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Can Governments Boost People's Sense of Well-Being? The Impact of Selected Labour Market and Health Policies on Life Satisfaction

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Abstract There is strong evidence that subjective well-being measures capture in a reliable way specific components of well-being that other non-subjective measures miss. The question of whether subjective well-being is policy amenable is however still largely unexplored in the research. This paper sheds some light on this issue, by looking at the impact of selected labour market and health policies on subjective well-being, using well-being data from the Gallup World Poll on the 34 OECD countries. The paper finds that the generosity of unemployment benefits and the strictness employment protection legislation affects positively life satisfaction, while out-of-pocket health expenses significantly reduce subjective well-being.

Keywords Happiness · Life satisfaction · Labour market policy · Health policy · Subjective well-being

A longer version of this paper is in Boarini et al. (2012).

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1 Introduction

The OECD has long been involved in measuring societal progress. This is reflected in the OECD's characterisation of its role as providing "better policies for better lives". Implicit in this statement is the question of how to define and measure "better lives", and how to estimate the impact of policies on those measures. The "OECD Better Life Initiative", which was launched in May 2010 as part of the OECD's 50th Anniversary celebration, represents one attempt to define and measure better lives. This initiative aims to provide comprehensive evidence on well-being patterns and trends in the OECD area and some emerging countries.

One of the dimensions of well-being considered in the better life initiative is subjective well-being.¹ Recent years have seen an explosion in the literature on the causes and correlates of subjective well-being, brought about by the increasing availability of data and evidence showing that self-reports of life satisfaction and current feelings are valid and consistent measures of people's sense of well-being. However, if measures of subjective well-being are to be used as indicators of societal progress, it is crucially important to know whether they are policy amenable. It is possible, at least theoretically, that measures of subjective well-being might be valid and reliable, but be largely determined by factors on which policy has no impact.

The paper attempts to test the impact of policy on subjective well-being in three specific policy areas: health co-payments, unemployment insurance, and employment protection legislation. These areas have been selected because health and unemployment are crucial drivers of life satisfaction. In addition, the OECD has good datasets on policy changes over time and across countries relating to these issues, which makes the empirical exercise sound and worthwhile. While the subjective well-being literature includes many studies on different determinants of life satisfaction, there are relatively few studies focused specifically on the impact of the policy environment. Frey and Stutzer (2000) famously provided strong evidence that democratic institutions affect life satisfaction, but Dolan et al. (2008) in a meta-review of what is known about the determinants of subjective well-being identify little beyond this with respect to the policy environment. More recently Ochsén and Welsch (2012) analyse the impact of labour market institutions in European countries. This paper uses a similar approach to that of Ochsén and Welsch and covers similar outcomes. However, the use of data from the Gallup World Poll in this paper provides a more sensitive measure of life satisfaction (Kroh 2006) than was available to Ochsén and Welsch and allows for the analysis to extend beyond European Union member states to encompass a wider variety of institutional structures. In addition, this paper also goes beyond the labour market to look at the impact of health co-payment levels on life satisfaction.

The first section of this paper—measuring subjective well-being—discusses the case for taking measures of subjective well-being as a robust and relevant source of information on the overall well-being of the population. An outline of the different elements of subjective well-being is provided, along with a brief summary of the evidence on the validity and reliability of measures of subjective well-being. The second section of the paper—data and method—then discusses the methodology for estimating the impact of policy settings in a

¹ The OECD Better Life Initiative defines well-being in terms of eleven dimensions: income and wealth, jobs and earnings, housing, work and life balance, education and skills, social connections, civic engagement and governance, environmental quality of life, personal security and subjective well-being.

country on subjective well-being. The two datasets used to estimate the model (the Gallup World Poll and the OECD dataset on labour market and health policies) are also described.

The core of this paper uses individual-level data from the Gallup World Poll and country-level data from the OECD dataset on labour market and health policies to test for the impact of policy settings in these areas on subjective well-being. A model is estimated using the methodology outlined earlier to provide estimates of the average impact of differences in the policy regime on subjective well-being. The robustness of these findings is then examined by re-estimating the model for different sub-groups of the population who would be expected to be affected by the policies in question in different ways. The paper concludes by discussing the implications of these findings in three dimensions. A brief overview of the implications of the findings for policy is outlined, along with the relevant limitations of the findings in this respect.

2 Measuring Subjective Well-Being

Measures of subjective well-being capture information on how people experience their lives. Although sometimes characterised as concerned with “happiness”, subjective well-being comprises several distinct concepts. In particular, an important distinction is usually made between *evaluative* measures of well-being, which reflect some cognitive reflection on the part of an individual, and measures of *affect*, which capture a person's emotional state at a particular point in time (Stiglitz et al. 2009). From this, it is typically argued that subjective well-being has three distinct components²:

1. *life evaluation*, i.e. the cognitive judgement by a person about their life as a whole;
2. *positive affect*, i.e. the experience of positive feelings and emotions by a person at a particular point in time;
3. *negative affect*, i.e. the experience of negative feelings and emotions by a person at a particular point in time.

For the purposes of this paper, life evaluation will be the main focus of analysis. Most of the literature looking at the determinants of subjective well-being has focused on life evaluations—particularly measures of overall life satisfaction. This reflects both data availability and also the conceptual fit between overall life satisfaction and policy concerns. In particular, some have argued that affect measures are an inappropriate benchmark for policy because they imply a purely hedonic conception of well-being that is not necessarily widely shared. Overall life satisfaction, however, captures people's judgements about their own lives relative to those goals that they set for themselves.³

2.1 Validity and Reliability

The relevance of subjective well-being measures to policy depends not just on conceptual appropriateness, but also on whether it is possible to measure subjective well-being in a

² There is a fourth dimension of subjective well-being, eudemonic well-being, which is not covered in this paper.

³ Despite this, Kahneman and Krueger (2006) argue that measures of affect are, in principle, preferable to measures of life evaluation for policy purposes, as they have better inter-personal comparability and because measures of affect capture the impact of life circumstances on what people actually experience.

valid and reliable way. There is no point in assessing policy in terms of a measure that cannot be reliably collected.

The case that it is possible to measure subjective well-being in a valid and reliable fashion is now strong. Measures of subjective well-being produce reliable results in that people generally give similar answers if asked the same question at different points in time. Test–retest results for subjective well-being measures yield correlations of between 0.6 and 0.7 for self-reports done on the same day (Krueger and Schkade 2008). Multiple item measures of subjective well-being do better than single questions, with test–retest scores close to 0.8 for time periods measured in weeks. These correlations are lower than for some objective measures of economic variables, such as income (0.9), but not dissimilar from other more complex economic variables such as consumption expenditure (0.6) measured over similar time periods (Carinna et al. 2009).

Questions on subjective well-being also have a high degree of *face validity*, in that concepts such as “satisfaction” or “happiness” are easy for people to relate to. For example, respondents generally have little difficulty answering questions on subjective well-being, with item-specific non-response rates much lower than for questions on income (Rässler and Riphahn 2006). Subjective measures also show *convergent validity* (i.e. they are supported by other objective measures that proxy for subjective well-being). For example, subjective measures of well-being correlate well with frequency of expression of positive emotions and with frequency of smiles—particularly “unfakeable” or “Duchenne” smiles (where the skin around the subject’s eyes “crinkles” in response to automatic and largely involuntary muscle contractions). Biological measurements, including left/right brain activity and levels of the stress hormone cortisol, show a consistent relationship with self-ratings of well-being (Diener and Tov 2012). In addition, both ratings made by friends, and ratings made by strangers correlate well with self-assessments (Kahneman and Krueger 2006).

Construct validity captures the degree to which a measure behaves in the expected way. For subjective well-being, construct validity is supported by good evidence suggesting that it meaningfully predicts behaviour, including the risk of suicide, sociability, extroversion, quality of sleep, and happiness of close relatives (Diener and Tov 2012). Changes in objective circumstances, including becoming unemployed and the onset of disability, have been shown to cause large and lasting changes in life satisfaction at the individual level (Lucas 2007).

Despite the robust body of literature indicating that it is possible to measure subjective well-being meaningfully, existing measures of subjective well-being face some significant limits. Measures of subjective well-being can be subject to significant impacts from passing factors influencing the respondent’s mood such as the weather on the day of the interview or the outcome of a sporting contest. However, there is relatively little evidence of this effect in the case of life evaluations (Lucas and Lawless 2011; Eid and Diener 2004), and even for measures of affect—which are intended to capture momentary feelings—the imparted bias is not as large as might be expected (Harmatz et al. 2000). This occurs, in part, because surveying generally takes place over an extended period of time thus ensuring that all responses to a question are not influenced by a single time-specific event.

The most significant issue affecting validity and reliability is that of differences in response styles between individuals and groups. When considering differences in responses between individuals, the risk is that different people may interpret response scales differently—for example, what one person refers to as a life satisfaction of “6”, another may refer to as a “9”. This issue, although clearly important, is likely to have limited practical

impact. For almost all statistical purposes, it is not necessary to make direct comparisons of individual scores. For example, in a sufficiently large sample, differences in response styles between individuals will average out and are unlikely to bias population averages.

The issue of differences in response styles is more problematic when these differences are correlated with characteristics of the groups studied, such as when comparing subjective well-being across countries. Here there is good reason to believe that differences in response styles may be a problem. Although studies have indeed shown that cultural differences do not generally lead to large differences in assessments of the drivers of life satisfaction (Helliwell 2008), there is good reason to believe that cultural factors do impact on the average response levels in different countries. In particular, it is often noted that East Asian countries tend to report a lower level of life satisfaction than might otherwise be expected, while Latin American countries report a higher level of life satisfaction (Diener et al. 2000). However, it is also important not to over-state the problems caused by cultural differences in response styles. While such differences have the potential to bias international rankings of average life satisfaction in a country, they will generally have little impact on analysis of the determinants of well-being. In particular, when it is possible to estimate country-specific fixed-effects, cultural bias is likely to be substantially captured by the fixed-effect term and will not substantively impact on the policy coefficients of interest.⁴

3 Data and Method

The variables selected for analysis in this paper fall into four broad groups: (1) measures of subjective well-being; (2) demographic controls; (3) other individual control variables; and (4) variables related to policy regimes at the aggregate country level where there is a plausible causal pathway for the variable to affect individual subjective well-being. Two datasets are combined to provide these variables: the Gallup World Poll and the OECD Statistical Database. The Gallup World Poll provides information at an individual level on variables of type (1), (2), and (3). This is merged with OECD information on the policy environment at a country level (4).

3.1 Description of the Datasets

The Gallup World Poll is a large scale repeated cross-sectional survey covering more than 150 countries. As of 2012, six waves of data have been collected (2005/2006, 2007, 2008, 2009, 2010, 2011), although not all countries participated in all waves. The frequency of the survey is annual in most countries, and quarterly in Japan, Germany and the United States. Sample sizes are generally limited to around 1,000 respondents in each country (with a few exceptions, e.g. 2000 for India and China). This relatively small sample size may allow comparisons across countries, but limits comparisons across population sub-groups within countries.

⁴ Testing for the impact of culture on cross-country differences in average life satisfaction is difficult, as there is no obvious simple method for distinguishing between cultural effects due to culture and those due to some other unobserved country-specific variable. Fleche et al. (2011), use data from the World Values Survey to explore the degree to which country-specific differences in the weights attached to different drivers of well-being affect how countries are ranked in terms of average life satisfaction. They find that heterogeneity in the country-specific weightings assigned to the determinants of life satisfaction has little effect on how countries are ranked.

The survey is based on a common questionnaire designed with the help of some of the leading scholars in this field, and it is aimed at comparing subjective well-being and feelings of people around the world.⁵ The core questionnaire (which is run in all participating countries) asks respondents a broad set of questions on socio-economic background, civil engagement, and satisfaction of living standard among other domains. One distinctive feature of this survey is that it combines information on both subjective well-being, and on people's assessments of their objective circumstances. Unfortunately, several questions were not asked in all waves, but only in some waves and/or in some countries.⁶

The measure of subjective well-being used in this paper is the Cantril ladder. This is a particular approach to measuring life evaluation that asks respondents to imagine a ladder with rungs from 0 to 10, where 10 is the best possible life for them and 0 is the worst possible life. Respondents are asked to indicate where on the ladder they would place their own life. This question is only one way to measure life satisfaction, and will be referred to as *life satisfaction* from here on.

Descriptive data for the variables used in this paper are provided in Table 1. The analysis covers the 34 OECD countries.

OECD data on the selected policy measures are available only up to year 2008/2009, depending on the policy variable of interest. Therefore, the analysis of the effect of policy measures on subjective well-being (Tables 3, 4) is based on waves 1–4 of the Gallup World Poll (2005/2006, 2007, 2008, and 2009). Three policy variables were selected for this analysis. These variables were selected as they can be expected to impact on subjective well-being in a relatively straightforward manner. They also have good coverage for the relevant countries over the time period covered by the Gallup World Poll. The three policy variables considered here are:

1. The unemployment replacement rate (replacement) captures the average unemployment benefit (net of income taxes) available to a worker over a 60 month period following the loss of their job, expressed as a proportion of their earnings. The replacement rate used is the overall average (averaging across different family types), including both unemployment insurance and unemployment assistance.⁷ For a given income, one would expect a higher replacement to increase a person sense of well-being, by reducing uncertainty about material conditions in the event of a job loss, although the effect may be partially or fully offset by higher aggregate unemployment (induced by weaker incentives to return to work)
2. The mean household out-of-pocket health expenditure for a country (health co-payments). This variable relates to the average level of health co-payments required when accessing health services in a particular country: it represents the household's

⁵ Among others, Nobel Prize laureate Daniel Kahneman (Eugene Higgins Professor of Psychology at the Woodrow Wilson School at Princeton University), Jeffrey D. Sachs (Director of The Earth Institute, Quetelet Professor of Sustainable Development and Professor of Health Policy and Management at Columbia University) and Angus Deaton (Dwight D. Eisenhower Professor of International Affairs, and Professor of Economics and International Affairs at the Woodrow Wilson School and Department of Economics, Princeton University).

⁶ The Gallup Organization generally employs in-person interviews in developing countries and telephone surveys in developed countries where telephone coverage is at least 80 % of the population. The sample is ex-ante designed to be nationally representative of the entire population aged 15 and over (including rural areas), but non-random response patterns are a likely source of ex-post bias. This issue is addressed by the post-stratification weights provided by Gallup.

⁷ The data refer to the OECD series: Net replacement rates (NRR) over a 5-year period following unemployment, 2001–2009; as available in OECD (2011).

Table 1 Summary of the Gallup World Poll variables used in the empirical analysis

Outcome domain	Variable ^a	Number of observations	Mean value	Max value	Minimum value	Standard deviation
Subjective well-being	Life satisfaction	112,117	6.65	10	0	2.01
Demographic characteristics	Female	112,117	0.57	1	0	0.50
	Age	111,118	47.18	100	15	18.25
	Age ²	111,118	2,558.9	10,000	225	1,831.67
	Married	109,547	0.54	1	0	0.50
	No. children	110,092	1.54	23	0	1.01
Other controls	Rural	106,044	0.15	1	0	0.35
	Log income ^b	90,169	14.6	20.93	0	1.43
	Secondary education	87,041	0.61	1	0	0.49
	Tertiary education	87,041	0.23	1	0	0.42

The statistics refer to the sample of OECD countries in waves 4 and 5 (2009 and 2010)

Source Author's analysis based on different waves of the Gallup World Poll

^a All variable are coded as dummies, except: the dependent variables (*life satisfaction*), *age*, *age*², *log income*, and *no. children*. The dummies take value 1 if the response to the question is *yes*, and 0 if *no*. For instance, *small town* equals 1 if the respondent lives in a small town (as opposed to a village, large city or suburb)

^b Base-2 logarithm of the imputed income. From 2005 to 2007, some of the income data was collected in monthly household income brackets in local currency and some using an open-ended question. From 2008 to present, respondents are first asked an open-ended income question and, if they say "they don't know" or refused to answer, they are asked a bracketed income item. The income data collected for each country is the median of the bracketed responses or the median of the continuous income data. This data has then been transformed into a continuous measure by the Gallup team. Also, imputation has been used to address the high item non-response rate

mean out-of-pocket expenditure for health (expressed in \$US at PPP, 2000). All other things being equal, one would expect higher health co-payments to be associated with a negative impact on subjective well-being reflecting decreased access to health services.

3. An index of the strength employment protection legislation (EPL). This is an index of the overall strictness of employment protection legislation in a country at a particular point in time. The index, which is taken from the *OECD Labour Statistics* database, attaches scores to different aspects of the labour market legal framework such as whether dismissal of a worker requires a written statement from the employer, the length of the delay until the start of notice for the employee who is being dismissed, requirements for severance pay, the need for special grounds for dismissal and so forth. The overall index is the mean score of three sub-indices each with a range of 0–6 and relating respectively to workers on permanent contracts, workers on temporary contracts, and rules around collective dismissal. One would expect that this index would be associated with a positive impact on subjective well-being for those in work, but would have a weaker relationship for those outside the labour market and possibly a negative relationship for particular groups of unemployed (e.g. youth or women, who may be excluded from work by less flexible labour market policy).

Table 2 Descriptive statistics for the policy variables included in the analysis

Variable	Obs.	Mean	Max	Min	SD
Replacement	53,850	55.8	76	9	17.6
Unemployment	53,850	6.7	18.1	2.6	2.9
Health co-payments	32,562	561.6	1,458	214	257.6
EPL	37,206	2.0	3.5	0.6	0.7

Statistics computed on the estimation sample of column 1, Table 3 (which is the larger estimation sample, including as sub-samples all other results in Tables 3, 4)

Source Author's analysis based on various OECD datasets

4. Finally, the aggregate unemployment rate is included since one side-effect of the two labour market policy variables considered is the potential for higher unemployment rates due to a less flexible labour market. Including the unemployment rate allows this effect to be controlled for.⁸ Table 2 presents the descriptive statistics of these policy variables.

3.2 Methodology

Compared to the large literature on the validity and determinants of subjective well-being (see OECD 2013, forthcoming), there is much less information on the more specific question of whether policy can affect subjective well-being. The existing literature in this area (e.g. Greve 2010) takes a largely descriptive approach, or focuses on the application of subjective well-being data to cost-benefit analysis (Dolan and White 2007; Dolan and Metcalfe 2008), rather than on exploring whether policy can affect subjective well-being. This reflects the fact that the measured impact of a policy on subjective well-being is likely to be small relative to natural variability in the data, requiring a large dataset which collects information over time.

Despite these difficulties, it is possible to test whether specific policy measures affect subjective well-being. One possibility is to take a quasi-experimental approach based on micro-data that follow the same person over time, to test whether a specific policy reform leads to changes in the subjective well-being of the group of people most affected by it. This is the approach taken by Chapple and D'Addio (2013), with respect to a number of social policies interventions including changes to pension eligibility and parental leave provisions.

An alternative to the quasi-experimental micro-data approach is to use a sufficiently large cross-country and cross-sectional survey, and to combine this with a dataset of policy variables with observations for each variable and for each country/wave. This approach has the advantage of not relying on the existence of a convenient natural experiment as do Chapple and D'Addio. This is the approach used by Ochsén and Welsch (2012) in their analysis of the impact of labour market institutions on life satisfaction. By drawing on observations over a wide range of years and across a wide range of countries, more observations are available; it is thus potentially possible to look at any issue for which a time series of a specific policy parameter can be found covering the relevant countries. On the other hand, a cross-country approach is at greater risk of confounding factors affecting

⁸ While health co-payments will also have behavioural effects, these are less obvious than is the case for labour market policy and there is no obvious variable that can be included to control for them.

the results, and is thus potentially less robust than a quasi-experimental approach. The Gallup World Poll provides a suitable cross-country panel, and the OECD policy databases provide some of the relevant policy indicators. Using the Gallup/OECD data this paper is able to replicate the Ochsen and Welsch methodology and extend the analysis across a wider and more varied pool of countries, and to a wider range of policy outcomes.

The empirical strategy in this paper follows the traditional approach for assessing subjective well-being drivers (see Frey and Stutzer 2005; Helliwell 2008). Consider a well-being function:

$$U = f(D, I, X)$$

where U is a measure of the subjective well-being of each person, D is a vector of demographic variables controlling for age and gender, I captures individual circumstances that are thought to impact on an individual's subjective well-being, and X captures average differences between countries' circumstances that are thought to impact on an individual's subjective well-being such as aspects of the policy regime for that country. With the appropriate data the well-being function can be estimated as follows:

$$U = \alpha D + \beta I + \gamma X + \varepsilon$$

The information for D and I are drawn from the Gallup World Poll. Data for X comes from the OECD policy databases. The analysis is done using ordinary least squares (OLS) regression with country and wave fixed effects, in line with Helliwell (2008). The post-stratification weights provided by Gallup are used to address sample selection bias and assign weights based on the observed characteristics of the Gallup sample compared to the population as a whole. Given the ordinal nature of measures of subjective well-being, ordinary least squares estimates are theoretically inefficient when compared to methods designed to deal with ordinal data such as a Probit model.⁹ For the sake of completeness, the analysis was hence also conducted by estimating the analogous Probit model. Since the associated marginal effects were very close to the OLS estimated coefficients (with the same sign and significance, and very similar magnitude—results available upon requests to the authors), the description of results provided below is based on the OLS analysis, which allows for a more straightforward interpretation.

Conceptually the element of interest in the equation above is γ , the coefficient associated with the presence of different policy regimes. If γ is significant this can be interpreted as evidence that the policy regime under consideration has a significant impact on subjective well-being. The sign and magnitude of γ provides information on the size and direction of the impact on subjective well-being. As in most cross-sectional studies of this nature, the proportion of total variance accounted for by the model (R^2) is of lesser interest as a high proportion of total variance will be accounted for by individual variance that a cross-sectional model cannot address.

4 Empirical Estimates

The impact on subjective well-being of selected policies

⁹ Ferrer-i-Carbonell and Frijters (2004) who investigated this issue in more detail conclude that, in practice, there is little difference between OLS estimates of subjective well-being functions and theoretically preferable methodologies such as Probit regression.

The analysis of the relationship between various well-being outcomes and subjective well-being can inform on the drivers of well-being, which is a preliminary step to put in place policies that can enhance people's lives. A key question, therefore, is whether policy can affect subjective well-being and, if so, to what degree?

Table 3 below reports the results of a regression with the unemployment replacement rate as the policy variable under consideration. The dependent variable is life satisfaction, while the independent variables include controls for the demographic and socio-economic status of individuals as well as the aggregate unemployment rate and the net replacement rate over a 60 months period following unemployment.

Regression (1) shows that the control variables have a largely similar relationship to life satisfaction to that typically found in the literature (see e.g. Dolan and Peasgood and White 2008). The unemployment rate has a negative and significant coefficient, with a 1 percentage point increase in the unemployment rate associated with a fall in average life satisfaction of just less than 0.1 points (the direction and significance is line with Di Tella et al. 2003). The unemployment replacement rate is also highly significant, with a small positive coefficient. More specifically, a 1 percentage point increase in the replacement rate is associated with an average increase in life satisfaction of approximately 0.06 points. Although this is a small effect (as compared to the impact of other demographic factors for instance), it is of interest that the effect is detectable at all, given the range of confounding factors and the fact that only a portion of all respondents are potentially affected by it.

To invalidate the assumption that the positive effect of the net replacement rate for unemployment on life satisfaction in model (1) is simply the result of omitted variables, we re-run the regression separately for those in the labour market and those not in the labour market. We would indeed expect that, if the unemployment replacement rate is picking up a real effect as opposed to unmeasured spurious correlates, the net replacement rate associated with unemployment insurance to be of greater importance to people engaged in the labour market than for those who are not involved in it. Models (2) and (3) report the results of regressions for people in employment—model (2)—and for people not in employment—model (3).

Taken together, models (2) and (3) present a plausible picture. The demographic and socio-economic controls have largely similar effects for both groups in the population. The unemployment rate has a larger impact on the average well-being of those people not in employment. This reflects the fact that those not in employment include the unemployed themselves; for this group, the effect of the unemployment rate includes both the direct effect of unemployment on that proportion of people who are unemployed and the indirect effect of the unemployment rate on people's sense of security. For those in employment, only the latter effect is captured. The replacement rate is significant for the employed population, but not for the population not in employment (including the unemployed and the inactive). This is consistent with the view that a higher replacement rate does, in fact, contribute to life satisfaction, possibly through a higher sense of security.

Ideally one should have broken down the “not in employment” into unemployed and inactive to test more closely the impact of replacement rates on the former. However, the imperfect measurement of unemployment in the early waves of the survey¹⁰ prevents testing this hypothesis more closely. Models 4 and 5 compare results for the aged, who have mostly withdrawn from the labour force and the working aged population. The replacement rate is significant for both groups, but ironically larger for the aged population.

¹⁰ In the first waves of the survey there was no specific question asking whether people were unemployed or not, as the question was phrased “Do you work or not”.

Table 3 Regression results: effects of unemployment replacement rates on life satisfaction

Independent variable	(1) All sample	(2) People working	(3) People not working	(4) Aged	(5) People of working age
Female	0.2308***	0.2388***	0.2728***	0.1595*	0.2227***
Married	0.4233***	0.3679***	0.4836***	0.1310	0.5331***
Age	-0.0811***	-0.0641***	-0.1044***	-0.0248	-0.1263***
Age squared	0.0008***	0.0006***	0.0010***	0.0002	0.0013***
Log income	0.2600***	0.2539***	0.2358***	0.2528***	0.2607***
Secondary education	0.3708***	0.4092***	0.3454***	0.3562***	0.3603***
Tertiary education	0.6470***	0.6722***	0.6453***	0.5037***	0.7042***
No. of children	-0.0601***	-0.0421*	-0.0782**	-0.2263	-0.0319
Rural	0.0777	0.0706	0.0904	0.1686	0.0556
Replacement rate	0.0592***	0.0876***	0.0449	0.0976***	0.0504***
Country unemployment rate	-0.0949***	-0.0464**	-0.1310***	-0.1092***	-0.0867***
Observations	53,850	27,819	22,141	11,376	42,474
R ²	0.175	0.185	0.158	0.214	0.178

Linear regression, weighted, on a stratified sample. Constant term, country and wave fixed-effects are included. Standard errors have been corrected for clustering at the country*year level. *** $p < 0.01$, ** $p < 0.05$, * $p < 0.1$

Source Author's analysis based on OECD.stat and The Gallup World Poll

This almost certainly reflects correlation across countries in unemployment replacement rates and pension replacement rates, and thus provides little information one way or the other on the impact of replacement rates on life satisfaction. Thus, the conclusions reached on the replacement rate remain tentative.

Table 4 below considers the two additional policy variables. Coverage of country/years is significantly smaller for the employment protection legislation and health co-payment datasets than is the case for the replacement rate dataset. Because of this, replacement rates are modelled separately from employment protection legislation and health co-payments.

The general pattern of coefficients in regression (6) is largely consistent with earlier regressions, with one exception. The aggregate unemployment rate appears to have a much greater impact in regressions involving employment protection legislation and health co-payments than is the case for regressions (1)–(5), however, the effect is still negative as would be expected.¹¹

Health co-payments show the expected negative relationship with life satisfaction, with a 1\$ increase in the mean level of co-payments associated with a fall in life satisfaction of approximately 0.005 points. Although this effect size may appear as small compared to the coefficient for employment protection legislation, it must be remembered that these two variables have different units. In fact, the coefficient on health co-payments implies a relatively large impact on subjective well-being compared to that for employment protection legislation given that the level of co-payments in the dataset varies from \$214 to \$1458. The coefficient is significant in regression (6) at the 5 percent but not the 1 percent level.

The employment protection legislation index is also highly significant and has the expected positive sign. This suggests that, controlling for other factors, a greater degree of employment protection legislation is associated with a higher level of life satisfaction. Although the coefficient on employment protection legislation is relatively large in absolute terms, the narrower range of the underlying variable (0.65–3.49) suggests that the overall effect of plausible changes in employment protection legislation on life satisfaction is likely to be less than is the case for health co-payments.

As was the case for the replacement rate, the observed relationships for health co-payments and employment protection legislation might be driven by some omitted variables that co-vary with the policy variables of interest over the countries and years considered. Regressions (7) through to (11) attempt to provide some additional tests of the validity of the relationships observed in regression (6) by exploring how robust the observed coefficients are for different sub-groups of the population.

In theory, employment protection legislation ought to benefit those in employment more than those outside it. For people with jobs, stronger employment protection legislation provides greater job security. On the other hand, people looking for work may find employers more reluctant to hire new staff in an environment where it is difficult to dismiss poorly performing workers. Conversely, for groups entirely outside of the labour market, such as the retired, we would expect to see relatively little impact from employment protection legislation. This picture is largely reflected in regressions (7), (8), (10) and (11). The coefficient for employment protection legislation is highly significant and positive for

¹¹ There is no obvious reason why including employment protection legislation and health co-payments in the model should have this effect, and it is likely that this simply results from the truncated sample of country/year observations included in regression (6). A regression on the same sample but without the inclusion of EPL or Health co-payments finds the unemployment rate not significant at all, suggesting that the truncated sample of country year observations is a problem for this variable.

Table 4 Regression results: effects of employment protection legislation and health co-payments on life satisfaction

VARIABLES	(6) All sample	(7) People working	(8) People not working	(9) People with children	(10) Aged	(11) People of working age
Female	0.1268***	0.1404**	0.1134	0.1126	0.1620*	0.0979*
Married	0.3538***	0.3047***	0.4289***	0.4435***	0.1276	0.4656***
Age	-0.0762***	-0.0575***	-0.1034***	-0.0719***	0.0733	-0.1181***
Age squared	0.0007***	0.0006***	0.0010***	0.0006***	-0.0004	0.0013***
Log income	0.2770***	0.3057***	0.2066***	0.2688***	0.2879***	0.2725***
Secondary education	0.3097***	0.2276*	0.2585**	0.3561**	0.3695***	0.2522***
Tertiary education	0.4731***	0.3523***	0.4661***	0.7876***	0.3989**	0.5108***
No. Of children	0.0211	0.0495	-0.0179	0.0807*	-0.0611	0.0493
Rural	0.1037	0.0882	0.1946*	0.0639	0.0739	0.1213
Unemployment rate	-0.5033***	-0.5314***	-0.3238	-0.8694***	-0.1321	-0.5468***
Health co-payments	-0.0046**	-0.0053**	-0.0024	-0.0081**	0.0005	-0.0051**
Epl	0.8933***	0.9643***	0.5391	1.5493***	0.1633	1.0432***
Observations	29,620	16,251	11,903	8,900	6,263	23,357
R ²	0.163	0.143	0.155	0.170	0.225	0.164

Linear regression, weighted, on a stratified sample. Constant term and country and wave fixed-effects are included. Standard errors have been corrected for clustering at the country*year level. *** $p < 0.01$, ** $p < 0.05$, * $p < 0.1$

Source Author's analysis based on OECD.stat and the Gallup World Poll

people in work—regression (7)—with a coefficient of almost 1. For the non-working population—regression (8)—the coefficient is only half the size and is not significant at the 10 percent level. Similarly, employment protection legislation has no significant association on the life satisfaction of the elderly—regression (10)—but a large positive and significant association on the working aged population—regression (11). In short, the relationship between employment protection legislation and life satisfaction varies across sub-groups of the population in the manner that would be expected if the regression results were capturing a genuine relationship.

It is somewhat more difficult to identify how the impact of health expenditure may vary across population groups than is the case for employment protection legislation. This is because out-of-pocket expenses may be a proxy of both quantity and quality of health services but also because the income variable is expressed in gross terms and thus does not reflect in-kind benefits and subsidies. The working population may be more affected by out-of-pocket health expenditure, either because in many OECD countries out-of-pocket health expenses are higher for people in work than for those out of work, due to more general health provision for the elderly population, income testing or subsidies for low income-earners, or because people of working age are richer and spend a larger amount of their income on private health for instance. The results from regressions (7)–(11) show that the coefficient for out-of-pocket health expenditure is higher for people in work, of working age and with children compared to other groups. In addition, the coefficient is significant for these groups at the 5 percent level, while it is not significant for those not working or for the elderly. This could be explained by the fact that for total health costs are the highest at the start and end of life, and around childbirth.

5 Conclusion

The primary aim of this paper has been to assess the degree to which subjective measures of well-being can be used to inform better policies. The objective is addressed through directly examining the degree to which subjective measures of well-being can be affected by a limited number of policy changes. There is relatively little literature directly addressing this issue, so the results are of interest.

The most striking finding is that, for all of the policy parameters tested, the coefficient was both significant and in the expected direction. Given that the policy issues under consideration are unlikely to be the dominant factor driving individual's subjective well-being, it is encouraging that any impact can be picked up at all. The robustness checks on population sub-groups lend some support to the view that the effect is genuine. This provides support to the view that overall life satisfaction is a relevant measure to use in assessing the impact of policy.

It is, however, more difficult to go from the coefficients identified in this paper to overall judgments about the impact of any of the policies considered on well-being. There are two reasons for this. First, it is important to consider that, in addition to the direct impact on well-being captured by the regression coefficient on the policy variables, each of the policy changes considered will have an indirect impact on subjective well-being via the influence of the policy on income levels, unemployment rates, and potentially other indirect effects. For policy purposes it is the net impact on subjective well-being via all these channels that matters rather than just the impact of the policy change directly on subjective well-being. Considering the full scope of impacts from each of the policy changes considered here is beyond the scope of this article. However, the results found in

this paper suggest that there is, in principle, nothing to stop such analysis from being carried forward fruitfully.

A second limitation is methodological. Since these results are driven by a relatively small number of changes in policy variables, some caution is warranted.¹² This is particularly the case with respect to the regressions discussed in Table 4 where the coefficient on the unemployment rate is implausibly high.

Nonetheless, the fact that the results are robust across the various specifications and align well with the expected underlying relationships suggests that looking for the impact of policy variables on subjective well-being in large cross-country datasets is a promising area for research. As the Gallup World Poll accumulates more waves over time, this sort of analysis could become increasingly powerful with respect to identifying the impact of policies on different aspects of people's life.

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¹² The policy results in this article are based off only four waves of data, giving a maximum of three policy transitions per country for each policy variable. In practice, the results are driven by a much smaller set of transitions—particularly in the area of employment protection legislation where change occurs only through the legislative process (replacement rates are affected by changes in earned income as well as the underlying rules of the social insurance system).

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