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Job Quality, Innovation and Employment – A Structural Equation Modeling on Regional Level

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Abstract: Job quality (JQ) covers the aspects that contribute to wellbeing through the impact on material living conditions or quality of life at work. The research aims to evaluate the relationship between the quality of jobs, in combination with the dimensions of innovation and other economic and social indicators, on the performance of the labor market. The analysis is carried out at the level of 193 NUTS 1, 2 and 3 territorial administrative regions. Job quality is estimated based on the results of Eurofound's sixth Working Conditions Survey 2015 (EWCS), which outlines some defining features of job quality. In the relationship between JQ and the growth of employment, we also introduced influences of innovation activities concerning the human resources involved, the financial support for research or the creation of collaborative networks between innovators, as well as intellectual assets in the form of patents applications, trademarks or design. The results of our structural equations modeling reveal an intense and positive causal relationship between the intellectual output (intellectual assets) and specific attributes of the job quality, especially regarding job prospects, skills and discretion, and the increase in the rate of employment.

Keywords: Job quality, Patent applications, Employment, Working conditions, Wage

1. Introduction

At European level, concerns about increasing labor market integration, meaning more and better jobs, are particularly intense in the business environment, among all citizens or national policymakers. Also, multiple approaches in this direction are broadly formulated and supported at the Community level through the Lisbon Strategy and the 2020 Strategy. Moreover, by supporting the UN's sustainable development goals, the European Commission considers in the reflection paper on a more sustainable Europe by 2030, among other things, education, science, technology, research, innovation and digitization or responsible business behavior, corporate social responsibility and new business models as a basis for sustainable development (European Commission, 2019).

Specifically, the proposed initiatives and measures are not only concerned with an increase in the number of employed people, but also with an increase in the job quality, which in turn can play a crucial role in improving the characteristics and size of the labor market. A literature review of the subject reveals the particular interest of the researchers for highlighting the general and specific aspects that may support such a process.

Work is one of the main determinants not only of material living conditions but also of the quality of life, a significant part of which is spent by people at their workplace, with a clear tendency to increase their active life. On average, a person spends on average 35-40 hours a week at work, and an increasing proportion of their adult life is in the form of paid work. Therefore, work is closely linked to people's quality of life and well-being. In general terms, job quality refers to the extent to which a set of job attributes contributes to workers' well-being to improve or worsen it (Muñoz de Bustillo et al 2011). Employment quality can play an essential role in all countries facing the issue of an aging workforce, as it is a critical factor in increasing employment sustainability (Eurofound, 2008).

The relationship between job quality, innovation activity, and development can be analyzed from different perspectives. As shown in the literature (Erhel and Guergoat-Larivière, 2016), the influences between innovation, job creation, and quality are positive. However, there are considerable differences between countries in terms of innovation systems or labor market policies, and implicitly, in terms of the outcome. Technological and non-technological (organizational) innovation is directly related to labor productivity, whose growth is reflected in more consistent wages, in changes in working conditions, which include a decline of the time spent at work. At the same time, there are structural changes in the economic activity of the countries, with immediate effects in terms of job creation as well as its quality. However, the relationship is also a reverse one (Muñoz-de-Bustillo, Fernández-Macías, and Grande, 2016, p. 3), job quality being itself "a driver of innovation." Quality of jobs is important because it affects attitudes, behavior, and results at individual, organizational and national level (Warhurst, Wright and Lyonette, 2017). Employees can use their knowledge and skills, and they can also complement and enhance their workplace, gain better experience, help increase productivity, which gives them a sense of identity and utility towards the workplace and towards the employer.

2. Labour Quality and Innovation

According to Holman (2013), there are different types of good jobs and bad jobs, which depend on the unique combination of their characteristics. The literature on this topic is consistent, but there is no common denominator in terms of content and indicators to measure the job quality, which reflects the multidimensionality and complexity of the concept. Nevertheless, several guidelines make it easier to highlight the importance of work quality in increasing employment. Given that job quality issues are estimated based on the results of the 2015 EWCS questionnaire of Eurofound, we will consider in this analysis those dimensions for which a number of quality indices have been established in the European Union member states and several candidate countries. The dimensions that we will use as observed variables in the empirical estimation are selected based on their proven (positive or negative) impact on workers' health and well-being. These dimensions (Eurofound, 2016) are:

The Physical environment (envsoc) index reflects the risks related to physical factors in the workplace. It comprises 13 indicators, which would affect employment (negative relationship);

The Work intensity (intense) index can be presented as a way to maintain and develop the interest of the workers in their work. High intensity of work is associated with a negative impact on health and well-being and, on an aggregate level, on employment (too much workload and an inadequate rhythm may reduce the probability of hiring). The index comprises three sub-dimensions: quantitative demands (working fast, tight deadlines, limited time, frequent interruptions), pace determinants and emotional exigencies, established on the basis of 13 indicators.

The Working time quality (wlb) index measures the incidence of prolonged working hours, the lack of a recovery period, atypical work time, work schedule and flexibility. A good job quality will increase the attractiveness for workers to stay longer in work, directly and positively influencing employment growth.

The social environment (goodsoc) index measures the extent to which workers enjoy the support of social relationships and negative social behavior such as intimidation, harassment or violence at the workplace. The extent to which workers experience favorable social relationships can directly influence the employment rate. Ensuring an excellent social climate, mutual trust between management and employees, recognition and good cooperation are essential aspects of organizational management, with positive results for both the organization and the workers. Failure to respect these social climate aspects can be detrimental to the organization and workers, resulting in adverse outcomes such as poor performance, low organizational commitment, and absenteeism (Eurofound 2016, p. 165).

The Skills & discretion (wq) index measures workplace learning and training opportunities, also with a direct and favorable impact on employment. Creative work and task variation can contribute to self-development at work, being also crucial factors in work motivation. In general, there is a high level of creativity and a variety of tasks associated with work in the EU-28 (Eurofound 2016, p. 85).

This is indicated by the large proportion of workers who reported that their work involves solving unforeseen problems or applying their ideas to their work. The Prospects (prosp) index refers to those aspects of the job that contribute to a person's need for employment, namely the material need for an income and the psychological need associated with self-esteem and identity. The indicator measures employment continuity assessed on the basis of a person's employment status and type of contract, job security and career prospects. This index combines a number of issues, including career prospects and the possibility of losing the job. It will directly and positively influence the growth of employment. The concept of prospects also includes job security and the possibility of career advancement. The opposite of job security - job insecurity - is recognized as a significant cause of stress (Green, 2015); when this occurs for an extended period, it can have detrimental effects on people's careers, health, and well-being. The Income (adincome_mth) index measures the monthly income of workers. The importance of income in increasing employment and in increasing work time is widely accepted and proven (direct and positive influence), even if the indicator is no longer considered the primary determinant.

In order to assess the existence, direction and intensity of the relationship between innovation and job quality in European states (EU-28 and Switzerland), we explored possible associations of labor quality components (estimated on the basis of employee data as they were calculated using information from EWCS 2015) and innovation (measured using the innovation index, according to the European Innovation Scoreboard 2016 (European Commission, 2016). Apart from the correlation between innovation and incomes, the other correlations have the same scale, and it is not necessary to transform the variables to interpret the results. Figure 1 shows the scatter plots between the innovation index and the seven dimensions of job quality, highlighting the nature and intensity of such associations.

There is a powerful correlation between innovation and income (R2 = 0.83), which is also the most robust. The correlation between innovation and job quality is high for the dimensions of autonomy and knowledge (R2 = 0.47) and average relative to working prospects (R2 = 0.29), the social environment (R2 = 0.23) and the physical environment (R2 = 0.23).

In contrast, the relationship is weak and very weak between the innovation index and the labor intensity, with R2 = 0.12, or in relation to the quality of working time (R2 = 0.05). A particular grouping of countries is apparent when observing the position of different countries. Countries in Central and Eastern Europe and Mediterranean countries are in the lower half of the graphs, with a low innovation index. Furthermore, countries with high job quality indicators in the correlation are grouped in the upper right corner (except for the social environment); this is where we find the northern countries like Denmark, Germany, UK, and Ireland.

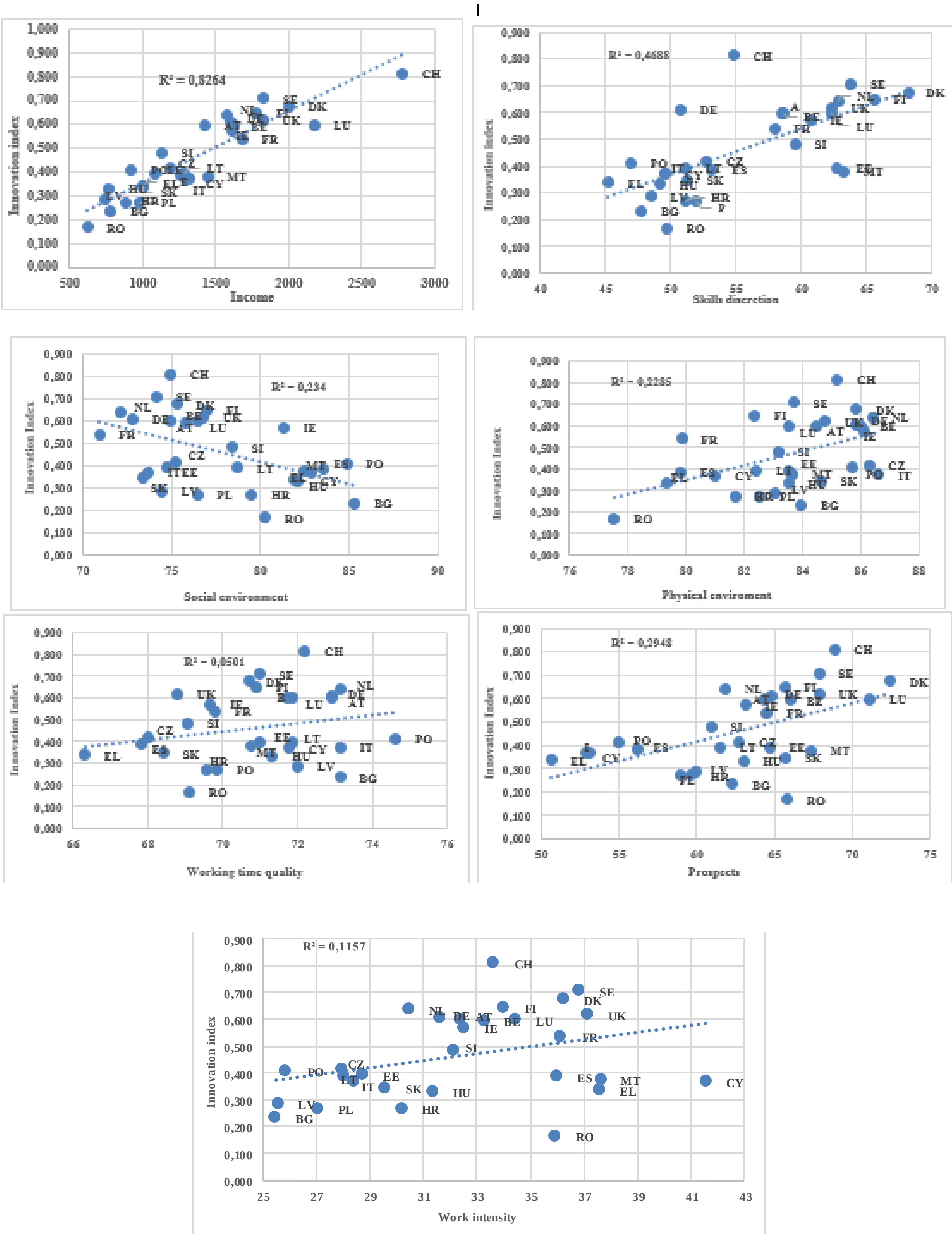

Figure 1: The relationship between job quality components and the innovation index
Source: Own graphs, based on data from EWCS 2015 and European Innovation Scoreboard 2016

Differences between countries are predominant especially in terms of income but also in terms of skills and autonomy in work. These countries are also the leaders in innovation. The weakest levels in innovation and job quality are found in countries such as Romania, Bulgaria, Hungary, Latvia, Croatia, and Poland. Progress on some job quality indices has been limited in these countries over the past ten years.

3. Direct and Indirect Effects of Innovation Activity and Job Quality on Employment

3.1 Aim and Methodology

Starting from the actual measurement framework on innovation performance (according to the European Innovation Scoreboard, 2018), our purpose is to test an explanatory model of the employment level, generally including as determinants of employment characteristics and dimensions of the job quality, alongside indicators on human resources and R&D investment (and which are being set as framework conditions in the innovation process) and on innovation activities (innovators who introduced product/process innovation and/or marketing/organizational innovation, networks of collaboration in joint public-private research efforts and intellectual assets generated in the innovation process, reflected in patent applications, trademarks and industrial design). We will use these measures in the econometric estimation as observed variables for the construction of latent variables (unobserved directly). Together with the job quality indicators, they will be the determinants of employment (outcome).

The general estimation model for establishing causal relationships to be tested is based on structural equation models (SEMs). They consist of a system of causal relationships between variables that specifies direct effects and induced indirect effects, including determinants that are not directly measurable (unobserved variables), but must be "measured" by means of indicators for which data are available. As the analysis is carried out at NUTS 1 and 2 regions for 2015, we considered only territorial units in the European space, for which we could find other necessary indicators that could be modeled using structural equation models. At the same time, together with the unobserved variables regarding the innovation activity, the specifications also estimate the influence of the job quality indicators already introduced as the observed variables. Job quality indicators are based on the results of Eurofound's Sixth European Work Conditions Survey, EWCS 2015, the survey of interviewees consisting of 35,765 employees.

Structural equation methods are widely used in quantitative analyzes to test complex multiple causal models that incorporate several latent variables, and the usual procedure is based on the analysis of the covariance relationships between variables. Many papers cite Hoyle (1995), according to which the modeling of structural equations is a statistical approach for testing hypotheses on the relationships between observed variables (manifest variables) and latent variables or constructs that are not directly measurable and are not determined a priori (unobserved, factors). The manifest and latent variables can be independent or dependent, depending on their position in the structural model. Thus, structural equation models (SEMs) contain both the measurement model (how to load the indicators on factors) and the structural model (the causal relationship between the factors). In the analyzed relation, there is an order in the antecedent – consequence relation, which explains the causal chain. Thus, a significant workforce depends on a set of various determinants: socio-economic, institutional, of support for research, of possible developments in research and innovation collaborations.

In our model, the dependent variable is the employment rate (ocup_to_2015). Independent variables include direct labor-related observations that are not associated with passive constructions, but also such theoretical constructs that reflect dimensions of human resources, public and private financial support for R&D, and innovation indicators. Thus, the measurement model consists of five exogenous latent constructs, which group a series of observed endogenous variables with possible effects on employment performance: latent L1 (Human Resources), L2 (Investments), L3 (Innovators), L4 (Collaboration Networks) and L5 (Intellectual Assets), the selected indicators being among the most commonly used in literature. Exogenous variables observed, which are determined outside the equation system, are also the ones concerning the job quality (they are not indicators for a factor) and can be considered latent variables with a single indicator, which is free of measurement error (variance of the error term is 0).

The latent constructs in the measurement model are considered as reflective, the observed variables being its manifestations; thus, the causal relationship is supposed to operate from construct towards the indicators. Along with the measurement model, the estimated structural equation also has a formative model in which the causal relationship works from the latent constructs and the job quality dimensions (observed variables) towards the employment variable. The latent variables and job quality dimensions are causal indicators, while the employment is derived from them.

L1 (Human Resources): The variable defines the dimension of human capital, measured by the level of education of the labor force and access to education. It has four indicators (observed variables): a young population with tertiary education (tert), lifelong learning participation (lll), scientific co-publications (copublic_st) and a number of citations (cited). The variable reflects the general conditions for increasing the qualification of the labor force, assuming the existence of causal relations with increasing its integration, respecting the fulfillment of some criteria regarding the covariance between variables (either between observed or between latent variables).

L2 (Research Innovation): The latent reflects public and private financial support for the research activity, comprising three indicators: business environment's expenditures for research (berd), public spending (ch_public), and expenditures for innovation besides research (ch_non).

L3 (Intellectual Assets), in the form of patents (pat), trademarks (trademark) and designs (design).

L4 (Innovators) - as an intermediate output of the research and innovation activity, comprising only two endogenous indicators: SMEs that introduced product /process innovations (inov_produs) and those with marketing/organizational innovations (inov_mk).

L5 (Collaboration and Information Exchange Networks): includes collaborating firms (sme_inhouse) as well as public institutions (copublic_privat) and public-private cooperation agreements (copublic_privat). Due to data reliability reasons, we also included the innovators who introduced new products through internal developments in this latent (Table 1).

3.2 Exploratory Data Analysis

In the case of a reflective model the blocks of manifest variables must be unidimensional in terms of the factorial analysis. The indicators should be highly correlated with each other as they observe or represent a phenomenon associated with a construct. A weak correlation would indicate a low validity of construct convergence (its consistency).

This hypothesis was verified on the observed data, using the Alpha Cronbach coefficient, for the latent variables. A block is generally unidimensional when Alpha Cronbach is more significant than 0.7. The scales used for this study are at an acceptable level, Alpha Cronbach ranging from 0.772 to 0.909 for strategic orientation dimensions and 0.816 for firm performance as shown in Table 1.

The coefficient does not have the required value for the latent L2, but even if taken separately the investment indicators can be considered representative for defining the latent, except public sector spending on R&D, which raises the issue of adequately reflecting this latency.

Table 1: Results of the exploratory analysis

Latent Variable	Structure	Alpha Cronbach	Test Scale
L1 (Human Resources)			0.8326
	Population with tertiary education (*tert*)	0.8457	
	Lifelong Learning (*lll*)	0.7571	
	Scientific co-publications (*copublic_st*)	0.7443	
	Citations (*cited*)	0.7984	
L2 (Investments)			0.3672
	R&D expenditure in the business sector (*berd*)	0.0943	
	R&D expenditure in the public sector (*public*)	0.0514	
	Expenditure other than R&D (*Ch non-C&D*)	0.5818	
L3 (Innovators)			0.9088
	Product/ process innovators (*inov_prod*)		
	Innovators in mk and organizational (*inov_mk*)		
L4 (Collaboration Networks)			0.7721
	Collaborations enter institutions (*Inov inhouse*)	0.7333	
	Collaborations between institutions (*Colab*)	0.6794	
	Private co-publications	0.6648	
L5 (Intellectual Assets)			0.7936
	Patent applications (*pat*)	0.7578	
	Trademarks (*marks*)	0.7014	
	Drawings and designs (*design*)	0.6970	

Source: Own processing in Stata

4. Results and Effects

Starting from a basic theoretical model, we sought the validation of relationships that can be empirically tested through structural modeling. A first test is a chi-square (□2) whose p-value would not suggest a good fit of the models. However, chi-2 is a subjective measure that easily rejects the model's fit, being sensitive to the size of the sample (especially as it is larger). That is why we completed the analysis with other statistical tests. In determining the model that fits the dataset, Kline (2015) recommends using the tests Root Mean Square Error of Approximation (RMSEA), Comparative Fit Index (CFI) and Standardized Root Mean Square Residual (SRMR). RMSEA is sensitive to sample size, being unable to check under non-normality of distribution.

The structural model in Figure 2 comprises three causal relationships networks: 1) between employment (dependent variable) and job quality (JQ), in combination with three latent variables with explanatory role (L3, L4 and L5); 2) between L3 with L1 and L2; 3) between L5 with L1 and L2. The first category consists of direct effects of the job quality dimensions, combined with innovative dimensions, on employment, and the latter two indirect effects of human resources and investment on employment through the two latent variables, L3 and L5. The unidirectional arrows in the graph illustrate the regression relationships in the model, while the double arrow is the covariance that might exist between two latent variables (indicating a possible bidirectional correlation), but without further specifying their role (there are co-variances between latent variables L1 ↔ L2).

Since a latent variable is not directly measurable, it will not have a unit of measure in which to express its variability. Therefore, it is necessary to assign a metric to describe relationships with other variables in the model. The solution is to fix in the model the value of one of the coefficients linking the latent variable with its indicators at 1. In the constructs of the model, the coefficient whose value is fixed at 1 is the first in each structure. For example, latent L1 has the fixed value 1 (not calculated) of the tertiary labor force variable (tert); latent L5 has the coefficient 1 for the patent indicator and so on. In this way, the latent variable will have a scale based on that of the explained variance of indicator 1 (reference variance) (Kline, 2011, 2015, p. 128).

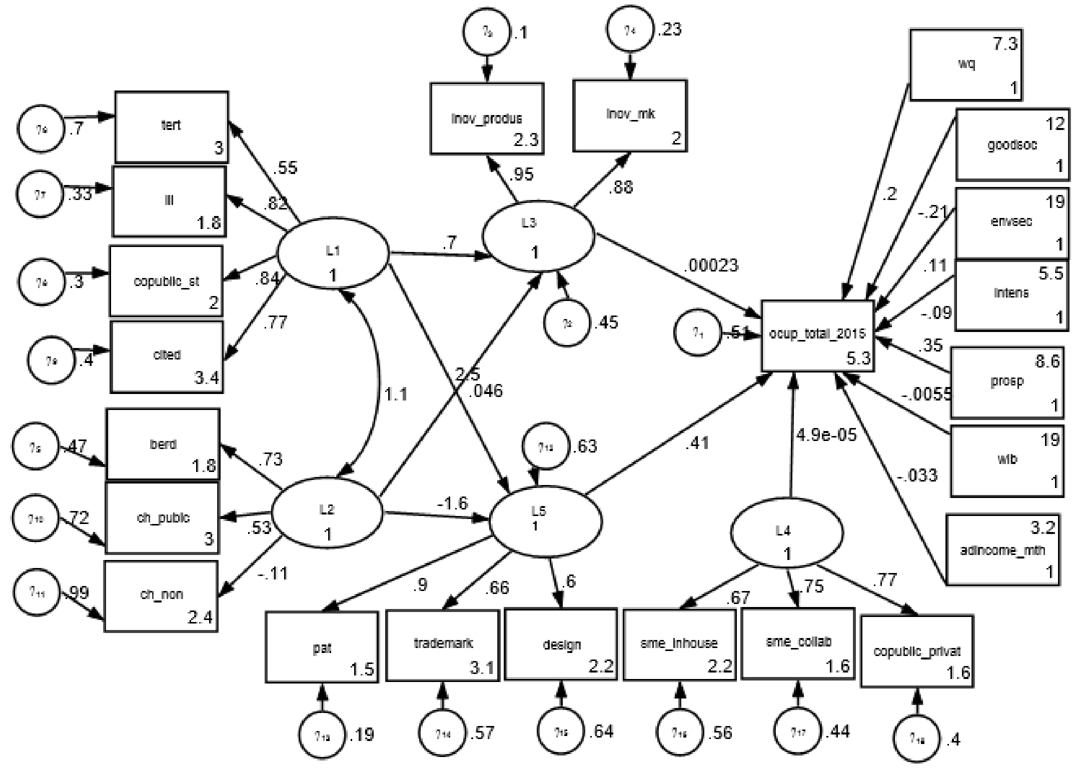

Figure 2. Direct and indirect effects of human capital, investment, and innovation in combination with job quality indicators
Source: own processing in Stata

To determine if an observed variable is a good indicator of the latent variable, we will analyze the standardized coefficients; the ability of an indicator to reflect well the latent variable assumes a standardized coefficient value greater than 0.7. For latent L1 these coefficients range between 0.77 and 0.84, except 0.55 for the tertiary education observed variable. We also found coefficients that fulfill this requirement for latent variables L3 (Innovators) and L4 (Collaboration Networks). In the case of latent L2, the standardized coefficient of the observed variable of non-R&D innovation expenditures is lower, but we considered necessary to include this variable in the model as a standard determinant in an economical process. On latent L5 (Intellectual Assets), the standardized coefficients are 0.90 for the patents variable, 0.66 for the trademark variable and 0.60 for design. We can conclude that the direct effects of the latent L5 (Intellectual Assets) are relevant. Under these circumstances, the role of the other latent variables is well diminished, but variables reflecting framework conditions (human capital and investments) are mediated via other latents and not looking at their direct effect on employment.

Figure 2 also shows that, along with intellectual assets (considered the output of innovation and included in latent L5), the most critical determinants for employment are specific dimensions of job quality (observed indicators). The job quality impact is assessed separately for each dimension of quality. Income (adincome_mth): the coefficient of elasticity of the employment rate concerning the income has is negative, but it is without statistical significance, an interpretation of the measure of this influence cannot be considered as conclusive. Skill and discretion (wq): there is a direct, positive relationship between training and employment: a 1% increase in the index would lead to a 0.2% increase in the employment rate. Physical environment (envsoc): a high level has negative effects on employment: a 1% increase in this dimension would lead to a 0.11% increase in the employment rate. Social environment (goodsoc): the coefficients are positive, which would suggest a positive influence, but the estimated coefficient has no statistical significance. Work intensity (intense): the minus sign of the coefficient would suggest a negative influence, but it has no statistical significance, even if the identified relationship suggests that higher labor intensity is not a factor in keeping workers in the workforce. Prospects (pros): the estimated coefficient regarding this dimension is significant at 1% level, with a high magnitude of the economic impact, a 1% increase in prospects leading to a 0.34% increase in employment. Work time quality (wlb): the employment in relation to this does not appear to be significant, the sign is nevertheless positive, suggesting an expected positive relationship.

The model in Figure 3 is also an extended model, but the estimation is different in that the influence of latent variables L1 (human capital) and L2 (investments) is included as a direct relation to employment and not mediated by intermediate results (performance) in innovation. Thus, the structural model comprises the same five latent variables, but whose influence on employment is estimated directly, similar to job quality. At the same time, we introduced more co-variances between the latents as follows: L1 ↔ L2, L3 ↔ L4, L3 ↔ L5 and L4 ↔ L5.

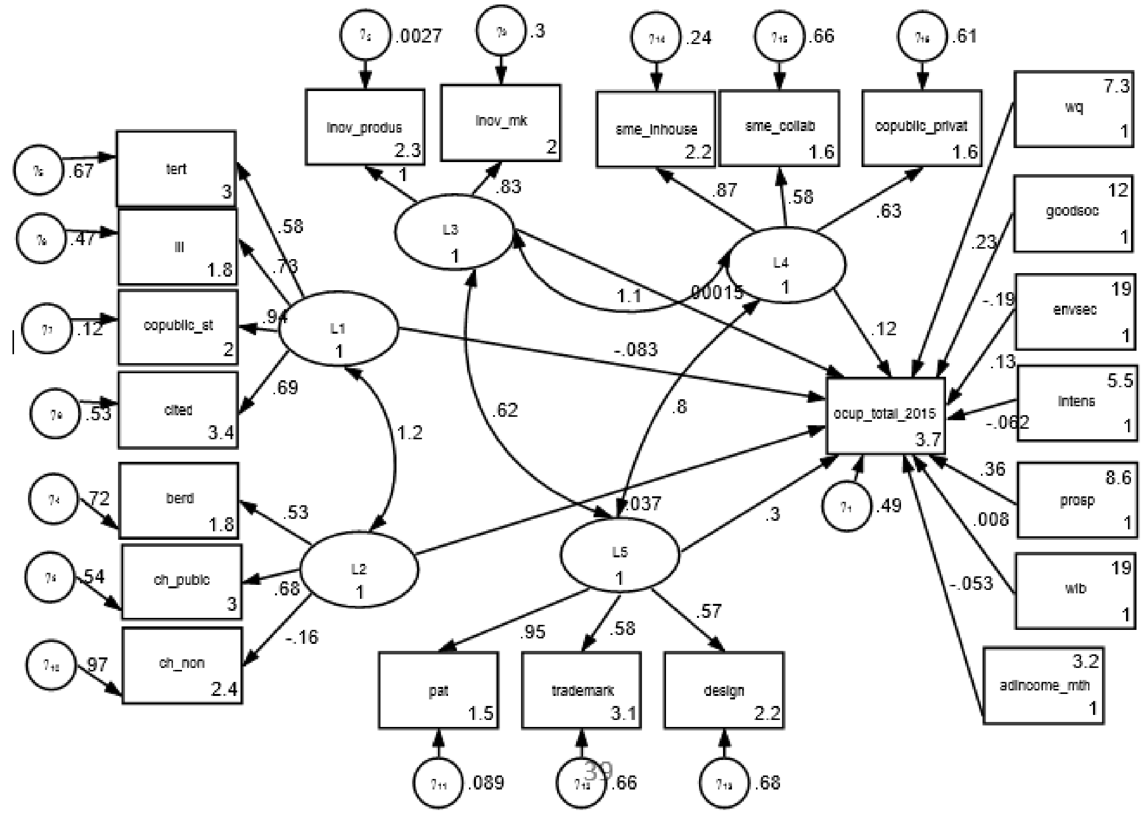

Figure 3: Multiple direct influences in the causal relation with the employment rate

The latents L1, L2 and L3 have standardized coefficients close to 0. Probably an explanation for the fact that the constructs regarding human capital, investment and innovators did not directly lead to precise results on employment is that there are substantial regional differences in the structure of their observed variables. In a separate assessment of the role of investments only in terms of R&D expenditures of the business sector as an observed variable, the effect on employment was the one expected, the coefficient of elasticity having the plus sign and statistical significance, indicating that an increase of these expenditures leads to very high employment growth.

The active, robust role of the variable latent L5 (intellectual assets, 0.3), along with that of L4 (collaborations, 0.12) is confirmed in this scenario. In contrast, the other latent variables are irrelevant when we introduced the correlations between L3, L4 and L5. At the same time, we notice the essential effects of job quality. The positive and, more importantly, the magnitude of the economic impact of Prospects (0.36) and Skill and discretion (0.23) on employment are confirmed. Given the structure of this model, the other job quality indicators would not have a significant influence on employment.

5. Conclusions

The analysis based on structural equations could demonstrate that there is a direct relationship between job quality, innovation, and employment. The particularly large number of variables that could be the real determinants of increasing labor market integration compared to the available observations led us to SEM equations as estimation methods where latent variables allow for a comprehensive measurement of these drivers. In particular, to highlight the role of JQ and innovation in terms of real, constant inferences on employment, we used extensive specifications to evaluate different combined effects, both in direct and indirect relationships, using different latent constructs based on observed variables as mediators.

The results of the SEM analysis highlight the particular importance of some dimensions of the job quality (related to the career development prospects, but also to the possibilities of attracting workers in the decision making process, the autonomy in establishing the methods and the rhythm of work, the flexible working time, defining the skill and discretion dimension). The output of innovation activities, measured by patents, trademarks and designs, and even the exchange of ideas by creating collaborative networks between innovators lead to the same direct result. The financial support for research (berd) in the business sector (when evaluated separately) may have a special effect; less conclusive effects on public spending on research may be caused by significant national differences or by their low levels.

References

- Cazes, S., A. Hijzen and A. Saint-Martin (2015). Measuring and Assessing Job Quality: The OECD Job Quality Framework, OECD Social, Employment and Migration Working Papers, No. 174, OECD Publishing, Paris.
- Chang kon Choi (2007). The Employment Effect of Economic growth: Identifying Determinants of Employment Elasticity. Available at: http://faculty.washington.edu/karyiu/confer/busan07/papers/choi.pdf
- Clark, A. E. (2005). What makes a good job? Evidence from OECD countries, in Stephen Bazen, Claudio Lucifora and Wiemer Saaverda (eds), Job Quality and Employer Behaviour, Basingstoke: Palgrave, pp. 11–30. Crossref
- Davoine L., Erhel C. and Guergoat-Lariviere M. (2008). Monitoring quality in work: European employment strategy indicators and beyond, International Labour Review, 147(2–3): 163-198. Crossref
- Diener, E. and Eunkook, S. (1997). Measuring the relation between job quality and individual indicators, Social Indicators Research, 40(1): 189–216. Crossref
- Erhel Christine and Guergoat-Larivière Mathilde (2010) Job quality and labor market Performance, Centre for European Policy Studies CEPS Working Document No. 330/June 2010. Crossref

- Erhel Christine (2016) Trends in job quality and new challenges for labor and employment policies in Europe.
- Erhel Christine and Guergoat-Larivière Mathilde (2016). Innovation and Job quality Regimes: A Joint Typology for the EU, QUINNE WP 5-2-2016.
- Eurofound (2016). Trends in job quality in Europe, A report based on the fifth European Working Conditions Survey.
- Eurofound (2008). Working conditions of an aging workforce. Luxembourg: Office for Official Publications of the European Communities.
- Eurofound (2016). Sixth European Working Conditions Survey – Overview Report.
- European Commission (2019). Reflection Paper on a Sustainable Europe by 2030.
- European Foundation for the Improvement of Living and Working Conditions. (2017). *European Working Conditions Survey, 2015. 4th Edition.* UK Data Service. SN: 8098.
- Eurostat (2018). Statistics Database.
- European Commission (2018). European Innovation Survey 2018.
- Findlay, P., Kalleberg, A. L. and Warhurst, C. (2013). The challenge of job quality, Human Relations, 66(4): 441–451. Crossref
- Findlay, P. (2015/2016). Job quality. In A. Wilkinson, & S. Johnstone (Eds.), Encyclopedia of Human Resource Management (pp. 236-236). Cheltenham, UK: Edward Elgar Publishing Ltd.
- Findlay Patricia, Warhurst Chris, Keep Ewart, and Lloyd Caroline (2017). Opportunity Knocks? The Possibilities and Levers for Improving Job Quality Work and Occupations 2017, 44(1): 3–22. Crossref
- Gallie Duncan (2015). The Quality of Work: Concepts and Theory CEE-Ingrid Summer School Quality of Working Life and Vulnerabilities, Noisy Le Grand.
- Green Francis and Mostafa Tarek (2016). Job Quality Indices For Europe. A Report Based on the Fifth European Working Conditions Survey. LLAKES Centre, Institute of Education, London.
- Green F., Mostafa T. (2012). Job quality indices using EWCS, Dublin Foundation.
- Holman, D. and C. McClellan (2011). Job Quality in Growing and Declining Economic Sectors of the EU, University of Manchester, working paper 2011.3 Crossref
- Holman, D. (2013). Job types and job quality in Europe, Human Relations 66(4): 475-502.
- Kline Rex B. Principles and Practice of Structural Equation Modeling, Fourth Edition, Guilford Press
- Muñoz-de-Bustillo Rafael, Fernández-Macías Rafael Grande Enrique (2016). Innovation and Job Quality. An Initial Exploration. QUINNE Working paper WP5-1-2016. Version 2. Apud Schalk, H.J. and Untied, G. (2000), "Wachstum und Arbeitslosigkeit". Gutachten für die Friederich Ebert Stiftung, cited in Dopke J. (2001) The employment intensity of growth in Europe. Kiel Working Paper No. 1021, Kiel Institute of World Economics. Crossref
- Muñoz de Bustillo R., Fernández-Macías E., Antón J.I. and Esteve F. (2011). Measuring More than Money. Cheltenham, Edward Elgar.
- Muñoz de Bustillo Rafael, Fernández-Macías Enrique and Fernando Esteve (2009). Indicators Of Job Quality in the European Union, European parliament.
- OECD, (2013). How good is your job? Measuring and assessing job quality. In: OECD (ed.): Employment Outlook 2013.
- OECD, (2014). How good is your job? Measuring and assessing job quality. In: OECD (ed.): Employment Outlook 2014, pp. 79-139. Crossref
- Ramstad Elise (2014). Can High-involvement Innovation Practices improve Productivity and the Quality of Working-life simultaneously? Management and Employee Views on Comparison Nordic journal of working life studies, 4(4): 25-45. Crossref
- Sissons Paul, Green Anne, Lee Neil (2017) Improving Job Quality in Growth Sectors: A Review of the International Evidence, Public Policy Institute for Wales
- Teo Timothy, Tsai Liang Ting and Yang Chih-Chien (2013). Applying Structural Equation Modeling (SEM) in Educational Research: An Introduction, Chapter 1, pp. 3-23, in Swe Khine (Ed.) Application of Structural Equation Modeling in Educational Research and Practice Myint, Sense Publishers Rotterdam / Boston / Taipei. Crossref

- UNECE (2015) Handbook on Measuring Quality of Employment A Statistical Framework.
- Warhurst Chris, Wright Sally Clare Lyonette (2017). Understanding and measuring job quality, the Institute for Employment Research, the University of Warwick.
- Warhurst C. and Knox A. (2015). Pushing forward the research and policy agenda on job quality, in A Knox and C Warhurst (eds), Job Quality in Australia, Fed. Press.
- Wright, S. (2015). Challenges in researching job quality. In A. Knox & C. Warhurst (Eds.), Job quality in Australia. Annandale, NSW: Federation Press.