Macroeconomic Indicators and Subjective Well-Being: Evidence from the European Union

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Abstract

This paper examines the role of factors which could have influenced subjective well-being (SWB) in European countries at a national level between 2010 and 2019. Macroeconomic variables in much of the existing literature have looked at GDP, inflation, government size and expenditure and their relationship to SWB. The current analysis included corruption, property rights, poverty, life expectancy, working time and emissions to enrich the existing body of literature. The World Happiness Index (WHI) is used to measure SWB in this study. The correlation analysis in this study shows a high level of correlation between WHI and the Human Development Index (HDI) which suggests the WHI is a suitable proxy for measuring subjective well-being. Next, the fixed and random effects models were estimated since the dataset was longitudinal, and we have also compared panel regression models with OLS regression models. This analysis revealed positive relationships of GDP, income and property rights on WHI, while poverty and unemployment impact WHI negatively, thus we can conclude positive relationship between material aspects of life and subjective well-being. Corruption and working time impact SWB in a negative way while the impact of life expectancy is positive. The regression models with inflation and emissions were not found to be significant in the research. The results were compared with existing studies based on individual as well as aggregated data. Similarities in results prove that it is possible to analyze determinants of SWB from aggregated data on national level. At the end, we formulate proposals for improving quality of life in the analyzed countries.

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INTRODUCTION

Subjective well-being is a popular research topic with over 14 000 publications touching on it in 2015 (Diener et al., 2017). As stated in a United Nations report: "The ultimate goal of every individual is happiness (happiness is used to measure SWB as explained in later sections), so then, it must be responsibility of the state, or the government, to create those conditions that will enable citizens to pursue this value, this goal" (Antolini and Simonetti, 2019, p. 264). The government can set policies to help citizens become happy. Diener et al. (2015) recommended creating national accounts of subjective well-being, as an indicator of national progress and growth. However, economic development of a country has set the ultimate goal of many governments. When studying the relationship between happiness and GDP (the macroeconomic indicator for economic growth of countries used since the second world war), the seminar work by Easterlin (1974) is usually the starting point. The main idea of the Easterlin paradox is that after reaching a certain level of income, happiness starts to decrease, contrary to expectations. Since then, many researchers have tried to confirm or refute this paradox. Recent research has confirmed the relationship between happiness, SWB and economic growth (Easterlin, 2015; Veenhoven and Vergunst, 2014). For decades, GDP has been treated as the sole indicator of objective well-being. However, the limitations of GDP were highlighted by the Stiglitz Commission, created by French president Nicolas Sarkozy in 2009. The conclusions of the commission were published (Sen et al., 2010) and concluded that GDP could not be the only measure that reflects people's well-being. It is not sufficient to only study the relationship between GDP and happiness, as there are numerous other variables that can potentially affect happiness. As such, this research is focused on the macro-determinants of subjective well-being at a national level.

The main aim of this paper is to find the macroeconomic variables associated with subjective well-being in the European Union during the period 2010–2019, analyze their relationship to SWB and propose recommendations based on those finding to governments with the aim of enhancing the SWB of EU citizens. The secondary aim of this study is to test whether it achieved comparable results by using aggregated data as other authors have done with individual data.

The paper is organized as follows. Section 1 describes the theoretical background including a review of the literature concerned with topics related to the determinants of subjective well-being. The data and methods used in this study are outlined in section 2 while section 3 discusses the results. The final section concludes the findings and policy implications.

1 THEORETICAL BACKGROUND

One of the most prominent studies on the relationship between income and SWB is the study by Diener et al. (2013) which used over 800 000 individual responses aggregated to a national level in 135 countries in the period 2005–2011. It found a stronger positive relationship between the increase in income and increase in SWB than between GDP and SWB. Yu et al. (2020) also focused on the relationship between income and subjective well-being using individual data in Germany and found a positive relationship. Wealth, as accumulated income, and its effect on SWB was also analyzed by D'Ambrosio et al. (2020) who found a positive relationship between SWB and wealth using OLS regression analysis on a German Socio-Economic Panel dataset. Hochman and Skopek (2013) also found the same (positive) relationship where their OLS regression analysis utilized data from the Survey of Health, Aging and Retirement in Europe aggregated to a national level. Another study by Van der Meer (2014) found a negative relationship between unemployment and SWB, using individual data from the 2004 European Social Survey. This result was later supported by Beja (2020) who used 2004 and 2012 European Social Survey data for the individual part and World Development Indicators dataset for the national level part. The negative impact of unemployment on SWB was found in both datasets. Based on these findings, aggregated macro determinants were used at a national level in this study to analyze the impact of selected variables

on subjective well-being. The study contributes to the existing body of literature by employing panel data analysis on various possible macro determinants of subjective well-being over a relatively long period (10 years). The selection of variables is examined in the following paragraphs.

The relationship between happiness and income is one of the most often studied questions in the field of quality of life (QoL) research. Easterlin (1974) showed that happiness does not always go along with GDP, and after achieving a certain level of GDP or income, further growth in GDP is not necessarily positively related with happiness. However, at the individual level, a positive relationship has been reported in numerous studies (Grable et al., 2013; Lucas and Schimmack, 2009; Yu et al., 2020). This relationship is referred to as the Easterlin paradox. There have been many articles which have studied, analyzed, explained and adjusted this relationship. Antolini and Simonetti (2019) confirmed the existence of this paradox in Italy. On the other hand, similar research in South Korea has not confirmed this (Slag et al., 2019). According to Lim et al. (2020) and Li (2016), the Easterlin paradox holds true even in some East and South Asian countries, although only in the ones that do not favor social values over income. In addition, it is important to keep in mind that the Easterlin paradox was discovered using data on income and happiness, almost 50 years ago. Since then, the American happiness gap between the rich and the poor has widened by about 40% (Okulicz-Kozaryn and Mazelis, 2017). There have been many attempts to model and improve the theory of the Easterlin paradox (Stelzner, 2021). However, these models usually work only under very specific circumstances, during a limited period and only in some countries, which makes them hard to apply in real life QoL research.

It is important to note that there is more to the relationship of income to happiness than just the Easterlin paradox. D'Ambrosio et al. (2020) found that both permanent income and wealth (accumulated income) were better predictors of life satisfaction than the current ones. Moreover, these predictors matter not only in absolute terms but also in comparative terms, so it is important who people compare themselves to. In Cape Town, it was found that income comparisons, both relative to neighbors and relative to oneself, affect subjective happiness differently, depending on age (Tibesigwa et al., 2016). Unfortunately, it was not possible to find a reliable source of data for these indicators, so it was not possible to analyze these relationships. Wealth and income distribution has no effect on QoL based on research carried out in 28 European countries (Zagorski et al., 2014). However, employment plays a role in the income and happiness relationship (Brzezinski, 2019). Based on this finding, Gross Domestic Product (GDP) per capita was chosen as the measurement of economic growth to test the Easterlin paradox. The adjusted gross disposable income of households per capita in the purchasing power standard (2010) from the Eurostat database was used as the measurement of income. Income distribution is not included since the at risk of poverty rate is used as the measurement of poverty. This will be explained further later in this chapter.

Unemployment goes hand in hand with income. Unemployment affects happiness negatively (Glatz and Eder, 2020; Pierewan and Tampubolon, 2015) although this relationship is not so simple. Luo (2020) suggests that there is at least one more important variable in the relationship between unemployment and happiness; material deprivation. Individuals who suffer from material deprivation during the period of unemployment feel unhappy. On the other hand, there are unemployed individuals that do not suffer from material deprivation. Those individuals can feel happy and even happier than during employment. Another important factor for unemployment and happiness is the quality of social institutions and their unemployment policies (Jakubow, 2016). In the current research, the focus is on unemployment, measured as unemployment rate, since it is not the aim to go too deeply into the relationship between unemployment and QoL.

There has not been much research done on the relationship between happiness and inflation. Raising the price of goods and services without raising income can cause a decrease in consumption, savings or both. Chen et al. (2014) have done research supporting this theory. The Harmonized index of customer prices is used in the current research because it uses the same customer basket for all our selected countries.

Papavlassopulos and Keppler (2011) have stated that: "We argue that life is valued for its quality, and, if positive, its extension is an improvement of well-being." In their study, life expectancy had a strong positive relationship to happiness and this relationship was as significant as the relationship of absolute income to individual happiness. Similar results have been presented by Jones and Klenow (2016) who found life expectancy had a positive relationship with subjective well-being. However, its importance varies in each country. Kageyama (2009) found gender was another important factor in the relationship between happiness and life expectancy. It is a fact that women live longer than men on average and this also affects happiness. Men are more stressed than women in general and this lowers their life expectancy. When men die, women become widows which can also lower their happiness. This relationship has not been analyzed in detail however since such findings are not the goal of this paper. However, this study is important as it shows the significant relationship between happiness and life expectancy. Veenhoven (2006) took the next step and combined happiness and life expectancy into one term Happy-Life-Year. The life expectancy at birth indicator from the Eurostat database was used in the current research. A significant positive relationship between life expectancy and happiness is expected.

Many researchers have dealt with the connection between corruption and well-being or happiness. In Lambsdorff (2007), corruption is defined as the misuse of public power for private gains. Corruption can have many consequences such as scaling down the trust among citizens. There is also evidence that trust increases happiness (Growiec and Growiec, 2013; Hommerich and Tiefenbach, 2018). Li (2016) used the happiness index from the WHR and corruption perception index (CPI) to find a negative relationship between a high level of corruption and decrease in the level of happiness. Amini and Douarin (2020) have presented the relationship between corruption and life satisfaction in Central and Eastern Europe (CEE). There is always a happiness gap between the former soviet countries and western European countries and they have concluded that corruption is the reason for this imbalance. Rodríguez-Pose and Maslauskaite (2012) have stated that: "different levels of individual happiness in CEE are therefore mostly determined by institutional factors such as corruption, government spending and decentralization." The transition countries are the focus of interest in a study by Bartolini et al. (2017). Their research is mostly concerned with social trust and the conclusion that social trust is a powerful predictor of the trends of SWB. To our knowledge, there has been no research in which all the EU countries are considered.

There have been various studies related to the work-life balance. It has been found that increasing working hours and overtime have a positive effect on life and job satisfaction, while the desire to reduce working hours has a negative impact on the satisfaction (Holly and Mohnen, 2012). Wirtz and Nachreiner (2010) have referred to the negative effects of long working hours on the subjective work-life balance.

Property rights or homeownership are also connected to happiness. There are relatively small number of studies, but all of them refer to the positive effect on happiness for homeowners (Cheng et al., 2016; Spruk and Kešeljević, 2016).

The importance of air quality as a determinant of life satisfaction is discussed in Ferreira et al. (2012). The impact of climate and air pollution conditions on happiness in the Spanish regions using individual-level data from the European Social Survey has been shown to be significant (Cunado and Perez De Gracia, 2012). In this study, the Eurostat indicator Greenhouse gas emissions per capita is used (Apergis, 2018) and it is assumed that it will have a negative effect on happiness.

2 RESEARCH METHODOLOGY

This study is based on the macroeconomic and social indicators published by Eurostat, the United Nations Development program, the Heritage Foundation and Sustainable Development Solutions Network. The subsequent selection of indicators is based on the previously mentioned studies. The research was focused on the member states of the European Union during the period 2010–2019. The United Kingdom and Malta were excluded from the dataset due to missing values. All the used variables, a brief description of them and the descriptive statistics are reported in Table 2. The variables GDP and DPD were transformed, using logarithmic transformation for further analysis.

First, the relationship between the WHI and HDI was examined using a correlation analysis to find out if the WHI is a suitable proxy for measuring subjective well-being. Spearman's correlation coefficients were used since the data did not have a normal distribution. This can be found in Table 1. The results showed a high correlation (above 0.8) for all the selected years and were statistically significant at 0.001 significance level. Yin et al. (2021) used data from over 150 countries in the period 2005–2018 to study the relationship between SWB and HDI. The authors used multiple OLS regression models and found out that HDI is a suitable indicator for measuring subjective well-being, more cognitive than affective one. This relationship was more prominent in rich western countries. Since the current correlation analysis showed a high positive correlation relationship between the WHI and HDI and the dataset consists of rich member states from the EU, it can be concluded that the WHI is a suitable indicator for measuring SWB.

Next, a regression analysis was carried out. The longitudinal character of the data was suitable to apply econometric methods for panel data. A OLS regression was done although panel regression models fitted the data better according to the Lagrange Multiplier Test (Breusch-Pagan) for unbalanced panels and F test for individual effects. The panel regression analysis was performed according to previous works (Kennedy, 2008; Park, 2011; Torres-Reyna, 2010). Several regression models for panel data were constructed and further analyzed, both with fixed and random effects. However, as suggested by Figure 1, the variables were strongly correlated which might affect the interpretations of the estimated coefficients. As a result, every variable was analyzed separately, by performing partial panel regression models as shown in Table 3. The preferred model selection was based on Hausman test results. The study checked for cross-sectional dependence (contemporaneous correlation) using a Pesaran CD test for cross-sectional dependence in panels, for serial correlation using a Breusch-Godfrey (Wooldridge) test for serial correlation in panel models and a Breusch-Pagan test for heteroskedasticity. The tests indicated the presence of the mentioned problems in the partial panel regression models, so a Panel-Corrected Standard Errors method was used to account for these problems (Bailey and Katz, 2011).

To check whether our results from partial panel regression models are robust, we run multiple panel regression model. To avoid problem with multicollinearity, we decided to run model with only one of the mentioned correlated variables in it. We chose GDP, because it is most commonly used variable associated with SWB. To clarify, we provide model specification in equation below, and characteristics of the complex panel regression model are shown in Table 4.

Table 1 Spearman's correlation coefficient between HDI and WHI for the years 2010–2019

	HDI10	HDI11	HDI12	HDI13	HDI14	HDI15	HDI16	HDI17	HDI18	HDI19
WHI10	0.873	0.884	0.895	0.880	0.875	0.876	0.870	0.875	0.880	0.866
WHI11	0.897	0.900	0.906	0.897	0.891	0.887	0.872	0.870	0.877	0.863
WHI12	0.865	0.868	0.876	0.885	0.879	0.878	0.866	0.867	0.874	0.861
WHI13	0.874	0.881	0.886	0.881	0.873	0.863	0.850	0.848	0.853	0.840
WHI14	0.834	0.842	0.855	0.852	0.848	0.847	0.834	0.839	0.843	0.831
WHI15	0.851	0.859	0.869	0.861	0.854	0.850	0.835	0.840	0.842	0.831
WHI16	0.820	0.824	0.834	0.831	0.821	0.825	0.814	0.816	0.822	0.805
WHI17	0.842	0.840	0.849	0.845	0.837	0.826	0.809	0.811	0.814	0.803
WHI18	0.877	0.877	0.879	0.877	0.872	0.859	0.845	0.846	0.852	0.838
WHI19	0.897	0.899	0.905	0.901	0.893	0.886	0.880	0.876	0.882	0.868

Source: Own research

$$WHI = \alpha + \beta_1 X_1 + \beta_2 ARP + \beta_3 UNE + \beta_4 WOW + \beta_5 GHE + \beta_6 HICP + \varepsilon .$$ (1)

Notes: α – intercept, β_i – coefficient, X_1 – one of five correlated variables, ε – error term.

The correlation analysis, panel regression analysis and other tests were performed in R version 4.1.1 and R Studio version 1.4.1717, The descriptive statistics were calculated using Excel 2019.

Table 2 Description and descriptive statistics of variables

Variable	Description	Source	Units of measurement	Min	Max	Average	Median	STDEV	N
HDI	Human development index	United Nations development program	Scale 0–1	0.788	0.955	0.883	0.884	0.040	260
WHI	World happiness index	Sustainable development solutions network	Scale 0–10	3.875	7.858	6.305	6.242	0.860	257
GDP	Real gross domestic product per capita	Eurostat	Chain linked volumes (2010) €	5 080.000	85 030.000	25 632.192	20 325.000	16 991.136	260
HICP	Harmonized index of customer prices	Eurostat	Annual average rate of change	−1.600	6.100	1.493	1.400	1.424	260
ARP	At risk of poverty rate	Eurostat	Total percentage	12.200	49.300	24.130	21.800	7.487	260
COR	Corruption perception index	Eurostat	Scale 0–100	33.000	94.000	63.569	61.000	15.848	260
UNE	Unemployment rate	Eurostat	Percentage of labor force population	2.000	27.500	9.404	8.000	4.859	260
LEB	Life expectancy at birth	Eurostat	In years	73.100	84.000	79.587	80.800	2.885	260
WOW	Average hours worked per week per employed person in a full-time job	Eurostat	In hours	38.400	44.600	41.143	40.900	1.069	260
PPR	Property rights	The Heritage Foundation	Scale 0–100	30.000	95.000	70.916	71.600	17.101	260
GHE	Greenhouse gas emissions per capita	Eurostat	In tons of CO_2	5.200	26.600	9.666	8.900	3.646	260
DPD	Adjusted gross disposable income of households per capita	Eurostat	In PPS (2010)	7 880.000	35 012.000	19 202.380	18 518.000	5 651.175	258

Notes: Min – minimum value, Max – maximum value, Average – arithmetic average, STD – standard deviation, N – total number of observations.
Source: Own research

Figure 1 Correlation analysis of variables
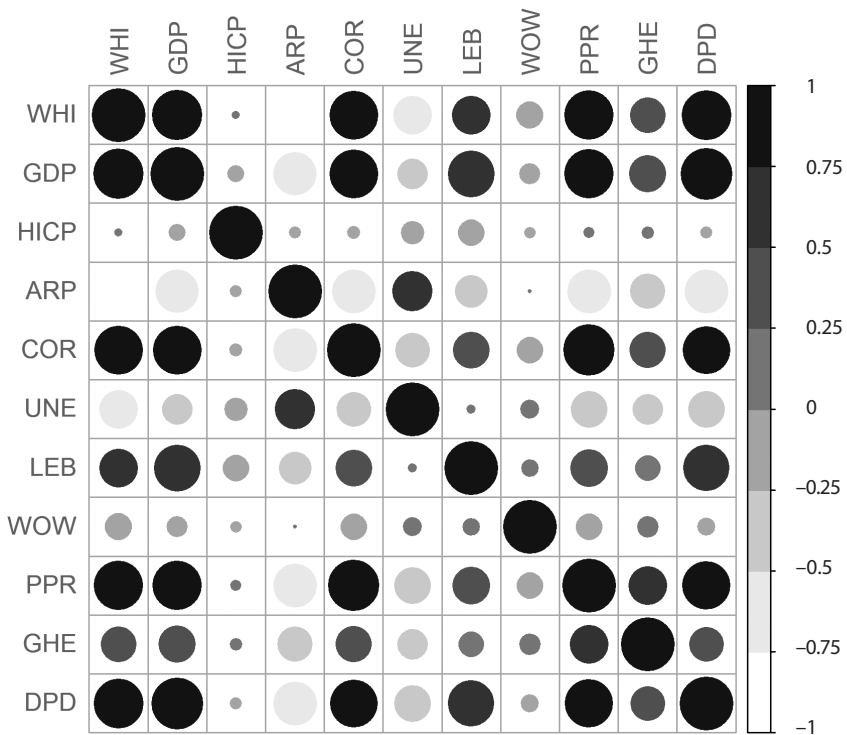
3 RESEARCH RESULTS

In this section the results from the panel regression analysis are discussed. There are only two out of the ten panel regression models which are not statistically significant in any of the considered significance levels. There are three models with a significant fixed effect and five models with a significant random effect (Table 3). The logarithmically transformed adjusted gross disposable income of households per capita explains almost 9 percent more variability of the dependent variable (in this case WHI used for measuring quality of life) than the logarithmically transformed gross domestic product per capita. This result is in line with Sen et al. (2010) which suggests that GDP is not always the most preferred measure for quality of life research. Both estimated coefficients for the income variables are significant and positive, so it can be concluded that there is a positive relationship between the material aspects of life and subjective well-being. Similar facts have also been previously found (Diener and Biswas-Diener, 2002; World Happiness Report, 2020). The coefficients for the logarithmic values of GDP and DPD are positive, which means that these results are not in accordance with the Easterlin Paradox. The current results suggest that an increase in income will cause an increase in happiness.

Poverty is one of the variables related to quality of life, supporting the previously mentioned relationship between the material aspect of life and quality of life. In the current model, the coefficient associated with the poverty variable is negative. This is consistent with other findings (Mood and Jonsson, 2016) where panel data methods were applied on individual longitudinal data from the Swedish Level-of-Living Survey suggesting poverty in general has a negative effect on social life.

Unemployment is closely related to subjective well-being. As expected, a negative relationship was discovered between unemployment and well-being. This is in line with other research (Beja, 2020) which showed that unemployment affects SWB in negative way and that the indirect cost of unemployment is about twice the size of the direct cost of unemployment. Another study (Van der Meer, 2014) also indicated the negative effect of being unemployed.

Inflation, the rising price level of goods and services in the economy, can influence subjective well-being in a negative way if not accompanied by a proportional rise in income. In this case, the real income of individuals decreases which can negatively affect SWB. In the current research, the relationship between inflation and subjective quality of life measured by the WHI is statistically insignificant and therefore no connection can be identified between the variables. This does not mean that there is no relationship between inflation and subjective well-being however. Rather, it means that this relationship was insignificant during the analyzed period in the selected countries. It should be noted that the dataset consisted of rich and financially stable western countries with relatively low levels of inflation. A similar study in China showed the negative effect of inflation on subjective happiness (Chen et al., 2014).

A first sight the results suggests that corruption raises subjective well-being, although when the Corruption perception index calculation is analyzed (0 representing a very high level of corruption and a score of 100 representing a very "clean" country) it can be seen that a rising level of corruption decreases subjective well-being. This is in line with the results from other studies (Amini and Douarin, 2020; Rodríguez-Pose and Maslauskaite, 2012). According to these studies, corruption negatively affects people's lives in two ways: Firstly, corruption mostly takes more money away from people with the fewest contacts in "high places" and acts as a cost of living in corrupt countries. Secondly, there is the psychological impact of paying a bribe for an otherwise free service.

Every individual wants to live a long and happy life. Life expectancy at birth predicts how long a newborn individual will live, so a positive relationship between life expectancy and the WHI was expected. Papavlassopulos and Keppler (2011) have found a strong positive relationship between life expectancy and happiness as have Cervellati and Sunde (2011). They found that rising life expectancy in highly dynamic economies had the potential to stimulate the economy from stagnation to growth by effective work allocation, which can also increase quality of life. The current research also showed the coefficient related to life expectancy at birth to be positive and statistically significant, supporting previous findings.

Everyone has limited time in their life. As a result, individuals need to distribute their time between work and other activities such as socializing with friends and family. In their study on 50 000 people in Italy, Mingo and Montecolle (2014) found leisure activities to be positively interrelated to happiness and well-being. Wirtz and Nachreiner (2010) also found a negative relationship between extended working time and subjective well-being. The current results are in line with these studies. The coefficient related to average working time is negative and significant and it can thus be concluded that there is a negative effect of increasing working time, which in turn lowers free time for individuals, on SWB, so people in general do not like to spend more time in work.

The property rights index is a sub-indicator of the Index of Economic Freedom (IEF) measured by the Heritage Foundation. It measures the extent to which an individual can accumulate capital freely, without restrictions from the government. Capital accumulation is a function of income which is related to SWB as mentioned at the beginning of this chapter. This study found that the possibility of accumulating capital freely had a positive relationship with subjective well-being. This supports previous findings which have shown the positive effect of economic freedom and property rights on subjective quality of life, although this relationship is only positive in the short-term (Spruk and Kešeljević, 2016). Another study examining this interrelationship in China (Cheng et al., 2016) found that property rights had an impact on SWB.

While the material aspects of life do matter, these macroeconomic indicators do not give the whole picture. Wu (1999) revealed a strong negative impact of economic growth side effects like air and water

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pollution on subjective well-being in China. This study uses the greenhouse gas emissions per capita indicator to at least touch on the topic of pollution and environment. This was inspired by Apergis (2018) who found a negative association between greenhouse gas emissions and personal well-being, both at an aggregate-country level and regional country level. He used a panel data methodological approach on 58 countries, including but not limited to the countries selected in the current research between 2005 and 2014. Surprisingly, the current results are in contrast to Apergis (2018). The current model is not significant in any of the considered significance levels, and it cannot be concluded that there is a relationship between greenhouse gas emissions per capita and SWB as measured by the WHI.

The results from multiple panel regression model were qualitatively the same as partial panel regression models. Coefficients decreased in absolute term, but this is expected in presence of other significant

Table 3 Characteristics of partial panel regression models

Variable	Preferred model	Coefficient	Significance	Coefficient of determination
Log(DPD)	Random	2.2574 (0.2387)	***	0.4817
ARP	Random	−0.0770 (0.0087)	***	0.4786
UNE	Random	−0.0723 (0.0101)	***	0.4011
Log(GDP)	Fixed	2.2908 (0.3806)	***	0.3934
LEB	Random	0.1934 (0.0426)	***	0.1784
PPR	Fixed	0.0171 (0.0047)	***	0.1493
COR	Fixed	0.0250 (0.0094)	**	0.0838
WOW	Random	−0.2754 (0.1190)	*	0.0653
GHE	Random	0.0271 (0.0396)		0.0045
HICP	Random	0.0004 (0.0184)		0.0001

Notes: Values are rounded mathematically to four decimal places. Standard errors of coefficients are in parentheses. *** denotes $p < 0.001$, ** $p < 0.01$, * $p < 0.05$, and · $p < 0.1$.
Source: Own research

Table 4 Characteristics of multiple panel regression model

Variable	Coefficient	Significance
Intercept	2.3376 (2.6715)	
Log(GDP)	0.7316 (0.1121)	***
ARP	−0.0403 (0.0065)	***
UNE	−0.0220 (0.0081)	**
WOW	−0.0498 (0.0530)	
GHE	−0.0095 (0.0119)	
HICP	0.0027 (0.0125)	
WOW	*	0.0653
GHE		0.0045
HICP		0.0001

Notes: Values are rounded mathematically to four decimal places. Standard errors of coefficients are in parentheses. *** denotes $p < 0.001$, ** $p < 0.01$, * $p < 0.05$, and · $p < 0.1$.
Source: Own research

predictors in a complex model. Similarly, to GDP model, we run alternative models with DPD, COR, PPR and LEB. All models were found to be significant on 0.001 significance level. We tested these five models as described in Section 2 of this article. Random and fixed effects were significant, there were no problem with cross-sectional dependence or serial autocorrelation, but GDP and DPD models had problem with heteroskedasticity present. To account for this a robust covariance matrix was used according to (Kennedy, 2008; Park, 2011) studies.

Unemployment and poverty indicators were significant, and their coefficients were negative in all different specification of models, while both income variables and corruption perception index were found to be significant and positively related to the dependent variable. The working time, emissions, inflation and property rights were not significant predictors throughout different specifications of models, so we can conclude, that our results from partial panel regression models are robust.

CONCLUSIONS

This paper shows that macroeconomic indicators are strongly related to subjective well-being by performing a panel data analysis on a dataset gathered from Eurostat, the United Nations Development program, The Heritage Foundation and Sustainable Development Solutions Network. The research was focused on member states of the European Union during the period 2010–2019. The World Happiness Index (WHI) from the World Happiness Report was used as the measure of subjective well-being. A positive relationship was found between income and wealth variables and quality of life. A negative relationship was also found between quality of life, poverty and unemployment. These findings lead us towards setting of a positive relationship between the material aspects of life, such as income or wealth, and subjective well-being. Thus, it can be concluded that this research does not support the Easterlin paradox, although there is more to this relationship than can be seen in the results. Fighting corruption will not only increase freedom but also increase subjective happiness. The amount of time spent at work can influence subjective well-being in negative way, since everyone has limited time in life and spending time at work means less time for family, friends or leisure activities, which can also influence health. Health goes along with environment. In the current research, a positive relationship was detected between life expectancy at birth and subjective happiness while the relationship between emissions and happiness was not significant. It can also be concluded that the relationship between selected variables and SWB does not change when using aggregated data instead of individual data, except emissions. However, this effect needs more attention in a separate study.

According to Azizan and Mahmud (2018), it is important to pay attention to the determinants of quality of life and subjective well-being in order to improve the overall quality of life of citizens. Their review study found income, wealth, employment and health to be the most important predictors of subjective well-being. Ngamaba (2016) has stated: "In order to decide what policies should be pursued in order to improve SWB there is a need to identify what the key drivers of SWB are." He used a cross-sectional multilevel random effects model on nationally representative data for 59 countries over the period 2010–2014. His results indicate that the most significant determinants of subjective well-being are health, household's financial satisfaction and freedom of choice. Diego-Rosell et al. (2018) have also shown that subjective material well-being and its objective determinants, including economic growth and income inequality, should remain at the center of the research and policy agenda. The current research is similar to these studies in that it examines the determinants, mostly macro economic ones, of subjective well-being. In line with those studies, the current results suggest that the most important predictors of subjective well-being are income, wealth, health and freedom in accumulating capital. This study differs from the other ones in variable selection and relatively long period of observation. It did not only include measurements of income like GDP and disposable income of households but also poverty,

unemployment, corruption, working time, life expectancy, inflation, emissions and property rights. To the best of our knowledge, there is no study like this in the existing body of literature.

From a policy perspective, the findings of this study suggest that it is important to focus on quality education in economics since it seems that people in the European Union are materialistically oriented. The negative impact of a materialistic lifestyle on subjective well-being and happiness has been shown by many researchers (Górnik-Durose, 2020; Kasser et al., 2014; Ng and Diener, 2014). In particular, Kasser et al. (2014) found that after a quick educational course people became less materialistic and happier. In other words, a proper education can lead people to a happier life as well as to a healthier one, at least from a psychological perspective.

This study also has its limitations. The first and biggest one is using an aggregated index for measuring subjective well-being and happiness. It is important to keep in mind that the goal was not to analyze the relationship of happiness and other macro-determinant in detail for each country, but rather focus on a longitudinal analysis for the entire European Union at once. The second limitation of this study is analyzing the entire group of European Union countries at once, without differentiating countries by degree of economic development. In future research it would be interesting to examine the relationships between the variables used in the article with attention to regions. However, there are no data that we are aware of for such an analysis at present. The third limitation is that more variables such as distribution of wealth in a country or quality of social institutions are needed to be taken into consideration when examining the impact of income and wealth on SWB. The fourth limitation of this study is its timing. The focus was on the period from 2010 to 2019, which were times of the economic crisis and post-crisis era. Future research should compare the determinants of happiness during such periods with a relatively stable macroeconomic environment, that we hope will come in the near future.

ACKNOWLEDGMENTS

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