

The Assessment of the Effect of Tree Cover and Consumption on the Happiness Index

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Abstract

Happiness is mainly related to the subjective evaluation of life consisting of different variables and is also affected by various factors. One of these factors is that consumption meets basic physical needs, luxury purchases, and psychological satisfaction. On the other side, quality of life improves, and the level of happiness rises if human keeps their connection with nature. In this context, we aim to analyze the link between tree cover and consumption with the happiness index using 31 selected countries' data. For this purpose, we used the method of pooling ordinary least squares. The results suit our argument that tree cover is more effective than consumption for a higher happiness level. By paying more attention to the tree cover and the environment, we can be happier and leave a more livable world to the next generations.

1 Introduction

Capitalist ideas have shaped the cities we live in and have turned into places of consumption. Although we perceive that consumption through advertisements is synonymous with happiness, does our entire life depend solely on our level of consumption, or does it lie beyond it (Abdallah et al., 2009)? When we look at Maslow's hierarchy of needs, consumption plays a significant role in our lives since it meets our nutritional needs and provides a certain level of satisfaction, enhancing our happiness. There are many studies analyzing the linkage between consumption and happiness. The definite result demonstrates the positive effect of consumption on happiness. Besides that, this result may not mean that more and more consumption is simultaneous with more and more happiness. Moreover, there is an overlooked point on this issue about happiness. Happiness consists of various components and requires that all the components are balanced.

In lots of studies, the environment is one of these components. People make connections with and live in nature, having an impact on their happiness level. Environmental settings in which people live account for the benefits of trees on the ecological side, such as mitigating air pollution and cooling down the heat. On the physical health of individuals, preventing asthma, improving the immune system, enhancing the health of heart and sleep quality, and prolonging life are the benefits. Reducing stress, feeling rejuvenated, and helping to heal depression are related to psychological wellness; as a result, people turn to trustier and more bountiful (Great Northern Regreenery, 2021).

In this regard, we want to focus on neither consumerism nor ecological consumption; we want to depict something more valuable beyond the daily hustle and bustle. Furthermore, we want to draw attention to natural/green and illustrate that living together is one of the most significant values in our lives. In this way, the next chapter describes the happiness and well-being. The benefits of the pleasure of consumption and green are in the third and fourth chapters, respectively. The last chapter includes methodology and analysis.

2 What is Happiness?

When considering the definition of happiness, it is logical to begin with Aristotle's happiness classification. He defines happiness with four levels: lateus, felix, beatitudo, and sublime beatitudo. In the lateus level, happiness comes from material objects; ego gratification constitutes felix; making the world a better place is beatitudo. The last stage, sublime beatitudo, describes perfect happiness in which we reach the completed act of being. In a nutshell, He stated, "Happiness is the meaning and the purpose of life, the whole aim and end of human existence (...) Happiness depends upon ourselves" (The World Counts, n. a.).

Daniel Nettle (2006) puts happiness into three levels in his "Happiness: The Science Behind Your Smile" book. The first level relates to feelings of joy and pleasure from various activities. The second level refers to well-being and a judgment or assessment about your previous experiments/feelings and other people. Happiness at the third level relates to self-actualization, like the ultimate apex of Maslow's hierarchy triangle (The World Counts, n. a.).

The query is whether the definition of happiness is simple satisfaction or beyond. One of the main arguments about happiness is the relationship with the subjective well-being concept since there was no consensus. Easterlin (1974) says that "happiness is not confined to economic well-being, [...] it corresponds to the broader concept of social welfare" (Proschle, 2020). Furthermore, Allin (2007) expresses that we can use well-being, quality of life, happiness, life satisfaction, and welfare interchangeably, but they have different meanings and concepts. In this step, we look closer at happiness and well-being by identifying two kinds of well-being. Objective well-being refers to material measurements of a person, such as income, nutrition, dwelling, education, and health. Collected individual data give an opinion indirectly for the well-being level of that person. Thus, this measurement becomes

a proxy for well-being. In subjective well-being data, we ask the people how they think about anything reflecting their life quality (Oman, 2021).

Oman (2021) states, “We also discovered that happiness and well-being are linked, but different and hard to define.” In contrast, the OECD (2013) accepts that they are synonyms and confesses that well-being covers a broader context. OECD defines well-being as “good mental states, including all of the various evaluations, positive and negative, that people make of their lives and the affective reactions of people to their experiences.” In the well-being concept, the OECD (2013) mentions that subjective well-being has three components: eudaimonic (flourishing), evaluative, and affect. The eudaimonic component includes the realization of self-potential, while evaluative and affective components connect with both capabilities and outcomes. Happiness is closely linked to eudaimonia because of the psychological part. Contrary to the other two approaches, Dutt (2006) examines the issue regarding subjective well-being and argues that subjective well-being cannot measure happiness. In particular, she insists that happiness includes more than well-being from a descriptive point of view.

Stanca and Veenhoven (2015) state that the term happiness looks like an umbrella covering various life quality indicators and corresponding them. In this context, we can categorize the quality of life into four groups:

- The livability of the environment
- The life-ability of the person
- The usefulness of life
- The satisfaction with life

The first term mentions physical conditions as preconditions of happiness. The second term, the life-ability of the person, refers to the capability of daily struggles. Life usefulness, the third term, is much more than a good lifetime and corresponds to the higher ideal. Satisfaction with life is relevant to the inner consequences of life and corresponds to the well-being concept (p.92-93). In this vein, they insist that happiness is not the same as well-being under permanent versus transitory or passing versus enduring satisfaction levels.

3 Consumption

A consensus exists that there is a positive causality from income to happiness. However, Headey et al. (2008) state that consumption data are more suitable for measurements of utility, satisfaction, or living standards. If consumption is a valid indicator of happiness-related values, the significant step is how this happens. The consumption process can realize life-enhancing goods groups (durable, food, housing, etc.), visible consumption (luxury products demonstrating status), and leisure activities (experience purchases) (Cheng et al., 2016; Kaus, 2013; Pugno, 2009 in Wang et al., 2019).

There are various motives to perform consumption for necessities or more. Necessities serve for the maintenance of life and, thus, well-being. However, more than this level of consumption might be mainly related to happiness. There are various indicators affecting the level of consumption. One is related to the other's consumption. In this way, the relative income hypothesis (Duesenberry, 1949) makes a base for consumption choices by depending on our decisions on others. Moreover, we notice the style of consumption adjusted to the expenditures of others, motivated by high income, utility, information issues (social interaction activities), network externalities (means of communication), norms, and status. The perception and attractiveness of consumption raise someone's purchases as others increase (Dutt, 2016).

Veenhoven is a pioneer in consumption studies and has done lots of studies with colleagues or sole while getting on which consumption patterns assure happiness. Of them, Burger et al. (2015) divide consumption as daily expenses, necessities, durable goods, education, food, health care, housing, transport, utilities, experience purchases (art, expenditure on leisure, luxury, etc.), and different kinds of ownership. Except for some variables, they reveal that consumption is not an absolute requirement for happiness. Besides this conclusion, there is no evidence in favor of the reducing role of consumption on happiness. The overall result suggests a Calvinist consumption style.

In this regard, consumption mostly belongs to the partitive and short-term satisfaction and happiness. So, this kind of satisfaction is different from life satisfaction. Moreover, the connection point between happiness and consumption is a utility (Stanca and Veenhoven, 2015). The impact of utility on happiness depends on what utility sources. Kahneman and Thaler (2006) distinguish between expectations and experiences, impacting the utility experienced in terms of happiness. Closely to Duesenberry, Rainwater (1974) accepts consumption as a sign of belonging to a society.

On the other hand, Cantril (1965) considers relative consumption as a determinative of well-being. Rainwater follows the same path as Easterlin (1974) for consumption. In other words, more consumption leads to more happiness, but the continuous increase in consumption does not mean the level of happiness increases (McNally, 1980, p.382). On this level, Stanca and Veenhoven (2015) question the link between consumption and happiness in two statements: the optimum level of consumption and the kind of experiences.

4 Trees, Canopy, and All Other Green Environment

In literature, we can classify the benefits of all green-related measurements as environmental, psychical, and physiological. Trees play two major critical roles for all of us by cleaning and refreshing the air. Therefore, trees benefit the ecological and human beings, such as heat stress, obesity, cardiovascular issues, etc. (Jones, 2021; Mouratidis, 2019). Environmental and physical sides are apparent and the subject of another study. We particularly mention the physiological benefits, meaning subjective well-being, life satisfaction, happiness, etc. To explain green-related well-being (thus happiness), we can evaluate three theories: Attention Restoration Theory, Stress Reduction Theory, and Biophilia Hypothesis.

Attention Restoration Theory, depicted by Kaplan and Kaplan (1989), tries to demonstrate that the natural environment helps people's minds to relieve from daily modern life routines causing mental fatigue. Due to lots of duties, people turn to be mindfully intense. Since green covers do not require such cognitive attention, they are beneficial for anti-stress (Ohly et al., 2016). They maintain the argument via the primary recovery sourcing from involuntary attention to nature. In contrast, our tasks need voluntary attention and become demanding actions that complete our mindful capacity. Nature improves mental power through involuntary/automatic attention (Ohly et al., 2016; Mouratidi, 2019).

Ulrich et al. (1991) propose a central question of whether any environment is healing the stress stemming from health or environmental issues. Another study of Ulrich's (1983) psycho-evolutionary theory inspired the stress reduction theory, and this theory accepts humans as a part of nature, not urban life. In this way, humans improve their mental disorders or find a remedy for stress by occupying a friendly nature more efficiently than in urban settings.

Ulrich, Kellert, and Wilson (1993) propose the Biophilia Hypothesis using an evolutionary perspective. Humans have spent more time in a natural environment than in an urban environment for a long time, and settled life has occurred much more recently. Therefore, we can meet our psychological needs by interacting with the nature with which we are familiar (Capaldi et al., 2014).

5 Methodology and Analysis

This paper aims to discover the dynamics of happiness with tree cover and consumption for both the short and long run. Our main argument asserts mainly the short-run impact of consumption and, however, the long-run effect of tree cover on happiness. Moreover, we aim to illustrate the potency of tree cover compared to consumption. Unfortunately, limited data for happiness (*hap_ind*) hinders dynamic analysis. So, we made a linear panel data analysis with pooled data. Our data ranges from 2013 to 2020 yearly period. We got the happiness index data between 0 (unhappy) and -10 (happy) from the Global Economy Rankings (2022). We chose the countries according to average happiness level (6.28) for eight years, and thus, we counted 31 countries except one country because of data unavailability in consumption. Moreover, we collected households' consumption (*hh_cons*) and tree cover percentage (*tree_cov*) from World Bank statistics (2023a and 2023b). Descriptive statistics are in Table 1.

Variable(s)	Obs	Mean	Std. Dev.	Min	Max
<i>hap_ind</i>	217	6.972488	0.427841	5.93	7.84
<i>tree_cov</i>	248	30.27845	19.06059	0.466474	73.73565
<i>hh_cons</i>	248	20283.2	10161.46	3170.962	44823.39

Table 1. Descriptive Statistics

In the first step of the analysis, we checked stationary conditions in panel units. Variables were stationary according to the Fisher-type Dickey-Fuller unit root test (Maddala and Wu, 1999).

ADF regression with drift -L (0)	<i>hap_ind</i>	<i>tree_cov</i>	<i>hh_cons</i>
Inverse chi-squared (62) P	105.0275	156.9991	130.7489
Inverse normal Z	-3.4191	-6.0958	-5.5266
Inverse logit t (159) L*	-3.4216	-6.5253	-5.3182
Modified inv. Chi-squared Pm	3.864	8.5312	6.1738

* All p-values are below 0.001

Table 2. Stationarity Detection

Then, we made the regression analysis with pooled data since we evaluated the countries with high happiness levels as unique. Pooled ordinary least square equation and results are as follows (Wooldridge, 2002).

$$Y_{it} = \beta_0 + \beta_1 X_{1it} + \beta_2 X_{2it} + \varepsilon_{it}$$

<i>hap_ind</i>	Coef.	Std. Err.	t	P> t	[95% Conf. Interval]
<i>tree_cov</i>	0.003782	0.001178	3.21	0.0020	0.001459 0.006104

hh_cons	0.000027	2.20E-06	12.28	0.0000	2.27E-05	3.14E-05
_cons	6.30766	0.064487	97.81	0.0000	6.180549	6.434771

Table 3. Regression Results

Table 3 illustrates regression analysis in which coefficients of parameters are statistically significant. Tree coverage is much greater than household consumption, as expected. A unit increase in tree cover and consumption caused approximately 3.8E-03 and 2.7E-05 units to increase in happiness index, respectively. 1% increase in tree cover rates led to an approximately 0.0038 unit increase in the happiness index level. Conversely, a unit rise in consumption level made by individuals causes a 0.000027-unit rise in happiness value.

6 Conclusion

Consumption improves our welfare and makes us happy. On the other hand, spending time with nature surrounded by trees helps our psychological part of safety, happiness, and stress. Our conclusion confirms the power of tree cover over happiness rather than consumption. Further research can analyze the impact of tree covers and consumption via dynamic patterns. Thus, we reveal short-run and long-run relationships between happiness index with consumption and tree cover.

References

- Abdallah, S., Thompson, S., Michaelson, J., Marks, N. and Steuer, N., 2009. The Happy Planet Index 2.0. Why good lives don't have to cost the Earth. New Economics Foundation, UK. <http://www.happyplanetindex.org/learn/download-report.html>
- Allin, P. 2007. Measuring societal wellbeing. *Econ Lab Market Rev* 1, 46–52. <https://doi.org/10.1057/palgrave.elmr.1410157>
- Burger, Chiperi, Kang, and Veenhoven, 2015. "Happiness and Consumption: A review of research", in 14th International Conference on Travel Behavior Research, Winsor UK July 19-23.
- Cantril, Hadley. 1965. **The Pattern of Human Concerns**. New Brunswick, N.J.: Rutgers University Press.
- Capaldi, C. A., Dopko, R. L., & Zelenski, J. M. 2014. "The relationship between nature connectedness and happiness: A meta-analysis". *Frontiers in psychology*, 976.
- Cheng, Z., King, S. P., Smyth, R., & Wang, H. (2016). "Housing property rights and subjective wellbeing in urban China". *European Journal of Political Economy*, 45, 160-174.
- Duesenberry, J. S. 1949. **Income, saving, and the theory of consumer behavior**. Harvard University Press, Cambridge
- Dutt, 2006. "Consumption and happiness: Alternative approaches", *New Directions in the Study of Happiness*, 1-58. P.1
- Easterlin, R. A. 1974. Does economic growth improve the human lot? Some empirical evidence, *In Nations and households in economic growth (pp. 89-125)*. Academic press.
- Great Northern Regreenery, 2021. How Trees Can Make You Healthier and Happier. Access date: 13.06.2023. <https://www.greatnorthernregreenery.com/how-trees-make-you-healthier-happier/>
- Headey, B., Muffels, R., & Wooden, M. 2008. "Money does not buy happiness: Or does it? A reassessment based on the combined effects of wealth, income and consumption". *Social Indicators Research*, 87, p.65-82.
- Jones, B. A. 2021. "Planting urban trees to improve quality of life? The life satisfaction impacts of urban afforestation". *Forest Policy and Economics*, 125, p.102408.
- Kahneman, D., & Thaler, R. H. 2006. "Anomalies: Utility maximization and experienced utility". *Journal of economic perspectives*, 20(1), pp221-234.
- Kaus, W. 2013. "Conspicuous consumption and "race": Evidence from South Africa". *Journal of Development Economics*, 100(1), p.63-73.
- Kellert, S. R., & Wilson, E. O. (Eds.), 1995. **The biophilia hypothesis**. Island press.
- Maddala, G. S., & Wu, S. 1999. "A comparative study of unit root tests with panel data and a new simple test". *Oxford Bulletin of Economics and statistics*, 61(S1), p.631-652.
- McNally, M. 1980. "Consumption, utility, and social process". *Journal of Post Keynesian Economics*, 2(3), p.381-391.
- Mouratidis, K. 2019. "The impact of urban tree cover on perceived safety". *Urban Forestry & Urban Greening*, 44, p.126434.
- Nettle, D. 2006. **Happiness: The Science behind Your Smile**. Oxford University Press.

- OECD. 2013. **In OECD guidelines on measuring subjective well-being**. Paris: OECD, Publishing. <https://doi.org/10.1787/9789264191655-en>.
- Ohly, H., White, M. P., Wheeler, B. W., Bethel, A., Ukoumunne, O. C., Nikolaou, V., & Garside, R. 2016. "Attention Restoration Theory: A systematic review of the attention restoration potential of exposure to natural environments". *Journal of Toxicology and Environmental Health, Part B*, **19(7)**, p.305-343.
- Oman, S. 2021. **Understanding well-being data: Improving social and cultural policy, practice, and research**. Springer Nature Switzerland AG.
- Proschle, 2020. Consumption and Happiness: How do they relate? University of Freiburg. Access date: 15.06.2023. <https://www.megforum.uni-freiburg.de/prevfora/Forum%202012/SOE%202012%20papers/Consumption%20and%20Happiness>
- Proschle, 2020. Consumption and Happiness: How do they relate? University of Freiburg. Access date: 15.06.2023. <https://www.megforum.uni-freiburg.de/prevfora/Forum%202012/SOE%202012%20papers/Consumption%20and%20Happiness>
- Pugno, M. 2009. "The Easterlin paradox and the decline of social capital: An integrated explanation". *The Journal of Socio-Economics*, **38(4)**, p.590-600.
- Rainwater, L. 1974. **What money buys**. New York: Basic Books.
- Stanca, L., & Veenhoven, R. 2015. "Consumption and happiness: An introduction". *International Review of Economics*, **62**, p.91-99.
- The Global Economy, 2022. Happiness index - Country rankings, <https://www.theglobaleconomy.com/rankings/happiness/>
- The World Counts, n.a. Four levels of happiness. Access date: 23.06.2023. <https://www.theworldcounts.com/purpose/four-levels-of-happiness>
- The World Counts, n.a. Types of Happiness in Psychology. Access date: 23.06.2023. <https://www.theworldcounts.com/purpose/types-of-happiness-in-psychology>
- Ulrich, R. S. 1983. "Aesthetic and affective response to natural environment". *Behavior and the natural environment*, p.85-125.
- Ulrich, R. S., Simons, R. F., Losito, B. D., Fiorito, E., Miles, M. A., & Zelson, M. 1991. "Stress recovery during exposure to natural and urban environments". *Journal of environmental psychology*, **11(3)**, p.201-230.
- Wang, H., Cheng, Z., & Smyth, R. 2019. "Consumption and happiness". *The Journal of Development Studies*, **55(1)**, p.120-136.
- Wooldridge, J. M. 2002. **Econometric analysis of cross section and panel data**. MIT press. Cambridge, Massachusetts
- World bank statistics. 2023a. Households and NPISHs Final consumption expenditure (constant 2015 US\$). <https://data.worldbank.org/indicator/NE.CON.PRVT.PC.KD>
- World bank statistics. 2023b. Forest area (% of land area). <https://data.worldbank.org/indicator/AG.LND.FRST.ZS>