Cárcaba, Ana; González Fidalgo, Eduardo

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The relationship between income and subjective well-being: the case of Spain

Ana Cárcaba[1] • **Eduardo González** *[2]

[1] *Department of Accounting, University of Oviedo, Spain*
[2] *Department of Business Administration, University of Oviedo, Spain*

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Abstract
This paper examines the evolution of individual subjective well-being (SWB) in Spain from 2013 to 2022, with special focus on its relationship with income. Of the many driving forces of SWB that have been identified in the literature, income is one of the most controversial. We use a large sample of individuals to analyze how income and SWB interacted during the post-2008 crisis period. As expected, our findings show that income is positively related to SWB, but it is so at a decreasing rate. The time interaction with income reveals that the effect of income has diminished over time. We conclude that, as material conditions improved in Spain during the period under analysis, the relevance of income in determining SWB did not.

Keywords: subjective well-being, life satisfaction, quality of life, Spain
JEL Classification Codes: I30, I31

1. Introduction

Happiness is a natural longstanding aspiration of humans on Earth. Since Economics is the science that studies how to obtain maximum satisfaction from existing resources, the study of subjective well-being (SWB) is a topic of main interest in the literature. At the end of the last century, the limitations of traditional measures of social progress, such as the gross domestic product, led researchers to propose SWB as an alternative meaningful measure to take into account in policy decisions. Unfortunately, determining what makes a happy life remains a controversial issue. SWB is related to social indicators of quality of life and also to the self-perception the individual has of his/her personal life. Genetic and environmental dimensions combine to produce wellbeing and happiness (Okbay et al., 2016). While little can be done to

* Corresponding author. E-mail: efidalgo@uniovi.es.

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modify the part that is determined by the genes, there is margin to act on the environmental elements (Arrondo et al., 2021).

Some of these environmental factors come from external shocks that affect societies during a given period. Economic crises or restrictions derived from pandemic situations are recent examples of shocks that may alter the dynamics of wellbeing. The aim of this work is to examine the evolution of SWB in Spain during the last decade and to establish the relative importance of income versus other determinant drivers. Our hypothesis is that the relevance of income should have diminished on time. The reason is twofold. On one side, the financial crisis of 2008 was left behind, reducing the determinant role of income. This should be the case if we accept that there are diminishing returns of income in generating happiness and therefore there is a threshold beyond which income no longer influences SWB (Cummings, 2000). On the other side, the impact of the pandemic may have affected priorities, increasing the importance of health and social relations over material conditions. In this paper, we use a big sample of individual-level data to shed light on these ideas.

1.1. Income and other major determinants of SWB

Although SWB is a unique perception that depends on each individual, there are some regularities that shape this variable (Sirgy, 2019). Back in 1990, the United Nations considered health, education and income as the three major elements of social progress (expressed in the well-known Human Development Index). There is no doubt that income is a major conditioning of progress and happiness (Sacks et al., 2010), but the effect may not be linear. While some studies do not find a satiation point of income (Stevenson and Wolfers, 2013), the prevailing view is that high-income individuals obtain little improvements (if any) in SWB with additional income (Diener et al., 2002; Dolan et al., 2008; Mentzakis and Moro, 2009). This is consistent with the well-known Easterlin's (1974) paradox. Consequently, our analysis of the last decade in Spain should reflect a lower SWB impact of income on time, since the economic evolution of the country during the decade has been undoubtedly positive.

According to our expectations about income, other determinants of SWB should have gained importance along the same period. Education and health, the other two components of human development, should have increased weight. However, the relationship between education and well-being is elusive. Educated people are better prepared to deal with their lives, but they may also increase aspiration levels (Graham, 2012). Some studies show that the effect of education is not too large if the indirect effect on income and health is controlled for (Helliwell, 2008). In contrast, health is perhaps the most unequivocal factor determining SWB (Dolan et al., 2008). It is reasonable to expect that, after the pandemic, health might have gained importance as a concern for most citizens.

Apart from the three variables included in the Human Development Index, there are many other factors affecting SWB. The OECD's Better Life Index points to several of these variables. Unemployment is one of them. There is a well-known negative effect of unemployment on SWB that operates beyond the lack of income that is associated with not having a job (Clark and Oswald, 1994; Oswald 1997; Lucas et al., 2004). Those working or inactive are happier than the unemployed, regardless of income. For the employed, the number of hours worked is

also important. Beyond some limit, increasing the hours worked also reduces life satisfaction (Meier and Stutzer, 2008). Finding the right balance between work and personal life becomes essential for a good life.

Social involvement, participation and trust in others are additional positive determinants of SWB (Helliwell, 2003; Meier and Stutzer, 2008). Trust and social support from others are critical for happiness (Helliwell and Wang, 2011). The way we have relationships with others (friends, neighbors, family, etc.) determine the potential for life satisfaction (Cohen and Wills, 1985; Helliwell and Putnam, 2004; Puntscher et al., 2015; Liu et al., 2017; Kahneman and Kruger, 2006; Lelkes, 2006). Loneliness is commonly associated with dissatisfaction with life. Argyle and Furnham (1983) found that married people are happier, an effect that extends to stable unmarried partners (Brown, 2000).

While other many factors have been identified in the literature (Arrondo et al., 2021), we will limit our study to the previous elements, which have a long tradition in explaining differences in SWB.

2. Methods

We measure SWB with the usual measure of the own perceived satisfaction with life in a scale from 0 to 10, where 10 is the highest level. Income is measured by disposable income. In case the family owns the house, an adjustment is made to ascribe the potential rent from the property. Education measures the highest attainment of the individual (being PhD the maximum and illiterate the minimum). Health is a measure of self-perceived health status. The rest of the variables measure the incidence of unemployment, the balance between work and leisure, the satisfaction with personal relations and the trust in society.

To these variables, we add some socio-demographic control variables such as age, gender, cohabitation, and immigrant status.

The model considers the dependent variable (SWB) to be a linear function of the variables indicated above, in the following manner:

$$SWB_{iht} = \gamma_t + \alpha_1 A_{iht} + \alpha_2 A_{iht}^2 + \alpha_3 G_{iht} + \alpha_4 M_{iht} + \alpha_5 C_{iht} + \beta_1 I_{iht} + \beta_2 I_{ijh}^2 + \beta_3 I_{iht} t \quad +$$
$$+\beta_4 I_{iht} G_{iht} + \beta_5 I_{iht} U_{iht} + t\delta_1 E_{iht} + \delta_2 H_{iht} + \delta_3 U_{iht} + \delta_4 L_{iht} + \delta_4 R_{iht} + \delta_5 T_{iht} + \varepsilon_{iht} \quad (1)$$

The sub-indexes refer to the individual (i), the household (h) and the time period (t). Recall that the data are pooled and therefore we cannot estimate a panel model with individual effects. We include time effects in the specification and quadratic terms for Age (A) and Income (I). The quadratic U-shaped relationship between age and SWB is well established in the literature (Blanchflower, 2021). In turn, the quadratic term of income will allow estimating whether the effect of income on SWB is decreasing (as we expect) or not. We also include an interactive effect between a time trend (t) and income. This will serve to test whether the effect of income on SWB decreases on time, which is part of our working hypotheses. We also include interactions between income and gender and income and unemployment. These effects will show how income affects genders differently or has a special effect on the unemployed.

Table 1. Variables

Variable	Definition
SWB	Degree of satisfaction with own life (0-10)
Socio-demographic	
Age (A)	Age of individual in each period
Immigrant (M)	Dummy variable equal to one if the individual is an immigrant and zero otherwise
Gender (G)	Dummy variable equal to one if the individual is a female and zero otherwise
Cohabitation (C)	Dummy variable equal to one if the individual lives with a partner and zero otherwise
Income	
Income (I)	Disposable income including ascribed house rent (thousand Euros)
QoL	
Education (E)	Maximum educational level attained (0-5)
Health (H)	Perceived health status (1-5)
Unemployed (U)	Dummy variable expressing unemployment (0,1)
Leisure (L)	Satisfaction with spare time (0-10)
Relations (R)	Satisfaction with personal relations (0-10)
Trust (T)	Trust in others (0-10)

Source: Own elaboration.

3. Data

The data for this study was taken from the Spanish survey on living conditions, which is carried annually by the *Instituto Nacional de Estadística* (INE). Specifically, we selected years 2013, 2018 and 2022 because only these years contain a special section with data on wellbeing. With these data, we can track the evolution of SWB along the last decade for a large dataset. Sample size has raised from some 35000 individuals in 2013 to more than 50000 in 2022, selected with a two-stage stratified sampling methodology. Our final sample is lower, since we only selected individuals in working ages (18-65). It includes 19026, 20454 and 35823 individuals in 2013, 2018 and 2022, respectively.

The data do not conform a panel, since the individuals are different from period to period. The sampling methodology of INE replaces 20% of the individuals every year, so that every 5 years the sample is completely renewed. Although the survey is conducted annually, the special module on well-being is only included once every 5 years. Therefore, the samples for 2013, 2018 and 2022 are completely different. Therefore, the complete sample conforms a pool of data.

4. Results

Table 2 exhibits the basic descriptive statistics of all the variables used in this analysis.

It shows how, in all periods, the sample is balanced by genders, being average age between 43-45. Most of the individuals sampled are Spanish nationals (between 87% and 90%), and around 60% live with a couple. The evolution of SWB displays a sharp increase in 2018 and a moderate decline in 2022. While the economic recovery after the financial crisis had an impressive effect on life satisfaction, the effects of the pandemic were non-surprisingly

negative. Note that the drop in 2022 occurs despite the steady improvements in income and unemployment. This suggests that the underlying SWB generating process may have reduced the weight of economic drivers after the pandemic, increasing the importance of QoL related variables. Consistent with this, we can see that, for most of the QoL variables, the evolution was similar to that observed for SWB. A sudden gain in 2018 followed by a counteracting drop in 2022. Education is the only QoL variable for which the improvement is steady. This makes sense, since education attainment levels cannot be immediately affected by unexpected short run events. We will need more time to be able to detect the effects of the pandemic on education levels.

Table 2. Descriptive statistics*

Variable	Avg. 2013	Avg. 2018	Avg. 2022	Min/Max
N	18,926	20,454	35,823	
SWB	6.99	7.46	7.19	0/10
	(1.93)	(1.71)	(1.89)	
Socio-demographic				
Age	42.9	44.2	44.9	18/65
	(13.1)	(13.2)	(13.2)	
Immigrant	0.095	0.13	0.13	0/1
	(0.29)	(0.33)	(0.33)	
Gender (female)	0.51	0.51	0.51	0/1
	(0.50)	(0.50)	(0.50)	
Cohabitation	0.62	0.61	0.61	0/1
	(0.48)	(0.49)	(0.49)	
Income				
Income	36.6	39.3	44.6	0/332
	(23.5)	(24.8)	(24.8)	
QoL				
Unemployment	0.22	0.14	0.12	0/1
	(0.41)	(0.35)	(0.32)	
Health status	3.96	4.01	3.90	1/5
	(0.77)	(0.78)	(0.78)	
Leisure	6.38	6.69	6.21	0/10
	(2.36)	(2.22)	(2.38)	
Education	2.99	3.20	3.49	1/5
	(1.44)	(1.49)	(1.45)	
Relations	7.84	8.26	7.81	0/10
	(1.65)	(1.46)	(1.70)	
Trust	6.28	6.69	6.27	0/10
	(2.05)	(2.15)	(2.24)	

Notes: * Standard deviations in brackets

The results of the econometric model relating SWB to its determinant factors are displayed in Table 2. We estimated three models, including first the socio-demographic variables and time effects, then income related regressors and, finally the QoL variables. Since the survey is structured by household and, in some cases, more than one individual from the household is interviewed, the observations are not independently and identically distributed. For the sake of consistent estimation, we run a clustered error regression model in which households are the clusters.

Year effects for 2018 and 2022 reflect the fact that SWB was much higher in 2018 and slightly higher in 2022, as compared to the base period 2013. The socio-demographic variables confirm, in part, our expectations. We observe a U-shaped relationship between age and SWB, which is well-established in the literature. However, after controlling for the QoL variables, the positive quadratic effect of age is statistically insignificant. The linear term is also much smaller (in absolute terms) in Model 3. This points to a possible relationship between ageing and QoL variables, that deserves attention in future research. Immigrants also show lower well-being, but this effect disappears when income is controlled for in Model 2. Therefore, it is not the status of being immigrant what reduces SWB, but the lower income associated to this social group. The effect of gender is aligned with past research findings that reported higher SWB for women (Arrondo et al, 2021). This effect is even larger when income and QoL variables enter models 2 and 3, which points to a genuine gender effect. Finally, cohabiting with a couple is strongly associated to higher SWB levels as expected.

The focus of this paper is set on the relationship between income and SWB. The results in Table 2 reflect a positive and significant income effect. Perhaps money can't buy happiness, but it certainly helps. However, consistent with our expectations, the quadratic effect of income is negative and statistically significant, which means that, as income increases, it can buy less and less happiness. The time interaction with income is also negative. This result can be interpreted in the line of the Easterlin paradox. As income increases steadily on time, SWB does not. Furthermore, it may eventually decrease. Our interpretation of this effect is related to the positive time evolution of income and the incidence of the pandemic in 2022. First, as individuals improve economically along the period considered, income becomes marginally less relevant to determine SWB levels. Second, the pandemic might have changed priorities from economic to QoL variables as major drivers of SWB. For instance, people may be more concerned about their health status after this shock. The interaction of income with gender is negative, which shows that women are less affected by income changes than men are.

The QoL variables included in Model 3 all show the expected signs, and the effects are statistically significant. The effect of unemployment (even after controlling for income) is negative. Furthermore, the interaction of unemployment with income is positive, which means that changes in income are significantly more relevant for the unemployed. Then, health, leisure, education, social connections and trust exert positive effects on SWB. We must notice that QoL related variables are the most important drivers of SWB, since the R^2 rises dramatically from 0.089 to 0.40 after they are incorporated to Model 3. Socio-demographic variables would explain a rough 5% of the variance, income an additional 4% and then QoL variables the remaining 31%.

5. Concluding remarks

Determining what makes a good life is a fascinating exercise in abstracting the main elements of well-being. Although SWB is an individual subjective perception and can be mediated by cultural factors, the literature points to a set of common major driving forces. Of course, income occupies a very central place in this set. Economics textbooks, still today, consider welfare and utility as synonyms, being income the single limiting factor in obtaining utility from

consumption. Not surprisingly, this limited vision has been seriously challenged during the last decades (Easterlin, 1995; Stiglizt, 2009).

Table 3. Determinants of SWB

	Model 1	**Model 2**	**Model 3**
Intercept	9.07	7.90	0.376
	(127.7)***	(100.8)***	(4.5)***
Time effects			
2018	0.512	0.507	0.170
	(22.1)***	(18.2)***	(7.0)***
2022	0.275	0.242	0.204
	(12.6)***	(5.69)***	(6.5)***
Socio-demographic			
Age	-0.097	-0.080	-0.012
	(-26.3)***	(-22.1)***	(-3.9)***
Age^2	0.001	0.001	0.0001
	(19.1)***	(15.4)***	(1.5)
Immigrant	-0.279	-0.017	0.031
	(-10.4)***	(-0.67)	(1.5)
Gender (female)	0.047	0.112	0.105
	(4.2)***	(5.0)***	(5.6)***
Cohabitation	0.697	0.530	0.425
	(37.1)***	(28.1)***	(28.4)***
Income			
Income		0.029	0.012
		(21.2)***	(13.1)***
$Income^2$		-0.0001	-0.0001
		(-12.8)***	(-9.3)***
Income·t		-0.0015	-0.0008
		(-3.4)***	(-2.7)***
Income·Gender		-0.001	-0.001
		(-3.1)***	(-3.8)***
Income·Unemployment			0.003
			(4.0)***
Quality of Life			
Unemployment			-0.886
			(-26.6)***
Health status			0.536
			(54.5)***
Leisure			0.147
			(42.7)***
Education			0.047
			(10.4)***
Social connections			0.327
			(61.2)***
Trust			0.120
			(31.8)***
$\mathbf{R^2}$	0.049	0.089	0.407

Notes: * Significance level 0.1, ** Significance level 0.05, *** Significance level 0.01

The results in this paper show that the effect of income on SWB is indeed limited. Our evidence confirms that increasing income also increases SWB, but it does so at a decreasing rate. Furthermore, the effect of income on SWB is diminishing on time during the period considered (2013-2022). We interpret this last result as the effect of changes in life priorities over time. For instance, if during the toughest days of the pandemic the weight associated to health and social relations gained momentum, then the relative importance of income should have diminished. However, more research is needed in order to establish the existence of a change in the relative importance of the different determinants of SWB. It would also be desirable to complement this study with an analysis of the effects of income inequality (Ngamaba et al., 2018).

Our findings point to an increase in the relevance of QoL related variables over economic variables. This would be relevant for policy making, since it can inform the strategies for pursuing sustainable welfare states. If QoL variables are at the forefront, the effects of an economic policy oriented towards increasing income may be limited. Instead, improving health (also through prevention), fostering social contact, providing education opportunities or increasing trust in society can be actions with more impact in sustaining and improving SWB levels in the future.

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