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Does Life Satisfaction predict Economic Preferences? Evidence from cross-sectional data

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Abstract
This paper investigates the effect of subjective well-being (SWB) on economic preferences by employing the Gallup World Poll and Global Preference Survey. First, by means of the LASSO "Least Absolute Shrinkage and Selection Operator," a regularized regression model, this paper presents evidence that life satisfaction is selected as an explanatory variable for patience, risk, negative reciprocity, altruism, and trust. Second, in order to assess the magnitude and statistical significance along with robust clustered standard errors, this study performs a variable selection process with a post-double-selection approach. The estimated coefficients are statistically significant, with a positive coefficient for patience and risk-taking, a positive and increasing effect exerted by SWB on altruistic behavior and negative reciprocity, and finally, a negative effect observed with respect to trust.

JEL Classification: C52, D01, I31

Keywords
behavioural economics — LASSO — subjective wellbeing

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Introduction

Individual decision-making comprises individual (timing of rewards and risk) and interpersonal (trust, altruism, and reciprocity) preferences. Due to the relationship between behaviour and several economic outcomes, Falk et al. (2018) has presented a global study to investigate the most important determinants in economic preferences variation. Among the determinants of the variation of economic preferences, we find positive feelings and emotional states, focusing on positive affect and happy feelings (Isen, 2008; Hermalin and Isen, 2008). However, evaluating the effect of happiness on economic preferences is still an open question, and the progress made so far has been exhaustively discussed by Lane (2017). Moreover, this large picture still lacks evidence of how *life satisfaction*, as a measure of subjective well-being (hereafter SWB)[1], could explain the variation in deep economic preferences. However, a recent study conducted in Germany by Haverkamp et al. (2023) identifies how the above-mentioned economic preferences, as explanatory variables, affect life satisfaction; the effect is positive and statistically significant for risk, patience, altruism, and trust. The purpose of this paper is to identify if SWB can successfully predict economic preferences against the opposite evidence. This is realized by employing both sources of data, the Gallup World Poll and the Global Preference Survey.

First, by means of LASSO *"Least Absolute Shrinkage and Selection Operator"*, a regularized regression model, this paper presents a model variables selection to verify if life satisfaction is selected as an explanatory variable for the six deep economic preferences; second, in order to assess the magnitude of the statistical significance along with robust clustered standard errors, a post-double-selection LASSO approach is performed. Finally, this paper presents evidence that life satisfaction is selected as an explanatory variable for patience, risk, negative reciprocity, altruism, and trust. The estimated coefficients are statistically significant, with positive coefficients for patience, risk, negative reciprocity, and altruism, and negative signs for trust.

Data and Summary Statistics

Based on the already known validity of the measures provided by the Gallup World Poll[2], this paper tests the validity of the self-reported measure of SWB as a predictor for the six deep economic preferences presented by the Global Preference Survey. The two primary sources of data used in this study are the following:

[1] Subjective well-being is characterized by three separate and correlated dimensions Nikolova and Graham (2020): *Affective* (regards temporary emotions and experiences, positive and negative ones, the former are related to happiness or joy, the latter are stress, anger and sadness), this dimension is captured by asking respondents about their feeling during the previous day. *Evaluative* (a judgment about circumstances of overall life and requires reflecting on life as a whole. This dimension is captured by a survey question like *"How satisfied are you with your life as a whole?"*), and *Eudaimonic* (captures the most important determinants in people's life purpose) Graham and Nikolova (2015).

[2] See Bjørnskov (2010); Aknin et al. (2013); Diego-Rosell et al. (2018); Helliwell and Wang (2010).

1. Firstly, the Gallup World Poll (hearafter GWP)[3] is a worldwide survey covering 90% of the world population. It measures different aspects of individuals' lives, from socio-demographic characteristics to attitudes, from life satisfaction to beliefs, and it measures how people value their own lives. This dataset is the single most relevant survey in the world, so far to perform and evaluate life satisfaction and happiness in the economics literature. The underlying aim of this dataset is to understand what makes life great and how to improve it for society;

2. Secondly, the Global Preference Survey (hereafter GPS)[4] is presented as a cross-sectional dataset that measures the following economic preferences: *risk, patience, reciprocity, altruism, and trust*.

However, the merged data set presents a total sample that includes around 80300 working-age[5] respondents across 76 countries, including a large number of variables.

Measuring Life Satisfaction

Figure 1 shows the worldwide level of life satisfaction, measured on a scale from 0 to 10. Looking at the Gallup World Poll surveys, the Cantril ladder-of-life question Cantril (1965) is built as follows: here, the respondents need to imagine a ladder from 0 to 10 (the worst/best possible life that they can imagine for themselves) and assign a value at their actual life through this ladder. The latter, Cantril ladder-of-life and the evaluative question as a measure of SWB are related with a correlation coefficient of about 0.75 Nikolova and Graham (2021).

European countries like Austria, Finland, France, Germany, Netherlands, Sweden, Switzerland, and the United Kingdom show the highest mean value of reported life satisfaction, together with Australia, Canada, the United States, Mexico, Venezuela, Brazil, and Chile. Analyzing the distribution of the average life satisfaction across the world in Figure 1, it is possible to distinguish a maximum mean value observed in four Northern European countries. Conversely, the bottom four countries of the distribution are in sub-Saharan Africa. Nevertheless, in this empirical study, the measure of SWB is collected with the following question: *"Please imagine a ladder with steps numbered from 0 at the bottom to 10 at the top. Suppose we say that the top of the ladder represents the best possible life for you, and the bottom of the ladder represents the worst possible life for you. On which step of the ladder would you say you personally feel you stand at this time, assuming that the higher the step the better you feel about your life, and the lower the step the worse you feel about it? Which step comes closest to the way you feel?"*

[3]Waves 2012.
[4]Conducted in a subset of countries that were surveyed by Gallup 2012.
[5]Working-age individuals aged between 15 and 64.

Economic Preferences and Life Satisfaction

The GPS includes individual levels of interpersonal (trust, altruism, and reciprocity) and individual (time preference and risk-taking) preferences. Furthermore, these preferences are based on two survey items for each, and the selection process is based on a validation study by Falk et al. (2015). The validation process consists of conducting incentivized choice experiments for each preference. All economic preferences are elicited through an optimization procedure that includes a combination of two survey items, one qualitative and one quantitative. The first is more abstract and has more explanatory power for individual behavior in the experiments; the quantitative one defines hypothetical choice scenarios for the respondents.

Among individual preferences, *patience* is built by combining the quantitative item (series of five binary choices between immediate and delayed financial rewards reporting the preference for a payment today or larger payment in 12 months) and the qualitative item reporting the willingness to wait on an eleven-point Likert scale ("*how willing are you to give up something that is beneficial for you today in order to benefit more from that in the future?*"). The *Risk* as individual behaviour, is captured by presenting a series of five binary choices (where the gamble was a lottery with a certain payment and a lottery with probability to win anything or a determined amount of money) and asking the following question: *"In general, how willing are you to take risks?"*. Moreover, how interpersonal preferences are elicited is presented here. *Positive reciprocity* the respondents are presented with a scenario in which they are lost in an unknown area, and a stranger offers them help to reach their destination. Then, the respondents are asked which amount of money they would choose, from 5 to 30 euros, to give to the stranger to say "thank you" for your help. The qualitative items are extracted by a self-assessment of the respondents' willingness to return a favor on an eleven-point scale. *Negative reciprocity* is elicited by three different self-assessments, each with equal weight in the final measure.

The first one asks how willing the respondents are to take revenge if they are treated in an unjust way, even if such actions result in costs ranging from zero to ten; the second and third items have the aims to probe respondents willingness to punish someone for unfair behavior, or toward a third person or themselves. *Altruism*, is elicited through the scenario presented here: the respondent receives an amount of money equal to one thousand euros and then asked how much of this amount she/he is willing to donate. The qualitative measure captures a self-reported willingness to give to good causes without expecting anything in return on an eleven-point scale. Finally, *Trust* is elicited through one question, which asks the respondent whether she/he assumes that other people have the best intention; this question is on a zero to ten Likert scale (for further explanation on the elicitation procedure, see Falk et al., 2018).

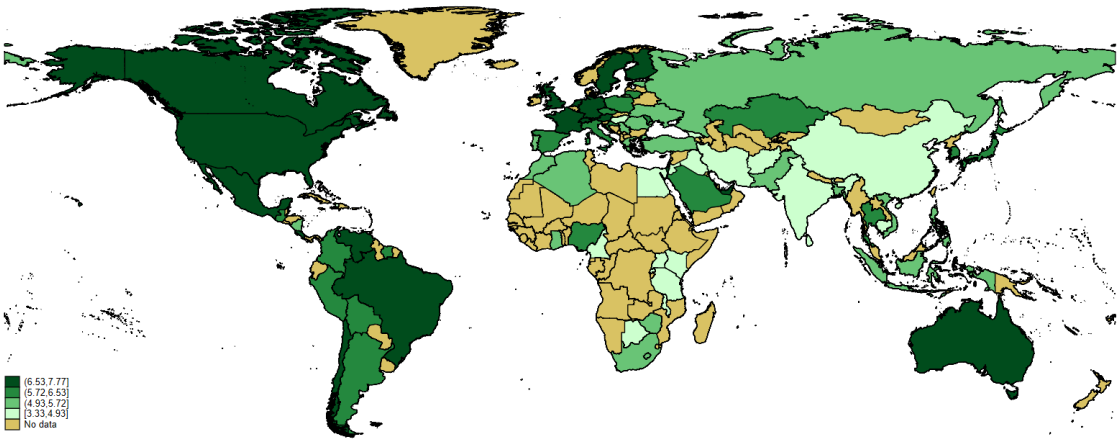

Figure 1. Distribution of Life Satisfaction

Note: authors calculation on Gallup World Poll data. The Figure plots the country's average mean value of life satisfaction.

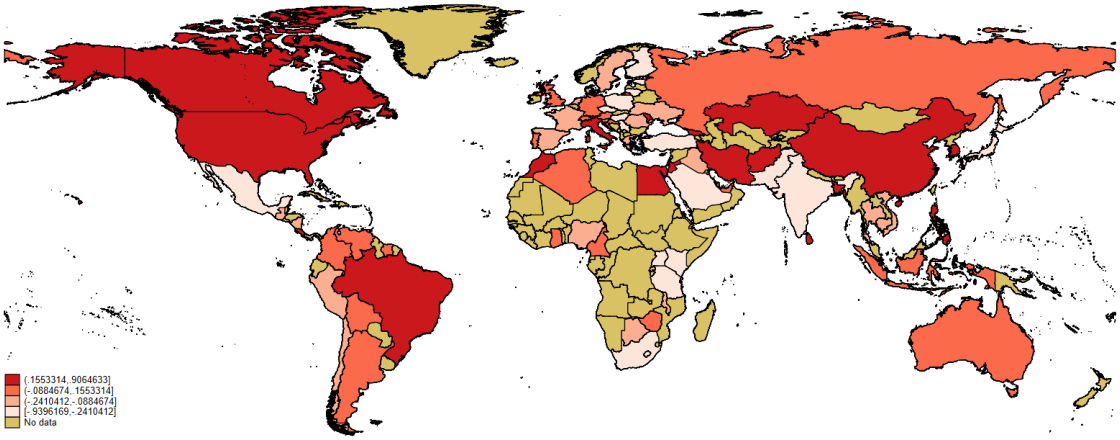

Figure 2. Distribution of Altruism

Note: authors calculation on Global Preference Survey. The Figure plots the country's average mean value of altruism.

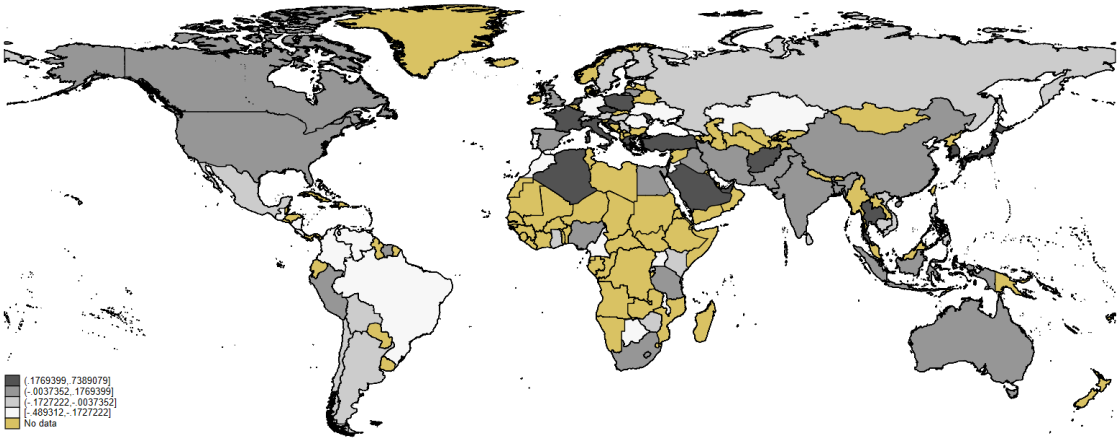

Figure 3. Distribution of Negative reciprocity

Note: authors calculation on Global Preference Survey. The Figure plots the country's average mean value of negative reciprocity.

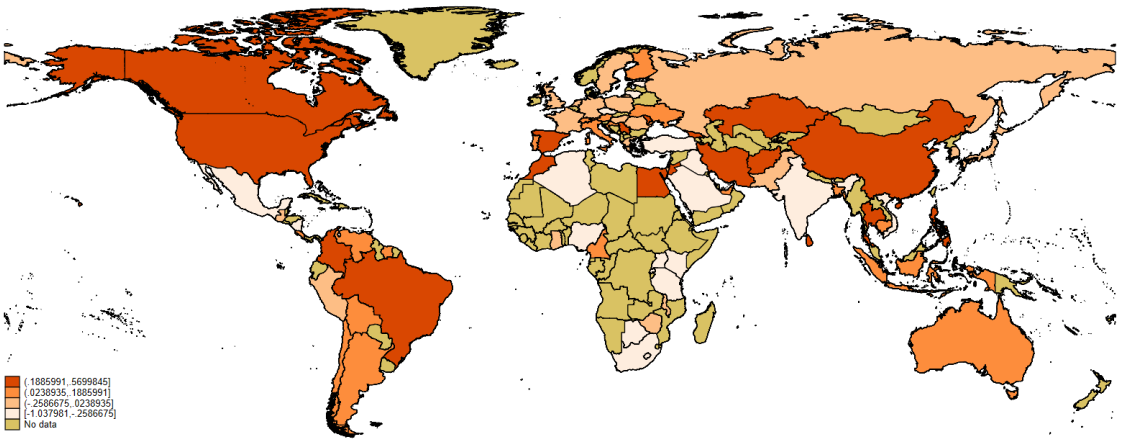

Figure 4. Distribution of Positive reciprocity

Note: authors calculation on Global Preference Survey. The Figure plots the country's average mean value of positive reciprocity.

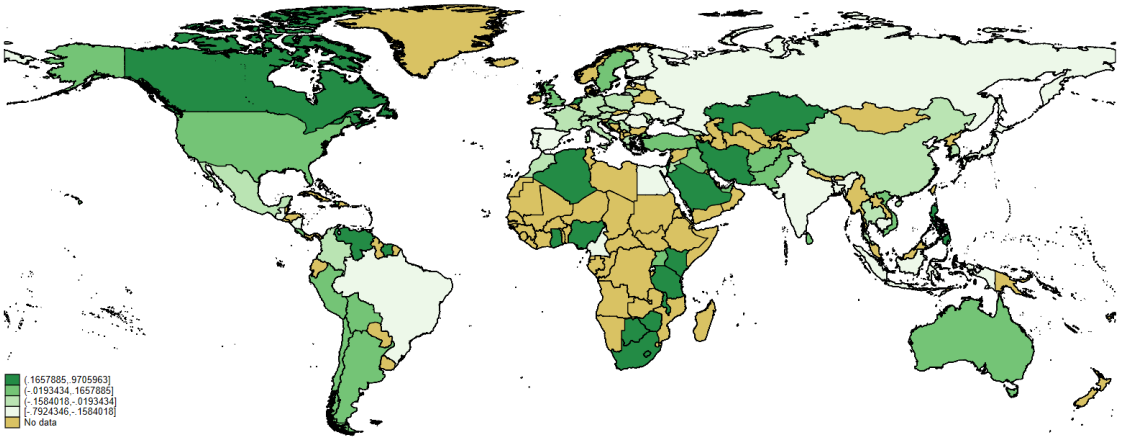

Figure 5. Distribution of Risk

Note: authors calculation on Global Preference Survey. The Figure plots the country's average mean value of willingness to take risk.

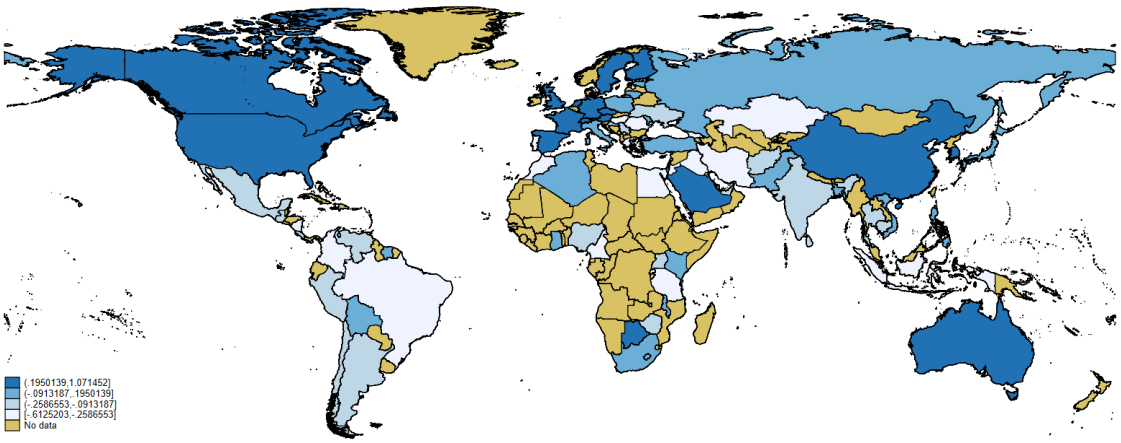

Figure 6. Distribution of Patience

Note: authors calculation on Global Preference Survey. The Figure plots the country's average mean value of patience.

Table 1. LASSO Variables model selection

	(1)	(2)	(3)	(4)	(5)	(6)
Dependent Variables	Patience	Risk taking	Pos. Recip.	Neg. Recip.	Altruism	Trust
Life Satisfaction						
level 1				-0.1627		
level 2						
level 3	-0.118	-0.103				-0.0927
level 4	-0.104	-0.100				-0.110
level 5	-0.089					
level 6						
level 7						
level 8	0.108	0.091				
level 9		0.098				
level 10	0.076	0.099			0.109	0.133
Country FE	YES	YES	YES	YES	YES	YES
Mean dep var	-0.034	0.151	-0.066	0.003	-0.055	-0.131
SD dep var	0.948	0.993	1.024	0.995	0.972	1.014
BIC	52477.4	52811.34	54665.43	54905.05	53630.67	54797.75
Observations	24,759	24,759	24,759	24,759	24,759	24,759
Potential Variables	270	270	270	270	270	270
Selected Variables	78	89	86	71	87	80
Train Sample R^2	0.135	0.191	0.171	0.099	0.139	0.127
Test Sample R^2	0.136	0.188	0.141	0.101	0.117	0.084
N. of cluster	49	49	49	49	49	49

Note: The table reports estimates coefficients from LASSO linear model selection. The total number of observations is divided in Train equal to 19,826, and Test equal to 4,933.

Empirical Strategy

In order to unveil whether life satisfaction is a good predictor of economic preferences, this study employs a variable selection process performed with a regularized linear regression. Like ordinary least squares, regularized linear regression minimizes the sum of squared residuals (RSS),[6] but imposes a regularization penalty that limits model complexity. LASSO is the most innovative and popular method for regularized regression, which penalizes the absolute size of the estimates coefficient[7].

Results

Table 1 presents for each economic preference regularized linear regressions, with selection criteria the Bayesian information criterion, BIC. Nevertheless, it is possible to observe that the variable life satisfaction[8] is selected among many potential variables. In all the regressions, the number of the selected variables is different due to the lambda selected by the selection criteria. The number of observations used during the selection variables process as a training sample equals 19,826, which is equal to 80% of the total number of observations available for the potential variable employed. The remaining observations are used as a test sample.

The results shown in Table 2 are standardized, so the estimated coefficients are in terms of units of standard deviation of the respective preference (relative to the individual world mean). In the regression table, it is possible to observe that the statistical significance of the explanatory variable life satisfaction differs for each reported level and each economic preference. It is possible to observe that lower (from 1 to 4) levels of life satisfaction are significant only for trust, middle values (5 and 6) are significant for risk, negative reciprocity,

[6]The distance between the observation and model predicted values.
[7]See Tibshirani (1996) for more details.
[8]This variable is employed as a categorical variable with the level 0 as baseline.

Table 2. LASSO Post Double Selection

	(1)	(2)	(3)	(4)	(5)	(6)
Dependent Variables	Patience	Risk	Pos recip	Neg recip	Altruism	Trust
Life Satisfaction						
level 1	0.040	-0.026	-0.045	-0.080	0.065	-0.175**
	(0.062)	(0.084)	(0.086)	(0.074)	(0.102)	(0.081)
level 2	-0.013	0.002	-0.110	0.050	0.001	-0.123**
	(0.052)	(0.062)	(0.082)	(0.067)	(0.067)	(0.053)
level 3	-0.058	0.023	-0.090	0.041	0.035	-0.152**
	(0.045)	(0.065)	(0.076)	(0.059)	(0.061)	(0.062)
level 4	-0.052	0.056	-0.095	0.096	0.086	-0.187***
	(0.050)	(0.057)	(0.073)	(0.061)	(0.071)	(0.063)
level 5	0.019	0.129	-0.049	0.156**	0.109	-0.143***
	(0.047)	(0.054)	(0.072)	(0.063)	(0.074)	(0.052)
level 6	0.040	0.188***	-0.044	0.152**	0.108	-0.104*
	(0.050)	(0.057)	(0.074)	(0.069)	(0.072)	(0.061)
level 7	0.134**	0.266***	-0.018	0.204***	0.170**	-0.080
	(0.054)	(0.063)	(0.076)	(0.076)	(0.077)	(0.056)
level 8	0.214***	0.354***	-0.012	0.198**	0.197**	-0.024
	(0.053)	(0.070)	(0.076)	(0.079)	(0.078)	(0.063)
level 9	0.249***	0.361***	0.009	0.210**	0.260***	0.039
	(0.050)	(0.073)	(0.078)	(0.085)	(0.082)	(0.066)
level 10	0.212***	0.352***	-0.005	0.202	0.265***	0.121
	(0.067)	(0.092)	(0.094)	(0.098)	(0.097)	(0.082)
Observations	24,759	24,759	24,759	24,759	24,759	24,759
Country FE	YES	YES	YES	YES	YES	YES
Cluster	49	49	49	49	49	49
Potential Variables	261	261	261	261	261	261
Selected Variables	65	65	65	65	65	65

Note: The table reports estimates coefficients along with standard error in parenthesis, all the regressions are performed with robust clustered standard errors for country. Level of significance: * $p < 0.1$, ** $p < 0.05$, *** $p < 0.01$

and trust, while higher levels (from 7 to 10) are significant for patience, risk, negative reciprocity, and altruism.

Nevertheless, a concave pattern emerges in the coefficients related to patience and risk, where rising levels of reported life satisfaction leads to a corresponding increase in the observed economic preference values up to level 9, after which the coefficient regresses by two levels.

This first evidence of an increase in the level of patience related to higher levels of life satisfaction is in line with the experimental findings when a positive mood is induced (see Ifcher and Zarghamee, 2011; Pyone and Isen, 2011). The second evidence regarding the increasing level of life satisfaction and willingness to take risks follows the so-called Affect infusion model proposed by Forgas (1995), which states that positive moods lead to risk-seeking behavior. The variation in negative reciprocity at increasing levels of life satisfaction is fluctuating, reporting a positive coefficient, suggesting that more satisfied people are more willing to engage in negative reciprocity in line with the findings reported by Dunn et al. (2010). Moreover, we observe an increasing pattern in the variation of altruism at increasing levels of life satisfaction in line with the experimental finding of induced happiness and altruistic behaviour (see Eisenberg, 1991; Capra, 2004; Kirchsteiger et al., 2006; Capra et al., 2010; Drouvelis and

Grosskopf, 2016; Konow and Earley, 2008). The variation of trust at increasing levels of life satisfaction reports negative coefficients in line with the negative correlation of Mellick (2014).

The selected variables in this analysis are smaller with respect to Table 1, according to the characteristics of this second approach.

All the regressions are performed by having the economic preferences contained in the Global Preference Survey as a dependent variable; the standard errors are robust and clustered by country.

Conclusions

This paper demonstrates that the reported level of subjective well-being, in particular the evaluative dimension, *Life Satisfaction*, is a predictor for deep economic preferences. From the reported level of life satisfaction, we observe that it is possible to understand how individuals in society tend to behave. These findings are related to the willingness to take risks, patience, altruistic behavior, trust, and negative reciprocity. However, due to the crucial economic implications reported by Falk et al. (2018) relating these six economic preferences and economic outcomes (e.g., educational achievements, saving behaviour, unconditional giving), this study suggests the need to consider the use of SWB data in conducting empirical studies to avoid omitted variable bias in the estimates. This paper enlarges the evidence of how SWB affects behavior by employing a survey dataset, the Gallup World Poll and the Global Preference Survey. A positive relation with concave pattern is observed with respect to the effect of SWB on Patience and risk; a positive effect is reported looking at negative reciprocity, the positive and increasing effect is exerted by SWB on altruistic behavior, and finally, a negative effect is observed with respect to trust.

However, further research is needed to better understand the effect of SWB and the predictive power of what individuals report about their level of Life Satisfaction. Thus, this paper will shed light on the effect of subjective well-being on economic preferences and individual behavior for further analysis employing both sources of data.

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