R2-count: Proportion of correct predictions; Adj. R2-count: Adjusted proportion of correct predictions; HL: Hosmer-Lemeshow specification test with 10 groups (null hypothesis: model well specified); Link test: the null hypothesis is that conditional mean is correctly specified.

Source: Own elaboration.

Predicted probabilities

Table D: DISCRETE CHANGE IN PROBABILITIES OF JOB SATISFACTION (MODEL C)

autonSI	0.041	careerSI	0.117***
autonSU	-0.101	careerSU	0.140
autonDI	-0.132**	careerDI	-0.107**
autonDU	-0.160**	careerDU	-0.073
securSI	0.027	leisurSI	-0.031
securSU	-0.180*	leisurSU	-0.001
securDI	-0.030	leisurDI	-0.111***
securDU	-0.001	leisurDU	0.048
learnSI	0.172***	statuSI	-0.025
learnSU	0.150	statuSU	0.066
learnDI	-0.029	statuDI	-0.009
learnDU	0.074	statuDU	-0.011
earnSI	0.009	usefulSI	0.050
earnSU	0.011	usefulSU	-0.103
earnDI	-0.101***	usefulDI	-0.141***
earnDU	-0.055	usefulDU	-0.070
challSI	0.075**	familySI	0.070*
challSU	0.095	familySU	0.042
challDI	0.004	familyDI	-0.006
challDU	0.097*	familyDU	-0.008

Note: permanent =1 tenure = 41.2 age = 30 and rest at zero, * p < 0.10, ** p < 0.05, *** p < 0.01.

Source: Own elaboration.



REFERENCES

- Allen, Jim and van der Velden, Rolf (2001): "Educational Mismatches vs. Skill Mismatches: Effects of Wages, Job Satisfaction and On-the-job Search", *Oxford Economic Papers*, vol. 3, pp. 434-452.
- Bender, Keith A., Donohue, Susan M. and Heywood, John S. (2005): "Job satisfaction and gender segregation", *Oxford Economic Papers*, vol. 57, pp. 479-496.
- Bowles, Samuel, Gintis, Herbert and Osborne, Melissa (2001): "The Determinants of Earnings: A Behavioral Approach", *Journal of Economic Literature*, vol. 39, pp. 1137-1176.
- Clark, Andrew E. (1996): "Job Satisfaction in Britain", *British Journal of Industrial Relations*, vol. 34 (2), pp. 189-217.
- Clark, Andrew E. (1997): "Job satisfaction and gender: Why are women so happy at work?", *Labour Economics*, vol. 4, pp. 341-372.

- Clark, Andrew E. (1999): "Are wages habit-forming? Evidence from micro data", *Journal of Economic Behavior & Organization*, vol. 39, pp. 179-200.
- Clark, Andrew E. and Oswald, Andrew J. (1996): "Satisfaction and comparison income", *Journal of Public Economics*, vol. 61, pp. 359-381.
- Clark, Andrew E., Oswald, Andrew J. and Warr, Peter (1996): "Is job satisfaction U-shaped in age?", *Journal of Occupational and Organizational Psychology*, vol. 69, pp. 57-81.
- Fabra, M. Eugenia and Camisón, Cesar (2009): "Direct and indirect effects of education on job satisfaction: A structural equation model for the Spanish case", *Economics of Education Review*, vol. 28, pp. 600-610.
- Freeman, Richard (1978): "Job satisfaction as an economic variable", *American Economic Review*, vol. 68, pp. 135-141.
- Gazioglu, Saziye and Tansel, Aysit (2006): "Job satisfaction in Britain: individual and job related factors", *Applied Economics*, vol. 38, pp. 1163-1171.
- Glenn, Norval D. and Weaver, Charles N. (1982): "Further Evidence on Education and Job Satisfaction", *Social Forces*, vol. 61 (1), pp. 46-55.
- Green, Fancis and McIntosh, Steven (2007): "Is there a genuine under-utilization of skills amongst the over-qualified?", *Applied Economics*, vol. 39, pp. 427-439.
- Hanson, Sandra L. and Sloane, Douglas M. (1992): "Young Children and Job Satisfaction", *Journal of Marriage and the Family*, vol. 54 (4), pp. 799-811.
- Jackson, Chris and Corr, Philip (2002): "Global Job Satisfaction and Facet Description: the moderating role of facet importance", *European Journal of Psychological Assessment*, vol. 18 (1), pp. 1-8.
- Kahneman, Daniel and Tversky, Amos (1979): "Prospect Theory: An Analysis of Decision under Risk", *Econometrica*, vol. 47 (2), pp. 263-292.
- Kalleberg, Arne (1977): "Work Values and Job Rewards: A Theory of Job Satisfaction", *American Sociological Review*, vol. 42 (1), pp. 124-143.
- Locke, Edwin A. (1969): "What is Job Satisfaction?", *Organizational Behavior and Human Performance*, vol. 4, pp. 309-336.
- Locke, Edwin A. and Latham, G.P. (1990): "A theory of goal setting and task performance": Englewood Cliffs, NJ: Prentice Hall.
- Lydon, Reamonn and Chevalier, Arnaud (2002): "Estimates of the Effect of Wages on Job Satisfaction", *Publication of the Centre for Economic Performance*.
- Maynard, Douglas C., Joseph, Todd Allen and Maynard, Amanda M. (2006): "Underemployment, job attitudes and turnover intentions", *Journal of Organizational Behavior*, vol. 27, pp. 509-536.
- McGuinness, Seamus and Sloane, Peter J. (2011): "Labour Market Mismatch Among UK Graduates: An Analysis Using REFLEX Data", *Economics of Education Review*, vol. 30 (1), pp. 130-145.
- Mobley, William H. and Locke, Edwin A. (1970): "The relationship of value importance to satisfaction", *Organizational Behavior and Human Performance*, vol. 5, pp. 463-483.
- Mora, Toni and Ferrer-i-Carbonell, Ada (2009): "The job satisfaction gender gap among young recent university graduates: Evidence from Catalonia", *The Journal of Socio-Economics*, vol. 38, pp. 581-589.
- Origo, Federica and Pagani, Laura (2009): "Flexicurity and job satisfaction in Europe: The importance of perceived and actual job stability for well-being at work", *Labour Economics*, vol. 16, pp. 547-555.
- Pollmann-Schult, Matthias and Buchel, Felix (2004): "Career Prospects of Overeducated Workers in West Germany", *European Sociological Review*, vol. 20 (4), pp. 321-331.

- Rice, Robert, Gentile, Douglas and McFarlin, Dean (1991): "Facet importance and job satisfaction", *Journal of Applied Psychology*, vol. 76 (1), pp. 31-39.
- Sloane, Peter J. and Williams, H. (2000): "Job Satisfaction, Comparison Earnings, and Gender", *Labour*, vol. 14 (3), pp. 473-502.
- Sousa-Poza, Alfonso and Sousa-Poza, Andrés A. (2000): "Taking Another Look at the Gender Job-Satisfaction Paradox", *Kyklos*, vol. 53, pp. 135-152.
- Sousa-Poza, Alfonso and Sousa-Poza, Andrés A. (2003): "Gender differences in job satisfaction in Great Britain, 1991-2000: permanent or transitory?", *Applied Economics Letters*, vol. 10 (11), pp. 691-694.
- Sousa-Poza, Alfonso and Sousa-Poza, Andrés A. (2007): "The effect of job satisfaction on labor turnover by gender: An analysis for Switzerland", *The Journal of Socio-Economics*, vol. 36, pp. 895-913.
- Usui, Emiko (2008): "Job satisfaction and the gender composition of jobs", *Economics Letters*, vol. 99, pp. 23-26.
- Vaisey, Stephen (2006): "Education and its Discontents: Overqualification in America 1972-2002", *Social Forces*, vol. 85 (2), pp. 835-864.
- Vila, Luis E., Garcia-Aracil, Adela and Mora, Jose-Gines (2007): "The Distribution of Job Satisfaction Among Young European Graduates: Does the Choice of Study Field Matter?", *The Journal of Higher Education*, vol. 78 (1), pp. 97-118.

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RESUMEN

Este artículo investiga los determinantes de la satisfacción laboral de los graduados universitarios en España. Basamos el análisis en la teoría de la discrepancia de Locke [Locke (1969)] y descomponemos la evaluación subjetiva de las características del trabajo en niveles de exceso y déficit. También estudiamos la importancia de la sobre-educación y la sobre-capacitación en la satisfacción laboral. Utilizamos los datos de la encuesta REFLEX. Nuestros resultados muestran que la satisfacción laboral es básicamente determinada por la evaluación subjetiva de las características intrínsecas del trabajo, con un impacto asimétrico de excesos y déficits. Otro resultado es que la sobre-capacitación es mucho más relevante que la sobre-educación para explicar la satisfacción laboral.

Palabras clave: satisfacción laboral, teoría de la discrepancia, sobre-educación, sobre-capacitación.

Clasificación JEL: J28.

