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IMPACT OF MACROECONOMIC INDICATORS ON SUBJECTIVE SATISFACTION

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ABSTRACT

Several analyses have already shown that subjective satisfaction levels are closely correlated with economic performance, and therefore there is a growing focus for governments to monitor the level of satisfaction in society. In our study, we investigate the relationship between subjective satisfaction and financial market variables using macroeconomic data for European countries over the period 2013–2022. From a financial perspective, the savings and loans of the population are a very significant share of the financial sector, which is influenced by both market and governmental factors. In our analysis we include demographic, economic and financial market variables. We find that increases in the ratio of savings to household credit are positively correlated with subjective satisfaction, while changes in the central bank base rate have a negative impact on household satisfaction.
Keywords: happiness, satisfaction, savings, central bank interest rate
JEL codes: G51, G530

INTRODUCTION

The measurement of subjective satisfaction and research into its determinants have become increasingly important in recent years. Satisfaction as a measurable subjective factor is identified and used in the literature with the concept of happiness (*Helliwell et al.*, 2022), the development of which is influenced by a number of factors. In an economic approach, money, income and wealth are central among the determinants. Following the financial indicators of individual European countries, we see very significant differences in household savings and credit, for a number of reasons. These may include differences in levels of development, economic performance, wealth structure, income levels, or even the different structure of public finance systems. However, the undisputed goal of individuals and households is to achieve happiness and financial well-being. At the level of the national economy, a significant part of the population's income is saved for later use. The lack of financial awareness and knowledge necessary to use financial products safely may firstly reduce the financial resources and wealth of individuals and, indirectly, the savings of the economy, thus affecting financial stability at both micro and macro levels. On this

basis, we have therefore formulated the question of what impact the development of macroeconomic financial indicators has on subjective satisfaction.

The relationship between money and happiness has been central to the analysis of many happiness researchers. However, there are many ways of interpreting money as an economic instrument, such as money supply, money quantity, but of course most researchers approach the issue from the household side, considering income and/or wealth as the financial variable that influences subjective satisfaction. In the literature on the subject, *Easterlin* (1974) found a strong positive relationship between income and happiness, as did *Clark* (2011) and *Diener & Biswas-Diener* (2002). Analysing data from the 1990s, *Di Tella & MacCulloch* similarly found a positive correlation between happiness and income, welfare state and (poor) life expectancy among the population of OECD countries, but a negative correlation with average hours worked, environmental degradation, crime, openness to trade, inflation and unemployment.

Easterlin's later work further elaborated on his earlier results. He concluded that individuals compare their income with the income of other people. People with higher incomes may then feel happier. If they find that the increase in other people's incomes may be higher than their own, their feelings of happiness are negatively affected. In such cases, they consider relative growth rather than absolute wealth. It is found that, although happiness and income show a strong positive relationship in the short run, over time happiness does not increase in proportion to income growth. This is called the Eastrelin paradox. (*Easterlin & O'Connor,* 2021)

Kahneman & Deaton (2010) found that having more money does not necessarily buy more happiness, but having less money also brings emotional pain. They argue that above a certain income level, the increase in income alone does not lead to greater happiness, but rather to an increasing role for certain social factors such as being with loved ones, leisure, etc. A similar finding was made by Takács (2005), who analysed data from Hungary and concluded that, yes, ultimately money makes people happy, but only up to a certain level *Takács*, 2005 and *Parádi-Dolgos & Bareith* 2022 found a non-linear relationship between income growth and happiness.

Several studies have also shown that although wealth growth increases happiness, the rate of increase is not very large and that there is a positive relationship between wealth and happiness, while there is a negative relationship between debt and happiness (*Jantsch & Veenhoven,* 2019).

Guven (2012), in an analysis of Dutch households, showed that people who are happier save more and spend less, and have a lower propensity to consume. Happier people spend more time making decisions and have more control over their spending. They expect to live longer and are therefore more concerned about the future than the present, with low inflation expectations.

Cryder et al. (2008) found in their research that emotional state and short-term financial decisions are strongly correlated. *Clark et al.* (2008) demonstrated a positive independent effect of subjective confidence on risky financial investments and insurance products. However, the results also indicate that happier individuals are less likely to invest in these assets. This novel finding is consistent with the mood maintenance hypothesis, which posits that individuals in good moods are reluctant to gamble, for example, because they do not want to undermine their sense of

happiness. Thus, these individuals are relatively more risk averse. It is noteworthy that the negative economic impact of investing in risky financial products and insurance is stronger than the positive impact of safe low-risk products.

In *Mimura's* 2023 survey, the correlation between happiness and savings was examined using data from Japanese households in 2018 and 2019. He found that savings in the previous year were not associated with higher happiness levels one year later, but higher happiness levels one year later were associated with higher savings and investment (*Mimura*, 2023). *Liu et al.* (2019) empirical results from Chinese households showed that total household debt significantly reduces family happiness, and the effect of different types of debt on happiness is heterogeneous. Different sources of housing loans have different effects on happiness, and only non-bank loans significantly reduce people's happiness.

In their book *Frey & Stutzer* (2002) examined the relationship between happiness and economics and happiness and democracy in Switzerland. They found that income increased happiness only slightly, while democratic institutions and autonomy increased it more. Inflation and unemployment reduce happiness (*Frey & Stutzer*, 2002).

In his 2013 paper, Easterlin examined growth in countries with different levels of economic development in relation to happiness in the long and short term. He concluded that economic growth does not cause happiness growth. In some cases, such as China, short-term happiness growth has not been demonstrated (*Easterlin*, 2013).

However, more recent research is now concluding that happiness is increasingly influenced by a variety of social factors, personal relationships, mental state, political issues, etc., in addition to economic and income factors (*Layard*, 2005; *Diener & Seligman*, 2004; *Helliwell & Putnam*, 2004).

MATERIALS AND METHODS

In our analysis we looked at the relationship between subjective satisfaction and savings. To do this, we included variables based on the literature and economic context. Our dependent variable was the happiness index published by the United Nations in the World Happiness Report. As an independent variable we collected data that have a significant impact on the financial and economic situation of a country. The net wealth of the population plays a significant role in maintaining the stability of the financial system, and so the stock of savings and loans was included as our variable. Both of these indicators are significantly affected by the level of the base rate of the central bank of the country in question, and have thus been added to our database. We have then collected variables that may be related to these data (inflation, consumption, GDP), as well as indicators on population (population density, unemployment, birth and death rates), development (HDI, education expenditure) and income (Gini Index). These data are correlated, so our results are only meaningful for developed countries.

For the analysis, the data were collected in a panel database, on which regression analysis was performed using the random effect method. We included 40 European countries in the study, for which we collected data from the period 2013–2022.

The study started by constructing a regression model with all variables included together. The results are presented in *Table 1*. During the analysis, we found that some variables showed an opposite relationship to our expectations, and there were also variables that did not yield a significant relationship. We therefore decided to group the variables into groups and thus construct different regression models. The variables were finally sorted into 3 groups: demographic variables, economic factors and financial indicators. Regression analysis was also performed for each group separately. In the present analysis, we assumed a linear relationship between these variables. In the future we would like to extend this with a logarithm model.

Calculations were performed using STATA version 17 software.

RESULTS AND DISCUSSION

The results of regression analysis to explore the determinants of happiness are presented in *Table 1*.

Table 1: Relationship between factors affecting subjective satisfaction

Variables		Demographic variables	Economic variables	Financial variables
	Coefficients	P-value	P-value	P-value
HDI	12.11389	0.000		
Female unemployment rate	-0.0513242	0.003		
Male unemployment rate	0.0592987	0.004		
Population density				
Life expectancy at birth for women	0.0002572	0.024		
	-0.0235407	0.436		
Life expectancy at birth for male				
	0.0258687	0.235		
Mortality rate				
Fertility rate	0.0364793	0.049		
Education expenditure	0.6014822	0.000		
	-0.0335093	0.278		
GINI Index	-0.0408373		0.000	
GDP per capita	0.00000966		0.009	
Household consumption	-0.0011153		0.896	
HICP				
EU membership	0.0071163		0.676	
	-0.1832671		0.095	
Household savings stock	0.0013237			0.876
Bank base rate				
Stock of loans to households	0.0486692			0.021
	0.0033361			0.003

In the analysis, we found that we obtained non-significant results for variables for which we expected a closer relationship. Of these, the stock of savings was the most

surprising, as we had assumed a positive relationship. People who have some savings are less stressed about the future, feel more secure about their financial situation and are therefore happier. The education expenditure variable showed an opposite non-significant relationship with our expectations. Here, we hypothesised that people in countries with higher spending on education would have higher educational attainment, better working conditions, higher wages and thus be happier. The relationship between household consumption and happiness also yielded some surprising results. We hypothesised that higher consumption means higher need satisfaction for people, and thus a higher sense of happiness. In contrast, the result showed that there is no relationship between the two variables. Life expectancy at birth did not show a significant relationship for either sex. However, the mortality rate and fertility rate showed significant positive results. There are important economic considerations behind these. In the case of higher mortality rates, this means that there will be a lower proportion of retired people, which will put less strain on the pension system. And in the case of a rising fertility rate, if more children are born, there will be a higher share of the active population, which can improve economic performance.

As a first sub-analysis, demographic factors were examined in relation to the happiness index (R^2=0.7725). No significant results were obtained for the male unemployment rate (p=0.702) and population density (p=0.179), nor for the death rate (p=0.606). Significant and positive directional relationships were found with HDI (p=0.000), male life expectancy at birth (p=0.000), fertility rate (p=0.000) and education expenditure (p=0.000). Significant and negative directional relationships were found with female unemployment rate (p=0.001) and female life expectancy at birth (p=0.001). The results are presented in *Table 2*.

Table 2: Relationship between happiness and demographic factors

Variables	Coefficients	P-value
HDI	8.4580	0.000
Female unemployment rate	-0.0480	0.001
Male unemployment rate	0.0065	0.702
Population density	-0.0001	0.179
Life expectancy at birth for women	-0.0767	0.001
Male life expectancy at birth	0.0942	0.000
Mortality rate	0.0066	0.606
Fertility rate	0.5333	0.000
Education expenditure	0.0713	0.000

Looking at unemployment, no significant correlation was found for men, while a negative effect was found for women. Looking at life expectancy at birth by gender, we also found a negative correlation for women. Unsurprisingly, in countries where the HDI (Human Development Index) is higher, this also has a positive effect on the happiness of the population. In this case, we have shown that increased spending on education also increases happiness.

In the next part of the analysis, economic factors were examined (R2=0.6791). Consumption (p=0.804) and HICP (p=0.635) did not show a significant correlation with happiness. A significant positive relationship was found for GDP per capita (p=0.000), although the effect was very small. A significant negative relationship was found for EU membership (p=0.041) and the GINI Index (p=0.000). The results are presented in *Table 3*.

Table 3: The relationship between happiness and economic factors

Variables	Coefficients	P-value
GINI Index	-0.0824	0.000
GDP per capita	0.0000	0.000
Household consumption	-0.0015	0.804
HICP	0.0076	0.635
EU membership	-0.1901	0.041

As in the original model, consumption is not significant, so we concluded that there is no correlation between happiness and consumption over this 10-year period for the countries we studied. The same conclusion can be drawn for the Harmonised Index of Consumer Prices (HICP). The GINI Index measures income inequality, which we have shown to have a negative relationship with happiness, i.e., if income inequality increases in a country, people's happiness and satisfaction decreases. The level of GDP per capita increases subjective satisfaction, but only to a very small extent.

We concluded the analysis by examining the financial indicators (R2=0.4756). All variables included in the analysis showed significant results (p=0.000), with savings and credit showing a positive relationship and the central bank base rate showing a negative relationship. In this category, further extension of the set of variables included is needed. The results are presented in *Table 4*.

Table 4: Relationship between happiness and financial factors

Variables	Coefficients	P-value
Household savings stock	0.0541	0.000
Bank base rate	-0.0389	0.000
Stock of loans to households	0.0097	0.000

In the analysis of financial indicators, we examined the evolution of the base rate of the central bank in the same year with the savings and loans position in the same year. Taking into account the lag effect would presumably show a different result. We intend to investigate this in a later stage. The household savings stock is positively correlated with happiness, i.e., if one's savings increase, one feels more secure about the future, both in terms of contingencies and long-term security, and is less stressed about one's financial situation, and therefore happier. There is also a positive correlation for credit. This is explained by the fact that the increase in credit is driven

by an increase in certain assets (e.g. property, car, etc.), which also leads to an increase in the feeling of security and therefore an increase in happiness for the population. In the case of the base rate of the central bank, a negative correlation was found, i.e., an increase in the base rate leads to a decrease in the feeling of happiness.

CONCLUSIONS

As we have seen in many literatures, we have identified subjective satisfaction with happiness. Based on their results, we concluded that household savings and credit have a positive effect on happiness. An increasing savings stock is consistent with previous analyses, i.e., it increases satisfaction, the sense of security and leads to positive macroeconomic effects. Likewise, this positive effect is also observed through the increase in wealth that can be achieved through credit. However, a negative relationship was found with the base rate of the central bank. The evolution of the central bank base rate has a double dimension. As we have seen in recent years in Hungary, an increase in the base rate of the central bank encourages the population to turn to safer forms of savings (e.g. government bonds). However, it has a negative impact on borrowing due to higher interest rates, which may lead to a postponement of investments and renovations.

As a further step, it may be worthwhile to investigate what correlations can be identified for the financial variables when the lagged effect is taken into account. We also want to overcome the limitation of assuming a linear relationship.

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