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Farm-level factors influencing farmers' satisfaction with their work.

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Abstract:

Well-being of farm workers is necessary in order to foster farming sustainability. We contribute with the research on well-being, exploring on what extent farm-level features influence farmers' satisfaction with their work and with their quality of life, using a data sample of 1099 farms in nine European countries. Results suggest that satisfaction with the farm work has a significant and large influence on the satisfaction with the quality of life. Farm-level aspects such as working time, age of assets, financial situation of the farm and social engagement significantly influence farmers' satisfaction with farming but their joint effect explains less than a quarter of it.

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1 Abstract

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2 Introduction

Although traditionally well-being has been measured thorough out consumption and income, the use of only material growth metrics for policy making may overestimate the utility derived from consumption and underestimate the disutilities associated with it (Hirschauer et al. 2015), misleading decisions that affects differences in welfare between individuals and between generations (Gowdy 2005). It is recognized that the progress measurement of society should include not only the measurement of income but also the current state of well-being, and besides, the prediction of change of factors that could affect it in the future, known as sustainability (Stiglitz et al. 2010).

So far, sustainability research has focused on the discussion about indicators of environmental sustainability, leaving a gap for consensus on the social dimension. A social indicator is defined as "*a direct and valid statistical measure which monitors levels and changes over time in a fundamental social concern*" (OECD 1976). Differences in values of social indicators for decision making are influenced by how actors perceive their reliability and validity, which poses a conceptual but also a measurement problem (OECD 1976; OECD 2013). Three levels of problems are identified with social indicators: (i) their conceptual and operational framework; (ii) the selection of their subcomponents and, (iii) the determination of their driving factors (OECD 2013). Moreover, despite the abundant research and the presence of sustainability objectives in policy instruments, the use and value of sustainability metrics by producers, retailers, consumers and policy makers is still unclear.

In the farming sector, arguments about the economically irrational behaviour of farmers has led to the premise that non-pecuniary benefits from farming play an important role in farm decision making (Howley, 2015). Exit from farming activities (Lips and Gazzarin, 2016), high farm abandonment rates, absence of farm successors and changes in rural populations call for an understanding of the determinants of rural quality of life (Arbuckle and Kast 2012) in order to find policy instruments that may foster intergenerational continuity of farming and a positive attitude towards the demanding challenges in the agricultural production.

The concept of quality of life is a subjective concern embedded in a cultural, social and environmental context that addresses individuals' perceptions of both positive and negative dimensions (WHO group, 1995). Factors affecting perceived quality of life are related to the individual capacities endowment but also to the characteristics of the surrounding environment. The current national statistics of several countries have included recently statistics that capture changes

in quality of life assessment although measurement and analysis related with specific sectors such agriculture are still in a development phase (Howley et al. 2017).

The purpose of this research is to determine the influence of farm-level factors in farmers' satisfaction with farming and its relationship with their perceived quality of life. We use a theoretical construct of farmer's work satisfaction and identified farm-level indicators that may influence these perceptions. A path model between perceptions and farm indicators is proposed throughout the calculation of both measurement and structural model using a Structural Equation Model-Partial Least Squares (SEM-PLS) approach, testing the validity and reliability of constructs, and presenting on how far the concepts are related between them. To an end, the last section presents concluding remarks and limitations of the research.

3 Social indicators: Theoretical background and hypotheses development

2.1 Quality of life, well-being and social indicators: concepts, use and measurement

Despite being studied for a long time, the concept of quality of life has been mentioned for the first time (as non-economic welfare) by Pigou in 1924 in the article *The Economics of Welfare*. The operationalization of the concept for research and policy making purposes has been debated since decades and, there is an agreement on its multidimensional and context dependent significance as stated by the definition of World Health Organization (1995:1405): "*Quality of Life is an individual's perception of their position in life in the context of the culture and value systems in which they live and in relation to their goals, expectations, standards and concerns.*"

The terms quality of life, well-being, subjective well-being, happiness and life satisfaction are used interchangeable in a large body of literature. Overall, quality of life and well-being generally refers to a number of dimensions that includes both observable and personal assessment indicators. On the other hand, subjective well-being, happiness research and life satisfaction are usually restricted to the individuals perceptions about their life. This differentiation is related on how the two lines of operationalization of the concept have taken place.

The first stream focuses on the measurement of capabilities, choices and functionings of the individuals. Influential theories such as Sen (1999) concretized in the Human Development Index that includes several basic dimensions of human development (UNDP 2015). The second stream is the happiness and subjective well-being (SWB) research that make use of life satisfaction as one of the key indicators of progress. Multiple initiatives such as European Quality of Life have been conducted in 2003, 2007, 2011, 2016 (Böhnke 2005, Grijpstra et al. 2014) and national statistical accounts for SWB have been implemented in several countries such as Sozio-oekonomisches Panel (SOEP) in Germany or a suite of indicators collected by the UK Office for National Statistics.

The last type of research has been accepted after many studies argue that the reliability of this type of variables can be as high and relevant as the other "hard" indicators. Still, strong objections against SWB are based on the argument that its isolated measurement could mask inequalities and obscure alternatives for public policy (Austin 2016). As a response to this argument, monitoring initiatives such as EU Beyond GDP initiative¹; EUROSTAT Eurostat's Quality of Life framework² and OECD Better Life Index³ and the creation of ad-hoc commissions such as the German Enquete Commission to discuss and work out "*alternative indicators of prosperity*" express the importance of measure progress with observable well-being indicators such as income, health, knowledge and

¹ http://ec.europa.eu/environment/beyond_gdp/index_en.html

² <http://ec.europa.eu/eurostat/web/gdp-and-beyond/quality-of-life/context>

³ <http://www.oecdbetterlifeindex.org/>

skills, safety, environmental quality and social connections (OECD 2013; EUROSTAT 2015) but also with the use of subjective individual perceptions in the evaluation of progress (EUROSTAT 2016).

Conclusive research about the link between subjective and objective indicators of well-being remains a challenge. The understanding is that SWB is determined by both the capabilities of the individual to cope with life (life-ability) and the characteristics or favourability of the social and natural environment of the individual (liveability) (Hirschauer et al. 2015). However, this linkage between subjective perception of quality of life and their determinants pose several methodological problems: analysis of ordinal scales, multicollinearity, measurement errors, omitted variables and possible reverse causality (Hirschauer et al. 2015; OECD 2013; Kristoffersen 2017).

2.2 Work satisfaction research in agriculture and hypothesis generation

Quality of the job is a multidimensional concept including observable characteristics of the job as they are experienced by workers (OECD 2017). Job satisfaction of agricultural workers have been studied considering motivation models, work related aspects, non-pecuniary benefits of farming and lately, farm characteristics.

Job satisfaction models agree that motivators of job satisfaction can be classified as intrinsic or extrinsic (Krumbiegel 2016). Bitsch and Hogberg (2005) analyse job satisfaction using Herzbergs theory motivators and hygiene factors. The first one includes recognition, achievement, possibility of growth, advancement, responsibilities and work itself while the hygiene factors are determined by salary, interpersonal relationships, company policies, working conditions, personal life status and job security. Theories such as the vitamin model approached by Meyerding (2016) include features involving soft and hard aspects of the work: the possibility of personal influence, the possibility of using skills, externally given goals, variety of tasks, clarity, contact with other people, income, physical security, valued social position, supportive leadership, career prospects and equality.

Another body of research focuses on the influence of work related aspects in the satisfaction with farmers. Work content, terms of employment, leisure time and income have been argued to have an influence on satisfaction with the job (Lips and Gazzarin, 2016; Mußhoff et al. 2013). Additionally, loans, modernity of the farm, supervision, work itself and satisfaction with health conditions have found to have a significant influence in the job satisfaction (Näther et al. 2015). Furthermore, non-pecuniary aspects such as life style, being self-employed, autonomy and independency in decision making, friendship establishment and recognition are also found in the literature as non-economic benefits influencing the decision of farm and the farmer welfare (Howley 2015, Key 2005, Kliebenstein 1980).

Along with personal motivators and work characteristics, farm features are also argued to have an influence in work satisfaction. Besser and Mann (2015) determined that the monetary utility of work, farm size and the perceived financial situation of the farm influence the satisfaction with the work according to the contexts of agricultural systems. Mann and Besser (2016) found also that farm diversification significantly increases job satisfaction.

The relationship between job satisfaction with life satisfaction is not straightforward (UNDP 2015). Näther et al. (2015) indicate that there exists a possible reverse causality between the two aspects. Farm income, farm debt and perceptions of adequacy of income have been significantly related with life satisfaction (Howley et al. 2017). However, farm operation success in terms of income does not necessarily imply more life satisfaction (Howley et al. 2017). Other criteria used by farmers to

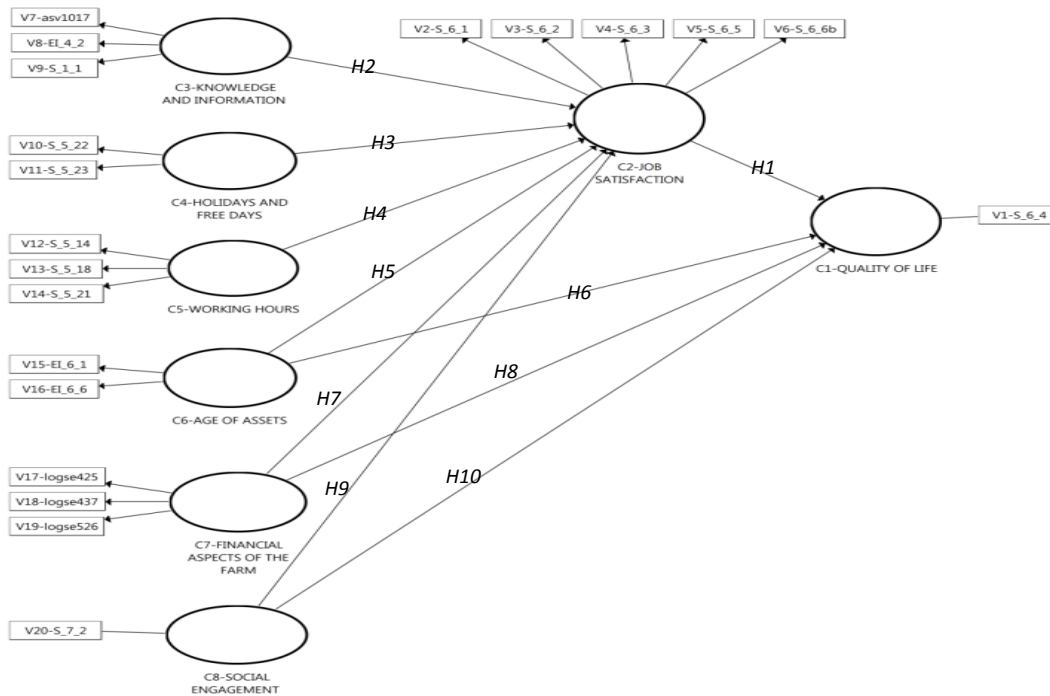
evaluate their success such as quality of life, time off, time with family, and reputation among other producers (Russell and Bewley 2013) may be more linked to life satisfaction.

In this regard we tested a construct called **C2-JOB SATISFACTION** including five dimensions: (i) satisfaction with *daily job tasks* that evaluates subjectively the perception of farming tasks in a typical day; (ii) satisfaction with *work-life balance* referring to the personal assessment of the amount of time that the farmer has to do things that she or he likes doing; (iii) satisfaction with *being a farmer* assessing to the perception of the profession chosen and its associated life style; (iv) satisfaction with *freedom of decision making* evaluating to the autonomy in decisions with regards to external influences; and (v) perceived *level of stress* on the job.

A path diagram was developed, specifying the hypothesized relationships between the manifested variables gathered and the theoretical latent variables to test the following hypotheses (Figure 1):

- H1. C2-JOB SATISFACTION influences C1.QUALITY OF LIFE.
- H2. C3-KNOWLEDGE AND INFORMATION influences C2-JOB SATISFACTION.
- H3. C4-HOLIDAYS AND FREE DAYS influences C2-JOB SATISFACTION.
- H4. C5-WORKING HOURS influences C2-JOB SATISFACTION.
- H5. C6-AGE OF ASSETS influences C2-JOB SATISFACTION.
- H6. C6-AGE OF ASSETS influences C1- QUALITY OF LIFE.
- H7. C7-FINANCIAL ASPECTS OF THE FARM influences C2-JOB SATISFACTION.
- H8. C7-FINANCIAL ASPECTS OF THE FARM influences C1- QUALITY OF LIFE.

Figure 1. Path diagram for the hypothesized relationships between farm indicators, job satisfaction and satisfaction with quality of life.



Source: the authors

4 Methods

3.1 Data and variables

The variables used are economic indicators of the farm Accountancy Data Network (FADN) and a questionnaire collected for a sample of 1099 farms in nine countries (The Netherlands-NL, Hungary-HU, Finland-FI, Poland-PL, Spain-ES, Ireland-IE, Greece-GR, France-FR and Germany-DE) between May 2015 and May 2016. Descriptive statistics are presented in Table 1.

The data set included both subjective and objective social indicators. We call *objective indicators* those variables that measure events or conditions in the farm. These indicators were classified into four main topics: knowledge and information, employment and working conditions, social engagement and succession and farm continuity (Table 1). As a contrast, *subjective indicators* are those metrics intended to measure perceptions of the farm manager about his experiences or affects with several domains of the work job and quality of life. All subjective indicators were presented in an 11 points scale, from 0 to 10 (Table 1).

3.2 Structural equation modelling- Partial Least Squares (SEM-PLS)

An identified method to account for measurement errors is the use of Structural Equation Modelling (SEM) which enables complex pathways to be tested simultaneously by focusing on relationships among underlying factors rather than measured variables (OECD 2013). SEM is based on strong assumptions of normality of the data. An alternative to overcome the assumptions of SEM is SEM-PLS, which is estimated with regression-based methods (instead of covariance), can handle reflective and formative constructs without assuming the normality of the data (Hair 2010; Hair et al. 2014) and it is recommended to use when the goal is predicting key target constructs, exploratory work, the model includes formatively measured constructs, and the latent variables scores are planned to be used in subsequent analysis (Hair et al. 2014).

We followed four steps suggested by Hair et al. (2017): (i) checking the data and evaluating correlations between subjective indicators and other social and economic variables. Because of their skewed distribution, the economic variables were log transformed; cases with missing values of the variables tested were not included in the analysis; (ii) running the SEM-PLS algorithm and using bootstrapping methods to calculate significance levels with the help of the software SMART-PLS (Ringle et al. 2015); (iii) evaluating the measurement models: loadings, composite reliability, Cronbachs alpha, average variance extracted (AVE) and Heterotrait-monotrait ratio of correlations (HTMT); and (iv) evaluating the inner model (structural model) through the path estimates and R^2 .

Table 1. Descriptive statistics of variables used

Constructs (Latent variables)	Indicators (Manifest variables)			
	Description	N	Mean	SD
C1- QUALITY OF LIFE	V1.Satisfaction with quality of life (scale from 0 to 10)	1068	6.97	2.05
C2-JOB SATISFACTION	V2. Satisfaction with daily job tasks (scale from 0 to 10)	1095	7.23	1.76
	V3. Satisfaction with work life balance(scale from 0 to 10)	1092	6.30	2.18
	V4. Satisfaction with being a farmer (scale from 0 to 10)	1094	7.58	2.09
	V5. Satisfaction with freedom of making decision (scale from 0 to 10)	1090	7.47	2.12
	V6. Stress perception (scale from 0 to 10)*	1081	5.88	2.35
C3-KNOWLEDGE AND INFORMATION	V7. Number of providers of advisory services (number)	1099	2.52	1.34
	V8. Years of experience as manager (years)	880	28.24	10.02
	V9. Number of total contacts of advisory service per year (number)	1044	29.89	37.94
C4-HOLIDAYS AND FREE DAYS	V10. Holiday days (days)	1014	19.01	32.39
	V11. Free days per week (days)	938	0.82	0.81
C5-WORKING HOURS	V12. Unpaid labour input in working units (AWU)	1099	1.52	0.76
	V13. Average weekly working hours of manager (hours)	924	34.76	12.21
	V14. Average day working hours during peak season (hours)	1062	11.64	2.72
C6-AGE OF ASSETS	V15. Average age of machinery (years)	1077	14.13	7.16
	V16. Average age of agricultural buildings (years)	1018	22.88	7.16
C7-FINANCIAL ASPECTS OF THE FARM	V17. Farm Net Value Added per AWU (EUR)	1099	23,355.12	40,609.43
	V18. Total assets value: Fixed assets + current assets** (EUR)	1099	1,023,147.0	2,304,859.0
	V19. Expenditure for the accounting year, not taking into account operations on capital and on debts and loans, the holding's capacity for saving and self-financing (EUR)	1099	120,489.9	671,653.9
C8-SOCIAL ENGAGEMENT	V20. Number of organizations and local events in which the farm takes part (number).	1099	2.93	2.53

*In order to have unidimensional scales, the original variable of stress perception scale was reverted. It thus implies lower stress the higher the score. The use of the reverted variable is indicated as S_6_6b in the rest of the article.

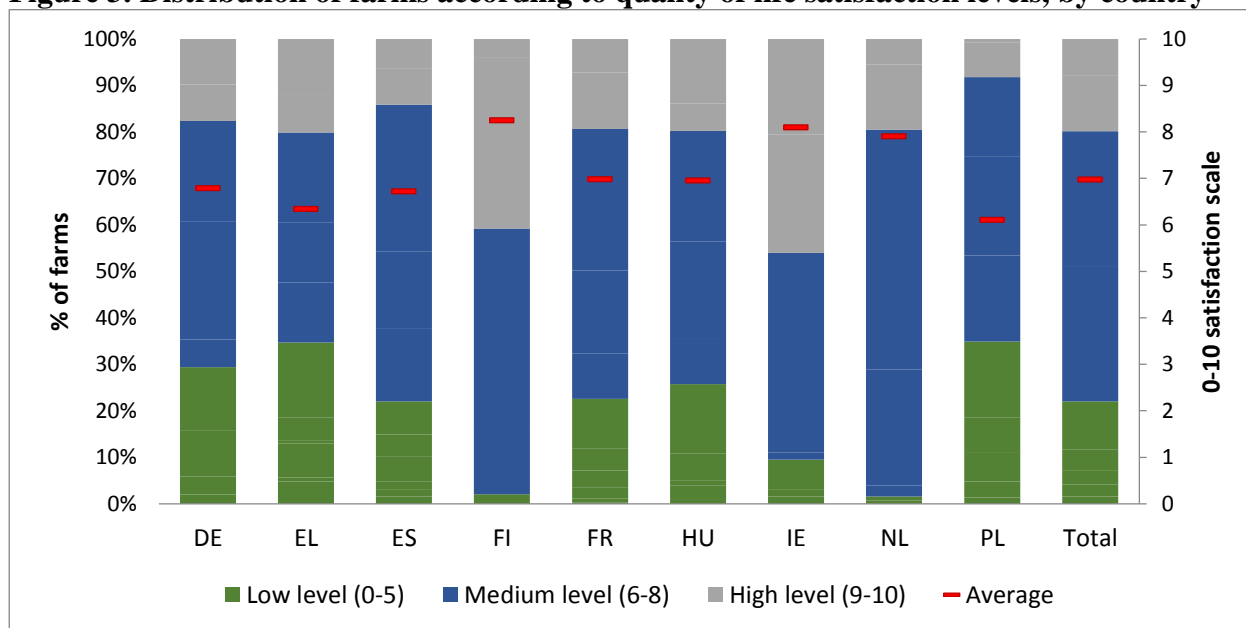
**Current assets include non-breeding livestock, stock of agricultural products and other circulating capital, holdings of agricultural shares, and amounts receivable in the short term or cash balances in hand or in the bank. Fixed assets are agricultural land, permanent crops, farm- and other buildings, forest capital, machinery and equipment, and breeding livestock (European Commission 2015).

Source: the authors

5 Results and discussion

Around 22.8% of farm managers expressed a low satisfaction with their quality of life (between 0 and 5); 58 % of the farms expressed a medium level of satisfaction (between 6 and 8) and almost a 20% stated a high level of satisfaction (between 9 and 10). Those percentages vary according countries and economic size of the farms (Figure 3 and 4). The dimension of the job which more farmers are less satisfied is work-life balance. On the contrary, the largest share of farmers that is very satisfied is found in the dimension related with the choice of the profession or being a farmer (Figure 5).

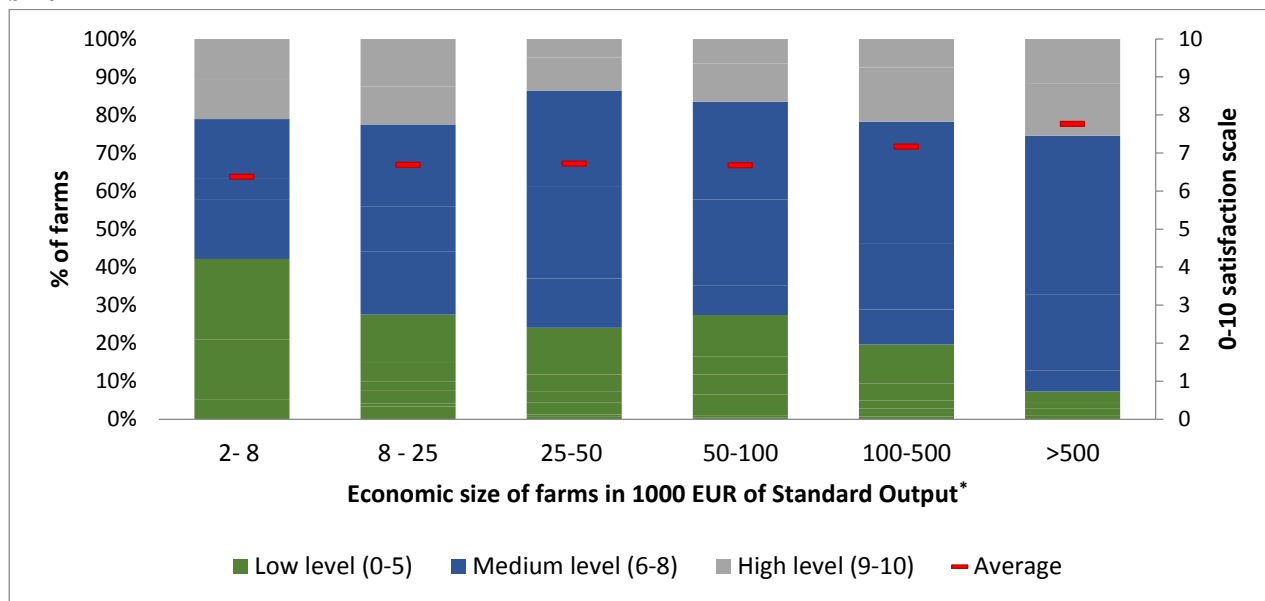
Figure 3. Distribution of farms according to quality of life satisfaction levels, by country*



Source: the authors

*Scores between 0 and 5 are considered low satisfaction scores, medium scores range between 6 and 8 and high satisfaction scores range from 9 to 10 (Eurostat, 2015).

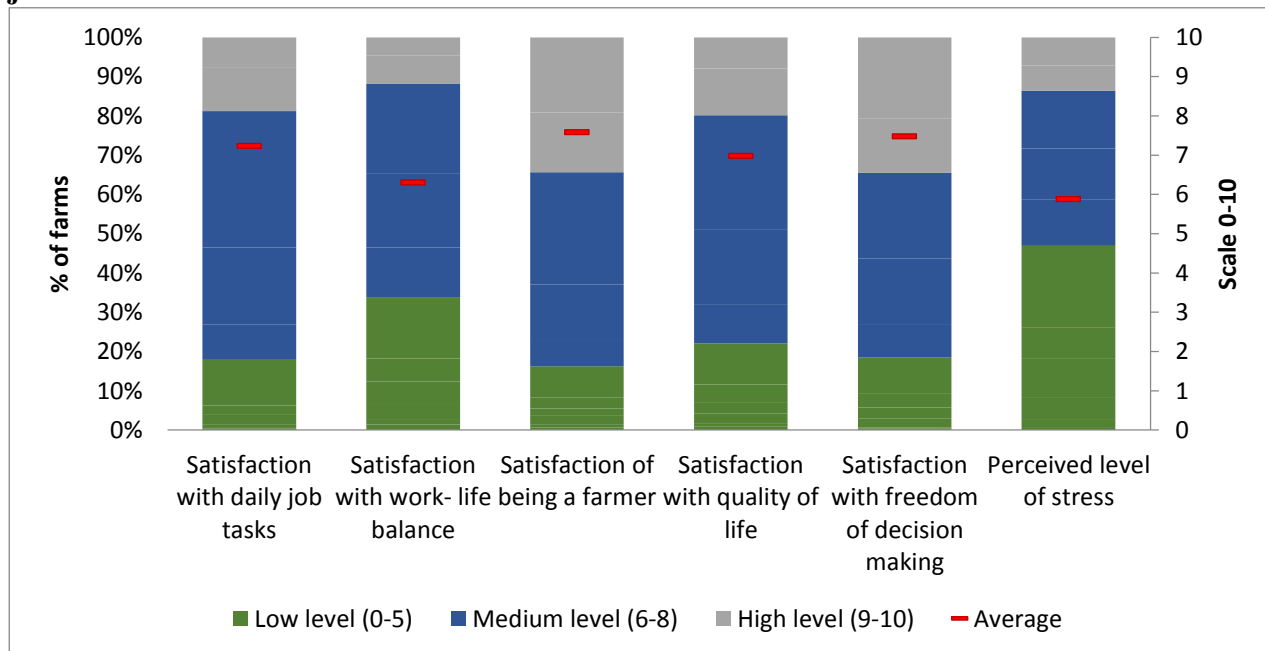
Figure 4. Distribution of farms according to quality of life satisfaction levels*, by economic size



Source: the authors

*Scores between 0 and 5 are considered low satisfaction scores, medium scores range between 6 and 8 and high satisfaction scores range from 9 to 10 (Eurostat, 2015).

Figure 5. Distribution of farms according to the satisfaction levels* with the dimensions of the job.



Source: the authors

*Scores between 0 and 5 are considered low satisfaction scores, medium scores range between 6 and 8 and high satisfaction scores range from 9 to 10 (Eurostat, 2015).

4.1 Measurement model assessment

We evaluated the measurement model of C2-JOB SATISFACTION with the indicators linked to it. Indicators *V5. Satisfaction with freedom of decision making* and *V6. Stress perception (S_6_6b)* presented the lowest loadings and lowest reliability. Therefore, we dropped *V6. Stress perception (S_6_6b)* of the final path model. With those changes, C2-JOB SATISFACTION can explain more than 60% of the variation of three out of four indicators linked with it (loadings ≥ 0.7). The indicator *V5. Satisfaction with freedom of decision making* has the lowest loading and reliability; however we kept it considering its effect in the construct validity. The construct explains on average more than 50% of the variance of the indicators (AVE >0.5) and presents internal consistency reliability (composite reliability >0.6 and <0.9) as well as discriminant validity (HTMT <1). All loadings are significant (Table 3).

Tested latent variables presented different degrees of reliability and validity. The construct C3-KNOWLEDGE AND INFORMATION has a low internal consistency reliability (loadings <0.7). Also, on average the construct reflects less than 50% of the variance in these indicators (AVE=0.407). All the other constructs explain on average more than 50% of the variance of the indicators (AVE >0.5) and have a composite reliability between 0.6 and 0.91, even when C4-HOLIDAYS AND FREE DAYS, C5-WORKING HOURS and C6-AGE OF ASSETS have a Cronbach's alpha lower than the recommended value (0.6). C7-FINANCIAL ASPECTS OF THE FARM complies with all the criteria of consistency reliability and validity. All the constructs show discriminant validity (Table 2).

Table 2. Assessment of the measurement models of latent variables

Construct (Latent variable)	Indicators	Indicators criteria			Construct criteria			
		Loads	Indicator reliability	p value	Composit e reliability	Cronba chs alpha	AVE	HT MT
C2-JOB SATISFACTIO N	V2-S_6_1	0.821	0.674041	0.000	0.823	0.713	0.546	<1
	V3-S_6_2	0.794	0.630436	0.000				
	V4-S_6_3	0.794	0.630436	0.000				
	V5-S_6_5	0.487	0.237169	0.000				
C3- KNOWLEDGE AND INFORMATION	V7-asv_1017	0.123	0.015129	0.624	0.354	0.256	0.407	<1
	V8-EI_4_2	0.967	0.935089	0.033				
	V9-S_1_1	-0.201	0.040401	0.563				
C4-HOLIDAYS AND FREE DAYS	V10-S_5_22	0.708	0.501264	0.000	0.833	0.438	0.715	<1
	V11-S_5_23	0.863	0.744769	0.000				
C5-WORKING HOURS	V12-S_5_14	0.790	0.6241	0.000	0.772	0.562	0.531	<1
	V13-S_5_18	0.652	0.425104	0.000				
	V14-S_5_21	0.670	0.4489	0.000				
C6-AGE OF ASSETS	V15-EI_6_1	0.875	0.765625	0.000	0.771	0.385	0.631	<1
	V16-EI_6_6	0.664	0.440896	0.000				
C7-FINANCIAL ASPECTS OF THE FARM	V17-Logse425	0.814	0.662596	0.000	0.910	0.802	0.772	<1
	V18-Logse437	0.777	0.603729	0.000				
	V19-Logse847	0.847	0.717409	0.000				
C8-SOCIAL ENGAGEMENT	V20-S_1_7	1.000	1	1.000	1.000	1.000	1.000	<1

Source: the authors

4.2 Structural model

The path coefficient between C2-JOB SATISFACTION and C1-QUALITY OF LIFE is significant and high: a change in one unit in the construct C2-JOB SATISFACTION influences a change in 0.709 (path coefficient=0.701) in the construct C1-QUALITY OF LIFE. Overall, the construct C2-JOB SATISFACTION explains 51.6 % ($R^2=0.516$) of the variance of C1-QUALITY OF LIFE (Table 3 and Figure 2).

In a second step, we have assessed the path model hypothesized. Despite most of the paths coefficients that explain C2-JOB SATISFACTION being significant, the influence of all the constructs in C2-JOB SATISFACTION is low (Table 4). C3-KNOWLEDGE AND INFORMATION is not significant, while C6-AGE OF ASSETS and C5-WORKING HOURS are significantly negatively associated with C2-JOB SATISFACTION. The construct tested that has a larger influence in C2-JOB SATISFACTION is C7-FINANCIAL ASPECTS OF THE FARM (path coefficient=0.204), when everything else remains constant. The construct C8-SOCIAL ENGAGEMENT formed by a single measurement, has a low path value with C2-JOB SATISFACTION and a slightly larger influence on C1- QUALITY OF LIFE.

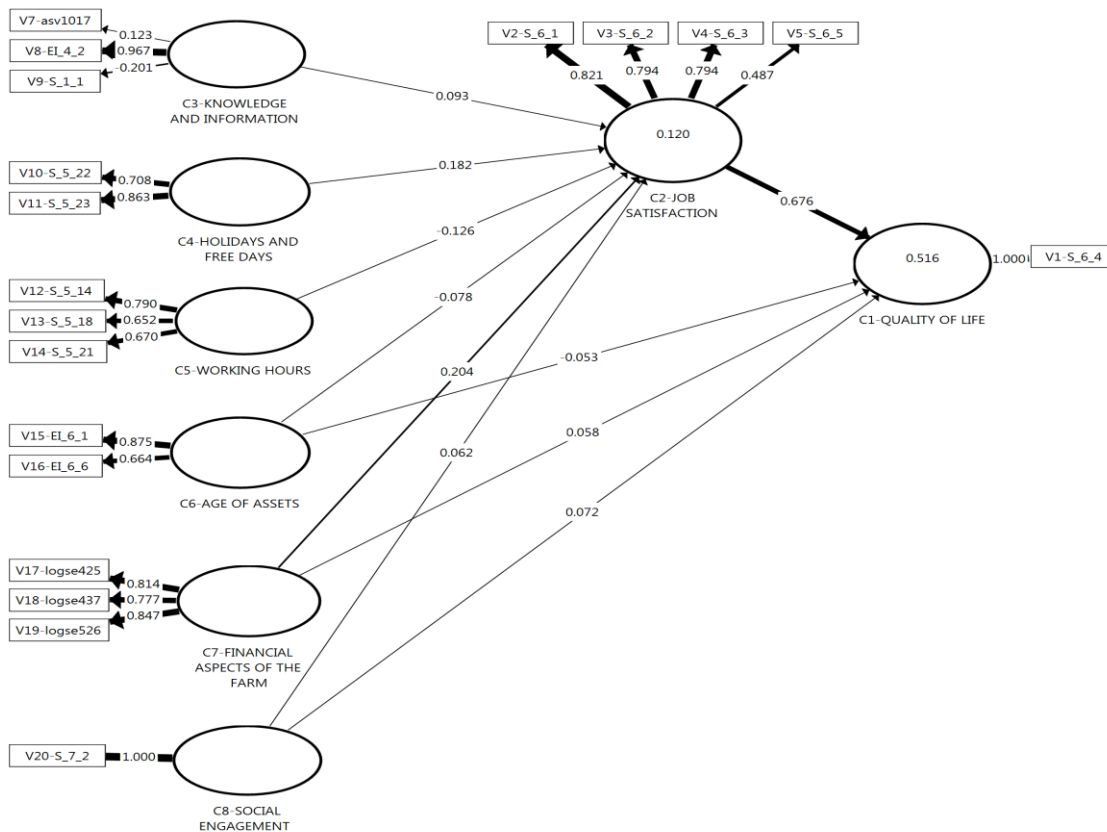
Overall, 12% ($R^2=0.120$) of the variance of the construct C2-JOB SATISFACTION is explained by the constructs linked to them. According to Hensher et al. (2017), this value could be considered as weak in business research, while it is similar to the values described by OECD (2013) namely between 3 and 35% mentioned in the studies aimed to find drivers of subjective well-being indicators.

Table 3. Path coefficients and significance

	Path coefficient	p values
H1: C2-JOB SATISFACTION → C1- QUALITY OF LIFE	0.676	0.000
H2: C3-KNOWLEDGE AND INFORMATION → C2-JOB SATISFACTION	0.093	0.175
H3: C4-HOLIDAYS AND FREE DAYS → C2-JOB SATISFACTION	0.182	0.000
H4: C5-WORKING HOURS → C2-JOB SATISFACTION	-0.126	0.000
H5: C6-AGE OF ASSETS → C2-JOB SATISFACTION	-0.078	0.012
H6: C6-AGE OF ASSETS → C1-QUALITY OF LIFE	-0.053	0.058
H7: C7-FINANCIAL ASPECTS OF THE FARM → C2-JOB SATISFACTION	0.204	0.000
H8: C7-FINANCIAL ASPECTS OF THE FARM → C1-QUALITY OF LIFE	0.058	0.008
H9: C8-SOCIAL ENGAGEMENT → C2-JOB SATISFACTION	0.062	0.021
H10: C8-SOCIAL ENGAGEMENT → C1-QUALITY OF LIFE	0.072	0.000

Source: the authors

Figure 2. Path model results



Source: the authors

6 Concluding remarks

We have asked farmers about their satisfaction with farming and their quality of life. Around one fifth of the total sample shows low level of satisfaction with their quality of life, one fifth of the sample indicates high levels of satisfaction and sixty percent of the sample are in between. Those proportions change according to the countries and economic size of the farms. Results shows that is valid and reliable to measure job satisfaction in the farming sector using four dimensions: satisfaction with daily job tasks, satisfaction with work-life balance, satisfaction with being farmer and satisfaction with freedom of decision making. The theoretical construct on job satisfaction can explain around 50% of the variance of the perceived satisfaction with quality of life of the farmers in the sample.

Farm-level drivers of the satisfaction with farming were also explored. Those drivers are derived from available manifested variables in farm-level information and have an acceptable convergent validity and composite reliability. Features of the farm such as financial aspects of the farm, age of assets, working time and social engagement have a significant influence in the satisfaction of farmers with their work, but the influence is rather weak: more than 80% of the variance of the satisfaction with farming is determined by factors not included in the available farm-level data set. While searching for drivers of perceived satisfaction with quality of life, we have to consider the “omitted variable problem” (OECD 2013): this analysis explored the influence of only extrinsic farm level attributes in the satisfaction with the job and quality of life. Two other aspects that are

not included in the data set may influence that perception. The first one is the favourability of the social or economic environment around the farmers, namely regional or local indicators of well-being beyond farm-level (Jantsch et al. 2016, Engelbrecht, 2009). The second one is the consideration of intrinsic motivations of the individual that affects satisfaction with job (Krumbiegel et al. 2016). Taking in to account that those factors are beyond farm-level, our results suggests that, if policy makers or researchers need to operationalize quality of life in the farming community, then it would be necessary to take into account those subjective dimensions when gathering information about farmers.

Methodological limitations on the analysis are also present. The analysis is based on cross-sectional data, not allowing controlling for external factors or circumstances. Additionally, further research is needed in order to establish moderator variables and differences across populations. Finally, there is still a current debate on the selection of techniques to test structural equation modelling: testing with covariance based methods to compare results may elicit alternative analysis methods.

7 References

Arbuckle, J. G., JR; Kast, C. (2012). Quality of Life on the Agricultural Treadmill: Individual and Community Determinants of Farm Family Well-being. *Journal of Rural Social Sciences* 27 (1): 84–113.

Austin, A. (2016). On well-being and public policy. Are we capable of questioning the hegemony of happiness? *Social Indicators Research* 127 (1):123–138.

Besser, T.; Mann, S. (2015). Which farm characteristics influence work satisfaction? An analysis of two agricultural systems. *Agricultural Systems* 141: 107–112.

Bitsch, V.; Hogberg, M. (2005). Exploring horticultural employees' attitudes toward their jobs. A qualitative analysis based on Herzberg's theory of job satisfaction. *Journal of Agricultural and Applied Economics* 37 (03): 659–671.

Böhnke, P. (2005). *First European Quality of Life Survey: Life satisfaction, happiness and sense of belonging*. Luxembourg.

Grijpstra, D.; Klaver, P.G.; Amber Veldhuis-Van Essen, C.; Weijnen, T. (2014). *Quality of life in Europe: Trends 2003 -2012*. Third European Quality of Life Survey. Luxembourg.

European Commission (2015). *EU farm economics overview*. Based on 2012 FADN data. European Commission. DG Agriculture & Rural Development. Brussels, Belgium.

Eurostat (2015). *Quality of life. Facts and views*. Luxembourg: Publications Office of the European Union. European Union. Statistical books.

Eurostat (2016). *Analytical report on subjective well-being. 2016 edition*. Luxembourg: Publications Office of the European Union. European Union. Statistical working papers.

Eurostat (2016). *Agriculture, forestry and fishery statistics. 2016 edition*. Luxembourg: Publications Office of the European Union. European Union. Agriculture and fisheries. Statistical books.

Engelbrecht, H-J (2009). Natural Capital, Subjective Well-being, and the New Welfare Economics of Sustainability. Some Evidence from Cross-country Regressions. *Ecological Economics* 69 (2): 380–388.

Gowdy, J.(2005). Toward a New Welfare Economics for Sustainability. In *Ecological Economics* 53 (2): 211–222.

Hair, J.F. (2010). *Multivariate data analysis. A global perspective*. 7. ed., Upper Saddle River, NJ, Munich, Germany: Pearson.

- Hair, J. F.; Hult, G. T. M.; Ringle, M. CH.; Sarstedt, M. (2017). *A primer on partial least squares structural equations modeling (PLS-SEM)*. Second edition. United States of America: Sage Publications.
- Hair J. F.; Sarstedt, M.; Hopkins, L.; Kuppelwieser, V.G. (2014). Partial least squares structural equation modeling (PLS-SEM). *European Business Review* 26 (2):106–121.
- Hirschauer, N.; Lehberger, M.; Musshoff, O. (2015). Happiness and utility in economic thought—or, what can we learn from happiness research for public policy analysis and public policy making? *Social Indicators Research* 121 (3): 647–674.
- Howley, P. (2015). The happy farmer. The effect of nonpecuniary benefits on behavior. *American Journal of Agricultural Economics* 97 (4):1072–1086.
- Howley, P.; Dillon, E.; Heanue, K.; Meredith, D. (2017): Worth the Risk? The Behavioural Path to Well-Being (68). *Journal of Agricultural Economics* 68 (2): 534–552.
- Jantsch, A.; Wunder, C.; Hirschauer, N. (2016). *Lebensqualität in Deutschland – Ein Vergleich von ländlichen und städtischen Regionen*. Selected paper presented in 56. Jahrestagung der GEWISOLA „Agrar- und Ernährungswirtschaft: Regional vernetzt und global erfolgreich“, Bonn, Germany.
- Kliebenstein J.; Barrett D.; Heffernan W. D.; Kirtley C. L. (1980). An analysis of farmers' perceptions of benefits received from farming. *North Central Journal of Agricultural Economics* 2 (2): 131-136.
- Key, N. (2005). How much do farmers value their independence? *Agricultural Economics* 33 (1):117–126.
- Krumbiegel, K.; Maertens, M.; Wollni, M. (2016).The role of Fairtrade certification for wages and job satisfaction of plantation workers. *GlobalFood Discussion Papers*. Göttingen, Germany.
- Kristoffersen, I. (2017). The Metrics of Subjective Wellbeing Data. An Empirical Evaluation of the Ordinal and Cardinal Comparability of Life Satisfaction Scores. *Social Indicators Research* 130 (2): 845–865.
- Lips M.; Gazzarin C. (2016): Job Preferences of Dairy Farmers in Eastern Switzerland: A Discrete Choice Experiment. *German Journal of Agricultural Economics* 65 (4): 254-261.
- Meyerding, S. G. H. (2016). Job satisfaction and preferences regarding job characteristics of vocational and master craftsman scholars and horticulture students in Germany. *Review of Agricultural and Applied Economics* 19 (01): 30–49.
- Mann, S.; Besser, T. (2016). Diversification and work satisfaction. Testing a claim by Marx and Engels for farmers. *Rural Sociology*: 00-00
- Mußhoff, O.; Tegtmeier, A.; Hirschauer, N. (2013). Attraktivität einer landwirtschaftlichen Tätigkeit – Einflussfaktoren und Gestaltungsmöglichkeiten. *Berichte über Landwirtschaft - Zeitschrift für Agrarpolitik und Landwirtschaft*, Band 91, Heft 2, August 2013.
- Näther, M.; Stratmann, J.; Bendfeldt, C.; Theuvsen, L. (2015). Wodurch wird die Arbeitszufriedenheit landwirtschaftlicher Arbeitnehmer beeinflusst? *Journal of Socio-Economics in Agriculture* 8: 85–96.
- OECD (1976). *Measuring social well-being. A progress report on the development of social indicators*. Paris, France: OECD.
- OECD (2013). *OECD guidelines on measuring subjective well-being*: Paris, France: OECD Publishing.
- Pigou A. C (1920). *The economics of welfare*. Edition 4. 1962. 876 p. MacMillan, London.
- Ringle, C. M.; Wende, S.; Becker, J.-M. (2015). "SmartPLS 3." Boenningstedt: SmartPLS GmbH, <http://www.smartpls.com>.
- Russell, R. A.; Bewley, J. M. (2013). Characterization of Kentucky Dairy Producer Decision-making Behavior. *Journal of Dairy Science* 96 (7): 4751–4758.
- Sen, A. (1999). *Development as freedom*. Oxford: Oxford University Press.
- Stiglitz, J. E.; Sen, A.; Fitoussi, J. (2010). *Mismeasuring our lives. Why GDP doesn't add up; the report by the Commission on the Measurement of Economic Performance and Social Progress*. New York, NY, United States of America: New Press.

UNDP (2015). *Human Development Report 2015-Work for Human Development*. United Nations Development Programme. New York, USA

WHOQOL Group(1995). The World Health Organization Quality of Life assessment (WHOQOL): position paper from the World Health Organization. *Social Science and Medicine*, 41(10):1403–1439.