ISLANDS AND SMALL STATES INSTITUTE, UNIVERSITY OF MALTA, MSIDA, MALTA

OCCASIONAL PAPERS ON ISLANDS AND SMALL STATES
ISSN 1024-6282

Occasional Paper Number: 03/2016

ASSESSING THE FACTORS INFLUENCING THE JOB SATISFACTION OF PUBLIC SERVICE EMPLOYEES IN MALTA – A BINARY LOGIT MODEL

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CLIVE SACCO[*]

ABSTRACT

This study surveys civil service employees and seeks to associate the level of education to job satisfaction in the public service in Malta. Hence, the primary objective is to analyse the relationship between job satisfaction, which is a 'non-monetary benefit', and other relevant independent variables, including educational attainment. The results indicate that the majority of the employment-related variables exert significant influences over job satisfaction and a strong and positive relationship exists between the satisfaction derived from the duties of the individual and overall employment satisfaction. Conversely, the lack of opportunities for advancement in the public service was a determining factor for the respondent's dissatisfaction. Another result, which is somewhat controlversial, is that the job satisfaction and the level of education were found to be negatively related, although this relationship was not found to be statistically significant.

1. INTRODUCTION

The key objective of this paper is to try and evaluate different aspects of employment which shape the employees' fulfilment in the Maltese civil service by comparing the varying degrees of job satisfaction, with a focus on the Maltese public service employees.[1]

For this purpose the following research questions were set:
1. Can a subjective variable like the job satisfaction of an individual be measured?
2. What are determinants which affect the job satisfaction of civil service employees?
3. Does the level of education have an effect on job satisfaction?
4. To what extent does the level of education affect job satisfaction, relative to other determinants?

The data utilised to answer these questions was acquired through a survey method. Questionnaires were sent to public service employees only who were then asked questions related to their educational and employment background. The data was analysed and an econometric analysis was ultimately carried out to test the relationship between education and job satisfaction, keeping other things constant . A detailed methodology and a breakdown of the structure of the questionnaire is presented in Section 2.

A number of studies only take into account one aspect of the returns to education, namely income, though the benefits of education are not limited only to earning a higher salary. Apart from the increase in monetary returns, occupational outcomes of education also relate to non-pecuniary aspects of employment, including the satisfaction of

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[*] This paper is a summary of a dissertation that the author submitted in partial fulfilment of the B.Com(Hons) Economics degree at the University of Malta in June 2016.

[1] Throughout this paper, *civil service* and *public service* are used interchangeably.

employees at their workplace (Haveman & Wolfe 1984). To sustain this argument, the literature provides evidence which illustrates that non-monetary returns improve the well-being of employees and therefore should be included in any study which aims to make an assessment on the economic value of education (Wolfe & Zuvekas 1997).

Nonetheless, it might not always be the case that higher levels of education mean higher levels of job satisfaction. Public employees, in particular, are sometimes perceived as not being content at their workplace and thus, the study of job satisfaction within the public sector is of major interest (Durst & DeSantis 1997). Job satisfaction is highly dependent on personal preferences which makes it rather difficult to identify and measure it. However, the literature generally assumes a number of relevant and objective factors which could explain such a subjective variable (Bucheli et al. 2010).

Due to the subjective nature of job satisfaction, economists have anaysed this subject with great caution, however its importance is undisputable as it is often used as a good predictor of job quitting and as a proxy of utility from employment. A study conducted by the European Union Programmes Agency (EUPA) which addressed a number of issues relating to higher education graduates[2] concludes that overall job satisfaction is perceived as the most important aspect of an employment amongst all higher education institutions (HEI). Other work-related aspects which resulted to be valued mostly by respondents were the 'opportunity for career development' and 'relevance of one's studies to the job', whereas high salary ranked the fifth (EUPA 2013). Therefore, this proves that job satisfaction should be monitored by employers and must not be taken lightly.

This paper is structured as follows. Following this brief introduction, Section 2 will give a detailed description of the methodology adopted to obtain the data for this study. The results are then presented in Section 3, whereby the main findings are analysed with reference to the empirical studies discussed in the literature review. Section 4 concludes the paper with a discussion on the implications of the results.

2. METHODOLOGY

This section presents a thorough explanation of the methodology used to carry out such research, the difficulties that will be encountered when using the method of Ordinary-Least Squares (OLS) and the econometric model used in this study. Also, this section outlines the assumptions and limitations of the study.

Research Design

Self-assessment ratings of job satisfaction indicate how people value different aspects of their employment, both monetary and non-monetary returns, according to their own personal preferences and expectations (Fabra & Camisón 2009). The target population of this paper consisted of civil service employees over the age of 21.

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[2] Higher education graduates from the University of Malta (UoM), Malta College of Arts, Science and Technology (MCAST), Institute of Tourism Studies (ITS) and private higher education institutions were invited to participate.

Outline of the questionnaire

In order to address the research questions set in the introductory section, a questionnaire was drawn up to determine the impact of education and other work-related elements on job satisfaction among civil service workers (refer to Appendix 1).

At the beginning of the questionnaire, respondents were provided with some information about the researcher, the purpose of the study and also some information regarding confidentiality. The consent granted by the participant was in the form of the voluntary completion of the questionnaire. In order to safeguard the participants' privacy, disclosed information was anonymous and kept confidential throughout the study.

The first section of the questionnaire consisted of a set of general questions on the respondent, for instance, gender and age. The second and third part focused on the educational and employment background of the participant respectively.

One possible weakness of online questionnaires is the misinterpretation of questions. In this regard, an attempt was made to reduce such drawbacks by asking questions which were as clear and simple as possible. Since the questionnaire was sent to a large number of individuals of approximately all ages, it was important to allow individuals to choose whether they preferred answering the survey in English or Maltese.

A total of 22 questions were included in the questionnaire, the majority being close-ended questions. Though 22 questions were asked in the questionnaire, not all questions were to be taken into consideration in this paper as some were disregarded since they are not of primary interest to the study.

For the purpose of the questionnaire, education was classified into nine categories, ranging from no formal education or pre-primary to a doctoral degree, as per Census of Population and Housing (NSO, 2012). Thus, in this survey, respondents had to choose among the following options: primary level, secondary level, post-secondary level, university level diploma or certificate, first (Bachelor's) degree or equivalent, Post-graduate diploma or certificate, Master's degree or Doctorate degree (PhD).[3]

An attempt was made to account for the employees' perception of the correlation between their education and employment. This question was asked in the format of an ordinal variable, where respondents had to choose an option among the following: 'not related at all', 'not related', 'somehow related', 'related' and 'very related'. The self-assessed measure of the match between education and employment is more appropriate since workers' perception is by far a better measure than any other indicators of labour market mismatches (Lourdes Badillo-Amador & Vila 2013).

The job satisfaction measure is an ordinal category and respondents had to choose any integer value from 1 to 5, with 1 labelled 'very dissatisfied' and 5 'very satisfied'.

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[3] It should be noted that 'no formal education or pre-primary' was removed from the analysis since none of the respondents formed part of this group

Similarly, the inclusion of another 8 characteristics of employment[4] was clustered into one question (*responses to 'how satisfied are you with each of the following aspects of your employment?'*), where responses were taken on a 5-point categorical rank (a value of 1 if very dissatisfied and a value of 5 if very satisfied).

For the final part of the questionnaire, respondents were asked to provide information regarding their income. This question was not mandatory to answer since respondents might consider providing such data as confidential. Participants were given seven income brackets to choose from: 'Up to €10,000', '€10,001 to €15,000', €15,001 to €20,000', '€20,001 to €25,000', '€25,001 to €30,000', '€30,001 to €35,000' and '€35,001 and above'.

Coverage

Civil servants were divided into five strata, according to their age brackets. They were contacted through their government e-mail addresses, provided by the Public Administration HR Office (PAHRO). Questionnaires were distributed to public service employees representing 18 different Ministries or Departments and to their respective entities, under the current government administration (Table 1).

Table 1: The list of Ministries under the current Government administration

1	House of Representatives
2	Ministry for Education and Employment
3	Ministry for Energy and Health (Energy)
	Ministry for Energy and Health (Health)
4	Ministry for Finance
5	Ministry for Foreign Affairs
6	Ministry for Gozo
7	Ministry for Home Affairs and National Security
8	Ministry for Justice, Culture and Local Government
9	Ministry for Social Dialogue, Consumer Affairs and Civil Liberties
10	Ministry for Sustainable Development, the Environment and Climate Change
11	Ministry for the Economy, Investment and Small Business
12	Ministry for European Affairs and Implementation of the Electoral Manifesto
13	Ministry for the Family & Social Solidarity
14	Ministry for Tourism
15	Ministry for Transport & Infrastructure
16	National Audit Office
17	Office of the President
18	Office of the Prime Minister

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[4] The additional 8 aspects of employment included in the questionnaire are the following: (1) Duties of the job, (2) Training and development programmes, (3) Opportunities for advancement, (4) Working hours, (5) Level of responsibility, (6) Relationship with co-workers, (7) Relationship with superiors and (8) Overall employment benefits.

The dissemination of the questionnaire took approximately 2 months, starting on the 26th of January 2016 and was sent to a total number of 12,355 individuals. Responses, which were kept anonymous to protect the respondents' privacy, were collected and sorted through *Google Forms.*

Regression analysis

To better analyse the relationship between job satisfaction and other independent variables, this study uses regression analysis. The Logit model were used for this purpose. This section first looks at the problems faced when using the OLS method to estimate a regression with a qualitative dependent variable. The second part shifts to explaining the main tool to analyse the data with a dichotomous dependent variable. For econometrics purposes, all regression analyses were carried out using the software *EViews 8.*

One fundamental assumption of the OLS method is that the endogenous variable has to be a continuous variable. In such analysis, the dependent variable (*job satisfaction*) is an ordinal variable, in the form of a likert-scale, ranking from 1 to 5 and hence it is not a continuous variable. Thus, since the dependent variable is qualitative in nature, entails that an OLS regression would be biased.

Mechanically, it is possible to estimate binary variable regression models using the OLS method through the Linear Probability Model (LPM), however there are certain limitations. The LPM generally assumes that the probability of the dichotomous dependent variable moves linearly with the value of the independent variables, irrelevant of the size of the value. The second limitation is that, the traditional hypothesis that the error term is normally distributed cannot hold if the regressand takes values of 0 and 1 only. Thus, the error term in LPM is heteroscedastic, making the traditional significance tests suspicious (Gujarati 2009). Due to such limitations, a Logit model is the best alternative.

For simplicity, the dependent variable was grouped into a dichotomous variable, taking only binary values; a value of 0 for 'very dissatisfied', 'dissatisfied' and 'neither satisfied nor dissatisfied' and a value of 1 for 'satisfied' and 'very satisfied'. This analysis will run an ordered logit regression of job satisfaction on several employment-related characteristics and include a number of control variables, such as gender, age and health status.

Assumptions of the research

Several variables are used in order to determine the main factors of job satisfaction, with a particular emphasis on the level of education. Prior to delving into the next section relating to the analysis of the data, it is important to take into consideration any assumptions of this paper.

One underlying assumption is that respondents are able to make self-assessments on a number of factors. Thus, the first fundamental assumption of this analysis, is that respondents answer truthfully and are able to rate their health status, job satisfaction and

a number of different aspects of their employment. Additionally, respondents may understand particular questions differently, however, for ease of comparability, it is assumed that different individuals comprehend and respond questionnaires in a similar way.

It is assumed that categorical variables, such as *health status*, which have a set of ordinal numbers, ranking from 1 (labelled as very good) to 5 (poor) have an a priori ordering of effects with, for instance, the second category having a larger effect than the first category and the fourth has a larger effect than the third category (also relative to the second category). Other categorical variables include *job satisfaction*. Similarly, education, is an ordinal variable and thus, it shall be assumed that the difference between categories is consistent. Thus, an increase in the level of education of a respondent reflects an increase in his or her level of education as stated by the MQF[5] level. For example, an increase from MQF level 3 to MQF level 4 is the same as an increase from MQF level 6 to MQF level 7. It is generally presumed that for each increment in education, there is a corresponding occupational payoff in terms of job satisfaction. In fact, this study aims at testing this assumption.

Different occupations reflect different characteristics which ultimately might have an impact on the individual level of job satisfaction. Thus, it shall be assumed that there is no dissimilarity between occupations with regards to job satisfaction.

The last assumption of this research is that these variables might not always be mutually exclusive, meaning that an individual's income might be related to the duties of the same individual (in which case the level of income increases with the level of responsibility) and they both impact the person's job satisfaction. For analytical purposes, if the correlation between the variables is not significant, they will be kept delineated.

The data

In this section, the focus shifts on the analysis of the data collected. A summary of the observations attained is presented, which is then followed by a breakdown representation of the individual variables. The second part presents a cross-correlation analysis between job satisfaction of public service employees (the endogenous variable) and other independent variables.

Out of the distributed 12,355 questionnaires, 2,262 questionnaires were fully and satisfactorily answered, giving a total response rate of 18.3%. Raw data obtained from the questionnaires was sorted in *Microsoft Office Excel* and then inputted onto the *SPSS software* for data analysis.[6]

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[5] The Malta Qualifications Framework, otherwise known as MQF consists of a set of regulations which 'determine the regulatory framework for the classification of qualifications and awards which can be provided through formal, non-formal and informal learning.'
Source: *Subsidiary Legislation 327.431: Malta Qualifications Framework for Lifelong Learning Regulations*
[6] There were 80 missing responses for the income-related question.

The question relating to the number of years in employment was omitted from the analysis due to a large number of missing observations. This variable was intended to be used as a proxy for the experience of participants. Another variable which was omitted from this study related to the occupation which civil service workers currently hold. Besides having a number of missing observations for this particular variable, it was also difficult to group the respondents' occupation into different categories. Thus, as mentioned in the previous section, it is assumed that there is no dissimilarity amongst occupations.

Analysis of the variables

In this section, an overview of the results is given. Reference is made to Appendix 2 which gives a summary of the number of observations for each variable. Also, Appendix 3 presents a descriptive table of statistics for the factors which are being studied.

Gender

Figure 1 gives data on the gender of the participants. More than half of the participants were female (56.8%), whereas the response rate from the male counterparts stands at 43.2%. For regression purposes, gender is treated as a dummy variable, with values of 1 if the respondents is a female and 0 if the respondent is a male.

Figure 1: Gender of Respondents
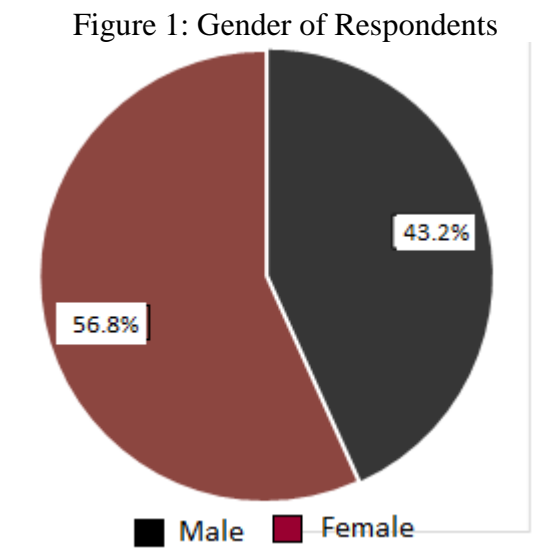
Age

Age was measured in years and from Figure 2 it is clear that there were similar number of responses from the first 4 age cohorts: 21 years old to 30 years old (20.1%), 31 years old to 40 years old (27.5%), 41 years old to 50 years old (29.4%) and 51 years old to 60

years old (21.8%). Figure 4.2 also shows that the older age cohort (61 years and over) makes up a relatively smaller proportion of the sample, accounting for approximately 1.2%. This is partly due to retirement. In regression analysis, this variable was coded as an ordinal variable, with a value of 1 for the 21 to 30 years of age bracket, a value of 2 for the 31 to 40 years old, a value of 3 for the 41 to 50 years old, a value of 4 for the 51 to 60 years old and a value of 5 for those respondents who are 60 years old and over.

Figure 2: Age of respondents (in %)
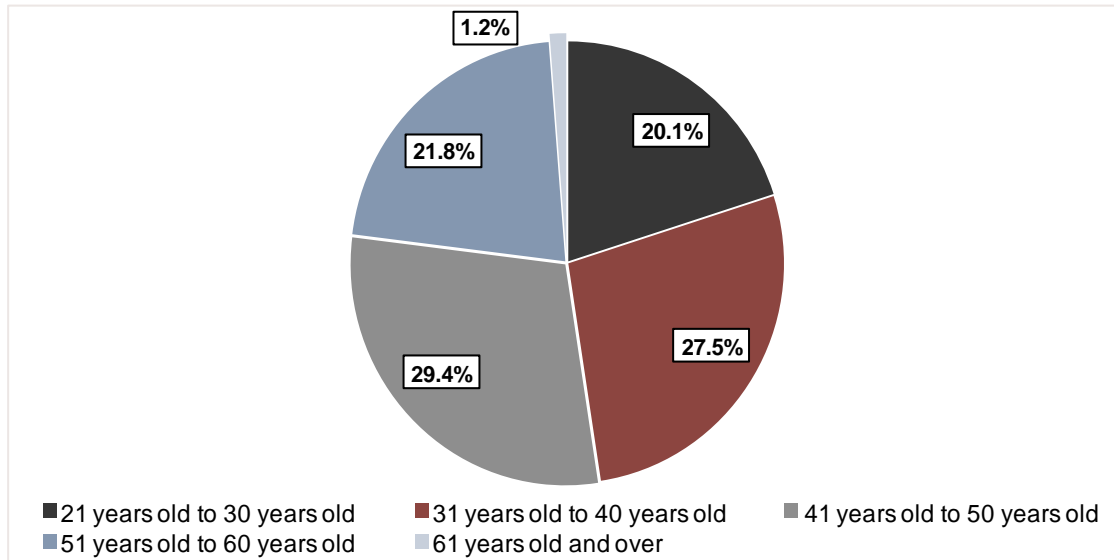
Legal marital status

The Census of Population and Housing which was conducted in 2011 was categorized into six relationship statuses (NSO 2012): Single (never married), Married, Separated, Widowed (not remarried), Divorced (not remarried) and Annulled. Therefore, following the same format, marital status was categorised into six categories in the questionnaire.

Most of the respondents are married (61.4%), whereas 29.9% of those who participated are single. The share of respondents who are separated, widowed divorced or annulled make up 5.1%, 1.0%, 1.2% and 1.4% of the sample, respectively. From these statistics, it is evident that only a very small number of respondents belonged to the latter four categories. Hence, for regression purposes, marital status was treated as a dummy variable with a value of 1 if the participant falls under the 'Married' category and a value of 0 if otherwise.

Health status

In general, results show that most of the respondents (63.5%) are in good health, followed by a 23.3% share of the respondents who claim a 'very good' health status. Few workers have responded a poor health standard (approximately 0.9%). This variable is ordinal and shall thus be coded accordingly: a value of 1 if the respondent reported a poor health status, a value of 2 for 'quite poor', a value of 3 for 'neither good

nor bad' and values of 4 and 5 if the respondent opted for 'quite good' and 'very good', respectively.

Educational attainment

Education was classified into eight categories in the survey, ranging from primary level to a doctoral degree.[7] Figure 3 depicts the number of respondents clustered by the level of education attainment. The largest share of respondents (26.3%) have successfully completed post-secondary level. This summary statistic also shows that education at primary level has the lowest share (0.3%). This is partly due to the fact that nowadays, education is compulsory till secondary level, thus at the age of 16. Therefore, there is a high probability that respondents who have a primary level education are aged 50 and upwards.

Tertiary-educated individuals make up the largest proportion of the sample, accounting for approximately more than 60% of the respondents. In addition, 23.7% of the participants have achieved a Master's degree level, whereas 58 respondents have a Doctorate degree.

Figure 3: The level of education attained by respondents (%)

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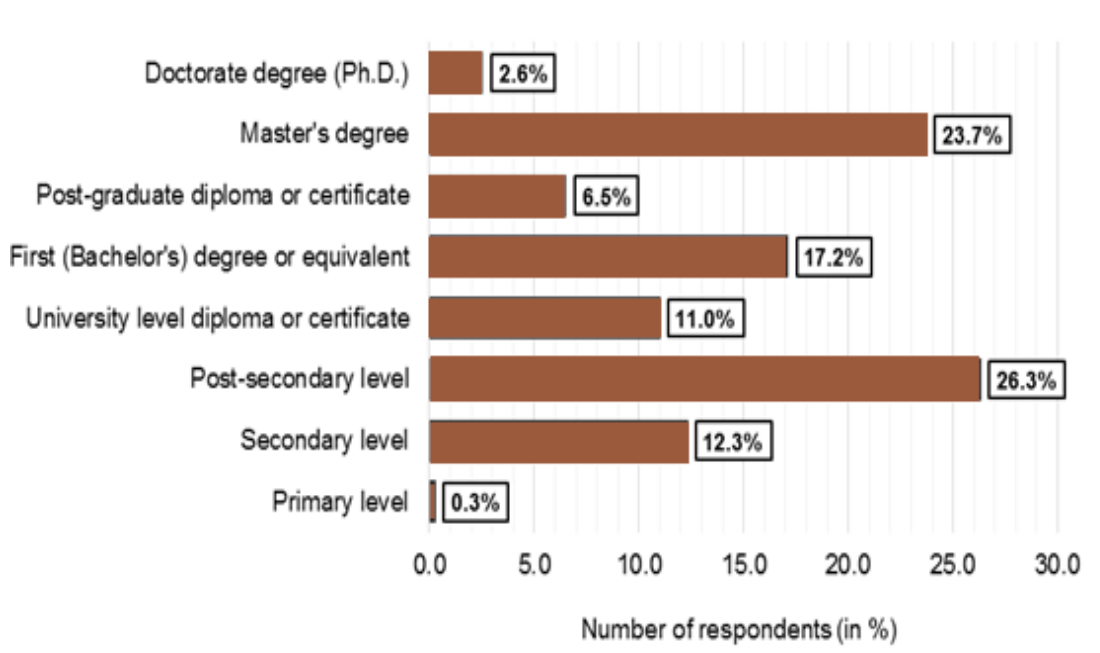
[7] The option to choose 'non-formal education or pre-primary' was removed as outlined in Section 3.3.

For simplicity, this variable was coded into educational levels as described by the Malta Qualifications Framework.[8] A 'Post-graduate diploma or certificate' and a 'Master's degree' are both pegged level 7, and thus, need to be grouped into one. Table 2 maps all the different qualification attainments against eight different education levels which reflect the different stages of the education process.

Table 2: The different levels of education and their corresponding MQF levels

Level of education	MQF Level
Primary level	MQF Level 1
Secondary level	MQF Level 2 and 3
Post-secondary level	MQF Level 4
University level diploma or certificate	MQF Level 5
First (Bachelor's) degree or equivalent	MQF Level 6
Post-graduate diploma or certificate	**MQF Level 7**
Master's degree	**MQF Level 7**
Doctorate degree (Ph.D.)	MQF Level 8

Employment status

In general, results show that almost all respondents (92.0%) were employed on a full-time basis. 6.2% of the participants were employed on a full-time basis with reduced hours. Respondents who worked on a part-time basis (1.2%) and on a casual basis (0.3%) constitute a relatively small share of the sample. This variable is treated as a dummy for regression analysis, whereby respondents who works on a full-time basis are assigned a value of 1 and a value of 0 if otherwise.

Job satisfaction

Overall job satisfaction was a self-assessed ranking where respondents had to choose from a likert-scale, an integer number from 1 (very dissatisfied) to 5 (very satisfied), depending on their own judgement.

The mean value of this variable is roughly 0.6 which shows that on average, respondents are fairly satisfied with their employment (see Appendix 3). By looking at Figure 4, it is true that the biggest share of respondents, almost half, report to be satisfied with their employment (43.2%). Since this study uses a binary logit model, we construct the dependent variable in the following way: a dummy variable, with a value of 1 if the respondent is either 'very satisfied' or 'satisfied', and a value of 0, for 'neither satisfied not dissatisfied', 'dissatisfied' or 'very dissatisfied' is generated.

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[8] Source: *Subsidiary Legislation 327.431: Malta Qualifications Framework for Lifelong Learning Regulations* at http://www.justiceservices.gov.mt/DownloadDocument.aspx?app=lom&itemid=11927

Figure 4: Overall job satisfaction of respondents (%)
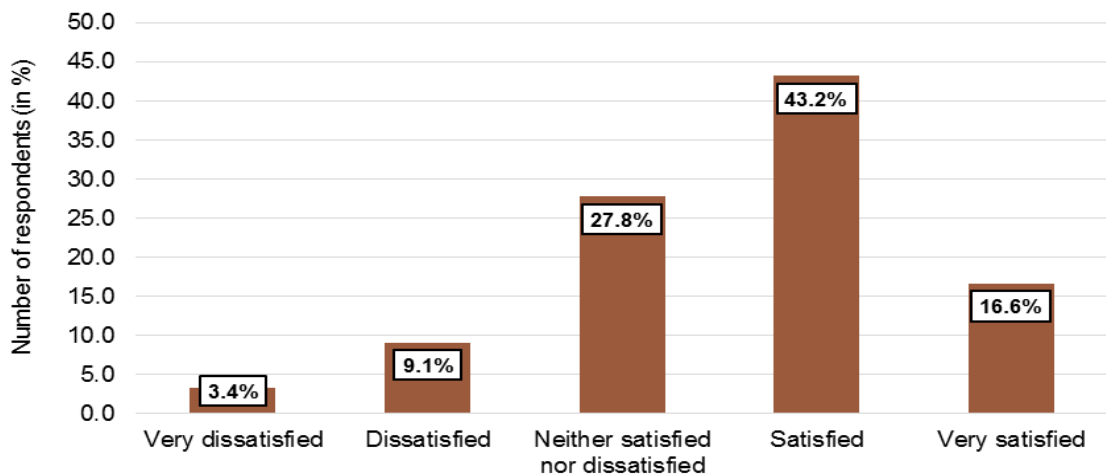
Other aspects of employment

On the same note as the previous self-assessment score, respondents had to self-assess other characteristics of their employment: duties of the job, training and development programmes, opportunities for advancement, working hours, the level of responsibility, the relationship with their co-workers and superiors and their overall employment benefits. Similarly to the self-assessed job satisfaction question, here, respondents could choose between five different categories ranked (1) for very dissatisfied up to (5) very satisfied, where the integers from 2 to 4 ordered intermediate levels of satisfaction.

From Figure 5, it is evident that the majority of the respondents are quite dissatisfied with the lack of opportunities for advancement in the civil service. In fact, this is proven by a considerable and significant correlation between job satisfaction and the opportunities for advancement (Pearson Correlation 0.386, Significance (2-tailed) 0.000) (refer to the correlation-coefficient matrix in Appendix 2). Also, a hefty number of additional comments by respondents sustain this result. Few of them are mentioned below:
*"There are very few opportunities to succeed in finding a job with regards to your level of education within the public sector. Many of the qualifications are not even recognized for an annual qualification allowance so makes one reluctant to further his studies."*
"No opportunities exist, where one would be able to achieve a promotion to motivate employees."
"There should be more opportunities for career advancement for those civil service workers who continue their studies (diplomas, degrees, masters etc.) especially if it's related to the public service."
"Experience is under-rated in current job opportunities."

Figure 5: The satisfaction level in other aspects as indicated by respondents (%)
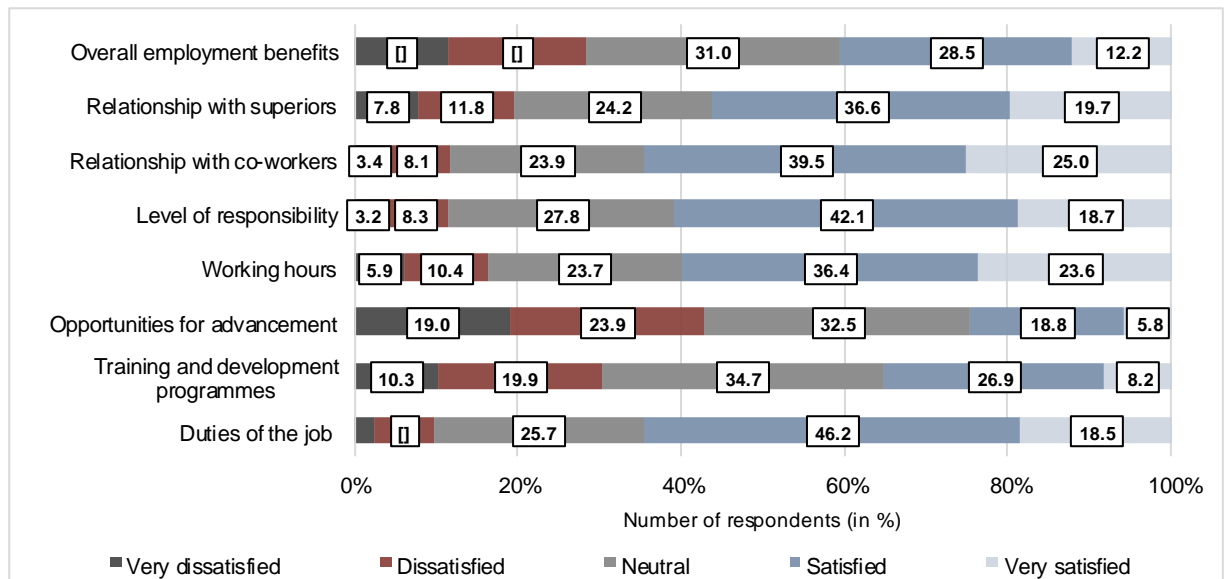
Two other aspects which are illustrated in Figure 5 are the overall employment benefits and the training and development programmes. Both factors seem to have a significant correlation with job satisfaction with a Pearson Correlation of 0.306 for the training and development factor and 0.383 for the overall employment benefits.

On the other hand, another significant aspect of employment which seems interesting is employment duties. More than half of the respondents report being either very satisfied or satisfied with their workload (64.7%). In general, civil service workers seem to also be satisfied with the relationship with their co-workers (25.5%), the hours of work (23.6%) and also the relationship with their superiors (19.7%). For regression analysis, all the factors which constituted this question were coded as follows: 1 (very dissatisfied), 2 (satisfied), 3 (neutral), 4 (satisfied) and 5 (very satisfied).

Income

As noted, the survey asked for the respondents' gross annual income. Such question was not mandatory to answer since respondents might consider providing such data as confidential. In this regard, the income variable had 7 categories, with the lowest category being 'up to €10,000' whereas the highest was '€35,000 and above', with each intermediate category having an increment of €5,000.

Most of the respondents are categorised within the €20,000 to €25,000 income bracket, as shown in Figure 6. There is a higher share of respondents who earn €35,000 and above (6.4%) relative to those categorised within the 0 to €10,000 bracket (2.3%). This variable is a categorical variable and thus, for regression purposes, each income bracket is assigned an integer: a value of 1 for the lowest income interval up to a value of 5 for the '€35,000 and above' income bracket.

Figure 6: The income of respondents (%)

Figure 6: The income of respondents (%)
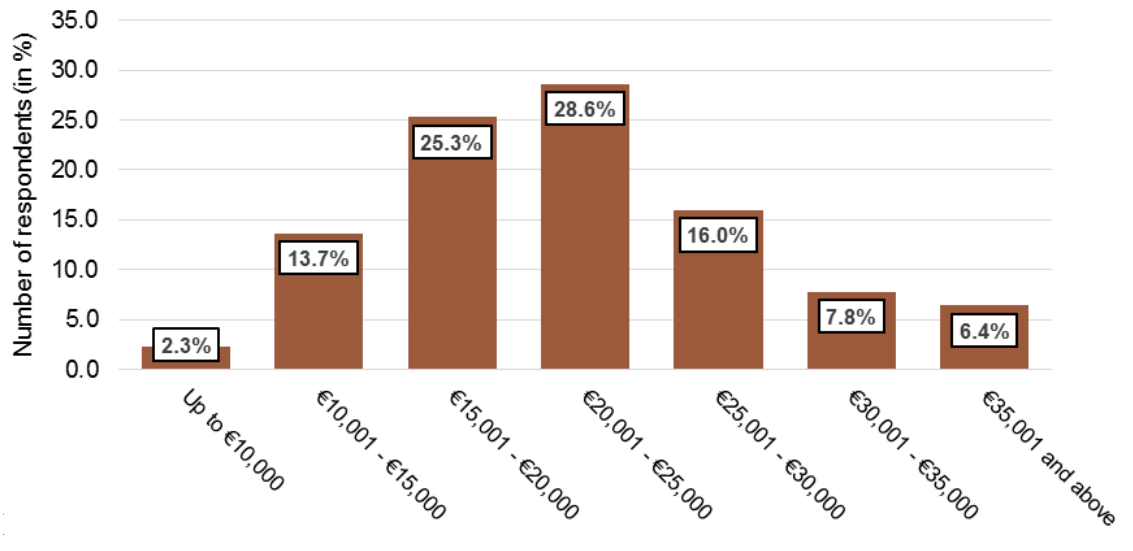
questionnaire seem satisfied with the income which they currently receive (44.2%). However, 41.1% of the respondents earn less than they would expect and another 12.2% share of public service employees who took part in the survey claim that they earn much less than expected. On the other hand, around 2.3% of those who answered this question earn higher than expected when taking into consideration their level of education.

Figure 7: Income expectations of respondents (in %)
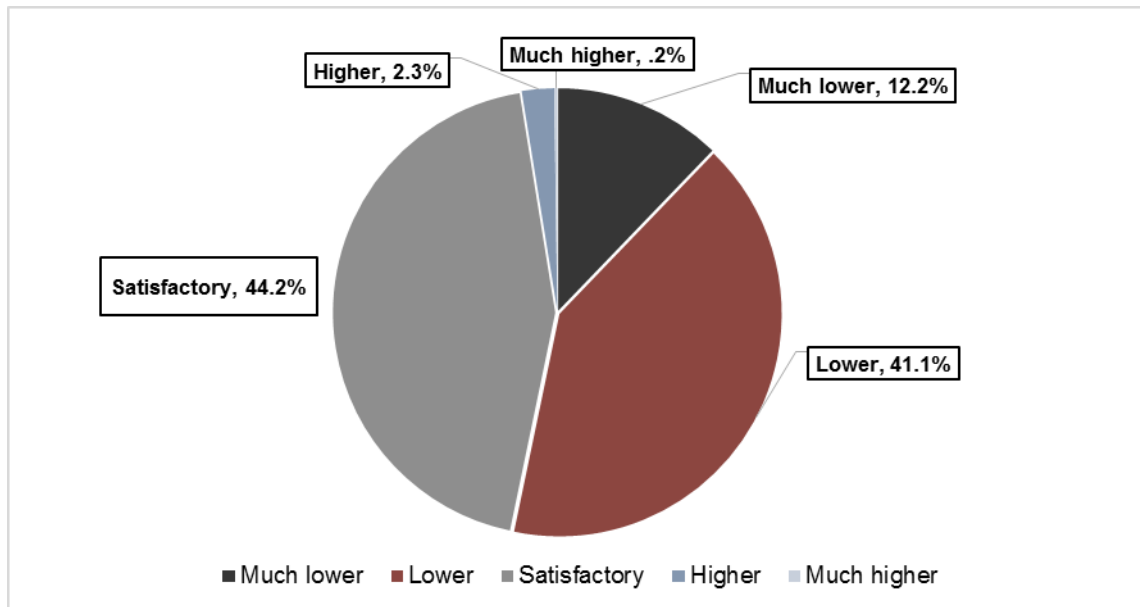
Data analysis: Correlations between variables

Job satisfaction and gender

A correlation-coefficient matrix (Appendix 2) was created using the *SPSS Software*, whereby it is used to investigate the correlation coefficients between each variable and the others.

One of the findings in this analysis is the relationship between gender and job satisfaction. There appears to be a mild correlation between job satisfaction and gender (Pearson Correlation 0.046, Significance (2-tailed) 0.005). In fact, this can be gleaned from Figure 8, where 17.1% of the female respondents claim to be very satisfied with their employment, compared to the 16.1% of the male counterparts who report to being very satisfied. Female respondents are slightly more satisfied with their jobs than men. There is a very small discrepancy between the share of male respondents who claim that they are satisfied with their employment and their female counterparts. Job satisfaction and the age of the respondents

Figure 8: Job satisfaction and gender
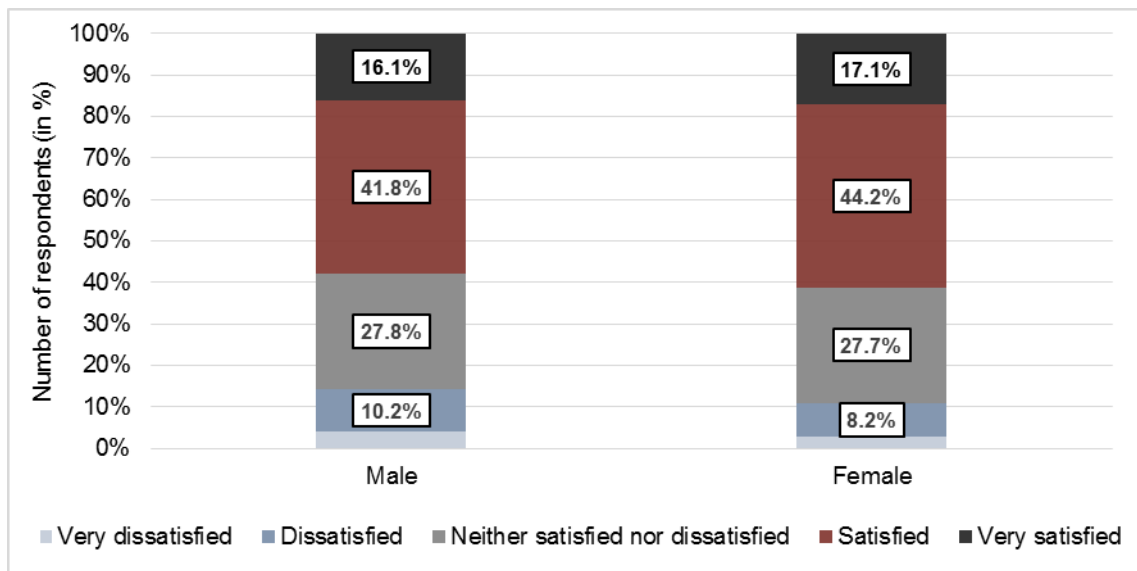
It is important to notice that from this sample, job satisfaction is relatively high at the first age cohort (15.0%) and then declines slightly in the '31 years to 40 years old' age cohort (13.%). Job satisfaction starts to increase in the following age cohort and continues to increase thereafter. This coincides with the argument presented by Herzberg et al. (1957) who concluded that job satisfaction is U-shaped in age.

Job satisfaction and the level of educational attainment

As discussed in the literature review, there is no universal agreement with regards to the relationship between job satisfaction and the level of education. In fact, at first glance, Figure 9 does not give a straight-forward relationship as the percentage shares of job

satisfaction seem to change slightly across all MQF levels. Only 7 respondents reported to having a level of education equal to MQF Level 1. Therefore one needs to be cautious with regards to its interpretation. An interesting observation is that 15.5% of the respondents who have a doctoral degree (MQF Level 8) report to being dissatisfied with their employment.

Figure 9: Job satisfaction and the level of educational attainment
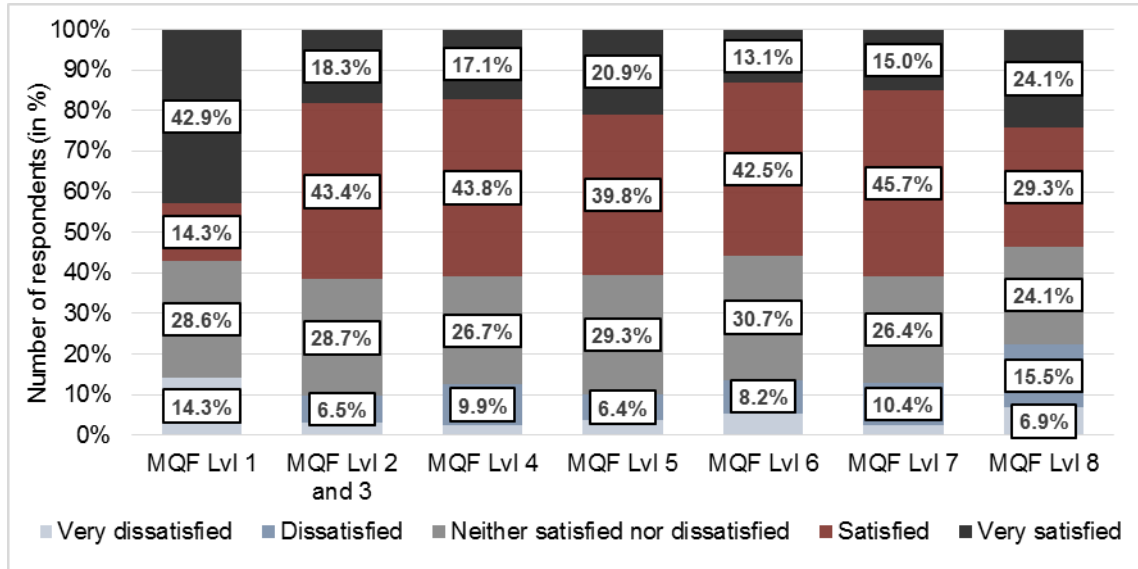
Job satisfaction and education-mismatch of tertiary-educated respondents

In some empirical studies (e.g. Clive mention 1 study) it is argued that competence mismatches tend to reduce workers' job satisfaction. In this regard, respondents were asked '*How related is your current occupation to your field of study?*' to which they had five categories to choose from: 'Not related at all' (1), 'Not related' (2), 'Somehow related' (3), 'Related' (4) and 'Very related' (5).

This question was answered only by respondents who have acquired a tertiary level of education and have a particular field in which they have expertise. Figure 10 illustrates very clearly that 20.5% of the respondents who consider their employment as not related to their field of study are classed as very dissatisfied and 21.9% are dissatisfied with their employment, whereas only 6.8% of those who report themselves to be mismatched are very satisfied.

Figure 10: The level of job satisfaction by education-job match
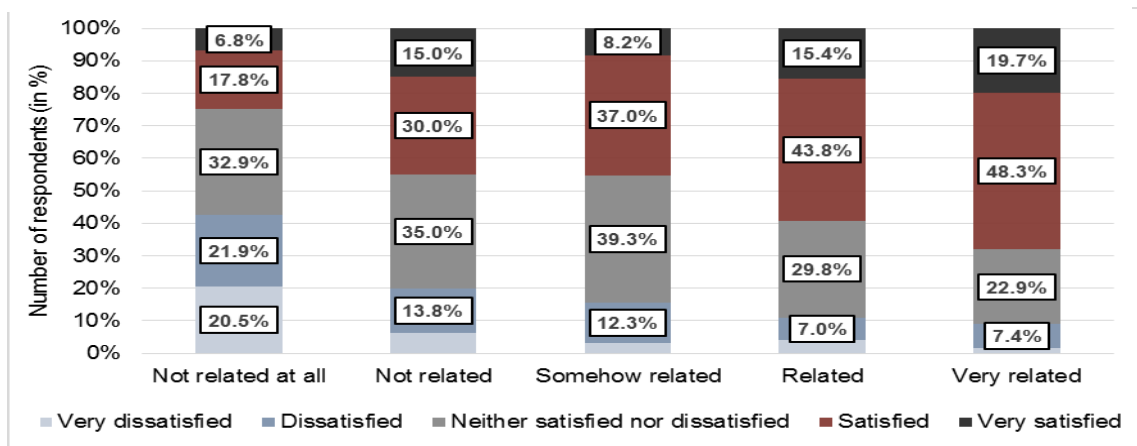
Some respondents also mentioned this aspect at the end of the questionnaire, with a particular respondent claiming the following:

"I would like to remark that in most cases you study about something and finally end up working and carrying out a different job. I studied about agriculture and ended up dealing only with local and EU legislations."

On the other end of the spectrum, a substantial percentage of those participants who have reported their job as being closely related to their field of study are very satisfied (19.7%) and satisfied (48.3%). As cited by a number of empirical studies, job-mismatching might be a source of job dissatisfaction. Similarly, this result shows that the degree to which employment matches the field of study of an individual will affect and eventually translate into a higher job satisfaction score. Figure 10 represents a positive relationship among job satisfaction and education-job match.

Job satisfaction and the gross annual income of respondents

From Figure 11 it can be seen that respondents with an income which falls in the '€35,000 and above bracket' seem to be very satisfied with their employment (23.4%). The same can be said for respondents who fall under the '€30,001 to €35,000' income bracket (18.6%). This is relatively high when compared to the 12.9% participants who report to being very satisfied with their job and fall under the '€10,001, to €15,000' bracket. The first bracket should be treated with caution due to the low response count.

Figure 11: The level of job satisfaction by the income of respondents
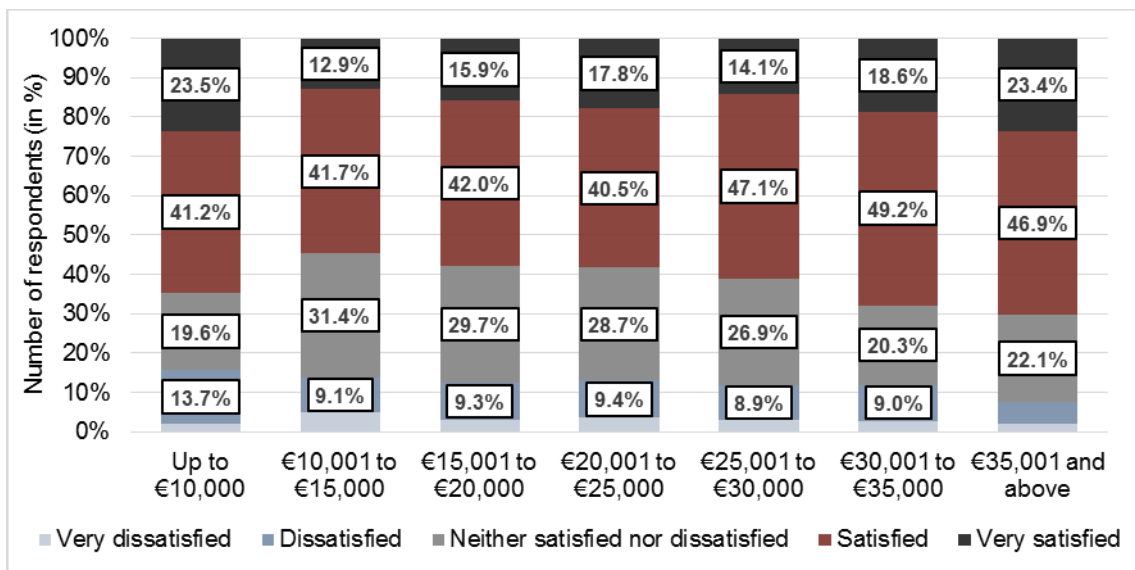
3. REGRESSION RESULTS

The main purpose of this section is to present the results which were derived from the application of econometric regression exercise on the data acquired in this study. As mentioned in Section 3, a logistic regression shall be used. Also, a number of diagnostic tests were used to assess the model.

The econometric model which is used in this study is a logit model and takes the following form:

$$L = \ln\left(\frac{P}{1-P}\right) = \beta_1 + \beta_2 X_1 + u_i \quad (eq.1)$$

Equation 1 states that the log of the odds ratio is a linear function of the βs and the Xs, where L is known as the logit (log of the odds ratio). The odds ratio is given by $\ln\left(\frac{P}{1-P}\right)$

and in this study it simply means the odds ratio (OR) of satisfaction at the place of work – the ratio of the probability that a person is satisfied with his/her employment to the probability that he or she is not satisfied at the workplace. Hence for a logistic regression with a dichotomous independent variable coded 1 and 0, the relationship between the odds ratio and the regression coefficient is the exponential function of the coefficient: $OR = e^{\beta_1}$.

Utilising what was studied in the literature review and the data analysis, a number of variables where incorporated to form a regression, with a qualitative dependent variable: *job satisfaction*, taking values of 0 (dissatisfied) and 1 (satisfied) for simplicity.

Table 3 gives a summary of the variables which shall be used in the econometric analysis and also shows the a priori relationship of the independent variable with the regressand.

Table 3: A summary of the variables used in the regression analysis

Dependent variable	Abbrev-iation	Measure of the variable	Description of the variable
Overall job satisfaction	JOB_S	Dummy variable	A value of 1 if the respondent is 'very satisfied' or 'satisfied', 0 if otherwise.

Independent variables	Abbrev-iation	Measure of the variable	Description of the variable	Expected Sign
Level of education	EDUC	Ordinal	A scale which defines the level of education of the respondent, ranging from 1 to 7, with 7 being a Doctorate degree.	+/-
Employment status	EMP	Dichotomous	A value of 1 if the respondent is a full-time worker, 0 if otherwise.	+/-
Duties of the job	DUTIES	Ordinal	A scale from 1 to 5 (with 5 being the highest), ranking the level of satisfaction vis-à-vis the independent variable.	+
Training and development programmes	TR_D	Ordinal	A scale from 1 to 5 (with 5 being the highest), ranking the level of satisfaction vis-à-vis the independent variable.	+
Opportunities for advancements	OPP	Ordinal	A scale from 1 to 5 (with 5 being the highest), ranking the level of satisfaction vis-à-vis the independent variable.	+
Working hours	HRS	Ordinal	A scale from 1 to 5 (with 5 being the highest), ranking the level of satisfaction vis-à-vis the independent variable.	+
Level of responsibility	RESP	Ordinal	A scale from 1 to 5 (with 5 being the highest), ranking the level of satisfaction vis-à-vis the independent variable.	+
Relationship with co-workers	CO_	Ordinal	A scale from 1 to 5 (with 5 being the highest), ranking the level of satisfaction vis-à-vis the independent variable.	+
Relationship with superiors	SUP	Ordinal	A scale from 1 to 5 (with 5 being the highest), ranking the level of satisfaction vis-à-vis the independent variable.	+
Overall employment benefits	BEN	Ordinal	A scale from 1 to 5 (with 5 being the highest), ranking the level of satisfaction vis-à-vis the independent variable.	+
Gross annual income	INC	Ordinal	Defines the gross annual income of respondents: (1) Up to €10,000, (2) €10,001 to €15,000, (3) €15,001 to €20,000, (4) €20,001 to €25,000, (5) €25,001 to €30,000, (6) €30,001 to €35,000, and (7) €35,000 and above.	+
Gender	FEMALE	Dichotomous	A value of 1 if the respondent is a female, 0 if otherwise.	+/-
Age	AGE	Ordinal	Ordinal variable that defines the age of the individual: (1) 21 years old to 30 years old, (2) 31 years old to 40 years old, (3) 41 years old to 50 years old, (4) 51 years old to 60 years old, (5) 61 years old and over.	+/-
Marital status	MARR	Dichotomous	A value of 1 if the respondent is married, 0 if otherwise.	+/-
Health status	HEALTH	Ordinal	A scale from 1 to 5 (with 5 being the highest), ranking the health status of an individual,	+

Table 4 gives four different regression results which were analysed prior to arriving at the final regression (Regression 4). Regression 1 took into consideration a number of variables which were studied in the literature. The significance of the variables and the R^2 were taken into consideration. Three other regressions were attempted with the aim of finding the best regression model.

Table 4: Estimation output of the regression using a *Logit model*

Dependent variable: JOB SATISFACTION

	Regression 1	Regression 2	Regression 3	Regression 4
Intercept	-6.26***	-7.657***	-8967***	-8.827***
EDUCATION				
EDUC	-0.111***	-0.088**	-0.277***	-0.090**
ASPECTS OF EMPLOYMENT				
INC	0.119***	0.123***	0.145***	0.115***
*CO_*	0.202***	1.788	-	-
SUP	0.591***	0.522***	0.536***	0.514***
TR_D	0.357***	0.195***	0.200***	-
OPP	0.278***	0.245***	0.236***	0.269***
DUTIES	-	1.221***	1.196**	1.168***
HRS	-	-	0.164**	-
RESP	-	-	-	0.250***
BEN	-	-	-	0.104**
EMP	-	-	-	-
OTHER CONTROL VARIABLES				
MALES	0.145	-	-	-
AGE	0.161***	0.116	-	-
MARRIED	0.045	-	-	-
HEALTH	0.362***	0.322***	0.277***	0.271***
SUMMARY STATISTICS **McFadden R-squared**	0.198	0.302	0.303	0.303
LR statistic	604.03	919.99	923.67	922.11
Prob(LR statistic)	0	0	0	0
Obs with Dep=0	909	909	909	909
Obs with Dep=1	1353	1353	1353	1353
Total observations	2262	2262	2262	2262

Notes: * Significant at the 10% level ($p < 0.1$); ** Significant at the 5% level ($p < 0.05$); *** Significant at the 1% level ($p < 0.01$)

The choice of model was based on the one which provided the highest values for R-squared as well as statistically significant coefficients on the explanatory variables as explained previously. Thus, the final model which was chosen is represented by tyhe following equation:

$$L = log\left(\frac{p(S = 1)}{1 - p(S = 0)}\right)$$

$$= CONST - \beta_1 EDUC + \beta_2 INC + \beta_3 SUP + \beta_4 OPP + \beta_5 DUTIES + \beta_6 RESP$$

$$+ \beta_7 BEN + \beta_8 HEALTH$$

Where, L refers to the, $log\left(\frac{p(S=1)}{1-p(S=0)}\right)$ is the odds ratio. *CONST* is the intercept, *EDUC*

is the level of educational attainment of respondents, *INC* refers to the gross annual income, *SUP* is the level of satisfaction of employees with regards to the relationship with their superiors, *OPP* refers to the satisfaction level with respect to the opportunities for advancement at the place of work, *DUTIES* is the level of satisfaction with regards to the duties of the job, *RESP* and *BEN* refer to the level of satisfaction associated with the responsibility of the job and the overall job benefits, respectively. Lastly, *HEALTH* is the level of health status of the respondent.

If the coefficients are substituted with the numerical values obtained from the regression output, the following result is obtained:

$$L = log\left(\frac{p(S = 1)}{1 - p(S = 0)}\right)$$

$$= CONST - 0.09\,EDUC + 0.12\,INC + 0.51\,SUP + 0.27\,OPP + 1.17\,DUTIES$$

$$+ 0.25\,RESP + 0.10\,BEN + 0.27\,HEALTH$$

However, these variables cannot be interpreted in the same way as the Ordinary-Least Square Method. As suggested by Gujurati (2009), the best way to interpret the regression output is by explaining the odds-ratio and the marginal effects.

Understanding and testing the results

Since this study makes use of a logit model instead of the standard OLS method, the usual statistical and inference tests cannot be used since the dependent variable is not continuous and thus testing the model would be biased. Therefore, a number of other inference tests were used to test the significance and reliability of the model.

Odds-ratio

In binary logit model, one common test which is used is the odds ratio. The odds ratio is a measure of association which approximates how much more likely, or unlikely it is for the outcome to be present among those with x=1 than among those with x=0. The odds

ratio is simply carried out by taking the exponential function of the coefficient (β), as seen in Table 5.

Table 5: Odds Ratio

Variable	Coefficient	ODDS RATIO (e^{β})
C	-8.827482	0.000147
HEALTH	0.271232	1.311579
EDUC	-0.090074	0.913864
DUTIES	1.168325	3.216600
SUP	0.514698	1.673133
INC	0.115011	1.121886
RESP	0.250405	1.284546
OPP	0.269657	1.309515
BEN	0.104426	1.110073

The Goodness-of-Fit Test (Hosmer-Lemeshow test)

An additional test to check for the significance of the model is the Hosmer-Lemeshow test. This is a goodness-of-fit test whereby if the p-value is greater than 0.05, the expected values show a good fit of the model. In this case, the null hypothesis is rejected since the p-value is 0.5521 as can be seen from Table 6. Thus this suggests that the observed and expected values do not vary significantly

Table 6: The Hosmer-Lemeshow test

	Quantile of Risk Dep=1			Dep=0			Total	H-L
	Low	High	Actual	Expect	Actual	Expect	Obs	Value
1	0.0027	0.1391	211	211.692	15	14.3084	226	0.03569
2	0.1409	0.2827	177	177.949	49	48.0512	226	0.02379
3	0.2842	0.4280	148	145.382	78	80.6178	226	0.13214
4	0.4280	0.5560	128	115.102	98	110.898	226	2.94521
5	0.5570	0.6723	85	86.9678	142	140.032	227	0.07217
6	0.6726	0.7619	56	63.1105	170	162.889	226	1.11152
7	0.7619	0.8195	41	47.0850	185	178.915	226	0.99334
8	0.8195	0.8776	30	33.8508	196	192.149	226	0.51524
9	0.8782	0.9442	24	20.4266	202	205.573	226	0.68723
10	0.9448	0.9889	9	7.43421	218	219.566	227	0.34095
		Total	909	909.000	1353	1353.00	2262	6.85728

H-L Statistic	**6.8573**	**Prob. Chi-Sq(8)**	**0.5521**

Likelihood ratio

To test the significance of the variables, it is also useful to test the null hypothesis that the all the coefficients are simultaneously zero with the likelihood ratio (LR) statistic. In fact, from Table 5.2, the LR statistic is equal to 0 and thus the null hypothesis is rejected. This suggests that the factors which were used in the regression analysis are fundamentally important in explaining the job satisfaction of respondents.

4. DISCUSSION AND CONCLUSION

Implications of the results

The results presented in the previous section indicate that the level of education is negatively related to job satisfaction. Though the relationship is not highly significant, this implies that individuals with higher levels of education tend to be less satisfied than those with lower levels. As indicated in the literature (e.g. (Glenn & Weaver 1982)), this could be due to expectations, possibly because highly educated individuals may have high expectations which might not be attained.

The results also suggest that other non-pecuniary aspects of employment have a higher impact on job satisfaction than monetary returns and the level of education. Thus, when analysing job satisfaction, attention should not only be given to education, but also to work-related aspects such as opportunities for advancement and overall employment benefits which have a high level of dissatisfaction among respondents.

Limitations of the study

This study is subject to a number of limitations, most of which are associated with the representativeness of the population. Firstly, questionnaires were only disseminated to public service employees who could be reached through a government e-mail address. Thus, this study omitted employees who did not have any access to a government e-mail address and thus could not be included in the sample. This could lead to a sample which is not representative of the whole population.

Another limitation was the choice of variables. The number of years the responent had been working in the public service, proxying experinece, was not included in the analysis.

Areas for further research

Following the major finding produced in this study, one possible area for further research is a more in depth study to explain why there is a negative relationship between job satisfaction and education.

Apart from that, since the primary focus of this study were public service employees, it would be very useful to extend such analysis to the private sector in Malta. The

literature gives a number of differences between the public and private sector and thus it would be interesting to identify the differences between the two sectors in Malta. In addition, the research can be extended to analyse cross-country similarities and differences.

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Appendix 1: The Questionnaire (in English)

Thank you for agreeing to take part in this questionnaire.

I am a fourth year student reading for a Bachelor of Commerce (Honours) degree in Economics. I am currently working on my dissertation which is aimed at analysing how the level of education attained by an individual affects job satisfaction.

By proceeding with this survey, you are giving the consent to use the data filled out in this survey. All responses will be kept confidential and will not be identifiable in any way. Additionally, your participation is completely voluntary and you may opt out at any time.

Sincerely,
Clive Sacco
clive.sacco.12@um.edu.mt
_____

Please answer the following questions in this section about your personal information. This data is only needed for statistical purposes.

1. What is your gender?

☐ Male
☐ Female

2.   What is your age?

☐ 20 years old or under
☐ 21 years old to 30 years old
☐ 31 years old to 40 years old
☐ 41 years old to 50 years old
☐ 51 years old to 60 years old
☐ 61 years old and over

3.   What is your legal marital status?
Mark one circle only.

☐ Single (never married)
☐ Married
☐ Separated
☐ Widow (not remarried)
☐ Divorced (not remarried)
☐ Annulled

4. How would you rate your general health status?
Base your decision on your own personal perception of your own health.

☐ Very good
☐ Quite good
☐ Neither good nor bad
☐ Quite poor
☐ Poor

> **Education background**
> *The questions in this section are related to your education background and to any qualifications you may have obtained following compulsory education.*

5. **What is the highest level of education that you have successfully completed?**

☐ No formal education or pre-primary *(Go to section 4)*
☐ Primary level *(Go to section 5)*
☐ Secondary level *(Go to section 5)*
☐ Post-secondary level *(Go to section 5)*
☐ Tertiary level *(Go to section 6)*

(Section 4)

6. **Are you interested in starting a course in the following years?**

☐ Yes
☐ No

(Section 5)

7. From a scale of 1 to 5, how much are you willing to further your education in the future?
This question focuses on your willingness to enrol in additional courses which might be relevant to your current employment.

☐	☐	☐	☐	☐
1	2	3	4	5
Not willing at all		Neutral		Very willing

(Section 6)

8. **What is the highest qualification that you have successfully attained?**

☐ University level diploma or certificate
☐ First (Bachelor's) degree or equivalent
☐ Post-graduate diploma or certificate
☐ Master's degree
☐ Doctorate degree (PhD)

9. **Looking back, if you were to choose again, would you opt for the same field of study?**

☐ Yes
☐ No

10. **From a scale of 1 to 5, how much are you willing to further your education in the near future?**
This question focuses on your willingness to enrol in additional courses which might be relevant to your current employment.

☐	☐	☐	☐	☐
1	2	3	4	5
Not willing at all		Neutral		Very willing

Relationship between education and current employment

11.   **Was the first qualification you obtained, a requirement for your current job?**

☐ Yes
☐ No

12.   **How related is your current occupation to your field of study?**

☐	☐	☐	☐	☐
1	2	3	4	5
Not related at all	Not related	Somehow related	Related	Very related

---

Employment background

The intention of this section is to gather some information regarding your current employment and occupation background.

If you are employed in both the public and private sector, for the purpose of this research project, please answer the following set of questions with respect to your employment in the public sector.

---

13.   **What position do you hold in your current main occupation?**
(Long-answer text)

_____

14.   **What is your employment status in your current main employment?**

☐ Full-time
☐ Part-time
☐ Full-time with reduced hours
☐ Casual basis

15.   **From a scale of 1 to 5, how would you rate your satisfaction at the place of work?**

☐	☐	☐	☐	☐
1	2	3	4	5
Very dissatisfied				Very Satisfied

16.   **How difficult do you feel it is to find a job that fits your abilities and expectations?**

☐	☐	☐	☐	☐
1	2	3	4	5
Very difficult	Difficult	Neither difficult, nor easy	Easy	Very easy

17.   **How many years have you been in your current main job?**
(Short-answer text)

_____

18. **How satisfied are you with each of the following aspects of your employment?**
On a scale of 1 to 5, with 1 being "very dissatisfied" and 5 "very satisfied", please rate the following aspects of your employment:

	1	2	3	4	5
Duties of the job	☐	☐	☐	☐	☐
Training and development programmes	☐	☐	☐	☐	☐
Opportunities for advancement	☐	☐	☐	☐	☐
Working hours	☐	☐	☐	☐	☐
Level of responsibility	☐	☐	☐	☐	☐
Relationship with co-workers	☐	☐	☐	☐	☐
Relationship with superiors	☐	☐	☐	☐	☐
Overall employment benefits (e.g. tax credits, flexible hours)	☐	☐	☐	☐	☐

19. Given your level of education, do you feel that your current income is higher or lower than you expected?

☐	☐	☐	☐	☐
1	2	3	4	5
Much lower	Lower	Satisfactory	Higher	Very higher

20. What is your gross annual income?
This question is optional. Please select the income bracket that applies to your situation. Gross annual income refers to your total income before deduction of taxes.

☐ Up to €10,000
☐ €10,001 - €15,000
☐ €15,001 - €20,000
☐ €20,001 - €25,000
☐ €25,001 - €30,000
☐ €30,001 - €35,000
☐ €35,001 and above

21. Were any additional courses/training required for your current position?

☐ Yes
☐ No

22. Do you consider yourself to be "over-educated" at your place of work?
"Over-educated' refers to an individual who has been educated to a higher academic level than is necessary.

☐ Yes
☐ No

- **If you have any remarks or feedback that you wish to add, please comment below.**
  (Long-answer text)

_____

Appendix 2: Correlation-coefficient matrix between variables

	FEMALE	AGE	MARR	HEALTH	EDUC	EMP	JOB_S	DUTIES	TR_D	OPP	HRS	RESP	CO_	SUP	BEN	INC
FEMALE	1	-.117**	.012	.032	-.053*	.199**	.046*	.015	.111**	.027	.048*	.007	-.001	.010	.125**	-.231**
AGE	-.117**	1	.413**	-.185**	-.247**	.023	.062**	.066**	.043*	-.058**	.024	.098**	-.079**	-.012	-.075**	.152**
MARR	.012	.413**	1	-.105**	-.130**	.096**	.057**	.075**	.034	-.024	.032	.057**	-.032	.019	.009	.090**
HEALTH	.032	-.185**	-.105**	1	.158**	-.032	.149**	.104**	.062**	.107**	.107**	.084**	.118**	.076**	.119**	.087**
EDUC	-.053*	-.247**	-.130**	.158**	1	-.058**	-.039	-.041	.024	.103**	-.052*	-.035	.057**	-.026	-.025	.447**
EMP	.199**	.023	.096**	-.032	-.058**	1	-.007	.026	.003	-.001	.112**	.034	-.001	.019	.077**	-.266**
JOB_S	.046*	.062**	.057**	.149**	-.039	-.007	1	.601**	.383**	.386**	.241**	.474**	.307**	.478**	.306**	.067**
DUTIES	.015	.066**	.075**	.104**	-.041	.026	.601**	1	.390**	.325**	.266**	.520**	.286**	.370**	.252**	.063**
TR_D	.111**	.043*	.034	.062**	.024	.003	.383**	.390**	1	.516**	.153**	.319**	.216**	.344**	.288**	.075**
OPP	.027	-.058**	-.024	.107**	.103**	-.001	.386**	.325**	.516**	1	.124**	.305**	.223**	.371**	.329**	.144**
HRS	.048*	.024	.032	.107**	-.052*	.112**	.241**	.266**	.153**	.124**	1	.328**	.194**	.240**	.442**	-.125**
RESP	.007	.098**	.057**	.084**	-.035	.034	.474**	.520**	.319**	.305**	.328	1	.299**	.369**	.309**	.070**
CO_	-.001	-.079**	-.032	.118**	.057**	-.001	.307**	.286**	.216**	.223**	.194**	.299**	1	.422**	.254**	.058**
SUP	.010	-.012	.019	.076**	-.026	.019	.478**	.370**	.344**	.371**	.240**	.369**	.422**	1	.360**	-.037
BEN	.125**	-.075**	.009	.119**	-.025	.077**	.306**	.252**	.288**	.329**	.442**	.309**	.254**	.360**	1	.007
INC	-.231**	.152**	.090**	.087**	.447**	-.266**	.067**	.063**	.075**	.144**	-.125**	.070**	.058**	-.037	.007	1

**. Correlation is significant at the 0.01 level (2-tailed); *. Correlation is significant at the 0.05 level (2-tailed)

Appendix 3: Table of descriptive statistics

	Mean	Median	Maximum	Minimum	Std. Dev.	Range	Observations
FEMALE	0.5676	1	1	0	0.495513	1	**2262**
AGE	2.5663	3	5	1	1.075963	4	**2262**
MARRIED	0.6140	1	1	0	0.486925	1	**2262**
HEALTH	4.0901	4	5	1	0.624433	4	**2262**
EDUC	4.3351	4.5	7	1	1.453731	6	**2262**
EMP	0.9204	1	1	0	0.270695	1	**2262**
JOB_S	0.5981	1	1	0	0.490382	1	**2262**
DUTIES	3.7108	4	5	1	0.929375	4	**2262**
TR_D	3.0291	3	5	1	1.098846	4	**2262**
OPP	2.6865	3	5	1	1.149346	4	**2262**
HRS	3.6127	4	5	1	1.127979	4	**2262**
RESP	3.6485	4	5	1	0.979125	4	**2262**
CO_	3.7449	4	5	1	1.029811	4	**2262**
SUP	3.4854	4	5	1	1.160499	4	**2262**
BEN	3.1308	3	5	1	1.174938	4	**2262**
INC	3.9146	4	7	1	1.430157	4	**2262**